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Cumulative Causation

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Abstract

Cumulative causation arises when a process is self-reinforcing and grows ever stronger, so that it does not equilibrate. It will continue indefinitely unless it is checked by outside intervention or leads to a crisis and systemic breakdown. Ideas of cumulative causation have numerous applications in economics and other social sciences, investigated by authors such as Nicholas Kaldor, Gunnar Myrdal and Albert Hirschman. In human geography, cumulative processes have particular relevance for inequalities between rich and poor regions, implying that without intervention the gaps will widen. This article discusses the nature of cumulative causation, examines its general features, and assesses its geographical consequences at national and global levels.

Keywords: increasing returns; vicious and virtuous circles; disequilibrium; Matthew effect; unequal development; regional policies

Definition

Cumulative causation occurs when changes within a system are persistent, self-reinforcing and strengthen over time: instead of slowing down, they accelerate and intensify. No countervailing forces dampen the changes and reverse them to restore equilibrium. A cumulative process is unstable, so that small disturbances to the system will snowball into major long-term trends. The self-reinforcing quality hinges on positive feedback that encourages further changes of the same type. Once started, a cumulative process will not come to an end of its own accord; unless checked by some external agency, it will carry on. Since the unbounded changes may ultimately threaten the system, it can also be terminated through systemic crisis.

With such a general definition, cumulative causation has myriad applications that span many academic disciplines. Examples can be found in natural sciences such as physics, chemistry and biology, in applied sciences such as engineering, electronics and meteorology, and in social sciences such as economics, sociology, psychology and geography. The present article dwells on social applications germane to human geography. It first looks at theories of cumulative causation, before considering its general features and then moving on to implications for human geography at national and global levels.

Theoretical Background

Theorizing about cumulative causation in social science has often been traced back to American institutional economists in the late-nineteenth and early-twentieth centuries. The key figure was Thorstein Veblen, who referred frequently to cumulative processes in his case for evolutionary economics. His ideas were a retort to the emerging school of neoclassical economics, which depended heavily on equilibrium assumptions. Neoclassicism, for Veblen, embodied a static and mechanical outlook incapable of offering an adequate account of economic evolution. As an alternative, he made a plea for a genuine evolutionary economics.

Cumulative processes were the vehicle of long-run change, underlying the rapid economic and social transformations that have marked the capitalist era.

While Veblen's thoughts on cumulative causation were expressed in general terms, a more detailed theoretical picture was put forward by Allyn Young. Drawing on Adam Smith's arguments about the division of labor, Young noted the connections between specialization, larger market size and improved productivity. Economies of scale will not be confined to individual firms but spread over an industry as a whole, given the interdependence of closely linked firms using each other's products. These external economies promote cumulative growth that never settles down to equilibrium. Higher productivity, lower costs, lower prices and increased demand will drive the expansion of the industry and the economy.

The work of Young inspired Nicholas Kaldor, who went on to explore the full economic significance of cumulative causation. Kaldor stressed the ubiquity of economies of scale: alongside economies internal to firms, there are external economies from increased specialization and links among firms, dynamic economies from new technology and knowledge, and economies of scope from joint production and distribution. Together, these scale economies guarantee that the economy does not equilibrate. Kaldor's views were elaborated into a broad critique of neoclassical economics and other equilibrium theories. He justified his conclusions with empirical research, the basis for Kaldor's growth laws, which declare manufacturing as the engine of growth and chief source of scale economies. The resulting policy advice was interventionist. An economy could not be self-correcting, hence the need for Keynesian macroeconomics and regional policies.

Social aspects of cumulative causation were elucidated by Gunnar Myrdal. Having started his career as a conventional economist, Myrdal became disillusioned with orthodox theory and turned towards American institutionalism. His prime interest was the divisive social aftermath of cumulative processes, whereby the rich gain ever more privileges and the poor fall further and further behind. Early research by Myrdal dealt with the circular causality across many dimensions that held back the progress of black people in the USA and led to their disadvantages becoming institutionalized. Later work examined global inequalities and the forces abetting them. Internal and external economies of scale were the salient influences:

poorer regions suffered ‘backwash effects’ through loss of population, rising average ages, low levels of welfare, outflow of capital, and a pervasive aura of decay. ‘Spread effects’ that disseminate the prosperity of growing regions were a possibility, but far weaker than the backwash effects. Without a policy response, current inequalities would swell to create lasting divisions.

Another prominent writer on cumulative causation at the global level was Albert Hirschman. Successful economic development, in Hirschman’s view, required inter-industry linkages among firms that expand together in mutually supportive relationships. Backward linkages promote the supply of inputs into new industries; forward linkages promote the processing, distribution and retailing of new, semi-finished outputs. The stronger are the inter-industry linkages, the faster will be the growth rate of the region or country. Poorer countries with natural resources but without the industrial infrastructure and linkages will see little economic development, despite the potential for this. The best way out of the impasse is to pursue unbalanced growth: a selective focus on certain industries can stimulate other industries through complementarity, induced investment and external economies. Growth occurs in a series of unbalanced disequilibria, as against a balanced equilibrium growth path.

Ideas related to cumulative causation have long been adopted in the Marxian tradition. Theories of monopoly capital, for instance, assume that increasing returns to scale will be common and that large firms will prevail both nationally and globally. Their dominance is attained partly by internal scale economies, investment and technical advances (concentration) and partly by external mergers and takeovers of smaller firms (centralization). The twin processes of concentration and centralization yield market power, which ensures a permanent surplus protected by the avoidance of price competition. Firms opt for non-price competition less damaging to profits. The motor of capitalism is the impulse towards capital accumulation, a cumulative process as the name suggests. The quest for profit spurs an eternal search for lower costs by whatever means possible, including the sourcing of cheap raw materials from poorer countries and the relocation of production to areas with low wages and flimsy employment regulation. Economic development will be uneven, and control will increasingly rest with multinational firms based in developed countries.

Cumulative causation has been studied mainly by heterodox economists and social scientists outside economics. It has always been an awkward topic for orthodox economics, seldom mentioned because it casts doubt on the equilibria crucial to neoclassical theory. In recent years, however, even the orthodox economic literature has belatedly admitted the relevance of cumulative processes. The ‘new economic geography’ brings to the fore increasing returns and scale economies, as invoked by earlier writers on cumulative causation, within what is still a neoclassical framework. This permits some implications of cumulative causation to be recognized, though the reliance on neoclassical theory gives a blinkered perspective with little interdisciplinary content. The incursion of cumulative causation into orthodox economics – its least promising terrain – serves to illustrate its importance.

General Features

Processes subject to cumulative causation will not be neat and tidy. They occur in historical time, which is irreversible, so history never repeats itself exactly and we cannot go back to former states. This contrasts with the logical time of many mathematical models, where a stable system may be dislodged briefly from equilibrium but then returns to it and could in principle stay there indefinitely. Unstable outcomes are often troublesome, unsettling and hard to predict, stirring up fundamental uncertainties about the future. Things can quickly spiral out of control. Yet the instability calls forth openings for growth and change that would not otherwise be present. A stable system will linger on and may stagnate, whereas an unstable one is likely to transform.

Cumulative processes can be highly uneven, beneficial to some but not everyone. In a cumulative process, success breeds success, failure breeds failure. The successful enter a virtuous circle of acclaim and prosperity; the unsuccessful enter a vicious circle of neglect and decline. The gap between winners and losers will widen, with no pressures to restore evenness. In academic literature, the tendency to fuel inequalities has been termed the Matthew effect (named after the Parable of the Talents in the Gospel of Matthew), such that the rich get richer and the poor get poorer. Practical cases are widespread, for the Matthew effect bears upon personal income and wealth, class hierarches, regional differences, international economic

development, media coverage, celebrity status, scholarly citations, and much else. Technical advances and improved communications will speed up cumulative processes and their divisiveness. The internet shows this clearly: some items on the web go viral in a remarkably swift cumulative process; other items with the same accessibility receive hardly any attention.

If burgeoning inequalities are seen as a problem, then policy intervention to offset them may be warranted. A cumulative process is not self-regulating and will keep churning out ever-larger divisions. Only a force coming from outside will be able to slow it down and reverse it, usually government action to monitor inequalities and restrain them. Cumulative causation has been associated with arguments for active state intervention in the economy. Keynesian macroeconomics, welfare measures, industrial strategies and regional policies can all be responses to the effects of cumulative causation.

A cumulative process left on its own will expand to a scale that may endanger the surrounding system or environment. In most cases, some external agency or happening will counteract the process and prevent a crisis. Systemic breakdown from cumulative processes remains rare. The risks are substantial, nonetheless, and matters can always proceed to breaking point. Rising inequalities unchecked by any welfare measures may provoke social unrest and the prospect of revolutionary changes to the social, political and economic system (for better or worse). The cumulative processes would then be ended only by a change of system. Rising industrial production propelled by cumulative growth pushes against the limits of a finite Earth, causing global environmental problems. To avoid a crisis, it will be advisable to react early to an adverse cumulative process, before it gets out of hand.

Regional Consequences

Cumulative causation can decide the varied fate of regions within the same country. Some regions may enter a virtuous circle of inward investment, higher productivity, rising profits and wages, growing population and an air of confidence. Others may have the opposite experience, in a vicious circle of disinvestment, low productivity, falling profits and wages, outward migration, and an air of decline. With no corrective tendencies, the trends will continue and

the regional disparities will become entrenched. The upshot will be the regional fractures observed in many countries (North-South or East-West divides; urban-rural differences; capital versus provinces; regions labelled as backward or problematic). Imbalances between rich and poor regions will be taken for granted, as if they reflected inherent traits. Residents of the poorer regions are liable to feel alienated and neglected, with a loss of social cohesion and increase in regional conflicts.

According to neoclassical economic theory, the economy's self-regulating properties should alleviate regional differences through relative-price signals and factor mobility. Labor would move towards high-wage regions, capital towards low-wage ones; both these movements would equalize the rates of return to factors of production, narrow the gap between regions and homogenize conditions across the economy. Migration and capital mobility have an equilibrating function for the economic system, and the net outcome will be efficient. As the economy self-regulates, policy intervention is superfluous unless markets fail. The only requirement for government is to reduce barriers to factor mobility and let the system adjust smoothly.

This neoclassical vision is denied by Keynesian economics, which plays down market-clearing equilibrium and emphasizes aggregate demand. Successful regions will have a surge in demand and enhanced market size as incomes and population rise; declining regions will have the opposite as incomes and population fall. Contrary to neoclassical assumptions, labor and capital will move in the same direction towards the more prosperous regions, whose advantages balloon in a cumulative process of expansion. With no countervailing forces, the regional disparities will only get worse if nothing is done. Government intervention will be needed to slow down or reverse the trends.

The standard form of intervention is to have a regional policy that assists the disadvantaged areas. Elements of such a policy would be investment subsidies and other incentives to invest in the region, improvements to the regional infrastructure, shifts of public investment and public employment into the region, incentives for companies to choose the region for their head offices or other departments, use of indicative planning for regional development, setting up of regional economic authorities, and publicity campaigns to highlight the region's advantages.

The policy could be tied to an industrial strategy that picks out potential sources of economic growth to catalyze development in disadvantaged areas. If successful, regional policy will halt the trend towards inequality.

Global Consequences

At the global level, cumulative causation opens up a gulf in the prosperity of nations. Although international trade supposedly benefits everyone, it confers greater benefits on bigger, stronger nations than smaller, weaker ones. Scale economies in developed countries give them a trading advantage, such that they gain market power and enjoy favorable terms of trade. Countries with little industry, reliant on primary products, end up offering these at low cost to the developed countries. The rising scale of industry spawns multinational firms that enter directly into less developed economies and exploit the cheap raw materials and labor. Trading disadvantages then become compounded as asymmetries in the ownership and control of the means of production. Multinationals will have headquarters in the developed world but exert their influence globally.

Neoclassical economic theory would predict rising resource prices as the world economy expands, thanks to the limited supply of scarce natural resources. Higher resource prices would assist the less developed countries and brake the rise in inequality. The predicted changes have not come about: far from rising as expected, natural resource prices have fallen. By the Prebisch-Singer thesis, the long-run trend in the prices of natural resources relative to manufactured goods is downward and the terms of trade for less developed countries are getting worse. There are several reasons. New resource discoveries have so far proved feasible, technical changes allow switches to other resources if necessary, productivity rises hold down the demand for resources, the ability of less developed countries to manipulate supply has been small, and market power has rested with the multinationals who control production. No price realignments have emerged to redress inequalities, and the cumulative processes have endured.

Rising inequalities engender permanent, institutionalized divisions between rich and poor countries. Economic power stays in the developed world, while less developed countries are

reduced to dependent status, in a center-periphery relationship. Poorer countries must rely on the multinationals as investors but have little say in the resulting activities. Investment decisions are made at the center, so the global ambitions of multinational firms outweigh the national interests of poorer countries. Ownership, management, finance, marketing, advertising, research and product design are all centralized, leaving the developing countries enfeebled. They can be played off against each other: challenges to the dominance of the multinationals can be met by threats to pull out and invest elsewhere. Global economic institutions too are located at the center and do not want to upset the prevailing order.

Unequal development has no equivalent of a national government that can step in to deter cumulative processes. Multinational firms operate on a global scale unmatched by any governmental authority with the necessary regulatory powers. In the absence of external, top-down authority, responses to cumulative causation must come from other, bottom-up sources and often from the poorer countries themselves. Because free trade is not in their interests, they may aim to relax it and escape its drawbacks. This sponsors arguments for fair trade rather free trade, in which local producers have protection from the multinationals and receive better prices for their output, assisted by calls for ethical consumption in the developed world. An allied response is to foster market power on the seller side of primary product markets, to counterbalance the market power of the multinationals on the buyer side. Overcoming inequalities in industrial strength will turn on the protection of infant industries under local control until they are large enough to compete globally. None of the available responses are easy, and they defy free-trade dogma.

Other responses to unequal development would need supranational regulation and tight coordination among national governments. Some international bodies such as the European Union do indeed have regional polices that cross national borders, though these do not extend far enough to tackle global problems of unequal development. Otherwise, it is left to individual national governments to react to world poverty and decide on any financial or other assistance. Various charities and non-governmental organizations seek to work internationally, but their efforts are limited in scale. A truly global resolution of unequal development would require close international cooperation to establish a new, global level of government. Instead of following a free-trade agenda and imposing austerity on poorer countries, the goal would be to

assist their development, subsidize local investment and sustain aggregate demand. This kind of global intervention faces many political obstacles and would be conceivable only with the abandonment of neoliberalism.

Glossary

External Economies of Scale

Efficiency advantages gained by interrelated firms in an expanding industry, compared with firms operating individually.

Internal Economies of Scale

Efficiency advantages associated with the size of a firm or other organization, compared with its smaller rivals.

Economies of Scope

Efficiency advantages derived from joint production and distribution of several related commodities, compared with production and distribution undertaken separately.

Keynesian Economics

A macroeconomic approach that stresses aggregate demand rather than market-clearing equilibrium and argues for active government intervention in the economy.

Matthew Effect

The proposition that existing advantages tend to bestow further advantages in a cumulative process (the rich get richer, the poor get poorer).

Neoclassical Economics

The standard form of microeconomic theory, as in most economics textbooks, based on assumptions of individualism, rational choice and market-clearing equilibrium.

Prebisch-Singer Thesis

An empirically based thesis that the prices of natural resources relative to manufactured goods are in chronic decline.

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