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Changing importance of quantitative methods in regional development and planning

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Abstract:
In the recent past the quantitative methods, which had been favorable in planning practice since the 1950s and 1960s, lost their popularity. This paper claims that the planning discourse and the underlying theories were imperative in this trend. The paper aims to present briefly the changing planning discourses since the 1950s, and the shift in the focus of regional planning connected to how growth has been perceived and theorized indicating that these changes were the main factors that downgraded the use of quantitative techniques. The last section, however, discusses that the increasing problems and vulnerability of regions and urban areas necessitate a paradigm shift, which should bring back the need for quantitative analysis on the agenda

Keywords: *Planning, quantitative methods, economic growth, regional development*

Introduction

Today planning and especially regional planning face a rather important dilemma. It has been a fact that in recent past, there is a loss in the interest on the quantitative methods and analysis and increasing popularity of soft techniques, parallel to the use of limited quantitative analysis. In this change, the shift from comprehensive and rational planning to communicative planning has been very important. The planning under the communicative rationality, focused on building frameworks that aimed consensus generation process depending on socially constructed priorities, paid limited attention to problem solving and identifying quantitative definite targets. However, in the contemporary period, planners are increasingly becoming unsatisfied on the outcomes and looking for new alternative approaches.

Why did the quantitative analysis, which had the prime importance in planning in 1950s and 1960s, loose its importance in the post 1980s period? Why today there is increasing criticisms on the decreasing importance of quantitative models in regional planning? What is current role of quantitative methods in planning?

In order to answer the questions above, in this paper I discuss three main streams of theoretical thinking, which are very much closely related to each other.

First, the changing rationality in which the planning is based upon; second, the changes in growth theories and third, the changes in spatial/regional development theories. These three streams of theoretical debates are very much interconnected and constitute the different segments of economic and political regime in a certain period. The brief analysis on these theoretical concerns introduced in the paper clearly shows why we have the problems of quantitative methods in the recent past and explains the current approach to quantitative models. Table 1 outlines the existing debates introduced in the coming sections.

Table 1. *The changing discourse of planning, economic growth and regional planning and the importance of quantitative methods*

<table>
<tr><td></td><td>Planning Paradigm</td><td>Growth</td><td>Regional/ Spatial Development Planning</td><td>Quantitative Methods</td></tr>
<tr><td>1950s</td><td>Instrumental rationality</td><td>Neo-classical growth theory</td><td rowspan="2">Growth based upon external capital transfer</td><td>Micro level analysis techniques</td></tr>
<tr><td>1960s</td><td></td><td>Development economics</td><td>The most popular times of quantitative models Quantitative revolution</td></tr>
<tr><td>1970s</td><td colspan="4">Transition Period</td></tr>
<tr><td>1980s</td><td rowspan="2">Communicative rationality</td><td rowspan="2">Endogenous growth</td><td rowspan="2">Territorial approach based upon endogenous dynamics</td><td>Loss of importance of quantitative models</td></tr>
<tr><td>1990s</td><td>New methods qualitative and GIS based methods</td></tr>
<tr><td>2000s</td><td>Integrative</td><td>Endogenous dynamics together with definite targets and long-term strategies</td><td>New Regionalism and increasing attention on external factors</td><td>Revival of interest in quantitative methods</td></tr>
</table>

The changes in planning discourse

While the contemporary idea of planning is rooted in the Enlightenment tradition of modernity, in the 20th century Mannheim's ideas on planning that attached systematized social scientific knowledge and techniques to the management of collective affairs in a democratic society became the source of inspiration for the rational decision making. Later, the attempts to systematize core areas of knowledge in planning development led to the rational planning model, which became a guide in the planning profession

and as an approach to problem solving in the public sphere beginning from 1950s onwards. Instrumental rationality dominated planning theory for more than 20 years, which based upon positivist perspective. Positivism holds that the scientific method is the best approach to uncovering the processes by which both physical and human events occur and asserts that the only authentic knowledge is that which is based on sense experience and positive verification.

By drawing on Keynesian economics and policy studies in political science, this approach highlighted planning's role as correcting market failures related to externalities, public goods, inequity, transaction costs, market power (Shiftel 2000). In this period, the rules were set out for welfarist redistribution, and governance mechanisms emerged to legitimize the distribution of welfare services among different social groups. Most of the existing literature has defined the governance practices of the Keynesian period as idealized forms, which obscured the different mechanisms that have been used by the system to work under the pressures of different interest groups.

Beginning from 1960s onwards, Keynesian economic model that supported by the strong state and modernist ideas and the rational decision-making faced important criticisms. The 1970s and early 1980s literature on urban movements, provided a clear indication that not everything was acceptable in the urban areas of the welfare states of the Western world (Castells 1983). Social movements were important as a plea for participation, protest and the demand for a structural transformation of the urban system (Castells 1977). Due to conflicting interests and efforts to benefit more from the welfare delivery and transfer of rights in the property market, tensions and struggles grew among different groups. Struggles around collective consumption (i.e. the consumption of services produced, managed and distributed on public basis) played a great role in shaping the new planning theory and were important so called reforms in planning systems.

In the change of the planning theory, also the criticisms on positivist analysis became important. One of the two of the important criticisms argued that positivism systematically failed to appreciate the extent to which the so-called social facts. The second, criticism claimed that representation of social reality produced by positivism was inherently and artificially conservative, helping to support the status quo, rather than challenging it.

Fainstein (2005:124) explains that “The reform movement was attacking the prevailing rational or quasi-rational model on two grounds: first, it was a misguided process; and second, it produced a city that no one wanted”. The reformers’ emphasis was on the roots of urban inequality and they were asking for to find ways to achieve democratic participation in planning. According to Outhwaite (1994:6), underlying theory of communicative rationality was his preoccupation with the idea that instrumental rationality, seen as a liberating force at the time of the Enlightenment, has now become a source of enslavement.

Problems in the Keynesian mode of regulation necessitated the change in the rationality that the planning was based upon. The alternative was there, the Habermasian communicative action theory, which is explicitly intended to be an alternative to the instrumental or strategic rationality of capitalism (Habermas 2001: 102 cited in Purcell 2009). Communicative action aims at

creating 'the ideal speech situation', which constitutes 'undistorted communication', where all participants affected by the decision participate in it meaningfully and everyone has an equal chance to participate in achieving the good of all rather than their particular self-interest (Habermas 1990 and 1993). Communicative rationality based planning theories, therefore, claims that "it may be possible to achieve the desired end because of the communication mechanisms, which theoretically inclusive to all collaborates" (Purcell 2009:149).

There appeared different schools of thought under communicative rationality, that varies between advocacy planning (Davidoff 1965), participatory planning with emphasis on negotiation (Susskind and Cruikshank 1987), communicative planning that is rooted in communicative action and decision-making practice based on communication and consensus building (Susskind et al. 1999; Forester 1999; Innes 1995), transactive planning (Friedmann 2008) and collaborative planning (Healey 1997). They aimed mainly on consensus generation among people with conflicting interests and accepted as variegated forms of planning based upon communicative rationality.

Today the ideas of both communicative and collaborative planning occupy an extremely hegemonic position in planning theory (Purcell 2009; Tewdwr-Jones and Allmendinger 1998) and since the targets of the communicative planning are not technically determined, instead socially constructed, there is less interest in quantitative methods. Purcell (2009:147) claims, "communicative planning offers an extremely attractive way for neoliberals to secure the democratic legitimacy they require, because it tends to reinforce the political-economic status quo while producing democratically legitimate decisions". There are some comments indicating that communicative action tends in the long term to reinforce the current status quo and suppressing radical and transformative edge to practice (Harris 2002). It favors some social groups and not others (Young 1996 and 1999; Fainstein 2000; Albrechts 2010). Flyvbjerg (1998: 209) also expressed skepticism about "the non-politicized processes of mediation and building consensus". Further limitations of collaborative planning are defined by Gunton, Peter and Day (2003) as limited applicability to only those cases where all relevant stakeholders are motivated to participate and/or management agencies are willing to delegate power, inequality in power that gives some stakeholders an unfair advantage and propensity to develop second best or vague outcomes in order to achieve consensus agreements, beside some others.

The changes in how growth is perceived and theorised

While the planning theories have changed also how the growth is perceived changed radically within the same period. According to Neoclassical Growth Theory, which has been the main theory of growth thought in economics throughout the 20th century, initial levels of physical capital, i.e. income per capita, determines the process of growth. In this theory, the free operation of market mechanism was thought to bring together the diminishing returns to marginal product of capital and end up with the narrowing of the disparities between regions. 1930s economic crisis, however, showed that growth process based on market dynamics is prone to crisis. It has been also indicated that the convergence argument of the Neoclassical Growth Theory proved to be inappropriate to what has been happening in the world, as newly available statistical

data and reliable econometric works have showed that striking differences between countries and continents have been increasing (Thirlwall, 1999).

Keynesian economic theory and growth that have defined the principles of welfare state was an alternative to understand the change how growth is perceived. In this way of thinking government intervention for overcoming the problems created by the market mechanism was accepted, which also supported the development of economic planning studies and methods. The quantitative models of growth became an integral part of decision making and allocation of resources. The Keynesian framework, was however mainly a response to the problems of the countries which have already developed market mechanisms.

It was only after 2nd World War, that a distinct body of thought in economic science emerged, which is called Development Economics, which focused on the problems of development in less developed countries and regions. It introduced concepts like economic structure, employment and population, and welfare. It is concerned almost only with the problems of the periphery and the issue of underdevelopment, and saw the process of development something different then growth. In early 1960s, the Neo-Marxist Economics developed as an attack to all these above mentioned economic theories that originated and developed at the core. Neo-Marxist economics emphasized the capitalism and the process of exploitation as the reasons behind the underdevelopment of the periphery. The 1980s economic crisis and the attempts to overcome the problems of in the capitalist development defined a turn in economic thinking. The neo-classical thinking became prominent back again. However, in a short time it became evident that the old way approach can not equate enough to explain the new world conditions.

In the late 1980s, Endogenous Growth Theory (Lucas, 1988; Romer, 1986, 1990, 1994; Krugman, 1995), has been developed as a response and criticism to Neoclassical Growth Theory. Endogenous Growth Theory made two important alterations in its predecessor. First, it replaced the assumptions of dimishing returns to marginal product of capital with increasing returns, and the argument of convergence across countries with that of divergence. Second, this model tried to endogenize the technical change, which was an exogenous variable within the framework of Neoclassical Growth Theory. Endogenous Growth Theory accepts the importance of physical capital, but by endogenizing the technical change, it further stresses the role of innovative capacity, human capital and social capital in economic growth.

In other words, it seeks to endogenize technical change by folding its production more fully into the neoclassical positive heuristic (Langlois, 2001). This point of Endogenous Growth Theory brings an important variable into regional development analysis. This new variable is human capital. To be more precise, while the Neoclassical Growth Theory explains economic development only with income and income growth, Endogenous Growth Theory introduced human capital as an important factor, whose accumulation is responsible for growth in GDP per person. For both human capital and physical capital accumulations, there is need for devoting resources to be invested. Accumulation of physical capital requires investments such as building factories or investing for new

equipment. On the other hand, accumulation of human capital requires knowledge acquisition, which comes through both active learning process and the process of knowledge production. Endogenous Growth Theory gives a central role for knowledge as a determinant of economic growth. It is argued that knowledge is an intangible capital good with increasing rather than decreasing marginal productivity, and this feature of knowledge is the key one in the reversal of the standard results about growth, that is diminishing returns (Romer, 1986).

Basically, once knowledge is created, it can easily spillover into the hands of others at zero marginal cost, and this process of spillover is the source of increasing returns that generate economic growth (Langlois, 2001). Spillover effects lead to an increase in productivity that exceeds the private gain (Grossman and Helpman, 1994), and the rate of investment and the rate of return on capital may increase rather then decrease with increases in the capital stock. Accordingly, 'the level of per capita output in different countries need not converge; growth may be persistently slower in less developed countries and may fail to take place at all' (Romer, 1986). Here, due to great emphasis on endogenous knowledge creation and spillovers, social capital also stands out as a crucial asset in regional economic development. To sum up, three main types of capital; human capital, social capital and physical capital, and innovative capacity are the assets that are put forward as most necessary for a region's economic growth. Among these concepts, innovative capacity and human capital stand out as most important.

More recently, this theory, integrating technological progress into the neo-classical growth model, has been transferred to spatial economics. The work pioneered by Krugman (1995), commonly referred to as the New Economic Geography, defines local externalities as the resource of increasing returns. According to him the factors of increasing returns are external to a firm but internal to a region. This situation explains the importance of agglomeration economies and how agglomerations sustain increasing returns via knowledge spillovers. After 1980s, Institutional Economics was revitalized and redeveloped as New Institutional Economics. The main argument of the Institutional Economics is that economic development is a social and institutional process. In this respect, the role of institutions is emphasized and considered as crucial in the development process of the less developed countries and regions.

The brief summary above shows that the new variables, which are rather diffficult to quantify is introduced via growth theories of the recent past. While the endogenous theory was trying to tackle the fuzziness of some concepts, the institutional economics was focused on building explanations rather than quantitative analysis. In fact, the endogenous growth theory is more concerned to analysis, but rather forecasting and simulation models. The change how growth have theorised had very important repurcussions on regional development theories and regional planning.

The changes in regional development theories

The regional development theories have been closely connected to the changing conceptual framework related to the growth process. Beginning from the 1930s, the Keynesian economics supported the interest in regional

differences and provided the new tools for defining disparities. Afterwards in the 1950s and 1960s, the Development Economics formed the main basis of regional analysis, planning and policies. The regional policies that were based on the development ideology of post-war period were focused on industrialization efforts of countries via large-scale enterprises. Creation of Growth Poles or initiating a polarized development process by government intervention and external resources was the main policy. In the distribution of public resources, the essential point was to minimize the cost of regional policy by selecting the most rational investment areas in different regions. These policies have been followed by both advanced and developing countries, although the outcomes of these policies on regional development were not very satisfactory and the new employment opportunities created by the public investment projects in infrastructure and manufacturing were inadequate to generate a growth momentum in less developed regions.

These types of policies became less conceivable after the 1970s economic crisis. Firstly, it became more difficult to operate regional policies due to changing economic conditions and relations, since the power of states has been widely deteriorated. Secondly, the waves of liberalization and deregulation affected negatively the development efforts via centralized decision-making systems. And lastly, the dynamics of the globalized economy favored areas with learning capacities and competitive power. 1970s crisis pointed that it was impossible to continue regional development policies based on strong government intervention and the external transfer of capital. That is why after the 1970s crisis endogenous development and local and regional initiatives for economic development received a strong appeal (Aydalot, 1986). While small enterprises became the core of attention, endogenous development based on small and medium enterprises was defined as an alternative to state led regional economic policy. Concurrently, local development was accepted as a means of integration to the world markets. Although this kind of emphasis to local brought a new understanding, it was not enough to explain what happened in the last two decades in many parts of the world. Several competing and co-operating models of territorial development/evolution came on the agenda, which were primarily based upon proximity and the spatial cumulativeness of learning dynamics (Breschi, 2000, Eraydin, 2001, Schmitz, 1999; Maskell and Malmberg, 1999; Amin and Cohendet, 1999). These models of development defined spatial agglomerations in different forms named as, innovative milieu (Camagni, 1991), industrial districts (Belussi, 1999), new industrial spaces (Scott and Storper, 1987), regional systems of innovation (Cooke, Uranga and Etxebarria, 1997) or learning regions (Morgan, 1997).

The industrial district literature emphasizes collective learning based on small firms that are specialized in different steps of production and their innovative capacities. Belussi (1999, pp. 734-736), based on the experience of Italian industrial districts, lists the factors that enable collective learning processes and the diffusion of technical change and know-how within local clusters. He emphasizes the sunken nature of knowledge, fluid interactions and many channels where information can quickly circulate among the firms in spatial and social proximity, higher levels of inter-firm cooperation, low transaction costs and stimulating environment for enterprises to adopt innovation process more rapidly. In this approach, in addition to other historical and socio-economic factors within that industrial cluster, the transmission of tacit knowledge, which is facilitated by trust and reciprocity among local firms, gets a special emphasis. The literature on high

technology industrial clusters or new industrial spaces also concentrate on local interdependencies and knowledge transfer among firms, while giving especial emphasis to research and development (R&D) and institutions that create externalities. In this approach cluster is a place where knowledge for new products and processes appears and spreads under the existing social regulation mechanisms prominent in that area. According to Scott and Storper (1987, p. 29) social regulations define the new industrial spaces by coordinating inter-firm transactions, organizing local labor markets and supporting community formation and social reproduction. The theory of regional innovation systems focuses on the institutional basis of learning following the debate on national innovation systems. The argument indicates that the different kinds of R&D institutions complement and compete with one another in support of learning processes and innovative activities (Gregersen and Johnson, 1997). At the regional scale, Cooke, Uranga and Etxebarria (1997) define an innovative industrial cluster as the area likely to have firms with access to others in similar or complementary sectors as customers, suppliers and partners. They also have access to such knowledge infrastructure as universities, research institutes, contact research organizations and technology transfer agencies. The interactive learning process in these areas are assumed to be promoted by governance structure of business associations, chambers of commerce and public economic development, training and promotion agencies as well as government departments. In innovative milieu, learning and innovation depends on the capacity of firms through relationships with other agents within a 'co-operative atmosphere'. Finally, the learning region model integrates these ideas in order to indicate the conditions of building knowledge-based dynamic competitive capacities (Morgan, 1997).

All of these theoretical debates are quite informative, but it is rather difficult to read out these theoretical attempts, as Malmberg (1996:398) has indicated, how the relations hold on an industrial system and the dynamics of spatial agglomeration and change. That is also, why Krugman (1995) criticized these soft theoretical frameworks due their anti clarity, which is also shared by Plummer and Taylor (2001). One thing that is obvious in these theoretical debates, however, is the importance of factors, which are difficult to quantify.

These theoretical constructs on regional development did not have very clear policy recommendations, except their emphasis on the importance of local embeddedness, institutional thickness and networking. The acceptance of the contingent nature of development created the difficulty to shift from theory to policy. The interest in local, however, prompted the new policy regime that is defined as governance, which denoted a heterarchic mode of self-organization and different modes of coordination of interdependent activities (Jessop, 1993). In practice, national governments that faced economic difficulties found it easy to define strategies for regions with potential of growth and capabilities, since they were searching for reductions in their commitments on financial resources and spending. These strategies were mainly in the form of supporting local institutions, production units and local networks (Eraydin, 2001).

The regional development theories and planning, which are mostly concerned with endogenous capacities, has been extremely attractive for policy and decision makers. Therefore, it has dominated the academic agenda for more than three decades. Today, however, there are increasing

criticisms on the emphasis on endogenous capacities indicating that they are not enough to solve the problems of regional disparities.

Conclusive remarks: Changing role of quantitative models depending on different planning paradigms, economic growth and regional development theories

The brief summary on the changes in the three strands of theoretical debates that form the basis of regional planning practice made the methods of instrumental rationality, less attractive. As it is said earlier, the existing planning trends favored more qualitative aspects of regional development with the help of soft techniques, but less on qualitative methods. In fact, in the contemporary social science, strong accounts of positivism have fallen out of favor since the 1980s. Planners, even if they follow positivist approach, generally avoid theoretical or philosophical commitments and follow methodological debates concerning clarity, replicability, reliability and validity. This type of approach and quantitative research, however, is far from bringing a new perspective and an alternative thinking. However, in the recent past, there have been increasing critiques on both the existing planning approach and the theories that define planning for development at different levels, which calls for an integrative rationality and the methods that redefines the need for numerical targets and long- term perspectives back to the agenda.

The first group of critiques stem from increasing problems in different fields. The problems addressed on the planning approach and its rationality can be grouped under three main headings. First, theories that are based upon communicative rationality are focused on more on the process but less on outcome and fail to acknowledge and account for the influence that external forces have in shaping decisions and outcomes. Second, in communicative planning scientific information is marginalized in collaborative decision-making processes because individual participants often lack technical expertise and depends upon socially constructed decisions not necessarily for rational reasons (Hillier 2003). Third, they neglect the power problems in communication process and fall short to adequately account for the role that power inequities play in shaping outcomes (Fainstein 2005).

A careful examination of the problems of urban areas in the contemporary period and increasing criticisms on dominant planning theories calls for a new thinking in planning, which is parallel to a call of a new economic system. While the problems of planning theory in terms of its use in the neo-liberal era is one of the first point in the new thinking, decreasing power of planning to harness unexpected economic, social and ecological problems constitute the latter. In this respect, the analysis and long-term scenario building should become essential, which necessitates for instrumental rationality and quantitative methods back to the agenda.

Another appeal for quantitative analysis comes from the fields of regional growth and planning. Towards the 1990s, while the literature was full of success stories, in many countries that tried to follow neo-liberal economic policies and to integrate the globalized economic system regional disparities were increasing. It became evident that in the absence of adequate local initiatives for collaborative action disadvantaged regions had only limited opportunities of development. This situation caused increasing interest on regional policies in the literature. On the one hand, the importance of central

government was rediscovered and several studies indicated the contribution of various support schemes that vary from financial incentives to industrial estates or training (Cooke and Morgan, 1994; Eraydin, 2001; Castells and Hall, 1994; Longhi, 1999; Masser, 1989; Park and Markusen, 1995; Massey, Quintas and Wield, 1992; Scott and Storper, 1987; Stöhr and Pönighaus, 1992). Furthermore, several examples emphasized the importance of national government policies in the provision of learning infrastructure (Jin and Stough, 1998), innovation activities (Asheim and Isaksen, 2002) and the construction of scientific and technological infrastructure. This new interest enforced a third way alternative to the state market dichotomy, the new regionalism, which is believed "to cushion the impacts of globalization by equipping people and regions with skills, networks and institutional thickness needed to compete in the global marketplace" (Webb and Collis, 2000:863). However, the new regionalism, which is the combination of institutional turn-network paradigms with neo- Schumpeterian endogenous growth theory, has the difficulty to answer the disparity problem and the loss of redistributive policies since it is hard to claim that building local capacities are sufficient for establishing a privileged position for less developed regions (Amin, 1999).

At present, the new agenda is shaped by the problems faced in the endogenous dynamics period and especially the exclusionary processes of disadvantaged regions from the global economy. There is an obvious need for the compensation for the functional loss of redistributive regulatory mechanisms at the national scale, therefore a new development paradigm.
It became evident that in the new planning and development paradigm, there is need reconsidering to identify the targets, long-term analysis and forecasting as well as building models of the future. That means that quantitative models should be more often used after two or three decades of neglect.

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Kantitatif yöntemlerin bölgesel kalkınma ve planlamada değişen önemi

1950 ve 1960'lı yıllarda çok gündemde olan kantitatif yöntemlerin yakın dönemde çekiciliğinin azaldığı görülmektedir. Bu makalede bu eğilimin ortaya çıkışında değişen planlama söylemi ve kuramlarının etkiliği olduğu vurgulanmaktadır. 1950'lerden bu yana değişen planlama söyleminin kısaca özetlendiği makalede, büyümenin kavranmasında ve kavramlaştırılmasındaki değişime dayalı olarak bölge planlamanın vurgu noktalarının farklılaştığı ve bu durumun kantitatif tekniklerin kullanımının azalmasına neden olduğu belirtilmektedir. Son bölümde ise, artan sorunlar ve kırılganlıklar nedeni ile planlamada yeni bir paradigma sıçramasına gerek olduğu, bunun ise kantitatif yöntemlerin kullanılmasını tekrar gündeme getireceği tartışılmaktadır.