

# On the Importance of Patterning Abstraction for Economic Theory

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## 1 INTRODUCTION

Economic happenings can be described in their historical concreteness or as a broad type. In the former case we say, for example, that an increase in the demand for steel by 298 tons on the world market causes its price to rise by 73 cents. In the latter case we merely observe how price tends to rise when demand increases, whereby the particular identity of the good in question as well as the magnitude of the increases in demand and price are ignored. Such a broad type is what Hayek (1967a, 1967b) called a “pattern”. If we assume that the historical specifics which patterns ignore are irregular, a pattern refers more particularly to the regular skeleton of a happening. Accordingly, we define patterning abstraction as the operation of eliminating irregular historical specifics so as to be left with a regular pattern. Long (2006) typifies this type of abstraction as ‘Aristotelian’.

Many economists acknowledge, implicitly or explicitly, that behavioural regularities exist only as patterns, but some of the logical implications of patterning abstraction for method remain insufficiently explored and poorly understood. This paper attempts to rectify this situation and to survey some of these implications in an effort to show how patterning abstraction can significantly contribute towards the solution of a wide variety of problems in economic methodology.

The argument is constructed as follows. Section 2 starts off by drawing a distinction between *pure theory* which aims to derive isolated behaviour patterns and *applied analysis* which endeavours to concretise and combine various such patterns for the purpose of explaining or predicting particular historical events. Section 3 argues that mathematical language by nature describes concrete, unpatterned events even when it leaves parameters unspecified. As such, it is unsuited to

pure theory, although it can legitimately be used for the purpose of applied analysis. Section 4 introduces a distinction between *pattern rationality* which is the rationality required to derive behaviour patterns and *concrete rationality* which is the rationality required to derive behavioural regularity in concrete events, after which sections 5 and 7 evaluate the realisticness (in Mäki's 1989 sense) of pattern rationality. In view of the fact that institutions are essentially the persistent patterns of the social environment, section 6 highlights the particular role of institutions in the derivation of behaviour patterns and section 8 investigates how patterns can become institutions themselves. Section 9 argues that patterning abstraction presupposes a form of methodological collectivism, be it a form which leaves certain important aspects of methodological individualism intact. Finally, section 10 briefly reviews how patterning abstraction aids the realism and testability of theory.

## **2 PATTERNING AND ISOLATING ABSTRACTION: PURE THEORY *VERSUS* APPLIED ANALYSIS**

Patterning abstraction, understood as ignoring irregular historical specifics, is not enough to render an historical process regular. The irregularity of historical processes can also reside in the fact that various causal relations, which are regular in themselves (at least as patterns), interfere with each other so as to produce an irregular combined result. For example, price may increase for many reasons besides an increase in demand. What we call isolating abstraction then consists of the operation of isolating one causal mechanism, e.g. the influence of an increase in demand on price, so as to describe it in its purity without interference from extraneous mechanisms (c.f. Mäki 1992)<sup>1</sup>. So, while patterning abstraction removes irregularity in the historical specifics of a single causal mechanism, isolating abstraction removes irregularity in the interaction between various causal mechanisms. After patterning and isolating abstraction have both done their job, we are left with a single, isolated pattern in the style of "price tends to rise when demand increases", which should be highly consistent within an appropriate institutional domain.

We take it for granted that the aim of theory is to bring out what is regular and general in historical processes. Without knowledge of generalities all particular facts will appear new, unique and random to us; they will speak an unknown language. If understanding involves relating the unfamiliar to the familiar, theoretical knowledge aids understanding by enabling us to present unfamiliar phenomena as a concretization and combination of various familiar regularities. Hence all theory is, by nature, general theory, which is not to say that its pronouncements are necessarily universal. As will be seen below, behavioural regularities exist by virtue of a certain institutional setting, which implies that they are generalisable only within that limited setting. Since institutions can change and are not the same for all economies, theory remains historically contingent (c.f. Hodgson 2001: 21-40).

In the way that we defined the term, patterning abstraction presupposes that isolating abstraction has already been applied: pattern abstraction removes the irregular historical detail from a single causal mechanism which, therefore, has already been isolated from other causal mechanisms. Isolating abstraction similarly presupposes that patterning abstraction has already been applied: it removes irregularity in the interplay between various causal mechanisms, which only as patterns are regular in themselves. The implication is that patterning and isolating abstraction can only be applied or reversed in tandem.

But this implication is valid for the social sciences only. It is our contention, the case for which will hopefully become increasingly compelling as we go along, that theory in the social sciences requires both isolating and patterning abstraction, but that isolating abstraction suffices for theory in the physical sciences. Hence the need for patterning abstraction is unique to social theory and, as such, of particular importance to it. Concrete physical processes can in principle be made regular by only controlling them (i.e. by isolating abstraction), but concrete social processes, even if they could be controlled, would still contain elements of irregularity. The abovementioned 298 tons increase in the demand for steel on the world market, at another time and in other circumstances,

may result in only a 45 cents increase in its price. But the isolated pattern “price tends to rise when demand increases” can remain consistent within a given institutional domain.

Hence social theory is abstract in a way which is different from how physical theory is abstract. The abstractions of physical theory are anti-historical and anti-empirical in that they do not occur in their purity and exactness outside controlled laboratory conditions. But, because the concrete (numerical) specifics of physical processes are not inherently irregular, it remains in principle possible for physical theory to explain and predict concrete events, provided interference from extraneous mechanisms is negligible (as it regularly is) or can effectively be kept at bay. By contrast, the abstractions of social theory are anti-historical and anti-empirical in that they are altogether incapable, on their own, of explaining or predicting events in their historical concreteness, if we assume that social theory is strictly about what is regular and general. The explanation or prediction of concrete historical events requires that the isolated patterns of theory be concretised and combined, which means that the concrete specifics of the historical case at hand must be incorporated into the analysis. But, because these specifics are inevitably irregular (which is why they were abstracted from in the first place), this concretization and combination can never be conducted in an exclusively formal way. Some degree of inexactitude, uncertainty and subjective judgment cannot be kept out of the explanation or prediction of concrete social events.

Social analysis thus requires us to make a distinction between, on the one hand, *pure theory* which aims to formulate isolated behaviour patterns and, on the other hand, *applied analysis* which reverses patterning and isolating abstraction by concretizing and combining the various patterns suggested by theory in an effort to explain or predict concrete historical events. Pure theory can be totally formal in the sense of deriving generalisable regularities according to a standard methodological format, while applied analysis has to be informal, in the opposite sense of its explanation being unique to a specific time/place instance and its method being variable and pragmatic, in a style akin to Ward’s (1972) storytelling. The above view of formality does not,

however, require that pure theory be expressed in mathematical language, which leads us to the topic of the next section.

### 3 MATHEMATICAL MODELLING AS *MISPLACED CONCRETENESS*

The message of Machlup's (1967: 6) famous "analogy of the theoretical automobile driver" is that theory can describe only patterns, whereby patterns are regarded as mathematical functions whose parameter values remain unspecified. Extending this idea to whole models, the suggestion is that abstract model structures can represent social patterns. This view of the nature of patterns is still widely held, being for example implicit in Buchanan's (1969) idea of the "pure logic of choice", taken for granted in Mäki's (1992, 1994) and Hausman's (1992) views on theoretical abstraction, and underlying Paqué's (1991) criticism of Hayekian patterns. But it is profoundly mistaken and the source of a great deal of confusion surrounding the nature of abstraction in economic theory (c.f. Hamminga and De Marchi 1994; Long 2006). Unfortunately, even Hayek himself regularly lapsed into the view that abstract model structures can represent social patterns (1937: 47; 1967b: 23f), which is responsible for at least some of the confusion surrounding his methodology.

In the context of his analogy about the theoretical automobile driver, Machlup (1967: 9) introduced the term *Fallacy of Misplaced Concreteness* (originally Whitehead's) to describe the logical error of using pure theory for the purpose of applied analysis. In line with his views on the nature of patterns, Machlup argued that this error is committed by those who insist on theory being able to quantify its parameters as a way of making itself applicable to concrete historical events, as the antagonists of conventional microeconomics during the marginal controversy did. But if we regard the *Fallacy of Misplaced Concreteness* more generally as the failure to apply patterning abstraction in social theorising, it is not committed when insisting on parameter quantification, but already at the prior stage of expressing behavioural regularities as mathematical functions.

Inherent in mathematical expression is a pursuit of numerical exactness, which requires that

events be described in their historical concreteness - numerical exactness is, after all, the ultimate form of historical pointedness. As such, any mathematical social theory, by overlooking patterning abstraction, is already guilty of the *Fallacy of Misplaced Concreteness*. This guilt shows up in the fact that attempts to theorise about concrete events lead to the positing of regularities which cannot be generalised. A behavioural relation like “price tends to rise when demand increases” is a true pattern, because it ignores irregular historical detail and is generalisable over many concrete cases (as long as a certain institutional set-up remains in place). But a mathematical reformulation of that same relation, for example as  $P = aQ + b$ , causes it to lose its status as a generalisable pattern, because involving irregular historical detail unique to specific time/place instances. First, any mathematical expression has to stipulate a particular form of relationship between dependent and independent variables, in this case a linear one, the choice of which depends on unstable historical detail. Second, unstable historical detail also determines the value of parameter constants  $a$  and  $b$ .

The awkward situation then arises of parameter constants being inherently un-constant, which is precisely why economic theorists decline to quantify them (Mirowski 1994, 1995). But if we admit that “economic theory is not based on the existence of certain numerical constants” and “these parameters do not matter to economic theory” (Backhouse 1997a: 156,157), why employ mathematical formulation at all? Without stable and quantifiable parameter values, the mathematical expression of a behavioural regularity does not convey any additional information beyond what is already available in the verbal, true-pattern expression thereof. The view of patterns as mathematical functions whose parameter values remain unspecified confuses *not quantifying* irregular historical detail with *altogether ignoring* such detail. Patterning abstraction is about the latter not the former (c.f. Long 2008’s reference to *precise abstraction* and *non-precise abstraction*).

It is noteworthy that theoretical physics, from which theoretical economics originally borrowed the mathematical method, regards it as an integral part of its task to quantify the parameter

constants in its functional relationships (Keynes 1973: 296; Hayek 1967b: 36). The very fact that parameter values in theoretical physics are potentially stable and quantifiable suggests that mathematical language is indeed appropriate to describe regularities in the physical world, just as the absence of parameter stability and quantifiability suggests the inappropriateness of mathematical language to describe regularities in the social world - at least at the level of pure theory. This difference between physical and social theory points to the fact that concrete physical processes can be made regular by controlling them (i.e. by isolating abstraction), while concrete social processes, even if they could be controlled, can be made regular only when historical detail is ignored as well, that is, when patterned.

It could still be argued that, even if parameters are never quantified, mathematical notation still has the merit of allowing the analyst to study the interrelationships between various behaviour patterns by combining them in a single integrated model. A study of the interrelation between various patterns may indeed have merit, but the problem is again that the resulting model structure is dependent on irregular historical specifics, which preclude it from being generalizable even within a narrow institutional setting. By freezing that interaction in a fixed model structure, isolating abstraction is partially reversed with the result that patterning abstraction needs to be reversed as well - recall how patterning and isolation abstraction can only be applied or reversed in tandem. Mathematical model structures cannot, therefore, represent generalisable theoretical patterns in social phenomena, but have to be chosen pragmatically so as to make that model structure fit a modelling technique or a certain narrow time/place context. The important implication is that pure theory can only come up with single behaviour patterns linking a single cause to a single effect, in the style of “price tends to rise when demand increases”, as is already implicit in our contention that social theory requires both isolating and patterning abstraction. Model building as an attempt to capture the interrelation between various such patterns has to fall outside the scope of theory.

The upshot is that mathematical expression in general and mathematical modelling in

particular legitimately belongs to the realm of applied analysis rather than pure theory. The isolated patterns of pure theory may certainly be mathematised for the purpose of their inclusion in some applied analytical (econometric) model seeking to explain or forecast some concrete historical process, as long as it is accepted that the analysis will thereby lose its generalness and contract a degree of inexactitude, uncertainty and *ad hocery* – as most econometricians indeed do (see Sims 2012). Pure theory thus functions as an aid to mathematical applied analysis, supplying it with potentially relevant behaviour patterns. But pure theory cannot and should not be mathematical itself.

It thus transpires how a great deal of what goes for theory in modern economics is actually not theory but a form of applied analysis, which is fine (after all, *what's in a name?*) as long as the analysis is indeed open to application by allowing parameter quantification. But it is not fine when the mathematical analysis resists parameter quantification, as a considerable amount of it does – especially in pure microeconomics. The contradiction in the term “inapplicable applied analysis” captures the problem with such analysis rather well<sup>2</sup>. The main reason why pure microeconomics does not admit application and parameter quantification is that it employs an inapplicable concept of agent rationality. The next section will further explore this theme.

#### **4      PATTERN RATIONALITY VERSUS CONCRETE RATIONALITY**

Because conventional mathematical theory implicitly seeks to formulate regularity in concrete events (what Lawson 1997 calls “strict event regularity”), it must endow its agents with a closed set of concrete benefit opportunities, which are unambiguously valued and exhaustively exploited. We will label this form of rationality *concrete rationality*. By contrast, pattern theory (i.e. theory which applies patterning abstraction) is not in need of such strictness, as it deals with only broad types of agents and broad types of benefit opportunities, the irregular historical specifics of which can be ignored. As a result, the emergence of regularity in patterned events merely requires that the overall

aggregate behaviour of many similar agents shows a predominant disposition towards, and is predominantly successful in, the exploitation of their benefit opportunities, whereby benefit is increased by an unspecified, be it significant amount rather than maximised to a specified limit. Accordingly, we will call this *pattern rationality*. Thus it already transpires how pattern rationality no longer requires strict maximising behaviour.

Vanberg's (1993) distinction between *case-by-case maximisation* and *rule following* is basically the same as our distinction between concrete and pattern rationality and similarly hinges on the application of patterning abstraction. Although Simon (1976, 1978, 1987) nowhere explicitly acknowledges this, patterning abstraction also plays a key role in his distinction between *bounded* or *procedural rationality* and *substantive rationality*. For example, he (1978: 6) remarks how substantive rationality is necessary to answer questions such as "how much flood insurance will a man buy?", while procedural rationality is sufficient to settle the broader issue which is "what are the structural conditions that make buying insurance rational or attractive?" - a question in which patterning abstraction is implicit. It remains, of course, possible to achieve forms of bounded rationality without patterning abstraction, but rationality limits must then be specified and expressly built into the model in often *ad hoc* ways (see e.g. Simon's 1991 criticism of Williamson). The beauty of patterning abstraction in this regard is that bounded rationality emerges spontaneously and systematically.

In whatever shape or form we take it, economic rationality has at least two aspects: a knowledge aspect and a motivation aspect (c.f. Pettit's 1995: 309 distinction between "content-centred" and "process-centred" assumptions). It presupposes that agents possess *knowledge* of benefit opportunities and that they have the *motivation* to exploit the known benefit opportunities. The next section will proceed with a discussion of how patterning abstraction lowers the motivational requirements of economic rationality, thus rendering it broadly realistic. Before section 7 can explain how patterning abstraction does the same for the knowledge requirements of

economic rationality, section 6 must first investigate the role of institutions in creating benefit opportunities.

## **5 THE MOTIVATIONAL REQUIREMENTS OF PATTERN RATIONALITY; SELF-INTEREST AND UTILITY**

To be able to derive determinate outcomes (behavioural regularity) at all, social theory has to assume that behaviour is ruled by a single motive (Menger 1985 [1883]: 83). For the case of economic theory, that motive consists of the pursuit of the net benefit derived from acquiring goods and services in the market place (tradables). Without patterning abstraction, the assumption of a single motive would mean that all concrete agents are exclusively driven by only that motive in all of their business dealings. Such are the motivational requirements of concrete rationality. But with patterning abstraction, it is sufficient that a significant majority of concrete agents is significantly driven by that motive in a significant majority of their business dealings. Put more succinctly, pattern rationality merely requires that the economic motive be predominant rather than universal.

If we define economic self-interest as the pursuit of one's own benefit in such a way that any regard for the benefit of others is overruled when coming into conflict with one's own (which corresponds with what Pettit 1995: 310-314 refers to as "self-regardingness"), self-interest is implicit in concrete rationality but not in pattern rationality. Even when the pursuit of personal benefit is predominant, there may be enough room for considerations of honesty, decency and fair play to break into and moderate that pursuit to such an degree that the resultant behaviour can no longer be described as self-interested in the above sense; while naked uncompromised self-interest remains consistent with pattern rationality, it is no longer necessary to pattern rationality. Market behaviour is indeed not always relentlessly and exclusively self-interested and "other-regarding" desires can play a role as well, even if naked self-interest always lurks just under the surface ready to assert itself whenever compromised too much (Pettit 1995, 2000) and even if the modern,

corporate form of capitalism has bolstered the economic motive to such a degree as to render corporate behaviour close to uncompromisingly self-interested (Van Eeghen 1997: 104-105).

Patterning abstraction can, furthermore, help us overcome an old objection to the concept of utility, understood as the benefit which economic agents pursue. The objection is that utility as a choice criterion involves circular reasoning: a good has greater utility than another because it is preferred and it is preferred because it has greater utility (Sweezy 1934 is the original source; for a more recent discussion see Hodgson 2001: 241-243). As such, the concept is vacuous and does not really explain anything. The same objection can be stated in an alternative way by arguing that utility does not explain any concrete choice because it is open-ended and unspecified, not referring to any particular benefit of acquiring any particular good at all (c.f. Buchanan 1969).

This barrenness of utility stems from conventional theory's ambivalence towards patterning abstraction. Given its use of mathematics, it ostensibly seeks to explain concrete choice, while it simultaneously employs a choice-criterion (utility) which abstracts from concrete choice by being unspecific about goods, agents and economic benefits. When utility is, however, used to explain patterns of choice in the style of "price tends to rise when demand increases", which leaves the concrete identity of goods, agents and economic benefits unspecified anyway, the problem disappears and the concept of utility can retain its rightful place in economic theorising. In other words, because patterning abstraction is already implicit in the concept of utility, it is suited to the explanation of behaviour patterns only.

There is a second, closely related way in which conventional theory is ambivalent towards patterning abstraction, to which we already drew attention: its mathematical expression suggests an intention to explain quantities, but it simultaneously declines to provide actual quantification by leaving parameter values unspecified. This ambivalence has, however, also proved useful, because it enabled conventional theory to employ utility as a choice criterion without ever having to face the problem of its immeasurability. Hicksian ordinal utility, too, can create the illusion of having solved

this problem only as long as quantification remains a mirage. For example, giving actual numbers to the slope and position of a demand curve would require giving actual numbers to the distance between indifference curves, which would immediately destroy ordinality and require quantifying cardinal utility.

If utility is indeed unsuited to the explanation of concrete choice and cannot be quantified, its mathematisation into marginal utility is also inappropriate, something which unfortunately escaped Menger (1982 [1871]). That is how Menger got lumped together with Jevons and Walras as marginal revolutionaries, in spite of some important methodological differences between him and the other two, especially where it concerns the use of mathematics in social theory (Jaffé 1976). An important source of ambiguity in Menger's writing is indeed that, although patterning abstraction plays a key role in his methodology, he was confused about some aspects of its nature and application (see also Van Eeghen 1996: 264-266)<sup>3</sup>.

Although the concept of utility as applicable to economic theory does not refer to any specific benefit and cannot, therefore, explain concrete choice, it is clearly not as unspecific as to be totally without content. While unspecific, economic utility is still limited as to its content; it can refer to many concrete benefits as long as they belong to the same broad type, namely the type that the acquisition of tradables can bring. For that reason, the economic motive can only be used in the theoretical explanation of market phenomena, a limitation which can be construed as a form of isolating abstraction (c.f. Mäki 1993b). Although non-market behaviour may, to a larger or smaller degree, be driven by the economic motive, that motive is no longer likely to be predominant, which would render it unsuited to being used in the theoretical explanation of that behaviour<sup>4</sup>.

In conclusion, both patterning and isolating abstraction contribute towards making the assumption of a single motive realistic. Patterning abstraction does so by turning this single motive into a broad type consistent with the drive to meet many different specific needs and by requiring mere predominance rather than universality for this single motive. And isolating abstraction does so

by restricting the applicability of this single motive to a limited context only, in this case the market place. When used to account for patterns of market behaviour, the motivational side of *homo economicus* is a broadly realistic abstraction. Most market participants *are* mostly motivated by economic benefit in most of their business dealings.

## **6 INSTITUTIONS AS PERSISTENT PATTERNS OF THE SOCIAL ENVIRONMENT**

Patterning abstraction has the further advantage of naturally guiding us towards granting institutions a prominent role in economic theorising. When the irregular specifics of behaviour are ignored, the irregular and transient specifics of the social environment in the theoretical explanation of that behaviour can be ignored as well. Theory is thus set free to focus on the regular and persistent elements of that environment, i.e. on institutions. Institutions can thus be characterised as the persistent patterns of the social environment which have the capacity to shape behaviour in systematic ways, like laws, habits, rules, traditions, conventions and organisational structures; it is precisely because parts of the social environment display persistence that a given cause can have a regular behavioural effect in the future. While most institutionalists (“new” or “old”) will roughly agree with this understanding of institutions (c.f. Mäki 1993a; North 1990, 1994; Hodgson 1998, 2001), none seem to realise that patterning abstraction lies at the root of institutions’ importance for theory<sup>5</sup>.

We owe to Douglass North (1993: 242) the insight that the specific role of institutions in theory is to explain the emergence of benefit opportunities: “Institutions .. provide the opportunity set in an economy”. The way in which this happens depends on the type of pattern in question. Two pattern types are relevant in this regard: comparative-context and event-triggered patterns (c.f. Van Eeghen 1996: 271-276). We will briefly introduce both these pattern types and show how, for each case, institutions can account for benefit opportunities.

A comparative-context pattern establishes the comparative benefit of a certain institutional

context relative to a competing, often hypothetical one. For example, the institution of inconvertible fiat money enhances the growth potential of capitalism by making the money supply more flexible thereby increasing the expected profit on most investments, although it makes the system more unstable too (c.f. Hicks 1967) - all relative to the institution of a convertible, commodity-based money. A comparative-context pattern thus establishes a comparative benefit of an institution over a competing hypothetical one, which systematically influences most, if not all, benefit-opportunity types.

By contrast, an event-triggered pattern is based on the emergence of a more narrow type of benefit opportunity, which is the combined result of an institution and a trigger-event (c.f. Hayek 1967c: 68-69). Take once more the pattern “price tends to rise when demand increases” as an example. The trigger-event is provided by the increase in demand and the required institutional setting is represented by a competitive market (in the sense of there being many demanders and suppliers), whereby both are needed for the benefit opportunity to emerge: the increase in demand raises the scarcity of the good concerned which intensifies the competition among demanders and the competitive market ensures that this increased competition among demanders will lead to an enhanced bargaining position of suppliers over demanders. This enhanced bargaining position constitutes a benefit opportunity for suppliers, as it enables them to push up the price. As a rule, a trigger-event is a once-off, more or less random occurrence, although it may sometimes be the systematic outcome of a previous event-triggered pattern.

It hardly needs mentioning that an institution on its own is not sufficient to account for a behavioural regularity. While it is able to explain (in combination with a trigger-event) the existence of a benefit opportunity, it cannot explain why that opportunity will produce a determinate behavioural response. That is where the function of the economic motive comes in: it ensures that benefit opportunities get roughly exploited. Conversely, the economic motive on its own is obviously not sufficient to account for a behavioural regularity either, as it cannot explain the

emergence of a benefit-opportunity pattern. In short, consistency in both social environment (institutions) and individual agency (the economic motive) are necessary to derive regularity in behaviour, whereby neither can be afforded explanatory primacy<sup>6</sup>. There is indeed an unfortunate tendency in social theory to grant explanatory primacy to either socio-institutional conditioning or individual agency (Granovetter 1985; Hodgson 1998: 181). As for economic theory, this tendency can once again be ascribed to a neglect for patterning abstraction.

For example, because conventional mathematical theory tries to arrive at regularity in concrete behaviour, its representative agent must also be given a closed set of concrete benefit opportunities, which is effected by way of a preference function. Since patterns of the social environment can evidently only establish patterns of benefit opportunities, institutions are no longer qualified to perform their function. The role of institutions thus being taken over by preference functions, behaviour gets to be explained in exclusively individualist ways: the *individual's* motivation and the *individual's* preference function.

Conversely, “old” institutionalists implicitly grant explanatory primacy to socio-institutional conditioning, insofar they reject the economic motive in the mistaken belief that it is irredeemably distortive of the real world. Hodgson (1998, 2001) comes close to this belief, because he apparently views the economic motive as being intrinsic to concrete rationality whereby he overlooks the ability of patterning abstraction to render the economic motive realistic, as discussed in the previous section. Having lost the economic motive, such “old” institutionalists are left with institutions as their only theoretical device, which disqualifies them from deriving behavioural regularity. As such, they are forced to give up on pure theory.

Faced with this problem, “old” institutionalists appear to retreat into applied analysis (“holistic analysis” in their terms), for the purpose of which they predominantly use behaviour patterns (habits and rules) which are borrowed from theoretical disciplines other than economics, such as psychology, anthropology or sociology (Wilber and Harrison 1976; Hodgson 1997, 1998).

There is clearly nothing wrong and everything right with a multidisciplinary approach to applied analysis, as concrete market processes may indeed display behaviour patterns which economic theory cannot account for. But an applied analysis of market phenomena should surely be conducted primarily with reference to behaviour patterns which are economic in nature, i.e. patterns which are derived from the economic motive in conjunction with economic institutions, understood as institutions creating benefit opportunities of the economic kind.

Even so, many “old” institutionalist writers have made valuable contributions towards pure theory by suggesting distinctly economic behaviour patterns; personally I have found the contributions by Henry Simons and Hyman Minsky insightful. Indeed, what enabled these writers to derive behaviour patterns was that they did not shy away from employing an economic motive, but then purely as a motive-force without the added baggage of strict maximisation and a closed set of fully ranked preferences. In other words, they unwittingly used the economic motive in a form as applicable to pattern rationality rather than concrete rationality. Once the economic motive is explicitly allowed back in, >old= institutionalist economics should be able to overcome its traditional weakness, which is the absence of methodological underpinnings for rigorous (but non-mathematical) institution-based theory.

## **7 THE KNOWLEDGE REQUIREMENTS OF PATTERN RATIONALITY**

We are now ready to deal with the knowledge requirements of pattern rationality. While concrete rationality demands that all agents know the specific content and precise quantitative value of all their benefit opportunities, it suffices for pattern rationality that only a significant majority of agents know the rough contours (i.e. patterns) of their benefit opportunities as shaped by their institutional environment, which is immediately much less demanding. But that still leaves us with the question as to whether it is plausible to presume that a significant majority of agents will indeed possess such knowledge. The answer will be somewhat different for comparative-context as opposed to event-

triggered patterns.

As for comparative-context patterns, agents do not need to know about the operation of a certain institution and understand how it raises their expected benefit relative to a competing institution. They merely need to take the factors into account via which their expected benefit is influenced. To proceed with the example from the previous section, agents need not understand how the institution of inconvertible fiat money raises their profit expectations relative to a convertible commodity money regime, namely by raising the flexibility of the money stock which facilitates faster economic growth; all they need to know is that future growth influences future profit. This is so obvious that we can take it as given that a significant majority of agents will possess the required knowledge.

The knowledge requirements of event-triggered patterns are somewhat different and more demanding. Not only must agents know about the relevant institutional setting, they must also be aware that the relevant trigger-event has occurred. In addition, they must understand how this configuration of circumstances creates a benefit opportunity for them. Take once again >price tends to rise when demand increases= as the paradigmatic example. Suppliers need to know that there is significant competition in their market (the institutional factor) and that overall market demand has increased (the trigger-event). Moreover, they must understand that increased demand in a competitive market creates a benefit opportunity for them in the form of an enhanced bargaining position over demanders. In this example the relevant knowledge is again so simple and straightforward, that we may almost take its dispersal among a significant majority of relevant agents for granted, especially if we may take a reasonable degree of market efficiency and a reasonably strong entrepreneurial culture (high entrepreneurial alertness) as additional attributes of the institutional setting.

But the benefit opportunities connected to event-triggered patterns need not always be as easily recognisable. It must be remembered that knowledge about an institution, having presumably

been around for a while, will most likely already have been dispersed. But since a trigger-event is a more or less random, once-off occurrence, the socialisation of knowledge about it may need time and additional institutional facilitation, as does the socialisation of the understanding that the institution-cum-trigger creates a benefit opportunity (c.f. Lange-von Kulesa 1997: 277). The more difficult the knowledge is, the more strongly conducive to the spread of knowledge the institutional environment is required to be if the socialisation of knowledge is to be accepted as plausible. Even so, there will presumably always be some institutional setting which is conducive enough to make it highly likely that knowledge about a certain benefit-opportunity pattern will get spread among a significant majority of agents. The relevant behaviour pattern will then occur only in that setting<sup>7</sup>.

The knowledge requirements of patterns rationality are thus capable of being met in principle, basically because future uncertainty can be partially overcome by the persistence of institutions and the economic motive. As long as the relevant institutions remain in place and the economic motive remains operative and predominant, the patterns under their influence will be more or less certain. And this high degree of certainty does not negate the changeableness and uncertainty of elements of the market process not shaped by institutions or the economic motive. Pattern theory can, therefore, afford to embrace radical uncertainty of the Keynesian and Knightian kind without any danger of lapsing into the theoretical nihilism of complete indeterminism. The radical uncertainty of agents= concrete expectations does not affect the high degree of certainty attached to their expectational patterns and, as such, to their behaviour patterns.

This high degree of certainty should obviously not be taken to mean that the historical market process as a whole becomes theoretically predictable: the possibility of deriving regularity at the level of pure theory does not imply the possibility of deriving regularity at the level of applied analysis. Although theory can contribute towards applied analysis by suggesting the various isolated patterns potentially of influence on a given economic phenomenon, it cannot determine whether these patterns will be triggered into action nor what their combined outcome will be, which depends

on irregular historical detail. While theory can thus help the applied analyst to meaningfully probe the concrete historical future, that future remains fundamentally uncertain and unknowable (c.f. Hayek's "pattern prediction" in Hayek 1967b). Even so, a thorough knowledge of the unsystematic specifics of a particular time/place setting on the part of the applied analyst can always enhance the quality of his or her prediction.

Having now established that both the motivational and knowledge requirements of pattern rationality can potentially be met, we have finally arrived at the point where its realisticness can be confidently asserted. The confidence with which diametrically opposed views about the realisticness of *homo economicus* are expressed appears startling. On the one hand there are those like Robbins (1935), Popper (1983 [1967]) and Hahn (1984: 5, 1985: 6) who claim its self-evident realisticness, while, on the other hand, there are those like the institutionalists and Austrians who unabashedly assert its hopeless unrealisticness. Our analysis makes it possible to realise how both can be correct, namely insofar the former assume that *homo economicus* possesses pattern rationality (which is realistic) and the latter assume that he or she possesses concrete rationality (which is unrealistic). One thing is, however, inadmissible and that is claim realisticness for the concrete rationality of the *homo economicus* of mathematical analysis on the basis of the realisticness of pattern rationality, such as Hahn (*ibid*) appears to do.

## **8 FROM PATTERNS TO INSTITUTIONS**

A behaviour pattern can turn into an institution itself, namely when it acquires persistence by getting entrenched in a law, habit, rule, norm or convention. The theoretical explanation of the emergence of institutions (insofar spontaneous and "organic" in Menger's terms) must, therefore, contain two elements: (1) an explanation of the initial appearance of a pattern and (2) an explanation of its becoming persistent (c.f. Pettit 1995: 324). Initial appearance can be accounted for in the same way as any other event-triggered pattern, namely with reference to a trigger-event and a prior institution.

For example, the initial appearance of money is the eventual result of the discovery of the benefit of exchanging a less marketable good for a more marketable one (trigger-event) in the context of a high intensity of trade (prior institution) - as Menger's classic argument goes. And persistence can be explained with reference to the persistence of the prior institution which created the benefit of the subsequent institution. For example, monetary exchange is persistent because intensive trade, which is responsible for the benefit of monetary over barter exchange, is persistent<sup>8</sup>.

The above comments allow us to make some brief critical remarks on Elster's (1979, 1983) widely accepted views on the deficiencies of what he calls "functional analysis", i.e. analysis which explains the emergence of institutions with reference to their beneficial consequences. Elster claims that such analysis is incomplete, because the mere beneficiality of a behavioural regularity cannot account for its initial appearance nor its persistence. Persistence requires, according to Elster (1983: 57), a feedback loop from the beneficial consequence of an institution back to its emergence, which functional analysis lacks.

But it seems that the beneficial consequences of an institution *are* able to account for its persistence, as they are the solution to a persistent problem created by a prior institution. As already mentioned, money-use is persistent because it has the benefit of solving the persistent problem created by persistently intensive barter trade. Persistence does not, therefore, require a feedback loop and functional analysis, being capable of explaining persistence (insofar conducted as pattern theory), is not quite as vacuous as Pettit (2000) makes it out to be. The principal weakness of functional analysis does not lie in its inability to explain persistence but only in its inability to explain initial appearance.

This weakness is due to the fact that functional analysis fails to distinguish (as does Elster) between rule-initiating and rule-following behaviour, the former being an event-triggered pattern and the latter a comparative-context pattern. By referring to the beneficial consequences of an institution, functionalism may provide an adequate explanation of rule-following behaviour, but it

has not thereby provided an explanation of rule-initiating behaviour. For example, the fact that monetary exchange is beneficial relative to barter exchange explains rule-following, but it does not explain the rule-initiating of why money was introduced in the first place. The latter, being an event-triggered pattern, requires a trigger in the form of discovery, which functional analysis does not provide.

Moreover rule-initiating and rule-following may refer to different types of behaviour with different types of benefit attached to them, which is what opens up the possibility for classic invisible-hand explanation. For example, the benefit of initiating money-use (exchanging a less marketable good for a more marketable one) is subtly different from the benefit of using money (exchanging goods for money rather than goods for goods), which is why the latter may be the unintended consequence of the former. We will have occasion to come back to this important issue in the next section.

## **9 THE METHODOLOGICAL COLLECTIVISM OF PATTERN THEORY**

The method of pattern theory is essentially collectivist in that it seeks to describe the predominant behaviour of many agents of the same broad type. Patterning abstraction does not allow theorising about the behaviour of concrete individuals, because that behaviour may just represent the exception to the pattern-rule. It should be borne in mind that a certain behaviour pattern cannot reliably be ascribed to *all* concrete representatives of the same abstract type, although conformity to the pattern will, by nature, always be predominant. Hence, a methodological individualism which demands the explanation of concrete individual behaviour forces that explanation out of the realm of pure theory and into that of applied analysis, where uncertainty and *ad hocery* have their proper place.

We now face a shocking result: if we agree that patterning abstraction is a key element of Austrian methodology in the tradition of Menger, Mises, Hayek and indeed Lachmann, there are better grounds to describe that methodology as collectivist than as individualist. The shock can,

however, be cushioned in three important ways.

First, the methodological collectivism of pattern theory does not imply that decision-making power be assigned to groups, as some versions of methodological collectivism do; it does not quarrel with the most basic methodological individualist claim that only individuals can make choices. The point requires some explanation. Given that the aim of theory is to formulate behavioural regularity, the agents over which it generalises are presumed to behave in the same way, which creates a dilemma when dealing with the aggregate behaviour of a concrete group. Either the individuality of the agents in that group is maintained but they are regarded as identical, or they merge into an undifferentiated collective with decisions being taken at the level of the collective. The former case involves a methodological individualism which demands micro-foundations in terms of the behaviour of a representative individual agent and the latter case encompasses a type of methodological collectivism which assigns decision-making power to groups, both of which infuse unnecessary unrealisticness into theory. Pattern theory escapes this dilemma, because it ascribes behavioural regularity to an abstract type of agent, the concrete representatives of which are the same only in the broad pattern of their motivation and social circumstances, but retain differentness and therefore individuality in the concrete specifics of their motivation and circumstances.

Second, the methodological collectivist nature of pattern theory does not imply that it is more suited to economy-wide macroeconomic analysis than it is to single-market microeconomic analysis. The degree of aggregation over concrete agents can differ according to how broad the agent type is taken, from very broad (e.g. the aggregate demander) to much more narrow (e.g. the demander for a highly standardised good in a competitive market), which is already sufficient to facilitate both macro- and microeconomic theory.

Third, as mentioned in the previous section, pattern theory presupposes that roughly the same patterns of knowledge can be ascribed to a significant majority of the concrete representatives of an abstract agent type, which, while often highly likely, is certainly not self-evident. As a result,

there is scope for an analysis of the process of knowledge socialisation, which must be partly individualistic in that it has to start with the knowledge of an individual initiator and investigate how, given certain institutional conditions, that knowledge can plausibly get socialised over the relevant group. This methodological individualism complements rather than conflicts with the methodological collectivism inherent in pattern theory, because a theory about knowledge socialisation is prior to pattern theory which proceeds on the assumption that the relevant knowledge is already socialised.

Lange-von Kulesa (1997: 276) notes how Hayek's methodological individualism can be grounded in precisely this way: "For him [Hayek] individualism is not an *ad hoc* assumption, but a necessary conclusion that follows from his assessment of the cognitive abilities of human beings and their integration into social processes" (see also Vanberg 1985: 82-83). However, Hayek's (1967c, 1982) theory of social evolution combines this kind of individualism with an inherently collectivist method as well, namely group selection. Hayek's eclecticism on this score has drawn opposite criticisms from both methodological-individualist (Vanberg 1986) and methodological-collectivist (Hodgson 1991) camps.

Although pattern theory has no objection to the idea of group selection in principle, it does have problems with Hayek's concept of a group. Pattern theory's group comprises a collection of concrete agents belonging to a single type and displaying a single behavioural regularity. By contrast, Hayek's group combines a set of various agent types displaying various behaviour patterns (c.f. Vanberg's 1986: 87 distinction between "kin" and "group"). This latter group concept is problematic, because a study of the interaction between various behaviour patterns requires the partial reversal of isolating abstraction and thus of patterning abstraction as well. Hayek's analysis of how the dispersed actions of individuals can spontaneously produce an overall social order cannot, therefore, be conducted at the level of pure theory. It can only be conducted by way of applied analysis, with the implication that its method is pragmatic and its results ungeneralisable as

well as subject to uncertainty, inexactitude and subjective judgment. Only to the extent that the analysis is comparative in nature and seeks to describe comparative-context patterns (e.g. “decentralised market planning is *comparatively* more equilibrium searching than centralised state planning”) can it remain purely theoretical and formal, because isolating abstraction is implicit in the comparative approach (Rizzo 1990: 26; Van Eeghen 1996: 271-274).

Vanberg (1986) may, therefore, be right in insisting that Hayek’s “theory” of social evolution must be individualistic, because as applied analysis it is forced to involve the irregular specifics of concrete cases. But Vanberg (1986: 79-81) seems wrong in insisting that invisible-hand explanation in general is inherently individualistic. First, invisible-hand explanation is not wedded to Hayek’s group concept and, therefore, does not need to be conducted at the level of applied analysis. Second, as mentioned in the previous section, the undesignedness of social institutions does not hinge on the discrepancy between the individuality and sociality of knowledge, but rather on the discrepancy between the benefit of two action types, rule-initiating and rule-following. Failure to appreciate this latter point seems also to have led Menger (1985 [1883]) to the mistaken conviction that classical invisible-hand explanation presupposes methodological individualism.

## **10 THE REALISM AND TESTABILITY OF PATTERNS**

An abiding problem in economic theorising is how to single out the regular elements in historical processes, while doing equal justice to the irregular elements therein. Just as with the contrast between constancy and change, theory should ideally affirm the one without negating or trivialising the other (c.f. Dow 1990; Chick 1995). Patterning (in combination with isolating) abstraction is able to do so, simply because it declines to theorise about irregular specifics. With irregular specifics taken out of a concrete process, theory is relieved from having to refashion that process in some distortive manner so as to make it regular, such as by assuming strict maximisation, a closed choice set and a fully ordered preference scale - in conventional neoclassical mode. By overlooking the

need for patterning abstraction, conventional theory has thus condemned itself to the unrealisticness of concrete rationality and forced a divide between rigour and relevance on the subject. Patterning abstraction can bridge that divide, because it is able to create rigour (be it of a non-mathematical kind) without compromising realism.

Patterning abstraction evidently does not paint a realistic picture of economic processes in any absolute sense. That picture is always idealised because it ignores historical specifics and considers only predominantly regular elements, which may not be present in every single concrete case. For example, the economic motive does not rule the behaviour of all market participants all of the time. Nonetheless, because that motive does predominantly drive the behaviour of the predominant majority of market participants in the predominant majority of their business dealings and because we are interested only in the broad pattern of things, the atypical can get drowned in the typical. That is why pattern theory, in spite of its idealisation, is able to retain such a degree of realism that its explanations can rightly be labelled as truthful. To speak in Mäki's (1989, 1992, 1994) terms: patterning abstraction can generate "truth", even though it will never be "nothing but the truth".

Isolating abstraction will equally contribute towards creating an artificial idealised world, in that real-life causal processes seldom or ever occur in their purity. For example, the behaviour pattern  $\text{price} \rightarrow \text{price tends to rise when demand increases}$  is a causal mechanism which will seldom or ever be observed in isolation; price will simultaneously be pushed in many different directions by many different factors, of which a change in demand is only one. But this does not take anything away from the potential relevance, and indeed realism, of a theoretical explanation of this isolated causal mechanism, as long as the theorist bears in mind that many other mechanisms can play a role in the causation of concrete price increases. To use Mäki's (1989, 1992, 1994) terms once more: isolating abstraction can create "truth", even though it will never be "the whole truth".

Of course, claiming that theory can be realistic rather begs the question as to how we know

that some theory X is realistic. This raises the issue of testing, which is generally considered to be so fraught with difficulty, that theoretical relativism or pluralism has just about become the only respectable position (e.g. Salanti and Screpanti 1997). We will briefly review the main source of difficulty in testing in an effort to show how patterning abstraction enables us to sidestep it.

When the mechanism to be theorised about is unobservable, which particularly applies to physical processes at the atomic and subatomic levels, theorists are forced to formulate hypotheses about what happens inside the black box. These hypotheses must then be tested indirectly by way of deducing observable consequences (predictions) from them - hence the hypothetico-deductive method (Stewart 1979: 40). The logical problem with indirect testing is that one can never be certain that the observed consequences were the result of the hypothesised premises; the same consequences could have been the outcome of other premises too. If, however, it can be established that the premises of pattern theory are in principle empirically observable, indirect testing by way of prediction is no longer necessary and the problem disappears.

As should be obvious by now, the premises of pattern theory are: (a) the presence of some institution, (b) the occurrence of some trigger event, (c) the predominance of economic motivation and the predominant possession of knowledge of benefit opportunity patterns on the part of economic agents.

As for institutions and trigger events, it is evident that they are observable, as Backhouse (1997b: 7) remarks: “The [stylised] facts that are relevant for theorists are often statements about institutions, or things that are known “directly from experience”. As for the economic motive, while we cannot directly observe other people’s minds, we can observe their speech and behaviour and we have experience of our own minds when involved in market activity. And such observation and experience points unequivocally in the direction of the economic motive being predominant in the market place. For all practical purposes, therefore, economic motivation can be grounded in empirical observation rather than accepted *apriori*, as Mises (1949) and, in his footsteps, Robbins

(1935) were inclined to do.

What makes the fulfilment of the knowledge requirements of economic rationality potentially observable is that patterning abstraction relieves theorists from having to probe the invisible mind of concrete agents so as to find out the specifics of their concrete knowledge and expectations, as concrete rationality requires. All the pattern theorist needs to know is that the typical agent is aware of his or her institutional surroundings and understands how certain institutions in combination with certain trigger events create certain benefit-opportunity patterns<sup>11</sup>. To obtain such knowledge, which is normally uncomplicated, no concrete person's mind needs to be penetrated at all. Hence the correspondence which Frank Knight saw between the social and natural sciences, namely that both deal with unobservable phenomena (see Hammond 1991), is mistaken.

If the premises of pure theory can indeed be empirical, conclusions do not need to be speculated or hypothesised about but can be deduced, in Aristotelean fashion, from the observable general nature of things. Economic theory thus becomes a matter of making explicit and manifest what is implicit and latent in the observable nature of human beings and their institutional setting, as was already Menger's (1983 [1871]: 53) view. While the method is deductive, it is not hypothetico-deductive so that prediction is not necessary for indirect testing. Of course, testing premises by direct observation does not yield complete certainty for the deduced future consequences, as we can never be totally sure that the premises, in particular some institution, will persist into the relevant future. Even so, the level of certainty can be so high that the theoretical deductions can for all practical purposes be described as reliable and truthful.

Although prediction is not necessary to test pure theory, it is necessary to test applied analysis, if prediction was indeed the aim of the analysis - applied analysis can, after all, also be used to explain the past. The predictive success of applied analysis is, however, as much the product of the success of its pragmatic and speculative assumptions as it is of the validity of its formal-theoretical building blocks (the isolated patterns used), which is exactly why historical prediction is

incapable of reliably testing the pronouncements of pure theory. The mistake of insisting on prediction as a way of testing pure theory is symptomatic of the confusion surrounding the proper domains of pure theory and applied analysis. Because conventional mathematical theorists unwittingly neglect patterning abstraction, they think they conduct pure theory when they actually practise a form of applied analysis (see section 3), which is why they are inclined to employ a mode of testing appropriate to applied analysis, namely prediction.

The irony is, of course, that conventional mathematical theory employs indirect testing by way of prediction, not because its hypotheses seek to probe an unobservable reality (which was the original rationale for using prediction as a test) but because these hypotheses are observably false, in particular where it concerns economic rationality. Successful prediction then serves as an instrumentalist justification for their manifest falsehood. Apart from the improper use of hypothetico-deduction which such instrumentalism entails, knowingly positing false hypotheses and knowingly constructing false theory remains perverse indeed.

## NOTES

1. Mäki (1992) uses a somewhat different terminology. What he calls *isolation* can be regarded as roughly similar to what we call *abstraction*. And just as he distinguishes between two forms of isolation (vertical and horizontal isolation), we distinguish between two forms of abstraction (patterning and isolating abstraction) along almost identical lines.
2. A sensible check on the unrestrained mathematisation of economics would indeed be to insist that any mathematical economic analysis should, in principle, be open to parameter quantification.
3. The inappropriateness of the concept of marginal utility does not, however, imply the inappropriateness of the related concept of incremental utility. In fact, all that is sound and useful in marginal analysis can equally be expressed in terms of increments in utility which need not be quantified nor assumed the result of infinitely small changes in goods quantities. Just to make the

point, it would, perhaps, be helpful if pattern theory were henceforth to speak of incremental rather than marginal utility.

4. Conventional mathematical theory has turned the fact that it has rendered utility barren to its advantage by claiming that its technique, rational choice theory, is applicable to any context, inside or outside the market place. It is thereby assumed that mathematical model structures can capture regular social patterns, which as indicated above is problematic. There is, nonetheless, a sense in which the economic method is equally applicable to other social disciplines. A single motive other than the economic motive may be predominant in an institutional context other than the market. For example, public-choice theorists may rightly presume that, within the institutional context of the state, behaviour is predominantly ruled by the desire to obtain and maintain political power, whereby the economic and other possible motives merely play reinforcing roles or else do not challenge its predominance. Utility then refers to the benefit of obtaining and maintaining political power.

5. This need not be entirely true. Hodgson (1998: 172-174) emphasises the key roles played by Kaldor's stylised facts and Weber's ideal types in "old" institutionalist methodology - theoretical constructs not very different from Hayekian patterns. Nonetheless, "old" institutionalists nowhere show how the theoretical explanation of stylised facts and ideal types automatically guides them towards the importance of institutions in theory-making. It is also appropriate to note in this context that Wilber and Harrison's (1976) "pattern modelling" has nothing to do with patterning abstraction in our sense. The essence of their pattern modelling is that it is "holistic", meaning that it "focuses on the pattern of relations among parts and the whole" (1976: 71). Wilber and Harrison's pattern modelling is thus equivalent to what we call applied analysis, as opposed to the isolated and patterned regularities of pure theory (c.f. Mäki 1993: 24).

6. Of course, the economic motive is already partially the result of the institutional conditioning of the market, which causes us to consider only those benefits which can be met by acquiring tradables.

But the fact that individuals have needs in general and strive to meet them can, for all practical purposes, be regarded as purely a matter of individual agency.

7. In case the trigger-event takes the form of the discovery of a novelty, the knowledge requirements may get overstated through a misunderstanding. These requirements do not concern the knowledge necessary to make the discovery, but only the knowledge about the discovery once it has already been made and once it has acted as a trigger. Put differently, it is the knowledge to imitate rather than the knowledge to originate which matters and which needs to be socialised. After all, the regularity and predictability of an event-triggered pattern does not require the regularity and predictability of its trigger.

8. This referring back to prior institutions may appear to hold the danger of infinite regress. While there will be regress, it is not infinite. At some stage, one will arrive at the foundational givens of human existence, which are not the product of human intentionality and, therefore, not the domain of social science: the more or less static nature of humans themselves (their basic needs, desires, abilities and limitations) and the structural elements of their natural environment (climate, soil, location and laws of nature) (c.f. Hayek 1967b, 1982). The emergence (initial appearance plus persistence) of institutions, insofar voluntary, is thus ultimately grounded in the, for all practical purposes, static nature of humans and their natural environment. As North (1994: 362) notes: “The initial architecture of the structure is genetic, but the subsequent scaffolding is a result of the experiments of the individual.” The subsequent scaffolding is experimental, because designed to offer solutions to the structural problems posed by the initial architecture (c.f. Schotter 1981: 17). And it should be clear that, as a rule, a variety of institutional solutions of varying quality are possible for a given set of structural societal problems. Insofar institutions offer only partial solutions, their persistence is evidently not only determined by the persistence of the problem they solve, but also by the quality of the solution they offer. An institution offering a poor solution will more easily be superseded by an institution offering a better one, although the sheer power of

Veblenian habit or political blockage (see North 1994) may obviously frustrate progress in this regard.

9. The assumption that agents already possess all necessary knowledge on which to base their decisions passes over all sorts of interesting issues about the nature of that knowledge as well as whether and how agents acquire it, which is the substance of Hayek's (1937, 1945) critique of conventional mathematical theory.

10. It should be obvious that only event-triggered patterns are relevant here. Comparative-context patterns are continuously operating as long as the relevant institutions are in place, with the result that the flow of historical time does not matter to them.

11. Hence, any theorising about the acquisition of concrete knowledge and the formation of concrete expectations becomes superfluous as well (c.f. Van Eeghen 1994: 163-166).

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