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MACAULAY'S PROBLEM

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Macaulay's Problem*

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Abstract: The model of economic man is either empirically testable and false, or it is non-testable and always true. The fact that neither position is entirely satisfactory is called Macaulay's problem. This paper first reviews and criticizes various attitudes toward this problem and then argues that Macaulay's problem is a pseudo-problem, because it assumes that the explicandum of the economic man model is individual behavior. Contrary to this assumption it is argued that the model attempts to explain changes of people's behavior on an aggregate level in response to changes in constraints. The paper posits that all the studied attitudes pertaining to Macaulay's problem can be reinterpreted and, to a great extent, reconciled in light of this view. It is also argued that this view helps to explain why the usual criticisms of the economic man model miss the point. A method for effective criticism is suggested.

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Macaulay's Problem

“What proposition is there respecting human nature which is absolutely and universally true? We know of only one: and that is not only true but identical; that men always act from self-interest. [...] when explained, it means only that men, if they can, will do as they choose. [...] If the doctrine that men always act from self-interest, be laid down in any other sense than this – if the meaning of the word self-interest be narrowed so as to exclude any one of the motives which may by possibility act on any human being, - the proposition ceases to be identical; but at the same time it ceases to be true.”

Lord Macaulay (1909:432-433)

1 Introduction

The model of economic man has for decades faced the following question: does this model represent a false empirical hypothesis or is it an irrefutable metaphysical postulate? I propose to call the fact that neither alternative is satisfactory ‘Macaulay’s problem’, as Lord Macaulay was probably the first to formulate this dilemma explicitly. The aim of this paper is to demonstrate that it is, in fact, a pseudo-problem.

In a nutshell, the argument advanced here is that the Macaulay’s problem emerges as a result of an incorrect assumption that the explicandum of the model of economic man is individual behavior. The circumvention of Macaulay’s problem then consists in acknowledging the fact that this model aims at explaining changes of behavior (rather than behavior as such) induced by changes of constraints on aggregate (rather than individual) level.

The paper is organized as follows: Section 2 provides precise definitions of the terms ‘economic man’ and ‘Macaulay’s problem’ as they are understood in this paper. Section 3 reviews and criticizes views that have been suggested to deal with Macaulay’s problems. In Section 4 an alternative view is proposed and compared to those discussed in Section 3. Section 5 concludes the paper.

2 The problem

I define ‘economic man’ (EM) as follows:

EM Given a choice problem, the decision maker chooses an element that is highest on her preference scale.³

I then refer to the following observation as ‘Macaulay’s problem’ (MP):

MP The explanation of behavior through EM is either truism or it is false.

Although not always explicitly spelled out, MP has long been known to exist (see e.g. Rosenberg 1995). Laville (2000) refers to a similar problem as an ‘empirical dilemma’. Vanberg (2002), besides identifying the problem, also specifies that zero empirical content of EM corresponds to the subjective notion of rationality, while refutable interpretation of EM with objective rationality. Elsewhere (Vanberg 2004), he distinguishes between non-refutable ‘rationality principle’ and refutable ‘rationality hypotheses’ (see also Pelikán 2010).

In spite of the general awareness of its existence there is no widely accepted solution to MP. Fig. 1 illustrates an overview of suggested solutions. In the next section, I discuss solutions (1) through (6) and consider the possible objections against them.

³ Maximization of some sort is usually identified with rationality; however, the term rationality continues also to be used in various other meanings; hence, to prevent unnecessary confusion, I avoid using this term whenever possible.

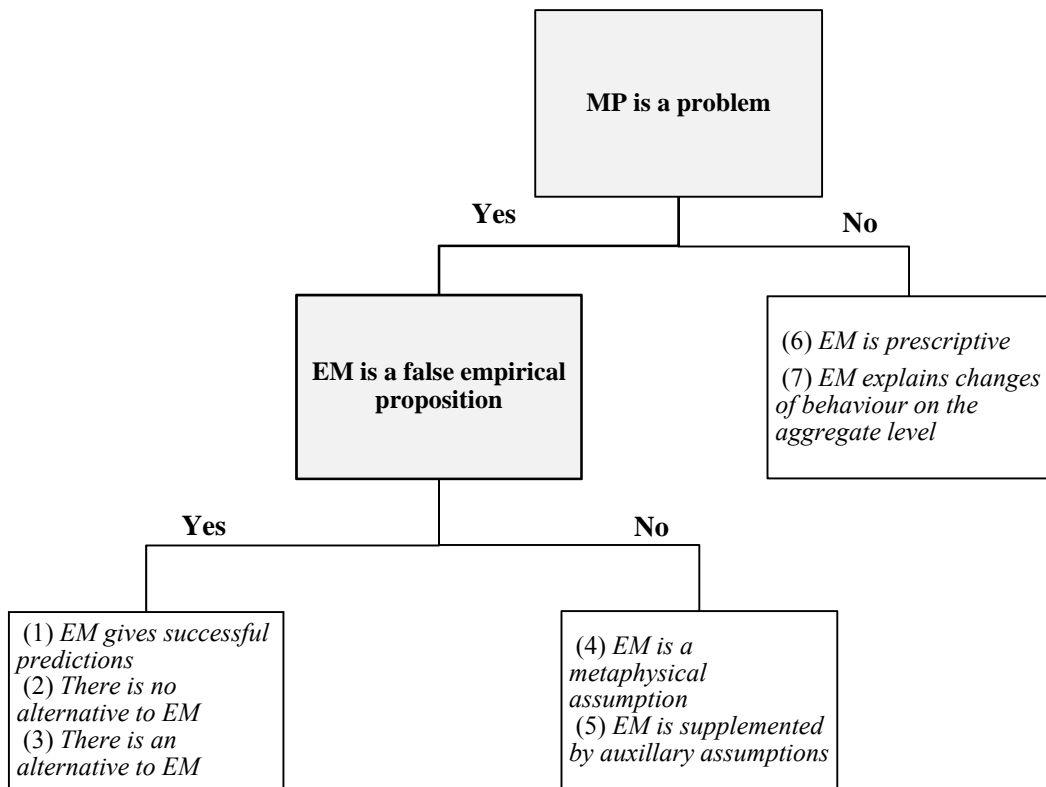


Fig. 1: Suggested solutions to MP

3 Attitudes toward Macaulay’s problem

This section corresponds with the diagram on Fig. 1 and is divided into three subsections: first discussed are the attitudes according to which EM is a false empirical proposition; then the focus is on attitudes claiming EM is empty of empirical content; finally, the view that MP is a pseudo-problem is dealt with.

3.1 EM is a false empirical proposition

(1) *It does not matter that EM is false, so long as it produces valuable predictions.* This has for a long time been the standard solution to MP, originating with Friedman (1953): it is not important how people “really” choose, we are justified in modeling their behavior “as if” it corresponded to

EM, provided we get predictions that withstand empirical test.⁴ An example of the “as if” principle in action runs as follows: a consumer who (given any income and prices) chooses according to a simple rule $x_1 = x_2$ acts to maximize the utility function $u = \min\{x_1, x_2\}$.⁵

There is a long line of criticism for this “as if” approach. First and perhaps the most obvious objection is that this principle requires giving up all ambition to explain phenomena (Melitz 1965; Bear and Orr 1967; Caldwell 1980). As Bear and Orr (1967:191) put it, a “scientist is concerned with how things happen, not only with what happens”. Camerer (2007) perhaps has something similar in mind when claiming that if a false assumption leads to a correct prediction, then it is presumably because of some hidden ‘repair’ condition. Then, according to him, the proper focus is on these ‘repair’ conditions.

A second objection is that a theory with false assumptions, although occasionally giving good predictions, also entails consequences that are falsified by facts (Nagel 1963; Rotwein 1959; Melitz 1965; Laville 2000). To use the above mentioned example of a consumer who acts as if to maximize $u = \min\{x_1, x_2\}$, assume that $p_2 = 0$. Then the consumer still chooses $x_1 = x_2$ however, the utility function predicts that she also sometimes chooses $x_2 > x_1$, which prediction fails.

This example also illustrates the third objection against the “as if” approach: if a theory gives us wrong predictions, we may abandon it as an instrument for generating predictions. However, we never really test it, for we do not know (since we never look at its antecedent conditions) the sphere of its applicability (Bear and Orr 1967; Popper 2002). To be more specific, although the model in the example above does not ‘work’ with $p_2 = 0$, it ‘works’ when both prices are positive and therefore can still be used to predict choices in the latter case. The “as if” approach thus cannot account for the growth of knowledge, because it is only an accumulation of newer and newer instruments of prediction.

⁴ The “as if” approach can also be interpreted as claiming that empirical criteria simply do not apply to assumptions, rather than that the assumptions are false. For discussion of this interpretation, see the next subsection.

⁵ Some other examples can be found in Rubinstein (1998).

A fourth objection is that the distinction between assumptions and predictions is not given once for all: a prediction can sometimes be turned into an assumption and vice versa (Melitz 1965; Nagel 1963; Hausman 2007). To give another example, consider the following proposition: “if choices of an individual satisfy generalized axiom of revealed preference (GARP) then her compensated demand curve for a commodity x is downward-sloping”. According to the “as if” approach, we do not care whether choices really satisfy GARP or not. Now assume that it is not a choice function that is the primitive of the theory, but a preference relation and consider the following proposition: “if for an individual the preference relation is complete, transitive and locally insatiable, then her choices satisfy GARP”. Thus GARP now becomes a prediction and hence it should be empirically tested.

The fifth and final objection is that adopting the “as if” approach could be viewed as what Popper calls an ‘immunizing stratagem’, since it appears to preclude criticism of assumptions and is thus unscientific (Samuelson 1963:233; Melitz 1965:49).⁶

(2) *EM is false, but there is no better alternative at hand.* There are economists who are not happy with the “as if” approach and argue that EM should be subject to empirical tests. A number of these tests can be interpreted as falsifying EM; yet, in a number of them, EM does well. The argument thus is that, even though the model is strictly speaking false, it is often works and, apart from that, there is no viable alternative to it (Smith 1991; see also Vanberg 2004 for further references). The latter argument is important, since as is often pointed out, EM cannot be replaced with nothing. Although this position is perfectly plausible when adopted by an applied economist, it is unacceptable for a theorist, who cannot be satisfied by sticking to a false model and not attempting to replace it with a better one. A theorist may thus want to switch to the view discussed next.

(3) *EM is false and there is a better alternative, at least in sight.* This solution is especially suggested by behavioral economists, who criticize EM for the neglecting framing effect (Tversky and Kahneman 1981, 1986), endowment effect (Thaler 1980) and other biases. The main problem

⁶ As an additional argument against the as-if approach, it is sometimes claimed that assumptions matter when we turn to welfare analysis (Rosenberg 1992:160; Røgeberg 2004:267).

with this position is that its advocates have so far not succeeded in constructing a new economic theory on the foundations of alternative choice models. Some even argue, that most of the work in the field, although motivated by the search for more realistic foundations (Rabin 1998, 2002), was unable to emancipate it from the “as if” approach (Berg and Gigerenzer 2010). There is also no agreement on what the alleged superior alternative to EM is: some claim that it is the bounded rationality approach (Conlisk 1996; Laville 2000), others root for program-based behavior, inspired by the evolutionary theory (Vanberg 2002; 2004) and yet others argue that folk-psychological explanations should be abandoned altogether (Rosenberg 1980; 1992; 1995). Thus, although it is claimed that the lack-of-alternative argument is outdated (Laville 2000), no one has yet demonstrated that the alternatives have greater explanatory power than EM.

3.2 *EM is a truism*

(4) *EM is a metaphysical assumption.* For most economists, having a false theory is a lesser sin than having an empirically empty theory. Not so for Ludwig von Mises and his followers (especially Rothbard 1957; 1977). Mises (1996: 18-20), argued that choice can never violate EM when interpreted adequately, i.e. when the agent’s knowledge, beliefs and values, are taken into account.

Such an interpretation of EM is clearly possible; now, what about the problem of the empirical content of this interpretation? Mises does not see it as a problem at all – for him economic theory is analogous to mathematics or logic and it produces – much like these disciplines – tautologies (Mises 1996:38). Nonetheless, his views were criticized e.g. by Sweezy (1934), Hutchison (1960) as methodologically unacceptable. Partly in response to these criticisms, it was specified that EM, in the Misesian interpretation, belongs to the more respectable category of synthetic a priori (Hoppe 1995; B. Smith 1996; 1986; Pavlík 2002; 2004; 2006).

I argue that this solution to MP is unsatisfactory. Whatever their philosophical or logical status, we may divide all theoretical propositions in two disjointed groups: either they can contradict factual statements (they have empirical content) or they cannot (they do not have empirical content). Assume that we want to explain some phenomenon, say downward-sloping demand curve: such an explanation must necessarily place some restrictions on individual choice.

For, if any choice is possible, then an upward-sloping demand curve is as plausible as a downward-sloping demand curve. Propositions that do not forbid certain outcomes to occur explain too much and thus cannot explain anything. Consequently, either EM must have an empirical content or, alternatively, certain additional assumptions restricting behavior must be adopted.

The same argument applies to the position combining apriorism and “as if” instrumentalism entertained e.g. by Machlup (1955) and Boland (1981), both of whom claim that empirical criteria are inapplicable to EM. According to Machlup, EM is an empirically un-testable ‘fundamental postulate’; Boland is more specific, claiming that EM is an ‘all-and-some statement’ that can be neither falsified nor verified and hence belongs to metaphysics and its criticism is “futile”. Boland’s argument is wrong, because the claim “there is something that an individual maximizes”, in fact means “preferences are complete and transitive”. That is, in principle, falsifiable as completeness and transitivity are universal statements (Mongin 1986) (although Boland might legitimately point out that these tests are difficult, if not impossible, to carry out). Furthermore, empirical testability is just one form of criticism: non-testability thus does not imply it is un-criticizable.

To conclude, although it is not denied that every science does rest on metaphysical assumptions (such as realism or causality), there seems to be no reason to assume that EM is one of them. In the absence of an argument that would demonstrate otherwise, EM must be treated as an empirical hypothesis or a definition.

(5) EM has no empirical content; its explanatory power resides in auxiliary assumptions.

There are economists who acknowledge the fact that EM is without empirical content but, unlike those who adopt the attitude (5), they find this fact problematic. They therefore emphasize the role of auxiliary assumptions (e.g. a particular preference structure) which are said to exercise the explanatory job (e.g. Arrow 1986 see also; Laville 2000 for further references). MP is, however, not solved in this way; it is just shifted and applies to these auxiliary assumptions.

3.2 EM is a pseudo-problem

(6) *EM is prescriptive rather than explanatory proposition.* This position is especially adopted with respect to some refinements of EM, such as expected utility theory (see e.g. Laville 2000 for references). The problem of this attitude is that if EM is prescriptive, then an alternative explanatory model of behavior must be constructed. The MP would probably be applicable to this new model. Moreover, if EM is only prescriptive, how can one account for the fact that it has often been successful in explaining phenomena? This problem is sometimes solved by claiming that EM is both prescriptive and descriptive (Luce and von Winterfeldt 1994; Harsanyi 1986; Sen 1987; Hausman 1992). Nevertheless, this solution seems unsatisfactory: if EM is explanatory, there is no need to instruct individuals how to choose, because they already do it; if EM is prescriptive, then individuals do not choose in line with this model.

In the next section one more view is discussed in more detail and it is shown that when adopted, it is capable of, to a great extent, reconciling the other positions mentioned in this section.

4 The Economic Man (EM) model does not explain behavior

4.1 Explicandum of EM

I argue the following view to be the most satisfactory approach of dealing with MP.

(7) *MP is a pseudo-problem, because individual behavior is not an explicandum of EM.*

According to this view, EM does not profess to explain individual behavior, but rather attempts to explain *changes* in behavior (Machlup 1946). This is best illustrated on the example of the standard demand theory:⁷ note that the explicandum of the demand theory is the fact that, all other things equal, if the price of a commodity goes up, an individual will buy less of this commodity (Viner 1925; Hicks 1978; Houthakker 1961; Samuelson 1974). In general terms, the explicandum is a response to a change in a constraint. Contrary to the claims of some economists

⁷ The choice of the demand theory as an example is not ad hoc: EM was actually born as a part of the demand theory and only later was applied in other areas.

(Arrow 1959; Kornai 1972; Rosenberg 1995; Vanberg 2004; Wong 2006), the question of why a particular commodity bundle was chosen remains unanswered.⁸

What are the implications for MP? To put it crudely, the proposition “an individual never chooses an alternative inferior to her preferences” is indeed a poor explanation of behavior because it is either false or empirically empty. Nonetheless, once it is acknowledged that this is not a hypothesis aimed at explaining behavior, but rather a *definition* of what it means “to prefer”, as used in a theory explaining changes in behavior (such as those described by downward-sloping demand curve), the problem disappears.

Now let us assume that a sequence of individual choices seems inconsistent with EM. There are three possible interpretations of this observation:

(i) EM is violated.

(ii) Preferences changed.

(iii) Individual’s perception of the choice problems differs from the observer’s perception, i.e. either the individual faces some unobserved subjective constraints (e.g. she is not aware of the feasibility of some alternatives that are known to the observer, see Masatlioglu et al. 2012) or her classification of choice alternatives is different from the observer’s (e.g. the observer considers all apples as the same while the decision maker distinguishes between green and red apples – see Hudík 2012).

Since the explanations (ii) and (iii) cannot be excluded, is it not the case that EM is not falsifiable and MP thus reappears in a new form?

The answer is negative, once it is admitted that that the focus of economists is on aggregate (market) rather than individual level (e.g. Becker 1962; Rosenberg 1995). For illustration, assume that a price for a good increases and the market quantity demanded goes up. If the number of consumers does not change and the Giffen behavior is excluded, the explanations (i)-(iii) remain possibilities. As for the explanation (ii), although it is not denied that inexplicable (in the light of the present state of knowledge about preference change, that is) changes of preferences occur, it

⁸ The thesis that EM does not explain choices also seems accepted now outside the demand theory (Binmore 2009; Gintis 2007).

is unlikely (unless there is a plausible reason) that positively correlated changes in preferences would occur at the same time in the minds of many people. Regarding explanation (iii), it is possible that the increase in price changes the perception of a good e.g. due to the snob appeal or a change in the perception of the quality of the good – see e.g. Alcaly and Klevorick 1970). Again, if there is no reason to assume that this explanation applies for many individuals at the same time (for example, the good in question is bread) it should be disregarded. Observed increased quantity in response to a price increase has to therefore be interpreted as the falsification of EM.

To sum up, according to the view just presented, EM explains changes of behavior in response to changes in constraints on the aggregate level. In the next two subsections, I first discuss how this view relates to the views (1) to (6), discussed earlier, and then I suggest why the usual criticism of EM fails and how to criticize EM effectively.

4.2 Comparison with the other attitudes toward MP

How does the view (7) relate to the alternative views (1) to (6)?

Views which consider EM as a truism, i.e. (4) and (5), seem to neglect the fact that this model aims at explaining changes of behavior rather than single actions. It is true that, provided we do not have an access to the agent's preferences, no isolated choice can falsify EM. An agent always chooses what she prefers, because that is how preferences are defined if we do not have access to the agent's mental states (the 'revelation' of preference by an action is thus not an a priori axiom but simply a definition). Nevertheless, as discussed in the previous subsection, the *sequence* of choices can violate EM.

Regarding the views treating EM as a false empirical proposition, i.e. (1), (2), and (3), they do not seem to sufficiently appreciate the fact that falsifications of EM on the individual level (if they are falsifications at all) fail to imply that systematic responses to changes in constraints consistent with EM do not occur on the aggregate level. In response to (1), even if it is admitted that EM is falsified in individual cases, we are not forced to adopt an "as if" approach because it presumably is not false "on average" (i.e. the individual falsifications are rare enough not to

influence the aggregate result – see e.g. Machlup (1946) and Rosenberg (1992)). As for position (3), the attempts to construct an alternative to EM must be evaluated by their ability to account for aggregate-level phenomena, which EM explains satisfactorily. As long as the effort is exercised on the explanation of individual choices, they will be irrelevant with respect to EM.

Finally, the view (6) according to which EM is prescriptive is perhaps also partly motivated by what is considered to be falsifications on the individual level. The fact that economists focus on aggregate-level phenomena helps to make sense of the fact that EM is considered both explanatory and prescriptive. It is an explanatory proposition with respect to the aggregate level and prescriptive on the level of individual agents.

4.3 Effective criticism of EM

Although the view (7) seems to be an adequate answer to MP, it suffers from its own specific problems. First of all, the link between the individual and aggregate level must be precisely specified. In particular, the question of “How many falsifications of EM on the individual level are admissible so that EM still correctly describes behavior of the representative agent” must be answered without turning the theory into tautology. A more serious problem is that systematic responses on the individual level do not imply the same systematic responses on the aggregate level and vice versa.

For instance, it is well known that the properties of individual demands translate into the properties of market demand only by adding restrictive assumptions on preferences (see Mas-Colell et al. (1995) for discussion and further references). Viewed from the opposite perspective, systematic responses to changes on the individual level are not a necessary condition for systematic responses on the aggregate level (Becker 1962).⁹ These results indicate that – provided the arguments of this paper are correct – the effective criticism of EM consists in pointing out this weak link between individual behavior and aggregate phenomena. An alternative model will replace EM only if it is capable of explaining observed regularities at the

⁹ Another complication is that aggregation is unacceptable when there are strategic interactions among individuals (Hayek 1952; Holland 1998).

aggregate level. As long as critics focus on the explanations of individual actions, EM seems to be safe.

5 Concluding remarks

I conclude this paper with two remarks.

First, throughout the paper I deal with EM as exemplified in the works of Becker and others inspired by them (for a review see e.g. Becker (1993) and Lazear (2000)). Refinements of EM, such as expected utility theory, theory of time preference or game theory must be dealt with separately. Even though the argument of the present paper does not apply to these refinements, the claim that individual behavior is not their explicandum seems to remain valid (see Hudik (2011)).

Second, one perhaps cannot avoid the question of whether the argument of this paper provides support or criticism of EM. The paper can be read as a defense of EM in the sense that it attempted to show that usual criticisms focusing on individual violations of EM miss the point. It is also a methodological defense. It shows that standard empirical criteria apply to EM and no methodological escapades are necessary. On the other hand, this paper also pointed the way to a successful criticism of EM. This can be achieved by demonstrating that it fails to explain what it means to explain, i.e. aggregate-level changes in behavior.

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