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A New Model Incorporating Leadership and Institutional Factors as Mediating Variables in Regional Endogenous Growth

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A New Model Incorporating Leadership and Institutional Factors as Mediating Variables in Regional Endogenous Growth

by

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Abstract

Theories and approaches to endogenous growth and regional development tend to neglect or at best underplay the role of leadership and the way institutional factors are considered is usually simplistic. This paper builds on the work the authors have been developing over the last year or so to develop a model framework of regional economic development that explicitly incorporates leadership and institutional factors along with the consideration of resource endowments and market fit and of entrepreneurship. An approach to operationalizing the model is proposed.

Introduction

Regional economic development may be viewed both as a process and an outcome. It is a multi-dimensional phenomenon, involving many actors and being influenced by many factors. It seems to defy precise definition. It is seen as a product and as a process. It incorporates both quantitative and qualitative characteristics. And it incorporates policy and strategy that may facilitate the development process and regional change. It is certainly dynamic.

Over time various theoretical approaches to regional growth and development have evolved. From the 1960s, proponents of what is known as *new growth theory* (Arrow 1962; Romer 1986, 1990; Lucas 1988) have separated *endogenous* and *exogenous* factors for analytical purposes. In recent times increasingly the focus has been on *endogenous* factors and processes (see, for example, Johansson, Karlsson and Stough 2001). Those are viewed as being fundamental in regional economic development, arising from the resource endowments and the knowledge base of a region, and being enhanced through entrepreneurship, innovation, the adoption of new technologies, leadership, institutional capacity and learning to become a continuous process.

Of course *exogenous* factors remain important to a region's economic performance and how it develops over time, and increasing importance is being placed on *endogenous* forces as determinants of a region's competitiveness and thus on policy initiatives that enhance local capacity and capability to develop and cope with rapid change in an increasingly competitive global environment. While endogenous growth theory makes mention of leadership and institutional factors, little systematic analysis has occurred to thoroughly conceptualise or measure their roles as endogenous factors in the development process.

Over the last couple of years the authors have embarked on a program of research to address that void, and this paper is the third in a series of presentations on that topic at meetings of the Regional Science Association. The first paper presented a PRSCO in Acapulco in July 2003 (Stimson, Robson, Stough and Salazar, 2003) proposed that a *virtuous circle* for the sustainable development of a region requires pro-active strategy which seeks to shift a region's performance vis-à-vis three dimensions – *leadership* (L),

institutions (I), and *resource endowments and market fit* (REM) - so as to optimize its position in a conceptual space which we call the *regional competitiveness performance cube* (RCPC). That paper discussed the nature of those three dimensions, highlighting the interdependencies between them and provided the rationale for why we believe it is important to re-conceptualise regional economic development in that way and what the implications may be for strategy planning. The second paper presented at NARSAI in Philadelphia in November 2003 (Stimson, Stough and Salazar, 2003) re-visited the conceptual framework discussed in the PRESCO paper but explicitly added the consideration of *entrepreneurship* (E), proposing a new model framework for conceptualizing regional economic development (RED) and performance in which a region's performance outcome is dependent on the interactions between REM as quasi-independent variables and L, I, and E as intervening variables. That NARSAI paper also reviewed eight case studies of cities or regions to illustrate the way interaction between those variables has occurred and evolved in their development and facilitated transition in response to changing circumstances.

In this paper we propose a procedure to operationalise that model framework in which specific measures are identified to measure the REM independent and the L, I and E intervening variables impacting RED.

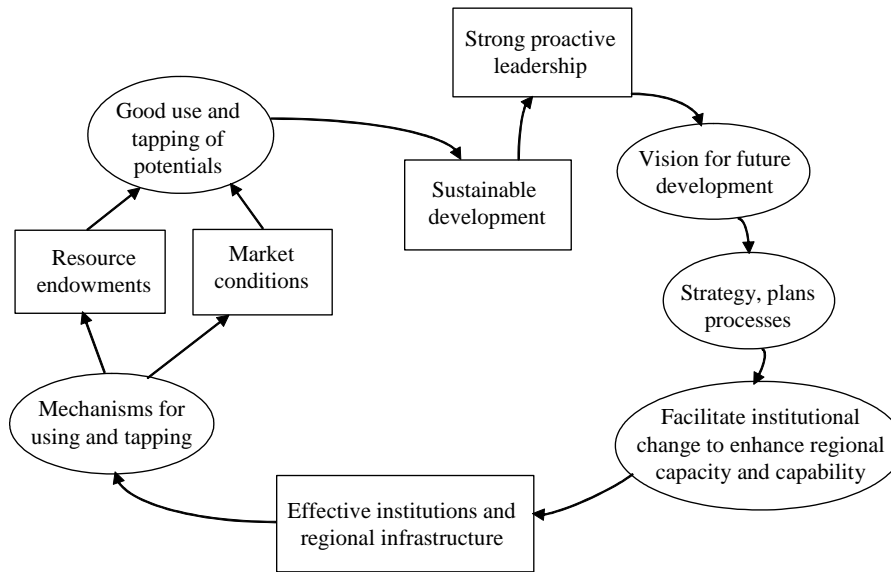
Review of the Conceptual Model Framework

A virtuous circle for sustainable regional development

In suggesting that the notion of pursuing a path for sustainable development may be conceptualized as *a virtuous circle*, Stimson, Robson, Stough and Salazar (2003) suggest that that 'circle' is maintained through *effective leadership* as it is used to *change and adjust institutions* in order to adapt the *structure, processes* and *infrastructure* of a regional economy that is appropriate and needed to meet and anticipate changing circumstances and to facilitate the optimal use of its resource endowments and to assist industries to tap their full market potential (see Figure 1). They expressed the view that *strong leadership* means a region will be *proactive* in *initiating regional economic development strategy* to *monitor* regional performance; that it will set a *vision* for its future development; and that the region will *implement processes* and *plans* that will *facilitate institutional change*. That, in turn, will enhance the *capacity* and *capability* of the region to *positively adjust* to changing circumstances; to attain a good fit with market conditions; and to harness its resource endowments in order to maintain and improve its performance and to achieve *sustainable development* as a *learning region* and to be one that is *competitive*.

It is argued that while in practice this process is often used, all too often it is used in a less than thoughtful and pre-planned way. That argument is derived from the notion that in regions that are performing well, or have been re-engineered and turned-around from performing poorly to perform better, it is the *presence of leadership* that has been crucial in providing the right policies and in creating and facilitating the right environment. In the case of a region like Silicon Valley, for example, that has channeled resource endowments into efficient allocations (Leipziger 1997). In such places leaders have initiated crucial institutional reforms, policies, projects and environments that benefited citizens in general (Rowen 1998).

Figure 1: The virtuous circle for sustainable regional development



The regional competitiveness performance cube (RCPC)

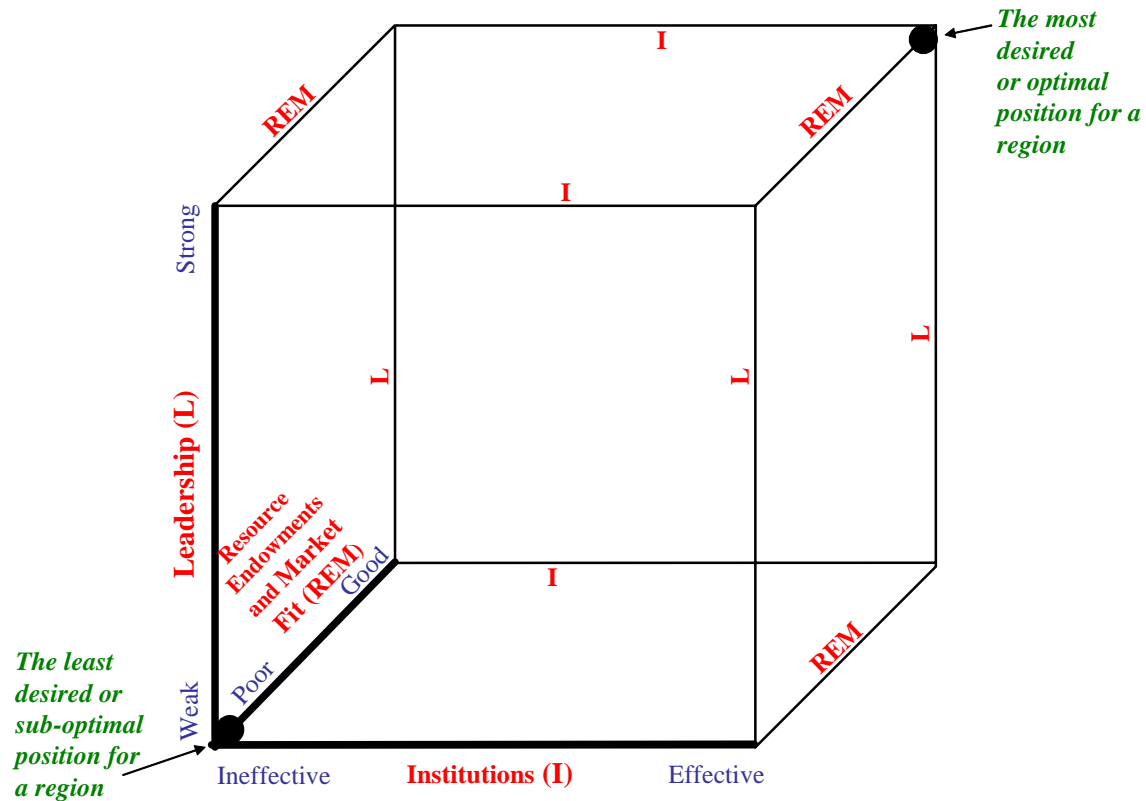
A *three-dimensional conceptual model* was developed by Stimson, Robson, Stough and Salazar (2003) to illustrate how, in the pursuit of sustainable development strategies and the implementation processes and plans through the *virtuous circle* approach, a regional economy might, over time, move from a *sub-optimal* to a more *optimal* position within what is called the *regional competitiveness performance cube (RCPC)* (see Figure 2). The dimensions of the RCPC are:

- strong vs. weak *leadership* (L)
- effective vs. ineffective *institutions* (I)
- good vs. poor *resource endowments* and *market fit* (REM).

At any point in time, any regional economy will fall somewhere within the sphere of the RCPC. Regional economies will vary greatly with respect to their position on the REM dimension, particularly concerning the magnitude, quality and mix of their resource endowments, and as well with respect to the prevailing market circumstances and to competitiveness of their industries in seeking to achieve a ‘fit’ with, and, therefore, to tap into market opportunities. Few if any regions will have a perfect fit because markets and market demand are dynamic due to changing *endogenous* and *exogenous* circumstances. The proposition put forward by Stimson, Robson, Stough and Salazar (2003) is that a regional economy needs to be striving at all times to adjust its institutions and its

productive organizations so as to maintain market fit by efficiently harnessing its resource endowments to be competitive and thus sustain itself. Some regions do that better than others; and how well a regional does it can change dramatically over time, for better or for worse.

Figure 2: The regional competitiveness performance cube (RCPC)



Stimson, Robson, Stough and Salazar (2003) develop a rationale which argues that strong leadership and good performance on the L dimension in the RCPC and the way it impacts with the effective or ineffective performance of institutions—the I dimension—represent key *endogenous* factors that distinguish a ‘good’ performing region and one that is on a path towards ‘optimal’ of performance as against a ‘poor’ performing region and one that is on a path towards ‘sub-optimal’ performance. Their proposition is that how a region performs on the three dimensions—L, I, and REM—in the RCPC will condition a region’s position within the RCPC. It is argued that regional economic development strategy needs to be formulated, and that appropriate plans and mechanisms need to be implemented, that are geared towards shifting the position of a region within the RCPC towards the top-right hand corner of the cube in order to achieve a position which reflects *performance optimality* for a *sustainable development* outcome.

A New Model Framework

It has been proposed by Blakely (1994:53) that the local/ regional economic development (RED) process is a function of a wide range of factors:

RED = f(natural resources; labour; capital; investment; entrepreneurship; transport; communication; industrial composition; technology; size; export market; international economic situation; local institutional capacity; national, local and state government spending; development schemes)

Such an array of factors encompasses both exogenous and endogenous variables.

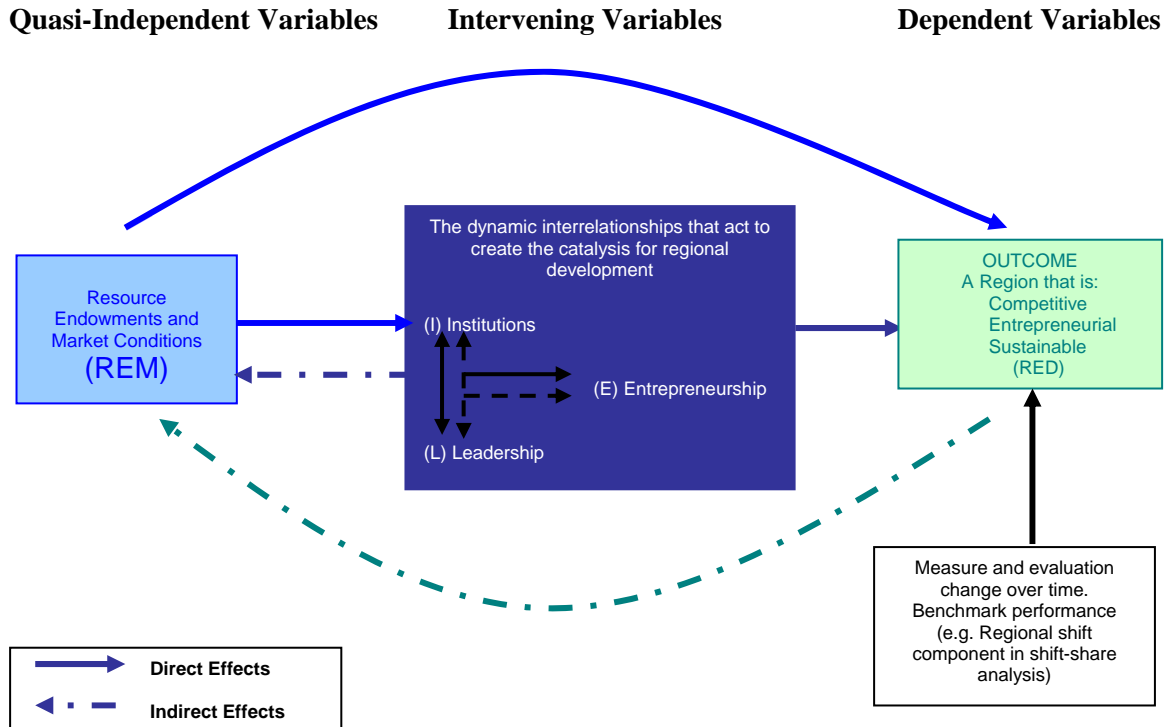
Using the three dimensions defining the axes of the RCPC in Figure 2, and in addition giving explicit consideration to the importance of *entrepreneurship* (E), Stimson, Stough and Salazar (2003) have proposed a new model framework depicted in Figure 3. That model may be represented as follows:

RED = f [REM mediated by (L, I, E)]

In the model the outcome of the regional economic development process (RED) is the degree to which a region has achieved a competitive performance, displays entrepreneurship, and has achieved sustainable development. Those *outcome states* are defined as the *dependent variables* in the model. That outcome state is conceptualized as being dependent on a set of *quasi-independent variables* relating to a city or region's resource endowments and its 'fit' with market conditions (the REM axis in the RCPC in Figure 2), that being mediated through the interaction between sets of *intervening variables* that encompass factors defined as leadership and institutions (the L and I axes in the RCPC in Figure 2) which may interact to facilitate, encourage or suppress entrepreneurship (E). Importantly, the model new framework represented in Figure 3 incorporates both *direct* and *indirect* effects in the interactions between REM (the quasi-independent variable) and L, I and E (the intervening variables). Also, the interactions between the intervening variables L, I and E may be both direct and indirect.

It is suggested in Figure 3 that these dynamic interrelationships and how they evolve and operate over time will shape the nature of the development and performance of a region, which may be measured and evaluated and benchmarked using well-developed and tried tools of regional economic analysis, including, for example, shift-share analysis and in particular through a focus on the regional shift component. The crucial dynamic depicted in Figure 3 is how the intervening variables (L, I and E) interact to create catalysts for more effective and efficient utilization of a city or region's resource endowments and how effectively it captures market opportunities. In other words, the interaction of L, I and E become the crucial catalytic factors in shaping not only the performance of a region - especially in influencing how effectively the REM factors are utilized and tapped - but also in enhancing the capacity and capability of a city or region to efficiently, effectively and successfully address the challenges and contingencies it faces over time in dealing with uncertainty and risk and in coping with change.

Figure 3: A New Model Framework for Regional Economic Development



The Components of the New Model Framework for Regional Economic Development

It is worthwhile to briefly elaborate on the components of the model framework – REM, L, I and E – and to explain why they are such crucial inter-related factors shaping the competitive performance of a region.

Resource endowments (natural, economic and social resources) and market conditions/fit (REM)

It is widely recognized that economic growth and performance is related or tied to resources. “The more endowed a region is in terms of resources the better it should perform *ceteris paribus*” (Stough, 1999). Thus, the capacity of local leaders to act will be considerably dependent on the resources available to them. Such resource endowments are diverse and differ from place to place and include; the area size of the region; natural resources such as climate, land, topography, materials and regional locational and environmental assets; historical economic base and industry structure and diversity; entrepreneurship; investment capital; competitive position; human capital; technological

and other infrastructure; access to markets; agglomeration economies; and so-on (Fainstein, 1983: 32; Judd, 1990: 21).

In the conceptual model framework we specifically incorporate the notion market conditions/market fit within the REM component, because the ability of enterprises in a region to engage in trade with other regions to capture market share outside as well as inside the region is so crucial, as economic base theory has for so long told us. Traditionally resource endowments of a city or region were seen to bestow either a *comparative advantage* or *disadvantage* on a place. But more recently - as Johansson and Karlsson (2001) emphasize - the role of the functional region vis a vis its location, trade and industry specialization is being seen in a different light. Location specialization and regional growth are more dependent on technology and scale effects together with influences from durable regional characteristics. Up until the 1980s, comparative advantages were mainly seen as being derived from resource-based models, but since that time economic specialization has, to a large extent, increasingly seen as being dependent on increasing returns, with differences in resources (factor initiatives) explaining only parts of trade flows and the location of production (this argument follows Krugman 1981, 1991). With increasing returns as a basic explanation, trade is seen as developing because there are advantages in specialization among regions with similar resource endowments; thus specialization and trade are driven by scale rather than by comparative advantage, with the gains from trade arising because production costs fall as the scale of output increases. Johansson and Karlsson (2001) also show how the internal market potential of a functional region is the prime home market which, together with increasing returns to scale, may give rise to processes of endogenous growth (or decline). Thus, resource-based and scale-based mechanisms combine to impact regional development. Regional market size is also important as it extends market potential. When a region has both, its competitive advantage increases, and there will be an increased possibility of a region 'growing' a wide range of industry sectors, many of which may be exported to other regions. The recently popular concept of 'industry clusters' is largely based on such premises.

However, a region might succeed even if it has few or relatively poor resource endowments or if there are few opportunities for economic expansion (Jessop, 1998:96), and that may be achieved through strong leadership and effective institutions acting as the catalysts and facilitating entrepreneurial activity to stretch and leverage those resource endowments that exist and to enhance market capture. Conversely, poor leadership and inadequate or inappropriate or ineffective institutions might mean that a region's resource endowments are not being used effectively and that market opportunities are not effectively pursued and tapped. In that way a region might experience a *competitive advantage* or *disadvantage*. The importance of competitive advantage is emphasized by Porter (1990); and more recently Moore (1996) links competitiveness to *collaborative* arrangements, which include strategic alliances, partnerships and resource sharing, which we have discussed as endogenous factors in the context of institutions and institutional arrangements.

Of course *scale* factors relating to the size and diversity of a region and the market opportunities it represents, as well as the external markets and their size and scope that

the region potentially and feasibly might tap, will be of considerable importance in impacting the nature and rate of economic development and growth in a city or region. Thus, we are not underestimating the effects of scale and agglomeration in the model framework. Indeed, as seen in much of the recent work in theories of endogenous growth, local externalities (Scott, 1988; Feser, 2001) are key factors in the regional economic development process.

Special importance is now being placed in those resources that the public and the private sector, and NGOs, can direct towards community economic development or community problem-solving (Stough, 1999). The degree to which such actors and decision-makers commit resources into the community and as well as the availability of resources for economic development will determine the scope and scale of local action, thus potentially enhancing the resource endowments of a region. The *scale effects* of agglomeration do suggest that larger places—particularly large metropolitan cities—will have a combination of resource endowments, market fit and other factors that provide them with an important advantage vis a vis smaller places. It is evident also that industry diversification is associated with urban scale, and that the role of new technologies - such as ICTs - is acting to enhance those effects (Duranton and Puga, 2000).

The factors referred to above may be regarded predominantly as *endogenous* influences; but they may also be *endogenous* as seen in the role of external market conditions. But there are also other *exogenous* factors that may operate to impact on regions and dramatically change the nature of their resource endowments. Global and national processes of economic and political restructuring increasingly are imposing new challenges and opportunities to regions. For example, deep-seated sectoral shifts have redefined the economic base of advanced capitalist economies. In places such as North America, Western Europe and Australia, those shifts have manifest themselves in the stagnation and decline in many mass production labor-intensive activities such as textiles and heavy manufactures. As a result, many regions have experienced unfamiliar uncertainty as they could no longer rely on past practices but had search for new economic activities and development strategies. The revolution in information and communication technologies (ICTs) and the accelerating pace of technology change, along with the mobility of capital, exacerbate that uncertainty and the rate and scope of the transformation that may occur in a city or region (Sheppard and Leitner, 1998:287).

These new challenges mean that regions - or even locations within them - need to offer a favorable set of conditions among the intervening variables in our model. Those regions that do offer a favorable set of conditions that result in strong leadership and effective institutions and which encourage and facilitate entrepreneurship will be more likely to become places with a *competitive advantage* (McGuirk, Winchester and Dunn, 1998: 110).

Leadership (L)

Leadership is not a straight-forward concept, particularly in the context of regional economic development, and there has not been a lot of published research that has

systematically analysed the nature of leadership and its role in regional economic development.

Leadership may be seen as “the capacity to create stable and durable mechanisms and alliances that promote economic regeneration and identifies a range of micro-level skills and macro-level resources that can generate that capacity” (Parkinson, 1990:241). While it is common for leadership to be seen in terms of a ‘great person,’ it might be more appropriately seen as an expression or result of ‘collective action’. Thus, in regional economic development, leadership is seen not as a ‘starring role’ but as a ‘collaborative action’ (Fairholm, 1994; Heenan and Bennis, 1999). Leadership might thus be defined as “the tendency of the community to collaborate across sectors to enhance the economic performance or economic environment of its region” (De Santis and Stough, 1999).

Heenan and Bennis (1999) points out that, in the new economy of increasing interdependence and technological change, collaboration is not just desirable; it is crucial. Previously, influence, power and decision-making often depended on single individuals, and leadership was based on traditional hierarchical authority relationship between leader and follower. But today, power, influence and decision-making are more dispersed among power stakeholders working together towards a common goal (De Santis and Stough, 1999; Heenan and Bennis, 1999; Judd and Parkinson, 1990). It is through collaboration and collective processes that regions will have the sufficient flexibility and knowledge to adjust to shocks and continuous changing conditions (Saxenian, 1994; Stough, 2001). In this sense, “leadership for regional economic development will not be based on traditional hierarchy relationships; rather, it will be a collaborative relationship between institutional actors encompassing the public, private and community sectors - and it will be based on mutual trust and cooperation” (Stimson, Stough and Roberts, 2002: 279). It will be about shared power, flexibility and entrepreneurialism to ‘energise’ a city or region to meet its competitive challenges and adapt its environment to the needed challenges (Porter, 1990). In this sense, leadership might be seen as “the vehicle that steers that adjustment process” (Stough 2001), operating by targeting and guiding adjustment in *institutions* (social rule structures) that enable a region to change in ways that help to sustain regional economic development. That involves the capacity to engage in risky behaviour (Doig and Hargrove, 1987; Hofstede, 1997).

It is in that context of *risk* that there is an obvious link between *leadership* and *entrepreneurial activity*, and this has been a focus of attention from both a management and a business development perspective in studies of the firm as well as in regional economic development. With respect to the former, the entrepreneurial role of a leader is to innovate and develop products or services to market and to effectively compete with—or out complete—competitor firms. In the latter context, community leadership for regional development may contain many individual entrepreneurs; however, their desire to collaborate—to work together—to create positive externalities beyond their own self-interest or profit is what generates and/or enhances effective leadership in a collective context for regional economic development

The following might be proposed as four key components of, or even preconditions for, effective regional leadership to enhance the economic development process:

- *Collaboration*, as leadership is about an expression of vision and the implementation of processes for the collective good—and for the whole community—of a region (Fairholm, 1994).
- *Trust* is essential for effective collaboration. Leaders and followers must have mutual trust to risk participation in collective action (Fairholm, 1994). If trust is lacking, leaders will find it difficult to have their views accepted.
- *Shared power*, which is characterized by low *power distance* and decentralized leadership power. The ‘power distance’ concept is defined by Hofstede (1997) as the degree of inequality in power between a less powerful individual and a more powerful individual, the existence of which engenders mistrust and makes cooperation and collaborative difficult. Power and responsibilities need to be dispersed while power bases are independent.
- *Flexibility*, which is necessary for innovation and creative thinking and which rigidity in control mechanisms hinders (Bentley 2002: 33).
- *Entrepreneurialism*, where community leadership shows entrepreneurial characteristics, believe in change, and initiates it to “energize” a region to meet its competitive challenges and adapt its environment to the needed challenges (Porter 1990), and this involves the capacity and willingness to engage in risky behavior (Doig and Hargrove, 1987; Hofstede, 1997).

It is evident that there is interdependency between *leadership* and *institutional* considerations. Collaboration, trust, power distance, and entrepreneurialism are products or outcomes of the interactions between those two dimensions in the RCPC in Figure 2, and it thus becomes a moot point as to whether the key components referred to above belong to one or the other or both of the L and I dimensions. This is neatly illustrated by Saxenian’s (1994) proposition that leadership will be characterized by horizontal structures rather than by vertical structures.

In regional economic development, it is the dynamic or, more precisely, the *catalytic* effect of leaders and of leadership that is crucial.

Institutions (I)

Institutions are crucial in providing the ‘rule structure’ and the ‘organisations’ within which a society operates. ‘Government’ is the system by which a nation state or city or region is governed, while ‘governance’ is the act or manner or process of governing and the office or function of governing.

North (1990) argues that the institutional framework determines the incentive structure of a society. “Institutions, together with the constraints of economic theory, determine the opportunities of a society” North, 1990: 4). The economic performance of or region over

time is fundamentally influenced by the way institutions evolve, how they decrease uncertainty, how they allow individuals to have access to information, and how they decrease market imperfections that increase transaction costs. “They can provide the stability in collective choices that otherwise would be chaotic” (Clingermayer and Feiock, 2001: 3).

The choices that political and economic actors make are shaped by the rules, conventions and beliefs embodied in things such as constitutions, property rights and informal constraints that, in turn, shape economic performance. The nature of those institutional factors and the degree to which they impose constraints or help facilitate action in the pursuit of opportunities are seen as conditioning the capital accumulation process and as a result the economic development of regions (Vazques-Barquero, 2002; 12). That is because their behaviour may act to:

- reduce transformational and production costs
- increase trust among economic and social actors
- improve entrepreneurial capacity
- increase learning and relational mechanisms
- enhance networks and facilitate cooperation among actors.

In regional economic development, Blakely (1994) refers to the necessity of having appropriate institutional arrangements to manage and fund the regional or local development strategy process and to ensure the implementation of plans and actions. Thus, the capacity and the capability of local institutions to initiate, undertake, and carry through plans and decisions are fundamental to that process. Institutional capacity-building is now seen as a fundamental factor in regional economic development. That is now being discussed as well in the context of the creation of ‘learning infrastructure’ and the ‘learning region’ (Simmie, 1997; OECD, 2000)..

From the work of Mouritzen and Svava (2002), Clingermayer and Feiock (2001), Fairholm (1940), some of the issues to consider in addressing the ways institutional arrangements may shape policy outcomes and the implications for regional economic development include the following:

- political institutional environment
- nature of executive government
- uncertainty and leadership turnover
- external constraints on local policy choices
- inter-institutional collaboration and network interaction
- trust as a governance devise
- institutional decentralization
- organizational culture
- governance culture.

Institutions do have a powerful influence on how organisations and regions adjust to change and stressors and can be powerful positive or negative *endogenous* influence on how the impacts of *exogenous* forces are managed. It is not the nature and structure of

institutions *per se* that is necessarily important, but rather the capacity of institutions to be fast and flexible to adjust appropriately to change and to anticipate change and manage risk in an increasingly uncertain and competitive world.. Here the link between *institutions* and *leadership* is evident.

Entrepreneurship (E)

Regional *leadership* needs to show *entrepreneurial* characteristics. Derived from Schumpeter's (1934) idea of entrepreneurialism, a region might be thought as being entrepreneurial if community leadership shows the following characteristics:

- The leadership believes in change and initiative to 'energize' it to meet competitive challenges and to keep progressing.
- The leadership possesses insights to enable it to identify opportunities and pursue innovative ideas to improve or adapt a region's environment to meet the needed challenges facing it through 'new combinations' or innovation in institutional arrangements (Jessop, 1998:84-5; Jessop and Sum, 2000:2290; McGuirk et al,1998).

Those entrepreneurial characteristics can be seen if attention is focused on the following (Jessop, 1998:85):

- (a) Using new methods to create location-specific advantages for producing goods/services or other urban activities to shift in the economic base of the city. Examples include technopoles, agglomeration economies, etc.
- (b) Introducing of new types of urban place or space for producing, servicing, working, consuming, living, etc. Examples can include gateways, intelligent cities, multicultural cities, creative cities, etc.
- (c) Refiguring or redefining the urban hierarchy and/or altering the position of a given city within it. Examples include the development of a regional gateway, hubs, etc,
- (d) Finding new sources of supply to enhance competitive advantage. Examples include attracting inward investment or reskilling the work force. Therefore, the focus on this factor will be on the tendency shown by the community to undertake entrepreneurial local initiatives
- (e) Opening new markets, whether by place marketing specific cities in new areas and /or modifying the spatial division of consumption through enhancing the quality of life for residents, commutes or visitors.

(f) Finding new sources of supply to enhance competitive advantages. Examples include changing the cultural mix of the cities, finding new sources of funding, or reskilling the workforce.

In each regard, entrepreneurialism in the context of a region contains the element of uncertainty that many see as the very essence of entrepreneurial activity. In this sense, “it is speculative in design and therefore dogged by all the difficulties and dangers which attach to speculative as opposed to rationally planned and coordinated development” (Jessop, 1998:84-5).

Outcomes (RED)

Taking into account the proposition that regions inevitably are influenced by their institutions, leadership, social composition, economic structure, and the degree of entrepreneurial activity - all of which interact and evolve in a unique manner over time and display a unique set of circumstances and a particular outcome state at any point in time - the conceptual model framework depicted in Figure 3 stresses the dynamic uncertainty of reality that confronts regions in the contemporary world. Regional economic development (RED) over time, and the outcome state of those factors and processes that affect RED, may be measured and evaluated through performance indicators relating to:

- the competitive performance of a city or region vis-à-vis other places
- the degree of entrepreneurial activity occurring
- the degree to which it has attained sustainable development vis-à-vis ‘triple-bottom-line’ economic growth and performance, social equity, and environmental quality indicators.

A way to conceptualise that outcome for a city or region at any point in time and its progress in economic development and its performance through time is to envisage its path through the regional competitiveness performance cube (RCPC) as proposed in Figure 2.

Developing an Operational Model

The crucial dynamic depicted in Figure 3 is how the intervening variables measuring the L, I and E mediating components interact to create catalysts for more effective and efficient utilization of a region’s resource endowments and how effectively it captures market opportunities (the independent variables measuring the REM component). In other words, the interaction of L, I and E become the crucial catalytic factors in shaping not only the performance of a city or region - especially in influencing how effectively the REM factors are utilized and tapped - but also in enhancing the capacity and capability of a city or region to efficiently, effectively and successfully address the

challenges and contingencies it faces over time in dealing with uncertainty and risk and in coping with change.

Difficulties

A major impediment to developing such an operational model is the difficulty that arises as a result of not having specifically defined and agreed variables that might measure the REM, L, I and E components of the model framework for RED. That problem is exacerbated in not having a precise definition of regional economic development and competitiveness performance. There is a considerable degree of what might be described as a ‘nebulous’ quality about the precise meaning of, let alone measurability of the components of the model framework. Furthermore, because the intent is to be able to ‘track’ over time the path of a region through the space in the RCPC as represented in Figure 2, a dynamic measure of RED is needed.

Even if we are able to propose and agree upon a set of operational variables that might measure the components of the model framework, then there is the further issue concerning the availability of secondary data suitable for providing a data base for regions across a state, province or nation.

An endogenous growth measurement approach

One feasible approach to measuring RED performance across the regions of a state or a nation is to take a simple surrogate measure of *endogenous growth*, namely the *regional or differential shift component* as derived from a *shift share analysis* of regional employment change over time. Secondary data tends to be readily available to do that in most countries and typically may be achieved using census data for industry employment in regions. That regional shift component is a reasonable surrogate measure of the degree to which employment growth or decline in a region is due to endogenous or within-region processes and factors against changes due to national and industry-mix shift effects. The *regional shift* component measure is thus proposed as the dependent variable and as a surrogate for RED in the model framework, and it is designated EG in the operational model proposed below.

Proposing variable for an operational model

We suggest in what follows sets of variables that might be appropriate to contemplate as measures of the independent and the mediating factors in the model framework for endogenous economic development.

Regional economic development and growth over time is represented as follows:

$$EG = f [RE, MF, \text{mediated by } (I, L, E)]$$

In that model the elements might be measured by combinations of variables such as those proposed below:

EG = **endogenous growth** in region; *i* = region *i*; *t* = time period, measured as:

- the aggregate regional differential shift component value in a shift share analysis.

RE = **resource endowments**, measured by a set of variables such as:

- area size of the region
- climate
- topography
- agglomeration of industry key sectors (measured by Location Quotients for employment in industry sectors)
- population size and rate of growth/decline
- education levels (a derived index of human capital) and literacy
- per capita income, income distribution, and income distribution change over time
- housing ownership
- investment in industrial and commercial construction, benchmarked to the region's national share vis a vis its national share of population
- infrastructure investment (per capita), such as on roads, schools, hospitals, etc
- industrial structure and change in industrial structure (measured by an industrial diversity index).

MF = **market fit**, measured by a set of variables such as:

- basic economic activity in key industry sectors (measured by Location Quotients for employment in industry sectors)
- airline connections with other regions/cities
- road freight in/out movements
- volume and value of exports in key products and services

It would also be useful to use variables that measure the degree to which the region's products fit with changing demand and related markets, to ascertain the degree to which supply fits the local market, and to evaluate the extent to which the local infrastructure provides the necessary linkages to export markets.

L = **leadership**, measured by a set of variables such as:

:

- the degree of change/stability in local political leadership
- expert judgmental assessment of leadership quality
- corporate headquarters located in the region
- density of business and community organisations per 10,000 population.

I = **institutions**, measured by a set of variables such as:

- institutional thickness (corporate and community organisations per 10,000 population)
- layers of government/government fragmentation
- formal institutions of governance, measured by number of public agencies per 10,000 population
- number of headquarters of major corporations (e.g. Fortune 1000 firms)
- value foundation capitalization per 10,000 population
- government fragmentation
- level of regional organizations (number and budget level)
- indices of social capital.

E = **entrepreneurship**, measured by sets of variables such as:

- churn rate/ business start-up rate
- venture capital activity
- corporate venturing activity
- patents issued per 10,000 workers
- Location Quotient of employment in ‘symbolic analyst’ occupations.

We would argue that *EG* is positively related to *RE*, *MF*, *L*, *I*, and *E*, but that there are likely to be lead and lag effects in the short to intermediate run, and perhaps cyclical effects in the longer run. Thus,

$$EG_t = RE_{t-1} + MF_{t-1} + (I_{t-1} \text{ to } I_{t-10}/10) + L_{t-2} + E_{t-2} + e$$

Conclusion and Next Step

This paper builds on the previous two papers presented at meetings of the Regional Science Association over the last year or so reporting on work we have been undertaking developing a new modeling approach to exploring processes of endogenous growth and how regional development may be influenced by, and facilitated through, leadership and institutional factors which incorporate entrepreneurship, but which also accounts for local resource endowments and factors relating to the ‘market fit’ of a region. We are seeking to develop a framework model for regional economic development that explicitly incorporates leadership and institutional factors – and entrepreneurship – as mediating variables within the set of independent variables as explanatory factors in the regional economic development and growth process.

In this paper we have progressed our argument to the stage where we propose an operational model, specifying the potential sets of variables that might be appropriate, and for which data may well be available, to implement such a model framework to

actually empirically measure the relationships between the RE, MF, L, I and E factors as processes of endogenous growth and development. Empirically testing the model framework through an operational application of the model applied to regions in a stage, or a selection of regions or of cities in a nation, will be the next stage in the development of this new modelling approach to which aims to explicitly test the role of leadership and institutional factors in endogenous growth and development.

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