



BUILDING RESILIENCE THROUGH GREATER ADAPTABILITY TO LONG-TERM CHALLENGES

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Building resilience through greater adaptability to long-term challenges

The opinions expressed and arguments employed herein do not necessarily reflect the official views of the OECD member countries.

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INTRODUCTION

Building resilience has become an issue of increasing priority for local policy-makers, in a context where:

- Greater openness and interdependence in the global economy has left local economies more exposed to systemic shocks that originate outside their remit, in various sectors and can be transmitted by a wide array of channels.
- The impact of these shocks on local economies and communities has become more asymmetric as their scope broadens. The financial and Eurozone crises have revealed profound disparities between economies that seemed hitherto set on a path of convergence, both in terms of their ability to resist downturns and recover from them. Data from (ESPON 2014) and (OECD 2015a) show wider differences in terms of growth and labour market performance at sub-national level and little evidence of catch-up over the period.
- Common long-term challenges, such as adapting to the effects of climate change and ageing populations, are likely to further deepen these disparities as local economies are unequally exposed to these trends and unequally equipped to deal with them.
- Measures implemented since the financial crisis have increased local and regional governments' share of the burden of adjustment. OECD countries have passed a wave of territorial reforms investing sub-national governments with greater responsibilities in a wide range of policy sectors. Secondly, this trend towards decentralisation has taken place against a backdrop of diminishing fiscal resources and reduced public investment (OECD 2015a).
- Adding to this burden, improvements on the analytical side have extended the policy horizon of local governments and administrations, and spurred demands for greater accountability from local populations. Better data collection and measurement at the local level, as well as broader sets of indicators, allow policy-makers and populations alike to identify local imbalances and capacity gaps with greater precision and highlight the need for coordinated action across sectors and levels of government in order to meet challenges and achieve development goals.

Resilience is a complex notion and a relatively new one in the public policy sphere. The notion of resilience has roots in different disciplines, but it is best understood in the context of *complexity science*. This recent and growing field studies the dynamic behaviour of adaptive systems using tools drawn mainly from evolutionary biology, game theory and physics. From its original focus on these core areas, complexity science has been progressively extended towards wider applications in economics and public policy, to which it contributes a set of analytical instruments, models and concepts. Within this context, the notion of resilience relates more specifically to the way in which complex systems respond and adjust to changes in their environment or internal parameters of functioning. Like many notions in complexity science, resilience cannot be transposed to economics and public policy without having first been redefined and adapted for these fields. What resilience provides is a model (or family of models) that can be used to describe the behaviour of fundamentally different types of systems (both natural and social) in response to a variety of disruptive shocks (acute crises and disasters; long-term chronic pressures; unforeseen emergencies and threats...) measured according to different criteria (robustness...) and along different timelines.

Turning this broad and general model into an explanatory concept that can be applied within a given field requires that at least three basic questions be answered regarding the nature of the system (*resilience of what?*), the nature of the challenge or change (*resilience to what?*) and the outcomes of adjustment (*resilience for what?*).

Nevertheless, despite these difficulties, resilience has garnered interest from policy-makers, practitioners and analysts. This interest has translated into efforts to conceptualise and operationalise it at the local level as a means to better integrate economic, social, environmental and institutional policy goals (OECD 2014a).

The OECD has been quick to recognise the potential that complexity science holds as a building block for NAEC, as well as the implications of resilience for public policy (OECD 2009). Recent OECD work has explored these implications in areas including foresight and crisis pre-emption (ECO), urban policy and governance (GOV), macro-economic policy (ECO) and labour market policy (DELSA). Similar research has also taken place outside the OECD. Most importantly from the point of view of our project, various institutions have developed frameworks for analysing resilience at the local level. A more in-depth discussion of these existing frameworks is provided in Chapter 6 of *Job Creation and Local Economic Development* 2016 (forthcoming).

Several significant lessons can be drawn from these different sources:

- Resilience is a multi-dimensional phenomenon that cuts across policy sectors. As such, it requires a joined-up approach to policy-making that can address complex interconnected challenges and balance trade-offs between economic, social and environmental goals. Furthermore, the levers for building resilience are dispersed between levels of government, as well as between policy sectors. Resilience building relies on effective multi-level governance and must be seen as a shared responsibility between national and sub-national governments. In practice, this often implies that the resources and capacity of national administrations must be combined with local modes of risk-management and grassroots initiatives in order to produce flexible responses that are adapted to local conditions (OECD 2015a).
- A more general conclusion can be drawn here - namely that special emphasis needs to be put on issues of governance when applying a resilience lens to growth and development. In this respect, policy settings and institutional arrangements become key elements for building resilience insofar as they can be organised in a way that promotes closer integration between economic, social and environmental goals, better coordination between levels of government and greater flexibility in the implementation of policy.
- On the question regarding resilience of what, the local economy has to be treated as a complex system which comprises many diverse stakeholders with varying, sometimes conflicting, interests. Building resilience in the local economy has a distinctly strategic aspect. As far as possible, policy-makers must take account of the effects that their interventions will have on the behaviour and motivations of local stakeholders and engage with them throughout the policy cycle. In order to do so, they need to ensure that the actions of a sufficiently broad coalition of local stakeholders are aligned with the pursued goal and support or develop coordination mechanisms (both formal and informal) that can sustain stakeholder involvement and collaboration on long-term strategies for building resilience.
- In this perspective, (World Bank 2013) has highlighted the importance of inclusion and participation in fostering resilience at the local level. Similarly, the resilience framework developed by the Centre for Local Economic Strategies (CLES) focuses on the interaction

between different sectors of the local economy (public, private and social) and on the need for mutually reinforcing partnerships.

- Existing frameworks offer a number of different models for analysing local resilience. Overall, they tend to follow two options.
 - (i) Basic types of resilience are defined which apply to different parts of the local economy. The *Building Resilient Regions* framework (UC Berkeley/ MacArthur Foundation) for instance organises factors of resilience into three broad categories (Regional Economic; Socio-Demographic; Community Connectivity) measured by different indicators. These indicators are then assembled into a composite index of Regional Capacity.
 - (ii) Core functions are identified for the local economy. Performance criteria are then established for assessing resilience and indicators devised for each function. ARUP and the Rockefeller Foundation have designed their *City Resilience* Framework around this model.

Both options have strengths and limitations. In the first case, a major methodological difficulty consists in finding rules for combining what are essentially different types of resilience into a single composite index. Measuring resilience as capacity can help to highlight margins for response and areas of vulnerability but it does little to shed light on the nature of resilience and on the processes through which the local economy adjusts to shocks. In the second case, measuring resilience as functionality, though useful for establishing benchmarks and best practices, restricts the applicability of the model by associating it closely with the type of functions performed by the local economy – which can be highly specific.

Presentation of the project

This paper seeks to develop an analytical framework that can identify and assess sources of resilience within the local area, in order to support efforts by local authorities to adapt their policies to future threats and opportunities for growth. As part of the project, an international literature review has been conducted, drawing lessons from existing work on resilience, and a Webinar series has allowed us to collect input from experts and practitioners on the topic of economic resilience, demographic change and green growth. The paper builds on these prior stages by:

- (i) Providing a working definition of resilience that can help operationalise the notion for the local economy without reducing its versatility;
- (ii) Using insights from complexity science to identify the processes which foster resilience in the local economy and address the main problems raised in our Webinar series.

Based on the prior stages of the project and on the guidelines set out by (OECD 2014a), this framework paper proposes to define local resilience as follows:

Box 1. A working definition of local resilience

Resilience is the quality that allows local economies to adjust to changes and shocks in a way that promotes sustainable development, well-being and inclusive growth.

The choice made here to identify resilience more closely with the processes of adjustment at work in the local economy can be justified on several grounds.

- It makes explicit an important distinction contained in (OECD 2014a)'s definition between the ability "to resist and recover from adverse shocks" and the ability "to *bounce back* stronger than before and to learn from the experience". This distinction is necessary in order to understand what separates resilience from other drivers of growth it is sometimes associated with, such as competitiveness. While competitiveness contributes to economic performance over the long-term and hastens recovery from adverse shocks, it does so through a capacity to attract physical and human capital from declining into growing sectors and make productive use of these factors rather than through a capacity to adapt and transform in response to these shocks, as is the case with resilience. The 1997 Asian crisis can help illustrate this distinction. Most of the East Asian economies were competitive at the time. However, the crisis revealed which were resilient, which were not and why.
- By focusing on adjustment, the working definition centres the analysis of resilience on the adaptive capacity of local economies. Adaptive capacity is difficult to measure due to the complex nature of resilience, but it plays an important role in explaining the regional variations in economic performance observed following the 2008 financial crisis.
- The focus on adjustment brings out the shared national/sub-national nature of resilience building and can help introduce multi-level governance as a key element of analysis. Margins for adjustment are determined to a large extent by structural policies set at the national level and constrained by macro-economic conditions, but measures taken at the local and regional level can significantly impact the outcomes of these policies and thus enhance or reduce adaptive capacity. (OECD 2012a) and (OECD 2014b) offer good examples of the possible trade-offs and complementarities between national and sub-national levels in terms of building resilience in labour markets.
- The proposed definition succeeds in maintaining the versatility of the notion of resilience. In accordance with (OECD 2014a), it sets goals for adjustment (sustainable development, well-being and inclusive growth), thus providing an answer to the question *resilience for what?* It does not narrowly specify the nature of the changes or the range of shocks addressed however. In this respect, it integrates the fact that the question *resilience to what?* needs to be left relatively open in order to reflect the complexity of the notion. Building resilience has a transitive (*building resilience to* specific challenges or potential threats) and an intransitive sense (*building resilience* throughout the local economy as an overall adaptive capacity). In the first case, resilience can be built through policy recommendations targeted at identifiable challenges or potential areas of vulnerability. In the second, more general sense, it consists in improving the capacity of individuals and local institutions to adapt – independently of the nature of the threat.
- Furthermore, the proposed definition also allows for different types of resilience based on different modes of response to shocks. At least three separate paths of adjustment can be characterised in this way, illustrating the three categories of resilience (stable growth; resistance to shock; recovery) recognised by (Röhn et al. 2015). These possible paths include:
- *Incremental adjustment*, which corresponds to a "reduced volatility" growth model where economic performance is maintained despite adverse shocks through interventions that progressively correct areas of vulnerability within the local economy.

- *Specialised adjustment*, which corresponds to a “shock resistance” path of development where specific parts of the local economy (labour markets, fiscal policy, labour mobility, firms...) act as stabilisers and provide the flexibility required to absorb the direct effects of the shock.
- *Radical adjustment*, in which all or a large number of sectors adjust allowing the local economy to “bounce back” or recover rapidly. The direct effect of shocks can be significant in this model as the economy adjusts, but the persistence effects are limited as the economy’s overall flexibility allows it to adapt to changing conditions and rapidly reach a new state of equilibrium.

Even redefined along these lines, resilience remains difficult to assess and operationalise at the local level. The input collected during the Webinar series highlights three main problems in this respect:

- Actual economic performance is an imperfect indicator of resilience. This problem has notably been recognised by the European Commission’s *Innovative Social Policies for Inclusive and Resilient Economies* project (INSPIRES) which attempts to separate labour market resilience from simple labour market outcomes, such as employment and unemployment growth.
- Reasons for doing so are twofold. First of all, resilience is highly sensitive to the performance metric used when measured in this way (ESPON 2014). Secondly, while data on the direct impact of shocks and the time path and rate of recovery tell part of the resilience story, they do not capture the local economy’s capacity to adapt directly, nor can they be generalised to other potential challenges or situations of crisis.
- The adaptive capacity, which constitutes the core element of resilience as defined here, is difficult to pinpoint. The analytical framework must be able to identify the general processes that adaptive capacity relies on, as well as the factors or qualities that enhance these processes and make local economies resilient.
- Resilience has a strongly contextual nature. Case studies show that local factors – including history, geography and culture – tend to play an important role in explaining whether a local area successfully recovers from a disruptive shock and how it does so. Similarly, efforts to model resilience at local or regional level underline the importance of hysteresis effects and path-dependence phenomena (Martin 2012). The framework must also account for this and allow for place-based variation in the assessment of resilience.

Following on the previously enounced definition of resilience, this paper uses the resources and insights of complexity science as a basis for addressing these problems and building a framework for assessing resilience in local contexts.

METHODOLOGY

Preliminary points

Selecting an approach: Dashboard of indicators or composite index?

A first issue to consider is whether the framework should present the various indicators of resilience in disaggregated form as a dashboard, or aim instead to combine them into a single composite index. Composite indices are powerful tools for evaluating and comparing trends across countries, regions and local economies, as well as for communicating results in a form that is both clear and understandable for a

broad audience. As a number of recent initiatives demonstrate, they can be applied to multi-dimensional phenomena including human development, well-being and resilience¹.

In the case of resilience, however, an aggregative approach is unlikely to help resolve the problems raised by the notion. Relations between the different dimensions of resilience are complex and dynamic: studies show many bivariate correlations between factors, but most of these relations disappear when subjected to multivariate analysis [see for instance (Augustine et al. 2013)]. With this in mind, combining these dimensions into a single and homogeneous index is not only difficult from a technical point of view, it runs the risk of masking important trade-offs and non-linearities. Furthermore, the contextual nature of resilience obviates the need and benefits of direct comparison, in favour of a deeper analysis centred on the processes of adjustment and place-specific factors which contribute to resilience *within a given territory*. The relative importance of factors is likely to vary from one context to another, which makes appropriate weighting difficult or arbitrary.

A dashboard approach offers more flexibility for dealing with the complex multi-dimensional nature of resilience. It can cover a variety of factors, using both quantitative and qualitative indicators, and allow for diverse and contextualised relations between them. As such, a dashboard constitutes an appropriate framework for analysing local resilience and assessing it in the field.

Putting resilience into context through a focus on local paths of development

A second issue consists in determining how and to what extent the contextual nature of resilience can be integrated into the analysis. The challenge here lies in designing a framework that can take account of place-based variation and changes in the factors contributing to resilience without losing its generality and comparative value. The present paper proposes to address this challenge by focussing on the local economy's path of development as a first key dimension for assessing resilience. In doing so, it recognises that local economies can differ in terms of the *type*, as well as the *degree*, of resilience they display. These types of resilience will rely in turn on different modes of adjustment and translate into distinct paths of development. By characterising their particular profile of growth, the framework paper seeks to provide a general yet context-sensitive basis for comparing and contrasting local economies in terms of resilience, as well as a relevant benchmark for assessing their performance over time.

A clearer understanding of the local economy's path of development can also help (i) identify the most important factors for resilience towards which analysis should be targeted; (ii) define the main threats and opportunities for growth it is exposed to based on the strengths and weaknesses of its growth profile – in effect, contributing a SWOT analysis for the local economy; and (iii) tailor recommendations to sectors where they will have the strongest impact. In this respect, the framework would pave the way for more in-depth field studies which can engage with the full range and complexity of factors affecting resilience within a given territory.

Assessing adaptive capacity through a complexity lens

Focussing on the local economy's path of development as a first key dimension has the added advantage of regrouping most of the indicators of local economic performance under a single heading on the dashboard. The remaining headings can then be directed towards capturing the more difficult aspect of resilience to analyse: the adaptive capacity through which local economies adjust and reorganise in order to deal with disruptive shocks. The literature on complexity science offers some useful insights into the key

¹ See for instance the UNDP's *Human Development Index*, the OECD's *Better Life Index* and the Building Resilient Regions project's *Regional Capacity Index*. An interesting discussion on the use and methodology of composite indices can be found in (OECD 2015b).

properties of adaptive systems and efforts have been made to operationalise the notion of resilience based on these insights. The framework proposed in this paper concentrates on three general properties that can be found in adaptive social systems (variability; effective resource allocation; capacity for coordinated action). It seeks to relate them to measurable processes at work in the local economy (economic diversification; local allocation mechanisms; governance). Evidence suggests that all three play a significant role in fostering resilience at the local level.

Structure of the dashboard

The proposed dashboard will be organised around the following headings:

- Assessing the sustainability of local economic development paths
- Diversifying the sources of growth
- Allocating resources effectively
- Coordinating action towards long-term trends through strategic governance

Assessing the sustainability of local economic development paths

Under this heading, the dashboard proposes to:

- Track the local economy's performance during and after the crisis, as well as its growth profile over a longer period if possible.
- Identify potential sources of vulnerability and margins for response, based on existing resources and imbalances in the local economy, as well as its exposure to long-term risks and challenges.

The main policy questions to be addressed include:

- How sustainable is the local economy's development path? What balance does it strike between dynamism and robustness?
- How did the local economy perform during and after the crisis? What type and degree of resilience did it display (reduced volatility; resistance to shocks; rapid recovery)?
- What risks is the local economy exposed to as a result of its growth profile, the state of its key resources and the long-term trends affecting it?
- What policy levers are best adapted for building resilience given the specificities of the local development path?

Two principal arguments are put forward in this section:

Sustainable development requires that the benefits of economic *dynamism* be weighed against the actual costs of lesser *robustness*, as captured by the local economy's growth profile (1.1), and the risk of future recessions, as measured by the build-up of local imbalances (1.2).

The trade-off between dynamism and robustness represents an important element by which to assess the sustainability of the local economy's development path. Dynamic economies have properties that can

make them more resilient to shocks. Faster growth generates more resources for dealing with existing challenges and future threats. Similarly, tighter labour markets can contribute to increase real wages and higher levels of investment can spur innovation and productivity gains. However, the benefits of economic dynamism need to be balanced against the effect it may have on robustness of growth, as well as the increased risk it may entail of future recessions. Less robust growth and more frequent downturns impose significant economic and social costs on local communities, both in the short-term (through loss of output, tax revenues...), but more importantly in the long-term where negative economic shocks can durably shape and downgrade the local path of development (lost activities and know-how may not be replaced, scarring effects resulting from long-term unemployment may impact the labour market prospects and well-being of local workers...). Greater robustness and reduced volatility can thus be factors of resilience, just as rapid growth can help. In this respect, assessing the balance struck between dynamism and robustness of growth in the local economy can provide a useful measure of the sustainability of its development path and shed light on the type of resilience it needs to build. This will be achieved by comparing the pace and duration of growth spells for the local economy.

Dynamism indicators:

Measures for the *pace of growth* should include indicators of output and employment, so as to give a broader picture of the benefits of economic dynamism. Average employment, unemployment and GDP growth rates should be used here. More precise options can be explored if need be (total employment and unemployment rates to control for the effects of demography and migration; rates of job creation and job destruction to underscore labour market dynamics).

Robustness indicators:

The average *duration of growth* spells can help characterise the local economy's growth profile as it offers a measure of the economy's ability to sustain growth and forestall downturns². In order to do so, a minimum amount of time has to be set for defining what qualifies as a "growth spell" and a particular indicator has to be selected since periods of growth for different indicators may not fully overlap. For instance, (Benner & Pastor 2013) argue that total employment (measured on a year-to-year basis to control for seasonal variation) constitutes the main indicator to focus on and propose to set the minimum significant period for a growth spell at 3 consecutive quarters of year-on-year increase.

Additional measures for robustness may include *economic volatility indicators* (standard deviation over the chosen period for GDP and employment growth rates) and *cyclical sensitivity indicators* (Okun coefficients).

Impact and persistence of crises indicators:

Complementing the balance between dynamism and volatility, measures can be given for the actual cost of downturns based on the performance of the local economy during the more recent period following the global financial crisis. Simple indicators may be used here to quantify the direct impact and persistence effect of the crisis on local economies (peak-to-trough variation and return-to-trend for GDP, employment and unemployment levels).

² Growth duration has been used as a measure of robustness both at the national level (Berg et al. 2012) and the regional level (Benner & Pastor 2013).

Benchmarks:

Benchmarks need to be established for assessing local performance on all of these measures (pace and duration of growth; impact of crisis...). Depending on available data, comparison can be made to national averages, to a broader sample of similar OECD regions, or to a mix of both.

Risk is an integral part of economic development and sustaining growth also depends on the ability to prevent imbalances from building up within the local economy. Local imbalances can precipitate or worsen future downturns. They are often seen as a counterpart of economic dynamism and a sign of unsustainable growth. However, lack of dynamism will also generate imbalances (unsustainable public debt...). In this respect, it may be interesting to explore the links between particular growth profiles and particular types of imbalance in order to better understand the threats that local economies are exposed to.

Significant efforts have been made following the financial crisis to construct Early Warning Systems (EWS) that can help identify potential sources of vulnerability, assess the risks they pose and pre-empt crises by redirecting policy towards mitigating emerging imbalances and threats to future growth. The OECD's Economics Department has developed a framework that can serve as a basis for analysing vulnerability at the local level. Most notably, (Röhn et al. 2015) establishes a set of indicators for detecting potentially threatening imbalances in various sectors of the economy (financial sector; non-financial sector; asset markets; public sector; external sector)³.

Indicators of risk:

Potentially useful measures could include indicators for debt levels (non-financial sector imbalances), conditions on and exposure to local housing markets (asset market imbalances), and the importance of fiscal transfers for local public expenditure (public sector imbalances). Financial sector indicators (leverage and capital ratios, loan to deposit ratios for the main local banks) may also be worth including in situations where the banking system is regionalised (ie. in Germany or Spain).

Sustainable development relies on the local economy's ability to foster and manage key resources and skills in order to respond to key challenges (1.3) and on its ability to deliver greater well-being and inclusion for local populations (1.4).

The importance of environmental sustainability for resilience at any level is evident and well-established (OECD 2014a). Various domains can be looked at here, with emphasis on adjustment to the long-term challenges addressed more specifically in the context of this project (demographic transition; green growth).

Environmental indicators:

Available measures at the local level should include indicators for *air pollution* (PM 2.5 concentration, national share of greenhouse gas emissions), *water quality* (availability and management) and *waste disposal* (percentage of solid waste disposed of in controlled area).

Infrastructure indicators:

Measures could include indicators for *energy supply* (availability and average cost/kwh, proportion of supply from renewable sources) and *traffic congestion* (if available), as well as an assessment of the extent and quality of *risk-based land-use planning*.

³ The predictive power of these indicators is verified for a series of past recessions in (Hermansen & Röhn 2015).

Skills indicators:

The performance of local education and training systems will be assessed under a later heading. From the point of view of sustaining development, *basic skill levels* are likely to matter most. (OECD 2012b) notably argues that the proportion of low-qualified workers constitutes an important brake on growth and productivity. The most useful indicators would therefore include the percentage of workers without a secondary qualification and PIAAC regional data (where available) on adult literacy, numeracy and ICT skills.

Demographic indicators:

In addition to standard demographic measures for population growth and ageing (birth rate, net migration, population growth rate for 65+/75+...), indicators could be used to reflect the pressure of demographic change on public finances (projected old-age support ratio) and adaptation to demographic change (accessibility standards, availability of health services and care for the elderly).

Measures of well-being are also worth integrating under this heading. Insofar as they increase individuals' resources and capacity to adapt, inclusion and well-being are factors of (as well as goals for) resilience. OECD work on regional well-being can help identify relevant available indicators (OECD 2015b).

Well-being indicators:

These should include household disposable income levels and Gini coefficients⁴, as well as poverty rates (either monetary or multi-dimensional). Local quality-of-life indicators could also be included, as quality of life represents an important local labour market development tool – particularly when it comes to attracting highly skilled workers.

⁴ Household disposable income affects long-term growth perspectives both as a measure of individual resilience at the household level and as a measure of the local economy's consumption capacity. (Benner & Pastor 2013) find evidence that a more equal income distribution – as proxied by the Gini coefficient – contributes to sustainable development by increasing the pace and duration of growth.

Table 1 summarises the proposed criteria and indicators for this section:

Table 1. Relevant criteria: Assessing the sustainability of local development paths

Table 1. Relevant criteria: Assessing the sustainability of local development paths

Theme and sub-themes	Criteria	Potential evaluation parameters
1) Assessing the sustainability of local development paths		
<u>1.1 Understanding the trade-offs between dynamism and robustness of growth</u>		
- <i>Dynamism</i>	Pace of growth	Average GDP, employment and unemployment rates over period
- <i>Robustness</i>	Duration of growth Volatility Cyclical sensitivity	Average duration of growth spells over period Standard deviation for GDP and employment growth rates for period Okun coefficients
- <i>Impact of crises</i>		Peak-to-trough variation and return-to-trend for GDP, employment and unemployment levels
<u>1.2 Preventing the build-up of local imbalances</u>		
- <i>Non-financial sector</i>		Corporate and household debt levels
- <i>Asset markets</i>	Conditions on local housing market Exposure to local housing market	Price-to-disposable income ratio Price-to-rent ratio Residential investment as % of local GDP Construction as % of total local employment
- <i>Public sector</i>		Proportion of fiscal transfers in local public expenditure
- <i>Financial sector</i>		Leverage, capital and loan-to-deposit ratios for main regional banks (regionalised systems)
<u>1.3 Managing key resources and skills for sustainable development</u>		
- <i>Environmental resources</i>	Air pollution Water quality Waste disposal	PM 2.5 concentration National share of greenhouse gas emissions Availability and management Percentage of solid waste disposed of in controlled area
- <i>Infrastructure</i>	Energy supply Traffic congestion Risk-based land use planning	Availability, average cost per kwh Proportion from renewable sources Commute time, delay hours, congestion costs Extent and quality
- <i>Skills</i>	Basic skills	Proportion of workers without a secondary qualification PIAAC data on adult skills (where available)
- <i>Demography</i>	Population change Demographic pressure	Birth rate, net migration levels, population change for 65+/75+ Projected old-age support ratio, availability and accessibility of care and services
<u>1.4 Delivering greater inclusion and well-being for local populations</u>		
- <i>Well-being</i>		Household disposable income, Gini coefficient, poverty rates (monetary and multi-dimensional)

Diversifying the sources of growth

Diversity in the sources of local economic growth constitutes a second key dimension for assessing resilience. It is intended to provide a measure of the local economy's adaptive capacity in terms of variability. The notion of variability covers the degree of diversification within the local economy, which can allow it to deal with a wider range of challenges, as well as the capacity for innovation through which it produces new solutions and adapts to change. The focus on variability adopted here means that other significant elements contributing to diversification and innovation will be left out at this stage of the analysis. Elements relating to the broader policy environment and to the performance of public employment services and education and training providers are discussed in following sections.

Under the present heading, the framework paper proposes to look at:

- Three different forms of diversification that can promote resilience at the local level: economic diversification, trade diversification and, building on existing LEED work on inclusive entrepreneurship, diversity in the profile and characteristics of business creators.
- Innovation, with an emphasis on its role as a complement to economic diversification.

The principal policy questions to be addressed here include:

- What kind of economic diversification can help foster resilience and long-term growth?
- What balance should be struck between a focus on high-growth traded sectors as opposed to job-creation in more crisis-resistant non-traded sectors (including the social economy)?
- How can trade diversification accommodate the risks associated with greater openness and integration into global value chains?
- What internal and external connections sustain the “clustered diversity” and spillover effects that favour innovation?
- Can more inclusive forms of entrepreneurship contribute to expanding opportunities and diversifying outlets for the local economy?

The benefits of diversification are strongly underlined by the resilience literature, both on theoretical and factual grounds. Two lines of argument are usually presented.

The first general argument, which can be related to the theory of risk management, applies mainly to economic (2.1) and trade (2.2) diversification. According to this perspective, diversification contributes to strengthen long-term growth and reduce volatility by spreading the risks associated with adverse shocks⁵ across a number of sectors and trade partners that are unequally exposed to these shocks. Evidence in favour of this argument is relatively solid, even at the local level. For instance, a broad and diversified productive base helps local economies withstand downturns and capitalise on opportunities for growth (Davies & Tonts 2010; Cowell et al. 2013)⁶. Conversely, localities whose productive base is heavily

⁵ These can be short-term and cyclical in nature, such as downturns in particular areas and temporary disruptions to global value chains, or long-term, such as loss of competitiveness or structural shifts in the global economy.

⁶ A similar argument in favour of export diversification for developing countries can be found in Hesse (2008).

concentrated or dependent on a number of legacy industries show a lower capacity to adapt to changing economic conditions and a higher risk of long-term decline (Polèse 2015).

The second line of argument insists on the positive effects that diversification has on the local economy's capacity to adapt to changing conditions and on its potential for innovation (2.3). According to this perspective, diversification strengthens adaptive capacity by reducing the economic and social costs of adjustment. Having a wider range of occupations, skills and know-how within the area makes it easier for the local economic structure and supply chains to recompose around new activities or sectors of growth, as opposed to developing these activities from the ground up. In this respect, diversified economies are better placed to deal with shifts in demand or competitiveness in the global market.

Diversification also increases opportunities for beneficial knowledge spillovers both within and between sectors. By expanding the range of skills contained within an area, diversification sets the ground on which rich and dense local knowledge networks can potentially develop and drive greater levels of innovation. Furthermore, diversity-driven innovation may be a self-reinforcing process, as wider labour market opportunities and a broader social capital basis can serve to attract highly skilled workers.

Finally, though it is rarely studied under this angle, inclusive entrepreneurship might constitute a source of resilience (2.4) insofar as greater diversity in the profile of business creators translates into greater diversity in the range of activities, ideas and business ventures generated in the local economy. In addition to spurring innovation, more inclusive forms of entrepreneurship may also lead to greater trade diversification as links between migrants and their home countries can help create opportunities and open new markets for the local economy.

Economic Diversification

The structure of the local economy represents the main and most evident measure for assessing its degree of economic diversification. From a resilience perspective, however, there are additional elements to explore. First of all, the degree of economic diversification is strongly correlated to the size of the local economy. While larger territories may be able to diversify successfully, smaller or more sparsely populated ones may lack the scale, resources, human capital or density of infrastructure required to do so. In these cases, an alternative (and more viable) strategy would consist in adopting "smart" forms of specialisation where diversity is achieved as part of a network of regions. Secondly, economic diversification may also affect resilience through the balance struck between high-growth traded sectors (which contribute to economic dynamism) and labour intensive non-traded sectors (which can constitute important reservoirs of job creation during downturns).

- Indicators for the local economic structure:

Standard measures for economic diversification, including *sectoral composition* and *market concentration* (Herfindahl Index), are likely to provide the best basis for comparison. The range of commodities produced is sometimes used as an indicator of economic diversification (UNESCAP 2014), but this may not be a good metric due to comparability problems and to the fact that it risks understating the importance of services. National statistics offices sometimes compile regional diversification indicators of their own (such as Canada's Economic Diversification Index) which can provide comparable data at sub-national level for particular countries.

The local economy's *spatial structure* may also impact diversification and resilience. Possible indicators here include the proportion of the population living in the central city as a measure of dominance/polycentricity⁷, and the Multimodal Accessibility Index designed by (ESPON 2014).

The *balance between manufacturing and services* represents another aspect of the local economic structure to consider as it determines the volume of job creation and affects the economy's employment elasticity of growth. The *size of the traded and non-traded sectors* reflects the local economy's exposure to shocks originating in other regions or outside the national territory. It can be measured using different methods: share of exports in GDP, input shares (if available at the local/regional levels)⁸. The *balance between high-growth sectors and the social economy* gives a further indication of the diversity and resilience of job creation in the local economy, since the social sector can constitute an important source of employment in downturns, as well as an effective means of integrating vulnerable populations into the labour market (OECD 2014b). LEED has considerable expertise and data to build on here.

- Indicators for smart specialisation:

The first and most important element to establish is whether the local economy is part of an institutional *platform* which coordinates activity and industrial policy across territorial boundaries. These platforms can operate at a national level (as part of national competitiveness agendas, industrial strategies...) or a supranational level (as with the European Commission's Smart Specialisation Platform). The impact of these platforms on the local economy can be gauged by looking at the resources allocated, as well as support, monitoring and evaluation mechanisms. (OECD 2013) provides benchmarks which may be useful in this respect. Measures of *interregional linkage* may highlight existing regional networks and capture non-institutionalised forms of smart specialisation.

Trade diversification

Trade diversification can be divided into two elements: the local economy's degree of openness and its degree of integration into global value chains. Global value chains present an additional risk as the position occupied by the local economy within these chains may leave it overly dependent on trade partners, vulnerable to shifts in global demand or exposed to disruptive shocks in other parts of the world (natural disasters, economic and political conflict...). The size of the local economy may need to be controlled for here as well, as it is generally correlated to both of these factors (openness and integration into global value chains), with smaller economies tending to be more open and integrated.

- Openness indicators:

Openness can be gauged through the ratio of total trade to GDP. This indicator could be further disaggregated to reflect interregional and international trade, if the data permit this. Diversity of trade partners can also be measured, distinguishing there again between interregional and international trade whenever possible.

- Global value chain indicators:

The OECD's Global Value Chain Participation Index can provide a background measure of the degree of *integration into global value chains*, though data are unlikely to be available at the local/regional level. When looking at the local economy's *position within global value chains*, factors of diversification

⁷ (Augustine et al. 2013) does not find a significant correlation between this indicator and resilience however.

⁸ Lombardo & Ravenna (2012) uses this method for calculating the respective size of the traded and non-traded sectors in a number of OECD countries.

and resilience include the share of key enabling technologies (including eco-innovative industries), sophistication of products and a reduced dependence on vertical trade⁹.

Innovation

Economic diversification can contribute to growth and resilience by spurring greater innovation in the local economy. The key element to determine here is whether diversity in the local economic structure goes hand-in-hand with the type of spatial knowledge agglomeration on which rich and dense networks of innovation can develop. Clustered diversity increases the potential for beneficial knowledge spillovers. The effectiveness of innovation networks also depends on the nature and quality of the connections that form within it (intra- or cross-sectoral, intra- or interregional...). (Glaeser et al. 1992) concludes, for instance, that knowledge spillovers between sectors are more conducive to innovation and growth than spillovers that remain contained within the bounds of a particular industry.

- Local innovation indicators:

The degree of innovation in the local economy can be measured by looking at indicators for *R&D* (spending and personnel, patent filing, birth-to-market-launch rates for new products...). If *growth and investment strategies* are implemented locally, levels of spending and support mechanisms should also be studied and assessed.

- Clustered diversity indicators:

The *degree of clustering* can be measured using location quotients for industrial clusters in key sectors for the local economy. Labour mobility between sectors and connections between the private sector and universities/ research institutes can be used as indicators for cross-sectoral *knowledge spillovers*. Other possible approaches for measuring the nature and quality of connections within innovation networks could consist in using surveys to study the extent to which innovations are shared between firms in the local economy (both within and across sectors) or the type and strength of these connections. In the latter case, Granovetter (1983) offers a potentially useful qualitative framework for analysing the strength of ties as a function of time, intensity, nature and reciprocity of interaction.

Inclusive Entrepreneurship

Diversity in the profile of entrepreneurs can help the local economy capitalise on opportunities for growth by contributing to increase and diversify the production of goods and services through the creation of new outlets, and by spurring innovation and economic diversification through the development of new products and services aimed at the needs of underrepresented groups. Here again, this is an area of LEED expertise and substantial work has already been done to disaggregate data on entrepreneurship and analyse outcomes for different underrepresented populations: youth, seniors, women and ethnic minorities (OECD/EC 2014c). Existing local data, indicators and tools developed by LEED should be used to deepen this section.

Key elements to highlight should include levels of *business creation* for these groups and the effectiveness of *support mechanisms* as the obstacles to business creation are particularly important for underrepresented populations.

⁹ The Economic Complexity Index compiled by the Observatory of Economic Complexity is an interesting indicator for diversification and sophistication, but here again data are unlikely to be available at the local/regional level.

- Business creation indicators:

Business ownership rates and start-up launch and mortality rates can provide a basic indicator for business creation by underrepresented populations, if data is available at the subnational level. Attitudes towards entrepreneurship held by these populations can also be included here as an indicator of likelihood to start a business and a source of potential barriers to business creation.

- Support indicators:

Different elements can be looked at: *entrepreneurial networks* (in particular the availability of mentoring and peer-learning for entrepreneurs from underrepresented groups), *training* targeted at entrepreneurs from underrepresented groups (planning, managerial skills...), *access to finance* and the degree to which *tax and social support systems* are adapted to entrepreneurship.

Table 2 summarises the proposed criteria and indicators for this section:

Table 2. Relevant criteria: Diversifying the sources of growth

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Theme and sub-themes	Criteria	Potential evaluation parameters
2) Diversifying the sources of growth		
2.1 Developing strategies for local economic diversification		
• Local economic structure	Sectoral structure	Sectoral composition of the local economy, Herfindahl index, National indicators (if available)
	Spatial structure	Proportion of the population living in the central city, Multimodal accessibility index (ESPON)
	Manufacturing/Services balance	Relative shares of local GDP
	Traded/Non-traded balance	Exports as % of local GDP, Input shares
	High growth/Social sector balance	Net job creation and % of total employment in knowledge intensive services and high-tech manufacturing Net job creation and % of total employment in the social economy
• Smart specialisation	Platform	Integration into a smart specialisation platform
	Interregional linkage	Support, monitoring and evaluation mechanisms Input/Output linkages
2.2 Mitigating the risks of greater openness to trade		
• Openness		Total trade to GDP ratio Diversity of trade partners
• Global value chains	Integration into GVCs	GVC participation index (OECD)
	Position within GVCs	Key enabling technologies as % of local GDP Vertical trade as % of local GDP Economic complexity index (Obs. for EC)

2.3 Promoting innovation through clustered diversity

<ul style="list-style-type: none"> • <i>Local innovation</i> 	<ul style="list-style-type: none"> R&D Growth/Investment strategies 	<ul style="list-style-type: none"> R&D spending as % of local GDP, patent filings, birth-to-market-launch rates for new products Resources and support mechanisms
<ul style="list-style-type: none"> • <i>Clustered diversity</i> 	<ul style="list-style-type: none"> Degree of clustering Knowledge spillovers 	<ul style="list-style-type: none"> Local quotient for industry clusters in key sectors Labour mobility between sectors, links between private sector and universities/research centres Surveys on innovation sharing between firms and strength of ties

2.4 Using inclusive entrepreneurship as a source of growth

<ul style="list-style-type: none"> • <i>Business creation</i> 		<ul style="list-style-type: none"> Business ownership rates, start-up launch and mortality rates (for all groups) Attitudes towards entrepreneurship
<ul style="list-style-type: none"> • <i>Support mechanisms</i> 	<ul style="list-style-type: none"> Entrepreneurial networks Targeted training Access to financing Tax and social support systems 	<ul style="list-style-type: none"> Availability of mentoring and peer-learning (for all groups) Availability and extent (for all groups) Availability and extent (for all groups) Assessment of their adaptation to entrepreneurship

Allocating resources effectively

The previous section argued that diversification facilitates change and innovation, as long as it also allows for clustering and the formation of strong local knowledge networks. The current section deals with another aspect of adaptive capacity: how effectively the local economy can adjust to change and recompose around new activities in response to disruptive shocks, long-term trends and emerging opportunities.

The effective allocation of capital, natural resources, labour and skills is a necessary counterpart to economic diversification. Furthermore, it instils resilience in the local economy by helping promote job creation and absorb negative shocks. Many of the processes determining the allocation of resources at the local level are defined or shaped by policies set at a national level. However, local-level mechanisms and institutions also have a significant influence on the effectiveness of labour market policies and performance of local labour markets, as well as the utilisation of skills and capital. The current section focuses on the first of these two complementary aspects of resilience: the local dimension of resource allocation and adjustment to change. The issue of multi-level governance will be developed in the next section.

Under this heading, the following areas need to be assessed:

- The actions taken by local employment services and training providers to foster greater adaptability in the local labour force, including for vulnerable populations.
- The performance of local education and training systems at all levels.
- The local economy’s openness to and use of capital inflows.

The main policy questions to be addressed include:

- How flexible is labour market policy implementation and what margins do employment services have to adapt programmes and resources to local economic conditions?
- How effective are matching mechanisms in local labour markets?
- What local initiatives are taken to improve and better utilise skills?
- How effective are local education and training providers at fostering the key cognitive and non-cognitive skills required for local economic and social development?
- What local initiatives are taken to attract and better utilise inward investment?
- Does investment translate into productivity gains or improvements in quality of life?

An effect of the global financial crisis has been to underline the importance of regional disparities and the strong territorial dimension of economic performance and resilience. These disparities are particularly salient in the case of labour market performance, where the recovery has been weak and uneven. Thus (OECD 2012a) concludes that macro-economic policy and structural reforms to labour and product markets will not be sufficient to restore employment to pre-crisis levels without accompanying adjustments to labour market policy aimed at better addressing local matching frictions and barriers to employment. A complementary perspective to this conclusion can be found in (OECD 2014b). It focuses on the implementation of labour market policy at the local level, on the nature of the challenges involved in local job creation and on the conditions under which local labour market institutions – in particular vocational education and training systems (VET) and public employment services (PES) – can help overcome these challenges.

The broader point to be made is that LEED's work casts light on an important part of the resilience puzzle: the degree of effectiveness with which local economies develop, allocate and make use of existing resources in order to sustain long-term growth and adapt to change. (OECD 2014b) has compiled data and established tools and best practices in a wide range of areas relating to local job creation. These can be used as a basis for analysing the effectiveness of local employment services (3.1), labour force development and skills utilisation (3.2), as well as the integration of vulnerable populations into the local labour market (3.4). To complete the picture on building resilience through better resource allocation, existing OECD work will be drawn upon to analyse the use and effectiveness of investment at the local level (3.3).

Labour market resilience

Increased matching frictions constitute a significant challenge for labour market institutions in the post-crisis world, particularly in areas where unemployment has risen the most. Potential causes of friction include growing mismatches between the supply of and demand for labour, as well as decreases in search or recruitment intensities. Some of these mismatches are issues for national policy and do not enter into the purview of a framework on local resilience. This is notably the case for issues relating to geographic mismatches and labour mobility. Skills gaps and sectoral or occupational mismatches are highly territorialised however and should be treated at the local level. Questions relating to the implementation of labour market policies, in particular their degree of flexibility and responsiveness to local conditions, represent another important factor to consider as they can influence the effectiveness of employment services and through it the resilience of local labour markets. In this respect, more flexible implementation of policy and more effective institutions can improve the functioning of local labour markets and increase the local economy's capacity to adapt to change. Job quality is another aspect to consider as it impacts on individual well-being and resilience.

(OECD 2012a) and (OECD 2014b) propose two complementary approaches for assessing labour market resilience which the dashboard could build on: a quantitative measure of matching frictions and matching efficiency; and a qualitative analysis of the effectiveness of local employment services.

- Indicators for matching frictions and efficiency:

(OECD 2012a) relies on Beveridge curves to measure *matching frictions* and a measure of *matching efficiency* based on a comparison between observed rates of job finding/job filling and those predicted by a model. In both cases, aggregated data is used but the measure of matching efficiency could potentially provide a background national variable. Beveridge curves could be constructed for local labour markets, if data for job vacancies are available at that level. In similar fashion, the INSPIRES project has developed a model-based measure of labour market resilience using regional data.

Alternatively, matching efficiency can be assessed indirectly by looking at the quality of career advice and job-search assistance, as in (OECD 2014b).

- Employment service effectiveness indicators:

(OECD 2014b) presents a wide range of relevant indicators developed by LEED and best practices relating to public employment services. The tools for assessing *flexibility* include an index of flexibility in the management of employment policies and programmes which aggregates many of the elements covered under this heading (programme design, budget management, planning...). Important elements could be disaggregated and presented separately according to need. Other indicators of flexibility could include the extent to which local employment services can adapt regulation or pursue innovative practices. LEED can also rely on existing questionnaires and methods developed within the *Local Job Creation* framework in order to qualitatively assess *capacity* (human and financial) within the employment services, *accountability* by local employment services and effective *collection and use of data*. As is already the case in the *Local Job Creation* framework, private actors operating in the sector (temporary work agencies) should be included in the analysis (through their relation to PES for instance).

- Job quality indicators:

The index of critical conditions in the working population presented in (OECD 2015b) offers a useful template for measuring *working conditions* in the local economy. It is based on the OECD Job Quality framework and can be adapted to reflect conditions specific to each national context.

Labour force development and skills utilisation

The formation of skills is an essential part of labour market resilience. Adequate skills help protect employment, increase the local economy's capacity to develop new activities and overcome skills gaps that can prevent it from reaching its full potential for growth. Level and quality of education matter when assessing skills, but general aptitudes (both cognitive and non-cognitive) also need to be taken into account as they influence productivity and tend to be highly transferable between sectors.

Skills formation (including in-work training and efforts to upgrade skills) is not the only means through which the match between jobs and skills can be improved. In this respect, efforts by employers to promote better utilisation of existing skills and measures that increase the effectiveness of local education and training systems (such as greater flexibility in the provision of training and emphasis on life-long learning opportunities) also contribute to build resilience in the local labour market.

Labour force development and skills utilisation are areas of LEED expertise and many of the indicators and methods from the *Local Job Creation* project and (OECD 2014b) can be applied here.

- Skills indicators:

The skills diagnostic tool presented in (OECD 2014b) can be used as an indicator for *skills gaps* at the local level. Regional data on high-level *generic skills* should be available from PISA and, for certain countries, from PIAAC (literacy, numeracy, ICT literacy), at least for cognitive skills. Comparable data on non-cognitive skills will be much harder to find. LEED's data on the range and availability of training in VET curricula could be used if it includes training in non-cognitive skills. The OECD's Education and Social Progress project is looking at this issue but probably does not have available data yet.

Skills utilisation can be measured by looking at the level of investment in workplace training, the degree of workforce participation in VET, and through the index of public/private collaboration on skills utilisation (OECD 2014b).

- Education and training systems effectiveness indicators:

The indices of flexibility within the VET system and employer engagement in the orientation of training services presented in (OECD 2014b) provide measures of *flexibility* and *responsiveness* in the education and training system. As was done for employment services above, methods developed in the *Local Job Creation* framework can be used to assess *capacity* (human and financial), *accountability* and *effective collection and use of data* within the local training system.

Effective investment

The level of investment in the local economy and the effectiveness with which it is allocated towards areas that sustain long-term growth and development constitute another source of resilience. Larger regions may be able to influence the level of inward investment they receive through strategies and initiatives designed to promote the local economy, but for most territorial units allocation and effective use are likely to be the main concerns.

Public investment provides another criterion to focus on. In 2012, local and regional governments were responsible for 72% of direct public investment in OECD countries (OECD 2015a). Assessing and ensuring the effectiveness of public investment at the local level has become an important policy issue, particularly in the post-crisis context of fiscal retrenchment and greater devolution. The OECD *Toolkit for effective public investment across levels of government* offers a comprehensive framework for doing so, including a questionnaire, data and best practices. Two points stand out more prominently in relation to local resilience. First of all, capacity-building must keep pace with institutional reform in order to avoid bottlenecks at the local level. In this respect, the more control local administrations have over the investment cycle, the greater their need for adequate resources – both human and material. Secondly, in a context of tighter budgetary constraints, local resilience must be built on a more efficient, intelligent and coordinated use of public investment. Recommendations to that end include efforts to adapt public investment to local conditions and leverage private sector investment.

- Inward investment indicators:

If data permit, total inward investment in the local economy could be measured and further disaggregated between inward investment from the rest of the country and foreign direct investment (a larger share of the latter being associated with greater attractiveness and diversification in the sources of financing). An alternative indicator for *the level of inward investment* could be obtained by qualitatively

assessing the efforts made to secure inward investment, looking for instance at initiatives to attract inward investment, degree of collaboration between public and private sector, activity of local developmental agencies... The contribution of inward investment to local resilience could be assessed by looking at its *sectoral allocation*, concentrating on education, public infrastructure, health, social care and the environment.

- Public investment effectiveness indicators:

The *Toolkit for effective public investment across levels of government* can be taken as a template for measuring *effectiveness* and its questionnaire adapted according to need. One approach could consist in transposing the criteria already used for VET and PES. *Flexible implementation* could notably be gauged by looking at the degree to which public investment strategies are adapted to the characteristics and needs of the local area. *Responsiveness* to local conditions could be measured by the extent to which local populations and the private sector are involved in the design, monitoring and evaluation of public investment projects, as well as the degree to which long-term impact assessments for these projects are risk-based. Measures of *capacity* should aim to assess the adequacy between the needs generated by public investment projects (including finances, manpower and expertise) and the resources available to local administrations. Insofar as they leverage public investment and help to spread risk, the use of multi-level financing instruments and public-private partnerships could also be taken as an indicator of financial capacity. Standards of transparency (notably in public markets) can provide an indicator of *accountability*. And *data collection and use* can be assessed by looking at local administrations' procedures for assessing capacity gaps, the use of target-driven investment strategies and institutional learning from experience

Inclusion of vulnerable populations

As mentioned above, social inclusion policies can have positive effects on innovation by helping diversify the profile of potential entrepreneurs. They also contribute to long-term growth and resilience through a second, more significant, channel by increasing the integration of vulnerable populations into local labour markets. Raising employment and participation rates constitutes a crucial element of growth strategies in a context of demographic ageing (see for instance the EC's EU2020 employment rate projections). Labour market exclusion among vulnerable populations (women; youth; older workers; migrants) is particularly important to tackle in this respect, as low participation by these populations represents a major brake on growth potential, as well as contributing to poverty. Furthermore, vulnerable populations face specific and challenging barriers to employment which are more effectively addressed at the local level using outreach and tailored approaches.

- Labour market outcome indicators for vulnerable populations:

Standard labour market indicators include employment, unemployment and long-term unemployment rates for all the populations studied. Poverty rates may also be considered. It would also be interesting, if possible, to survey employers' attitudes towards hiring and training these populations.

- Targeted policy indicators:

(OECD 2014b) provides an index for targeting of employment and training programmes to "at-risk groups" which can be used as a general indicator. Specific social inclusion policies considered here should include affordable childcare and flexible workplace arrangements (*women*), targeted supports for NEETs and school dropouts including 2nd chance education opportunities and participation in pre-apprenticeships and apprenticeships (*youth*), training programmes and initiatives aimed at retaining older workers (*older workers*), skills/qualification recognition and language training (*migrants*).

Table 3 summarises the proposed criteria and indicators for this section:

Table 3. Relevant criteria: Allocating resources effectively

Theme and sub-themes	Criteria	Potential evaluation parameters
3) Allocating resources effectively		
3.1 Building resilience into labour markets through closer attention to local challenges		
- <i>Matching frictions and efficiency</i>	Matching frictions	Beveridge curves for local labour markets (if vacancy data are available)
	Matching efficiency	Matching efficiency model (OECD) Labour market resilience model (INSPIRES) Quality of career advice & job-search assistance
- <i>Effectiveness of local employment services</i>	Adaptation to local conditions	Index of flexibility in the management of employment policies and programmes, Regulatory waivers, other disaggregated factors
	Capacity	Existing LEED methodology
	Accountability	Existing LEED methodology
	Data collection and use	Existing LEED methodology
- <i>Job quality</i>	Working conditions	Index of critical conditions in the working population (OECD)

3.2 Fostering adaptability in the labour force and workplace through better provision and utilisation of skills

• <i>Skills</i>	Skills gaps	Skills diagnostic tool (LEED)
	High level generic skills	Regional PISA and PIAAC data (where available), Availability of training for non-cognitive skills in local VET curricula (if collected by LEED)
	Skills utilisation and upgrading	Investment in workplace training Workforce participation in VET Index of public/private collaboration on skills utilisation (LEED)
• <i>Effectiveness of local education and training services</i>	Flexibility	Index of flexibility within the VET system (LEED)
	Responsiveness	Index of employer engagement in the orientation of training services (LEED)
	Capacity	Existing LEED methodology
	Accountability	Existing LEED methodology
	Data collection and use	Existing LEED methodology

3.3 Making effective use of investment at the local level

• <i>Inward Investment</i>	Level of inward investment	Total inward investment (rest of country/FDI) Local initiatives, developmental agencies, public/private sector collaboration
	Sectoral allocation	Education, public infrastructure, health, social care and environment as % of total
• <i>Effectiveness of public investment</i>	Flexibility	Degree to which public investment strategies are adapted to local characteristics and needs
	Responsiveness	Risk-based impact assessment Involvement by local population and private sector over the investment cycle
	Capacity	Adequacy of manpower, professional skills and budgetary resources for public investment Multi-level financing, public-private partnerships
	Accountability	Transparency in public markets
	Data collection and use	Capacity gap assessment, target-driven strategies, institutional learning from experience

3.4 Expanding the potential for growth through greater inclusion of vulnerable populations

• <i>Labour market outcomes for vulnerable populations</i>		Employment, unemployment (overall and long-term) rates for vulnerable populations Poverty rates for vulnerable populations Employers' attitudes towards hiring and training vulnerable populations
• <i>Specific policies targeted at integrating...</i>	Women	Affordable childcare and flexible workplace arrangements
	Youth	Support for NEETs and school dropouts
	Older workers	Training and retaining programmes
	Migrants	Skills/qualification recognition, language training
	General	Employment and training targeting index (LEED)

Coordinating action towards long-term trends through strategic governance

The final heading of the dashboard deals with the issue of governance. Quality of governance is a powerful driver of resilience that works through numerous and often reinforcing channels. It does so directly by targeting areas of vulnerability and adapting capacity to challenges, but also indirectly by framing the resource allocation processes within the local economy and through the positive effect it has on factors such as income (Kaufmann & Kraay 2002), human development (Charron, Lapuente & Dijkstra 2012) and the effectiveness of public investment (OECD 2015a). The difficulty consists in determining what constitutes “good” governance in the perspective of building local resilience. For this reason, governance deserves to be analysed under a separate heading, despite the fact that it is inextricably linked with most of the dimensions of local resilience.

At a more immediate level, enhancing the quality of governance implies that the resilience of the local institutions themselves be shored up – notably by increasing accountability and public trust, improving the delivery of public services and encouraging civic participation in policy-making processes and debates (OECD 2014a). These pillars of institutional resilience have been weakened by successive crises. Rebuilding them represents an urgent practical goal as they can contribute to restore much-needed political margins of manoeuvre and counteract negative public perceptions on the limited capacity of government to respond to external shocks or citizens’ needs. However, resilience building also invites a deeper reflection on the structures of governance and conditions for policy intervention. The multi-dimensional nature of resilience and the insights provided by complexity science can help define the aspects of governance that should be singled out for analysis.

Under this heading, the framework paper proposes to assess:

- The institutional arrangements and mechanisms through which government actors operating at different levels coordinate policies for building resilience at the local level.
- The governance platforms which allow diverse stakeholders to participate in the design and implementation of local development strategies.
- Foresight capacity and contingency planning at the local level.
- Measures of trust and participation in local institutions.

The main policy questions to be addressed here include:

- To what extent has resilience been mainstreamed into local planning and development strategies?
- Are there mechanisms in place ensuring collaborative planning and implementation between levels of government, and how effective have they been?
- To what extent do local institutions take an integrated cross-sectoral approach to development?
- How accountable are local institutions and how responsive are governance platforms to the needs of stakeholders?
- Do capacity gaps exist in the implementation of local development strategies and emergency responses?

- How actively engaged are local communities in resilience building initiatives?

The complexity lens adopted in this paper suggests that emphasis be put on the broad capacity for collective action when assessing governance as a factor of local resilience. Several conclusions flow from that premise.

First of all, the multi-dimensional nature of resilience calls for greater coordination across policy sectors and jurisdictions, as well as between levels of government (4.1). Adaptive capacity is reinforced when public authorities are able to take a comprehensive approach that can match the complexity of the problems involved and implement joined-up policies for economic development at the local level. Public authorities must also have the means to act effectively within a multi-level governance framework. As mentioned above, resilience-building is a shared responsibility and relies on complementarity of action between different levels of government – in particular between the resources and capacity which exist at the national level and the local knowledge and implementation mechanisms which can adapt policy to specific territorial needs and conditions.

Secondly, capacity for action covers not only the structures of governance but also the conditions for effective policy intervention. In this respect, resilience-building underlines the strategic dimension of public policy and the need for local governments to understand, engage and coordinate with a large and often diverse set of stakeholders in order to effect transformative change (4.2). Resilience strategies should therefore have deep social and institutional roots at the local level: sustainable economic development implies not only a *whole of government* but also a *whole of society* approach.

Furthermore, the strategic dimension of resilience-building requires that issues of foresight, commitment and timing of action be considered (Bristow & Healy 2014). To do so, local governments must have access to the data and capacity necessary to identify, plan for and address critical risks (4.3). Lastly, while public leadership and management are essential, capacity for action also relies on public support and participation. Traditional measure of institutional resilience must therefore be taken account of when assessing quality of governance (4.4).

Policy coordination across sectors, jurisdictions and levels of government

Assessing policy coordination in a multi-level framework is a complex task. It implies looking at the degree to which policies are joined-up at each level, as well as the degree of vertical integration between levels. Evidence suggests that both joined-up policies (OECD 2014b) and vertical integration (EC 2013) contribute to sustainable growth and resilience in local economies. Much of the analysis will be qualitative in nature and should take place as part of the mapping of the institutional environment. Elements to look at include not only the institutional arrangements at national and local level, but also mechanisms for coordinating local development policy both horizontally and vertically.

A common problem to consider at all levels is that of political and administrative fragmentation, as it constitutes an obstacle to joined-up policies and a brake on productivity and growth (Benner & Pastor 2013). One of the main goals of recent territorial reforms has been to address fragmentation with the aim of improving the efficiency of local public services (OECD 2015a).

- Coordination indicators:

Measures of coordination and fragmentation at the *national level* should focus on the modes of governance for local development policy. Questions to consider include whether local development policy has its own dedicated ministry, depends on another ministry (economics, trade, infrastructure, internal affairs...) or is shared between different ministries; what inter-ministerial coordination mechanisms exist

to steer policy in these domains and how effective they are. At the *local level*, LEED has considerable expertise to draw on regarding the analysis of policy coordination. Initiatives designed to promote networked approaches to public governance should also be looked at as they can contribute to greater flexibility. The Metropolitan Power Diffusion Index provides a useful tool for measuring political fragmentation at the local level (Benner & Pastor 2013).

- Vertical integration indicators:

Integration between levels of government can be measured by looking at the existence of vertical coordination *mechanisms* and the degree to which they allow for exchange of information, joint implementation of policy and consensus formation. *Complementarity* can be assessed by looking at policy coherence between levels of government, as well as the degree of subsidiarity allowed for in questions of employment, training and local economic development.

Stakeholder involvement

Horizontal collaboration with actors operating at the local level is another important aspect of capacity for action. Its extent and effectiveness can be gauged by looking at the degree of involvement of local stakeholders (private sector, NGOs, social enterprises...) in the governance platforms where local development strategies are designed, at the input they may have on the production of policy and public services, and on local governments' ability to gather data and learn from institutional and non-institutional stakeholders.

- Indicators for stakeholder involvement in governance platforms:

LEED has data covering horizontal collaboration within governance platforms and has established some best practices, notably in (OECD 2014d), which may be useful to assess performance in this domain. Governance platforms can also improve resilience by acting as a commitment device for local governments and administrations. Insofar as they contribute to disconnect local development strategies from the electoral cycle, governance platforms can provide continuity and help ensure buy-in by public officials. This last dimension can also be looked at.

- Indicators for stakeholder involvement in producing policy and services:

(OECD 2015b) provides an interesting experiment and possible best practice in terms of co-production of policy and services. In doing so, it highlights the benefits of stakeholder involvement throughout the policy cycle. Relevant indicators here may include use of participatory budgeting, citizens' fora and consultation with non-governmental experts.

- Indicators for data collection and management:

Local governments' understanding of the responses of local stakeholders and their interaction with policy and regulation can be gauged by looking at the collection of behavioural data at the local level. Data quality and management can be measured by looking at the instruments used to assess the impact of policy and regulation.

Governance of critical risks

Resilience requires that the time-horizon of policy intervention be rethought and better aligned with the complex and unpredictable nature of critical risks. (OECD 2014e) proposes a series of recommendations aimed at achieving this goal. A number of these recommendations apply to local

governments, including the need to develop foresight capacity in order to anticipate risks and detect emergent threats; to increase preparedness and responsiveness by organising emergency response capabilities and continuity planning; and to mainstream resilience into the local policy cycle.

- Foresight capacity indicators:

The issue to determine here is the extent to which local governments have access to foresight capacity, either through national agencies or because they have developed local capacity of their own.

- Indicators for emergency response capabilities:

Indicators should include the extent of *continuity planning* both for business and critical public services, the use of *risk-based standards* (notably for land-use planning) and the existence of *mechanisms* through which services and agencies involved in emergency response can coordinate (the UK's Local Resilience Fora provide an example). *Preparedness* is also an issue of strategic importance here. Rolling out new measures can be extremely difficult to achieve in times of emergency, a more effective approach therefore consists in building on existing measures and investing in capacity rapid for scale-up.

- Indicators for resilience mainstreaming:

The degree of mainstreaming can be measured by looking at strategies or agendas designed to promote resilience concerns throughout local administrations and initiatives to raise public awareness of sustainability challenges.

Institutional resilience

While national leadership and management are essential, local institutions have important advantages in terms of public trust and outreach which make them key actors for building resilience. Openness by local institutions can further reinforce this, as can the degree of civic engagement by the local community which also provides a measure of self-reliance, connectivity and social resilience. Finally, better understanding of existing policies and strategies among the local community can help create a shared vision of resilience and forge “epistemic communities” which are better able to act collectively. In this respect, it is possible that “knowing together contributes to growing together” (Benner & Pastor 2013).

- Trust indicators:

National statistics offices may have available data on interpersonal and public trust at the sub-national level. Similarly, it may be possible to disaggregate data from national-level surveys if they have sufficiently large samples. Alternatively, (Charron, Lapuente & Dijkstra 2012) have developed a subjective indicator for Quality of Governance which covers attitudes towards public institutions at a regional level within the EU.

- Openness indicators:

Degree of openness can be assessed by looking at open-government initiatives and the degree of public data-sharing by local institutions.

- Participation indicators:

Traditional indicators for civic and political participation include voter turnout and the proportion of the population which belongs to a political party, NGO or volunteers for a philanthropic association. Voter

turnout is sometimes calculated based on national elections, but turnout for local elections measured against the national average is likely to provide a better indicator for our purpose here (civic engagement with local institutions).

- Indicators for shared vision:

This can be measured by surveying local populations’ understanding of resilience policies and strategies. Table 4 summarises the proposed criteria and indicators for this section:

Table 4. Relevant criteria: Coordinating action towards long-term trends through strategic governance

Theme and sub-themes	Criteria	Potential evaluation parameters
4) Coordinating action towards long-term trends through strategic governance		
4.1 Coordinating policy across sectors, jurisdictions and levels of government		
• <i>Coordination</i>	National level	Assessment of the modes of governance and coordination mechanisms for local development
	Local level	Existing LEED methodology (joined-up policies, flexible implementation), use of networked approaches to public governance Metropolitan Power Diffusion Index
• <i>Vertical integration</i>	Mechanisms	Assessment of coordination mechanisms, use of networked approaches to public governance
	Complementarity	Assessment of policy coherence between levels, Degree of subsidiarity allowed in employment, training and local development
4.2 Involving stakeholders for in-depth transformative action		
• <i>Horizontal collaboration in...</i>	Governance platforms	Existing LEED methodology Degree of buy-in by local officials
	Production of policy and services	Participatory budgeting, citizens' fora, consultation with non-governmental experts
• <i>Data collection and management</i>		Behavioural data, instruments, policy and regulatory impact assessment
4.3 Governing critical risks strategically		
• <i>Foresight capacity</i>	Availability	Local or national
• <i>Emergency response capabilities</i>	Continuity planning	Extent (business and critical public services)
	Standards	Risk-based land-use planning
	Coordination of emergency services	Mechanisms and fora
	Preparedness	Breadth of existing emergency responses and capacity for scale-up
• <i>Mainstreaming of resilience</i>		Existence of comprehensive resilience agenda or resilience strategies, public awareness initiatives
4.4 Earning public trust		
• <i>Trust</i>		Interpersonal and public trust surveys Quality of governance indicator (Charron et al.)
• <i>Openness</i>		Open-government initiatives, data-sharing
• <i>Participation</i>		Voter turnout for local elections, % of the population involved in a political party, NGO, philanthropic association
• <i>Shared vision</i>		Understanding of resilience policies and strategy

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