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Capital, Institutions and Urban Growth Systems

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Abstract

In recent years, both endogenous capital accumulation and institutional theories of economic growth have emerged as central sources for explaining uneven development across cities and regions. This paper seeks to connect both theoretical stances as a means of explaining urban and regional growth differentials. It conceptualises urban economies as growth systems combining the interaction between capital and institutions at the firm, inter-firm and spatial level. In these systems, the capital drivers of growth are not merely the result of preferences and existing capital endowments, but are mediated by a set of institutional factors.

Introduction

Over a number of years the identification of the determinants of economic growth has emerged as one of the most intriguing streams of inquiry in the fields of economic geography and spatial economies. As Lucas (1988) put it, ‘once you start thinking about growth it is difficult to think about anything else’. As a result, urban and regional growth theory has increasingly drawn on the notion that the growth of cities is endogenous, with it stemming from a city’s capability to invest in a range of intangible assets, in particular human capital (Lucas, 1988), innovation (Romer, 1986; 1990), as well as more contemporary factors such as entrepreneurship capital (Audretsch and Keilbach 2004a, b, 2008) and network capital (Huggins and Thompson, 2014a; 2015a). The key argument of urban and regional endogenous growth theory is that these assets provide cities with the capability to facilitate

long-term growth (Johansson et al., 2001; Capello and Nijkamp, 2009; Capello, 2011; Stimson et al., 2011). Therefore, long-term differentials in growth across cities and regions will emerge as a result of differences in the structure of their economic systems, especially their endowment of these assets and the preferences of economic agents and actors. Alongside the endogenous capital accumulation model of regional growth, however, an emerging field of economic study has sought to cut into the growth debate at a different level by placing the concepts of institutions as the central source for understanding uneven urban and regional development and growth differentials (Farole et al., 2011; Rodríguez-Pose, 2013; Tomaney, 2014).

Endogenous capital accumulation theories of growth are based on preferences, endowment, resource allocation, and intentional investment decisions (Romer, 1986; 1990). Institutional theories of growth, on the other hand, are based on constraints, incentives, and organisational arrangements (North, 2005; Acemoglu and Robinson, 2012). Although these two theoretical positions are usually considered as distinctive explanations of economic growth differences, it is interesting to consider the extent to which they may interact given that both theories can be considered to be endogenous in nature (Acemoglu et al., 2005; Farole et al., 2011). For example, preferences and investment decisions may be shaped by prevailing institutions, whilst the availability and accumulation of capital may shape incentive structures and organisational arrangements. Furthermore, an institutional approach facilitates a consideration of the ownership structure of stocks of capital.

Scott and Storper (2015) allude to the interrelation between capital and institutions when they highlight the joint role played by the dynamics of agglomeration and the nexus of locations, land uses and human interactions in understanding urban development. However, despite the implicit connection between the two perspectives on growth differentials, there has been little work, with only a few notable exceptions (e.g. Stimson et al., 2009), that has sought to more explicitly understand or frame the relationship between them.

The aim of this paper is to seek to develop a more transparent link between institutional and capital accumulation theories of growth from the viewpoint of analysing differentials across cities and regions. It seeks to establish a theoretical framework that draws on the institutional and capital accumulation theories of growth as a means of developing a systems-based conceptualisation of urban and regional growth. It conceptualises urban economies as growth systems through which different forms of institutions are associated with different forms of capital accumulation. In this model, the capital drivers of growth are not merely the result of preferences and existing capital endowments, but are mediated by a

set of institutional factors. The paper builds on the existing acknowledgement that both capital and institutional factors relating to the nature, quality and performance of: (1) firms within a city or region; (2) inter-firm connections stemming from markets and networks; and (3) the governance of the urban political economy are key determinants of differential patterns of spatial economic growth.

The existing literature, however, is limited in fully explaining the types of capital and institutional factors that impact on the growth dynamics associated with the firm, inter-firm or urban and regional level as a whole. Therefore, the paper presents a more granular analysis that identifies with greater specificity the range of ‘capitals’ and institutions, and the relationships between them, that are required to be accounted for when addressing questions relating to why some cities and regions grow faster than others, as well as identifying those cities and regions that are best placed to achieve the highest future rates of economic growth. As a means of articulating the potential methodological value of this approach, the paper outlines how the theoretical framework may be employed in both quantitative and qualitative empirical research strategies.

The approach adopted here echoes the notion of cities as ‘Schumpeterian hubs’ for recombining capital in order to generate innovation (Veltz, 2004; Storper and Manville, 2006). Merely investing in such capital, however, may not be enough to secure high growth urban systems (Storper, 2013). Therefore, although capital accumulation may be able to partly explain economic growth, institutions in the form of the incentives and constraints relating to the organisation of production and the capability to accumulate capital are potentially more fundamental determinants of economic growth (Helpman, 2004; Tomaney, 2014). In particular, the paper seeks to extend and integrate conceptions of urban growth by meshing theories relating to territorialised modes of capital orchestration with emerging institutional theories of urban and regional development.

Fundamentally, the article proposes that urban growth systems constitute the interaction between capital and institutions with respect to three forms of organisational arrangements: firms; markets and networks; and the governance of the political economy. *Firm-level growth dynamics* concern the role of human capital and knowledge capital and the learning and innovation institutions that constrain or incentivise the accumulation of these forms of capital. *Inter-firm level growth dynamics* concern the transactions and interactions between firms through the markets and networks they form, and the role of entrepreneurship capital and entrepreneurial institutions in market processes, as well as the network capital and associational institutions required to facilitate knowledge flows. *Urban and regional level*

growth dynamics relate to the overall governance of urban and regional political economies, especially with regard to the institutions of ownership and the allocation of physical capital.

In order to achieve its aims, the remainder of the article is structured as follows. The next two sections critique the key literature concerning the role, respectively, of capital accumulation and institutions in determining economic growth. Drawing on this critique, the article presents a systems model for delineating the major capital and institutional variables underpinning urban and regional growth and the proposed connection between them. This model is then utilised to consider the establishment of empirical research strategies by which to operationalise the proposed theoretical framework.

Capital Accumulation and Urban Economic Growth

The success of cities and regions will clearly be related to their capacity and capability to achieve economic growth, and understanding how and why such growth occurs is central to a number of research streams. For instance, research in spatial economics seeks to understand the role of agglomeration effects, trade costs, and other urbanisation factors (Storper, 2010). More generally, contributions from economic geography and spatial economics have become increasingly concerned with understanding and demonstrating the urban and regional micro-foundations of macroeconomic growth models (Capello, 2011; Stimson et al., 2011). Urban theorists have often focused on the socially unequal processes and outcomes of urban growth, arguing that it often the preserve of, and driven by, elite regimes, machines and coalitions (Harding, 1994; 1997; Harding and Blokland, 2014). Endogenous growth theory, on the other hand, has focused on the role of human capital, knowledge and innovation in city and regional growth processes, with a need to better understand the mechanisms underlying urban growth patterns identified as a key priority in aiding effective economic development policy (Stimson et al., 2011; Duranton and Puga, 2013).

Endogenous capital accumulation models are to some extent allied to contributions related to the New Economic Geography (Krugman, 1991), which, like antecedents such as models of circular and cumulative causation (Hirschman, 1958; Myrdal, 1957; Kaldor, 1957), emphasise the notion of increasing returns from capital investment (Storper and Scott, 2009). Similarly, work on urban and regional competitiveness has sought to pinpoint the ‘territorial capital’ of cities, which covers the wider set of natural, human, relational, and organisational assets promoting economic growth (Camagni et al., 2009; Camagni and Capello, 2013; Huggins et al., 2014). Such a conceptualisation of the factors underlying growth are consistent with wider views from the field of economics, whereby economic growth is

dependent on capital accumulation (Duranton and Puga, 2013). However, it departs from the traditional view which places the accumulation of physical capital at the centre of explanations of growth differentials (Solow, 1956; 1957; Swan, 1956). Instead, it relates more to a Schumpeterian perspective that highlights the role of intellectual capital, principally concerning the creation and accumulation of knowledge as the principal driver of growth differentials (Boschma and Martin, 2010; Cooke et al., 2011). The entrepreneurial, knowledge, and innovation capacity of cities and regions are generally considered to be key factors impacting upon the future economic development and growth trajectory of regions, and are strongly tied to the lineage of Schumpeterian theory (Schumpeter, 1934), as well as more contemporary theories relating to the endogenous nature of economic growth.

Theorists of economic development have increasingly drawn upon models of endogenous growth to better understand the factors determining such development (Johansson et al., 2001; Andersson and Karlsson, 2007). Importantly, the use of the term endogenous is a recognition of the argument that economic growth is influenced by the use of investment resources generated by economies themselves, rather than the exogenous factors associated with traditional growth models (Lucas, 1988; Romer, 1986, 1990; Aghion and Howitt, 1998). For instance, a Lucas-type (Lucas, 1988) production function model of urban growth may take the form of:

$$Y_c = F(H_c, K_c) \tag{1}$$

Where Y = is the change in economic output of a city (c); K = the stock of physical capital in the city and H = the stock of human capital.

Romer (1986), however, specifies a model of long-run growth in which knowledge is assumed to be an input into production that has increasing marginal productivity. Adapting Romer's (1986) model to the urban context, it can be proposed that the output of a city (c) is a function of not only physical capital and human capital, but also the stock of knowledge or research capital:

$$Y_c = F(H_c, R_c, K_c) \tag{2}$$

Where R = a city's stock of knowledge or research capital.

These models make clear that growth is considered to be driven by the technological change arising from intentional investment decisions made by profit-maximizing agents, with the stock of differing forms of capital – and investments in such capital – determining the rate of growth (Romer, 1990; Ha and Howitt, 2007). However, whilst endogenous growth can be considered the desired outcome of knowledge-based development and innovation, it is the process of endogenous development that is the foundation of the growth trajectories of economies (Vázquez-Barquero, 2007). In particular, cities and regions are increasingly considered to be key territorial units within which endogenous forms of development flourish through their innovative milieu – or what some have referred to as ‘technopoles’ (Castells and Hall, 1994), ‘industrial districts’ (Capello, 1999), or ‘clusters’ (Porter, 1998) – facilitating knowledge flow and new knowledge creation.

Institutions and Urban Economic Growth

Somewhat contrary to the capital accumulation model of urban and regional growth, institutional theorists argue that differences in growth and prosperity across nations, cities and regions are more fundamentally related to the type, stage of development, and efficiency of the economic and political institutions that underpin economic systems (Henderson and Wang, 2007; Farole et al., 2011; Acemoglu and Robinson, 2012; Rodríguez-Pose, 2013; Tomaney, 2014). Within this paradigm, the prevailing view is that differences in ‘the rules of the game’ across economic systems are a key driver of growth differentials (Rodrik, 2000). Implicit, although not always explicit, within this institutional theory of growth is that more efficient institutions will facilitate the development of the conditions that allow the forms of capital accumulation associated with endogenous theories of growth to flourish.

In general, institutions are defined as being the humanly devised constraints that structure such interaction covering both formal (de jure) - rules, laws, constitutions - and informal (de facto) - norms, behaviour, conventions - constraints and their enforcement, which then define the incentive structure of societies and their economies (North, 2005). Institutions, especially those of a more formal nature, can be further categorised as: (1) economic institutions, such as individual property rights, contracts, patent laws and the like; or (2) political institutions, which generally refers to the extent to which democratic political rules underlie the nature of territorial governance (Acemoglu et al., 2005). Institutions can also be categorised according to whether they are innately ‘extractive’ or ‘inclusive’, with extractive institutions tending to be those which result in rent-seeking behaviour (Acemoglu and Robinson, 2012).

Two core streams of institutional literature have emerged in recent years: that associated with economic and political science (North, 1990); and that drawing on sociology and organizational theory (DiMaggio and Powell, 1983, 1991). The former stream is where institutions act through rules, procedures and agreements, whilst the latter views individuals as making decisions based on heuristics associated with conventions linked to shared cultures. Scott's (2007) three categories of institutional forces recognises a similar division, with: the regulative pillar capturing rules of the game, monitoring and enforcement; the normative pillar drawing on socially accepted norms within professional and organisational interaction; with the third being a more culturally orientated cognitive pillar. The first pillar can be seen to be related to more formal institutions, with the second and third pillars associated more with the concept of informal institutions.

The influential 'varieties of capitalism' approach to institutional argues that differing institutions develop to match the activities undertaken in an economy (Hall and Soskice, 2001). In other words, institutions that dominate an area are partly created by the activities undertaken within the area. For example, this literature normally regards most continental European economies as Coordinated Market Economies (CME), whereby strategic interaction between firms and other actors such as trade unions is used to coordinate activities. The UK and other Anglo-Saxon nations are perceived to possess more Liberal Market Economies (LME), whereby markets coordinate the activities of firms and other actors. In their review, Acemoglu and Robinson (2012) advocate that the institutions of democratic capitalism are the principal means for achieving prosperity, which could be perceived as a perspective that is ethnocentrically skewed toward the cultural values of nations with systems manifesting relatively strong democratic capitalism. However, it is not necessarily the case that capitalist economic systems are fixed within a nation, with some scholars suggesting the existence of regional varieties of capitalism within nation states (Crouch et al., 2009).

In effect, institutions, in the shape of both the tangible and intangible characteristics constituting the political economy of cities and regions, and the functioning of their economic systems, are either enablers or constrainers on growth. Institutional enablers are the conditions and factors that facilitate growth by creating an environment that is conducive for firms to operate at their highest level. These enablers principally encompass institutions that support economic actors in taking advantage of perceived opportunities. While some of these institutions are fixed across nations, such as law, regulation, and property rights, others may be subject to urban and regional differentiation. In this sense, urban and regional institutions

can be considered to consist of the underlying rules of the game relating to factors such as the incentives to: save and invest; embrace competition, innovation and technological development; engage in education and learning; engage in entrepreneurship; participate in networks; along with the presence and structure of property ownership and the provision of public services. Enabling institutions will take account of urban and regional contextual factors, with complementary institutions developing through repeated interactions. Constraining institutions may limit the directions in which an urban economy can develop in the future. Therefore, choices that push places towards the development of a particular set of institutions over another may influence growth in the long term (Huggins et al., 2014).

Cities with institutions conducive to enabling economic development are likely to increase their growth by attracting investment, skills, and talent. Some examples include: local business regulations, which allows commercial activity to be efficient; the ease of doing business; local government initiatives; and ultimately, the perceptions of businesses and individuals in a city (Crouch et al., 2009; Rodríguez-Pose, 2013). In order to better understand the nature of urban economic systems and their growth performance, it appears useful to add these institutional factors to such system frameworks. More specifically, it would seem appropriate to consider the institutions that facilitate or impede the extent to which the capital inputs of urban economic systems are effectively transferred into high value outcomes. Similarly, there is a need to consider how institutions enable the transfer of economic outputs into high-grade outcomes.

There are clearly different routes to achieving growth and prosperity (Kitson et al., 2004; Malecki, 2007). Some of these routes are likely to be more attractive for some cities and regions than others. However, whether or not cities and regions are truly free to choose their economic development paths, or whether past history dictates the future potential of an economy is another question. The evolutionary school of economic geography suggests that urban and regional development and associated institutions are likely to be determined, at least to some extent, by past histories (Boschma and Frenken, 2006; Martin and Sunley, 2006; Boschma and Martin, 2010). Cities that are tightly bound in their structures and networks may not be able to move to alternative development paths, so when hit by exogenous shocks, they are unable to escape from a declining growth spiral (Huggins and Izushi, 2007; Martin and Sunley, 2006). These factors have ramifications for cities, especially in the long term, as activities taken to increase growth may have hidden costs in terms of the welfare of the population, which may compromise future growth, particularly if key workers cannot be retained (Florida et al., 2011; Mellander et al., 2011). The evolutionary nature of

urban economic development may further limit a city's ability to move away from industries providing only a low contribution to growth. Institutional theorists suggest that a key means of escaping a downward evolutionary economic trajectory is through the development of institutions that facilitate effective economic development (Acemoglu and Robinson, 2012; Acemoglu et al., 2005; North, 1990, 2005).

Institutions also play a role in ensuring that the wealth required to improve standards of living replenishes the inputs of urban and regional economic systems. In a series of works, Rodríguez-Pose, Storper, and their colleagues (Farole et al., 2011; Rodríguez-Pose, 2013; Rodríguez-Pose and Storper, 2006; Storper, 2005, 2008) have developed the framework of community – which represents a spatially localised notion of institutions – and society – which conversely represents spatially broader institutions – in order to better place institutionalist approaches central within explanations urban and regional economic development. In the process, this framework highlights the importance of geographical context when examining institutional models of growth. Both community and society are considered to influence economic development through the expectations and incentives provided to economic agents (Farole et al., 2011). However, as the authors acknowledge, how these effects vary across cities and regions is little understood, excepting that community and society effects are likely to reinforce one another (Farole et al., 2011).

Contributions from new institutional economics have recognised the temporal nature of institutions, with it argued that embedded informal institutions are likely to endure far longer than those association with more formal governance mechanisms (Williamson, 2000; Rafiqui, 2009). In general, institutions introduced indigenously, and which evolve endogenously, are the most likely to persist over time, and are likely to be relatively 'sticky' as they will have evolved from pre-existing institutions and beliefs (Boettke et al., 2008; Boettke and Fink, 2011). Institutions exogenously emerging from, for example, national government are likely to be less sticky, and even less so in the case of institutions and institutional change emerging from supranational governments (Boettke and Fink, 2011). This emphasises the need to move beyond the notion of institutional 'thickness' (Amin and Thrift, 1995) to also consider institutional 'stickiness' (Boettke and Fink, 2011).

Urban and regional institutions can be considered to consist of those that are either spatially inward or outward looking, with such institutions sometimes being in conflict with formal national level institutions, resulting in unintended consequences (Thornton, 1999). Where there is conflict between formal and informal institutions, North (1990) suggests that informal institutions determine underlying behaviour to the greatest extent. One perspective

is that informal and formal institutions may be substitutes for one another, and strong urban and regional community cultures may develop to fulfil the role of weak ineffective formal institutions (Durlauf and Fafchamps, 2003). This means that where formal institutions no longer support existing activities within a city, it is not beyond possibility that the prevailing informal institutions may actually strengthen to fill this gap (Huggins and Thompson, 2015b).

Framing Urban Growth Systems

The above critique has suggested two potential approaches to understanding and framing urban and regional growth systems. As indicated, there is both some commonality and differences, and improved analytical strength may come from linking and combining them, since high capital provision provides no guarantee of significant economic growth without compatible high quality institutions. Also, high quality institutional provision may be of little benefit without appropriate capital to advantage of institutional incentivisations. Therefore, it would seem of theoretical and empirical value to extract and connect the particular elements and insights of each conceptual approach as a means of developing a fuller understanding of urban and regional growth processes.

In order to being to frame an urban growth system it is necessary to consider how the relevant institutions and capital may be structured with regard to the organisational arrangements that can be said to depict a city or region (Martin, 2000; Rafiqui, 2009). Organisational arrangements consist of the different modes of governance that agents implement to support production and exchange, and are generally considered to include: markets, networks and firms, and the various combinations of forms that economic actors develop to facilitate transactions; contractual agreements that provide a framework for organizing activities; and the behavioural traits underlying the arrangements chosen (Ménard and Shirley, 2008). For the purposes of conceptualising an urban growth system, the firm as an organisational arrangement would appear to be fundamental building block upon which growth is likely to hinge. Second, the markets in which these firms undertake economic transactions are likely to be further guiding factors underlying the growth of a city or region. However, alongside market transactions, other non-market network relationships, especially those concerning flows of knowledge, are likely to also play a role in determining urban and regional growth trajectories. In this depiction, markets and networks are not alternative modes of governance, but are interwoven modes that are at the heart of contemporary capital accumulation. Therefore, the role of markets, networks and firms is to provide the organisational structure for capital accumulation. However, this overlooks the importance of

a broader organisational framework as identified by new institutional economists (Ménard and Shirley, 2008). In the case of a city or region, this would encompass arrangements concerning the political governance – in particular, the politico-economic governance – of these places.

Based on these organisational arrangements, it is possible to depict a growth system with three interdependent levels, as shown by Figure 1: *firm-level growth dynamics*; *inter-firm level growth dynamics*; and *urban and regional level growth dynamics*. The remainder of this section of the article seeks to flesh out and contextualise the various components of each of the three growth levels.

Figure 1 About Here

Firm-Level Growth Dynamics

Firm-level growth dynamics concern the nature, quality and performance of firms in a city or region, and focuses on the interaction between relevant capital and institutions, and how this influences the types of firms in a city, as well as how these firms may shape the institutional framework and capital endowments of a city. Clearly, firms are dependent on the role of human capital – in the form of the skills base of a city (Lucas, 1988) - and knowledge capital – in the form of the technology and research expertise available for innovation (Huggins and Izushi, 2007), and, therefore, the learning and innovation institutions that constrain or incentivise the accumulation of these forms of capital. In the case of human capital, ‘learning institutions’ such as intra-regional and inter-regional labour markets create incentives and constraints as to the type of human capital formed in particular a city, as well as conventions in relation to workforce development and city education systems (Glaeser, 2011). For example, urban and regional institutions have been found to influence the movement and migration of human capital across urban and regional settings (Nifo and Vecchione, 2014), with the accumulation of capital also a factor in determining regional labour markets (Bande and Karanassou, 2014).

Institutions in the form of labour markets enable human capital, in form of skilled and talented individuals, to take advantage of the benefits of specialisation, encouraging economic growth (Acemoglu et al., 2005). Therefore, there is likely to exist to a recursive relationship between the nature of firms in a city, as typified by patterns of economic specialisation, and the institutions and human capital available to the city. Similarly, others have argued that institutions, of either a regional, national or global kind, influence firm behaviour and subsequently patterns of industrial specialisation, with the relationship being

bi-directional in nature, i.e. firm behaviour also impacting upon relevant institutions (Crouch et al. 2009). On the opposite side of the coin, cities may have a more diversified portfolio of firms that are either related or unrelated in their ‘variety’, and recent work again suggests that institutions play a role in determining these patterns (Boschma and Capone, 2014).

With regard to knowledge capital, there is a need to consider innovation institutions in the form of the incentives and constraints to creating and/or embracing new technology, as well as conventions in relation to the financing of innovation and norms regarding the ‘restriction’ or ‘freedom’ of ideas (Storper, 2013). For example, where innovative opportunity exploitation is encouraged through greater rewards (e.g. lower effective tax rates) or at the very least are not discouraged (as might be the case where high administrative burdens are present), the marginal latent innovator is more likely to pursue innovation opportunities (Baumol et al., 2009). Although conventions in relation to the financing of innovation, both R&D and ‘softer’ innovation, and incentives and constraints with regard to undertaking differing forms of innovation - e.g. radical, incremental, technological, or social – are likely to stem from national and supra-national level institutions, more localised formal and informal institutions also play a role (Caragliu and Nijkamp, 2014; D’agostino and Scarlato, 2015), and a significant study by Rodríguez-Pose and Di Cataldo (2015) strongly suggests that innovative capacity, or knowledge capital, is related to the quality of institutions concerning the political governance of a region.

Alongside these formal institutions, less formal institutions in the shape of the nature of inter-firm competition are likely to play an equally, if not stronger role, in shaping the knowledge capital capacity of city. The competition conditions under which firms in a city or region operate are likely to shape the rate and character of innovation within the places, with those firms operating within the most sophisticated and demanding markets for particular products or services tending to be those that are most likely to possess the highest levels of innovation (Porter, 1990; Huggins and Izushi, 2011). Whilst such competition can be considered an informal institution arising from the incentives and constraints emerging from within an industry, in most cases it is accompanied by formal institutions in the form of competition policy regulations prescribed by national and supranational government that seeks to ensure new entrepreneurs and their firms do not face unfair obstacles when entering their chosen markets (Audretsch et al., 2001). These issues relating to markets and entrepreneurship are considered more fully as a form of inter-firm growth dynamic (see below).

Inter-Firm Level Growth Dynamics

Organisational arrangements relating to the connection between firms through markets and networks form the basis of inter-firm level growth dynamics. In this case, the interaction between capital and institutions is considered to influence the nature of the market and networks within which firms in a city or region are situated, as well the extent to which these organisational arrangements impact upon associated capital and institutions. Inter-firm level growth dynamics, therefore, concern the transactions and interactions across economic agents, with the effectiveness of firms to enter and successfully compete in their respective markets being likely to rely on the accumulation of entrepreneurship capital, referring to the capacity of a city or region to generate entrepreneurial activity, whereby entrepreneurs are alert to market opportunities and subsequently contribute to economic growth (Audretsch and Keilbach 2004a; b). In this conceptualisation, entrepreneurship capital encompasses not only the available entrepreneurial talent that allows firms to operate in high value and tradable markets, but also the capability to access the finance entrepreneurs may require to invest in the resources required to engage in these markets (Acemoglu et al., 2005).

Cities and regions with a high density of firms capable of engaging in high value and tradable markets tend to be those with high rates of entrepreneurial capital, with Audretsch et al (2012) referring to these places as possessing highly ‘entrepreneurial regional regimes’. Effective institutions supportive of entrepreneurship make it possible for economic actors to take advantage of perceived opportunities (Sautet and Kirzner, 2006; Acs et al., 2008; Boettke and Coyne, 2009). Entrepreneurial institutions come in the form of the incentives and constraints to engaging in entrepreneurial activity. Institutions may direct individuals or organisations towards the adoption of similar entrepreneurial practices and structures to those currently prevailing in a locality, ensuring they gain support and legitimacy for their actions (DiMaggio and Powell, 1983; Etzioni, 1987; Kibler et al., 2014). In general, it is clear that the type of entrepreneurial activity present in a locality may also be influenced by the quality of institutions present (Stenholm et al., 2013). Entrepreneurial institutions encompass a wide range of incentives, constraints and conventions, which Henrekson and Sanandaji (2011) summarise as including property rights, tax codes, social insurance systems, labour market legislation, competition policy, trade policies, capital market regulation and the enforcement of contracts, and law and order. In other words, a general range of institutions impact upon the nature of urban and regional entrepreneurship and the markets within which these entrepreneurs engage.

A growing school of research has identified the particular role of localised and regional institutions in shaping entrepreneurial capital and the subsequent market orientation of firms (Qian et al., 2013; Fritsch and Kublina, 2015). Cities with entrepreneurially conducive institutions may increase their competitive advantage by attracting investment, skills and talent (Turok, 2004). Entrepreneurial alertness is linked to judgement, creativity and interpretation, and cities with strong institutional traditions with regard to entrepreneurship may have a competitive advantage if they are able to perpetuate this over time and generations (Huggins and Thompson, 2015a). In the UK, the spatial unevenness of financial institutions across regions has been recognised as potentially a key impediment, with economically weaker cities and regions being unable to improve either their entrepreneurial or growth prospects (Klagge and Martin; 2005; Martin et al., 2005; Hutton and Lee, 2012).

At a national level, it has been found that places with better developed financial institutions and systems tend to grow and develop faster (Levine, 2003; 2005; Demetriades and Law, 2006). Indeed, the mere availability of finance is only found aid growth up to a certain point after which institutional constraints such as the weakening of the quality and effectiveness of financial intermediation take hold (Law and Singh, 2014). At a city and regional level, whilst the 2008-2012 financial crisis made clear the possibility of financial institutions having a negative impact on the growth of cities and regions with significant institutional activity, it is generally considered to be the case that a lack of such institutions, and associated capital and equity markets, in many cities and regions restricts entrepreneurship and subsequent growth. Equity gaps in cities and regions limit entrepreneurial and venture investment (Klagge and Martin, 2005; Martin et al., 2005; Sunley et al., 2005). As others have argued, capital markets do not function in a space-neutral way, and a highly centralised institutionalised system may well introduce spatial bias in the flows of capital to firms, leading to differing growth trajectories across cities and regions (Klagge and Martin, 2005; Wójcik, 2009; Turner, 2011).

Alongside markets, recent research on agglomeration economies has identified the role of networks, in the form of ‘communication externalities’, as important factors that sit alongside externalities pertaining from human capital (Charlot and Duranton, 2006). This suggests that both inter and intra-city networks are themselves a type of capital shaping urban growth processes, i.e. network capital, in the form of investments through which firms gain access to knowledge to enhance expected economic returns (Huggins and Thompson, 2014; 2015a), Work on the notion of organisational fields has focused significant attention on the

relational systems that link organisations into networks, whereby organisation fields consist of those organisations that, in the aggregate, constitute a recognised area of institutional life (DiMaggio and Powell, 1983; Scott, 2007). In this case, the capital value of networks within and across cities is likely to be regulated by a series of ‘associational institutions’ in the form of conventions with regard to inter-organizational collaboration and cooperation, especially associational business behaviour and norms of trust and collective action (Cooke and Morgan, 1998; Huggins and Thompson, 2014).

Knowledge networks and the ‘easy flow of ideas’ have been argued to be one of the key explanatory factors underlying the reasons why cities often grow and flourish, despite a range of counter negative externalities being in play (Glaeser et al., 1992; Gordon, 2013). Cities are considered to be key locations for high rates of network formation due to the high density of actors and high frequency of human interactions (Glaeser, 2011). An institutional perspective on these networks and flows suggests that firms are incentivised to engage in networked activity through the availability of formal associational institutions, such as chambers of commerce, business and trade associations, as well more informal institutions in the form of the geographic clustering of firms within which networked cooperation and collaboration is fostered through embedded institutional norms and customs (Cooke and Morgan, 1998; Farole et al., 2011).

Importantly, with the rise of globalisation and agendas such as those related to city-regions, there is an increasing acknowledgement that networked interaction is never entirely locally bounded. In particular, geographic clustering theory is increasingly encompassing more diffuse forms of agglomeration, especially with regard to the type and geographic scale at which external economies become manifest, and the extent to which these are shared across cities and the wider regions in which they are located (Malmberg and Maskell, 2006). Given this, the network capital of firms, and the associated institutional enablers, are tending to evolve toward a wider spatial pattern, facilitated by new institutional mechanisms such as ‘temporary clusters’ and ‘field configuring events’ (Huggins and Thompson, 2014).

It should, however, be noted that there is a potential dark side to such network institutions and interactions, which may have a negative impact on urban and regional growth. In particular, the nature of competition and precarious and asymmetric relationships may result in network ties from negative effects may emerge, locking firms into low value and unproductive networks, and stifling the creation of new knowledge and innovation (Huggins and Thompson, 2015a).

Urban and Regional Level Growth Dynamics

Urban and regional level growth dynamics relate to organisational arrangements concerning the overall governance of urban political economies, especially with regard to institutions concerning the ownership of urban and regional assets, in particular physical capital. In general, there is a growing recognition that the institutions impacting upon the ownership of capital play an increasingly important role in determining economic outcomes (Piketty, 2014; Acemoglu and Robinson, 2012). Although a plethora of factors are highlighted in the emerging literature, those with relevance to the urban context include: the public or private ownership of land and infrastructure (Pacione, 2013); the provision of public services; the provenance of public and private business and home ownership (Rodriguez-Pose, 2013); as well as rules with regard to industrial relations, corporate governance and rent seeking behaviour (Hall and Soskice, 2001).

In their essay on the institutions of ownership in the UK, Hutton and Lee (2012) argue that over many years a failure in the structure of the national institutions of ownership of both public and private sector assets, in particular a lack of diversity in ownership and the location of ownership, has led to contemporary patterns of uneven development. In this context, contemporary low growth cities and regions are likely to have suffered from past economic and political institutions that were innately 'extractive' (Acemoglu and Robinson, 2012), with the power underlying any prosperity generated lying in the hands of a small, and often spatially external, elite.

As others have found, national institutional frameworks interact with their more localised institutional counterparts through a range of channels and mechanisms (Gertler, 2003; Farole et al., 2011), with the strength of these channels being mediated by the location and reach of particular institutions (Storper, 2013). In recent ground-breaking research, Charron et al. (2014) find significant differences in the institutions associated with political governance across the regions of European Union member states based on the 'quality' of local forms of governance. This suggests that political governance is a relational phenomenon incorporating institutional factors at a range of spatial scales and distances. In this vein, Pike et al. (2015) illustrate how the institutions of governance concerning local economic development in England operate through not only multiple agents, but also multi-scalar institutional settings that are frequently the targets of government imposed institutional change. Therefore, although much of the political governance of cities and regions will lie with national government, clearly local, city and regional governments are likely to have a range of powers to impact upon economic growth, with one of most important being that

relating to physical capital and land use regulations, especially with regard to investment in infrastructure projects (Storper, 2013).

As well as infrastructure projects that directly impact upon a city's economic prospects, a more indirect role of urban and regional government is its role in determining physical capital as manifest by the housing stock of a city. As Duranton and Puga (2013) suggest, the fact that housing stock is a very durable form of capital means that it is an important factor in shaping the economic evolution of cities. For example, the amount of land made available by local government for housing development may be a factor in determining the subsequent prices of homes in a city or region (Storper, 2010). Indeed, the effect of land use decisions with regard to housing are likely to be heightened in coming years with growing trends in many cities for rearranging intra-urban space according to strategies concerning the revitalisation of selected places within a city (Harvey, 1974; Scott, 2014), with the emergence of subsequent gentrification impacts accompanying volatile changes in house prices.

Furthermore, as the capital accumulation model of growth is dependent on the savings and consumption propensities of communities (Kaldor, 1957), the decisions of urban and regional political governance with regard to housing and land use policy may impact on the savings and consumption propensities of its local communities through its role in determining housing patterns and prices (Campbell and Cocco, 2007). In recent years, little attention appears to have been given to differences in savings and consumption rates across cities and regions, although research from the 1990s in the UK and Canada suggests significant differences, with such differences having potentially important implications for regional growth and development (Murrell, 1993; Muellbauer and Murphy, 1994). More recent research has also found that differences in consumption activities are to be found across regional contexts in the UK (Johnston, 2011).

Institutional Reproduction, Change and Decay

Urban growth systems and their various components are evolutionary systems within which institutions will reproduce themselves, change or decay, particularly as economic conditions change, as represented by the feedback mechanism shown in Figure 1. The generation of new capital may reinforce existing institutions that may be positive or negative in its outcome. It may help sustain institutions that promote growth or it may entrench institutions that possess rent-seeking traits resulting in low rates of growth, or growth that is not equitable for a city or region as a whole. With changes in economic conditions, institutions considered effective at

one point in time may be less appropriate at other times (Rodríguez-Pose, 2013). This hints at the requirement for institutional flexibility as a means of responding to economic change. As Rodríguez-Pose (2013) argues, although institutions may promote opportunities for economic growth, they may also result in systems with low growth trajectories, whereby a city or region is locked-in to institutions that are unable to adapt to changing economic conditions. Bathelt and Glückler (2014) similarly note the evolutionary and potentially path-dependent nature of the relationship between economic interaction and institutions, resulting in both intended and unintended consequences that impact on existing institutions in terms of their decay or the enactment of new institutions. These perspectives confirm that the types of interaction between capital and institutions across the three levels identified above will be evolutionary in nature.

Empirically Analysing Urban Growth Systems

This section aims to provide pointers as to how the theoretical framework presented above may be operationalised in an empirical manner from both a quantitative and qualitative perspective. Returning to the endogenous models outlined earlier, the analysis presented above indicates that alongside the roles of human, knowledge and physical capital, account should also be taken of a city or region's stock of both entrepreneurship capital and network capital in order to capture the inter-firm growth dynamics at play within and across cities and regions. Therefore, a more complete model would consist of:

$$Y_c = F(H_c, R_c, E_c, N_c, K_c) \quad (3)$$

Where E = a city's stock of entrepreneurship capital, and N = its network capital.

Empirically it is a relatively straight forward task to measure the stock of each capital asset type at the urban and regional level, with human capital usually measured by rates of educational or skill attainment, knowledge capital by expenditure on R&D activity, entrepreneurship capital by the stock of new start-up firms, network capital by the level of knowledge-based ties and frequency of interactions, and physical capital by indicators such as the value of existing infrastructure and gross fixed capital formation.

At this stage, however, the model takes no account of the nature of institutions. Given this, a key question with regard to articulating an empirical methodology is: how might we best define how 'good' or 'successful' particular institutions are? Although terms such as 'thickness' and 'stickiness' give us an indication of the nature of institutions, they do not

necessarily measure their effectiveness. In this case it would seem appropriate to refer to the ‘quality’ of institutions (Charron et al., 2014), particularly their quality in incentivising the accumulation of the capital forms leading to economic growth. Therefore, the type of capital accumulated in a city or region, and the quality of associated institutions, will define the nature of its growth system. However, unlike the relatively straight forward task of measuring stocks of capital, the difficulties in measuring the quality of institutions means that there have been few attempts to incorporate institutions into urban and regional growth models. One notable exception is that of Stimson et al. (2009) who introduce ‘institution’ and ‘leadership’ variables into a regional endogenous model. This represents a particularly novel development, and in this line the five institutional forms identified above facilitate a further extension of their approach:

$$Y_c = F[(H_c, LI_c)(R_c, II_c)(E_c, EI_c)(N_c, AI_c)(K_c, OI_c)] \quad (4)$$

In this extended formulation, institutions enter equation (4) as follows: *LI* = quality of the learning institutions in city *c*; *II* = quality of the innovation institutions; *EI* = quality of the entrepreneurial institutions; *AI* = quality of the associational institutions; and *OI* = quality of the institutions of ownership. In this case, the term $(H_c, LI_c)(R_c, II_c)$ is a measure of the *firm-level growth dynamics* of city *c*, the term $(E_c, EI_c)(N_c, AI_c)$ is a measure of the *inter-firm level growth dynamics*; and the term (K_c, OI_c) a measure of *urban and regional level growth dynamics*. However, an outstanding issue for future empirical research strategies is the extent to which it is possible to assign quantitative measures that identify the relative quality of different institutional features, and whilst some existing indicators may act as useful proxies, new data collection is likely to be necessary in many contexts.

Indeed, a deeper understanding of the role of institutions means that any quantitative analysis should ideally be complemented by a more qualitative assessment of the variation in the types of institutions and their quality across cities and regions. The means by which institutions and their quality can be measured is a matter that continues to challenge institutional economists, with no clear methodology emerging beyond trying to identify relevant and robust proxies (Robinson, 2013; Voigt, 2013). Perhaps the most promising route forward is to relate behavioural changes among a particular community, in this case a city or region, to institutions and institutional arrangements that are likely to promote or constrain particular types of behaviour, in this case that associated with the facilitation of economic

growth. Where significant positive behavioural changes occur, and no significant external ‘noise’ is identified, it could be argued that institutions are of a relatively ‘high’ quality.

In a recent analysis of the contemporary growth patterns of cities and urban areas in the UK, Martin et al. (2014) find that, with only a few exceptions, high growth almost exclusively occurs in the south of England, especially the cities and regions in and around London and the Greater South East. On the other hand, those cities and urban regions with the lowest recorded economic growth are exclusively situated in the more northern quarters of the UK. This suggests significant differences in the growth systems across each type of city and region. As means of beginning to consider these differences from a qualitative perspective Table 1 summarises some of the key capital and institutional features that distinguish high from low growth cities and urban regions. In the south, urban growth systems are relatively high in terms of capital accumulation and institutional quality across the three levels, being rich in terms of the availability of human and knowledge capital, and enabling institutions.

Similarly, they possess high quality institutions and rates of capital in relation to organisational arrangements concerning markets, networks and political governance. Based on this, these cities and regions can be said to typify urban growth systems that are far more likely to result in relatively high rates of long-term economic growth. Unfortunately, the relative paucity of capital and high quality institutions across the cities and regions in the north leads to them being categorised as possessing low growth urban systems. In a comparative study of two cities in the UK – Cambridge (‘south’) and Swansea (‘north’) – Simmie and Martin (2010) identify a number of similar differences in growth systems traits to those found more broadly across high and low growth cities.

Table 1 About Here

Conclusion

This article has presented a systems-based approach to connecting endogenous capital accumulation and institutional theories of urban and regional growth as a means of delineating a framework to better understand how investment in capital assets, especially intangible assets, are related to the institutions underlying the economic functioning of cities and regions. In the past, both capital accumulation and institutional theories of growth and development have been criticised by some scholars for their lack of explanatory power (Glaeser et al., 2004; Chang, 2011), which is perhaps a result of each theory being viewed

somewhat in isolation. A meshing of these theoretical approaches, however, indicates that urban and regional growth is a highly endogenous, recursive and evolutionary process whereby the interaction between capital and institutions at a number of different, yet interdependent, levels of organisational arrangement may offer more explanatory power. Clearly, this will require more formal empirical modelling to determine, although an ongoing problem in this respect is how to best measure institutions (Voigt, 2013). Indeed, part of the problem with some empirical studies concerning the role of institutions is that it is not always clear whether or not the proxy measures employed to capture institutional ‘performance’ are fit-for purpose (Shirley, 2013). Moving forward, amongst urban and regional scholars there is an opportunity to develop further institutional economic thinking that seeks to capture ‘institutional quality’.

Cities will continue to act as laboratories for entrepreneurship and innovation, and future policymaking would do well to recognise that increasing the stock of associated intangible capital alone is unlikely to produce significant increases in economic growth unless high quality institutions are in place. Storper (2010) argues that it is difficult to propose a ‘varieties of city capitalism’ in a similar manner to that employed by those analysing institutions in a comparative manner across nations (Hall and Soskice, 2001). Nevertheless, by identifying the connection between types of institutions and forms of ‘growth capital’, it is possible to consider distinct varieties in the economic growth systems and models at play across cities and regions. Within an economic environment whereby intra-regional economic unevenness has become as manifest as the long-time recognition of inter-regional unevenness, a key issue for both theorists and policymakers is to understand how the institutional structure of a city or region promotes economic growth that is as equitable as possible, and avoids the forms of rent-seeking by economic and political actors that often undermines long-term and sustainable economic growth.

Finally, it is acknowledged that the economic growth system framed in this article does not encompass some of the deeper rooted determinants of growth and development stemming from the socio-spatial cultural or social capital traits of a city or region (Putnam, 2000; Huggins and Thompson, 2016). In this case, whilst institutions can be considered to be the rules of the game governing growth processes, cultural and social traits encompass the extent to which such rules are adhered to, as well as the way in which they foster future institutional change. Nor does the article seek to frame wider development goals beyond economic growth, such as those related to social development, well-being, and the sustainable environmental development of cities and regions. Although these factors are vital

features when considering urban and regional development in the round, they fall outside the contemporary capital and institutional drivers framing urban and regional economic growth systems.

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Figure 1: Framing Urban Growth Systems

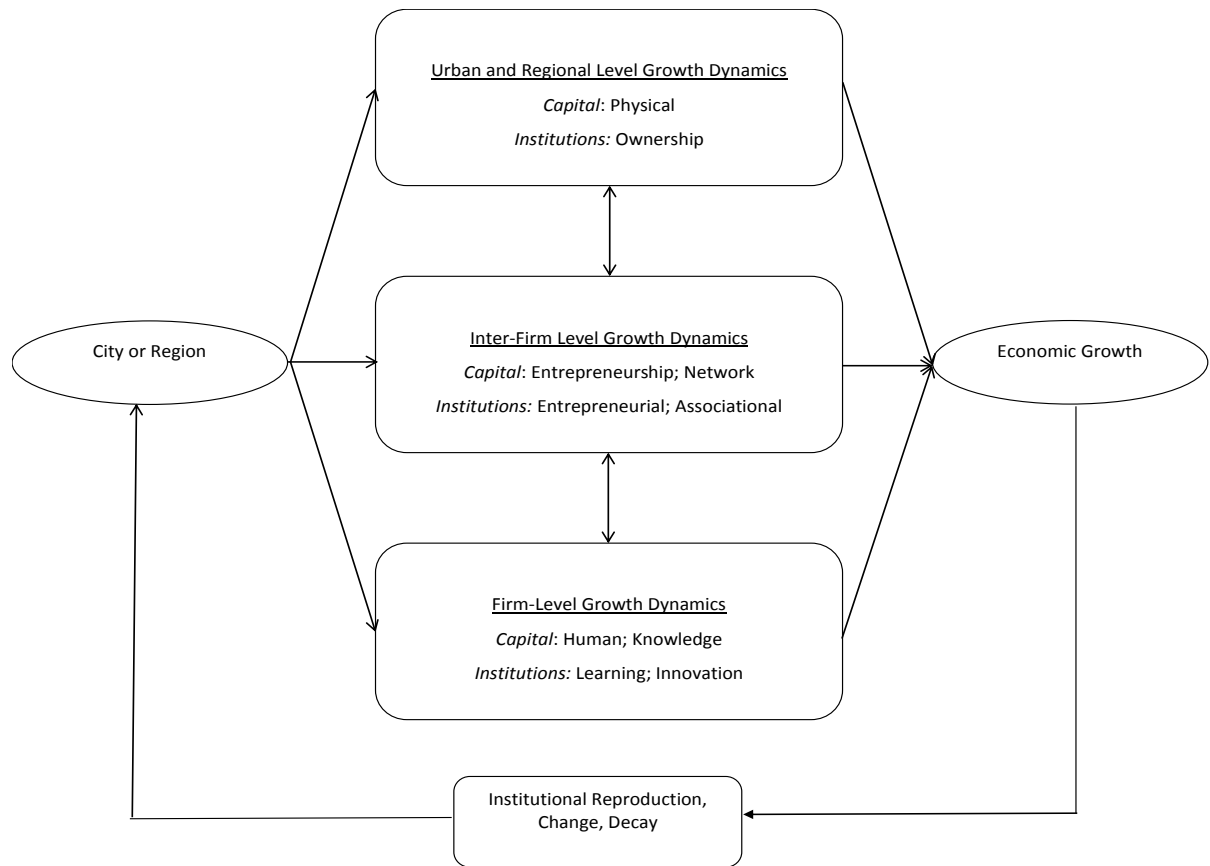


Table 1: General Features of Economic Growth Systems in High and Low Growth Cities of the UK

	High Growth Cities	Low Growth Cities
<i>Firm-Level Growth Dynamics</i>		
Human Capital	Evolving global talent centre, fuelled by 'brain attraction'	Stagnant and relatively low skills base, compounded by 'brain drain'
Knowledge Capital	Rich base of knowledge workers, technology, and expertise	Lack of knowledge workers and associated technology and expertise
Learning Institutions	Dense and flexible labour markets	Weak labour markets
Innovation Institutions	High density of public and private sector engagement in innovation	Low density of public and private sector engagement in innovation
<i>Inter-Firm Level Growth Dynamics</i>		
Entrepreneurship Capital	High rates of entrepreneurship and associated venture finance	Below average (national) rates of entrepreneurship and venture finance
Network Capital	High incidence of business network formation and knowledge flows	Relatively low rates of business network formation and knowledge flows
Entrepreneurial Institutions	Plentiful opportunity to access entrepreneurial support mechanisms	Lack of opportunity to access entrepreneurial support mechanisms
Associational Institutions	Strong industrial clustering, especially among firms operating in highly tradable markets	Lack of strong industry clusters
<i>Urban and Regional Level Growth Dynamics</i>		
Physical Capital	Strong infrastructure, transport systems and built environment	Weak and dated infrastructure
Institutions of Ownership	History of inclusive institutions - centre of public ownership, especially since 1970s. Key location for the head-quarters of large domestic and international firms	History of extractive institutions - extractive industries, dependency on the branch plant activity of international firms