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Towards a Conceptually Precise and Logically Consistent Synthesis of Evolutionary and Institutional Economics for Safe Policy Applications

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Pavel Pelikan
Department of Institutional Economics
Prague University of Economics

Abstract: Institutional factors and evolutionary processes are now widely recognized to play key roles in the working and development of economies. Growing numbers of specialists in the study of the one *or* the other have been obtaining valuable knowledge about each. But an essential part of this knowledge is turning out to concern their interconnections, which are still far from well understood, as the specialists in one have rarely been interested in the other. This paper helps to clarify these interconnections with the help of the recently proposed conceptual model of evolutionary-developmental economics. The model interrelates institutional rules (in the sense of North's definition of "institutions") with economic evolution, defined as producing them, and with the dynamics of economic development (in the sense of Schumpeter, Nelson and Winter), which they shape and constrain. This splits the analysis of economic change into two interrelated, but clearly separable parts: (I) Comparative Institutional Statics with Developmental Dynamics; and (II) Institutional Dynamics, or the Evolutionary Analysis proper. The paper summarizes the so far obtained results of Analysis (I), outlines the conduct of Analysis (II), and indicates what policy implications could be obtained from both.

Introduction

That institutional factors and evolutionary processes play crucial roles in the working and development of economies has become a well-established truth, recognized by a growing number of economists. There are also growing numbers of specialists in the study of the one *or* the other, who have obtained, and keep obtaining, valuable knowledge about each.

What more recently started to emerge as an essential part of this knowledge, but has not yet been as widely recognized, is that the factors and the processes are intimately interconnected, and that some of the most important pieces of knowledge about them can be obtained only if their interconnections are well understood and properly taken into account. But clarifying these interconnections has not been easy. One difficulty is excessive specialization: most of evolutionary economists have been leaving aside institutional factors, while most of institutional economists have been paying little attention to evolutionary processes.

Another difficulty is that both institutional factors and evolutionary processes have many aspects interesting to study. This has caused the two fields to ramify into many mutually not fully compatible strands, in which the same terms are used in more or less different and not always clearly defined meanings, to begin with the very terms “institutions” and “evolution.” In consequence, the work on the interconnections has mostly been limited to broad reflections on the different strands and the different aspects, while only little has been said on what exactly should be interconnected with what and how.

This paper presents an ongoing and still far from concluded search for advancing this work. Its main purpose is to interconnect the two fields by means of a well-defined conceptual model, which could also help answer some of the most basic questions of economic policy. These may roughly be condensed into two: (1) Why some economies have grown rich and others remain poor? (2) Which policies could government conduct, and from which ones it should abstain, to help a poor economy grow rich and prevent a rich economy from becoming poor? While this search started several years ago (see, e.g., the response to Nelson 2002 in Pelikan 2003), most of its so far obtained results have been published during the last five years (Pelikan 2010, 2011, 2012, 2013, 2014).

As opposed to many evolutionary and institutional economists aiming at a maximum of realism, this search joins standard economics in its respect for Occam’s razor: its objective is to make the model as simple as possible – *only not so simple as to give the given questions the wrong answers*. An important by-product of this respect is a difficult to oppose argument

for making economics institutional and evolutionary. While many modern scientists may not accord much merit to realism as such, hardly anyone can deny the need to extend economic analysis at least as much as to avoid, in the answers to the above questions, the serious errors that its standard, institutional factors and evolutionary processes neglecting variants, are now known to have committed.

To cope with the great variety of strands of the two fields, the strategy of the search is simple, perhaps even somewhat brutal. This is to select only those strands that are terminologically and operationally clear enough to be practical – possibly after some extensions and adjustments – for building a well-defined conceptual model, and omit all the others. But, emphatically, this does not imply any criticism of the latter. The only reason for omitting them is that they are not practical enough for this building.

The selected strand of institutional economics is the one following North (1990), in which institutions are clearly defined as humanly devised constraints on human actions and interactions – comparable to “the-rules-of-the-game” – and distinguished from organizations as collections of the individuals “playing the game.” The model only slightly modifies North’s terminology. As the term “institutions” is still used in many other not always well-defined meanings – perhaps most importantly in financial economics, where it typically denotes large banks and other important financial *organizations* – it appears safest to reject it from any theory trying to minimize misunderstandings. To express the meaning that North had in mind, the model replaces it by the sharper term “institutional rules,” and enlarges it by the one of “institutional framework,” defined as the collection of all the formal and informal institutional rules that belong to an economy.

The selected strand of what is usually called “evolutionary economics” is the one following Schumpeter (1912/1934) with its neo-Schumpeterian extension pioneered by Nelson and Winter (1982) – but with a twist. This is that the model includes a conceptual distinction that classifies the processes studied in this strand as “development” – which corresponds to how Schumpeter himself called them – and not “evolution,” as Nelson and Winter proposed to do. But the model agrees with this strand on an important point: it rejects the standard perfect rationality assumption and recognizes that human rationality, in the sense of cognitive abilities, is bounded. It moreover adds a novelty which proves to have important impact on both evolutionary and institutional analyses: this is to recognize that human rationality is not only bounded, but moreover unequally so across individuals.

Without being any direct metaphor of biological neo-Darwinism, the model is largely inspired by it. More precisely, as explained in more detail in Pelikan (2011, 2012), the model

generalizes some of the most fundamental principles of neo-Darwinism in a way that makes them easily and fruitfully applicable to economic analysis, including policy analysis. The principles are extracted from the recent form of neo-Darwinism known as evolutionary-developmental (“evo-devo”) biology, which increases attention to how the processes of evolution (phylogeny) interrelate with those of development (ontogeny). This is why the model and the kind of economics that it represents are labeled “evolutionary-developmental,” or “evo-devo.”¹

The model thus makes what appears to be the first well-defined distinction between *economic evolution* and *economic development*, which it also uses as the key point for interconnecting evolutionary economics with the institutional one. As explained in more detail below, the model puts institutional rules and frameworks in its center, as the outcomes of economic evolution, and defines them as guiding and constraining economic development.² In consequence, the analysis of economic change falls into two interrelated, but clearly separable parts: (I) Comparative Institutional Statics with Developmental Dynamics; and (II) Institutional Dynamics, or the Evolutionary Analysis proper.

The rest of this paper is organized as follows: Section 2 outlines the model; Section 3 describes the main steps of Analysis (I) and summarizes some of its already obtained results; Section 4 indicates ways to conduct Analysis (II); and Section 5 concludes by briefly discussing what policy implications could be obtained from both.

2 – A conceptual evo-devo model of economic change: an outline

The model reposes on the usual micro-view of an economy: a collection of *individuals* using their *rationality* to pursue their *objectives* (preferences) under a number of *constraints*. But it departs from the most usual variants of this view by admitting three facts of life:

- the objectives need not be narrowly selfish, but may also contain pro-social components – e.g., concerning neighbors, the entire economy, and the environments;
- the rationality (in the sense of cognitive abilities) is bounded, and moreover unequally so: more for some individuals than for others;

¹ This evo-devo generalization of Darwinism may appear similar to the generalization by Hodgson and Knudsen (2010), but differs from it in several important ways – in particular by using to economists more familiar terms, and by offering clearer connections to institutional economics. A critical comparison of the two generalizations for their applicability to economic analysis, with the focus on the policy one, is in Schubert (2014).

² The economists *who like and understand modern biology* may find it enlightening to compare the institutional rules and frameworks of economies to the genes and genomes of organisms. The genomes are the results of biological evolution – the phylogeny – and act as the guides of, and constraints upon, the development of their organism – the ontogeny. Emphatically, however, this interdisciplinary parable is not an essential part of the model; all the other in modern biology less well educated economists should disregard it.

- the constraints, in addition to the usually considered resource ones, also include the economy's institutional rules – both formal, such as laws codified by known legislators and/or judges, and informal, such as social norms introduced by often anonymous social innovators during cultural evolution with more or less strong influences of religions.

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Its view of economies as collections of individuals classifies the model as “methodologically individualist” or “reductionist.” But, emphatically, it is not *naïvely* reductionist: it does not claim the economy to be a simple “sum” of the individuals, as is done in the naïve reductionism that the advocates of holism love to criticize (and that they likely invented themselves as an easy to beat straw man). It admits that the individuals may be aggregated in complex ways, in which key roles are played by the prevailing institutional rules.

Moreover, as the model recognizes that humans are endowed with extensive learning abilities, it includes important feedback loops between individuals and societies. Its answer to the old question of whether individuals form society or whether society forms individuals can be summarized as follows: each society together with its institutional rules must first be formed by some individuals; but, once formed, it acquires properties that strongly influence, via the individuals' learning abilities, the behaviors of all of its individuals both actual and future, while some of these behaviors may contribute to its further forming and reforming. In agreement with modern evolutionary psychology, however, human learning abilities and the consequent variety of societies that humans could possibly form and to which they might lastingly adapt – however enormous they might appear – are recognized limited.

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Compared to the standard resource-allocation models, which depict resource stocks and flows within a given network of markets and organizations, the model moreover depicts how such a network forms, reforms, and develops. To understand that all this also results from individual behaviors, these are modeled in two dimensions: operational and organizational. Their organizational behaviors make individual selectively associate with, or dissociate from, each other, and thus form and reform (self-organize into) a certain markets-organizations network. Their operational behaviors make them play, within the network formed, the usually studied economic roles – such as those of producers, consumers, traders, savers, and investors.

The organizational behaviors may to a large extent have their own preferences, only partially correlated with the preferences of operational behaviors – for instance, individuals may, and usually do, also have other motives and consider other factors for associating with each other and forming organizations than economic gains.

Note that organizations introduce a complication. As each has some internal institutional rules of its own, modeling an economy with them makes it necessary to consider institutional rules of more than one level – such as the level of the entire economy and the level of its firms. The two may be importantly related – such as the national corporate law that constraints the firms' choice of their corporate governance. But in this brief outline this complications will not be elaborated.

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More needs to be said on the roles of institutional frameworks, and on the division of economic change into economic evolution, which forms and reforms them, and economic development, which is guided and constrained by them. It may also be useful to spell out that institutional frameworks are far from determining how their economies work and develop, but they significantly shape and constrain both. They often are the binding constraints on the economies' development.

But economic development and economic evolution may appear difficult to distinguish for two reasons, which call for clarifications. One is that both must deal with an imperfectly known future, and both must therefore proceed by some more or less blindly generated *trials*, which are submitted to a systematic *selection*. At first sight, the two searches may therefore look similar. It is therefore important to realize the crucial difference: developmental trials tentatively change the network of markets, firms and government agencies *under the guidance and constraints of the prevailing institutional rules*, whereas the evolutionary trials tentatively change these rules – the formal ones by legislators or judges, and the informal ones by socio-cultural innovators.

Note that the model thus also dispels the frequent misconception that market selection is comparable to natural selection. It makes it clear that, far from natural, this selection is part of economic development, and therefore significantly shaped and constrained by the prevailing institutional rules – such as property rights in general and the laws regulating entry and exit in particular. Comparable to natural selection is only the selection of these rules, in which they are judged also for the ways in which they facilitate, or hinder, market competition and selection.

The second reason is the possible closeness of the two time scales: the speed of the evolutionary changes of institutional rules may sometimes come close to the speed of the developmental changes of the markets-organizations networks. The conceptual distinction should not be difficult to realize, but this possible closeness has an important consequence for the entire process of economic change. The changed institutional framework cannot start

guiding the development from scratch, but must take over the network developed under the rules of its predecessor.³ This also brings to light the rarely noted fact that the often discussed path-dependence of economic change is in fact double: the one of institutional frameworks, and the one of markets-organizations networks.

All this allows the interactions between economic evolution and economic development to be described as follows. The current institutional framework of an economy shapes and constrains its development, which results in the forming of a certain network of markets, firms and government agencies, together with the technologies employed. This framework is the body of the economy that makes it work and perform. If this performance is successful (in the sense explained below), the institutional framework may stay put; if not, it is rejected and the evolutionary search must continue by more or less changing a more or less large subset of its rules.

However, due to the discontent with any status quo and the urge to search for novelties that appear to be inseparable part of the genomically given human nature, even some quite successful institutional framework may be rejected. The evolution must then continue by some new trials, which may be less successful. Such a lack of success may then trigger a long series of trials and errors, before some sufficiently successful institutional framework is found, and the evolution could take again a more or less long rest.

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It should now be clear, at least in principle, how the model interconnects the selected strands of institutional and evolutionary economics, together with why the label of Schumpeterian economics is changed from “evolutionary” back to the original “developmental.” But, to make their interconnections operational, the model requires both strands to enlarge the scope of their analysis. The Northian strand of institutional economics, in which institutional rules have mostly been examined for their effects on transaction costs and other incentives, is required to extend attention to their effects on the dynamics of economic development – such as the conditions of entrepreneurship, market competition and selection, and economic freedoms in general. While transaction costs play important roles also in these effects, they are far from telling the entire story.

³ The readers who found it enlightening to compare the institutional rules and frameworks of economies to the genes and genomes of organisms, as suggested in footnote 2 above, should pay particular attention to this closeness, by which this comparison is most seriously limited. The phylogeny producing and changing genomes is very much slower than the ontogeny that forms, under the guidance of a genome (and with a more or less extensive help of environments), the organism. This also allows each changed genome to start guiding the ontogeny from scratch (a new ovum) – as opposed to the changed institutional framework that must start with the markets-organizations network left to it by its predecessor.

The strand of the Schumpeterian dynamic developmental economics is required to extend attention from the narrow category of institutional frameworks that will be here classified as “capitalist,” with relatively limited roles for government economic policies, to a broader variety of institutional frameworks – such as different types of dirigisme, socialism and welfarism – and examine how the processes of development (which Schumpeter so nicely called “creative destruction”) would be guided and constrained by them.

3 – Comparative Institutional Statics with Developmental Dynamics

The split of economic change into economic evolution and economic development divides its analysis into two stages: (I) examining and comparing different given, assumedly constant institutional frameworks for their effects on the working and the development of the markets-organizations network of economies; and (II) studying the evolution of these frameworks, consisting of more or less radical change more or less large subsets of their rules. Analysis (I) may be referred to as “Comparative Institutional Statics with Developmental Dynamics”; and Analysis (II), as “Institutional Dynamics,” or “Evolutionary.” The two analyses are strongly interrelated, but may to a large extent be conducted separately.

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Analysis (I), the topic of this section, appears possible to include into the established field of comparative economics, but as a foreign body that subverts many of the standard results. These have mostly been about the *static* efficiency of different given, assumedly constant markets-organizations networks of economies – often termed “resource-allocation mechanisms.” In contrast, Analysis (I) recognizes such networks to be variable, and turns to comparing different given institutional networks for the *adaptive* efficiency with which they allow and induce such networks to form, develop and adapt to changing environments.⁴ This analysis, although it continues to be institutionally static, is developmentally dynamic – as opposed to the standard comparative analysis, which is static both institutionally and developmentally.

A nice clue for realizing the insufficiency of that analysis, and the importance of developmental dynamics, can be found in Schumpeter (1976/42: 84): “... the problem usually

⁴ The present meaning of the term “adaptive efficiency” was initially defined in Pelikan (1988), and adopted by North (1990). It is now possible to put it a little more precisely: adaptive efficiency is the ability of a markets-organizations network, *due to the prevailing institutional framework*, to flexibly keep adjusting to changes both in the available human capital and in economic and technological environments. Importantly, adaptive efficiency and static efficiency may involve difficult trade-offs: to increase the former, it is often necessary to sacrifice some of the latter.

visualized is how capitalism administers existing structures, whereas the relevant problem is how it creates and destroys them.“

A classical example is the erroneous way in which the standard analysis compares socialist planning with capitalist markets. The culprit is the standard assumption that in both cases all firms are efficiently organized and managed. This makes it possible formally to prove – by means of sophisticated mathematical models of informationally *decentralized* planning, elaborated by some of the most respected economists of their time (including two Nobel laureates) – that socialist planning can be at least as efficient as capitalist markets.

This proof even appears to reject the old objection by von Mises (1920) that socialism cannot conduct a rational economic calculus, and the one by Hayek (1945) that informationally *centralized* planning of a large economy is impossible. As explained in more detail below, the Schumpeter clue leads to a much stronger objection. This is that the fatal, but by standard analysis overlooked weakness of *all* forms of socialism is not in their ways of administering the resource-allocation *among* socialist firms – be this done by central planning or by socialist markets – but in the *internal qualities* of these firms, implied by the ways in which any institutional framework that may reasonably be called “socialist” can shape, and must constrain, their “creation and destruction.”

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To be clear and productive, analysis needs a well-defined domain. For Comparative Institutional Statics this domain may be visualized as a map where different institutional frameworks are represented by points; and the types and sub-types into which they may be classified, by more or less large areas.

To be fruitful, the classification must allow analysis to deduce meaningful propositions valid for all frameworks of each type and sub-type. To be interesting, the classifications must at least roughly correspond to how different forms of economies are usually called in actual politico-economic debates.

A very simple, but for present purposes sufficient classification can be elaborated by starting with the classical distinction between “socialism” and “capitalism.” As both these terms have been given several more or less different and not always well-defined meanings, it is important to define the present ones. In the spirit of the Marxian tradition, which emphasizes the form of the ownership of capital, including the ownership of firms and banks, the two broad categories of institutional frameworks are defined here as follows.

- Capitalist frameworks allow this ownership to be both private and tradable, and consequently make room for the forming and development of financial markets.

- Socialist frameworks require all of this ownership to have some collectivist form – belonging to the state (government), or to the collectives of employees (cooperatives), or to a combination of the two. Importantly, a socialist network need not require the use central planning, but may allow the forming and development of many markets – with the crucial exception of the financial ones.

This classification is not entirely exhaustive, as it leaves aside the mostly outmoded frameworks in which the ownership of capital is private, but non-tradable. It is also asymmetrical: socialism is defined to exclude all forms of private ownership of capital, but capitalism may admit some collectivist ones – both by government and by voluntary cooperatives. The reason for this asymmetry is the fruitfulness of analysis: it will allow some clear results to be obtained by relatively simple means.

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The task of the analysis may then be described as discovering for different points and areas on the map some important properties that would allow them to be evaluated and compared – such as allocative efficiency, adaptive efficiency, growth of GNP, unemployment, and the distributions of income and wealth.

This large number of important properties raises the problem of the preferences or values according to which they should be weighed, which in standard analysis depends on the subjective values of the analysts. In contrast, evolutionary analysis allows the comparison to be free of such values. Instead of letting the analysts choose a certain social welfare function with a certain efficiency-equity tradeoff, it can evaluate institutional frameworks more objectively for their evolutionary sustainability. This can be deduced from their abilities to keep passing two relatively separate tests: (A) for *economic efficiency*, and (B) for *political acceptability*.

To pass Test (A), the framework must be able to provide the economy with a certain minimum of efficiency, both allocative and adaptive. This minimum depends on the harshness and the variability of the natural and economic environments: the harsher they are, the higher is the required minimum of allocative efficiency; and the more variable they are, the higher is the required minimum of adaptive efficiency.

To pass Test (B), the framework must be able to meet certain minimum demands for what is usually called fairness, equity, or social justice – both procedural, concerning its rules as such, and substantive, concerning the outcomes to which it leads. These demands depend in part on the cultural values of the population, and in part – as experiments in behavioral economics started to discover – on the inborn social instincts of Homo sapiens. An important

instinct, which appears possible to deduce from experiments with the ultimatum game, is a limited tolerance to economic inequalities. This alone is a strong reason why, for an evolutionary success, perceiving institutional rules as procedurally just is not enough; the substantive justice of the outcomes to which they lead is bound also to matter.

As the perception of what is just, both procedurally and substantively, depends on values, these must be recognized to play important roles in Test (B). But this may appear to contradict the above claim that evolutionary analysis can be value-free. It is therefore important to realize that the values from which the analysis is free are those of the observing analysts, whereas the ones involved in Test (B) are those of the population observed. These values are themselves subject to selection during cultural evolution, which both influences, and is influenced by, economic evolution. For instance, cultures with strong egalitarian values may cause all institutional frameworks to fail both in (A), because of their tendencies to discourage individuals from innovating and enterprising, and in (B), because of their exaggerated demands for equality, which no real-world economy may be able lastingly to meet. What may be the future of such destructive values, however, is a question for institutional dynamics – or, in other words, the evolutionary economics proper – on which a few words will be said in Section 3 below.

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According to the results of the two tests, the map of institutional frameworks can be partitioned into four areas: (1) the frameworks that succeed in (A), but fail in (B); (2) those that succeed in (B), but fail in (A); (3) those that fail in both; (4) those that succeed in both.

The sharpest result of the present analysis concerns all socialist frameworks: they are excluded from Area (1), and therefore also (4) – and may thus only be found in (2) or (3). Although they have a theoretical potential to succeed in (B), and thus belong to (2), many of them will fail even in that, if they lack, as all of the really tried ones actually did, effective defenses against the rent-seeking of the ruling socialist politicians and bureaucrats. But the most fundamental cause of their evolutionary failure is their inherent inability to succeed, in the face of only mildly severe and moderately changing environments, in (A).

To clearly see why, it suffices to elaborate the above-cited Schumpeter clue with a few simple steps, first taken in Pelikan (1988, 1992). The first step is to interpret the idea of “creative destruction” as development by trial-and-error – which can be shown inevitable, given the fact that the future can never be perfectly known. This leads to comparing different institutional frameworks in two respects: (a) for the variety of the entrepreneurial trials allowed; and (b) for the speed and the precision of discovering and correcting, or eliminating,

the errors committed. Compared to virtually any capitalist framework with reasonable freedom of enterprise and reasonably precise rules for the exit of firms, all socialist frameworks prove doubly inferior: without private and tradable ownership of capital, they both make fewer entrepreneurial trials and allow many more of the inevitable errors to remain uncorrected for much longer. As opposed to the standard comparative analysis of socialist planning with capitalist markets which produced a draw, the evo-devo analysis produces a clear two-to-zero victory for at least some forms of capitalism.

Perhaps the strongest empirical corroboration of this result was provided by the unification of East-German and West-German economies: the most serious weakness of the East-German socialism turned out not to be in its central planning, which was relatively easy to replace by market exchanges. It was in the qualities of its firms as they had developed during some 40 years within the East-German socialist institutional framework: overgrown, with productivity in average only about 25% of the West-German ones. As is well known, this weakness proved much more difficult to remedy.

An additional theoretical corroboration can be inferred from the above-noted recognition of unequally bounded rationality across individuals. As formally modeled in Pelikan (1999) and verbally summarized in Pelikan (2010), this recognition turns human rationality into a singular kind of scarce human capital, which raises two problems: (i) how to select, from the population of unequally rational candidates, the relevantly most rational entrepreneurs and investors; and (ii) how to prevent the jobs of the selected entrepreneurs and investors from growing more difficult than what their holders can handle without causing socially costly competence-difficulty gaps (in the sense of Heiner, 1983). It is then easy to demonstrate, by a simple comparative institutional analysis, that all socialist institutional frameworks are substantially inferior to at least some capitalist ones also in the solving of these problems.

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All this implies that Area (4) may possibly contain only forms of capitalism – but far from all. Many may indeed be found in the other three areas. Area (1) includes those that lack sufficient redistribution policies. Capitalism, when shaped by suitable institutional rules and supported by a suitably dimensioned government, has indeed the potential to be efficient enough both allocatively and adaptively. But it causes incessantly growing, sooner or later politically unsustainable, economic inequalities. The fundamental reason is that the working of market competition and selection – even if shaped by institutional rules that meet all the norms of procedural justice – will allow relevantly more rational individuals to keep growing

relatively richer and richer than the relevantly less rational ones. Although in good times the latter may grow somewhat richer in absolute terms, experiments in behavioral economics indicate that for most people the relative wealth also matters, often even more. While the critical limit is difficult to establish with precision, there must definitely be one. Without some redistribution policies, market competition and selection will therefore sooner or later hit this limit and become politically unsustainable. This will happen sooner if the institutional rules are not just – for instance, if they allow majority stockholders to dispossess minority ones, or managers to extract too high rents from the owners, or politicians and public servants, in collusion with friends in private firms, to extract too high rents from the taxpayers. Then many wealth inequalities are perceived as undeserved, and the critical limit will be lower.

But many capitalist frameworks may also fail in (A), and thus belong to Areas (2) or (3). A classical example is an incomplete design of property rights which may cause critically wasteful externalities. Another example is the use of so extensive redistribution policies that economic inequalities are indeed reduced to a politically sustainable level, but, because of the growing costs of these policies and their negative effects on work efforts and productive investments, such overly welfare capitalism becomes unsustainable economically.

A subtle example is an excessive growth and low efficiency of government. The subtlety is in the reason why this is counted as a failure of capitalism. This is that no form of capitalism appears able evolutionarily to succeed without a suitably dimensioned government – for instance, for formulating the demand for, and financing the purchase of, crucial collective goods, such as general education and industrial infrastructure; and for designing and enforcing formal institutional rules without which market competition and selection would sooner or later deteriorate and possibly self-destruct. A capitalist institutional framework may therefore fail in Test (A) if it is unable to prevent the needed government from growing unsustainably large, fatally inefficient and/or corrupt.

Some forms of capitalism may even fail in both (A) and (B), and thus belong to Area (3). As illustrated by the recent financial crisis, important examples are those forms that let the selection criteria of investors be distorted and the entire financial sector overgrow. This sector may consequently be consuming more and more resources for its internal trading, while being only little useful, and possibly even growing harmful, for the rest of the economy. It is important to realize that this is a possible failure of capitalism itself, which mistaken government policies may aggravate, but cannot be accused of being its prime cause. A purely capitalist institutional framework, without any government interference, can indeed be shown

to develop this double failure all by itself.⁵

But, importantly, the finding that many forms of capitalism are not evolutionarily sustainable must not obscure the other finding that, if any evolutionarily sustainable institutional framework for a large human economy exists at all, it must be of the capitalist type. It may only be added that it must be of a certain sub-type, which must include two kinds of rules: (i) for some politically acceptable redistribution of income for final consumption which would preserve the needed minimum of both types of efficiency of production; and (ii) for protecting the economy against over-expansion of both government and the financial sector.

But many details of such a successful sub-type of capitalism are still largely unknown. It appears possible only roughly to hypothesize that rules (i) must include a net consumption tax, known to be the least harmful for investment, entrepreneurship, and job-creation; and rules (ii) must include a combination of transparency and hard budgetary constraints for government, and some antitrust laws limiting the growth of financial firms together with some small taxes on certain financial transactions.⁶

4 – Elements of Institutional Dynamics, the Evolutionary Economics proper

Institutional Dynamics may be seen as continuing Comparative Institutional Statics, using the same map of different institutional frameworks. While the latter is limited to the properties of each taken in isolation, the former extends attention to their possible changes, by which a framework may be reformed and transformed into another framework. This may be visualized as adding to each point on the map some pillows indicating the directions of its possible or necessary changes.

But there is an important difference between the two analyses in dealing with novelties. In Comparative Institutional Statics, the frameworks compared are assumed known and given, and novelties are limited to those discovered during development – such as technological, organizational and marketing innovations. Institutional Dynamics, in contrast, admits and even expects innovations in the forms of institutional rules, both formal and

⁵ Intuitively, both an over-expanding government and an over-expanding financial sector might be compared to forms of cancer that grow to the detriment of the organism. It might then also be interesting to observe that immunological defenses against cancers can be found encoded in the genomes of all evolutionarily successful multicellular organisms – and see in it a hint that institutional defenses against over-expansion of both government and the financial sector may have to be parts of evolutionarily successful forms of capitalism. Emphatically, however, this biological comparison is meant only informally to inspire understanding readers, and is not a formal part of the present argument.

⁶ A preliminary summary of why to limit the growth of financial firms and tax financial transactions is in Pelikan (2013), and a more extensive analytical justification of these policies in Pelikan (2014).

informal. But this calls for a clarification of how to understand the map. This is that the map may still be assumed to have definite boundaries, corresponding to the variety of forms of economies and societies that humans may be expected, due their genomically given social instincts and learning abilities, to be able to form and learn to adapt to. The map must only be admitted to contain many still unknown points and areas, which may be attained only by means of institutional innovations. Similarly, each of the defined types of institutional frameworks may also be assumed to have definite boundaries and to contain many still unknown points and areas. Thus, for instance, a capitalist framework may be reformed by many institutional innovations, and yet the new framework may still be classified as capitalist.

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In the short run, there may be many different directions in which any institutional framework might be changed, and it is virtually impossible to predict which ones. The changes of the formal rules depend on the interests and the knowledge of the legislators, on which some educated guesses might sometimes be possible to make. But the informal rules may change according to trends of fashion and whims of public opinion, which are much more difficult to predict. Much may then also depend on the relationships between the two: to what extent informal institutional rules may influence the legislature, and to what extent formal institutional rules may influence the changes of the informal ones.

A little more appears possible to say about the long-run changes. The results of Comparative Institutional Statics make it possible to predict that only institutional frameworks belonging to Area (4) may become lastingly stable, while those belonging to Areas (1), (2) or (3) will sooner or later be forced to change. But both parts of this prediction are subject to important qualifications. As noted above, human restlessness and desire for change may destabilize even a successful framework solidly belonging to Area (4). On the other hand, the forced change of an unsustainable framework may not be in the direction of making it sustainable – the change may only transform it into another unsustainable form, possibly belonging to the same type or the same area, which will then sooner or later be again forced to change.

An example that appears to illustrate the recent evolution of most of the developed western economies is the oscillation between welfare forms of capitalism with so extensive redistribution policies that they become unsustainable economically, which makes them fall into Area (2), and its economically more efficient forms causing incessantly growing economic inequalities, which soon makes them unsustainable politically, and thus fall into Area (1). Whether or not this oscillation may converge to a form that is lastingly sustainable

in both ways is still a largely open question – just as the question of whether or not such a successful form exists at all.

Other interesting examples may be found in Acemoglu and Robinson (2012), where such nice institutional forms are believed to exist and maintain themselves by means of “virtuous circles” – although their properties are little specified, with the exception of being defined as “inclusive.” On the other hand, some bad forms belonging to Area (3), defined as “extractive,” are there also believed lastingly to exist and maintain themselves by means of “vicious circles.” This may appear to disagree with the present prediction that such forms will sooner or later be forced to change. But the disagreement may depend on differences in the time perspective. Such forms may indeed maintain themselves for a long time, and yet eventually fail – but possibly only after many decades or even centuries.

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Not much more can be said here about Institutional Dynamics, not only because of the limited scope of this paper, but also because the research presented in it has not yet advanced into it much farther.

5 – Possible policy applications of evo-devo analyses: concluding remarks

As policy applications are mentioned in its title, the paper cannot end without indicating how the two evo-devo analyses may be expected to help policy. It should first be noted that their possible help is limited to questions concerning the economy’s institutional framework, including the policy instruments that the framework allows or requires government to handle. But they cannot say much about the actual uses of these instruments. Here is the greatest difference between them and standard policy analysis. This is specialized in such uses, typically seeking to optimize the use of a *given* policy instrument. In contrast, the evo-devo analyses concern the apparently simpler, but more fundamental, and for the economy’s performance often more important question: *whether or not* to use this instrument at all.

But this is far from denying all usefulness to standard policy analysis. This is recognized useful, but only under two conditions: first, that the policy instrument whose use it tries to optimize has been given green light by the evo-devo analyses; and second, that it does not build on any simplifying assumption under which some use of this instrument could be proved optimal, while using it in the real-world would be disastrous.

The importance of these conditions clearly appears when thinking of the frequently made, but logically faulty jumps from the standard formal proofs that, under certain

simplifying assumptions, a certain use of a certain policy instrument is optimal, to justifying the use of this instrument by a real-world government in a real-worlds economy. Socialist planning, selective industrial policies, and deregulation of banks are perhaps the most striking examples: all three were proved optimal by standard policy analysis and all grossly failed in the real world.

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Considering government as a policymaker, it is important to distinguish the *legislature*, which forms and reforms the formal institutional rules, from the *executive*, which handles those policy instruments within those limits that the formal institutional rules allow or require it to do. This distinction makes it possible to specify that the evo-devo policy implications are addressed to the legislature, but much of their contents concerns the executive. Most result from Institutional Statics. If successful, this analysis can indicate what institutional framework would help a given economy improve its performance, and point out the rules on which that framework differs from the actual one. Why such indications often concern the executive is that it is often the policy instruments and the limits of their uses that most urgently need to be changed. This distinction also makes it easy to dispel the apparent paradox that institutional reforms aimed to weaken an over-expanded government often require strengthening it: what needs to be strengthened is the legislature to enable it to cut down, often against strong resistance, the over-expanded executive.

Among the main points of the evo-devo analyses, the following four appear most promising as sources of novel policy implications: (i) evolutionary sustainability as the evolutionary criterion of economic performance; (ii) increased weight of adaptive efficiency; (iii) the adaptive-efficiency failures of the financial sector; (iv) the bounded rationality of government. It is this last point that most directly concerns the executive: it introduces an important but so far rarely considered constraint on the complexity of admissible economic instruments that the executive could safely handle, without causing important losses due to competence-difficulty gaps (for more on this point, see Pelikan 2010).

But some implications for the legislature might also be provided by Institutional Dynamics – namely those concerning the way from the knowledge of good institutional rules to its effective application. This way is known to be long and full of obstacles, on which sufficiently advanced Institutional Dynamics might throw some light. Some of these obstacles are known to reside in informal institutional rules, which are often also the main causes of the economy's poor performance. To search for policies that might help evolutionary processes transform such hindering rules into economically more favorable ones

is indeed one of the socially most important tasks of Institutional Dynamics.

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But there may also be other difficult to overcome obstacles. Perhaps the best-known is the legislature itself, if it has vested interests in the institutional status quo, which makes it unwilling to make any institutional change – even with the best knowledge of what other institutional rules would be good for the economy.

In this case, the knowledge might help the political opposition, and that in two ways: (i) to debunk the official propaganda which often tries to defend the status quo by false claims that it promotes the interests of the entire society; (ii) to enlighten the opposition itself in order not to favor, and if successful not to implement, an institutional change that would harm the economy even more than the status quo. It is of course also possible that the leaders of the opposition have no stronger pro-social values than the actually ruling elite, and only seek an institutional change to advance their own interests. In such an unfortunate society, no analytical knowledge about the effects of different institutional rules and frameworks, however extensive and correct, may help.

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