

## Explaining Legal Change from an Evolutionary Economics Perspective

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### A. Introduction

Institutions can have a decisive impact on economic performance. The law is particularly important in shaping the institutional framework for economic activities. Legal rules can be viewed as socio-technological devices used to help individuals solve the coordination problems and conflicts that arise in an environment of scarce resources.<sup>1</sup> In such an environment, the law affects both the allocation as well as the distribution of resources, and is itself influenced and altered by economic evolution. However, our understanding of the determinants and mechanisms of legal change from an economic perspective remains rather weak.

The traditional neo institutional economics and law and economics perspectives have made a measured contribution to our theoretical and empirical understanding of legal change.<sup>2</sup> Yet these two perspective are deeply rooted in neoclassical

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<sup>1</sup> MARTINA ECKARDT, TECHNISCHER RECHTSWANDEL UND RECHTSEVOLUTION. EIN BEITRAG ZUR ÖKONOMISCHEN THEORIE DER RECHTSENTWICKLUNG AM BEISPIEL DES DEUTSCHEN UNFALLSCHADENSRECHTS IM 19. JAHRHUNDERT (2001); Wolfgang Kerber & Klaus Heine, *Institutional Evolution, Regulatory Competition and Path Dependence*, in THE EVOLUTIONARY ANALYSIS OF ECONOMIC POLICY 191–222 (Pavel Pelikan & Gerhard Wegner eds., 2003).

<sup>2</sup> RUBIN COOTER & THOMAS ULEN, *LAW AND ECONOMICS*, 5<sup>TH</sup> ED. (2007); THRAINN EGGERTSON, *ECONOMIC BEHAVIOUR AND INSTITUTIONS* (1990); EIRIK FURUBOTN & RUDOLF RICHTER, *INSTITUTIONS AND ECONOMIC THEORY. THE CONTRIBUTION OF THE NEW INSTITUTIONAL ECONOMICS* (1998); RICHARD POSNER, *ECONOMIC ANALYSIS OF LAW*, 5<sup>TH</sup> ED. (1998). The law is part of the formal institutions of a society. Nevertheless also informal rules, which are not considered in the following, play an important role for legal change. See, e.g., FRIEDRICH HAYEK, *LAW, LEGISLATION AND LIBERTY, RULES AND ORDER*, VOL. 1 (1973); FRIEDRICH HAYEK, *LAW, LEGISLATION AND LIBERTY, THE POLITICAL ORDER OF A FREE SOCIETY*, VOL. 3 (1979); JACK KNIGHT, *INSTITUTIONS AND SOCIAL CONFLICT* (1992); DOUGLAS NORTH, *INSTITUTIONS, INSTITUTIONAL CHANGE AND ECONOMIC PERFORMANCE* (1990a); STEFAN OKRUCH, *INNOVATION UND*

microeconomics, and as such, they remain at their core concerned with the impact of given legal rules on economic activities. To a large extent, this reflects the inherent static nature of neoclassical microeconomics (stable preferences, rational choice behavior, and equilibrium),<sup>3</sup> wherein the economic problem is reduced to optimization (i.e., choosing the best option from a given set of alternatives). The decisive question of how the legal alternatives themselves are generated is thus not analyzed and so novelty and change are assumed to be exogenous.

Change, on the other hand, is the main starting point of the evolutionary economics perspective. Calling into question the stable preferences on which the traditional premise of optimization is based,<sup>4</sup> evolutionary economics purports that innovation, uncertainty, and the “constitutional lack of knowledge” are central characteristics of modern economies which have to be addressed in economic theorizing.<sup>5</sup> The perspective’s very aim is the explanation of economic, technological, or institutional change over time; central issues include the generation of innovations and their diffusion through imitation and learning.

At the core of evolutionary economics lie three key assumptions or building blocks.<sup>6</sup> First, while mainstream neoclassical economics assumes a closed action space with homogenous and representative actors, evolutionary economics assumes one that is open with undefined processes. To this end, evolutionary

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DIFFUSION VON NORMEN: GRUNDLAGEN UND ELEMENTE EINER EVOLUTORISCHEN THEORIE DES INSTITUTIONENWANDELS (1999); Eric Posner, *Law, Economics, and Inefficient Norms*, 144 UNIVERSITY OF PENNSYLVANIA LAW REVIEW (1996), 1697–1706.

<sup>3</sup> EGGERTSON, *id.*

<sup>4</sup> Indeed, a number of different methods from different disciplines reflect recent interest in these issues. See CARSTEN HERRMANN-PILLATH, *GRUNDRIS DER EVOLUTIONSÖKONOMIK* (2002); GEOFFREY HODGSON, *ECONOMICS AND EVOLUTION. BRINGING LIFE BACK INTO ECONOMICS* (1993); STANLEY METCALFE, *EVOLUTIONARY ECONOMICS AND CREATIVE DESTRUCTION* (1998); Richard Nelson, *Recent Theorizing about Economic Change*, 33 JOURNAL OF ECONOMIC LITERATURE 48-90 (1995); Richard Nelson & Sidney Winter, *Evolutionary Theorizing in Economics*, 16 *The Journal of Economic Perspectives* 23-46 (2002); ULRICH WITT, *THE EVOLVING ECONOMY: ESSAYS ON THE EVOLUTIONARY APPROACH TO ECONOMICS* (2003).

<sup>5</sup> JOSEPH SCHUMPETER, *CAPITALISM, SOCIALISM, AND DEMOCRACY*, 3<sup>RD</sup> ED. (1950); Friedrich Hayek, *Rechtsordnung und Handlungsordnung*, in *Freiburger Studien Gesammelte Aufsätze* 161–198 (Friedrich Hayek ed., 1969).

<sup>6</sup> For some time now evolutionary arguments are prominent in the law and economics literature. Usually they refer to gradual innovations and changes in contrast to discrete ones. Note however, that evolutionary economics cannot be reduced to this notion. It is more comprehensive in that it uses a process perspective, trying to broaden the static neoclassical approach to encompass the endogenous generation of novelty, be it gradual or discrete (METCALFE, *id.*; NELSON, *id.*; NELSON & WINTER, *id.*; WITT, *id.*).

economics assumes heterogeneous actors that exercise bounded rationality due to limited information-processing capacities and create subjective cognitive models to make sense of the world as they perceive it.<sup>7</sup> Moreover, actors are assumed to be creative and able to generate novel activities in any domain in which they are engaged. The evolutionary economist thus seeks to explain the mechanisms that generate and transmit new action opportunities. Pursuant to Schumpeter's notion of "creative destruction," these mechanisms can be perceived as new ways of doing things by re-combining existing and well-known action possibilities as well as generating novel ones.<sup>8</sup> Hence, economic change is perceived as a trial-and-error process of experimentation with new economic activities, involving not only technological and organizational innovation, but also political and legal innovation.

However, it may be argued that a focus on the endogenous generation of new action states is at odds with our everyday lives and experiences. Indeed, our lives are often characterized by a certain degree of regularity and stability, as opposed to the chaos and unpredictability purported by the evolutionary economic perspective. There must be forces at work that limit the continuous generation of variety by heterogeneous creative actors. Hence, a second main building block of evolutionary economics is the study of the selection mechanisms, including the relevant selection environments, of the activities analyzed.

Since evolutionary economics is concerned with economic evolution over time, the perspective's third main building block is the analysis of those mechanisms that lead to the patterned transmission of innovations from one period to the next. This includes not only mechanisms of differential "reproduction," but also mechanisms that generate path-dependencies. This is particularly important in regard to institutional, and consequently, legal change.

To date, however, evolutionary economics has dealt mainly with change in the technological and organizational domain, as opposed to institutional and legal evolution. While there are some promising approaches that seem to be a good starting point for further research efforts, a comprehensive evolutionary economic theory of legal change has not yet been articulated. To this end, this paper begins with an overview of typical evolutionary explanations of legal change: its main actors, key determinants, and the central mechanisms of the different approaches that bring about legal change are identified. By pointing out the evolutionary aspects of the different approaches, their contribution to the explanation of legal

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<sup>7</sup> Arthur Denzau & Douglas C. North, *Shared Mental Models: Ideologies and Institutions*, 47 KYKLOS 3-32 (1994).

<sup>8</sup> JOSEPH SCHUMPETER, *THEORY OF ECONOMIC DEVELOPMENT*, (2<sup>ND</sup> ED.) (1934); SCHUMPETER, *supra*, note 5.

change becomes clear. The following analysis is confined to the change of specific legal rules. From an evolutionary economics point of view legal change takes place through the generation and dissemination of legal innovations over time.<sup>9</sup> The main mechanisms are statutory and judge-made legal change. While statutory legal change relies on legislation and thus on collective action, judge-made legal change is brought about by the judiciary through individual lawsuits.

Section B starts with a short account of the public choice approach to politics and thus to statutory innovations. It is followed by a cognitive-evolutionary approach to policy-making which analyses statutory legal change in the Schumpeterian tradition. Section C considers both Hayek's explicit evolutionary view<sup>10</sup> of judge-made legal change as a trial-and-error process as well as the law and economics literature that implicitly draws on evolutionary arguments. While the approaches discussed so far more or less exclusively deal with the generation and dissemination of single legal innovations, Section D turns to the notions of legal paradigms and of legal path-dependence that allow one to draw more specific hypotheses about the direction of legal change over time. Section E widens the horizon by presenting an approach that deals with the co-evolution of legal rules, technology, and the economy. Finally, Section F concludes with a short summary and a brief outlook on further areas of future research.

## B. Statutory Legal Change as an Innovation Process

### *I. The Public Choice Approach to Politics*

Given that economic policy in modern democracies is implemented by a set of legal rules, the economic analysis of politics can be construed as a concurrent analysis of statutory legal change. The dominant approach to political economy is based on traditional neoclassical economics.<sup>11</sup> Its main focus is on equilibrium outcomes that

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<sup>9</sup> A comprehensive evolutionary economics theory of legal change has to further clarify its research object. For example, a legal rule can be defined as comprising the following three components: (1) the facts which decide to what economic activity it applies; (2) a legal norm which prescribes which actor is allowed to carry out what action; and (3) the burden of proof which states who has to bring the necessary information before the court in case of an action. See ECKARDT, *supra*, note 1, 19-22.

<sup>10</sup> For an overview of Hayek's reasoning on economic and legal theory, see Scott Beaulier, Peter Boettke & Christopher Coyne, *Knowledge, Economics and Coordination: Understanding Hayek's Legal Theory*, 1 NYU JOURNAL OF LAW AND LIBERTY 209-223 (2004); ECKARDT, *supra*, note 1; OKRUCH, *supra*, note 2.

<sup>11</sup> JAMES BUCHANAN & GORDON TULLOCK, *THE CALCULUS OF CONSENT* (1962); MANCUR OLSON, *THE RISE AND DECLINE OF NATIONS: ECONOMIC GROWTH, STAGFLATION AND SOCIAL RIGIDITIES* (1982); MANCUR OLSON, *THE LOGIC OF COLLECTIVE ACTION* (1965); WILLIAM NISKANEN, *BUREAUCRACY AND*

are brought about by marginal adaptations of rational utility-maximizing actors to changes in exogenous variables. The relevant actors in this paradigm include voters, special-interest groups, politicians or political parties, and bureaucracies; all of these parties seek to maximize rents, or in this case, votes. Under this model, there is an exchange of votes for election promises or for the expected legislation by the parties elected. In other words, politicians, political parties, and the government are largely conceived as only passively reacting to the demands expressed by voters or interest groups. Following this argument, it can further be asserted that the content of a statute is based on the interests of either the median voter, predominant interest-group, or government controlled bureaucracy. By specifying exogenously given restrictions, objective functions, and exchange mechanisms, empirical testable hypotheses can be tested against the outcome of the political bargaining processes and thus the typical content of statutory legal change. Note, however, that political markets – like any other economic market – are not immune to market failure, meaning that statutory legal change does not always lead to efficient outcomes.<sup>12</sup>

While the various strands of Public Choice deal with specific aspects of legislation, they all have in common that they usually assume the set of political options and thus the set of legal alternatives as given. Any deviations from the standard assumptions of neoclassical economics have, however, come under increased scrutiny in recent years. A prime example is that of the “cognitive turn” by North, who deviates from the behavioral model of standard microeconomics.<sup>13</sup> Aside from assuming that individuals act under incomplete information and conditions of bounded rationality, North supposes that they also interpret the information received in the light of subjective theories and beliefs. For collective action to take

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REPRESENTATIVE GOVERNMENT (1971); Charles Rowley, *Public Choice and the Economic Analysis of Law*, in LAW AND ECONOMICS 123-173 (N. Mercuro ed., 1989); CHARLES ROWLEY, ROBERT TOLLISON & GORDON TULLOCK, *THE POLITICAL ECONOMY OF RENT SEEKING* (1988); DENNIS MUELLER, *PUBLIC CHOICE III*, 3<sup>RD</sup> ED. (2003); DENNIS MUELLER, *PERSPECTIVES ON PUBLIC CHOICE: A HANDBOOK* (1997); NICHOLAS MERCURO & STEVEN MEDEMA, *ECONOMICS AND THE LAW. FROM POSNER TO POST-MODERNISM* (1997); GORDON TULLOCK, *ON VOTING. A PUBLIC CHOICE APPROACH* (1998); ALBERT BRETON, *COMPETITIVE GOVERNMENTS. AN ECONOMIC THEORY OF POLITICS AND PUBLIC FINANCE*, (1998).

<sup>12</sup> However, supporters of the efficiency redistribution hypothesis argue that competition among different interest groups leads to efficient redistribution. See, e.g., Gary Becker, *A Theory of Competition among Pressure Groups for Political Influence*, 98 *QUARTERLY JOURNAL OF ECONOMICS* 300-371 (1983); David Bullock, *Are Government Transfers Efficient? An Alternative Test of the Efficient Redistribution Hypothesis*, 103 *JOURNAL OF POLITICAL ECONOMY* 1236-1274 (1995); DONALD WITTMAN, *THE MYTH OF DEMOCRATIC FAILURE: WHY POLITICAL INSTITUTIONS ARE EFFICIENT* (1995); Donald Wittman, *Why Democracies Produce Efficient Results*, 97 *JOURNAL OF POLITICAL ECONOMY* 1395-1424 (1989).

<sup>13</sup> NORTH, *supra*, note 2; Douglas North, *A Transaction Cost Theory of Politics*, 2 *JOURNAL OF THEORETICAL POLITICS* 355-367 (1990b).

place, communication transmits these subjectively held views of the world in commonly shared views (ideologies), which govern decisions and behavior.<sup>14</sup> As a consequence, the set of alternatives from which to choose is no longer a given. Thus, even under competition, feedback-effects to select out inefficient alternatives might not work because individuals do not hold the “true” cognitive models about the cause-and-effect relations on which their decisions are based. This effect might even be intensified because of the path-dependent nature of institutional change.<sup>15</sup> Although Public Choice theories are based on Schumpeter’s idea of democracy as competition for political power, it has taken quite some time before the Schumpeterian notion of creative entrepreneurs was also applied to the political arena.<sup>16</sup>

Thus, while the Public Choice literature provides us with rich insights into the determinants and mechanisms of different institutional settings for statutory legal change, it only superfluously deals with the question of how collective goods and thus how statutory legal innovations are actually generated and disseminated.

## *II. A Cognitive-Evolutionary Approach to Policy-Making*

On the other hand, the cognitive-evolutionary approach to policy-making casts statutory legal change as an innovation process.<sup>17</sup> It applies Schumpeter’s notion of

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<sup>14</sup> NORTH & DENZAU, *supra*, note 7.

<sup>15</sup> North also refers to the importance of entrepreneurs for creating innovations and for enhancing the adaptive efficiency of an economy and thus alludes to the Schumpeterian line of evolutionary economics. But so far he has not systematically integrated this notion in his transaction cost approach to politics. For a critical appraisal of the cognitive turn in Neo Institutional Economics, see Siegwart Lindenberg, *The Cognitive Turn in Institutional Analysis: Beyond NIE and NIS*, 154 JOURNAL OF INSTITUTIONAL AND THEORETICAL ECONOMICS 716-727 (1998).

<sup>16</sup> For academics that explicitly supplement traditional Public Choice analysis by integrating Schumpeterian ideas, see BRETON, *supra*, note 11; PATRICK DUNLEAVY, *DEMOCRACY, BUREAUCRACY AND PUBLIC CHOICE* (1991); Reiner Eichenberger & Angel Serna, *Random Errors, Dirty Information, and Politics*, 86 PUBLIC CHOICE 137-156 (1996); Bruno Frey & Reiner Eichenberger, *Anomalies in Political Economy*, 68 PUBLIC CHOICE 71-89 (1991); Gebhard Kirchgässner & Werner Pommerehne, *Low-Cost Decisions as a Challenge to Public Choice*, 77 PUBLIC CHOICE 107-115 (1993); SCHUMPETER, *supra*, note 5. For examples of how the process of collective opinion formation can be explored in more detail, see Michael Wohlgemuth, *Evolutionary Approaches to Politics*, 55 KYKLOS 223–246 (2002a); Michael Wohlgemuth, *Democracy and Opinion Falsification: Towards a New Austrian Political Economy*, 12 CONSTITUTIONAL POLITICAL ECONOMY 223–246 (2002b).

<sup>17</sup> Alfred Meier & Susanne Haury, *A Cognitive-evolutionary Theory of Economic Policy*, in *THE EVOLUTION OF ECONOMIC SYSTEMS. ESSAYS IN HONOUR OF OTA SIK 77* (Kurt Dopfer & Karl Raible eds., 1990); ALFRED MEIER & TILMAN SLEMBECK, *WIRTSCHAFTSPOLITIK: KOGNITIV-EVOLUTIONÄRER ANSATZ* (2ND ED.) (1998);

the entrepreneur as creator of innovations to all participants in the political process. Politicians and the government are thus no longer modeled as merely passive actors that react to the demands of voters, interest-groups, or the bureaucracy. But rather, they are actively engaged in generating novel solutions to collective problems that ultimately leads to the drafting of new legislation. Moreover, it is assumed that even the problems themselves are not given, but are created in a collective process of cognitive construction. In contrast to Public Choice theories, both the set of alternatives from which a new statute has to be chosen and the very problem to which it provides a solution is not seen as objectively known *ex ante*.<sup>18</sup>

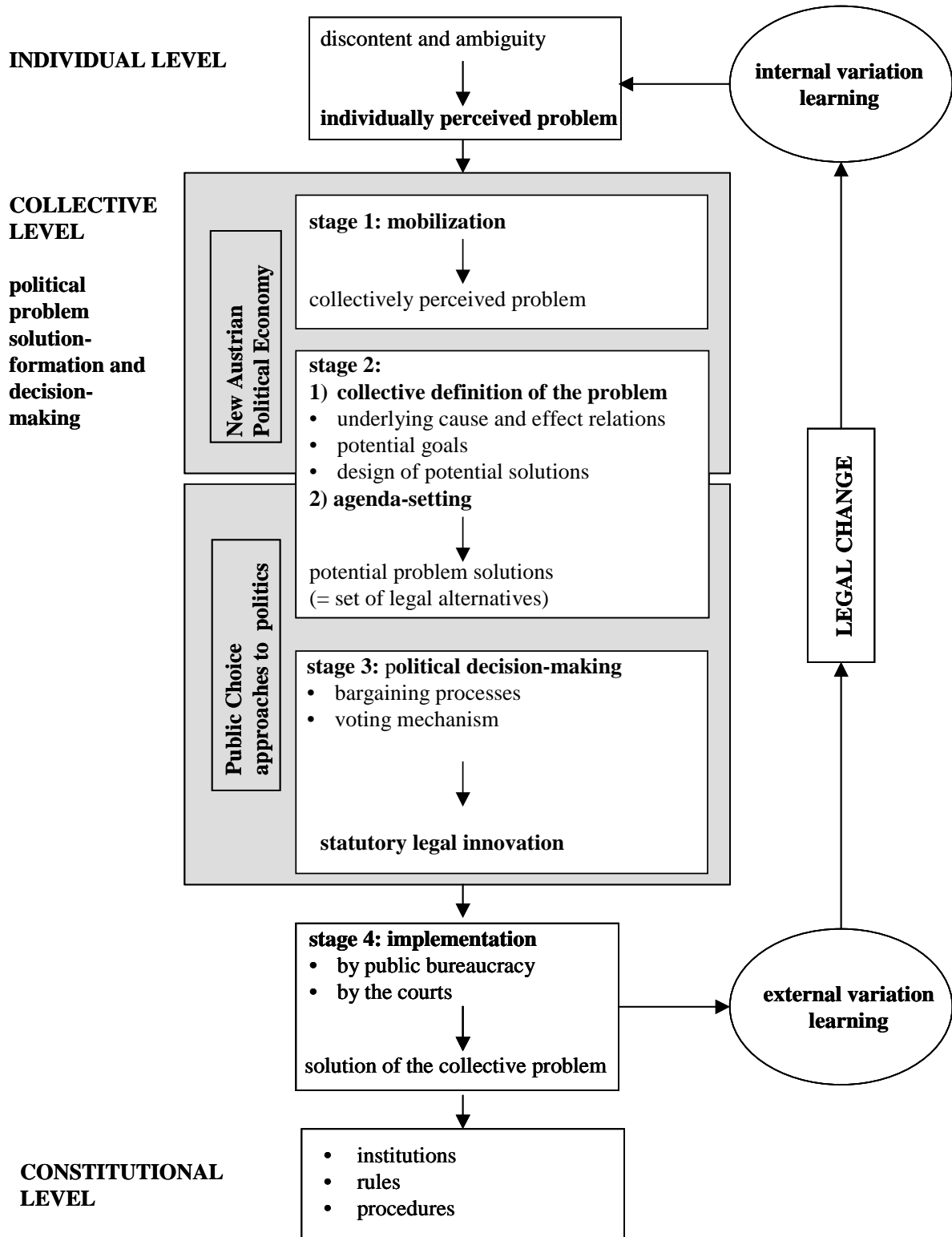
Obviously, endogenizing these hitherto exogenous variables limits the explanatory power of the traditional utility-maximizing economic approach, which assumes a given invariable and closed set of alternatives. The cognitive-evolutionary approach to policy making applies a multi-level variation-selection concept which allows one to derive empirically testable hypotheses. Three main levels are distinguished, which are characterized by different variation mechanisms, selection environments and principles as follows: the individual, the collective, and the constitutional level. They are interlinked by the individual actors, who generate variations on each level – although through different mechanisms, and by the outcomes of the different selection processes which in turn affect the working of the other levels (*figure 1*).

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Tilman Slembeck, *Ideologies, Beliefs, and Economic Advice – A Cognitive-Evolutionary View on Economic Policy-Making*, in THE EVOLUTIONARY ANALYSIS OF ECONOMIC POLICY 128-161 (Pavel Pelikan & Gerhard Wegner eds., 2003); Tilman Slembeck, *The Formation of Economic Policy: A Cognitive-Evolutionary Approach to Policy-Making*, 8 CONSTITUTIONAL POLITICAL ECONOMY 225-254 (1997).

<sup>18</sup> SLEMBECK (1997), *id.*, 227.

Figure 1: A Variation-Selection Approach to Statutory Legal Change



Source: Adapted Tilman Slembeck, *The Formation of Economic Policy: A Cognitive-Evolutionary Approach to Policy-Making*, 8 CONSTITUTIONAL POLITICAL ECONOMY 225-254 (1997).

While the constitutional level defines the institutions, rules, and procedures that govern the problem-solving process on the collective level, the starting point for all statutory innovations is the individual.<sup>19</sup> Based on methodological individualism, this approach applies a cognitive model of action that incorporates elements from cognitive science. By assuming cognitive creativity, novelty can emerge endogenously. Continuously generated novel ideas and perceptions lead to innovations, which can be interpreted as being created by Schumpeterian entrepreneurs. But bounded rationality and satisfying behavior set a first limit on the ubiquitous generation of variety. Individual discontent with the actual situation and ambiguity with respect to the information received and the theories held lead individuals to the perception of problems that have to be solved.

The implementation of statutory innovation requires the passing of a four-stage collective problem solving process. At the first stage, mobilization of other individuals and resources must be sufficiently high to convince others about one's own view of a problem.<sup>20</sup> After successful mobilization, the problem enters the second stage in which a collective definition of the problem is generated through public debate and opinion formation.<sup>21</sup> It encompasses the underlying causes, their potential effects, the goals to be pursued and the potential solutions. The more novel a problem is, the higher is its uncertainty and the more controversial its resulting debates. Due to the limited problem-solving capacity of legislation, which itself is a consequence of the limited resources and time, a number of different collective problems "compete" with one another. If an issue is finally put on the political agenda, preliminary views about its proper definition, the goals, and the effective instruments have been reached.

On the decision-making stage, political exchange and thus bargaining processes dominate.<sup>22</sup> Here the questions dealt with by the Public Choice approach come into sharp focus. The resources available to the political decision-makers and the

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<sup>19</sup> SLEMBECK (1997), *id.*, 230-231.

<sup>20</sup> The resources necessary to mobilize support and political pressure differ according to the number of potentially affected persons and the extent of the problem. Accordingly, elite problems, structural problems, interest group problems and crisis problems can be distinguished (SLEMBECK (1997), *id.*, 231-233).

<sup>21</sup> SLEMBECK (1997), *id.*, 233-238.

<sup>22</sup> SLEMBECK (1997), *id.*, 238-241.

institutional setting such as the voting rules and the role of committees prove to be the decisive selection criteria for the finally enacted legal innovation. While traditional approaches to statutory legal change end with the passing of a statute, in the cognitive-evolutionary approach, its implementation is explicitly taken into account.<sup>23</sup> Both public administration and the courts have discretionary power to modify its content. Therefore, new processes of reinterpreting the underlying problem as well the meaning of the statute may start over again.

Statutory innovation thus implies hypotheses about the cause-and-effect-relations of the collectively perceived problem, which is based on the subjective theories and beliefs of the actors and that can thus potentially be wrong. As a consequence, both the underlying problem may remain unsolved and new problems originating from unforeseeable reactions to the new statute may emerge. The resulting external variation initiates new efforts that will perhaps lead to additional legal innovations. Moreover, learning takes place because the effects of the statutory innovation are assessed on the individual, the collective, and the constitutional level. Thus, there is an ongoing process of legal change.<sup>24</sup>

## C. Judge-made Legal Change as a Discovery Procedure

### *I. Legal Change as a Trial and Error Process – The Austrian Perspective*

Hayek's notion of competition as a trial-and-error process plays a prominent role in evolutionary economics. The starting point of his reasoning is the fundamental knowledge problem of human beings.<sup>25</sup> This is in stark contrast to the neoclassical assumption that preferences, tastes, information, resources, skills are already given as data before competition starts, which then works solely as an allocation mechanism. According to Hayek, the economic problem is exactly that the data and assumptions of neoclassical economics are not and cannot be known by anyone in advance. Therefore competition serves as a mechanism to discover and communicate information about the underlying variables.<sup>26</sup> It sets incentives for

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<sup>23</sup> SLEMBECK (1997), *id.*, 241-243.

<sup>24</sup> SLEMBECK (1997), *id.*, 245-248.

<sup>25</sup> HAYEK, *supra*, note 2, 11-15.

<sup>26</sup> Friedrich Hayek, *Economics and Knowledge*, in Hayek, INDIVIDUALISM AND ECONOMIC ORDER 33-56 (Friedrich Hayek ed., 1948a); Friedrich Hayek, *The Use of Knowledge in Society*, in INDIVIDUALISM AND ECONOMIC ORDER (Friedrich Hayek ed., 1948b); Friedrich Hayek, *The Meaning of Competition*, in INDIVIDUALISM AND ECONOMIC ORDER (Friedrich Hayek ed., 1948c); Friedrich Hayek, *Competition as a Discovery Procedure*, 5 THE QUARTERLY JOURNAL OF AUSTRIAN ECONOMICS 9–23 (1968/2002).

individuals to search for new knowledge. Since competition allows for the parallel testing of different hypotheses, it makes more information available than could be used otherwise. Competition can be thus conceived as a permanent trial-and-error process in which new hypotheses are continuously generated and tested.<sup>27</sup> This notion of competition as a discovery procedure underlies also Hayek's reasoning about the evolution of societies and their institutions which he refers to as cultural evolution.<sup>28</sup> Consequently, he has also analyzed judge-made legal change from this point of view.<sup>29</sup>

Like markets, Hayek regards the law as a spontaneous order which is the result of an ongoing evolutionary process.<sup>30</sup> He sees judge-made legal innovations as a mainly unintended outcome of administering the law.<sup>31</sup> The necessary precondition is that conflicts are brought to the courts. If conflicts arise out of novel economic situations, legal innovations have to be generated, since legal rules are always only a response to past conflicts. Because a judge cannot refer to an already established legal norm or convention, he or she has either to derive a legal innovation from higher legal principles or to create one from the start. But also in the case of already well-known situations, conflicting expectations of the actors involved about the relevant legal rule can result in an action by which it will be modified just by chance. By referring to informal legal norms and conventions a judge will derive the legal rule applicable to the case at hand. However, in the course of explicitly articulating an informal legal rule, it is inevitable that slight modifications or legal innovations occur; this also holds for routine cases. Accordingly, Hayek assumes that judge-made legal innovations are to some degree the result of chance.<sup>32</sup>

The variety of viable legal innovations is restricted by the selection and retention mechanisms inherent to the court system. In particular, a judge has to be able to

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<sup>27</sup> The Austrian notion of competition as a discovery procedure is thus also compatible to Popper's idea of hypothesis testing and falsification (KARL POPPER, *OBJECTIVE KNOWLEDGE - AN EVOLUTIONARY APPROACH* (1972).

<sup>28</sup> For his concept of cultural evolution see Hayek, *supra*, note 2; Friedrich Hayek, *The Results of Human Action but not of Human Design*, in *STUDIES IN PHILOSOPHY, POLITICS, AND ECONOMICS* 95-105 (Friedrich Hayek, 1967), FRIEDRICH HAYEK, *THE FATAL CONCEIT - THE ERRORS OF SOCIALISM* (1988). This concept has been extensively criticized. For a detailed analysis, see e.g., HODGSON, *supra*, note 4; OKRUCH, *supra*, note 2, 123-136; VIKTOR VANBERG, *RULES AND CHOICE IN ECONOMICS* (1994), 77-94, 95-106.

<sup>29</sup> Hayek discusses statutory legal change largely according to public choice theory (HAYEK (1979), *supra*, note 2, 1-40, 98-105).

<sup>30</sup> HAYEK, *supra*, note 26; HAYEK, *supra*, note 5; HAYEK, *supra*, note 2.

<sup>31</sup> HAYEK, *supra*, note 2, 94-123.

<sup>32</sup> See HAYEK (1973), *supra*, note 2, 78, 99-118. For a more elaborated discussion of this argument, see ECKARDT, *supra*, note 1, 95-106; OKRUCH, *supra*, note 2.

defend his legal innovation according to the valid legal principles against other members of the judiciary. Thus for Hayek, the socialization of the judges is decisive.<sup>33</sup> He assumes that they acquire a preference for interpreting conflicts in accordance with the given legal order during their professional training. Therefore, each judge strives to decide cases in line with the legal principles handed down by legal tradition. In addition, he supposes that the same holds true for of the application of statute-based law, even if the legislature had once intended that a statutory legal rule should be interpreted in a different manner.<sup>34</sup> In general, Hayek prefers judge-made legal rules since he assumes them to be better able to create stable expectations based on abstract legal rules, which are a prerequisite for the working of a market economy. But he also acknowledges that under specific circumstances statutory legal innovations are more advantageous. Because of the gradual evolution of judge-made legal rules, they may also result in an undesirable path, which can not be reversed that easily and quickly by the courts. In addition, in case of novel conflicts, immediate legal action may be required, and the legislature requires less time to promulgate publicly known legal innovations than the judiciary.<sup>35</sup>

For Hayek, administering the law by the courts is a trial-and-error process in which hypotheses as to the proper interpretation of legal rules are continuously tested. The central selection mechanism of the finally applied legal rule is the socialization of the judges.<sup>36</sup> Gradual modifications and novel interpretations of well-established legal rules may lead to their application in varying economic situations in the future. In addition, novel conflicts may arise because of conflicting expectations of the individual actors regarding the valid legal rules, and again have to be decided by the courts.<sup>37</sup> As a consequence, the administration of law by judges entails a permanent process of trial-and-error that contributes to the evolution of the law.<sup>38</sup>

Hayek thus directs the attention to the knowledge-creating features of legal change, which is an ongoing task in an evolutionary environment. More recent research has

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<sup>33</sup> HAYEK, *supra*, note 2, 65-67.

<sup>34</sup> HAYEK, *supra*, note 2, 66.

<sup>35</sup> Hayek also admits that sometimes judges may even destroy the legal tradition they had supported so far. However, he is not precise as to the underlying causes and mechanisms (HAYEK (1973), *supra*, note 2, 66).

<sup>36</sup> HAYEK, *supra*, note 2, 120.

<sup>37</sup> HAYEK, *supra*, note 2, 78, 120.

<sup>38</sup> HAYEK, *supra*, note 2, 65, 102.

emphasized that Hayek's concept of judge-made legal evolution cannot only be applied to the Anglo-Saxon common law system.<sup>39</sup> In the case of statutes, courts have to decide the precise content of a statutory legal rule while applying it to the actual case at hand as well. Thus, at any given point in time, there usually are quite a number of more or less differing interpretations of the same overall legal rule applied within a jurisdiction. However, legal heterogeneity is limited due to the selection and retention mechanisms inherent to legal systems. Thus, conceiving judge-made legal change as a trial-and-error process holds also for civil law systems.

## *II. The Law and Economics Approach to Legal Change*

The law and economics approach to legal change has as its genesis neoclassical economics. There are two main lines of law and economics reasoning on the evolution of law. The first approach, which is outlined in greater detail in the following, analyses legal change within a given legal system. It sees the driving force of legal change in the frequency to litigate. In contrast, the second, more recent approach, sees the driving force for legal change in competition between different legal systems and thus in free choice of law.<sup>40</sup> Since Kerber provides an elaborate discussion of the latter's working mechanisms in this volume, it should suffice here to note that in contrast to the former one, competition among legal rules between different legal systems addresses not only the question of the selection mechanisms but also of the sources for novel legal rules.

Judge-made legal change is, for the most part, an unintended byproduct of the ordinary administration of law by the courts. A statutory legal innovation is the outcome of a collective problem-solving process and is immediately binding for the whole jurisdiction once it is enacted.<sup>41</sup> In contrast, to be binding for the whole

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<sup>39</sup> ECKARDT, *supra*, note 1; OKRUCH, *supra*, note 2; GEORG VON WANGENHEIM, DIE EVOLUTION VON RECHT. URSACHEN UND WIRKUNGEN HÄUFIGKEITSABHÄNGIGEN VERHALTENS IN DER RECHTSFORTBILDUNG (1995); Georg von Wangenheim, *The Evolution of Judge-made Law*, 13 INTERNATIONAL REVIEW OF LAW AND ECONOMICS 381-411 (1994).

<sup>40</sup> Emanuela Carbonara & Francesco Parisi, *Choice of Law and Legal Evolution: Rethinking the Market for Legal Rules*, in LEGAL STUDIES RESEARCH PAPER SERIES, UNIVERSITY OF MINNESOTA LAW SCHOOL, Research Paper No. 07-38 (2007), available at <http://ssrn.com/abstract=1011376>; Anthony Ogus, *Competition between National Legal Systems: A Contribution of Economic Analysis to Comparative Law*, 48 INTERNATIONAL AND COMPARATIVE LAW QUARTERLY 405-418 (1999).

<sup>41</sup> At least, this is the usual idea. However, Aoki makes quite clear that it is not the wording of a statute, but people seeing it as binding for their actions that makes a legal rule an institution. In this way, the distinction between statutory and judge-made legal rules becomes somehow blurred (MASAHIKO AOKI, TOWARD A COMPARATIVE INSTITUTIONAL ANALYSIS (2001)).

jurisdiction, judge-made legal innovations first have to be disseminated through the hierarchical court system. To explain the process of judge-made legal change in detail, the selection mechanisms driving the diffusion of legal innovations are an explicit topic in the law and economics literature.<sup>42</sup> Similar to the public choice approach to statutory legal change, the law and economics approach applies the main ideas of standard microeconomic theory to judge-made legal change (table 1), but it also uses evolutionary arguments.

Table 1: Analogy between economic markets and courts

	Markets	Courts
<b>Supply side</b> Actors, behavioral assumptions	Firms, profit maximization	Judges, utility maximization (income, reputation)
<b>Demand side</b> Actors, behavioral assumption	Consumers, utility maximization	Litigants, income maximization
<b>Objects of exchange</b>	Goods and services vs. money	Legal rules (public good) and income (private good) vs. reputation (private good) and income of the judges (public costs)
<b>Coordination Mechanism(s)</b>	Invisible hand of the market (price mechanism)	Impartiality of the judges

Source: Adapted from RICHARD POSNER, *ECONOMIC ANALYSIS OF LAW*, 5<sup>TH</sup> ED. (1998).

The typical reasoning of the law and economics literature is briefly illustrated with reference to Posner's.<sup>43</sup> On markets all relevant information is communicated through price signals, with the price mechanism as the decisive coordination mechanism. For Posner, the market mechanism guarantees an efficient resource allocation according to consumers' preferences, which are revealed by their willingness-to-pay. However, he assumes that in cases of high transaction costs,

<sup>42</sup> COOTER & ULEN, *supra*, note 2; Vincy Fon & Francesco Parisi, *Litigation and the Evolution of Legal Remedies: A Dynamic Model*, 116 *PUBLIC CHOICE* 419-433 (2003); Vincy Fon, Francesco Parisi & Ben Depoorter, *Litigation, Judicial Path-Dependence, and Legal Change*, 20 *EUROPEAN JOURNAL OF LAW AND ECONOMICS* 43-56 (2005); MERCURO & MEDEMA, *supra*, note 11; RICHARD POSNER, *ECONOMIC ANALYSIS OF LAW*, 7<sup>TH</sup> ED. (2007). Note that Hayek remains rather unspecific in this respect.

<sup>43</sup> For a short summary of other approaches discussing judicial incentives and litigation as a selection mechanism, see Hugo Mialon, Paul Rubin & Joel Schrag, *Judicial Hierarchies and the Rule-Individual Tradeoff*, 15 *SUPREME COURT ECONOMIC REVIEW* 3-20 (2007).

courts provide a more economical allocation of resources and thus work as a substitute for the market mechanism.<sup>44</sup>

Legal rules impose “prices” on potential economic activities. It is assumed that utility maximizing individuals take these into account when they decide whether to carry out an activity or not; thus, the willingness-to-pay (for the sanctions imposed by certain legal rules) reflects the preferences of individuals. According to Posner, the impartial judge takes on the role of the invisible hand of the market.<sup>45</sup> Aside from specific ethics, which are learned by the judges in the course of their professional training, the hierarchical structure of the modern court system ensures the efficient allocation of property rights by the courts. Therefore, utility-maximizing self-interested judges will pass only decisions that are in line with the overall legal order, since the overruling of a judgment by a higher court would lead to a loss of reputation for the judge of the lower court.

Legal innovations are assumed to be unintentionally generated by judges through the application of given legal rules to the specific case at hand.<sup>46</sup> By chance a judge might slightly modify an existing legal rule. Such legal innovations, which at first only hold for the case at hand, are disseminated in two ways. Firstly, the party defeated might appeal to a higher court, which in turn might confirm the decision of the lower court, thus turning this legal innovation into a precedent. Secondly, similar conflicts might lead to a higher frequency to litigate; therefore, the underlying legal rule is brought to court more often. Hence, the probability rises that it will be modified more often by different courts of the jurisdiction.

These mechanisms inherently use evolutionary ideas. No longer a given set of assumed legal alternatives, the process through which legal innovations and thus variety is created is explicitly modeled. Moreover, the selection mechanisms that restrict the range of viable legal rules are explored. The well-known and broadly discussed hypothesis that judge-made legal change tends to enhance the proportion of legal rules that promote economic efficiency entails a statement about the direction of judge-made legal change over time.<sup>47</sup> It implies that the court system should be able to perfectly mimic competitive markets.

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<sup>44</sup> POSNER, *supra*, note 2.

<sup>45</sup> POSNER, *supra*, note 2, 581-584.

<sup>46</sup> POSNER, *supra*, note 2, 587-596.

<sup>47</sup> George Priest, *The Common Law Process and the Selection of Efficient Rules*, 6 JOURNAL OF LEGAL STUDIES 65-82 (1977); Paul Rubin, *Why is the Common Law Efficient?* 6 JOURNAL OF LEGAL STUDIES 51-63 (1977); William Landes & Richard Posner, *Adjudication as a Private Good*, 8 JOURNAL OF LEGAL STUDIES 235-284

This efficiency hypothesis has drawn a lot of attention and a number of objections have been raised.<sup>48</sup> They mainly concern the specification of the selection environment that is necessary to render the term “efficiency” meaningful, and the common goods characteristic of efficient legal rules.<sup>49</sup> Since both litigants as well as judges are assumed to maximize their individual utility, a suboptimal production of efficient legal rules is to be expected as individual actors take into account only those costs and benefits which directly accrue to them. Thus, it is not that convincing that inefficient legal rules are brought to court more often than efficient ones since this would imply different incentives for individual actors for taking legal action.<sup>50</sup> It seems just as plausible that efficient legal rules are contested more often than inefficient ones due to their distributive effects, if certain actors are systematically burdened by an efficient legal rule, and if the costs of taking an action are relatively small compared to the potential gains.<sup>51</sup> Thus, Cooter/Ulen conclude that “(t)he problem with viewing a court as a market is that redistributive gains are frequently more important than inefficiencies in channeling litigation.”<sup>52</sup>

To sum up, the efficiency thesis of judge-made legal change cannot be supported from an evolutionary economics point of view. Nevertheless, the law and economics approach to judge-made legal change provides a good starting point for further elaboration. In contrast to the standard neoclassical model, it takes legal rules not as given, but explicitly deals with their generation and dissemination. The

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(1979); George Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 JOURNAL OF LEGAL STUDIES 1-55 (1984); Peter Aranson, *Electoral Competition and Entrepreneurship*, 5 ADVANCES IN AUSTRIAN ECONOMICS, 183-215 (1998); POSNER, *supra*, note 42; Rubin Cooter & Daniel Rubinfeld, *Economic Analysis of Legal Disputes and Their Resolution*, 27 JOURNAL OF ECONOMIC LITERATURE 1067-1097 (1989); COOTER & ULEN, *supra*, note 2; James Hackney, *Law and Neoclassical Economics Theory: A Critical History of the Distribution/Efficiency Debate*, 32 JOURNAL OF SOCIO-ECONOMICS 361-390 (2003).

<sup>48</sup> For a discussion of what kind of efficiency makes sense as a principle to evaluate and guide legal change, see Francesco Parisi & Jonathan Klick, *Functional Law and Economics: The Search for Value-Neutral Principles of Lawmaking*, 79 CHICAGO-KENT LAW REVIEW 431-450 (2004). For a discussion of the law and economics approach from a behavioural perspective, see Christine Jolls, Cass Sunstein & Richard Thaler, *A Behavioral Approach to Law and Economics*, 50 STANFORD LAW REVIEW 1471-1550 (2001); Grant Hayden & Stephen Ellis, *Law and Economics After Behavioral Economics*, 55 KANSAS LAW REVIEW 629-675 (2001).

<sup>49</sup> Wolfgang Kerber, *Recht als Selektionsumgebung für evolutionäre Wettbewerbsprozesse*, in ZWISCHEN EVOLUTION UND INSTITUTION. NEUE ANSÄTZE IN DER ÖKONOMISCHEN THEORIE 297–326 (Birger Priddat, & Gerhard Wegner eds., 1996); VANBERG, *supra*, note 28.

<sup>50</sup> Rubin Cooter & Lewis Kornhauser, *Can Litigation Improve the Law Without the Help of Judges?* 9 JOURNAL OF LEGAL STUDIES 129-163 (1980); COOTER & ULEN, *supra*, note 2.

<sup>51</sup> Louis De Alessi & Robert Staaf, *The Common Law Process: Efficiency or Order?*, 2 CONSTITUTIONAL POLITICAL ECONOMY 107-126 (1991); HACKNEY, *supra*, note 47.

<sup>52</sup> RUBIN COOTER & THOMAS ULEN, LAW AND ECONOMICS 496, 1<sup>ST</sup> ED. (1988).

frequency to litigate and the hierarchical structure of the court system define the relevant selection environment, which influences the pace and direction of legal change. Moreover, in recent years the law and economics literature has not only broadened the scope of subjects analyzed but also the methods used. So it not only relies on static maximization, but also draws on game theoretic approaches to model legal change. However, as Aoki impressively shows, these two approaches are still static in that they both assume a given action space from which the actors choose according to a given available selection of strategies.<sup>53</sup> In contrast to that, Aoki suggests a cognitive-constructivist view and formulates a subjective game theoretical approach. His concept of institution-induced, individual game-models no longer relies on a closed action space but allows for variety implying genuine novelty, and thus for one of the main ingredients of evolutionary approaches. Although he only implicitly deals with legal change, his approach might prove very fruitful for analyzing the interrelationship of institutional change (comprising legal evolution) and economic change.

#### D. Legal Paradigms and Path Dependence

The approaches presented thus far focus on the mechanisms of either statutory or judge-made legal change. To derive hypotheses about the direction of legal change, complexity has to be taken into account.<sup>54</sup> For this, the concept of legal paradigms may prove helpful.<sup>55</sup> Legal paradigms allow for integration on the one hand a model of human action, which includes cognitive creativity as an endogenous source of novelty and thus as a variation mechanism, and on the other hand the concept of path dependence, which serves as an additional selection and retention mechanism.

Both the notion of paradigms and of path dependence have been developed in the economic analysis of technological change. Therefore, they allow drawing from the

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<sup>53</sup> AOKI, *supra*, note 41.

<sup>54</sup> Although the interdependence between statutory and judge-made legal change has been addressed by a number of authors, so far no coherent explanation as to the relative weight of these two main mechanisms of legal change has been developed. See, e.g., Donald Boudreaux & A. C. Pritchard, *Reassessing the Role of the Independent Judiciary in Enforcing Interest-Group Bargains*, 5 CONSTITUTIONAL POLITICAL ECONOMY 1-21 (1994); ECKARDT, *supra*, note 1, 176-201; HAYEK, *supra*, note 2; LANDES & POSNER, *supra*, note 47; POSNER, *supra*, note 2.

<sup>55</sup> ECKARDT, *supra*, note 1; KERBER & HEINE, *supra*, note 1; KLAUS HEINE, REGULIERUNGSWETTBEWERB IM GESELLSCHAFTSRECHT. ZUR FUNKTIONSFÄHIGKEIT EINES WETTBEWERBS DER RECHTSORDNUNGEN IM EUROPÄISCHEN GESELLSCHAFTSRECHT (2003).

rich insights gained in the evolutionary branch of innovation economics.<sup>56</sup> Legal paradigms can be defined analogous to technological paradigms. This latter concept was introduced by Dosi, who draws on Kuhn's notion of scientific paradigms.<sup>57</sup> Since legal rules can be conceived as socio-technological devices to cope with interpersonal coordination problems and conflicts as a consequence of scarce resources, legal paradigms can be defined as encompassing all positive and negative heuristics how to legally cope with particular problems as well as the specific legal rules generated by and applied to them.<sup>58</sup> A legal paradigm defines both the cognitive frame within which novel legal problem-solutions are looked for as well as the methods used to generate and disseminate legal innovations. A given dominant paradigm entails the prevailing way of perceiving and dealing with legal problems. Only if inconsistencies and contradictions prove too strong under the given legal paradigm, the underlying positive and negative heuristics will be scrutinized and eventually changed.

The legal paradigm in place also delimits the scope for viable legal innovations if a novel problem emerges or a given legal rule is modified. As a consequence, it also strongly influences the direction of legal change, however without prescribing the particular content of the legal rules applied. At any point in time there are a number of different legal rules that can solve the underlying socio-economic problem while at the same time being compatible with the overall legal paradigm. However, the actually applied legal rule is the outcome both of chance and of the contingencies (like the influence of different interest-groups) as well as the result of the legal rules applied in the past and thus of path dependence.

Although the concept of path dependence was developed without reference to the notion of technological paradigms, the two concepts are complementary.<sup>59</sup> While the concept of legal paradigms might serve as a heuristic device that delimits the overall scope for legal innovations, the concept of path dependence helps to explain the mechanisms that link the applied legal rules to one another over time.

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<sup>56</sup> Giovanni Dosi, *Technological Paradigms and Technological Trajectories. A Suggested Interpretation of the Determinants and Directions of Technical Change*, 11 RESEARCH POLICY 147-162 (1982); METCALFE, *supra*, note 4; NELSON & WINTER, *supra*, note 4; PAOLO SAVIOTTI, *TECHNOLOGICAL EVOLUTION, VARIETY AND THE ECONOMY* (1996).

<sup>57</sup> THOMAS KUHN, *THE STRUCTURE OF SCIENTIFIC REVOLUTIONS* (2<sup>ND</sup> ED.) (1970).

<sup>58</sup> ECKARDT, *supra*, note 1, 196-200; KERBER & HEINE, *supra*, note 1.

<sup>59</sup> BRIAN ARTHUR, *INCREASING RETURNS AND PATH DEPENDENCE IN THE ECONOMY* (1994); Paul David, *Clio and the Economics of QWERTY*, 75 AMERICAN ECONOMIC REVIEW 332-337 (1985); S.J. Liebowitz & Stephen Margolis, *Path Dependence, Lock-in and History*, 11 JOURNAL OF LAW, ECONOMICS, AND ORGANIZATION 205-226 (1995); NORTH, *supra*, note 13, 92-104.

Therefore, legal innovations are partly shaped by the previously applied legal rules.<sup>60</sup> So far no consistent classification of the factors that cause path dependences through positive feedback effects has been developed.<sup>61</sup> But it seems not to be controversial that sunk and switching costs due to set up- and fixed costs and institution specific-investment, dynamic economies of scale that result from network externalities and learning effects, and complementarities contribute to the persistence of a particular legal path.<sup>62</sup> Furthermore, the complexity and genuine uncertainty that characterize the process of legal change foster path dependence, since the actors involved will rather base their decisions on routines than taking an optimization approach.<sup>63</sup> Such routines are also part of the overall legal paradigm, since the positive and negative heuristics guide both the perception of the legal problem under consideration as well as the search for novel legal problem-solutions.<sup>64</sup>

The path dependence of a given legal trajectory might lead to lock in-effects which prevent the application of superior legal rules.<sup>65</sup> Nevertheless, a given legal paradigm is compatible with various legal trajectories. Generated by creative actors legal innovations might be adopted which eventually lead to either ramifications of the given legal trajectory<sup>66</sup> or even to competing trajectories. Also shifts between legal paradigms are possible which would imply a change in the positive and

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<sup>60</sup> The existing legal rules form a legal trajectory. According to Dosi, a technological trajectory is "the pattern of 'normal' problem solving activity ... on the ground of a paradigm" (DOSI, *supra*, note 56, 152).

<sup>61</sup> For a detailed formal treatment of legal path dependences by applying the concept of frequency-dependency, see WANGENHEIM, *supra*, note 32.

<sup>62</sup> ECKARDT, *supra*, note 1; Oona Hathaway, *Path Dependence in the Law: The Course and Pattern of Legal Change in a Common Law System*, 86 IOWA LAW REVIEW 601-661 (2001); HEINE, *supra*, note 55; KERBER & HEINE, *supra*, note 1; Daniel Kiwit, *Path-Dependence in Technological and Institutional Change – Some Criticisms and Suggestions*, MAX-PLANCK-INSTITUT ZUR ERFORSCHUNG VON WIRTSCHAFTSSYSTEMEN, DISKUSSIONSBEITRAG 10-95 (1995); NORTH, *supra*, note 2, 92-104; Anthony Ogus, *The Economic Basis of Legal Culture: Networks and Monopolization*, 22 OXFORD JOURNAL OF LEGAL STUDIES 419-434 (2002); Eric Woerdman, *Legal Inertia and Path Dependence: An Economic Exploration of Analogies and Definitions*, in INSTITUTIONS IN LEGAL AND ECONOMIC ANALYSIS 23-45 (Aloys Prinz, Albert Steenge & Jörg Schmidt eds., 2004).

<sup>63</sup> NELSON, *supra*, note 4; RICHARD NELSON & SIDNEY WINTER, AN EVOLUTIONARY THEORY OF ECONOMIC CHANGE (1982), 96-136; NELSON & WINTER, *supra*, note 4).

<sup>64</sup> ECKARDT, *supra*, note 1, 196-200; WOERDMAN, *supra*, note 62.

<sup>65</sup> KERBER & HEINE, *supra*, note 1

<sup>66</sup> Such ramifications might result when a legal innovation is generated to solve a particular aspect of the underlying socio-economic problem which so far has been addressed also by the original legal rule. As a consequence, both legal rules will form independent paths in the future.

negative heuristics applied to the search for legal problem solutions. Although the notion of both legal paradigms and legal path dependences seems to be a fruitful approach to derive additional statements about the direction of legal change over time, more conceptual and empirical work is necessary to explore its contribution to a comprehensive theory of legal change.

### E. Law, Technology and Economic Change

The approaches discussed so far have in common that they concentrate on the mechanisms of legal change that are inherent to the law. Although they assume changes in economic variables as one of the main driving forces for legal evolution, the impact of economic change, which is itself an evolutionary process, is not analyzed in more detail. A more comprehensive framework for analyzing the co-evolution of law and technology and its economic impact is presented in Eckardt.<sup>67</sup> Technological, economic and legal change are viewed as the outcome of specific variation-selection-processes. They are nevertheless linked to each other due to the wealth effects they cause, since the latter set incentives for individual actors to actively engage in the generation and dissemination of technological as well as legal innovations (*figure 2*).<sup>68</sup>

The starting point of this approach is the appearance of novel negative technological externalities, which arise as an unintended, but inevitable by-product of technological innovations.<sup>69</sup> Similar to the variation-selection approach to statutory legal change discussed in section 2.2, a cognitive model of human action is applied, according to which cognitive creativity is the main source from which

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<sup>67</sup> ECKARDT, *supra*, note 1.

<sup>68</sup> The fruitfulness of this approach is shown in several case studies which focus on the evolution of the German tort and accident law which was a result of the introduction of modern technologies like railroads and steam engines in the 19th century, see ECKARDT, *supra*, note 1, 207-311; Martina Eckardt, *The Evolution of the German Tort Law in the 19th Century – An Economic Analysis of the Evolution of Law*, in INSTITUTIONAL ANALYSIS OF HISTORY 83-116 (Oliver Volckart ed., 2004).

<sup>69</sup> Due to the complexity of the subject dealt with, this approach concentrates on the impact of negative technological externalities on legal evolution. However, it should become obvious that it can be easily modified to analyze other aspects of the co-evolution of law and technology as well.

novel ideas emerge.<sup>70</sup> The various variation and selection mechanisms finally lead to technological and legal innovations.

To cope with the particularities of technological change the concept of the industry life cycle is used as an heuristic device.<sup>71</sup> It allows specifying the economic selection environment which changes over time due to the generation and dissemination of techno-logical innovations. Several phases in the evolution of a market can be distinguished, each with its own constraints, behavioral incentives, and outcomes.

According to the concept of the industry life cycle, industries show some uniform patterns with respect to the rate of adoption of technological innovations, their improvements and market entries and exits, output growth, and changes in prices and qualities.<sup>72</sup>

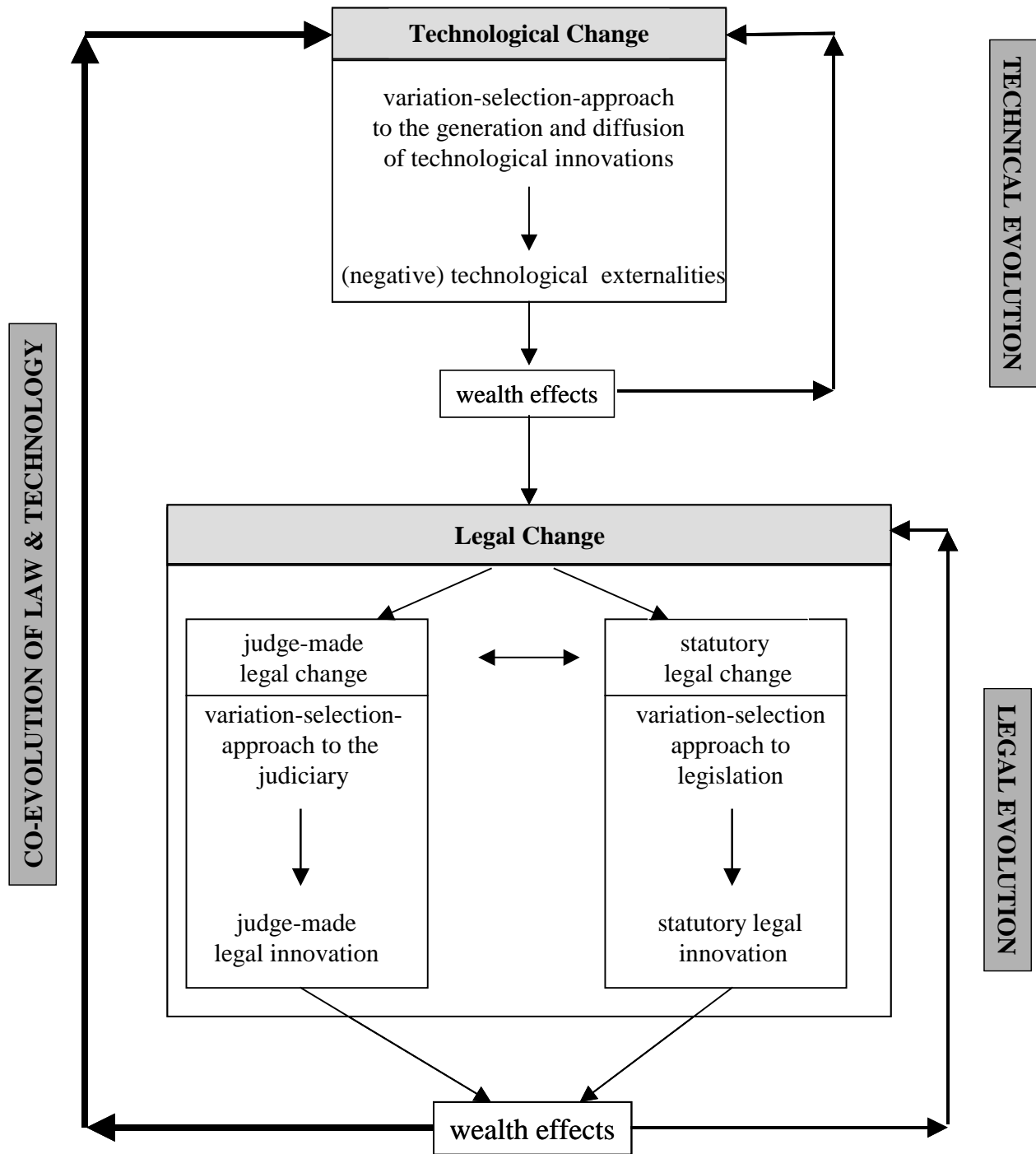
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<sup>70</sup> ECKARDT, *supra*, note 1, 69-75.

<sup>71</sup> ECKARDT, *supra*, note 1, 75-87.

<sup>72</sup> DAVID AUDRETSCH, *INNOVATION AND INDUSTRY EVOLUTION* (1995); Wesley Cohen & Steven Klepper, *The Anatomy of Industry R&D Intensity Distributions*, 82 *AMERICAN ECONOMIC REVIEW* 773-799 (1992); Steven Klepper, *Entry, Exit, Growth, and Innovation over the Product Life Cycle*, 86 *AMERICAN ECONOMIC REVIEW* 562-583 (1996); Steven Klepper & Elisabeth Graddy, *The Evolution of New Industries and the Determinants of Market Structure*, 21 *RAND JOURNAL OF ECONOMICS* 27-44 (1990).

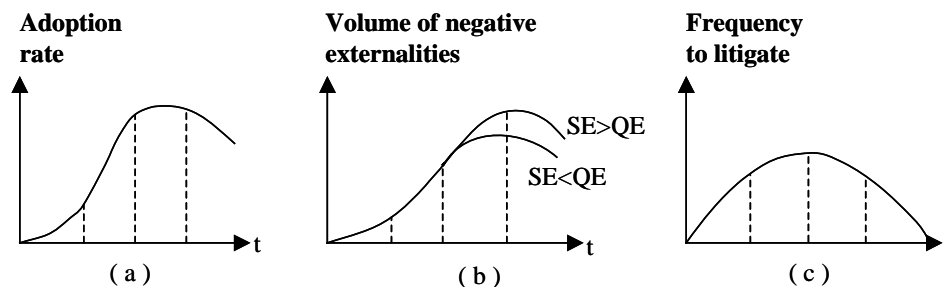
Figure 2: Co-evolution of Law and Technology



Source: own composition.

Successful technological innovations, which are disseminated over time, usually have not only positive, but also negative effects. These arise as an unavoidable by-product of a new technology. However, their extent also changes over the industry life cycle.<sup>73</sup> It depends positively on the rate of adoption of the new technology (scale effect) and negatively on additional technological improvements which take place inter alia through learning-by-doing and learning-by-using (quality effect) (Figure 3 a, b). As a consequence, over the different market stages not only the volume of negative externalities but also the ensuing volume of wealth reduction varies systematically so that, in principle, empirically testable hypotheses can be derived.

Figure 3: Judge-made Legal Change Over the Industry Life Cycle



$t$  = time;  $SE$  = scale effect;  $QE$  = quality effect

Source: own composition.

Eckardt suggests that these wealth effects link legal change to technological change. Since judge-made and statutory legal changes are different mechanisms for generating legal innovations, they have to be discussed separately. However, the impact of technological innovations is incorporated in this approach in a consistent way through the industry life cycle, which constitutes the economic selection environment. It is assumed that wealth effects set incentives for individuals negatively affected by a new technology to turn to the law. They are induced so by the potential redistributive gains from legal innovations. Both statutory as well as judge-made legal innovations can be linked to technological change in a systematic way, which allows to identify regularities and thus again to derive testable hypothesis about the co-evolution of law and technology.

<sup>73</sup> ECKARDT, *supra*, note 1, 112-116.

Judge-made legal innovations are linked to the industry life cycle since the incentives for individual actors to take legal action increase the more they are negatively affected by wealth reductions due to the use of the new technology (Figure 3 c). Individual actors can go to court to get either compensated and/or to prevent additional negative externalities. Judge-made legal change is modeled using a variation-selection-approach, which is based both on the litigation frequency approach of the law and economics literature,<sup>74</sup> as well as on Hayek's view of judge-made legal change as a permanent trial-and-error process.<sup>75</sup> All actors involved (judges, litigants) are assumed to be creative. Because abstract legal rules are applied to particular cases, varying interpretations are inevitable so that the administration of the law by the judges inevitably generates legal innovations. The extent of the variety and heterogeneity of these legal innovations is positively correlated with the novelty of the underlying legal conflict. It is highest in the early stages of the industry life cycle of a new technology. It takes time until a specific legal innovation has passed the hierarchical structure of the court system and eventually has become a precedent, which then is binding for the decisions of lower courts in similar cases. It is assumed that the frequency to litigate positively varies with the wealth reductions caused by the new technology.

Thus, the diffusion of a legal innovation that at first only applies to the particular legal case at hand depends on (1) the selection mechanisms provided by the court system<sup>76</sup> and on (2) the economic selection environment which is represented through the industry life cycle and the resulting incentives to litigate. During the life cycle a legal problem-solving routine evolves, which leads to a growing homogeneity of court decisions.<sup>77</sup> As a consequence the frequency to litigate decreases since potential litigants can form more stable expectations as to the outcome of an action. Therefore out-of-court settlements become more attractive. In addition, interest groups can also influence judge-made legal change.<sup>78</sup> On the

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<sup>74</sup> However, the notion that judge-made legal change is directed towards more efficiency is rejected.

<sup>75</sup> ECKARDT, *supra*, note 1, 132-149.

<sup>76</sup> This is for example characterized by the juridical socialization, the rules of interpreting the law, legal theory, the hierarchical structure of the court system, the role of precedent (ECKARDT, *supra*, note 1, 138-142).

<sup>77</sup> According to Nelson, "routines can be understood as the behaviors deemed appropriate and effective in the settings where they are invoked" (NELSON, *supra*, note 4, 68). For a formal treatment of the impact of litigation on the generation of new legal remedies through judge-made legal change, see FON & PARISI, *supra*, note 42; FON, PARISI & DEPOORTER, *supra*, note 42.

<sup>78</sup> See also, Michael Hutter, *Transaction Cost and Communication. A Theory of Institutional Change, applied to the Case of Patent Law*, in LAW AND ECONOMICS AND THE ECONOMICS OF REGULATION 113–132 (Göran Skogh & Johann-Matthias Graf von der Schulenburg eds., 1986); Francesco Parisi, *Rent-Seeking through Litigation: Adversarial and Inquisitorial Systems Compared*, 22 INTERNATIONAL REVIEW OF LAW AND

one hand, they can affect the frequency of litigation because generally they have more resources available for taking legal action. On the other hand though, they can provide more specialized information and thus can even influence the content of judge-made legal innovations. Since the costs for the formation of interest groups also vary over the market life cycle, again testable hypotheses about the potential impact of different kinds of interest groups on judge-made legal change in different stages of the life cycle can be derived.<sup>79</sup>

If actors are not content with the distributional results from judge-made legal innovations, they can try to alter them through the legislation. However, this requires the formation of interest groups. To analyze statutory legal innovations the variation-selection approach presented in *Section B.II.* is applied. Again, technological and legal changes are linked through the wealth effects exerted by the new technology, which vary over its life cycle and constitute the economic selection environment. It is assumed that in the early market stages first a collective perception of the problem at hand must be generated. Successful statutory innovations require that the negative externalities produced as by-products of the new technology are collectively perceived as a problem which should be regulated by the law. In the later market stages, bargaining processes dominate, which can be analyzed by employing the findings of the Public Choice approach to politics (*Section B.I.*).

In any case, however, creative political entrepreneurs play an important role. They not only react passively to the demand of voters or interest groups, but actively create commonly shared perceptions of the underlying problems and offer statutory innovations. Again the selection mechanisms of the legislative system limit the variety of viable statutory innovations. The rules laid down by the constitution define the relevant political selection environment. They determine what kind of problems can be treated by legislation and what actors are formally involved. Actors who are formally not allowed to take part in legislation have higher costs of putting through their interests than other parts of the population. The demand for statutory innovations is further influenced by the economic selection environment, since the costs of interest group formation vary according to the type of problem and the opportunity costs of the dominant interest groups<sup>80</sup>.

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ECONOMICS 193-216 (2002); Paul Rubin, Christopher Curran & John Curran, *Litigation versus Legislation: Forum Shopping by Rent Seekers*, INDEPENDENT INSTITUTE WORKING PAPER #8, (1999), available at <http://www.independent.org/tii/WorkingPapers/LitigationVsLeg.pdf>. Last accessed : 27 March, 2008.

<sup>79</sup> ECKARD, *supra*, note 1.

<sup>80</sup> The most relevant interest groups are the producers of the negative externalities, their competitors, and the persons negatively affected by the resulting wealth reductions (ECKARD, *supra*, note 1, 161-170).

Since these too change systematically over the industry life cycle, again testable hypotheses about the timing and the potential content of statutory innovations demanded for by interest groups can be derived.

Statutory and judge-made legal innovations and their resulting wealth effects not only affect the legal, but also the technological evolution, since the law is part of the selection environment under which technological change takes place (*Figure 2*). Who has to bear the costs of negative technological externalities, which arise as a by-product of technological innovations, is itself a consequence of the legal rules in force. For example, if the producers of the negative externalities have to bear these costs, they will have stronger incentives to invest in technological change which is aimed to reduce these externalities. But if the persons negatively affected have to bear them, they will have incentives to demand products which eventually may help to reduce them. There are incentives for additional technological innovations. However, they will lead to another path of technological change.

Although this approach to the co-evolution of law and technology needs further analytical and empirical elaboration,<sup>81</sup> it provides a uniform and consistent way to cope with the relationship of technological and legal change.

## **F. Conclusion and Outlook - Institutional Competition and Legal Evolution**

Law matters – both for long-term economic evolution as well as for more short-term economic performance. The approaches presented above give an overview of the main lines of reasoning about the central mechanisms of legal change from an evolutionary economics perspective. Evolutionary economics seems to be fruitful for explaining the generation and dissemination of legal innovations over time. The approaches discussed show that cognitive behavioral models, which stress creativity as a source for the endogenous generation of novelty, and various methods and concepts developed to explain technological and economic change are also appropriate for dealing with the peculiarities of legal change. In addition, distributional conflicts prove to be a relevant determinant of legal change. Evolutionary economics thus extends the explanatory power of an economic approach to legal change.

We are, however, still far from a comprehensive theory of legal change. The most elaborated approaches deal either with statutory or with judge-made legal change.

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<sup>81</sup> See for example, ECKARDT, *supra*, note 68.

Although progress has been made in comparing different sources of statutory, judicial, and customary law, there is still room for further research, in particular in analyzing the interdependence of statutory and judge-made legal change.<sup>82</sup> Moreover, the impact of public bureaucracy on legal change during the implementation and application of legal innovations has been largely neglected so far. An evolutionary economic approach to intra-jurisdictional competition might perhaps be a promising starting point for gaining further insights. Although it is widely acknowledged that legal change is of an inherent path dependent nature, the theoretical foundation for this assertion is rather weak up to now.

Moreover, all the approaches discussed above analyze legal change within one jurisdiction. Both legal history and current developments, however, show that legal change does not take place in isolation. Legal rules are often imitated from rules in other jurisdictions and even from quite different legal traditions. Additionally, due to the growing economic and political integration, institutional competition has become more intense over the last years. Moreover, both on a regional as well as on a global level there is a growing number of supranational bodies trying to solve coordination problems and internalize externalities among different autonomous jurisdictions. Thus the growing literature on *inter*-jurisdictional legal change seems to be quite promising in increasing our understanding of legal change. For a comprehensive overview of the ongoing research in this field see Kerber in this volume.<sup>83</sup>

Given intensifying economic integration, the continued analysis of the evolution of law, technology, and the economy remain on the research agenda. In this regard, using the framework provided by Aoki to explicitly integrate legal change in the analysis of institutional change may provide new insights. In addition, more empirical studies on the hypotheses presented by Eckardt can increase our knowledge regarding the utility of this line of reasoning for explaining the interdependences of technological and legal change.

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<sup>82</sup> Francesco Parisi, *Sources of Law and the Institutional Design of Lawmaking*, 19 JOURNAL OF PUBLIC FINANCE AND PUBLIC CHOICE 95-122 (2001); POSNER, *supra*, note 2.

<sup>83</sup> Wolfgang Kerber, *Institutional Change in Globalization - Transnational Commercial Law from an Evolutionary Economics Perspective*, 10 GERMAN LAW JOURNAL 3 (2008).

