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Local Economic Development: A Framework for Analysing
Local Development Processes in the Knowledge-Based
Economy**

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Tech-based Inequalities and the New Policy Dimension in Local Economic Development: A Framework for Analysing Local Development Processes in the Knowledge-Based Economy

Lorenzo Ciapetti¹

Abstract

There has been an increasing emphasis in recent years on the role of tech-transfer programs in local development, highlighting the potential benefits of a new knowledge-based competitiveness. The dominant goal of a knowledge society in advanced countries, however, has prompted a weak debate on the pressures that originate from this new paradigm at local level and on the *inequalities* it generates. The variables that intervene to shape and steer local economic development (LED) in the knowledge-based economy are here considered in order to build a general framework of analysis. The proposed analytical framework for LED recognises the importance of six dimensions: *contextualisation, expectations, timeliness, capabilities, interdependencies and inclusion*. It is argued that a crucial policy dimension stems from the several asymmetries that may arise with regard to the different capabilities of the involved local actors (firms, institutions, individuals) *vis-à-vis* the *cumulative advantage* dynamics of knowledge and technology. A problematic issue, raised by means of a cross-country comparison between the US and Italy, pertains to the exclusion of “disadvantaged actors” (small firms and low-skilled individuals) in technology-based development programs. It is also argued that inequalities in terms of access to technology risk to hinder governance-based processes in local development. To this end, a countervailing investment in deliberative forms of democracy would require a policy path that aims at reducing LED disequilibria by means of an *adaptive, democratic and creative* process of learning. Implications for a future comparative research agenda among localities are introduced with regard to this perspective.

Keywords

Local economic development; knowledge economy; governance; tech-based development; inequality

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A development project is a special kind of investment.

The term connotes purposefulness, some minimum size, a specific location, the introduction of something qualitatively new, and the expectation that a sequence of further development moves will be set in motion.

Hirschman, 1967

Introduction

In Europe, there has been an increasing emphasis in recent years on the role of tech-transfer programs in promoting local development, especially with regard to the synergies that may arise between firms' R&D and the research conducted externally in university-based or private laboratories. This emphasis has tended to highlight the potential benefits of a new knowledge-based competitiveness, in accordance with the Lisbon Agenda².

In development terms, the tech-based scenario implies a neat differentiation between those local actors (firms, individuals) that have an access to technology sources and can "upgrade" their technological and productive potential and those actors that do not have such capacity.

In broad terms, there has been a considerable increase of research on the potentially disruptive implications of a globalised and knowledge-based economy with regard to the way with which "non-elite" actors (the less-skilled individuals; the less advantaged communities, firms in developing countries, etc.) access knowledge and benefit from technology. The major perspectives that have been used to describe this threat have focused on the inequalities of access to science and technology (Cozzens *at al.* 2007), the problem of a public and open access to science (Nowotny, 2001; Gallino, 2007), the problems of inequality of globalisation and the approach of value chain

² The term competitiveness is permeating all the current debate on local development but as all buzzwords "it is frequently used in a confused and confusing way". For a critical approach to the competitiveness frenzy please see Bailey *et al.*, 2006.

upgrading (Kaplinsky, 2000; Humphrey, Schmitz, 2002; Gereffi, 1998), the issue of a democratic and governance-based decision-making approach to tackle development obstacles raised by globalisation (Sugden, Wilson 2003). More generally, there has been attention to inequality related to skills and wage, especially in the US context (Neckermann, Torche, 2007). However, less attention has been devoted to ways in which localities, as complex systems, face a potential scenario of uneven technology-driven development similar to the perspective of uneven development and inequalities due to the activities of multinationals, first raised by Hymer (1972) and recently reintroduced by Cowling and Sugden (1999) and Bailey and Driffield (2002).

Arguably, the recent technological and scientific acceleration of the knowledge-based economy (and the dynamics it entails in terms of specialisation, production and economic growth at global level) exerts unprecedented pressures on localities in advanced societies and creates a problem of uneven development within territories based on the relative capabilities (of firms and institutions) to enlist knowledge and technological resources and promote an adaptation of the human capital potential.

These pressures entail a process of adjustment, in which institutional adaptation (via governance mechanism) becomes necessary to bring about a better 'match' between the new technology and the local system³.

The present paper draws from the basic assumption, in agglomeration theory, that the environment and the milieu matter in the performance and development of the firm (Marshall, 1916; Beccattini, 2002; Porter, 1998; Krugman, 1991; Malmberg *et al.*, 1996) and that the firm – territory nexus (Malmberg, 2004) plays a central role in Local economic development (LED).

³ There is not yet easily available evidence for these processes. A few examples arise from recent field research conducted by the author on Emilia Romagna clusters (Antares, 2005; 2007). Imbalances or inequalities have been especially recognised in the packaging cluster (between leading firms and subcontractors in terms of access to technology), in the mechanical cluster (between the technological change in leading firms and the overall capacity of the territorial system to sustain such change). A further inequality is related to the issue of "skill-mismatch" in advanced economies: an example of such scenario can be witnessed in a LED programs in the US (Ciapetti, 2006).

Since the elements of this nexus are interdependent a perspective is also reasserted in terms of the co-evolution between institutions and firms⁴.

In a LED perspective, this technological re-orientation of a locality far from being the responsibility of firms alone, can be successfully managed only through viable mechanisms of governance between firms and institutional actors. This governance mechanism has been, indeed in Italy, the cornerstone of industrial districts' development (Dei Ottati, 2002). However, globalisation has increased the divergence in the ways and modes single firms compete (Berger, 2005) and this prompts a question on the possibility of preserving (or recapturing) the externalities linked to local agglomeration. Firms (especially leading district-based SME's) tend to respond to global pressures through upgrading strategies (Humphrey, Schmitz, 2002). Whereas these strategies are contributing to the improvement of some districts' performance (Rabellotti, 2003), a challenge remains in terms of adaptation of the capabilities of remaining clusters' actors, especially small firms acting as subcontractors (Camuffo, Furlan, Grandinetti, 2005)⁵.

The perceived risk is that of facing a de-territorialised kind of LED in which elite firms, although anchored territorially, compete in the global arena and local linkages (the classical cluster's externalities) are increasingly lost in favour of new tech-based international partnerships⁶.

There is indeed a policy dimension related to the question of how new and external knowledge integrates into spatially clustered firms and territories that is also, conversely, a question about how localities and their institutional set-

⁴ Although the idea of co-evolution is not new (Nelson 1994; Lynskey 2006), the level of analysis is taken at level of localities and a evaluative framework is introduced to assess progress in the direction of local development.

⁵ In the language of the resource-based-view of the firm (Teece and Pisano, 1994), there is a concern on the dynamic capabilities and the *absorptive capacity* of firms (Cohen, Levinthal, 1990) at cluster level.

⁶ On the risks of deterritorialisation in globalisation see Storper M., "Territories, flows and hierarchies in the global economy", in Cox K.R. (ed.), *Spaces of globalisation*, The Guilford Press (1997)

up can tap into global flows of knowledge and technology in a sustainable mode⁷.

The present paper refers to a concept of locality that encompasses firms, institutions, organisations and the relationships between these actors (Sugden, Wilson, 2005). The term governance refers to a flexible pattern of public decision-making, that highlights the capacity of actors to co-ordinate policy and solve public problems in a complex context (Pierre, 1999).

The twofold perspective (locality and governance) has recently been introduced to assess the level of collective action and the results of deliberative democracy in LED initiatives⁸. It has been argued that deliberative democracy in LED tends to increase participation, propension for cooperation and actors' capabilities by means of learning by doing (Cersosimo, Wolleb, 2006). Since a critical reconstruction of deliberative democracy is not within the scope of the present paper, the paper attempts to highlight the limits and potential of a governance-based LED program taking into consideration the idiosyncrasies among actors with regard to *preparation, capabilities and choices* of development. In doing that, awareness exists that "each and every way of organising economic activity is characterised by a particular type of governance" (Bailey *et al.*, 2006) and that there is room to alter the path of development by means of a "strategic choice framework" that accounts for deliberative and representational issues ("variations in sets of people") and contextualisation ("variations in the basis upon which [people] choose")⁹. The paper's concern, however, is exactly for the restrictions concerning the "basis of choice"; or for a local development scenario that is compounded by the space-time and market dynamics of innovation and by the limitations due to

⁷ We purposefully use the adjective "sustainable" to refer to a LED dimension that envisages competitiveness and social cohesion at the same time.

⁸ The framework of deliberative democracy has been used to assess the level of production of local public goods (as witnessed in Territorial pacts in Italy) by Cersosimo and Woelleb (2006). For a recent critical survey on deliberative democracy please see Gbipki, 2005, *Dalla teoria della democrazia partecipativa a quella deliberativa: quali possibili continuità?*, Stato e Mercato n. 73, aprile 2005

⁹ Bailey *et al.* (2006) lay down an interpretative framework that tends to give a prominent role to "choice" rather than "strategy" in economic development.

path-dependency that are witnessed in the evolution of competitive clusters around the world (Saxenian,1994 Scott, 2006)¹⁰.

From this perspective, arguably, the balance between a *democratic* potential for local development, based on the governance framework and local capabilities, and a *deterministic* view of the development process, based on global market dynamics and local capital endowment, should be reached through an appropriate set of public policies that take into account both forces and design a long-term strategy that tap into that potential and attempt to tackle any imbalances. This kind of scenario opens up new opportunities for deliberative democracy at local level ¹¹.

The idea of a tech-based challenge to localities stems from the view that a failure to adopt appropriate measures to countervail the pressure of the knowledge-based economy may result in a belated and uneven development of the locality, due to the rapidity of global, economic and technological processes and the time requested to adapt to technological change on the part of SME's¹². Without an intentionally-designed LED program, inequalities are bound to increase. The question therefore is how can LED become an inclusive process¹³. On the whole, the confrontation of localities with a globalized and knowledge-based economy opens up opportunities for

¹⁰ A case in point could be represented by a recent local development debate in a locality of Emilia Romagna, Italy, about the possible integration of transformative technology for biomaterials engineering into the local food supply chain to reap the benefits of a potential bioraffinery market and get the public consensus for a “green technology”. Whereas the local technology endowment is available, the patents for such biomaterials are concentrated in the hands of few pharmaceutical firms around the world. On the one hand this scenario implies high costs for licensing the technology; on the other hand an independent path of research leading to autonomous patents implies an R&D scale that is not within the capability of existing local firms. This story, in our view reaffirms the conundrum of local economic development in the knowledge-based era.

¹¹ The options of deliberative democracy represent a complex issue in political science which cannot be within the scope of this paper (see Gbikpi, 2005 and Regonini, 2005). The aim is to draw attention to a new LED perspective that increases the actors' capacity to exploit the democratic potential and efficiently reduce the inequalities of access to knowledge and technology. In this case inclusive policies will have to be balanced with efficient policies

¹² Indeed much of the pace of technological change at local level is pinned on the capacity of leading firms to adopt new solutions. Classical clusters' firms face an incremental scenario of change (as recently witnessed by the author in Reggio Emilia, *The Reggio Emilia mechanical cluster*, forthcoming) which implies that an acceleration of change requires external “catalyst institutions” to support R&D activities.

¹³ Assuming with Cooke and Leydesdorf (2006) that inequality in the knowledge economy is generated by mechanisms of inclusion or exclusion. Which again calls for an evaluation of deliberative forms of participation *vis a vis* efficiency.

governance-based frameworks that enable the integration of new knowledge, stemming from firms with knowledge channelled through institutional actors who act as knowledge producers or gatekeepers. From this perspective, for example, the increasing attention towards tech-transfer programs between University labs and firms (following the US tradition of extension programs), in some Italian regions, seems to confirm the need for this kind of integration¹⁴.

The remaining part of the paper is organised as follows: the first section tries to briefly outline the “new knowledge hype” scenario; the second section illustrates the opposite forces at work in knowledge-based LED in terms of a “cumulative advantage VS creativity” debate; in the third section the potential conflicts of LED are presented through two cases, one in the US and one in Italy. The cross-country comparison is used to stress two different forms of exclusion. In the fourth section the potential and the limits of a governance-led and tech-based LED program are discussed with reference to an analytic framework; the issue of what kind of LED actions should be implemented to fight inequalities is discussed in the fifth section; finally the conclusion is drawn discussing a “learning-by-interacting” type of process in LED.

1. The knowledge hype

The growing attention towards a knowledge-based economy both in Europe and in the US, stemming from the proclaimed need to invest in innovation and tech-transfer to tackle the competition of a globalized world, is definitely shaping and steering the policies of most advanced countries in advanced¹⁵.

¹⁴ It could be argued, though, that so far regional policies (in Italy, at least) have relied on tech-transfer to streamline productive excellence and not to reduce the frictions of technological adjustment (which would require a wider inclusion of small firms in tech-transfer programs).

¹⁵ It is difficult to define a single trigger event for this new policy perspective. In Europe, the EU Council of Lisbon of 2000 is generally held as a turning point in the strategy to catch up with the more technology-intensive US economy and to start invest in the knowledge economy. In the US action plans towards a knowledge based economy are more recent (Council on Competitiveness report *InnovateAmerica* of December 2004 and the report by the National Academy of sciences and the Committee on Prospering in the global economy of the 21st century *Rising above the gathering storm: energising and employing America for a brighter economic future* of 2005).

Although knowledge has always played a pivotal role in economic development since time immemorial, and this role has been recognized by several authors (Smith, Marx, Shumpeter, Simon, Hayek, Arrow, Machlup, Bell, Solow among others), the so called knowledge-based economy has only recently acquired the status of autonomous discipline thanks to the recognition of an unprecedented expansion of knowledge-intensive activities (Foray, 2000).

From a historical perspective the rise of a knowledge economy seems to be accompanied (and explained) at least by four factors: a growth in the share of intangible capital (investment towards training, education, R&D, health expenditure, etc.), the centrality of science and technology (especially in sectors such as pharmacy, biotechnology, information and communication technologies, new materials), the growing speed and intensity of innovation and the information technology revolution (David and Foray, 2002).

Recently, the acceleration in knowledge production has entailed an increase in patenting activities (that is the protection of inventions which is also a measure for the knowledge stock), especially in new industries (information, biotechnology and computer technology) and a parallel rise in University patenting (that is patents of inventions stemming from University research) (Powell and Snellman, 2004).

Moreover, a growing body of economic research has been devoted in the last years to analyse the mechanisms by which knowledge is transferred (or spills over) and the degree to which this process is geographically localised. A major conclusion of many scholars' contribution is the recognition that knowledge spillovers matter in the formation of industrial clusters and agglomeration (Porter, 1998; Audretsch, Feldman, 1996).

There is also a growing evidence on the relevance of technology and knowledge for the trajectory of economic development, which is not in itself a new perspective (Shumpeter, 1911; Marshall, 1916), but has been assuming, over the last ten years, a new "useful analytical" orientation "linking the

knowledge generation sub-system (mainly laboratory research) to the knowledge-exploitation system (mainly firms and, say, hospitals or schools) via technology transfer organizations in regional innovation systems” (Cook and Leydersdoff, 2006).

The foregoing illustration prompts at least two considerations with regard to the increasing attention towards the knowledge economy: there is a trend of specialisation towards new branches of knowledge (what can be described as a new *knowledge focus*); and there is also a confirmation of a spatial dimension in the dynamics with which knowledge is produced and put into use (what can be described as *geography of knowledge*).

2. The cumulative advantage of knowledge and the creative power of place

In neo-classical theory, knowledge as been defined as a non-rival (inappropriable) good (Arrow, 1962). Other authors of the so called “new growth theory” (Romer, 1986; Lucas, 1988) have introduced the notion of knowledge as a kind of capital with increasing returns (increases in the stock of existing knowledge increase the rate at which knowledge is created).

Whereas the first argument (absent a market mechanism) has represented the conceptual basis for the public support of basic research over the last decades, the second argument has been at the centre of the debate on knowledge accumulation and appropriation.

On opposite terms, evolutionary economics argues that it is not the stock of knowledge but how it is used that seems likely to shape how fast an economy grows and how rapidly it can acquire new knowledge (Sabel, 1994).

From all perspectives, it is evident that knowledge is a unique kind of capital. To what extent does its accumulation determine the nature of agglomeration in geographical terms? This question has accompanied much of the theoretical debate on cluster formation and development over the last two

decades. Two perspectives have dominated the scientific debate: on the one hand the contributions building on work on agglomeration economies and industrial clustering (Marshall, 1920; Beccattini, 1998; Krugman 1991; Porter, 1998); on the other hand, the research focused on national systems of innovation and the institutional framework that helps sustain knowledge-based and innovation-oriented policies at regional and national level (Nelson, 1993). Closely related to the second argument is the notion of learning regions seen as places which foster social learning process among firms (Morgan, 1997). More recently, some authors have put forward new theories of spatiality, stressing the new dimensions of spatial distancing of learning as forms of organisation that “permit relational proximity at a distance” (Amin, Cohendet, 2005) and allow to conceive networks substantiated by “mental proximity” (Sacchetti, Sugden, 2005).

On the whole, the intersections between place and science are recognised as crucial in a knowledge-based society. Hall (1998), in a remarkable intellectual voyage across the history of cities in different centuries and civilisations, has argued that the success of cities like Manchester in the XVIII century, Berlin in the XIX century, Detroit in the early XX century or San Francisco over the last 40 years, seems to show that, for the blossoming of a particular trade or industry, a particular “combination of the person, the place and the time was just too propitious for it to be otherwise”. Recently, it has been recognized that other important concomitant factors like the massive presence of public research contracts and world leading university research labs, in the case of Boston for example, contribute as well (Best, 2005). This kind of interpretative framework has led to the analysis of the local advantages of innovation. In particular Saxenian (1994) has illustrated the concept of regional advantage from the perspectives of Silicon Valley and Boston “Route 128” agglomerations.

It has been acknowledged, however, that whereas this thread of research is helpful in understanding the dynamics at work, it should not be seen as a general recipe for tech-based development, since those particularly successful stories, are a hard match for any other locality or city in the world

that do not happen to have that particular mix of timely opportunities, infrastructures and human capital endowment (Hall, 2000). The story of some US university-industrial partnerships show that the timing and the choices made under specific circumstances by local actors is equally important in shaping a region's prospects of success or failure (Leslie, 2001). In other words, efforts to foster development can prove sometime unlikely to determine the expected results, unless a number of "proper conditions" obtain. The challenge is one of orchestrating potential factors of success along a trajectory of regional advantage (and not disadvantage)¹⁶.

More recently, Scott (1998, 2006) has argued that the question of dominant forces of economic concentration should be reframed in a perspective of analysis on the factors that lead to "creative fields" in industrial and urban agglomeration¹⁷. The relevance of creativity in LED is not a new perspective: Florida (2002) has particularly stressed the role of "Talent, Tolerance Technology" as propitious elements in the rise of a thriving local economy; the notion of creativity is even more intriguing for the opportunities it offers to consider how it is shaped by a deliberative process of participation in production and knowledge production (Sacchetti, Sugden, 2007).

To sum up the foregoing illustration, LED seems to be the at the centre of two opposite forces: a *deterministic scenario*, as given by the cumulative advantage principle with which knowledge and innovation tend to cluster in specific places¹⁸ and a *creativity scenario*, where entrepreneurialism and "bottom-up" development dynamics tend to dominate¹⁹. These two forces play a concomitant role on knowledge and agglomeration and it is rather difficult to

¹⁶ In section five an attempt is made to convey all the "proper conditions" into an analytical framework of LED.

¹⁷ For Scott (2006) the creative field "is represented by sets of industrial activities and related social phenomena forming geographically-differentiated webs of interaction giving rise to diverse entrepreneurial and innovative outcomes".

¹⁸ We purposefully use the term cumulative advantage to refer to a process of increasing (capital) accumulation (in a given set of activities) by actors that have been first movers in the activities concerned. In other words "the advantage of one individual or group over another grows (i.e., accumulates) over time, which is often taken to mean that the inequality of this advantage grows over time" (Di Prete and Eirich, 2006). Merton was the first to introduce the concept under the metaphor of the Matthew Effect (1988) to explain advancement in scientific careers.

¹⁹ Here the term creativity is used to denote the potential to produce something new starting from the entrepreneurial and cultural traits of the territory (see Hall, 1998; Allen, 2006).

have a cut and dried reply to the question whether it is the search for knowledge that leads to agglomeration or viceversa (Allen, 2006).

As for the policy dimension, the effect of “cumulative advantage” in LED suggests path-dependency and it may increase development disequilibria if not mitigated by a *learning framework* that extends the learning (or absorptive) capacity of leading firms to the entire institutional set-up of a locality²⁰. In other words, institutional actors should “learn to learn” along the lines of the transformation process that concerns firms’ capabilities and technology. Such a framework should ideally be the result of a co-evolutionary governance-based approach aiming at exploiting the forces of geography and creativity to enable local actors (not only firms) to make choices and be responsible for those choices²¹.

3. Global challenges in a local perspective

A central question in LED is how localities adapt to the global challenges (Savitch, Kantor, 2002). The following analysis of two cases in a comparative cross-country perspective highlights the presence of several context-based determinants for analysing the difficulties of a LED program. The two cases of local development could not be farther apart in expectations and purposes²². They are analysed with regard to inequalities along a development path. The Baltimore case illustrates a situation where inequality concerns the community residents’ capacity to access the benefits of a major biotech park project; the Bologna case illustrates the inequality among local cluster firms to adapt to technological change.

Baltimore, US

²⁰ Or rather a territorial governance-based framework that strive to resolve development imbalances.

²¹ This prescriptive scenario, of course, often clashes with the reality of short-term, risk-averse political choices at local level.

²² In comparative analysis this represents a “most different system design” (Przeworski and Teune, 1970, Meckstroth T.W., 1975) to understand the contextual determinants.

In the US context, Baltimore is more than one city (Levine, 2000; Orr 1992). With reference to the intense urban renewal of the last two decades, Levine (2000) has traced “three Baltimores”: the Renaissance City, the underclass city, the prosperous suburbia. This powerful image of a multiple city offers the proper context to analyse the severity of socio-economic problems affecting east Baltimore neighborhoods. East Baltimore lags behind the city of Baltimore with particular reference to median household and family income and labour participation rates. In the early ‘90’s, the state of decay of the area had already raised profound concern on how to pragmatically tackle the problem of Baltimore’s east neighbourhoods predicament. Revitalisation efforts on the part of public and private actors had to be aimed at what was, under a general perception, “the worst neighbourhood in the US”. Against this general background, a major revitalization effort has been put forward over the last 5 years, together with a major biotech park project sponsored by and adjacent to Johns Hopkins University. Indeed, several projects and ideas to revitalise the decadent neighbourhoods in East Baltimore have existed for many years prior to the biotech park initiative, but had succumbed to the ebb and flow of partnerships and politics at city level. The current initiative is coordinated by a non profit organisation that acts as bridging institution between the public and the private sector. One crucial aspect of the entire biotech park project has been the involvement of the community level (that in US context means the “non-elite actors in development programs). The extension and quality of the dialogue between the City and local communities over the entire project has alternatively been depicted as satisfying or very bad, according to different sources²³. There has been, undoubtedly, a particular commitment on the part of the City to “negotiate” the project at all possible levels, but this does not eliminate a substantial problem that this project has faced since its inception: the question of land clearance in the biotech park area and subsequent relocation of property tenants. A further challenge of the entire project is given by the issue of human capital and skill training. The final estimate available for the employment impact of the East Baltimore Biotech Park was for a total of 8,000 jobs to be created once the

²³ Interviews by the author. See Ciapetti 2006.

project is fully developed and leased, but many of these jobs will entail a level of skills that do not match the current abilities of local residents.

Bologna, Italy

In the Italian context, Bologna is an affluent city located in an affluent region (Emilia Romagna). Over the last ten years, in a difficult competitive scenario for Italian cluster firms, the local economy has showed good signs of resilience (Banca d'Italia, 2007), thanks to the traditional specialisation in the mechanical sector. The territory of Bologna has therefore managed to preserve the traditional manufacturing base, over the last decade, relying on the diverse and dynamic composition of its medium-to-low tech firm clusters. Yet, small and medium sized enterprises, which represent the backbone of the territory's economy, face a changing competitiveness scenario²⁴. Technological change is occurring in leading firms in key specialised clusters (e.g. packaging machinery) and calls for an increasing adaptive capability on the part of the local subcontractor's network²⁵. Whereas the leading firms' drive to technological change has led to a reorientation of regional policies towards the creation of a network of high-tech districts coordinated through the regional innovation agency, the low-tech small firms that represented an essential part of the "district's recipe" to development lag behind and face effects ranging from "skills mismatch" to complete closure. There is not a cut and dried solution to this scenario. Small firms' associations strive to introduce programs that can help to reduce the imbalances within the supply chain, but many of these efforts seem to clash against leading firms goal to decrease costs and increase their pace in technological change. This, in turn, calls into question the role of University research, since even leading firms are dependent, to some extent, to external R&D. The current debate on LED at regional level is indeed centred on the role of the University system as a vital actor for tech-based programs. Arguably, the technological re-orientation

²⁴ See Antares, 2006.

²⁵ See Antares, *Research report the packaging cluster*, 2005.

seems to exclude small firms. The local and regional challenge of tech-based development is compounded by the tradition and funding mechanism of the university system at national level.

At least three considerations can be inferred from the foregoing narratives. Firstly, in both cases the objective of inclusion seems to be marginalised by a growing role of tech-based strategies. The unprivileged actors are different since the contexts and objectives are diverse. The point, however, is that in both cases the mechanisms of governance fail to rise to the challenge of inclusion. Secondly, the institutional context matters when mechanisms of adaptation at local level are considered. Governance has indeed its own contextual mechanisms and the role of non-profit institutions in the US context is played by firms' associations (and other public agencies) in Italy. Lastly, in both contexts Universities are a key player in the tech-based development game. The two academic contexts are hardly comparable, but the role of University is confirmed as pivotal in the knowledge-based economy (see Etzkovitz, 2004).

4. A proposal for an analytical framework

From the theoretical perspectives and case studies illustrated so far, a series of key dimensions for LED can be formulated. A future agenda of research could attempt to use these dimensions in a comparative way to assess the development path among localities. The analytical framework proposed below intends to take a little step in this direction and draws attention to long term dynamics of a development project. It does not aim at producing an exercise of wishful thinking. It simply sets out a model for identifying and monitoring the potential inconsistencies in a LED policy path.

From all the above considerations, six “variables” are recognized as crucial for LED:

- *Contextualisation* refers to place, culture, history, entrepreneurialism and knowledge endowment (and is related to many considerations

made in regional advantage theory, including the role of cumulative advantage, as introduced in this paper).

- *Expectations* concern expected results and outcomes (and again are related to regional advantage theory and the expected localisation patterns of specific sectors and industries).
- *Capabilities* refer to technological and other competencies of involved actors and implies a question on how they can be operatively implemented.
- *Timeliness* implies an overall analysis of how feasible is a given project given technology, knowledge and other local constraints/opportunities. It also refers to the ripe time conditions for a project (here the theoretical framework is the one related to the evolution of territorial agglomeration and the analysis of industry-university partnerships).
- *Interdependencies* implies the interlocked nature of choices and decisions among actors at local level (and is related to the perspective of collective action and to the dynamics of social capital).
- *Inclusion* refers to steps taken towards reduction of inequalities in LED (it is related to perspectives such as “skills-mismatch”, “upgrading”, “catching-up”, etc.).

The above variables have an objective dimension (*what are the critical elements of LED?*) and a policy dimension (*what can/could be done?*). The two dimensions together offer an evaluative scheme for a given LED initiative, as shown below.

Example: the decision to invest in a technological park in a low-tech locality

	Description	LED Critical issues	Policy Check list
Contextualisation	The aim is to understand the potential of a major project in terms of local endowment	What is the overall industrial potential at regional level?	Can local policies influence alternative paths?
Expectations	The aim is to circumscribe the set of results and outcomes of the project, producing “high-profile” scenarios and “low-profile” scenarios	Is there room for a high profile scenario (i.e. a high -tech biopark)?	Can local actors agree to a high profile scenario?
Capabilities	The aim is to assess the presence of local capabilities	Are there endogenous capabilities (e.g. high-tech firms or labs?)	Can local policies devise “inward-investment” programs?
Timeliness	The aim is to understand if economic, social, industrial conditions are ripe for the investment	Are there major stumbling blocs?	Did all local actors converge on the choices made? Are there exceptions taken at local, regional, national level?
Interdependencies	The aim is to highlight the common interest among actors and the need for a collective agenda. It highlights inter-firm interactions and networks too.	Have priorities been set with regard to LED?	What kind of Led agenda can deter free-riding and risk-aversion of single actors?
Inclusion	The aim is to understand the presence of “inequalities” and imbalances	Have the interests of all local actors (i.e. small firms) been considered?	Can local actors design an “inclusive” and efficient policy?

The choice of creating an incubator or a high-tech park in a locality dominated by low-and- medium-tech industries and firms is problematic both for the local governance mechanism and for the consequences in terms of our inequality issue.

Two possible questions in the arena can be: What type of benefits can be extracted? And for what actors?

Evidently without a negotiated, long-term, vision-led kind of agenda and a strong local leadership the chances are that such a project is carried out for “elite high-tech firms”, or is not implemented at all²⁶.

It can be inferred from the above framework that a further issue in LED is that of the “optimal scale of intervention”²⁷. The key point, however, is that LED is a directional process in which a series of variables drive the overall outcome and that policy and governance can intervene to steer this process. This potential should not be overrated, however: the variables that are determinant for the process are often subject to ex-post determination and to chance (Cooke, Leydesdorff, 2006; Arthur, 1994).

Overall, the above representation could represent the basis for future research on LED seen from the perspectives of leverage of local forces and reduction of inequalities.

5. How to tackle inequalities in LED?

So far a set of arguments has been introduced to support the view that a knowledge-based economy poses a challenge to local economic development. This challenge is centred upon the capabilities of local actors to reconcile the *cumulative advantage* forces of the knowledge economy with choices of development made through governance mechanisms²⁸.

From a theoretical perspective, the key dimensions relate to a scenario of adaptation, based on dynamics of co-evolution between firms and institutions (Nelson, 1994), deliberative democracy and creative use of the innovation potential of the local system.

There are indeed several related questions concerning the level of involvement and participation of local actors in this LED scenario.

²⁶ Ideally it could represent a critical project that includes all actors in a LED perspective, taking in account the spillover potential for local firms and the potential for new firms.

²⁷ What is the appropriate territorial scale to tackle a development problem in the knowledge-based economy? It has been recently argued that, for all the emphasis on localities, the national level is still crucial for a proper design of technology and innovation policies.

²⁸ A challenge compounded by the observation that initial disadvantages at an early stage of a process grow larger over time (Di Prete, Eirich, 2006).

First of all, is there a theory, or a set of theories from which we can draw for directions of LED? As a response to this question and to remedy a basic “lack of theory” (Bingham, Mier, 1993), efforts have been made over the last decade to reach a conceptualization of local economic development²⁹. The assumption is made here that the aim of a local development program is an overall sustainable form of progress encompassing elements of growth, social cohesion and capacity-building (Sen, 1984).

Secondly, why should awareness of imbalances or inequalities matter in the design of LED? The term inequality is drawn from the current debate in sociological studies (Neckerman and Torche, 2007) and is here used mainly to describe the uneven distribution of skills and technology that may arise within a cluster of firms or a territory (at individual and collective level) and lead to discrimination between the “haves” and “have-nots”, in the context of the knowledge economy³⁰. The debate between a “pro-growth” and “entrepreneurial” kind of development and a countervailing social dimension is longstanding (Harvey, 1989; Molotch, 1976). The question is whether this kind of imbalances really exerts a cost on localities in terms of a “de-territorialised” perspective of development that may induce to under-invest in local cluster linkages, inducing to miss the opportunity to support (or re-create) local *spillover* mechanisms between the “territorial elites” and the “territorial laggards”³¹. Since the key issue concerns a choice between inclusion or exclusion in/from the knowledge-based economy (Cooke, Leyedesdorff, 2006), there is the need to increase the debate on these options, to avoid a

²⁹ An effort in this direction was made by Bingham and Mier (1993). At least 50 theories or models related to local economic development were recognised and encompassed within 7 interpretative “metaphors” (Economic development as problem solving, economic problem as running a business, economic development as building a growth machine, economic development as preserving nature and peace, economic development as releasing human potential, economic development as exerting leadership, development as a quest for social justice).

³⁰ The term can indeed refer to unequal knowledge endowment, unequal preparation, unequal power status among actors. Inequalities may originate between leading firms and small firms; between firms and institutions; between low-skilled and high-skilled individuals.

³¹ Mechanisms that could entail for example a greater investment in training programs for small firms, or the creation of “technological platforms” among local small firms belonging to a specific supply chain, with which small firms can achieve the right scale to interface University labs and design innovative projects.

situation where choices and options are simply imposed by the market. There is indeed need for more research focused on inequalities in LED.

Thirdly, can a governance-based LED program pursue at the same time its development objectives and reduce this kind of inequalities? The experience of Territorial Pacts in Italy, between 1998 and 2004 represents a unique opportunity to assess the factors that determine the success or failure of a governance-based LED program in Europe³². It has been recognized that, in that experience a crucial element was represented by local leadership and the relationships it was able to forge through governance mechanisms to pursue solution of conflicting stances and confer technical legitimacy to LED choices (Cersosimo and Woelleb, 2006). From this perspective a positive reply can be given to the question whether governance-based public policies can influence the local institutional context. Yet experience from Italian territorial pacts also points to a scenario where suboptimal choices are made because of risk aversion or search of short term consensus (ibidem). There are cases where actors simply fail to adopt long-term perspective because of the power struggle occurring in the local arena. In the US case, for example, LED difficulties stem from the very conditions of inner city neighbourhoods. In this respect, the tension is aggravated by the dynamic and logic of the private-sector, real estate markets and labor markets, contributing to reinforce inequality and inefficiency (Goldsmith, 1997) and often leading to savage and uncontrolled use of city space and resources under the influence of political and economic forces (Hartman, 2002).

Finally, is there room for innovation and creativity in LED? Past and recent research recognizes an important role for creativity in steering the path of local development. Yet the capabilities of local institutional actors do not always allow innovative projects to take off due to the search of short-term consensus and risk-aversion (Cersosimo and Woelleb, 2006). A future agenda of research could probably attempt to identify better under what conditions the “creative capital” can influence public policy to shape an

³² Territorial Pacts were firstly introduced in Italy as anew type of “bottom up” local policies and were subsequently introduced at European level as well.

innovative and inclusive development scenario for localities. The need is felt for a new set of indicators that could help identify the conditions that allow (or hinder) the flow of creativity and innovation at local level.

6. Conclusion

The paper has attempted to highlight the implications of a new policy dimension of local economic development related to the rise of tech-based inequalities.

As Hirschman (1967) has pointed out “a development project is a special kind of investment. The term connotes purposefulness, some minimum size, a specific location, the introduction of something qualitatively new, and the expectation that a sequence of further development moves will be set in motion”. This movement with a purpose does not eliminate the issue of problems which can be encountered along the road, but it offers a conceptual framework for thinking about the dynamics of economic development.

We believe that Reese and Rosenfeld (2002) are right when they argue that “the dependent variable in local economic development research is problematic in both definition and measurement respects”.

This paper posits that this difficulty is due to the fact that an effective LED program is dependent on the level of cumulative advantage that a specific technology, industry or cluster have in geographical terms; on the contextual governance mechanisms that are put into play to contrast the polarised confrontation between elite actors and other actors at locality level; on the role that critical projects, with the involvement of public-private partnerships, are allowed to play³³.

Clearly, this is not a solution for the “dependent variable” argument of local development, but it is an attempt to circumscribe the *independent variables* that affect local development in the knowledge-based era.

³³ By *critical projects* we refer to that particular kind of project that has the proper dimension, participation and support to alter the economic situation of a locality.

The central question is how can actors involved in a LED program attempt to break the deadlock of deterministic forces and strive to reduce inequalities? By means of a general evaluative framework an attempt has been made to show that there are several conditions that should be considered. Awareness of such conditions does not eliminate the risk of sub-optimal choices or risk-aversion, but certainly calls for an agenda of local development where short-term strategies become more difficult and local actors are prompted to think of the long terms consequences of making and not making choices.

Given the dynamic nature of development projects, a useful way to conceive the implications of the purposeful movement is by conceiving a development project as a learning or discovery process and accounting for the possible uncertainties to be faced along the road. Theories of institutional learning (Gertler, Wolfe, 2002) can thus be applied to conceive development as a process that increases the capabilities of the actors (Sen, 1988). Along these lines, Sabel (1994) has motivated the implications of an institutional framework that he calls “learning by monitoring” that is aimed at increasing the involvement of actors in actually monitoring the interdependent process of learning.

A future (but hopefully not too far) research agenda for LED should attempt to include the determinants and effects of such learning process into the analysis of outcomes of local economic development and should be doing this from the perspective of adaptation (measurement of the co-evolution of firms and institution), democracy (measurement of the outcomes of deliberative forms of democracy) and creativity (a measurement of how the creative capital is created and transferred within localities). This agenda would not only represent a wealth for LED researchers but could be the cornerstone of a new political economy at local level.

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