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Institutions, Sustainability Transitions and Aspects of Internationalisation

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Abstract

The shift towards economic activities that are environmentally sustainable involves the need to overcome incumbent socio- technical regimes that are environmentally unsustainable but difficult to replace. Technological and institutional co-evolution of practices and technologies with large scale effects and strong path dependencies create significant obstacles that stand in the way to adapting technologies that cause less or no damage to the environment. This phenomenon has been termed "carbon lock-in" (Unruh, 2002), it impedes the introduction of environmentally friendly practices and technologies or makes it an uphill struggle. Until recently, most existing studies have taken single national systems as units of analysis while issues of internationalization are just emerging on the agenda. With a high degree of uncertainty involved, becoming part of a sustainability transition is a risky proposal for any firm, and even more so if this is happening in foreign markets where market conditions and institutional settings may be substantially different from those encountered in the firm's home markets. With the purpose of discussing further directions for research, this paper will take a focus on institutional settings in foreign markets and how they affect foreign firms with a special focus on sustainability transitions and systems of innovation.

Introduction

There is an increasing awareness that the rapid degradation of the environment and consumption of finite natural resources needs to be curbed. Economic activities should be conducted in modes that are more sustainable. Existing ways of conducting activities are not sufficiently resource efficient, at multiple levels there is a pronounced need for improving the competitiveness of innovation systems. These sets of problems have attracted substantial academic interest, and there is a rapidly growing focus on achieving a healthier environment by creating institutional support that fosters environmental innovations in larger socio-economical systems (Geels 2011). Lately, a growing amount of contributions in the relevant literature have (see Markard et al.,

2012) provided a number of alternative insights into the functioning of systems of innovation with a special view on issues related to sustainability. In this context, studies of sustainability transition serve to describe multi-dimensional phenomena which are essentially cross disciplinary as they cannot be fully understood by relying on a single discipline alone (Geels 2011). The concept of sustainability transitions can be employed for solving essential societal problems in different domains like transportation, energy or food.

While in the 1980's and 1990's the focus was on avoiding and containing single incidents which led to environmental damages, the focus later changed to taking a more systemic view as environmental damages and exhaustion of natural resources were increasingly seen as a result of sub-efficient and damaging sorts of economic activities seen from a macro level. Previously, the main focus was on reduction of environmental degradation at the level of individual firms; attention is now turning towards a more system oriented view (Lundvall and Johnson, 1994), (Freeman, 1997). Here, firms are seen as a part of a wider innovation system, from a technological, geographical, social or political view. Therefore it is not just individual firms that count, instead they are seen as a part of a wider system that include suppliers, costumers and other stakeholder (Smith et al., 2005). This strand of research revolves around the assumption that the implementation of green innovation in an isolated manner is insufficient, rather these kinds of efforts should be embedded within a wider context which is shaped by institutions and various kinds of actors (Smith et al., 2005). The recent body of literature increasingly shifts the emphasis towards a holistic view as environmental problems are often result of a complex set of technological, societal and institutional circumstances that have developed over time and that cannot easily be abolished or reconfigured. In many cases, quick and isolated "technological fixes" (Markard et al., 2012). will not be helpful in providing fundamental solutions as their effect may often be only temporary and incomplete. Instead, what is necessary are changes on a systemic level.

From this background, the problem concerning sustainability transitions is to determine how new emerging technologies and sustainable practices can maintain themselves against existing incumbent (and non-sustainable) socio-technological systems. These systems can be of different nature, for example in the area of transport, agri-foods, or energy. Although they are damaging to the environment, incumbent systems are difficult to overcome as they are entrenched. Reasons can be found in vested interests, sunk investments, established habits and norms that have their origins in path-dependency related factors (Unruh, 2002). Green innovations struggle against incumbent systems on various dimensions which can be of economic, technical, political cultural character. Transition research is concerned with the question about how new innovations and practices emerge and how they can successfully sustain themselves against existing systems. Are there any typical patterns and what influences them? In this sense, research in transitions is of multi disciplinary nature including economic geography, innovation and a large

variety of other social science related topics including institutional analysis. However, the discussion on institutions in the context of sustainability transition research often seems to be rather ambiguous and vague. This article is concerned with clarifying and discussing the roles of institutions in the light of sustainability transitions.

Systems of Innovations

Based on different variations of systems of innovation approaches, there is a significant and growing body of literature that deals with so called "sustainability transitions" towards more environmentally friendly regimes. A variety of frameworks offer solutions to analyze existing conditions and suggest possible steps towards obtaining changes in various dimensions that lead to an overall higher degree of sustainability. Increasing environmental sustainability of socio-technical regimes has become a topic which attracted increasing interest in the political and scientific discussion. Central to the research in systems of innovation is the finding that firms do not innovate in isolated manner, instead, they are linked to complex systems of innovation seen as regimes consisting of networks, institutions and individual firms that follow certain environmental and technological practices. Whether these are finally successful depends on the intensity of interaction of local socio-political landscapes with a larger environment on a global scale and whether niche experiments can result in socio-technical regimes that are more sustainable (Angel and Rock, 2009). Markard et al. (2012) have identified four alternative approaches which are to some aspects interrelated but offer different perspectives on transition with a special focus on sustainability:

- *Transition management* model (Smith and Kern, 2009; Kern and Smith, 2008; Grin et al., 2010; Kemp and Rotmans, 2005) is concerned with providing a guide to realizing a gradual process of transformation with the aim of achieving an alternative governance model for conserving and protecting environmental resources. The model aims at engaging and including a wide array of stakeholders. The main motivation is to engage and motivate as many participants as possible through creating shared visions and by learning and gaining experience. This way, it is intended to create niches for new systems and technology by experimentation and adaptation. As the learning process continues and intensifies, these niches will grow and eventually evolve into dominating systems. The intended outcome is to achieve modes for sustainable development by implementing changes as multiple levels. The model of transition management relies on learning by doing and takes a long term perspective with a trajectory along the time line that can take a substantial number of years.
- *Strategic niche management* model (Kemp et al., 1998; Raven and Geels, 2010) is concerned- similar to the previous model- with regime shifts

to achieve sustainability by forming niches through a process of strategic niche management. Strategic niche management researchers argue that *innovation journeys* can be initiated by creating technological niches which serve as protected spaces which make experimentation and adaptation possible. Once such niches have been successfully created, they can serve as building blocks towards broader societal transfer processes and sustainable development. Researchers in this field are interested in historical studies to learn from previous experiments and how they can be adapted to find solutions to current problems.

- The *multi level perspective* (on socio- technical transitions) model (Smith et al., 2010; Geels and Schot, 2007; Geels, 2002) considers three dimensions to study technological transitions, with the aim of gaining a better understanding on the dynamics of changes in socio- technical systems. From this perspective, scientific and technological aspects are added to the production perspective with the aim of fulfilling beneficial societal functions. Once a regime shift has occurred, then a transition has been completed. The process of regime shift involves all of the three below mentioned dimensions; at each level the speed of shift can be different: for a while a new sustainable regime can still coexist with incumbent (and unsustainable) regimes.

The three levels are:

1. Niche or micro-level is where radical innovations are initiated. The multilevel perspective assumes that new or radical technologies need protected space to develop, as they are too fragile to sustain themselves in unprotected spaces where they are exposed to full competition. The potential of new technologies which are still protected spaces cannot be predicted, some will fail while others will successfully evolve. Niches serve as protected space so that the viability of new technologies can be sufficiently tested by providing margins for experimentation.
2. Regime or meso-level takes a view on networks which exist between different groups of stakeholders and communities. The major difference between niche level and landscape is that here, innovations will evolve gradually so that the participants in the network have time to learn and adapt to the new regime. Therefore change is slow and gradual, as actors are still locked in by previously existing regimes which are unsustainable and need to be substituted. Dimensions include infrastructure, technology, and user practices including symbols meaning.
3. Landscape or macro-level is where changes take an even slower pace. The macro- level stands for the general environment which is determined by general economic and technological conditions, cultural values and general environmental conditions.

- *Technological Innovation systems* (Bergek et al., 2008; Jacobsson and Johnson, 2000; Hekkert et al., 2007) scholars take a view on functions of an innovation system, and are therefore interested in a deeper understanding of dynamics that are inherent to innovation systems. Innovation systems play an important role for technological change. It is assumed that there may be a number of functions that are in particular relevant for the functioning of an innovation systems. The central point of the technological innovation systems model is a determined technology or technological field. It aims at analyzing both structures and processes and to understand what supports them and where they face obstacles. From the technological innovation systems angle of view there is not just a need to stimulate knowledge flows but also to exploit them. Processes and networks are more important than tangible goods, the free flow of knowledge and competences and the creation and growth of dynamic industrial sectors is seen as important (Carlsson and Stankiewicz, 1991). Actors, processes, and institutions are central to the technological innovation systems approach. These are the elements or the structural factors of the innovation system, they are linked together in form of network structures.

Institutions

State and institutions

North describes institutions as the rule of the game within a society (North, 1990). They form the basis of the incentive systems that act as a basis for human behavior in the social, economic and political sense. In North's view, institutions provide a structure for daily life and human interactions, in the sense that those rules will not have to be renegotiated continuously. As they provide fixed frames in which individuals (or firms) can move, institutions define and limit the choices of individuals (North, 1990, pg. 4). Culture determines features of institutions, while culture itself is a result of human creation. Culture can manifest itself in cultural artifacts, or through intangibles. Culture and the understanding of what it is differs widely (Gullestrup, 2006): Triandis (2000) has named a large array of sources of cultural misunderstandings which can be experienced on multiple dimensions and can be rooted in language, social structure or religion. Cultures may differ on dimensions like complexity, tightness, individualism/ collectivism, diffuse/ specific and so on (Hofstede et al., 1991; Trompenaars and Hampden-Turner, 1998). Those polarities are reflected the way institutions are constructed, depending on those circumstances, institutions serve to:

- establish norms governing relationship in society through governing trust and authority
- define state policies and norms for regulating and supporting economic actors

- regulate the governance of access and use of financial capital
- establish the organization of the education system, regulations and norms governing the management of human resources

An important role is played by the state, for example in terms of the nature of interference into the economy, and to what extent this is happening. This can be in terms of coordination, or giving support to preferred industries or firms. Whitley (2011, pg. 469) uses the term "*dominant developmental states*", where business are dependent on state actions and the kind of policies which are pursued. In these situations, political risks can be more substantial than market risks. In other countries, especially the anglophone type we find more reliance on regulatory effort in lieu of more direct interventions. As institutions simultaneously have enabling and limiting functions, they define what actors are permitted to do, and under what conditions this can happen.

Institutions can be formal or informal. Formal institutions are actively devised and thus often codified. Informal institutions are of more tacit characteristics, they can be informal norms and conventions which may have evolved over time. Sets of formal and in particular informal institutions may vary widely between different cultural settings. In a system with a strong development oriented state where priority is put on of growth, firm's dependency on the state is high, as was the case in post war Korea (Amsden, 1992; Whitley, 1993). Conversely, in a system with weaker institutions, trust between individual actors becomes a factor of significant importance as firms cannot depend on an efficient legal system to settle disputes, a phenomenon that can be observed for example in China. In these circumstances, managers profit from maintaining direct relationships with political decision makers for risk control. Firms compete with each other for access to government decision makers, and will put less effort in establishing stable mutual links among themselves, which inhibits the creation of stable intra- firm networks. In other countries- especially the anglophone cultural environment- legal institutions are well developed while state intervention is not seen as desirable. In these environments with an arm- length relationship to the state, firms reliance on legal system is more accentuated and the element of trust loses relative importance. These countries see a higher degree of market based ownership control, and authority is less personal and more procedural (Whitley, 2011, pg. 473) Here, we identify research opportunities: in the context of internationalized systems of innovations and emerging technologies, how will firms that are embedded in the institutional settings of their home base (Niosi et al., 1993; Breschi et al., 1997) handle institutional configurations in foreign environments? For example, how does this affect their strategy and organizational structure? To enhance and complement these perspectives we see possibilities for further research on how a specific regulatory environment affects the strategy formation of firms in terms of innovation.

Here, among other factors, the functioning modes of university industry technology transfer play a role, as a substantial number of emerging tech-

nologies find their ways out of university incubators, spin-offs or other kinds of university related technology transfer. This needs to be seen in a wider context, which also involves educational institutions. Likewise, home market educational institutions have an impact on cross national capabilities of a firm. A further aspect touches on standardization and certification procedures which can vary depending on the country in focus, and which may in turn impede the effective development and transfer of cross national competences.

Firm level

In fluid national labor markets and high degree of standardization of educational certification, employing firms have more difficulties in attracting long term committed employees. Employees show less willingness to develop firm specific competencies, but on the other hand, it becomes easier to hire and fire staff. As a consequence, firms can gain flexibility in rapidly changing and adapting their knowledge base. The institutional settings determine governance modes and how firms are managed. Firms can be organized in different forms which may come as a result of differences in the institutional environment. Larson (2000) groups the literature which explores the relationship between business, innovation and sustainability into three mayor clusters: a) the public policy view where state regulation is seen as a driver of innovation, b) a view which studies the voluntary contributions of firms to support environmental protection, and c) the resource based view which regards environmentally friendly innovation as a part of strategic posture of firms to gain competitive advantage, based on the Resource Based View (Petersen, 2006; Wernerfelt, 2006). Whitley (2011, chap.16) distinguishes between various forms of degree and type of ownerships which impact management's margin for decision taking processes. Firstly, there is the archetypal owner-controlled firm, where the owner manager takes decisions that affect the daily operation of a company. Salaried managers have to follow the instructions of the owner manager and are tightly controlled. Ownership may also manifest itself in more remote forms, where owners are still relatively closely connected to their company, in the sense that they have sufficient leverage to take influence on significant decisions. This will be the case when owners carry enough specific weight in terms of their voting rights. If ownership becomes more dispersed, owner will have less specific impact on firms decision with the result that banks or other financial institutions that administrate voting rights for small shareholders will gain a more significant influence on the decision making processes. Market based ownerships will then tend to emphasize short term profit maximization (Whitley, 2011, chap.16). Similarly, other interest groups may gain influence on firm's decision when more remote forms of ownership are encouraged. These can include organizations for employee representation, business associates and others which exercise power through institutionalized forms of governance.

As pointed out, when trust in institutional arrangement is low actors will

not have confidence in the functioning of the legal system including courts and public administration or accounting systems. In these circumstances, trust between actors will be low, and owner do not feel that their rights are adequately protected. Actors will only develop commitment to people with whom they have strong relational bonds. Then, business relationships will often depend on kinship or other personal ties. In similar circumstances, employment relationships will often depend on hierarchical authority and paternalistic relationships which rely on control and formal procedures are the preferred mode of operating.

Whitley (2011, chap.16) points out that companies have varying competences, which depend can also depend on their location: when companies own local organizations or facilities in different countries, these outpost may independently develop competencies themselves that are distinct from those at the home base. When a company is able to develop a certain capability in one country, this does not mean that it will be able to do so in another one, for a number of reasons. a) international institutions that govern employer/employee relationship may be too weak to create a base for labor relationship that is sufficiently reliable for both sides, b) there may be a belief that domestically acquired competences are superior, and c) companies may be reluctant to share power with foreign managers because of variable and shifting institutional settings. In consequence, the characteristics of operations abroad may well be different from those that companies maintain at their home base. Therefore, as Whitley (2011, chap.16) argues transnational companies will not necessarily significant change of their knowledge base just because they maintain operations abroad.

Transfer of knowledge and competences across transnational boundaries should become easier when institutional setting and conditions between countries are quite similar. This will facilitate development of new technologies across boundaries as well as problem solving as internationally available skills are sufficiently comparable between countries. Easy transfer of skilled employees across boundaries will equally facilitate knowledge transfer. Even if differences in institutional setting are more accentuated, the facilitation of international information transfer will enable transfer processes when partners find a common language by continuing communication and exchange of specialists. Finally (Whitley, 2011, chap.16) hints to the fact that institutional differences call for well developed cross national procedures and routines which are *per se* inflexible, in consequence a multinational firm will have more difficulties in rapidly adapting to changing market conditions and new technological opportunities.

Perceptions of institutions

Institutions can manifest themselves in form of organizations (Scott, 1994). Managers face different institutional settings when venturing abroad, which leads to the question of how they perceive the environment in terms of in-

stitutions. As pointed out, institutions are result of rules, norms, behaviors of individuals and groups. Rules can be endogenous or exogenous, which means that individuals can either embrace them or see them as externally imposed. For example, in their own home markets, managers consider the rules, beliefs and norms as well as local organizations as familiar and natural. To illustrate the point we can draw on the example of a system that secures property rights. There are political rules that determine how these rights are to be regulated and handled, how owners of properties can be identified, and how offenders will be sanctioned. These rules may seem exogenous to a individual (or firm), as she or he has no influence over them and can therefore not unilaterally change them. On the other hand, if individuals fully accept the underlying beliefs, rules and norms, then they will see them as part of their own, so they will be of endogenous nature. They see them as a natural part of their given environment, and act accordingly. The picture is different when the same individual (or firm) starts acting outside the boundaries of its familiar home markets where conditions are different. There, for these individuals (or firms) conditions will seem be endogenous as they are unfamiliar. They may learn how to navigate within this foreign institutional settings, but not in form of tacit knowledge, at least initially. We assume that persons (or firms) that are unfamiliar with a foreign environment will feel that it is exogenous to them; misunderstandings rooted in culture are more likely to happen.

Levchenko (2007) sees insufficient contract enforcement and property right as a source of frictions. This relates to the holdup problem, which arises when relation specific investments are made. When institutions work insufficiently and are of inferior quality, contracts become more *“incomplete”* (Levchenko, 2007). With imperfect institutions, factor rewards are not equal between different industries. For instance in some industries, salaries will be higher than in others. which is where the *“good”* jobs are. While some countries suffer from insufficient institutions, those countries that have well functioning institutions enjoy competitive advantages. The other key role is competitive advantage generated as a result of the fact that developed have institutions that are superior to those in underdeveloped countries. As a result, qualified jobs would be moved to the developed countries, leaving the less developed countries in a situation where they can profit from the result of trade gains. The superior institutions of developed countries allow them to specialize in those sectors that are most attractive (Costinot, 2009). The implication is that institutional differences have an impact on trade patterns; institutions, along technology and other factor endowments serve to explain different development patterns (Levchenko, 2007; Acemoglu et al., 2007). Levchenko points to other authors who have shown that institutions, along technology and factor endowments generate differences between developed and developing countries. (Costinot, 2009; Acemoglu et al., 2007). The theoretical implication is that institutional differences are important for determining trade patterns.

Emerging/ Developing Economies

Institutional settings in emerging/ developing economies may take a different *gestalt* in the eyes of firm managers from mature economies who are used to matured institutions and relative stability of institutions. Internationalizing firms that are active in emerging economies meet varying market conditions, in terms of quality of institutions and infrastructure, market conditions, income per capita and so on. Countries like labeled as '*emerging economies*' like China, Malaysia, South Korea or Thailand in Asia or Brazil, Chile or Mexico in Latin America are experiencing strong rates of growth and offer interesting conditions for companies from industrialized countries. While countries in these groups have been mainly experienced successful growth patterns, other countries have done less so. Many countries within the group of emerging economies face the problems of uneven distribution of wealth Altenburg (2009) A primary concern for policymakers in these countries is reduction of poverty, which involves finding adequate solutions for the problem related to uneven distribution of wealth and poverty. In mature economies, where poverty related problems are less pressing politicians may favor politics to support various forms of sustainability transitions that for financial reasons may not seem acceptable in poorer and less developed countries. When reduction of poverty is foremost on the agenda of governments, efforts in R&D will be directed towards projects that aim at satisfying basic requirements for poverty reduction like provision of basic foodstuff as well as standard merchandise which serve to satisfy the needs of poorer layers of the population. Those R&D expenditures can be funneled towards innovations which serve to improve water quality, increasing crop yields, fighting and containment of diseases, improving the telecommunication infrastructure, etc. James (2004). With exceptions, the overall expenditures into innovation and R&D, however, have tended to be lower than in fully developed countries as there will often be a more pronounced need for investments aimed at solving problems related to- for example- insufficient infrastructure. Government sponsored development initiatives can fail: Altenburg (2009) argues that although there are cases of successful industrial developments in some emerging economies (for example a successful aircraft industry in Brazil), other projects initiatives have proved to be less successful, for example airspace initiatives in India or failed attempts to create an automotive industry in Malaysia. In some cases innovative activities may even have negative effects on the poorer layers of the population, an extreme example in this direction is the nuclear program in Iran. Even initiatives that serve to preserve scarce resources and reduce carbon emissions can eventually have a negative impact: for example, the transition towards biofuels pursued by some governments has been criticized for reducing the availability of basic foodstuff which is needed for provision of basic low cost alimentation. There is no guarantee that government sponsored programs for fostering sustainable development have a successful outcome.

As regions and nations show differences in their patterns of development, economic specializations differ in intensity and direction (Asheim and Gertler,

2005). When firms embark on new activities outside their national boundaries or regions they find different conditions that challenge their ability to adaptation. Firms which engage in cross border activities see opportunities, if they are successful they are possession of knowledge which constitutes a competitive advantage (Kogut and Zander, 2003). Knowledge is transferred through the international activities of the firm, which constitutes the firms advantage and the primary reason to venture abroad (Kogut and Zander, 2003). The firm is a superior vehicle for knowledge transfer, in particular in its tacit form. Venturing abroad into foreign markets exposes a firm to the disadvantages that result from *liability of foreignness* (Zaheer, 1995), in other words, the inherent disadvantage foreign firms suffer in host countries because of their status as outsiders.

Hollingsworth Five Levels of Institutional Analysis

The field of institutional analysis is dispersed over a variety of disciplines and sub-disciplines, and according to (Hollingsworth, 2000, pg. 600) there is little coordination among scholars who are researching in the field of institutional analysis. To achieve more coordination in the field, Hollingsworth (2000) has created a conceptual map with the aim to achieve an improved mutual understanding of the respective research activities. The map includes five different levels that are conceptually linked to each other. The layers are ordered in relation to stability and resistiveness, the lower levels are less stable while the higher level show more endurance.

The first level: institutions

At the first level are norms, habits and values that are the most enduring and less likely to change rapidly. These basic components form the basis for the other four layers in the map, because these underlying values can determine the compliance (or non-compliance) of rules, and what will cause changes (Hollingsworth, 2000). In each society there are different sets of rule systems. For example, in a family rules and norms may be applied in different ways according to the context, for instance educational institutions or workplace (Burns et al., 1987). In a society there may be *meta rules* that stand above other, lesser rules, which may be necessary to avoid the collapse of a society when sets of rules and norms become too complicated and contradictory. An individual is born into a society and is socialized; individuals acquire cognitive frameworks which lead their decisions. Institutions provide individual with guidance, so that there is no need to continuously put the established rules of the game into doubt. Individuals or institutions have mutual influence over each other (Hollingsworth, 2000). Institutions shape and restrict the actions of individuals, but individuals can also influence institutions. Looking at those issues firm and managers may face when venturing into foreign markets, Legro (1997) suggested assessing norm and rules for their relative strengths, based on simplicity, durability and concordance.

The second level: institutional arrangements

This level is concerned about the way different economic actors involve in mutual coordination. This includes suppliers and buyers of raw material, knowledge and information, human resources, regulations, provision of finance and so on. The coordination of these actors leads to solving different kinds of problems, for instance how to set prices, what quantity and quality to deliver, how to define standards, how to finance activities and so on. These activities can be organized in different ways, for example there are different types of states: authoritarian developmental, regulatory or welfare. Transactions can be organized in different ways, for example within hierarchies, within markets or network structures. Institutional analysis implies that actors may not be determined by one institutional arrangement alone. Changing institutional arrangements have an effect on the way actors will coordinate according to the determined situation. When institutional arrangements change, the impact on the coordination systems influence the actor's outcomes. (Hollingsworth, 2000). It is institutions that determine what *kind of arrows a firm has in its quiver* when it is implementing its strategy (Ingram and Silverman, 2002). Just as institutional arrangements impact coordination mechanisms, these will have an influence on the dominant mode of innovation. Institutional arrangements can be looked at on two dimensions: the action motive and the distribution of power (Hollingsworth, 2000). Economic transactions between actors can be conducted in market mode, or within hierarchies or in networks (Williamson, 1981). Networks provide an alternative mode, and often involve motives of self-interest in conjunction with social obligations. In contrast to market mode, power is unevenly distributed within hierarchies and networks. Although power is most evenly distributed in markets, institutions play an important role as there is an increased need for codification of rules. Various forms of institutions (collective associations or state intervention) are required to ensure the enforcement of rules. In mature industrialized economies conducting activities in market mode is usually the dominant mode, but precaution needs to be taken that institutions are enabled to prevent undesired excess of market activities that can lead to excessive conflicts or ruinous competition. Market modes provide the condition for participation of multiple actors. When markets work smoothly, institutions that support market activities are barely noted (McMillan, 2007). But in case that institutional arrangements are not sufficient to ensure for an effective functioning of markets, personal ties based on trust become more important. Although micro-bonds between actors exist in all kinds of societies, they gain especial importance when institutions that can enforce market mechanism are weak, as we discussed above. Then, ties based on trust become more important, and transactions are conducted within the context of networks and hierarchies, where power is unevenly distributed and concentrated in the hands of relatively few individuals or in smaller groups. If this is the case, then sustainability transitions will predominantly depend on the few individuals and groups. When markets work poorly, as is often the case in less developed immature economies, there will

usually be a lack of market supporting institutions while informal institutions gain relative weight (Peng et al., 2008).

The third level: institutional sectors

A social system of production is a result of the link between rules norms and values that govern a society (first level) and of the array of social institutions (second level). Institutional sectors comprise all organization that are part of a society and that provide a certain type of product or service. Institutional sectors also include different systems within society like the state, education, research or financial markets (Hollingsworth, 2000). Institutional sectors are embedded in a system of culture and values that are particular to a given society. To varying degrees, institutional sectors are configured to adapt to changing circumstances, but will usually evolve in line with their habitual style. This aspect is of importance for the analysis of sustainability transitions, as these usually imply the need to system change and adaptation; different institutional sectors can to varying degrees accommodate sustainability transitions. Concerning the international perspective of sustainability transitions, it is difficult to transfer institutional arrangements from one society to another. From the perspective of sustainability transitions, a development that is possible in one national system of innovation may not encounter the necessary conditions in a second society with different institutional arrangements (Hage and Hollingsworth, 2000; Hollingsworth and Boyer, 1999). The opportunity would be to study the conditions under which conditions a firm can become a successful actor in a foreign market which is undergoing a sustainability transition. Can the firm be equally successful in another society or country? Are there any necessary adaptations which need to be taken to realize a successfully implemented strategy?

The forth level: organizations

The level of institutional analysis is concerned with organizations. While North (1990) contents that there is a distinction line between organization and institutions, other theorists argue that institutions are reflected in organizations. Organization change and are influenced by endogenous circumstances, but they also have an impact on the external environment which develop over time. Changes in institutional environments impact the structures of organizations within determined societal sectors (Aoki, 1990; Slack and Hinings, 1994). This results in complex interrelationships with mutual non-linear feedback mechanism, which are difficult to analyse if not a longitudinal perspective is taken. Hollingsworth (2000) argues that in societies where rules, norms and habits are most developed and where institutional pressure to conform is most pronounced, there will be less variation in form of organizations. On the other hand, where rules, norms and habits are less developed, institutional pressure to conform will be less marked. As a result, there will be greater variation in institutional variety. In Hollingsworth (2000) view, those societies that

show most rigidity in their structure will be less successful in accomplishing radical innovations in applied and basic science. As a consequence, we hypothesize that in the light of sustainability transitions, societies which show rigidity in their structure will be inclined towards innovations in sustainable innovations and corresponding system change if there are central (political) control instances that are able to take impact on rigid structures. Less powerful organizations will most probably not be able to implement changes that overcome rigid structures.

The fifth level: outputs and performance

Different types of institutions and social systems result in different economic performance. At the level of output and performance, economic systems and institutions show most flexibility. This is reflected in variety of different court rules as far as the legal system is concerned, different policies at the state level, and different product, services and technologies at the enterprise level. In terms of innovation styles, there may be significant differences but imitations across borders is most simple and feasible at this stage (Hollingsworth, 2000). The idea of techno-economic paradigm states that different technologies necessitate different institutional arrangements and socio-technical systems (Freeman, 1989). Institutional inertia may prevent a society from adopting to changing techno-economic paradigms Nelson (1994). Taking a focus on sustainability transitions we speculate that under conditions of techno-economic compatibility between to systems, technology transfer and innovation may be possible when the right conditions are given. This may depend on the degree of integrability of a product or service and how it can be implemented in a foreign system which is on its on track sustainability transition. If sectors overlap between societies, as it can happen for example in sectoral system of innovation (Breschi et al., 1997), a transfer of knowledge and technology can be possible in the way that societies enrich each other when they have embarked on a sustainability transition path. One important factor can be compatibility of systems, but it could also be compatibility on product/service level. Technologies that show a higher degree of modularity will be easier to integrate in other environments.

Outlook

As already pointed out, in the context of sustainability transitions there is criticism that institutions are widely discussed in a rather incoherent manner. The concept seems to remain fuzzy and is not applied in a coherent manner. Even in the international business related literature, these issues have only recently been taken up (Peng et al., 2008). From an institutional point of view, this paper aims to elaborate on issues firms have to deal with when they become part or even shape sustainability transition. What are research issues for companies that are engaged in bringing green technology to emerging economies? From the perspective of institutional analysis, this article has

pointed out some areas which seem under-researched and therefore present opportunities. In particular, there seems to be little evidence on how firms that are engaged and form part of a sustainability transition handle issues related to institutions when engaging in various forms of internationalization activities. As we have pointed out, institutions are relevant on multiple dimensions and can pose a challenge to internationalizing companies, in particular when they only dispose of limited resources.

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