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Beyond Harmonization: ICT Policymaking in Regional Economic Communities

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Regional economic communities, which are growing in numbers and size, play an increasingly important role in information and communication technology (ICT) policymaking. As seen through the lens of complex adaptive systems theory, such systems should strive to generate adaptive policies through adaptive policymaking processes that position them to respond to rapid technological change. To date, however, regional policymaking has been overly concerned with policy harmonization as an outcome, possibly to the detriment of other important goals. Despite this bias, upon closer examination, one finds that regional communities do foster adaptivity through their roles in the formation of epistemic communities, capacity building, and resource pooling. These activities contribute to variation, interaction, and selection, all key processes for adaptation. It is this degree of adaptivity, and its required balance between policy harmonization and competition, that should be the basis for analyzing the effectiveness of regional policymaking.

Keywords complex adaptive systems, policy harmonization, regional economic communities, regional integration

In the multilevel and international system of policymaking (Hosein, 2004), regional economic communities such as the European Union are playing an increasingly important role in information and communication technology (ICT) regulatory policymaking. This importance derives, in part, from their growth in numbers and size, as well as increases in their general policymaking activities: Already in 2000 there were an estimated 50 regional economic communities, and many of these regions have seen their membership numbers grow (Alesina, Angeloni, & Schuknecht, 2005; Hooghe & Marks, 2001; Van Gorp & Maitland, 2008).

Frequently, regional economic communities pursue economic integration through policy harmonization, which can be seen as both a process and an outcome. Particularly in the ICT realm, regions explicitly focus on harmonizing telecommunications policies across their member states, through the development of regional model policies that member states can or must use to develop their own national policies. However, harmonization has been difficult to achieve and here, building on research in political science (see, e.g., Majone, 2005; Levi-Faur, 2004), it is argued that integration does not necessarily require harmonization, and further that an overemphasis on harmonization as an outcome may limit adaptivity. The highly dynamic ICT sector necessitates adaptive policymaking in order to adjust to changing market conditions and to anticipate technological change (Bauer, 2004; Cherry, 2007). Adaptive regional policymaking systems can generate innovative policies that are regionally optimal, rather than favoring one member state over others, and are robust to the dynamic nature of the ICT sector.

The need to revisit the goals of regional policymaking is apparent when viewed through the lens of complex adaptive systems theory (Axelrod & Cohen, 2000). Drawing on this theory, we identify processes required for system adaptivity that have particular relevance for regional policymaking, namely, variation, interaction, and selection.

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The question then remains as to whether or not, despite the bias toward harmonized policies, these processes that support adaptivity can be found in regional policymaking activities.

To this end, we analyze selected activities common to ICT policymakers across two regions, namely, the European Union (EU) and the Southern African Development Community (SADC). Using data gathered from both in-person interviews and secondary sources, the analysis focuses on the formation of epistemic communities (Haas, 1992), capacity building and resource pooling. We find that despite the bias toward harmonization, regions undertaking these activities do provide support for adaptive policymaking processes. Consequently, a greater emphasis on these activities, among others, that are already underway will enable greater adaptivity, which we argue is a more appropriate measure of a region's policymaking effectiveness as compared with the level of policy harmonization achieved.

The findings of this study provide a basis for further intra- and interregional ICT policymaking research and may also be of interest to regional scholars in political science (see, e.g., Farrell, 2005; Fuchs, 1994; Humphreys & Simpson, 2005; Majone, 2005), as well those studying other regulated industries (see, e.g., Heine & Kerber, 2002; Van der Laan & Nentjes, 2001). Also, by providing examples from multiple regions, this research contributes to the nascent comparative regional literature (see, e.g., Acharya, 2006; Farrell, 2005; McCormick, 2005). Finally, by suggesting alternate measures for regional policymaking effectiveness it may influence the perceptions of regional stakeholders, and in lower income regions these may include the donors that provide their resources.

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REGIONAL COMMUNITIES, INTEGRATION, AND HARMONIZATION

Regional economic communities such as the European Union (EU), the Southern African Development Community (SADC), and the Association of South East Asian Nations (ASEAN) have experienced significant growth over the past three decades (Van Gorp & Maitland, 2009b). While not all regional communities have been successful (Farrell, 2005), those that are have experienced growth in numbers and size due to a variety of factors, including the need for geographically proximate countries to work together in response to pressures of globalization (Hurrell, 2005). This growth has also been explained as a strategic response to perceived interregional competition, such as between the member states of the North American Free Trade Agreement (NAFTA) and the EU (Hooghe & Marks, 2001; Terada, 2006). As a result, regional communities are playing a significant role in many policymaking domains, such as security, trade, transport, and telecommunications, and in particular in the domain of regulatory policy (Majone, 1994, 1996).

The multilateral nature of regional policymaking, in which multiple national contexts must be taken into account, creates an additional requirement for adaptive policymaking processes. In general, adaptive policymaking is a process that dynamically adjusts to changing conditions or anticipates change and is thus robust to it. While this may generate improved outcomes, particularly in dynamic conditions, as discussed in greater detail in the third section of this article, negative unintended consequences may also result. Despite the risks of unintended consequences, policymaking systems must adapt to changing market conditions, and together, the policymaking system and the market are coevolving systems (Cherry, 2007; Cherry & Bauer, 2004). In the regional context, adaptive ICT policymaking, which is highly influenced by regional governance, must adjust to and hence co-evolve with technological change as well as divergent and changing national political and market contexts.

Within the multilateral regional system, adaptive policymaking must contend with a variety of factors, one of which is the competing forces of divergence and convergence. In these systems, convergence emanates from purposive action arising from the broader goal of economic integration. However, competing interests of a wide range of regional constituents (national, subnational, etc.) have the potential to lead to divergence. The clash of these forces creates challenges for policy harmonization, which economic communities often indicate to be their primary goal (see, e.g., Van Gorp, 2008). This suggests new approaches to harmonization may be required, as discussed next.

Divergence

While regions differ on a variety of economic factors, including cumulative gross domestic product (GDP) and intraregional income disparity (Van Gorp & Maitland, 2009b), at a high level, ICT policymaking structures are somewhat similar. These universal structures typically include a general policymaking entity, within which a sector-specific committee addresses issues related to ICTs. Additionally, a separate entity, typically a regulators' association, serves as the regional equivalent of national autonomous regulators, albeit with diminished powers. In the European Union, for instance, this structure is reflected in the umbrella policymaking entity of the European Commission, within which resides the directorate-general for Information Society and Media that in turn works closely with the quasi-independent European Regulator's Group. Similar structures can be found in SADC, ASEAN, and the Asia-Pacific Economic Cooperation (APEC) forum, among others (Saga, 1999; Van Gorp, 2008).

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These structures are part of a system of multilevel governance (Hooghe & Marks, 2001) that must contend with competing interests on many levels. Primary among them is the conflict between regional and national authority (Farrell, 2005; Majone, 1996). In the EU, the balance of authority in ICT policymaking generally favors supranational over national governance (Levi-Faur, 2004), with broadcasting being a possible exception (Humphreys & Padgett, 2006). For member states this balance means the region can be coercive but it can also legitimize actions that are unpopular among constituents at the national level (Thatcher, 2002). This occurred, for example, during the early years of telecommunications market liberalization in Europe, where the European Commission combined coercion and negotiation to overcome national level opposition to reform by incumbent network operators (Humphreys & Padgett, 2006). Thus, regional policymaking must contend not only with national governments, but also with subnational governments and interest groups, as well as other regional institutions, transnational and international interest groups, and international counterparts such as the World Trade Organization (WTO) (Fuchs, 1994). Examples of competing interests in regional ICT policymaking can be found worldwide, including in the Caribbean regional community (CARICOM) (Lodge & Stirton, 2006), as well as the East African and Southern African Development Communities (EAC and SADC, respectively) (Van Gorp & Maitland, 2009a; Van Gorp, 2008).

Convergence

While regional policymaking must contend with multiple levels of interests, the force of economic integration (Lloyd, 2005) attempts to steer these interests toward a common regional solution. This solution represents a collective response to, and possibly protection against, broader global economic integration (Grieco & Ikenberry, 2002). Between regions these solutions, or governance mechanisms, vary, as do their levels of integration (Lawrence, 1996), thereby influencing both policymaking processes and what are considered legitimate outcomes of these processes. In highly integrated regions, legitimate outcomes are often limited to policy harmonization. However, a more nuanced view of integration suggests that policy harmonization, with its costs as well as benefits, may not always be required.

Policy Harmonization Policy harmonization is both an outcome and a process and in both forms has associated benefits and costs for the region as well as its member states. As an outcome, the benefits of economic integration and, by association, policy harmonization are discussed widely in the popular globalization discourse (see, e.g., Friedman, 1999; Wolf, 2004). They include reducing uncertainty to generate increased investment by multinational firms through the creation of similar market conditions and predictable policy environments across member states. With common rules, firms are more likely to pursue regional rather than merely national service strategies, resulting in higher numbers of service providers in many markets. Further, the requirement for member states to maintain similar policies thwarts their attempts to attract investment through tax advantages, subsidies, and special treatment. Freed from the lure of pursuing these advantages, firms are more likely to compete regionally on price and service quality. Additionally, regionally harmonized policies may also serve as a competitive advantage vis-à-vis other regions.

As an outcome, the costs of policy harmonization are discussed less often; however, an exception is found in debates of the merits of policy harmonization versus competition that originated in analyses of policy competition among the states in the Unite States (see, e.g., Esty, 2000; Sykes, 2000). This debate has been taken up by some European scholars (see, e.g., Baldwin & Cave, 1999; Heine & Kerber, 2002; Hosein, 2004).

Harmonized policies ideally generate similar market conditions across member states and in doing so may incur two costs. First, a regulatory policy that is optimal for multiple member states may simply not exist, thereby forcing region-wide adoption of a policy that favors one member state over others. Second, homogeneous legal environments leave no alternative venues in cases where regulatory capture and rent-seeking occur (Sykes, 2000). For example, in a region in which member states' policies differ, a regional firm can choose to operate in those states with policies favorable to new entrants. Such policies may be politically unfeasible across the region as a whole and in a strictly harmonized regime may simply not be adopted.

As a process, policy harmonization is achieved through purposive action undertaken by coordinating bodies often involving several rounds of negotiations. This is, however, only one means by which similar policies emerge. Policy diffusion and convergence (Seeliger, 1996) may occur through industry pressure, national strategic behaviors, or sometimes even happenstance (see, e.g., Hosein, 2004; Suda, 2005). Further, convergence of policies may result from member states' unilateral actions, often referred to as domestication, transfer, or emulation (see, e.g., Bennett, 1991; Dolowitz & Marsh, 2000; Simmons, Dobbin, & Garrett, 2006). While all of these policy transmission mechanisms are at play both within and beyond regional communities, and indeed can compete with the regional community for influence over policy processes and outcomes (see, e.g., Levi-Faur, 2004), here the focus is limited to that of regional policy harmonization as purposive action.

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The purposive action of policy harmonization has several benefits, including the following. First, the process can serve as a knowledge-sharing mechanism through which a deeper understanding of technical and economic issues results. This can be particularly important in regions where some national regulators are understaffed. Second, the process can help establish common goals, whether or not similar approaches are used to meet those goals. Third, if the harmonization process includes multilateral negotiation, it presents an opportunity to provide at least some benefit to each member state.

These benefits of the harmonization process are most apparent in an ideal process, with the costs incurred in less-than-ideal processes. Such is the case when during the harmonization process countries channel their efforts not to finding an innovative or optimal solution for the region, but instead to influence regional policymakers to adopt regulations favorable to their nation. Favorable policies are those that are either less costly for their country to adopt, because they are similar to established rules and more closely match current industrial practices, or those that require a practice in which the nation-state holds a competitive advantage (Heritier, 1996; Majone, 1996). Hence, while such actions may initially generate costs only for other member states, they eventually harm the entire region by calling into question its policymaking capabilities.

A second potential cost of the harmonization process is its role in reducing the potential for policy competition. Here policy competition is meant to signify deliberation and experimentation across all stages of the regional policymaking process. On one end, policy competition may simply be limited to the exchange of ideas for policy solutions that occurs during the policy selection process, and thus in some instances it may serve as a precursor to rapid policy harmonization. At the other end, policy competition may indeed require full implementation in selected member states, to enable observation of the actual performance outcomes. This latter interpretation, one discussed by Baldwin and Cave (1999), is likely to slow policy harmonization, if indeed it ever results.

In addition to incurring these costs, policy harmonization is difficult to achieve. While most discussions of policy harmonization focus on outcomes, the difficulty in achieving these outcomes causes attention to be shifted, as is the case throughout the remainder of this article, primarily to the process. Successful harmonization processes are most likely to be found in highly integrated regions such as the EU, which for instance has been able to harmonize policy in international roaming and in some aspects of 3G spectrum licensing. Nevertheless, many failures are found in the EU as well (see, e.g., Carlberg, 2001; Nemec, Sagat, & Leos, 2004). These failures result in part from the process of transposition, which is meant to take into account the diversity in member states' legal systems, but results in rules of a similar genre but that are quite diverse in their details (Heritier, 1996; Jordana, 2002). Indeed, the importance of the process is exemplified in the latest European Commission report on the state of the single European electronic communications market, which states:

> The regulatory framework currently allows a great deal of latitude as to the exact rules to be put in place and in the way in which they are actually applied. The result is that the regulatory environment is frequently based on inconsistent approaches which greatly hinder the realisation of a real single market across the Union and the economic benefits flowing from it. (European Commission, 2008)

In other regions where economic integration is less vigorously pursued, attempts to fully harmonize policies are seldom made. More commonly efforts are made to establish similar goals resulting in so-called "model policy guidelines," as found in SADC and APEC (see, e.g., Saga, 1999; Van Gorp, 2008).,

Thus, as the process of policy harmonization incurs costs along with its benefits, and as an outcome is difficult to achieve, it may seem odd that regional telecommunications regulators' associations continue to view the outcome of policy harmonization as such an important, if not primary, goal. For example, statements on the web sites of the Communication Regulators Association of Southern Africa (CRASA) and the European Regulators Group (ERG) describe their missions, respectively, as "Our Vision is to become a model regulatory association through the design and implementation of harmonised regulation and policies," and "to seek to achieve consistent application, in all Member States, of the provisions set out in the Directives of the new regulatory framework." Further, in order to do so, the ERG seeks as one of its three main tasks "to identify appropriate regulatory instruments which promote greater harmonisation in the application of Framework" (ERG, 2007, p. 3). While we can only speculate as to why regulators have chosen these goals, an examination of policy harmonization's association with economic integration may shed light on the issue.

Positive, Negative, and Differentiated Integration

Within a region the process of economic integration aims to establish a similar market context across member states. While it is frequently presumed that similar market conditions can only result from the process and outcome of policy harmonization, this is not necessarily the case. The extent to which policy harmonization is required for economic integration depends on the type of integration that occurs. So-called positive, negative, and differentiated integration types can be defined by their processes, in particular by both the mechanism through which a common approach is established as well as the degree of consensus

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(Majone, 2005). In *positive* integration a region seeks to establish a common market through the process of policy harmonization. Conversely, in *negative* integration similar market conditions are achieved simply by removing the government's role in resolving a particular issue, and, for example, relying instead on market mechanisms or industry self-regulation, as has occurred in some segments of the telecommunications sector. In *differentiated* integration, subgroups within the region can move forward on integration through either positive or negative approaches, while others can opt out. The possible forms of integration are defined by regional governance, which varies across regions and over time.

Further, these integration types are largely ex post descriptions of processes that arise due to a variety of factors. These factors, which include, among others, changing regional contexts and industry pressure, influence which integration process is feasible in a given context. For example, deregulation or the use of industry self-regulation may be the result of many factors, including industry lobbying, an inability to regulate in a complex environment, etc. However, if carried out in a coordinated manner by member states, the resulting deregulation gives rise to higher levels of integration through negative integration processes.

Such a changing regional context can be observed in the EU, where the increasing number of member states has changed the nature of integration and policymaking processes. With a greater number of member states making positive integration more challenging, negative integration and new forms of governance such as the Open Method of Coordination (OMC) are on the rise. The OMC exemplifies a shift from required coordination and centralized decision making to a governance regime with increased flexibility, nonbinding coordination, benchmarking, and policy learning (Majone, 2005; Peterson & Shackleton, 2006; Tulmets, 2005).

This change is notable as in the early days of the EU such informal means of coordination were considered heresy (although some argue they existed all along; e.g., Levi-Faur, 2004). Also, it has been argued that the EU's previous bias toward positive integration and policy harmonization was actually motivated by a latent federalist bias and those seeking more power for the regional versus national government, as opposed to the needs of the integrated market (Majone, 2005). In contrast, regions such as ASEAN have always been governed in ways that predispose member states toward differentiated integration (Acharya, 2006).

Hence, doubt has arisen about the need for and consequently the value of policy harmonization, particularly as a prerequisite for integration. Instead, the differing processes of integration suggest that greater attention to the overall process of regional policymaking, of which the policy harmonization process is just one component. This increased emphasis on process occurs at a time in which the EU appears to be pursuing positive integration less vigorously, bringing it into greater alignment with approaches taken by other regions. This trend suggests that knowledge generated about regional policymaking processes in any one region may have wider implications and greater opportunities for learning between regions may emerge.

Thus, to date regional policymakers have served primarily as agents of integration, pursuing the process and outcome of policy harmonization to a greater or lesser extent. These efforts are carried out in complex systems of multilevel governance through which multiple interests compete for dominance. Within the highly innovative and dynamic ICT sector, the complexity of this system, coupled with the lack of balance in attention to both the benefits and costs of the harmonization process, suggests that new approaches to understanding regional policymaking are required. One approach that can overcome these challenges is that of complex adaptive systems (CAS) theory. As will be discussed in the following section, complex adaptive systems theory provides a way of thinking in which the "inherent virtue of harmony, efficiency, and hierarchical lines of authority are questioned" (Axelrod & Cohen, 2000, p. 29).

REGIONAL POLICYMAKING AS A COMPLEX ADAPTIVE SYSTEM

The literature on complex adaptive systems, with its primary roots in evolutionary biology and the scholarship of the Sante Fe Institute (see, e.g., Casti, 1994; Kauffman 1993, 1995), is developing rapidly in a number of fields. Given the vastness of this literature, instead of a comprehensive overview, here the discussion is derived primarily from extant work in the fields of organization science, public policy, and telecommunications. First a brief general overview of fundamental concepts is provided, followed by a focused discussion of concepts with particular relevance for regional policymaking.

CAS Fundamentals

Complex systems are primarily characterized by frequent interactions between a variety of system participants or agents at different levels of centralization (Casti, 1994). Hence, agents in complex systems may exist in highly centralized parts of the system as well as in decentralized and nested subsystem parts. The behavior of such systems may be determined by an overarching entity within the system or a controlling subsystem that specifies the system's collective behavior. Alternatively, in their absence, system behavior may be determined by aggregation of the actions of individual agents. Systems in this latter condition are

called *self-organizing*. This self-organization helps establish order, which is considered an emergent property of the system that is derived from the manner in which lower level behaviors are aggregated (Kauffman, 1993).

Self-organization is seen as a key to adaptivity, particularly as it enables complex systems to coevolve with their environment. This coevolution, similar to self-organization, results from the aggregation of adjustments to the environment made by individual system participants or agents, rather than a uniformly implemented system-wide reaction. However, aggregated reactions do not always generate adaptivity, and may instead generate a fixed state or chaos. When the aggregated adjustments generate change and bring the system only to the "edge of chaos," rather than plunging it into chaos and disorder, the system is considered *adaptive*. It is argued that the systems that can achieve this balance between order and chaos, and hence are adaptive, are favored in biological processes of natural selection (Kauffman, 1993).

The patterns of interactions between agents within a system also have implications for its dynamic behavior. In particular, the variety of ways in which agents are interconnected results in a variety of responses to changes in initial conditions. Consequently, in adaptive systems small changes in initial conditions can generate a range of possible consequences throughout the system from small to large. This can be contrasted with chaotic systems, where small changes in initial conditions frequently cause large changes in outcomes (Anderson, 1999). Furthermore, this variance in the dynamic nature of complex adaptive systems has implications for the system's performance, which is assessed by its "fit" with its environment. In particular, the wider range of possible consequences, from small to large, enables adaptive systems to establish a better fit to their changing environment (Kauffman, 1993).

It should be noted that while achieving a better fit is possible, it does not always occur. Adaptation may save a system from a fixed or chaotic state, but in doing so it may move a system to a less optimal solution, thereby reducing its fit and harming system performance. Further, even when adaptation moves a system forward in terms of performance, it may not achieve a fit that is optimal system-wide. Consequently, while adaptation is generally considered a positive attribute of a system, it is necessary to recognize that it can generate both positive and negative outcomes, acting as a double-edged sword (Axelrod & Cohen, 2000).

These general concepts of complex adaptive systems (CAS) theory provide many advantages for its application to research on regional policymaking. Similar to its advantages for organization science (e.g., Anderson, 1999), CAS provides a framework for regional policymaking research that places emphasis on the interactions between agents and is inherently a multilevel theory. These characteristics differentiate CAS from other dynamic systems theories such as cybernetics, general systems theory, chaos theory, and catastrophe theory (Anderson, 1999). Also, while its multilevel, multi-actor nature is similar to that found in public policy theories such as multilevel governance (Hooghe & Marks, 2001) and policy networks (Marsh & Rhodes, 1992; Rhodes, 2003), CAS more strongly emphasizes policymaking's dynamic nature. Ideally, CAS can serve as complement to these public policy theories and possibly by integrating both formal and informal multilevel structures can serve as an integrating mechanism. Finally, as regards regional policymaking, with its pro-harmonization bias, CAS more directly emphasizes the importance of balance between heterogeneity and homogeneity, thereby increasing its potential to generate new insights, as discussed next.

Variation, Interaction, and Selection

In general, complex adaptive systems theory can aid analyses of what are widely recognized as complex policymaking processes (Kingdon, 1984). To date its application in the telecommunication policy field has been used to advocate for policies that are adaptive to the dynamic and emergent character of both telecommunications markets and technologies, as well as to lend insight into the policymaking process (Bauer, 2004; Cherry, 2004, 2007). In particular, it is argued that policies should be "dynamically sustainable," robust to changes both internal and external to the policymaking system. Internal changes include the complex and adaptive nature of the legal system, which in turn requires that policymaking and market systems be viewed as co-evolving systems. External changes include technological change endemic to the sector, such as the convergence that has blurred the traditional distinctions between telephony and media services. These adaptive policies are most likely to be generated through adaptive regulatory policymaking systems, which Bauer (2004) describes as "an experimental, dynamic trial and error process."

Building on these analyses, and focusing primarily on adaptive policymaking processes, here we seek to further delineate the necessary mechanisms for such processes. Of particular relevance are the three system processes through which adaptivity is achieved, namely, (1) variation, (2) interaction, and (3) selection (Axelrod & Cohen, 2000). As discussed earlier, the different ways in which agents are interconnected in a system have implications for its adaptivity and performance. Systems that are homogeneous, in either their components or the strategies they generate, are limited in the range of solutions they can employ to respond to change. Yet a system with a complete absence of homogeneity may be too chaotic to function effectively. Hence in order to be adaptive, systems must achieve the

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appropriate balance of variety and uniformity, and further must provide assessments of which variations are beneficial for performance (Axelrod & Cohen, 2000).

The assessment occurs through processes of exploration and exploitation. In exploration a system generates innovative strategies that help it evolve. In exploitation the system copies for itself strategies found to be successful within the system. In this way the system achieves stability through the replication of successful strategies, while at the same time promoting adaptation.

The concept of variation is useful for examining the trade-offs between the processes of policy harmonization and competition, particularly the concepts of eternal boiling and premature convergence (Axelrod & Cohen, 2000). These are, respectively, two extremes of the exploration and exploitation processes. When eternal boiling occurs good ideas are not allowed to solidify, creating in a sense excessive exploration. For policymaking eternal boiling would be the equivalent of a continuous policy competition, where new policies are continually considered and none is chosen or implemented. Conversely, premature convergence occurs when speedy imitation of an initial success cuts off future system improvements. In policymaking this might occur, for example, when the process of harmonization succeeds but not through careful deliberation but instead from quick decisions and implementation of a suboptimal policy.

Recent studies of the EU have begun to analyze the mechanisms through which these trade-offs between exploration and exploitation, or harmonization and competition, occur. For example, Benz (2007) describes the EU Open Method of Coordination as enabling both policy deliberation, as a process of harmonization, and competition. While he finds that policy competition is seldom used, the fact that it is identified as a mechanism within the OMC may increase the likelihood of its use in the future.

The second critical system process for adaptation is interaction. While the importance of interaction was discussed earlier, here the specific characteristics of interaction that determine the level of variation are discussed. In particular, interaction patterns can be described by proximity, activation, and space. In a system, actors' interaction patterns are influenced by proximity, with closer actors more likely to interact. However, proximity also can be represented by other factors such as social networks or class. Also important to establishing interaction patterns is activation, or the factors that determine when actors interact. Examples of activation factors include budget cycles or collective actions that make proximate people likely to engage in an activity together. Finally, interaction patterns will also be influenced by space, including time. Clearly, interaction will be dependent on physical location, but will also be dependent on the time during which a location is occupied. People working collaboratively across time zones understand well the implications that, for example, "office hours" have for the interactions with teammates.

Interaction processes are critical to regional policymaking in numerous ways. As described by the model of multilevel governance, regional policymaking requires numerous interactions. As observed by Axelrod and Cohen (2000), the diffuseness of these interactions may be important to achieving balance between exploration and exploitation. Following this logic, in the policy realm achieving a balance between policy competition and harmonization will depend on the extent to which all multilevel governing forces are engaged in the policymaking process. Indeed, as noted by Benz (2007), the development of the policy competition mechanism within Europe will require greater involvement of lower levels (e.g., subnational and regional) of government. Also, the temporal component of interaction is critical when analyzing policy harmonization. If, for example, interactions between some countries go forward while others are delayed, learning and subsequent adoption of policies may also be delayed but may eventually occur. Hence analyses of policy harmonization must occur over time (Seeliger, 1996).

The final system process is that of selection, a higher order process through which choices are made between variations to be copied or destroyed. While in biological systems this choice is made through the process of "natural selection," in complex policy systems more directed—and faster—forms of selection are employed. The processes of selection in policymaking systems are geared to selecting the policies, or in the parlance of Axelrod and Cohen the *strategies*, proposed by organizations. Systems of selection should take into account several issues, among which are the criteria of success. Here we argue that selection criteria need to be well defined, and recognize that harmonization is just one of many goals that member states have for both their policies and their policymaking processes. Thus, to be adaptive, regional policymaking processes need to balance mechanisms that foster both harmonization and competition, facilitate interaction, and promote effective selection processes.

Building on these ideas, regional policymaking bodies can be seen as complex adaptive systems that exist within the broader information and communication technology services ecosystem. In this ecosystem, subsystems of regional and national policymakers, firms, lobbyists, and consumers, among others, co-evolve (Kauffman, 1993, 1995). In order to adapt to changes in these tightly coupled subsystems, each subsystem must maintain its "adaptivity."

In regional policymaking these mechanisms for adaptivity will in part be determined by regional policymaking governance. In the regional realm such governance must specify mechanisms designed to explicitly manage conflicts between member states, taking into account

economic and power differentials. Further, adaptivity requires that governance mechanisms also explicitly consider technological change and the dynamic nature of market structures in the policymaking process. Yet at the same time regional governance must afford some level of stability, by replicating carefully selected successful strategies in the process of policy harmonization.

To date, in the domain of regional ICT policymaking the failure to achieve harmonization suggests that, intentionally or not, some degree of balance has been achieved. The question remains, however, as to the extent that regional policymaking systems foster adaptivity in general. In the following section we provide evidence of adaptivity-fostering activities undertaken by regional policymakers. In particular, we describe how these activities contribute to the generation of variation, interaction, and selection processes, all critical processes for an adaptive system.

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ACTIVITIES OF REGIONAL POLICYMAKERS

Similar to other policymaking forums, the process of regional policymaking consists of a wide range of activities including, but not limited to, meeting with stakeholders, studying policy proposals, keeping current on relevant technical knowledge, meeting together with fellow policymakers, benchmarking, identification and sharing of best practices, and interregional cooperation. Here we describe three activities that are common to the European Union (EU) and Southern African Development Community (SADC), and are likely undertaken across a variety of regions. Data were collected from primary and secondary sources. Primary sources include face-to-face interviews with policymakers and regulators in the SADC region in 2006. Secondary sources include reports, policies, and regulations collected from policymakers and regulators, as well as information from organizational web sites, collected between 2006 and 2008.

Data indicate that three related activities are inherent to the coordinating role of regional policymakers, and contribute to adaptivity: (1) the formation of epistemic communities, (2) capacity building, and (3) resource and demand pooling. It is noteworthy that these activities are rarely recognized, particularly in popular notions of what regional policymakers achieve. Nevertheless, they arguably constitute valuable benefits to membership in and of themselves, and furthermore potentially have a role to play in harmonization.

The Formation of Epistemic Communities

In the domain of policymaking, epistemic communities are defined as networks of professionals with recognized expertise that make an authoritative claim to policy-relevant knowledge within a particular domain or issue area (Majone, 1996). Therefore, the knowledge base of an epistemic community frequently serves as the basic assumptions upon which policy positions are formulated, by defining the cognitive framework through which market participants, policymakers and politicians operate. For example, Cowhey (1990) partly attributes the change from the "natural monopoly" regime to the liberalized market regime to a change in epistemic community. Nevertheless, while important to the policymaking process, epistemic communities' influence is limited as they cannot always overcome the forces of power, politics and implementation constraints (Haas, 1992; Majone, 1996). In regional policymaking two types of epistemic communities form: one external and the other internal, with each contributing to adaptivity. Within these two types of epistemic communities, many separate communities exist.

External epistemic communities have their central node in the offices of the regional administration responsible for the issue. This regional administration is surrounded by a vast "issue network" of experts from the national administrations, independent experts, academics, public interest advocates, consumer groups, and economic and professional organizations. In the EU, policymaking issues are shaped in part by the 800 nonprofit organizations and roughly 350 "EU affairs" offices of large firms located in Brussels (Mazey & Richardson, 2003).

In the telecommunications realm, regional policymakers not only interact with epistemic communities but have also played a significant role in their development. For example, in the case of the European ISDN User Forum (EIUF) the European Commission covered administrative expenses which enabled free membership, and in the case of the Information Technology User Group (INTUG) and the European Communications Technology User Association (ECTUA), the groups help the European Commission by supporting desired policy positions and serving as a buffer between the European Commission and powerful national actors (e.g., telecom operators) (Fuchs, 1994). Similarly, in SADC, the Southern Africa Telecommunications Association (SATA) was created under a SADC protocol. There, SATA brings together operators from the region to make recommendations to both SADC itself as well as the Communications Regulators' Association of Southern Africa (CRASA).

While epistemic communities are usually referred to as "external" groups that try to influence policymakers, regional communities also engage in creating epistemic communities among policymakers internally. To carry out coordinated policymaking, the group of disparate national administrators that are assigned the task of being the "regional representative" by their home country need to form their own vision of the "dominant paradigm" for policymaking. Unlike their external epistemic community counterparts, the internal epistemic community is not focused

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exclusively on one "issue area" but instead spans a range of issues. The need for such groups is particularly pressing in regulatory policymaking, where national regulators face common regulatory policymaking and enforcement issues. Participation in the regional body allows national representatives to work collectively to define positions prior to facing national actors.

Three examples of such communities are the two telecommunications regulators' groups of the European Union and a similar organization associated with SADC. The two European groups—the European Regulators' Group and the Independent Regulators Group (ERG and IRG, respectively)—are differentiated by their relationship to the European Commission. The first is a formal body of the European Commission, which helps the commission understand national regulatory constraints arising from regional policies. The second is an independent group in which national regulators get together to share knowledge and establish strategies, particularly when their collective position differs from that of the commission.[1] While these organizations' primary activities are coordinating policy implementation among the national regulators, in the process they develop shared approaches and understandings, which become the basic assumptions through which their policy and regulation implementations are undertaken.

In SADC, the Communications Regulators Association of Southern Africa (CRASA) is similar to the two European groups (ERG and IRG) and actually falls in between these two in terms of its relationship with the regional body. While it is a formal body of the regional community, it has a greater level of independence than the ERG (Van Gorp & Maitland, 2009b). The epistemic quality of CRASA is reflected in its annual report (see CRASA, 2006). In the report, CRASA reports on its name change in which it substituted the broader term of *Communications* for *Telecommunications,* by which TRASA became CRASA. This move reflected the convergence occurring in the communications sector, as well as changes in regulatory structures in some of its members. In this sense the internal epistemic community of this region is establishing the underlying assumptions of regional policymaking by reflecting market realities into the policymaking realm.

Thus, in both regions the functions of the internal and external epistemic communities contribute to adaptivity in three ways: First, by bringing new ideas both from outside the policymaking realm (in the case of the external communities) and from the various member states (in the internal communities), the formation and nurturing of epistemic communities promote variety within the regional policymaking process. Second, by engaging with diverse groups (businesses, nonprofit organizations, consumer groups, etc.), the degree of interaction in the policymaking process is enhanced. Third, the epistemic communities, by defining a commonly accepted "state of current knowledge," can facilitate selection and potentially policy harmonization.

Knowledge Sharing and Capacity Building

Partially as the result of interactions within epistemic communities, in regional policymaking deliberation and negotiation processes result in knowledge sharing (Sebenius, 1992). While the often informal means of knowledge sharing are important vehicles for the transfer of information, explicit mechanisms can be established as well. Such mechanisms are important means to develop skills of regulatory staff, and constitute an important means to establish or increase the credibility of regulatory authorities (Goulden, 2005; Schware, 2003). These explicit mechanisms, often referred to as capacity-building programs, are particularly important for leveling the regulatory capacity of new members in expanding regions such as the EU or for many member states in lower income regions. Regions facilitate capacity building through knowledge transfer among large and small member states during the development of regional policies, through bilateral linkages established within the regional community, and through formal multilateral capacity-building programs. Each of these mechanisms, which foster adaptivity, is discussed in turn.

First, as part of a region's activities to develop regional policies, deliberation processes lead to capacity building through knowledge transfer. National-level policymakers and regulators that together make up a region are a heterogeneous group, whose national organizations vary in size and capacity. Wealthier countries with larger policymaking and regulatory staffs typically come to the regional realm with a broader and deeper knowledge base, and hence are sometimes thought of as transferring their knowledge and experiences to their smaller counterparts. Nevertheless, smaller countries may have expertise to share as well. For example, in SADC knowledge is exchanged between extremely diverse countries: SADC's wealthiest member, South Africa, has a GDP per capita about 20 times as large as SADC's poorest member, Malawi (Van Gorp, 2008). This variety of wealth is frequently reflected in the degree of resources available to national regulators. Particularly for those regulators with limited resources, they depend on regions for knowledge transfer and capacity building. For example, a manager at a South African telecom company finds that it is a "challenge as to how regulators could produce their own guidelines without outside help. People have good ideas, but their capability is just sometimes lacking. . . . Even the EU's regulators would not always be capable to do that. But with assistance of consultants they can do it. But the capacity problem is more prevalent in Africa than in other regions."

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Regulators indicate that they learn about specific regulatory areas from each other, even though their backgrounds may vary. Within the SADC region, knowledge sharing has, for example, been fruitful between the very different countries of Tanzania, South Africa, and Botswana. While the latter is a country with less than 2 million inhabitants and a regulator with about 70 staff, South Africa as the regional (and sub-Saharan) economic power, with a population of 45 million people, has a regulator that employs about 300 staff. Despite this disparity, South African regulatory staff suggest that they can learn from the governance model of Botswana. One former employee from the South African regulator (ICASA) notes: "Botswana has a very strong regulator . . . . It's a good model; a lot of regional regulation looks at it, because that's the standard. Whenever you have to ask somebody . . . . how it should be structured, then Botswana is the thing."[2] Even Tanzania, one of the poorest countries in the SADC region with a much smaller regulatory staff than found at ICASA, can be held up as model for particular areas of expertise. As a former ICASA employee remarks: "Tanzania has not only converged the regulator to be a communications regulator like we did in South Africa, but they've also gone further to structure the licensing regime in accordance with convergence. Which means therefore we would learn lessons from Tanzania in terms of challenges of convergence because they have gone further."[3]

The second mechanism of capacity building is through bilateral linkages. While often regional communities do not explicitly facilitate bilateral exchanges, the trust that is built between regulators and policymakers from various member states provides the foundation for informal bilateral knowledge sharing. In Europe these informal knowledge-sharing activities are described in the European Regulators' Group (ERG) documentation as well (IRG/ERG, 2006, p. 8): "In addition to the programmed work of ERG, ERG seeks to facilitate NRAs [National Regulatory Authorities] with experience of implementing the EU framework in assisting other members. This assistance can be informal or be organised through more formal mechanisms such as ad hoc conferences on specific issues, exchanging staff or assistance programmes. In most cases this is done on a bi-lateral basis." In SADC the region has played a role in developing both formal and informal bilateral relations. A manager at the Botswana regulator explains that the region has facilitated increased informal bilateral interactions: "We share ideas with other regulators through CRASA [the Communications Regulators' Association of Southern Africa] as part of the SADC region. Policies or guidelines may be of some use. If you have any issue you are free to consult other regulators. Of course the relationship comes from CRASA meetings. So it is a networking mechanism."[4] In addition, CRASA also played a formal role in enhancing bilateral relations. As indicated by a staff member at the Tanzanian regulator,[5] CRASA has played a vital role in establishing a peering program where staff members of different regulators in the SADC region visit each other.

The third mechanism of knowledge sharing and capacity building is formal multilateral capacity-building programs. More formal mechanisms of knowledge sharing may include tutorials provided by various members and technical subcommittees or even training programs. In particular, training programs that aim to develop policymaking and regulatory capacity are highly valued by member states. As telecommunications regulation requires highly specialized knowledge, it is unlikely that staff come to their positions with sufficient training. Training in everything from general topics such as law and policy to the highly specialized topics of interconnection and universal access are required. As policymaking coordinators regional communities can help provide this education.

Examples of formal capacity building programs can be found in both Europe and Southern Africa. In Europe training is particularly important for accession countries whose policymaking and regulatory staffs may be unfamiliar with practices adopted by older EU member states. Consequently, the IRG, in cooperation with the Directorate Generals (DGs) for Information Society and Enlargement of the European Commission, held training programs in Brussels, Prague, and Budapest in 2002. In Southern Africa, workshops and training are organized by CRASA on such topics as universal fund models, costs and tariffs, human resource development, and Internet policy (Van Gorp, 2008).

In fact, the emphasis placed on regulatory capacity building in the Southern African region is one likely difference to be found in comparisons between high- and low-income regions. For example, the Communications Regulators Association of Southern Africa (CRASA) in cooperation with overseas development agencies from the United States, the United Kingdom, and Sweden (USAID, DFID, and SIDA, respectively), among others, founded a training program called NetTel@Africa.[6] The training program, with the cooperation of national regulators and universities from across the southern African region as well as the United States, launched a program to provide online training, certificate, and degree programs in telecommunications policy.

These three mechanisms of knowledge transfer and capacity building foster adaptivity by contributing to variety in policies as well as interaction. First, as studies of policy competition have shown, it is unlikely that one policy is optimal for all jurisdictions. Hence, sharing of experiences between heterogeneous member states (here described as large and small, although other differentiators such as wealth can also apply) can both foster variation

and promote understanding of different national contexts, a form of interaction. Further, the bilateral exchanges can both foster variation or promote efficient selection processes through the copying of successful strategies or the destruction of unsuccessful ones. Finally, multilateral and formal mechanisms for knowledge sharing can contribute to the establishment of the "commonly accepted current state of knowledge" yet at the same time can foster variety by giving each national policymaking system the skills to craft policies that are optimized for their particular national circumstances. In particular, the skills may reduce their dependence on consultants' "boiler-plate" policy models that likely (unintentionally) foster regional policy harmonization but may not generate locally optimized outcomes.

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Resource and Demand Pooling

In low-income regions, hiring the consultants mentioned earlier to aid in the drafting of policies may be a luxury, one that is only affordable when other nations with similar needs are willing to pool funds and jointly contract for services. The need for such services arises in part from the high level of technical and administrative skills regulatory policy requires (Majone, 1994). Naturally, regions in their coordinating role can aid in the pooling of both resources and demand to fulfill knowledge requirements, which by requiring greater interaction, foster adaptivity

In the absence of the coordinating function of the regional community, each national administration would incur the expense of hiring a consultant to provide expertise. In some cases, resources might be unavailable and hence the knowledge is simply not obtained. In this case, the region can help provide the requisite knowledge by facilitating the pooling of fractional contributions to hire a consultant or by pooling demand, which may enable the region to raise donor funds for training. In the Southern African region a director at the Botswana regulator finds this resource pooling one of the valuable aspects of CRASA: "It is expensive to have a consultant, which you often need from the first world, and they charge in pounds or U.S. Dollars. Usually we get assistance with USAID, CTO, or some other donor agency. [Therefore,] as a country it becomes cheaper to adopt something through the region."[7] Similarly, in Europe the pooling of funds contributed by member states' national regulatory authorities (NRAs) makes possible full-time regional staff for the European Regulators' Group. This enables staff to carry out a variety of functions, including, among other things, generating benchmarking reports, arranging meetings, and facilitating interactions with a wide range of stakeholders.

Together with the epistemic community and knowledge-sharing activities, resource and demand pooling have implications for adaptivity. For example, resource and demand pooling can help provide the training and consultants that can expose national policymakers to new ideas, thereby enhancing variety. At the same time, however, by accessing these resources jointly, member states are likely to engage in the negotiation of differences up front at the time the resources are being consumed. For example, a consultant hired jointly to draft a policy will likely spur rounds of negotiation during the formulation of the draft, rather than facing these negotiations later at the policy implementation phase. In this way, processes of interaction and selection are fostered. Further, the staff that is funded through pooled resources can manage greater frequency of interaction with a variety of stakeholders and thereby bring new issues and ideas into the policymaking process.

Thus, through the activities of the formation of epistemic communities, capacity building, and resource pooling, regional policymakers support adaptivity by enhancing variation, interaction, and selection. In part, the three facilitate variation either by bringing new ideas into the policymaking process or by supporting the capacity of national policymakers to develop policies that are optimal for their circumstances. Epistemic communities, capacity building, and resource pooling facilitate interactions not only by increasing the frequency of interactions but also by increasing the diversity of types of participants to those interactions and also the types of interactions themselves (bilateral, multilateral, formal, and informal). Finally, the support for variation and interaction that those three activities provide, in turn, creates indirect benefits for selection processes. The increased knowledge and variety of solutions as well as interactions and opportunities for deliberation increase the chances that policy selection will generate informed and balanced outcomes.

It should also be noted that the three activities just discussed, by improving the knowledge base and capacity of national regulators and making more efficient use of limited funds, enable regional policymakers to contribute greater value not only to regional and national policymaking processes but also to individual and corporate tax payers. These benefits may not necessarily accrue through harmonized policies, but through a deep understanding of the technologies and issues at hand, and a harmonized understanding of fundamental regulatory principles, they may generate a more uniform and rational multinational regulatory environment.

COMPLEX AND ADAPTIVE REGIONAL POLICYMAKING

Viewing regional policymaking through the lens of complex adaptive systems theory suggests that these systems and their processes have the potential to be adaptive and thereby generate policies that are robust to the changing

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technological environment. From this perspective, policy harmonization is merely one process and one potential outcome. This is not to say that harmonization processes should be abandoned, only that they should be viewed as part of a broader selection process designed to promote a variety of innovative, adaptive and regionally optimal policy solutions. Further, with multiple paths to regional integration (positive, negative and differentiated), an exclusive emphasis on the harmonization process not only is unnecessary, but may in fact delay integration.

Regional policymaking systems can achieve adaptivity by designing their regulatory governance (Levy & Spiller, 1994) in a way that fosters variation, interaction, and selection. As the mentioned examples suggest, many regions already have the foundation for an adaptive policymaking system. What is required now is to recognize the value of these processes and analyze their effects on policymaking outcomes, both positive and negative. These analyses may in turn provide recommendations for organizational changes that can further foster adaptivity that generates positive outcomes.

In addition to its focus on adaptivity, an additional benefit of complex adaptive systems theory is that it promotes analyses that are inherently dynamic. Regional economic communities are constantly changing, adding and losing members, and revising their goals to contend with changing economic and political trends (see, e.g., Fligstein & Sweet, 2002). In these circumstances, the focus on emergence and evolution in complex adaptive systems theory, while not discussed in depth here, can provide a basis for understanding the dynamic process of regional policymaking.

From a more pragmatic perspective, the existence of a regional community should not be taken for granted, as is often the case in regionalization studies. Sustaining regional governance requires a policymaking system that both is adaptive and has popular support. Hence, in the long run a region's degree of adaptivity, and in particular the balance that is achieved between policy harmonization and competition, may be an appropriate criterion for judging the effectiveness of regional policymaking. Currently effectiveness is typically judged by whether policies are harmonized or not, a dichotomous choice that is typical when analyses are focused on outcomes rather than processes (Sebenius, 1992). Such a view of effectiveness may distort perceptions of the value regions bring to their member states. These perceptions of effectiveness are in turn crucial to decisions made by regional stakeholders. In low-income regions these stakeholders may include international donors upon which they rely to sustain their regional policymaking activities. Donors' perceptions of regional effectiveness are likely to influence the amount of resources they allocate to regional endeavors. It is thus crucial that these donors assess regional effectiveness not solely on the extent to which policy harmonization is achieved but instead on the extent to which processes foster adaptive policymaking.

Additionally, in seeking balance between policy harmonization and competition, regions need to develop variation, interaction, and selection processes in ways that expand participation. In the EU a lack of transparency exists in policymaking, possibly arising from the so-called democratic deficit (Heritier, 1996), and it is argued that fostering policy competition, which by its nature extends participation, may be one way to overcome this deficit (Benz, 2007). Nevertheless, other regions need to assess the transparency of their processes as well and foster greater participation, as similar critiques apply to CRASA in the SADC region. While facilitation of growth and diversity in epistemic communities is one mechanism, democratic mechanisms that enable wider participation in defining the agenda, not merely the possible solutions, may be required.

CONCLUSIONS

Regional policymakers are seen today primarily as agents of regional integration, put in place to generate consensus and foster policy harmonization. However, in order to promote the adaptivity necessary for the policies and policymaking processes in the highly dynamic ICT domain, regional policymakers should seek to strike a balance between their role as agents of integration and facilitators of adaptivity.

Policymaking is increasingly a multilevel process that includes subnational, national, intergovernmental, and supranational entities. At the regional level the process is tied to the broader goals of regional integration and policy harmonization, which has costs as well as benefits. Complex adaptive systems theory, through its strong emphasis on adaptivity, offers a dynamic approach to understanding regional policymaking. Activities currently under way by regional policymakers, namely, formation of epistemic communities, capacity building, and resource pooling, contribute to adaptivity of the policymaking system. Valuing these activities, whether or not they generate harmonized policies, is important and suggests that a process rather than outcome view of regional policymaking and harmonization is necessary. Particularly in developing regions, like SADC, but also increasingly in the EU, which is growing in membership size and intraregional income disparity, insights into these policy processes shed light on valuable membership benefits such as capacity building, which is key to the development of effective regulatory regimes and consequently competitive telecommunications markets.

This research makes a first step toward a general theory of regional ICT policymaking that can explain and predict

processes and outcomes. However, much work is left to be done. Three fruitful directions for future research include first developing a deeper understanding of the structural properties of regions that generate adaptivity through, for example, in-depth studies of ICT policymaking selection processes and the role of centralized versus decentralized decision making. Such studies might also further integrate insights from international policymaking studies (e.g., Hosein, 2004; Levi-Faur, 2004).

Second, more insight into conditions under which adaptivity leads to better as opposed to worse outcomes is needed. Within this realm, comparative research on regional epstiemic communities might examine the degree to which shared mental models (see, e.g., Denzau & North, 1994) are generated and their subsequent effects on adaptivity. Also, interregional comparisons of the use of a variety of regulatory mechanisms, including self- and co-regulation, and the use of adaptation strategies such as adaptive walks, patching, and jumps (see, e.g., Kauffman, 1993; Cherry, 2007), may uncover structural elements that can explain differences in adaptation, as well as why adaptation produces positive versus negative outcomes.

A third area for future research is investigation of the impact of regions on knowledge generation. While in this study it is argued that regional policymaking leads to knowledge generation through knowledge-sharing and capacity-building efforts at the regional level, increasing regional activity risks a decrease in local knowledge generation arising from lower levels of involvement by civil society, consumer groups, and other private interest groups in policymaking processes (see, e.g., Grande, 1996). Both intraregional and comparative research can study the changes in local knowledge generation over time as well as the ways in which structural elements, such as the ease with which local organizations can travel to the centers of regional policymaking, influence the incentives for local knowledge generation. Further, research could shed light on the governance mechanisms that influence these processes, for instance, the impact of supranational versus intergovernmental regional structures on the extent of divergence in interests among various stakeholders and potential subsequent implications for local knowledge generation (see, e.g., Schneider, Dang-Nguyen, & Werle, 1994). Finally, it must be noted that to ensure a generalizable theory, future investigations should also seek to formalize the interregional comparisons implicit in this research.

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NOTES

1. See http://erg.eu.int/index_en.htm and http://irgis.anacom.pt/site/en/irg.asp, respectively.

2. Personal interview, June 2006, Johannesburg, South Africa.

3. Personal interview, June 2006, Johannesburg, South Africa.

4. Personal interview, September 2006, Gaborone, Botswana. See also Van Gorp (2008, p. 94).

5. Personal interview, November 2006, Dar Es Salaam, Tanzania.

6. See also http://www.dot-com-alliance.org/newsletter/article.php?article_id=138.

7. Personal interview, September 2006, Gaborone, Botswana. See also Van Gorp (2008, p. 94).

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