

Uskali Mäki

ON THE METHOD OF ISOLATION IN ECONOMICS

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It is sometimes said that the laws of economics are 'hypothetical.' Of course, like every other science, it undertakes to study the effects which will be produced by certain causes, not absolutely, but subject to the condition that *other things are equal*, and that the causes are able to work out their effects undisturbed. Almost every scientific doctrine, when carefully and formally stated, will be found to contain some proviso to the effect that other things are equal: the action of the causes in question is supposed to be isolated; certain effects are attributed to them, but only *on the hypothesis* that no cause is permitted to enter except those distinctly allowed for. (Alfred Marshall: *Principles of Economics*)

1. Introduction

Faced with the essential complexity of the world, every science is compelled to employ methods of modifying or deforming it so as to make it or the image of it¹ theoretically manageable and comprehensible. Economics is no exception in this regard. Even more, in the field of economics these methods are visible, pervasive and subject to open con-

troversty, and in this way the field provides the philosopher of science with particularly inspiring materials for developing general ideas about the principles and problems of deforming reality for cognitive (and possibly other) purposes. On the other hand, a careful philosophical scrutiny of these methods may help provide the perplexed economist with conceptual tools and insights that improve the quality of self-reflection and of the terms of controversy within the discipline.

The primary focus in this paper is on what may be called *the method of isolation*, whereby a set of elements is theoretically removed from the influence of other elements in a given situation. In the history of economics, we can find many formulations of this method and see the decisive role it plays in the attempt theoretically to comprehend economic phenomena. The first systematic exposition that I am aware of is Johann Heinrich von Thünen's (1826) discussion of the methodological character of his theory of agricultural land use. Some of the more important later formulations are due to John Stuart Mill (1836, 1843), Karl Marx (1859, 1867), Carl Menger (1883) and Alfred Marshall (1890). (See, e.g., Hausman, 1981; Nowak, 1980; Mäki, 1989a; 1990b; 1990c.)

I propose to do the following in this paper. First, in the absence of established conceptual conventions in the study of these questions, a few conceptual and terminological clarifications and distinctions will be suggested in order to identify some of the relevant aspects in the process of the deformation of our images of reality which pervades scientific theorizing. For instance, suggested specifications will be provided for notions such as isolation, abstraction, idealization, omission, and for their interconnections.

Second, various facets of the method of isolation will be discussed. It will be argued that, given the conceptual stipulations, the method of isolation is a central method employed in economics, and that many other methods such as that of idealization are subservient to it. Distinctions will be suggested to illuminate the variety of different kinds of isolation involved in economic theorizing. Questions of the pragmatics and metaphysics of isolation will also be briefly discussed. Examples will be provided to illustrate the pervasiveness of isolations in theoretical economics. The crucial role of isolation in econometrics, however, will not be discussed.

Third, isolation will be related to what I suggest calling "realisticness" as an attribute of economic theories and their constituent parts. The sug-

gested conceptual clarifications are used to shed some light on the age-old issue concerning the “realisticness” of purportedly predictive or explanatory economic theories or of the “assumptions” they involve. It will be shown how many obscurities prevailing in the debate can be dispelled. In particular, the clarifications should help us locate the strategic points in the controversy and uncover some of the hidden presuppositions on both sides of the front line. Critics of what they regard as overly “unrealistic assumptions” usually argue that theories and their assumptions have to be “realistic” in order to render economic phenomena understandable. However, due to the ambiguity of the predicate ‘is (un)realistic,’ the relationship between realisticness and understanding is much more complicated. For instance, it will be pointed out that, on suitable conceptual specifications, a *realist* economist with a suitable social cosmology pursuing ambitiously explanatory theories is obliged to employ “assumptions” that are “*unrealistic*” in many senses of the word.

In the course of the discussion, a few critical comments will be forwarded regarding Leszek Nowak’s seminal work on idealization in science as presented in his *The Structure of Idealization* (1980).

The paper is primarily concerned with some of the conceptual and philosophical underpinnings of the method of isolation as practiced in economics, while the economic substance of the suggestions is kept to a minimum. This may increase the general relevance of some of the points put forward.

2. The issue of realisticness

The most chronic ongoing methodological controversy in economics is concerned with the question of whether this or that theory, model, or “assumption” is justifiably “realistic” or “unrealistic” – whether and for what purpose it is legitimate to assume that firms maximize profits and consumers maximize utility, that returns are diminishing and the market demand curve faced by firms is horizontal, that agents’ expectations are rational and preferences are given, or that goods are homogenous and perfectly divisible, to give a few paradigmatic examples.

The long history of this controversy comprises many representative episodes such as, in the last decades of the nineteenth century, the Irish Comtean attack on the alleged narrowness of classical economic theory and the *Methodenstreit* between Austrian subjectivists and German his-

toricists; the controversies over the “laws” of returns in the 1920’s and over the marginalist pricing assumptions in the 1940’s; and the long debate, from the mid–1950’s onwards, over Milton Friedman’s thesis that it really does not matter if the assumptions of economic theory are utterly unrealistic.

In these debates, ‘is realistic’ and ‘is unrealistic’ are plagued by multiple ambiguity. In earlier work I have tried to provide specifications for some of the important alternative senses in which these expressions have been and may be used in the discourse concerning economic theories (see, e.g., Mäki, 1988 and 1990a). To list some of the more relevant implicit meanings of the term, *realisticness*² has been and is being attributed to representations that refer to real things (referential realisticness); represent features had by their real referents (representational realisticness); represent truly features of the things they refer to (veristic realisticness); are observational; are comprehensive; are complex; are concrete; are well confirmed in empirical tests; are plausible; are practically relevant. On the other hand, ‘is unrealistic’ has been taken to apply to representations that do not refer to anything real; do not represent any features had by their existing referents; are false; are non–observational; are non–comprehensive; are simple; are abstract; fail in empirical tests; are implausible; are practically useless.

It is important to understand that while some of these attributes are mutually connected, others are conceptually independent. Some of them are purely semantic, while others are pragmatic. Still, all of them are relevant in examining economic theories and controversies about them. In the course of the discussion to follow, I deal with some of these senses of (un)realisticness, in particular those which are involved in the method of isolation.

3. Isolation, abstraction, idealization

In the literature discussing the question of the deformation of our image of reality, it is often the case that no clear–cut divisions are made among categories such as idealization, abstraction, isolation, simplification, generalization, and so on. There should be no doubt that such a situation is not very helpful in promoting more detailed studies of these matters. For the purposes of the present discussion at least, the following conventions will be suggested.

In an *isolation*, something, a set X of entities, is “sealed off” from the involvement or influence of everything else, a set Y of entities; together X and Y comprise the universe. The isolation of X from Y typically involves a representation of the interrelationships among the elements of X. Let us call X the *isolated field* and Y the *excluded field*. It should be obvious that any representation involves isolation: isolation is ubiquitous in human cognition.

The idea of isolation should not be mistaken for the familiar distinction between endogenous and exogenous variables in an ordinary economic model. Endogenous variables are those whose values are determined within the system of relationships depicted by a model, while the values of exogenous variables which affect the system are determined from without the system. In such an economic model, the objects of one or more of both the endogenous and exogenous variables are isolated from other objects so as to examine the influence of the objects of the latter variables on the objects of the former in isolation from all other influences.

A representation is often taken to be “unrealistic” by economists if it isolates a very small set of features from a very large set of features. ‘Is unrealistic’ in this sense means something like ‘covers only a relatively small segment of elements in a given situation.’ The accompanying sense of ‘is realistic’ then is something like ‘is comprehensive.’ Realisticness in this sense is a matter of the “size” of the isolated field relative to the “size” of the excluded field. The distinction between ‘is realistic’ and ‘is unrealistic’ as so specified is not dichotomous. These concepts allow for differences of degree. For example, we may say that within standard neoclassical economics, partial equilibrium models are more unrealistic than general equilibrium models since they isolate the relations within a single market or between two or more markets from the other markets in the economy; and that traditional institutional economics provides representations of the economy that are more realistic than neoclassical representations in that, besides market relations mediated by prices, they encompass factors such as cultural habituation and social power.

A most typical situation in which a student of economics confronts the idea of isolation is when writing down a demand function for a good when the demand is assumed to depend only on the price of that particular good:

$$(1) \quad q_1 = f(p_1)$$

The simple point is that (1) involves greater isolation and is thus straightforwardly more “unrealistic” than

$$(2) \quad q_1 = f(p_1, p_2, \dots, p_n)$$

where p_2, \dots, p_n are the prices of the complements and substitutes of good 1. (There are other senses in which (2) may be more realistic than (1), such as that of faring better in empirical tests.)

Isolation in this general sense can be distinguished from *abstraction*, which I take to be a subspecies of isolation. In an abstraction, a universal or quasi-universal is isolated from particular exemplifications. For example, the notion of labour input in the general form of an economist’s production function (such as $Q = F(L, K)$ where Q is the output, L is the labour input and K is the capital input) is based on abstraction. It denotes a kind of universal (or quasi-universal) stripped of reference to any spatio-temporally specified instances of labour. The same applies to the fundamental concept of a market. It is formed by isolating from the particularities of this or that market for, say, Swedish carrots, Finnish paper machines, Danish philosophers, the stocks of the Norwegian state oil company, and Islandic currency. For the purposes of macroeconomic modelling, an intermediate abstraction is reached by lumping particular markets together in a few groups while setting their particular features aside; the result is a set of generic markets for consumer goods, investment goods, labour services, financial assets, and money. Abstracting further from the differences between these types of markets gives us the universal notion of a market.

It is a notable implication of this usage that abstractions also reside outside the borders of the isolated field of economic theories or models. For example, an abstract partial equilibrium model may isolate a single abstract market from other abstract markets. In general terms, isolation is an operation which may function on a given level of abstraction. When isolation brings about a switch of such a level, it is called abstraction. We may refer to these two cases metaphorically as “horizontal” and “vertical” isolation. In *horizontal isolation*, the level of abstraction remains un-

changed, while in *vertical isolation* the level of abstraction changes. Obviously, any instance of theory or model formation involves both kinds of isolation.

Sometimes the formulation of the issue of realisticness involves the notion of abstraction. We may say that one representation is more unrealistic than another if it is more abstract, and that it is more realistic than another if it is more concrete, that is, involves more particularities. Taken literally, this notion would seem to be the one employed when somebody complains that the concept of economic man is not an adequate description of "you and me," that is, of particular persons, but is instead concerned with an "abstract fiction."

Using our example of a simple demand function, we may say that

$$(3) \quad q = f(p)$$

which applies to any market for which the demand for a good is a function (of whatever form) of its own price, is more abstract than

$$(4) \quad q = a + bp$$

which gives the equation linear specification, with a and b as parameters. (4) is true only of those markets for which the relationship between demand and price is linear. It, in turn, is more abstract than

$$(5) \quad q = 8.5 - .85p$$

in which the parameters have been empirically estimated for one particular market. The move from (3) through (5) is one of descending abstraction or of increasing concreteness, whereas the move from (1) to (2) is an instance of opening up an isolation or of increasing comprehensiveness, with both the isolated and excluded elements at the same level of abstraction. While the move from (5) to (3) is a case of vertical isolation, the move from (2) to (1) is an example of horizontal isolation.

In economics as elsewhere, the term 'abstraction' is often used to denote what I call horizontal isolation (for example, see Nowak, 1980;

Cartwright, 1989; Lawson, 1989; Dilworth, 1989). The distinction between the two is often useful though, such as when clarifying the difference between the two moves about demand functions above.³

Isolation in the present sense is sometimes also called *idealization*. In this usage, idealization is understood widely, so as to encompass almost anything that theoretically deforms reality (see, e.g., McMullin, 1985). For the purposes of the present essay, I will be using 'idealization' in a narrow sense in which idealizations are formulated in terms of limiting concepts designated or designatable by variables with the value 0 or $|\infty|$. Idealizations of this specific kind abound in economics. Examples are assumptions of full employment, zero transaction costs, zero cross elasticities, perfectly divisible goods, and infinitely elastic demand curves. 'Idealization' in the present sense comprises what Nowak (1980, p. 28) calls an "idealizing assumption" which has the form

$$p(x) = 0$$

that is, the value of magnitude p attributed to object x is assumed to be zero even though, as a matter of fact, $p(x) \neq 0$. Thus, in regard to this term there is uniformity between the usage adopted here and that of Nowak, on whose views I will be commenting.

Sometimes, even when idealization is being distinguished from isolation and abstraction, the idea of a limit is not used. Mere modification or deformation of some of the properties of an object is taken as characteristic of idealization. Again, it is possible to divide such modifications of properties into several kinds, such as understatements and overstatements – and idealization as a subspecies thereof, taking understatement or exaggeration to absolute extremes (see Mäki, 1990a). Other terminological conventions are possible, of course. For instance, the three kinds above might be called "understating idealization," "overstating idealization" and "extremal idealization."

Idealizations are unrealistic in the straightforward sense that they are false statements – a completely different sense from that in which isolations are unrealistic. Furthermore, idealizations are deliberate falsehoods. That is, they are not errors. The simple sense in which idealizations are unrealistic is a dichotomous notion that does not permit differences of de-

gree. (On the other hand, if we take the falsehood of idealizations to involve varying “distances” from the truth, then their unrealisticness may come in degrees: some falsehoods are closer to the truth than others.)

It follows from the suggestions in this section that the usage adopted here concerning ‘isolation,’ ‘abstraction’ and ‘idealization’ tends to diverge from that of Nowak, whose phrasings often seem to imply the conflation of all three notions such as in the statement referring to “the method of abstraction in the Marxian sense, i.e., the method of idealization” (Nowak, 1980, p. 34). In the present paper, abstraction is taken as a special kind of isolation while idealization in the stipulated narrow sense is often used as an auxiliary technique for generating isolations.

4. Kinds of isolation

There are many possible ways to classify different isolations employed in science. I already mentioned the distinction between horizontal and vertical isolation. Of the remaining possibilities, I suggest just three more distinctions among kinds of isolation that are relevant in regard to understanding the method as used in economics.

The first is the distinction between material and ideal or theoretical isolation. There are two kinds of *material isolation*. The first is manifest when a real system, relation, process, or feature, based on a causal intervention in the processes occurring in the world, is materially closed from the involvement or causal interference of some other real entities. Laboratory experimentation in some natural sciences is based on purported material isolations. This kind of material isolation may be called *experimental isolation*. The second kind is based on utilizing naturally or spontaneously occurring closures in the real world, that is, closures that have not been causally brought about by the research community. This variety of material isolation may be called *spontaneous isolation*.

Theoretical or ideal isolation, on the other hand, is manifest when a system, relation, process, or feature, based on an intellectual operation in constructing a concept, model, or theory, is closed from the involvement or impact of some other features of the situation. Theoretical isolation is based on “thought experiments” instead of laboratory experiments: isolation takes place in one’s ideas, not in the real world. Theoretical isolation is a traditional forceful procedure used in economics, and I will

focus on it in the sequel. That is, I will not comment on the attempts to bring about material isolation in so-called experimental economics.

It is popular among economists to view "isolative" modelling as a kind of experimentation. As a leading new classical macroeconomist Robert Lucas suggests, "[o]ne of the functions of theoretical economics is to provide fully articulated, artificial economic systems that can serve as laboratories in which policies that would be prohibitively expensive to experiment with in actual economies can be tested out at much lower cost" (Lucas 1980, p. 696). Of course, Lucas could have added that strictly controlled experimentation in actual economy-wide systems is impossible: theoretical isolation is not only cheap but, along with less than strict experimental isolation, it is often the only option economists have.

The second distinction can be made between what may be called internal and external isolation. In an *internal isolation*, one isolates a system from influences coming from within the system, while *external isolation* closes a system from influences that have sources which are external to the system. Both internal and external isolation are relevant in economics.

Internal isolation is used when, for example, the internal organization of business firms is ignored in standard neoclassical economics, or when, in an equilibrium analysis, the process of adjustment of a system to an exogenous "disturbance" is ignored. Macroeconomic reasoning based on aggregates also involves internal isolation, namely isolation from microeconomic processes. For instance, when explaining a given rate of inflation – that is, a change in the price level of an economy – by using a simple quantity theory of money, relative prices as part of the microeconomic underpinnings of the macroeconomic relation are assumed to be fixed. This means that the price level is isolated from changes in relative prices, i.e., the macro is isolated from the micro.

External isolation is manifest when, in microeconomics, the functioning of a given market is examined in isolation from some other markets, as in partial equilibrium analysis. Also, if a simple growth model is formulated in terms of, say, capital, labour, investment and consumption while ignoring the role of government policies, it utilizes external isolation. The same is the case when the relationship between, say, inflation and unemployment is analyzed in domestic terms, that is, not taking account of foreign trade and international movements of capital and labour.

In the examples above, most of the included and excluded factors are “economic” ones – they belong to the ordinary purview of the discipline of economics. A third distinction gives us a richer view of various isolations on which economics as well as other scientific disciplines depend. Let us call *interdisciplinary isolations* those isolations which help define and close the boundaries of a discourse that characterizes a whole discipline. Thus, it is the task of interdisciplinary isolations to define the domain of “economic” discourse in contrast to the scientific domains of “physics,” “geology,” “biology,” “psychology,” “sociology,” “political science,” “history,” etc. Within any one of these disciplinary domains or isolated fields, further isolations take place. They may be called *intradisciplinary isolations*. For example, such isolations help isolate one set of economic entities from another.

Thus, what we get is a hierarchy of isolations. Furthermore, such a hierarchy does not stop at either of these ends. At one end, the domain of “scientific” discourse is isolated from the domains of “ethics,” “religion,” “art” and other such “non-scientific” discourses. At the other end, each scientific discipline comprises a moving and sometimes hazy hierarchy of intradisciplinary isolations. In mainstream economics, there is the great division between “micro” and “macro.” Within macro, there are further divisions such as that between the domains of theories of “growth” and theories of “development.” Within the domain of theoretical research on growth, schools or orientations build upon their own characteristic isolations such as those of the “neoclassical” and “Cambridge” approaches. Finally, within one theoretical approach, specific models, such as the one-sector and two-sector models within the neoclassical theory of growth, are built upon specific *intra-approach isolations*.

Any single discipline and any single theory or model within a given discipline thus involves a large and complicated system of isolations with varying roles, forms and strengths.

5. Techniques of isolation

The techniques of theoretical isolation available in economic theorizing comprise what I propose to call omission and idealization. In what follows I discuss these two techniques and their relation to the nature of the *ceteris paribus* clause.

As was said above, an *idealization* in the narrow sense adopted here is or can be formulated by an economist in terms of limiting concepts. In other words, in an idealization it is assumed that a variable designating such a concept has the value 0 (or $|\infty|$). Such an idealization may be used for excluding the influence of a factor from the isolated field by mentioning it and assuming that a relevant variable has one of these extreme values even though this is not its true value. *An idealization of an element in Y is a representation of that element.* What is more, an idealization is a *false representation*. Let us call the set of factors idealized in a given theory or model the *idealized field* of that theory or model. The set of elements constituting the *idealized field* is a subset of the excluded field.

The following example is particularly illustrative, since it involves the idea of closure also in one of its standard economic senses. When, in a macroeconomic model, it is assumed that an economy x_i is closed from other economies, this is accomplished by assuming that

$$(C) \quad E(x_i) = 0 \text{ and } I(x_i) = 0$$

that is, that both the exports and imports of the economy x_i are nil.⁴ Exports and imports belong to the idealized field of the model. By bringing about such an external isolation of a country from the rest of the world, the idealizing assumption also closes the model from complications arising from variables denoting aspects of foreign trade. Certain domestic relations are thereby isolated from foreign relations. Note that it is conceivable that we study a country which happens to have no foreign trade as a matter of fact, thus constituting a case of spontaneous material isolation. In such a case assumption (C) would not count as an idealization at all. It would be a true statement of the economy under examination, i.e., the economy would be isolated in the real world, not only as a result of a thought experiment in one's model.

To give another example, in neoclassical equilibrium analysis the speed of adjustment of a set of endogenous variables to an exogenous "shock" is assumed to be infinite, or, stated in other words, adjustment is assumed to take place instantaneously. Formulated in either way, the assumption is plainly false – and it is bound to be that way, as no real economy could conceivably have that property. The function of such

a falsehood is to bring about an internal isolation: the idealization makes it possible to avoid considerations of the adjustment process between two equilibrium states. These states, in other words, have been isolated from the process connecting them. The equilibrium states belong to the isolated field, while the process leading from one to the other is placed in the idealized field of the theory.

In both of these examples, the excluded features are represented. Those features are picked out and given false representations. This is why we can say that *an idealizing assumption is referentially and representationally realistic but veristically unrealistic*. For instance, (C) is referentially realistic since it may be taken to refer to any really existing economy. It is also representationally realistic since it represents a feature which virtually any existing economy has. If, on the other hand, we were to make assumptions that, say, the kinetic energy of an economy is nil, this would not be a representationally realistic assumption, since economies do not have kinetic energies in the physical sense of the term (a metaphorical reading of the assumption might change the situation). Stated in more general terms, if an entity x has (does not have) magnitude $p(\neq 0)$, then it is representationally realistic (unrealistic) to attribute p to x while assuming that $p(x) = 0$. Finally, in most cases, assumption (C) is false, i.e., veristically unrealistic, since most countries do export and import goods or services or capital. Thus, by employing idealizing assumptions, i.e., referentially and representationally realistic but veristically unrealistic statements, economists are able to formulate isolative models, i.e., representations that are unrealistic in the sense of being non-comprehensive.

Let us relate the discussion to Nowak's formulation of what he calls an "idealizational statement" (Nowak, 1980, p. 29):

(T^k) If $G(x)$ and $p_1(x) = 0$ and ... and $p_{k-1}(x) = 0$ and $p_k(x) = 0$ then

$$F(x) = f_k(H_1(x), \dots, H_n(x)),$$

where H_i ($i=1, \dots, n$) denote the *primary* factors influencing magnitude F , while p_j ($j=1, \dots, k$) denote the *secondary* factors. I have two comments on this. First, in the light of the foregoing, (T^k) might be more aptly called an *isolative statement* which isolates the field consisting of G, F ,

and H_i ($i=1, \dots, n$) from p_j ($j=1, \dots, k$) by using the technique of idealizing assumptions. Second, in (T^k) the excluded field appears as coextensional with the idealized field, although in practice the idealized field is typically just a small subset of the excluded field. In many cases, this generates no problems, but for the purpose of understanding important forms of progress and disagreement in economics, it is important to recognize the extensional nonequivalence between the excluded field and the idealized field. For this we need the concept of omission.

An *omission* is a kind of implicit idealization in that the factor omitted is not mentioned at all in the presentation of the theory or model; thus, no assumptions concerning the value of a variable designating the omitted factor appear either. Among the omitted factors are typically those that do not occur to an economist in ordinary research situations as possibly having an appreciable impact on the economic phenomena under investigation. Characteristically, what is omitted by an economist is not conceptualized by her qua economist. *An omission of an element in Y does not involve a representation of that element.* This implies that, unlike idealizations, an omission is not a false representation even though it can be transformed into an idealization by introducing an explicit statement to the effect that the "weight" of the element is nil. Let us call the set of omitted factors in a given theory the *omitted field* of that theory. The omitted field is a very large subfield of the excluded field.

Omissions are effective means of theoretical isolation: the set of objects or features included in the isolated field is closed from the involvement or influence of the set of omitted factors or features. The set of omitted factors in standard presentations of neoclassical price theory includes an infinite number of things, from legal rules and organizational routines to the speed of Jupiter and the number of chromosomes characteristic of orchids, whereas an institutionalist economist might omit only Jupiter and orchids of these four factors. The omitted fields of neoclassical and traditional institutionalist theories are not the same.

We may refine the above suggestions by using the familiar distinction between a "model" and a "story" in an economist's theoretical presentation. A *model* provides a more or less rigorous and skeletal representation of the relations within the isolated field, while a *story* attached to the

model is a looser and thicker commentary which gives flesh to the thin skeleton and which may vary somewhat from audience to audience. Idealizations tend to be formulated as part of the model. Other exclusions may be mentioned in the story or not at all. Those that are not mentioned either in the model or in the story are silent omissions in the absolute sense. Those exclusions that are mentioned in the story but not in the model often take the form of what might be called *storied idealizations*. They have the form “the role of p is not considered here” or “ p is assumed to have a negligible impact on the dependent variables” or “let us forget p for a moment” or the like. (It is also conceivable that they take on the form of more rigorously formulated idealizations, given that economists are accustomed to formulate statements of the form $p(x) = 0$.)

Idealizations and omissions may also concern the *rates of change* of the features of objects. Indeed, such assumptions play an extremely important role in economics. For instance, in standard neoclassical models it is typically assumed that production techniques and consumers’ tastes do not change during the period considered. Such assumptions may be formulated in a more summary fashion by using the *ceteris paribus* clause, that is, the assumption that *all other things are constant* (I am here restricting the attention to this literal translation of ‘*ceteris paribus*’ while being fully aware that there are other established usages of the expression). This clause appears in virtually all carefully formulated economic models.

The *ceteris paribus* assumption appears to be reformulable as a set of idealizing assumptions in our sense. It says that the rate of change of all but included factors is nil even though in fact it is not. What is excluded by such assumptions is not a set of factors or features denoted by a set of variables y_1, \dots, y_n , but instead a set of their actual rates of change, usually designated by $\dot{y}_1, \dots, \dot{y}_n$ (where both y_i and \dot{y}_i belong to Y , the excluded field). What is assumed is not that

$$y_1 = 0, \dots, y_n = 0,$$

but instead that

$$\dot{y}_1 = 0, \dots, \dot{y}_n = 0.$$

Note that it is also possible to use the *ceteris paribus* clause to effect a higher-order freezing of rates of change, i.e., to deliver the message that the rate of change of the rate of change of a given variable is nil. Whatever the contents of the *ceteris paribus* clause, it seems possible to think of it as a special case of idealization.

However, it may appear that the *ceteris paribus* assumption is actually an encompassing omission, since no explicit representations of any individual elements of Y occur in it. Against this, it may be suggested that the expression 'ceteris' or 'all other factors' can be taken as a compound representation of those (extremely numerous) factors, hence the assumption involves idealizations. A formulation of a model in which the words '*ceteris paribus*' do not appear at all would involve omission of changes within Y.

The *ceteris paribus* clause is often interpreted as stating that all the *relevant* factors remain constant. On such a reading, the assumption would involve idealizing representations of the rates of change of the "relevant" factors, while the "irrelevant" factors and their possible changes would just be omitted. For instance, among the presumably relevant factors in regard to neoclassical models are production techniques and consumers' tastes; the *ceteris paribus* clause is typically assumed to cover their changes so that they do not have to be separately mentioned. On the other hand, the non-constancy of planetary constellations or the average blood pressure of male consumers is usually regarded as irrelevant in the neoclassical vision of the economy, hence their exclusion is based on omission.

6. The centrality of isolation

I would like to argue that the method of isolation plays a particularly central role in economic theory formation relative to some other general methods used by economists and other scientists. The first aspect of this centrality is simply an implication of the suggested definition of the concept of abstraction in section 3 according to which abstraction is a special case of isolation. Every abstraction employed in economic theories is, by definition, an isolation. The second aspect is an implication of what was stated in section 5. Namely, I suggested that idealization and omission

can be used as means for effecting isolation in theoretical research. In this sense, isolation has primary status while idealization and omission are secondary.

This would seem to differ from Nowak's view. In analogy to the distinction between what he calls the "principal" and "secondary" factors within the domain of scientific theory, he applies the same notions to the domain of metatheory or methodology, by distinguishing between principal and secondary methods of scientific cognition. He argues for the "idealizational conception of science" according to which "the method of idealization is the essence of cognition." Formulated in other words, this statement is that "if the basic feature of reality is that it is differentiated with respect to significance, then the principal method of cognition of reality has to be the only method which is able to recognize that feature, that is, the method of idealization. All the remaining methods such as the axiomatic method, the method of modelling, of approximation, etc., are to be treated as secondary procedures..." (Nowak, 1980, p. 107).

Although he is not quite clear about this, "the method of idealization" in Nowak's sense seems to amount to introducing "idealizing assumptions" (of the form $p(x) = 0$) and using them for the construction of "idealizational statements" (of the form of (T^k)) (*ibid.*, pp. 28–31). Given this usage, it would appear that from the perspective of my suggestions above Nowak has misidentified the essence of cognition in economics. It is rather the method of isolation which is, as it were, "the essence of cognition"; the method of idealization would have the status of a "secondary procedure," albeit a very crucial one. Sometimes, however, Nowak characterizes the method of idealization in such a way that it seems to amount to the method of isolation. Read in the light of such passages, Nowak would only have *misnamed* "the essence of cognition." This conclusion is already hinted at by my earlier suggestion that one had better call (T^k) an isolational statement.

There is a third aspect to the centrality of the method of isolation in economics, based on the contrast to the method of postulation or transduction of new theoretical entities in the fashion of modern physics. Namely, some of the most fundamental notions in standard economic theories seem to conform much better to an "abstractive" or isolative

rather than to a transductive or postulational conception of theory formation in science.

Take the concept of economic man as an illustration. Economic man is an agent equipped with some spectacular properties and capacities (such as, in standard cases, certain kinds of perfect calculative rationality and perfect knowledge of the options) and deprived of some others (such as immediate altruism, ignorance, learning capabilities, habitual inclinations, social and cultural ties.) Although this creature does not quite resemble ourselves, it is not like quarks or black holes as postulated in physics. Unlike these theoretical entities, which are unfamiliar to us from the point of view of our ordinary commonsense framework, economic man is very much an entity rooted in our commonsense conceptualization of the world. In its relevant portions concerning the human world, this framework is an intentional framework within which human behavior is conceptualized in terms of purposes, intentions, desires, and expectations, in short, in various mental terms. There is no difference in this regard between people and their actions described, explained, and predicted in this commonsense framework and the characterization of economic man in economic theory. Both occur within the frame of folk psychology. (See Rosenberg, 1989; Mäki, 1990b and 1990c.) The difference is that economic man is a strongly idealized and isolated version of ordinary humans. The assumption of perfect information, for example, idealizes the amount of information ordinary people have to the extent that the maximizing behaviour of economic man can be considered in isolation from the facts related to the acquisition and processing of information.

For another example, take the ontic furniture of standard micro-economic equilibrium theory. There you have consumers, producers and goods and their prices and quantities, all of them familiar objects from our everyday experience rather than transducted theoretical entities. These objects retain the status of commonsense entities even though they are idealized and isolated in many ways. For example, the goods of a specific market are assumed to be perfectly divisible and homogenous, and, in partial equilibrium analysis it is assumed that there are no elasticities across the boundaries of many markets. Such assumptions deform the economy as we know it from our daily experience, but do not serve to introduce new theoretical entities after the fashion of physics.

7. The pragmatics of isolation

Let us now provide a few brief remarks on some of the pragmatic aspects of the method of isolation, such as economists' aims, strategies, background beliefs, and social contexts when using isolations. In general, we are interested in the pragmatic conditions and consequences of drawing the dividing line between the isolated and excluded fields and, within the latter, between the idealized and omitted fields.

Perceived disciplinary boundaries typically set conditions for isolation and the techniques used. Omission is customary in regard to most of those entities that do not fall within the perceived scope of economics: most entities falling within the scope of disciplines other than economics are typically excluded without mentioning them, i.e., interdisciplinary isolation is typically based on omission. On the other hand, entities excluded but falling within the perceived scope of economics are often, but not necessarily, mentioned separately by using idealization. In other words, both omissions and idealizations are ordinarily used to bring about intradisciplinary isolations. Finally, excluded entities are regularly mentioned in idealizing assumptions when they fall within the scope of a specialized research field or approach in economics; this is done in order to distinguish one's specific model from those of others or from the earlier or later versions of one's own model. That is, some of the intra-approach isolations tend to be based on the employment of idealizations.

Taking account of the audience structure of theoretical presentations provides an opportunity for qualification. The above hypotheses are based on the assumption that the audience consists primarily of by and large like-minded economists. When this assumption is relaxed, many other compositions become possible, and they too may be conjectured to influence the role of omissions and idealizations in an economist's isolations. For instance, when an economist confronts a receptive lay audience, the proportion of silent omissions in her presentation may be relatively large and that of idealizations virtually nil. Situations where the orator and the members of the audience are all competent economists who share a theoretical outlook may not be that different: only a few idealizations may appear in the midst of a large number of silent omissions. When an economist wishes to persuade a group of suspicious scholars having a background in the other social sciences, storied ideali-

zations may play a particularly emphatic role, and so on. Further qualifications can be introduced, e.g., by considering the consequences of whether the presentation is oral or written.

The method of isolation is confronted with a contestable terrain. The making of isolations constitutes a major issue both within and between schools of economic thought that endorse what may be called rival *isolative strategies*. An isolative strategy dictates a choice of *what* is isolated (i.e., a decision on where the boundary line between the isolated and excluded fields is drawn) and *how* it is isolated (i.e., how the line is drawn, using either idealizations or omissions). The former aspect may be called the *substantial* aspect of an isolative strategy, while the latter may be dubbed the *style* of isolation. Rival and at least partly incompatible commitments concerning what counts as relevant and irrelevant (or primary and secondary or essential and inessential) in explaining economic phenomena are at the core of theoretical disagreements. Such disagreements range from differing conceptions of the scope of economics to varying emphases regarding the order in which particular variables are introduced in a series of models belonging to one and the same theoretical orientation. Furthermore, they may take on communicative or non-communicative forms, such as either open controversy or silent coexistence.

It may be hypothesized that the uses of idealization and omission have different consequences with regard to promoting or obstructing communication between parties that disagree on isolative strategies. It is likely that if the parties share the omitted field but differ about the idealized field, communication will be easier than when there are drastic differences concerning the boundaries of the omitted field. This is because, by definition, the omitted field is a field of silence. This point provides a perspective for understanding some aspects in the difficulties that economists often encounter when trying to communicate with other social scientists and vice versa; as the interdisciplinary isolations tend to be based on omissions, unargued attitudes flourish in the relationships between the practitioners in the two sets of social sciences.

On the other hand, the intradisciplinary situation in, say, sociology or management research may be different from that in economics partly because, in these fields, isolations are varied and, to a relatively large extent, tend to be based on omissions. One might expect that such a discursive prac-

tice regarding isolations provides weaker opportunities for argumentative communication among researchers of different persuasions than in economics, where a larger proportion of the exclusions tend to be spelled out. In principle, it should be easier for dissenting economists to raise questions and urge responses regarding excluded factors that are clearly represented by using the conceptual resources of their fellow economists, that is, by using idealizing assumptions, than regarding omitted factors that these other economists are not accustomed to conceptualizing at all. Lest this statement be misunderstood, let it be emphasised, firstly, that many controversial isolations are based on omissions also in economics, and secondly, that the technique customarily used for effecting isolations provides just one factor among many that play a role in enabling or constraining argumentative communication within scientific disciplines.

It is also noteworthy that economics itself is not uniform with regard to the style of isolative strategy. For instance, in neoclassical mainstream economics many of the isolations tend to be based on idealizations, while in traditional institutionalist economics a larger proportion of them tend to be based on omissions. This is probably at least partly so because neoclassical economists, unlike the institutionalists, are interested in proving theorems, and for this purpose it is often useful to spell out formally the relevant inclusions and exclusions in one's models.

In general, we may hypothesize that the ontological exclusion of entities and the methodological exclusion of styles tend to be paralleled by a social exclusion of people from intradisciplinary or intra-approach communication. In other words, the choice of an isolative strategy tends to involve an isolation of a community of discourse. The extent to which and the forms in which this tendency manifests itself are contingent upon factors such as those discussed above.

From still another perspective, the pragmatic aspect of isolation is manifest in the strategy of research involving responses to two questions: first, whether the excluded entities are believed to have a major or minor or no impact on the included entities; and second, whether or not the excluded entities are later on included. We obtain four possible strategies (which are not intended as exhaustive of all strategic options).

First, the factors in the excluded field may be believed to have, in the real world, only minor or no impact on the isolated field, and therefore

they will be excluded from consideration for good. This may concern the status of such factors in a certain class of models or in the discipline at large. An example of the former would be the income of cotton farmers in the models of the price of icebreakers. As an example of the latter, most economists think that gender is such a factor. The exclusion of such factors is an example of what Musgrave calls "negligibility assumptions" (Musgrave, 1981).

Second, it may be believed that entities in the excluded field do have an appreciable impact on the included entities, and therefore it is decided that they will later on be included in one's model. For instance, foreign trade is often treated in this manner in macroeconomic modelling: one starts with a model of a closed economy which is later on opened by inserting variables for exports and imports, the balance of payments, etc.

The third case is one where the excluded factors are believed to have a major impact on the included entities, but are not going to be included at a later stage, because they are regarded as falling outside the relevant disciplinary boundaries. The treatment of the legal framework of economic processes is a typical example of this case, at least in standard neoclassical theorizing.⁵

Fourthly, it is conceivable that an excluded factor, which is believed to have only a minor impact on the included entities, is still introduced at a later stage for some reason other than belief in its role in economic processes, such as its analytical tractability.

8. The metaphysics of isolation

What is it that is isolated in an isolation? What is the general character of the included and excluded entities? What are the metaphysical conditions for drawing the line dividing the isolated and excluded fields? There are alternative ways to answer these questions.

Nowak suggests that the use of what he calls the method of idealization is linked to a commitment to what he calls ontological essentialism. His usage of 'essentialism,' however, is very ambiguous. Essentialism, Nowak maintains, subscribes to the objective distinction between "principal and secondary factors," between "essential and adventitious factors," between "an inner connection and its manifestation," and between "what is real and what is apparent" (Nowak 1980, pp. 52, 95). As the paradig-

matic case, he discusses at length the law of value in Marx, where the time of socially necessary labour required for producing a given commodity constitutes the essence of that commodity's price.

I have two critical comments on Nowak's suggestion. First, he seems to conflate the above and other similar distinctions although they evidently do not coincide as regards their metaphysical import. For instance, it is not, metaphysically speaking, particularly informative to equate the notion of "basic determinants ..., that is those which affect most strongly the phenomenon under consideration" (*ibid.*, p. 96) with the notions of "what is real" or "the inner structure of phenomena." Second, the method of isolation does not seem to be necessarily tied to any of the metaphysical distinctions suggested by Nowak. At the extreme, some uses of the method appear metaphysically indifferent.⁶

For these reasons, I submit that it would be advisable to recognize the variety of the metaphysical and other grounds of isolations. In the case of economics, there is no doubt that isolations are not metaphysically uniform. Sometimes the way of dealing with a given isolation is a reflection of an economist's global philosophical inclinations (such as essentialist realism or fictionalist instrumentalism); often, however, it is just a local matter of the analytical or formal function of the isolation in a given context.

Take the example of isolating the substitution and income effects from one another and then putting them together again in a demand function. The idea is that a price change of a given good has an influence on the demand for the good through two channels: first, the consumer substitutes it for other goods while remaining on a given indifference curve (e.g., his total utility remains fixed), and second, the consumer changes his demand in reaction to a change in his income while prices remain constant. The idea is neatly represented by the so-called Slutsky equation:

$$\frac{\partial q_i}{\partial p_i} = \left(\frac{\partial q_i}{\partial p_i} \right)_{U=\text{constant}} - q_i \left(\frac{\partial q_i}{\partial y} \right)_{\text{prices}=\text{constant}}$$

Here q_i is the quantity demanded of the good in question, p_i is its price, and y is the consumer's income. The first term of the right-hand side is the substitution effect while the second term is the income effect. When using the Slutsky equation, it is not presupposed and it does not seem to

make much sense to presuppose that one or the other of the two effects constitutes the "essence" of the price effect or the "principal factor" causing a change in demand. Instead, the point of these isolations is to separate the total effect of a price change into two distinct effects so as to get a more detailed conception of how price and demand are related. The Slutsky equation would seem to involve what Nowak (1980, p. 104) calls a "degenerated essential structure." It should be obvious, however, that by using the equation one does not thereby commit oneself to "ontological phenomenalism," contrary to what seems to be implied by Nowak's definitions.

Still, I agree that the method of isolation and some kind of ontological essentialism are often related and that their relationship is far from artificial. Let me suggest the expression *essentialist isolation* for cases that are not similar to isolations underlying the Slutsky equation. This makes essentialist isolation a kind of ambiguous residuum. The user of essentialist isolation subscribes to one or more of Nowak's (and other related) distinctions as objective distinctions. This means that essentialist isolation is metaphysically neither neutral nor uniform. Instead, it permits specifications of varying metaphysical strength.

Subscription to a distinction such as that between primary and secondary factors can be taken to imply a weaker form of essentialist isolation than, say, the distinction between reality and appearance. Or, provided the structure of the isolated field is conceptualized more explicitly in causal terms, viewing causation in terms of greater and lesser events implies a weaker version of essentialism than considering causation in terms of powers and the conditions of their exercise. Nowak's case, the economic theory of Karl Marx, is an example of a theory believed by many commentators to be grounded on strong essentialist premises (although Nowak's own analysis in terms of "factors" tends to weaken the version of essentialism attributed to Marx). Another example is Carl Menger, founder of the Austrian tradition of subjectivist economics, who is a committed Aristotelian essentialist (see Mäki, 1990b; 1990c). On the other hand, it may be more plausible to attribute weaker forms of essentialist isolation to Alfred Marshall or Milton Friedman (see Mäki, 1990a). The specific differences between these and other cases can be revealed only by a closer analysis of the methodological views of the authors and the economic theories they espouse.

I would like to posit a regulative principle that I suggest should be kept in mind in any future attempts to analyze isolations in economics: given that in economics there are many kinds of isolation employed in different corners of the discipline and at various conceptual levels, one should be prepared to discover that isolations are used for various purposes with various metaphysical presuppositions. Not only are the same isolations understood differently by different economists or schools of economic thought or at various stages of the development of the discipline, but it is also perfectly conceivable that the same economist or school may accept theoretical constructions which contain isolations that involve strong essentialist commitments together with other isolations that are understood instrumentalistically.

The choice of isolations may be motivated by formal tractability or by a strict essentialist metaphysics, to give two extreme options, and there are other options in between. I conclude that the method of isolation is not necessarily linked to ontological essentialism.

9. Isolation and the issue of realisticness I: Truth and falsehood

Let us now return to the issue with which we began. This and the next section will be devoted to the issue of realisticness in the context of the method of isolation. I begin with a discussion of the relationship between some of the major meanings of 'realisticness' and 'unrealisticness,' namely those linked to truth, falsehood, and isolation. An isolation typically involves the representation of both the included and some of the excluded entities. What can be said about the truth-value of these representations? Not surprisingly, the answer depends on one's philosophical orientation, such as that of empiricism and instrumentalism or realism and essentialism.

There are at least three "kinds of truth" that are violated by an isolative theory or model. Truth proper, or "nothing-but-the-truth" is violated by the idealizing assumptions that help bring forth the isolation in that they state that $p(x) = 0$ while in fact $p(x) \neq 0$. Veristic unrealisticness, i.e. falsehood, here concerns some of the representations of the entities in the excluded field. Secondly, the isolation itself violates "the-whole-truth" in the sense of the ensuing representation being non-comprehensive, since a number of factors present in a given situation are excluded either by

idealization or by omission; the isolative theory or model encompasses only a limited slice of the situation. Thirdly, the implications of the isolative theory typically violate “nothing–but–the–truth” about empirical phenomena for the simple reason that the theory fails to take account of all the factors that have an impact on those phenomena. These implications would hold precisely only with the proviso that the excluded field is, as a matter of fact, causally impotent in regard to the isolated field. The isolated field is not materially isolated, and thus the theoretically isolated causes combine with many of the excluded causes so as to generate phenomena which diverge from those that are implied by the isolative theory alone. Here, violation of nothing–but–the–truth is a consequence of violating the–whole–truth.

A radical empiricist will be inclined to conclude from all this that the isolative theory or model is simply false (see, e.g., Cartwright, 1983). This conclusion, of course, presupposes the realist premise that the theory is representationally realistic, that is, represents something that exists. In the case of transductive theories (in which unfamiliar theoretical entities are suggested) an empiricist finds it tempting to think of the theory as non–representational, having no truth value at all. However, if the theory merely or primarily accomplishes isolations within the familiar common-sense domain, denouncing it as false is perhaps more natural for an empiricist. The acceptance of such a theory as paradigmatically legitimate implies a version of instrumentalism that is more plausible in economics than the version that used to be popular in the philosophy of physics: while the traditional version of instrumentalism regarding physics suggested that physical theories may be accepted as useful instruments that are neither true nor false, i.e., as something other than semantically full–fledged representations of physical reality, a more plausible version of instrumentalism regarding economics would hold that economic theory may be accepted as a false yet useful representation of the world (see Mäki, 1988; 1990a).

From a realist and essentialist point of view things look different. If it is assumed that the world is objectively organized into essential and inessential or primary and secondary factors, then what we termed essentialist isolation has a chance of delivering a true message about reality. Essentialist isolation violates both “nothing–but–the–truth” in its component

idealizations and “the-whole-truth” in narrowing down the isolated field. At the same time, formulated in terms of the weak vocabulary of primary causal factors, essentialist isolation can be read as delivering the message that (i) the factors and causal mechanisms contained in the isolated field are real, that (ii) these factors have a certain significant impact on the explanandum, thus constituting its primary determinants, and that (iii) the effect of these factors on the explanandum is mediated by the causal mechanisms depicted by the theory. Each of the statements (i) to (iii) may be thought of as either true or false. In the case of successful isolation, they are true, i.e., nothing but true.

This means that an economist employing the method of isolation can pursue the truth about the economy while having to live with false elements in his theory. In other words, the pursuit of realisticness in an ambitious sense presupposes the acceptance of many kinds of unrealisticness.

Nowak uses the predicate ‘is realistic’ in a way that deserves comment. In his language, a law statement, T^i , is “a more realistic presentation” than statement T^{i+1} if the latter involves a larger number of idealizing conditions (i.e., statements of the form $p_i = 0$ which eliminate the object of p_i from consideration). In other words, T^i is “more concrete” than T^{i+1} or it is a concretization of T^{i+1} in that $p_i (\neq 0)$ is taken into account in T^i . (Nowak, 1980, p. 108.) This amounts to the idea that realisticness is a matter of comprehensiveness or “concreteness”: one representation is more realistic than another if it encompasses additional features of a given situation.

Elsewhere, however, Nowak uses the same term in a different sense. He contrasts idealizing assumptions or conditions (such as $p_k(x) = 0$, which is not fulfilled by any actual object) to “realistic” assumptions or conditions (such as $p_k(x) \neq 0$, which is fulfilled by any object of the universe of discourse of the theory under consideration). (*Ibid.*, pp. 28–29.) This amounts to the idea that realisticness is a matter of truth, in contrast to the falsehood of idealizing assumptions.

This implies that, without warning, Nowak uses the attribute ‘realistic’ in two different senses, one related to “the-whole-truth”, the other to “nothing-but-the-truth.” No other kinds of ‘realisticness’ seem to be employed by Nowak.

It follows that the notion of realisticness in the sense of truth about the isolated essence of the object under study has not been formulated in Nowak's framework. He does have the notion of "essential truth" (*ibid.*, pp. 136–137), but this has to do with a comprehensive representation of the whole structure of principal and secondary factors.

It seems that viewing the method of isolation as "the essence of cognition" provides a better possibility for adopting the missing notion. Namely, it becomes natural to apply the concept of truth (and falsehood) to the isolating theory itself, not only to the idealizing assumptions involved, their relaxations, and the forthcoming all-encompassing picture of the object under study. *An isolating theory or statement is true if it correctly represents the isolated essence of the object; otherwise it is false.* The theory inevitably involves false assumptions, but this does not undermine the possibility that its fundamental message is true or close to the truth.

An example given by Daniel Hausman is illuminating. As a consequence of a reduction of Brazilian coffee output, due to a severe frost in 1976, the price of coffee rose considerably.

The simple and relatively uncontroversial explanation is that buyers competing with one another for the decreased supply of coffee bid up its price. ... *The actual story* is of course much more complicated. Any moderately detailed history of the 1976 coffee price increase would have to consider questions of international trade, transportation, and exchange rates, the role of wholesalers and retailers and their expectations concerning the consequences of the frost, the effects on different grades of coffees, the possibilities of employing different methods of roasting coffee beans and brewing coffee, the extent of substitutability between coffee and tea and so forth. But the simple supply and demand explanation surely captures *the heart of the story*. (Hausman, 1990, pp. 168–169; italics added.)

"The heart of the story" may be taken as akin to a potentially true account of the isolated essence or the primary determinants and their causal mechanisms involved in the process. "The actual story," on the other hand, is a more comprehensive account which encompasses many secondary factors as well.

10. Isolation and the issue of realisticness II:

Key points of controversy

Given that the method of isolation has a particularly central role in economics, it is not surprising that many types of methodological, theoretical, and empirical controversy are linked to it. In this final section I briefly discuss some such problem areas involving the notions of realisticness and unrealisticness. There are many ways in which the method of isolation as used in economics is related to the issue of realisticness. I will mention some of them while keeping in mind that 'realisticness' and 'unrealisticness' may be given a variety of alternative specifications.

First, a common and usually relatively harmless issue is whether the impact of some of the less fundamental excluded factors is negligible or not, that is, whether the isolation of a given relation provides sufficiently good approximations in the explanations and predictions produced. Such an issue is often situated on metaphysically and methodologically uncontested ground, for example, within the cosmology and axiology of a single school of economic thought. The issue may then concern the tuning of one's isolations, such as the addition of another variable of an uncontroversial type to one's model (e.g., the price of carrots in a model of the demand for cabbage), so as to improve predictive accuracy.

Second, there are those who are suspicious of any formulation of an economic theory or model employing assumptions which are not believed to be precisely true or which serve to exclude factors that might be thought of as relevant. In such cases the issue is to be specified as that of unqualified narrowness versus comprehensiveness or the unqualified truth versus the falsehood of the representations of a theory. Assumptions involving idealizations, such as the assumption that goods are perfectly divisible and homogenous, or that the economy is closed and in full employment equilibrium, may be objected to simply because they are, in most cases, false, and contribute to eliminating from consideration factors that may appear to belong to the total situation. Paying little or no attention to the goals of such isolations and idealizations, the critics become annoyed simply because of the obvious perceived discrepancy between a theory and the way the world appears to them. Such critical doubts are sometimes held by practically minded people, beginning students of economics, and some scholars in other social sciences, or, more gener-

ally, by people who are more accustomed to making uncontrolled isolations by using omissions. Among professional economists, such criticisms are occasionally levelled across the borders separating schools of thought, that is, against theories which one does not like, even though one's own theory is rife with similar falsehoods and isolations.

Third, there is the more serious methodological version of the above criticism which complains about the untestability of the fundamental statements of economic theory due to the falsity of the subsidiary idealizing assumptions. The traditional criticism of this kind states that strongly isolative economic theories fail to satisfy the condition of testability because the related *ceteris paribus* clause does not hold and cannot be made to hold (since the respective isolations are not of the material kind). Because all other things do not remain unchanged, empirical evidence can have no reliable bearing on the rational acceptability of the theory to be tested. In particular, this circumstance permits economists to hold theories with insufficient or no empirical support, that is, theories which are unrealistic in this specific sense. Some improvement would be forthcoming, the critics argue, if more of those unstable "other things" were incorporated into one's theory as variables, thus making the theory more realistic in one more sense.

The fourth way in which isolation is related to realisticness has to do with truth (or "nothing-but-the-truth") in regard to the isolated slice of reality. At issue is the question of whether this or that theory or model has managed to isolate those elements of the object of study that are believed to be essential. In such cases the parties do not take issue with essentialist isolation, which is recognized as a legitimate pursuit in economics. If a theory is successful as a vehicle in this pursuit, then it achieves realisticness in one sense while being radically unrealistic in another. If not, then it distorts economic reality so much as to destroy its own explanatory capacities. The celebrated and despised neoclassical theory of general equilibrium is a case in point. This is how it may be defended as being based on a weak essentialist isolation:

... in reading descriptive historical or anthropological material, I often find that I am reminded of general equilibrium models. That is, the environment of the actual economy is reminiscent of the environment of a stylised theoretical model, often with some *key elements especially prominent*... (Townsend, 1988, p. 6; emphasis added.)

If this is the case, Townsend thinks, general equilibrium models may be taken as “a way to catalogue actual economies, to interpret reality” (*ibid.*).

Another popular view is diametrically opposite:

My basic objection to the theory of general equilibrium is not that it is abstract [that is, involves isolations] ... but that it starts from the wrong kind of abstraction [i.e., isolation], and therefore gives a misleading ‘paradigm’ ... of the world as it is: it gives a misleading impression of the nature and the manner of operation of economic forces. (Kaldor, 1978, p. 202.)

Kaldor provides a general idea of why he thinks the fundamental isolation of general equilibrium theory distorts reality: The theory “went astray ... when the theory of value took over the centre of the stage – which meant focusing attention on the *allocative* functions of markets to the exclusion of their creative functions – as an instrument for transmitting impulses to economic change.” (*Ibid.*, p. 181.) In other words, Kaldor argues that the essentialist isolation attempted by neoclassical general equilibrium theory was a failure in that relatively inessential features of markets “took over the centre of the stage.” (See Lawson, 1989, for a discussion of Kaldor’s views.)

Fifth, specific fundamental isolations may be criticized for being excessive for this or that particular application, not for being fatally misdirected as attempts to capture the generally essential features of the economy. In these cases, the issue is whether a particular basic isolation has been taken too far for certain purposes rather than whether it has incorrigibly failed to hit its target or whether isolation is legitimate in principle. An example might be Hirschman’s critique of the parsimony involved in the fundamental assumption of “the self-interested, isolated individual who chooses freely and rationally between alternative courses of action after computing their prospective costs and benefits” (Hirschman, 1985, p. 7). This postulate arguably applies only to studying routine action with predictable outcomes, that is, instrumental action with a clear separation of the process into means and ends (*ibid.*, p. 12). But once economists enter the realm of the uncertainty and unpredictability of non-instrumental action, they have to take account of the whole complexity of human nature, including the capacities of persuasive communication and self-evaluation as well as various unresolved tensions. Hirschman argues that this must take place “for the sake of greater realism” (i.e., realisticness) and that this “helps us understand matters that have been found puz-

zling, such as collective action and shifts in labor productivity" (*ibid.*, p. 19). The general idea is that, for certain applications, theory has to be made more comprehensive with regard to its fundamental assumptions.

The remaining two key issues are the most serious ones in that they involve positions which question the centrality of the method of isolation in economic theorizing.

The sixth issue is a metaphysical one related to the third aspect of the centrality of the method of isolation mentioned in Section 6 above, namely the fact that standard economic theory appears to share the ontic furniture of common sense, the difference between the two being based on the specific isolations and idealizations imposed by economics on the ordinary commonsense framework. Some writers question this feature of economic theories. Alexander Rosenberg (1983) has argued that standard economics fails as an explanatory and predictive endeavour to the extent that it is dependent on the intentional vocabulary of folk psychology. The language of preference and expectation does not represent natural kinds, i.e., it does not carve nature at the joints, and, we may add, it is in this sense unrealistic. This situation can be improved only by postulating entities, real natural kinds, that transcend the ontic realm of common sense. This suggestion reflects an essentialist concern, but one that cannot be taken care of merely by performing isolations among familiar "folk entities." Standard economics, according to this criticism, suffers from insufficient ontic depth.

Seventh, the legitimacy of strong isolations in general can be questioned altogether on the basis of organicist metaphysics. It is possible to hold an organicist view of the constitution of the economy according to which the nature of an element in an organism is dependent on its interrelations with other elements. This is the stance adopted by some institutionalist economists who subscribe to what they often call "holism." By this they mean the idea that the primary and undistorted object of study in economics should consist of "organic" social wholes as intertwined sets of institutional structures. Accordingly, the behaviour of separate individuals or markets or even a narrowly conceived "economy" is not a legitimate object of analysis. Some of these institutionalists advocate what they call "pattern modelling," a way of theorizing about social wholes (see Diesing, 1971; Wilber and Harrison, 1978). There is no

doubt that such a Comtean approach involves using various isolations (typically by means of omissions), but it is equally clear that they are relatively weaker when compared to what is found in neoclassical economics. Such Comtean economists then pursue realisticness in the sense of comprehensiveness (or "the-whole-truth"); it is conceivable that to them only the-whole-truth implies nothing-but-the-truth. Standard neoclassical economics, according to this criticism, suffers from insufficient width, and, due to this, from insufficient depth as well.

This point relates to a major problem involved in the method of isolation as used in studying social and economic phenomena. This is the question of whether the causes of economic phenomena are combined "mechanically" or "chemically," to use J.S. Mill's phrases. When causes combine "mechanically," their effects can be "added up" like vectors, and the outcome is an additive "sum" or "resultant" of the effects of those causes taken singly. On the other hand, when causes are combined "chemically," some qualitatively novel, emergent outcomes ensue. (See Mill, 1843, Book III, Ch. VI, and Book VI, Chs. VII and IX.) It is easier for the user of the method of isolation to deal with the domain of "mechanics" than that of "chemistry." No wonder, therefore, that standard neoclassical economists do their work most of the time as if economics were "mechanics." The challenge they are requested to meet concerns the relative adequacy of the "mechanical" versus the "chemical" metaphysics and of the methods respectively supported by them in the study of the economy.

*Department of Economics
University of Helsinki
Aleksanterinkatu 7
SF-00100 Helsinki 10
Finland*

NOTES

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¹ Here and there in the paper I do not distinguish between the object and our linguistic representation of it, in order not to make the exposition too tedious. Thus, it is usually the case that when I talk about "the deformation of reality" or the like, I intend it to encompass "the deformation of our image of reality" or the like. Daniel Hausman reminded me of the obvious need for clarity here.

² In (Mäki, 1988) I suggested, as against a prevalent practice, that we should not talk about the "realism" of theories and statements, but instead about their realisticness. 'Realism' can be restricted to its ordinary philosophical usage once 'realisticness' becomes used as an attribute (or, rather, a whole family of attributes) of scientific and other representations.

³ Terminological conventions other than the one suggested here are possible: we could talk about vertical and horizontal *abstraction* instead of isolation. It is the distinction between "verticality" and "horizontality" which is crucial in my proposal.

⁴ Nowak seems to think that the assumption of a closed economy can be formulated as that of the equality of exports and imports, that is, as

$$(B) E(x_i) - I(x_i) = 0$$

(see Nowak, 1980, pp. 8, 141). (B), however, characterizes an open economy which has its trade in balance.

⁵ What were believed to constitute the established disciplinary boundaries of economics are becoming more and more hazy; therefore, we should beware of premature statements in this regard.

⁶ Discussions with Daniel Hausman have alerted me to the difficulties of using the terms 'essence' and 'essentialism.'

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