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The paper sketches the current ecological and economic context of sustainable regional development with focus on the imperative for change to a post carbon economy, the need for innovation within the learning system of public administration and policy challenges for securing system viability.

Post Carbon economy and sustainable growth

The liberalization waves of the world economy in the last decades have resulted in an unprecedented phase of economic growth coupled associated with a rise of majorly Asia and South America. Beside that, it has caused as well a major dynamics of further urbanization on a global scale, which in turn challenges the development of rural and even more remote areas. The efficiency gains of production triggered a further increase of living standard which in turn resulted in an exponential growth of the world population with 7 billion to be reached in 2011.

This unparalleled growth in wealth is neither equally distributed nor does it fulfil the necessary conditions for long term growth. Even worse, it has brought about an overstretch of natural buffer capacities, an all-time decline in biodiversity¹, a gigantic waste of energy and other biological resources as well as, a human induced increase in carbon dioxide highest in the last 650.000 years. This short-sighted way of short-term survival is based on an anthropocentric world view, a one way ideology and an overconfidence bias accompanied with a comprehensive steering claim. Disregarding most risks associated with this kind of „exponential growth culture’’², this way of life triggered a multi-dimensional crisis, since we have so far failed to bring societies on a sustainable growth path.

This multidimensional crisis combines a crisis of the environment, a crisis of food and water supply, a coming crisis of arable land, and as well a crisis of the social system which are to be held responsible for these results. Social and governmental institutions proved to be incapable to avoid these real threats and risks, which are interconnected and often mutually reinforcing. Finally, it is an ethical crisis of unlimited growth.³

The base of the currently prevailing system not being sustainable is under huge ethical, ecological and economic adaptation pressure. And since public rules and regulations are mainly bound to territorial units, the shift of the economy towards locally much more flexible added-value chains across territorial units creates a huge governance problem. And because, apart from transfer payments within a national public finance scheme, a major source of funding of public goods is a territorially bounded tax base, there is a vast funding risk for the provision of public goods in local budgets, in particular in areas which lag behind with respect to economic growth.

In all, there is a clear link between the size and nature of these risks, the way governmental and governance leaders approach these risks, the effectiveness of the policy response in a decentralized multi-level governance system and the likelihood to manage these risks in a convincing manner in the sufficient time frame.

¹ For an introduction to biodiversity and a case study of biodiversity loss and agricultural supply chain risk see in particular: World Economic Forum (2010): Biodiversity and Business Risk. Accessed at: http://www.pwc.de/de/nachhaltigkeit/assets/Biodiversity_businessrisk.pdf (01.07.2011)

² Hubbert, M.K. (1976): Exponential growth as a transient phenomenon in human history. The fragile earth. towards strategies for survival. Accessed at: <http://www.hubbertype.com/Hubbert/wwf1976/print.htm> (01.07.2011)

³ Michels, G.R. (2010): Nachhaltigkeit und Ordnungspolitik in der Krise. Berlin, p.7

The spatial dimension

Since space structures major production factors by proximity, it matters for economic growth. And because the local and regional endowment with natural resources can hardly change, the emphasis of the analysis is made on labour availability and its quality, infrastructure and institutional settings, and the way different actors act in their reflexive relationship with organizational and institutional structures.

Fundamentally, proximity provides access to local natural endowments, which directly and indirectly affect growth. Proximity decreases transaction costs, facilitates exchange and knowledge spill-over effects and increases options to act. It also helps to create intangible assets, which can be considered to be cumulating input factors for economic activity and respective investments as well as productivity⁴. Intangible assets can also positively contribute to both firm and industry performance,⁵ in particular within supply chains. Interestingly enough, there is a fairly marked, direct impact of social capital on innovation outcomes.⁶

Intangible assets can be easily divided into internal and external ones. As internal intangible assets such as software, research and development, patents, employee training and specific economic competencies directly determine firm productivity, external intangible assets directly and indirectly influence productivity. In particular, social capital, knowledge capital and institutional capital represent important kinds of external intangible assets. These localized externalities attract or distract in a general but very concrete way the agglomeration of economic activities and enhance or decrease their performance.⁷

A wide body of literature⁸ supports the significant impact of institutions on economic performance on the macro-level.⁹ Because firms represent on meso- and micro levels the elements of the macro level, there is a direct link from intangible local assets to macroeconomic performance of a region.

But is the agglomeration of economic activity really good for economic growth and sustainability?

Neoclassical economists thought that regional disparities naturally diminish with growth because of diminishing returns to capital. Among competitors, regional labour and capital mobility lead to the factor price convergence and, therefore, over time to the convergence of regions, too. Later the view was held that growth is a cumulative process across space, which is likely to increase regional inequalities. Williamson¹⁰ claimed that national development created increasing regional disparities in the early stages of development, and expected regional convergence after having reached the top. If, after some time, increasing factor costs trigger diseconomies in the agglomeration center, capital is likely to move to the periphery and other regions with lower capital costs. Taking place simultaneously with knowledge spill-over effects, it might enhance the reallocation of productive

⁴ Marrocu, E. et. Al. (2009): Intangible assets and firm productivity. Accessed at: <http://crenos.unica.it/crenos/en/content/intangible-capital-and-firms-productivity> (02.07.2011)

⁵ Agrighetti, A. et Al. (2011): The determinants of intangible assets in manufacturing firms: Evidence from Italy. Accessed at: http://www.fabiolandini.altervista.org/paper_ALL1.pdf (02.07.2011)

⁶ Artis, M. et Al. (2010): Does social capital reinforce technological inputs in the creation of knowledge? Evidence from the Spanish regions. Accessed at: http://www.iareg.org/fileadmin/iareg/media/papers/wp5-10_Miguel_Moreno_Artis.pdf (02.07.2011)

⁷ Marrocu, E. et. Al. (2009), *Ibd.*, p.15

⁸ Borner, S. et. Al. (2004): Institutional efficiency and its determinants. The role of political factors in economic growth. Accessed at: <http://browse.oecdbookshop.org/oecd/pdfs/free/4104011e.pdf> (02.07.2011)

⁹ International Monetary Fund (2003): World Economic Outlook, April 2003, Chapter 3. Accessed at: <http://www.imf.org/external/pubs/ft/weo/2003/01/> (02.07.2011)

¹⁰ Williamson, J. G. (1965): Regional inequality and the process of national development, in: Economic and Cultural Change 13 pp. 1-84

factors across sectors and regions, which leads to spatial convergence. Or put differently: economic development first increases and subsequently decreases primacy, which is the share of the largest city in the total urban population. By now, extensive empirical evidence supports the Williamson hypothesis, as major cross-country studies show.¹¹ Additionally, it provides a theoretical basis for regional policies, which favour the dispersion of industrial activity.

Succeeding studies found similar evidence for the Williamson hypothesis for the Mediterranean countries and the EU,¹² Eastern Europe, and China with different shapes of their respective Williamson curve.^{13 14} Finally, the comprehensive study of Brülhart finds that agglomeration boosts GDP growth up to only a level of 10.000 US-Dollar, with interregional equity losing relevance in more advanced stages of development and the cost of misguided agglomeration policies being highest among poorest countries.¹⁵

For more than 80-100 countries between 1960 and 1995, Henderson found a turning point towards decreasing the overall national growth of app. 5000 US-Dollar per capita income (at 1987 purchasing power parity), before it modestly declines.¹⁶ He also emphasizes the exceptional role of investments in inter-regional transport infrastructure for balancing economic concentration, with the effect rising with income.¹⁷ This is ever more relevant because growth losses from concentration tend to rise with income! Szörfi, however, finds similar bell shape pattern for the EU countries with regional disparities increasing until a country reaches an income level between 20.500 and 22.800 Euro per capita, depending on the respective model.¹⁸

However, what these studies rather neglect is whether agglomerations fulfil sustainability conditions. This is even more relevant because there might exist huge adaption costs to transform them towards sustainability. Energy efficiency, overuse of resources, waste, higher social density stress of the population, air and water pollution without sufficient buffer capacity are, for instance not usually included in production costs, as long as there is no mechanism to enforce the polluter pay principle and include the negative external effects into the price mechanism. It all starts with a change in consciousness (Bewusstseinswandel)¹⁹.

Summing up the evidence and combining it with the objective requirements for effective long-term regional development policies, an increasing number of countries started recently to strive for squaring sustainability, economic wellbeing and the political claim of leadership. This leads to the role and capacity of state agents in a multi-level governance system.

¹¹ Cerina, F. et. Al. (2009): Is Agglomeration really good for Growth? Global Efficiency and Interregional Equity. Accessed at: http://www.iareg.org/fileadmin/iareg/media/papers/wp5-15_Cerina_Mureddu_2.pdf (02.07.2011)

¹² Farahmand, S. et. Al. (2010): Does the development level influence the relationship between economic growth and urban concentration? (Evidences from Mediterranean Countries and EU). Accessed at: <http://gdri.dreem.free.fr/wp-content/b1-2sameti-urbanconcentration.pdf> (02.07.2011)

¹³ Gyuris, F. (2009): Dynamics of inter- and intraregional development disparities in time in China and in East Central Europe. Accessed at: http://geogr.elte.hu/ref/REF_Cikkek/GyurisFerenc/gyurisf_jiaxing_2009_eng.pdf (02.07.2011)

¹⁴ And specific for the Chinese case: Ohnishi, H. (2007): Forming Kuznets Curve among Chinese Provinces. Accessed at: http://www.jstage.jst.go.jp/article/ker/76/2/155/_pdf (02.07.2011)

¹⁵ Brülhart, M., et. Al. (2008): Agglomeration and growth: Cross-country evidence. Accessed at: <http://www.hec.unil.ch/mbrulhar/papers/agglrowth.pdf> (02.07.2011) and for the European Union: Szörfi, B. (2007): Development and Regional Disparities – Testing the Williamson Curve Hypothesis in the European Union, pp.100. Accessed at: http://www.oenb.at/en/img/feei_2007_2_tcm16-79078.pdf (02.07.2011)

¹⁶ Henderson, J. V. (2000): The effects of urban concentration on economic growth. Accessed at: <http://jpkc.ecnu.edu.cn/ggzcgj/shoukejiaoran/chengshiguihua/How Urban Concentration Affects Economic Growth.pdf> (02.07.2011)

¹⁷ Ibid., p.26

¹⁸ Szörfi, B. (2007), pp.111

¹⁹ Von Weizsäcker, C. F. (1991), Bewußtseinswandel. München

State capacity, responsiveness, and innovation

Because the form of human-made institutions and the attitude of the people constituting these institutions do not necessarily follow its desired function,²⁰ a review of state capacity and the respective effectiveness blocking factors is necessary. This refers to the distribution of budgets, decision-making powers, efficiency in the implementation of sustainable growth policies and their respective controlling by independent agents.

Interestingly enough, public administrative innovation is necessary to increase firm productivity. And because there is no one-size-fits-all, it is essential for policy effectiveness and, hence, for policy design to adapt to the local factor conditions, to emerge as an agent for growth. Therefore, administrative reform policy is economic policy, because it is a precondition for its effectiveness!

A core task for increasing state capacity especially on the subnational governance and governmental level is to develop the people who constitute these institutions. Hence, human resource management is vital for the success of the political goal to be achieved. Or put differently: because there is a competitive disadvantage of delayed and blocked reforms and missing innovations, the false HR-hiring- and management strategies and practices are a major risk to avoid. This appears to be a public administrative equivalent to the social capital argument in the knowledge production function, because it is rooted in a rather universal disposition of human behaviour and motivation. The goal to be responsive to citizens and other stakeholders while being ignorant to employees is hardly to be achieved convincingly. Recent studies confirm this view and stress the importance of the soft aspects as employee satisfaction and morale, which are considered to be the most important drivers of performance.²¹ Finally, all development strategies and respective policies, which presume smart public „learning organizations”,²² need first of all employees who are willing and able to learn and reflect, thereupon innovate and therefore increase effectiveness of public good provision.

Diversity in nature is not only useful to maintain survival of the fittest. In human terms, institutional diversity creates the experimental option space to cope in time with the fundamental uncertainty. This is even more relevant with more ecological processes have to be included into decision-making about the allocation of state capacity. The flexibilization of government to governance, where applicable, represents the advance in understanding and indicates higher responsiveness of the prevailing governmental system to innovate. And a true structural variety requires a sufficient degree of autonomy to be counted as a variety in a sense of Asby's law.²³

A federal system is a structural decision for variety. Functional and political decentralization to subnational governments is also a mechanism to increase effectiveness in the fit of public policies to local and regional preferences.²⁴ And as there is a „trilemma of federalism”,²⁵ there is also a variety of existing solutions. Overall, there is strong evidence for the efficiency thesis of federal

²⁰ Rodrik, D. et. Al. (2003): The primacy of institutions (what it does and what it does not mean), p. 33. Accessed at: <http://www.ppge.ufrgs.br/giacomo/arquivos/eco02237/rodrik-subramanian-2003.pdf> (02.07.2011)

²¹ Van Dooren, W. et. Al. (2008): Institutional drivers of efficiency in the public sector, p.20. Accessed at: <http://www.oecd.org/dataoecd/42/38/40305170.pdf> (01.07.2011).

²² Serrat, O. (2009): Building a learning Organization. Accessed at: <http://www.adb.org/Documents/Information/Knowledge-Solutions/Building-a-Learning-Organization.pdf> (02.07.2011)

²³ Asby, W.R. (1958): Requisite variety and its implications for the control of complex systems. Accessed at: <http://pespmc1.vub.ac.be/Books/AshbyReqVar.pdf> (03.07.2011)

²⁴ Van Dooren, W. et. Al. (2008), p.20

²⁵ The three parts of the „Trilemma of Federalism” are: 1) The principle of fiscal equivalence, which means the congruence between the territorial scope of government actions and their respective financing. 2) The principle of power-sharing between the federal level, and the sub-national entities regarding the decisions on fiscal issues. 3) The principle of equality of living conditions in each of the sub-national entities.

systems.²⁶ In particular the decoupling of original territorial organization from the provision of public goods as with FOCJ's appears promising.²⁷ However, a lively competition coupled with a strong unifying idea is possible, as Switzerland in particular shows. The balance of the Swiss federal and cantonal rights is accomplished by a shared vision of mutually respecting and protecting federalism. In general, the tax competition of the cantons appears to be not harmful for the economic performance of the cantons.²⁸ Furthermore, taxation power seems to be strongly correlated with tax morale, whereas tax morale is rather positively correlated with institutional quality.²⁹ That points to the need of „conditional cooperation” responsiveness in (public) institutions. „Conditionally cooperative responsiveness” constitutes therefore a goal for public administrative reform, since it creates generalized trust in the electorate and among tax payers and, therefore, increases tax revenues!

Policy challenges

Various pathways lead to regional growth, but the ecological ones are the most reliable, because they inhibit a frontrunner pricing power in a competitive environment. Therefore, the earlier the strategic turn happens in a region and the more effective its implementation is done in institutional terms, the sooner and more successful in economic terms will it turn out to be. Innovation-driven productivity gains provide the opportunity to reconcile ecological objectives with social and individual preferences. Only they make the institutional settings fitting, since they are self-referential in a social sense.

Since there is no unique pattern of sustainable growth in a „one-size-fits-all” way, long-term economic growth across all regions requires primarily an increased institutional fitness and responsiveness, which enables one to learn, innovate and live up to:

1. The challenge of integrating the idea and need of sustainability into public ethics and rules
2. The challenge of policy shift targeted at regional disparities towards releasing endogenous growth-drivers based on sufficient decentralization
3. The challenge of increasing state capacity by innovations in public administration across all vertical and horizontal levels towards more subsidiarity and accountability
4. The challenge of a requisite variety in developing governance systems to fit multi-scale settings if the bottom-up approach³⁰ is to be considered
5. The challenge to develop a systemic and reflexive approach with sufficient consistency in the eyes of all stakeholders

²⁶ Feld, L. (2005): Fiscal equivalence and the increasing dispersion / divergence of public goods claims – Do we need a new interpretation?, in: Färber, G.; Otter, N. (2005): Spation aspects of federative systems. Speyer. pp. 147

²⁷ FOCJ – Functional Overlapping Competing Jurisdictions. For further details about FOCJ's see: Frey, B.S. et. Al. (1996): To harmonise or to compete? That's not the question, in: Journal of Public Economics 60 (1996), pp. 335-349; Frey, B.S. (2005): Functional Overlapping Competing Jurisdictions: Redrawing the geographic borders of administration. Accessed at: http://www.bsfrey.ch/articles/436_05.pdf (03.07.2011)

²⁸ Feld, L. et. Al. (2004): Fiscal Federalism and Economic Performance: Evidence from Swiss Cantons. Accessed at: http://www.rzuser.uni-heidelberg.de/~bo3/informations/pdf/Feld_Federalism.pdf (03.07.2011)

²⁹ Frey, B.S. et. Al. (2007): Tax morale and conditional cooperation. Accessed at: http://www.bsfrey.ch/articles/453_07.pdf (03.07.2011)

³⁰ In this radio interview Nobel prize laureate 2009 Elinor Ostrom argues that people should be empowered to organize themselves in small ways that scale up to a global network. Government can be helpful in doing that, but people shouldn't rely on it alone. Accessed at: http://www.npr.org/blogs/money/2009/10/podcast_elinor_ostrom_checks_i.html (04.07.2011)