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ABSTRACT (<100 words). Behavioural Economics' milestones, Endowment Effect and Loss Aversion, have been recognized as 'well documented,' 'robust,' and 'important' even by the critics. But well documented, robust, and important *what*? Are these stylized facts, theoretical constructs, or psychological truths? Do they express genuine preferences or are they judgement mistakes? We discuss the problems with the nature of these claims in the lights of the goals of Behavioural Economics: to improve economics' realisticness and to be considered mainstream. We argue that, under sensible interpretations of Loss Aversion and Endowment Effect, Behavioural Economics is neither more realistic than, nor part of the mainstream.

KEYWORDS. Behavioural Economics, Decision-Making, Endowment Effect, Loss Aversion, Uncertainty

JEL Classification. A12, D81

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In the early days economists cared for real people. When there existed no formal discipline concerned with studying individual psychology, economics was that discipline and "[m]any economists moonlighted as the psychologists of their times" (Camerer & Loewenstein 2004, p. 5). The study of individual psychology was central to many fathers of economics, witness Adam Smith (1759, see also Nava et al. 2005), who traced a broad and nuanced psycho-moral profile of his fellow citizens, Jeremy Bentham's (1823) investigations into the foundations of individual utility, and Francis Edgeworth's (1881) preliminary account of social utility, in which one agent's utility is affected by the other agent's payoff. And so did Vilfredo Pareto (1916) and Irving Fisher (1930). Not to mention John Maynard Keynes, who rejected the idea the real economic agents rely on mathematical probabilities, but maintained instead that they calculate subjective risk and sometimes employ "practical theories of the future" (Keynes 1937, p. 114) – for instance following a convention when they lack reliable information or believe others have superior knowledge, or overweighting present conditions in their estimates about the future (Keynes 1921, p. 275) – in order to cope with an uncertain world, and who was attentive to the emotional and intellectual differences that tell speculators apart from the herd and the gamblers in the financial markets (Keynes 1910; 1936, ch. 12; see also Carabelli 1988). This caring for people was later abandoned and, as economics progressed in the direction of an ever more formalised branch of applied mathematics, individual agents were replaced by rational machine-like decision makers (Mirowsky 2002). While psychology was emerging as a distinct branch of academic knowledge, economists began rejecting it as unscientific.

A few decades later, Behavioural Economics marks the return of psychology in the camp of economic theorising (Sent 2004). Though it was born as a critique of the psychology-free mainstream, Behavioural Economics now seeks a position within its ranks, claiming that their methods and assumptions are not radically different.[1] The behavioural enterprise aims at empowering mainstream economics with better tools, by employing methods inspired by other social sciences, and specifically by means of more realistic psychological foundations: increased realisticness is indeed its main acknowledged objective. In this way, Behavioural Economics "increases the explanatory power of economics by providing it with more realistic psychological foundations," and it advances economics on its own terms by means of "generating theoretical insight, making more accurate predictions, and suggesting better policies" (Camerer & Loewenstein 2004, p. 3). Grand aims of this kind did not only inspire the enthusiastic rhetoric of an ever-expanding league of behavioural economists: it afforded substantial results and in the recent years, Behavioural Economics has witnessed several manifestations of the broad recognition of its successes (Rabin 2002, Sent 2004).

[1] Tomer (2007, p. 478) identifies as the unifying tract of the many strands of Behavioural Economics the belief that the dominance of mainstream economics is "the key social evil."

The assumptions and methods of Behavioural Economics, however, suffer from some confusion as to their exact nature and their expected function. Most of these concepts, for instance, may be variously regarded as stylized facts, theoretical constructs, or general truths about human psychology. In the latter case, moreover, one might want to investigate whether they originate in authentic preferences, in judgement failures, or in the human emotional profile. Answering some of these questions, we argue, is not only a worthy intellectual undertaking in its own right, but also important both to appreciate the increased realisticness it affords and to locate the contribution of Behavioural Economics in the intellectual landscape with respect to the mainstream. We argue that, under sensible interpretations of Loss Aversion and Endowment Effect, Behavioural Economics is not more realistic than the mainstream and that it can hardly fit with it.

ECONOMICS AND REALISTICNESS

Criticisms against the neoclassical approach to modelling human agents have taken rather elaborate forms, but they generally boil down to an objection against the individual ability to maximise expected utility. For instance, individuals do not possess the cognitive skills required to compute optima, they lack reliable probability information about various states of the world in a complex ecosystem, or they do not know well-defined sets of alternatives and their consequences in a rapidly evolving environment. In other words optimisation is humanly unachievable. In a related argument, maximisation is seen as an instrumental theory which may be upheld on empirical grounds, but which does not (nor needs to) succeed at illuminating the micro-foundations of individual decision-making. A more precise description of human agency would, instead, need precisely those foundations and it would almost certainly result in a rebuttal of optimisation.[2] Optimisation is thus unrealistic.

When an agent performs an action, economic theory treats her 'as if' she optimised: she is presumed to have maximised a preference function of some sort. Since real agents often fail or do not even attempt to maximise, the maximisation assumption is paired with an externalist view of rationality (Satz & Ferejohn 1994) and a selection argument (for a thorough discussion see Vromen 1995). The reasoning goes that, even without an impeccable calculation power or complete information, agents still maximise. The 'evolutionary' argument (Alchian 1950) maintains that competition sets in motion a mechanism akin to natural selection, so that only those who generate profits (by whatever means) stay in the market. One can throw a coin to deliberate over one's actions, but if one's choice is not good enough, one is selected against by competitive pressure, while the lucky competitor who got it right will instead prosper. Under sufficient levels of competitive pressure the result is the equivalent of maximisation (Enke 1951,

[2] For a review of some critiques and qualifications to the standard Bayesian theory, see Carabelli (2002, p. 166ff.).

Penrose 1952).[3] Men thus act 'as if' they were maximising (Friedman 1953). Because decision-making occurs differently from what economists suggest, rational choice theory is typically regarded as a normative statement of how agents *should* act in order to be rational (Hardin 2001), whence psychologists like to conclude that "normative and descriptive analyses of choice should be viewed as separate enterprises" (Tversky & Kahneman 1987, p. 91).

Indeed, these objections owe their weight to whether one's study of decision-making (and consequently one's behavioural assumptions) is *descriptive*, i.e. it aims at plausibly depicting what actually happens; *normative*, i.e. it ponders about what should ideally happen; or *prescriptive*, i.e. it suggests what ought to be done (usually for the first to turn into the second). The three perspectives are related in several ways, but only the specific goal of a theorist on a specific occasion sets the standards required for judging one approach superior to another. The choice of one approach, furthermore, makes it possible to advance more pointed critiques and suggestions for improvement. For instance, if one considers subjective expected utility (SEU) as descriptive, any behaviour that does not fit with it signals a shortcoming of the theory; while to treat SEU as a normative theory means that documented deviations should be regarded as individual failures or irrationalities.

It seems rather sterile, therefore, to endlessly criticise economics' mainstream on the grounds that its behavioural assumptions are unrealistic, if realisticness at the individual behavioural level is not one of its recognized goals.

WHAT IS UNREALISTIC?

It is important, therefore, to shed at least some light on what is meant by realisticness and why one should indeed care.[4] A trivial and immediate counterargument against the unrealisticness critique would indeed be that perfect realisticness is both impossible to achieve and it would make a theory so complex to be undesirable. And the complaint that economics is in some measure lacking in realisticness, if indeed true, may also be quite pointless.

What is to be explained by economic theory is not individual behaviour. If it were, economics would obviously have to entertain itself with an account of human agency that is more realistic in a number of ways. But it aims at providing explanations of various economic phenomena – e.g. changes in prices and quantities – and the behaviours of individual economic agents are just intermediate elements in those explanations. The traditional goal of economic theory is not to accurately reproduce decision-making as it occurs inside the human brain, but to plausibly describe – in

[3] Alchian (1953) accepts this line of reasoning, but claims the superiority of the evolutionary approach because it is more realistic. Winter (1964), however, shows that the result of evolutionary forces needs not coincide with maximisation.
[4] For a discussion of 'realisticness' and a clarification of the differences between 'realisticness' and 'realism' see Mäki (1989). The issue also concerns several ways in which it is possible to interpret the relationship between a theory and the world – e.g. isomorphism (Van Fraassen 1980), similarity (Giere 1988), analogy (Hesse 1966), idealisation (Cartwright 1983), caricature (Gibbard and Varian 1978), reference (Davis 2004a), metaphor (McCloskey 1990), etc.

order to be able to predict – the observable outcome of decision-making or actions. If economists' behavioural assumptions do not hinder the development of a clear causal explanation of a target phenomenon, there seems to be no ground for complaints.

A theorist may easily explain the formation of global oil prices in consequence of such and such shock by means of concepts like 'market rigidities,' while positing that all oil buyers and sellers behave as the rationally self-interested representative agent. That none of the actual buyers and sellers actually does and that there exist no mysterious market entity which is being rigid might not trouble us too much, in so far as we get the changes in prices right. Several properties of competitive markets suggested by economic theory often emerge even though agents are lacking in rationality and selfishness (Becker 1962). Many recent experimental studies show that "while *individual* irrationalities are observed in experimental markets, *market* irrationalities may not be observed" because "even in markets populated entirely by irrational actors, several fundamental features of markets, such as price and quantity realizations, meet neoclassical predictions after a few rounds of market experience" (List & Millimet 2005, p. 29). The evolutionary argument can thus be pushed even further: given sufficiently strict institutional rules, there is not even a need for natural selection to play a role. Institutional design might, as it were, 'invisible-handedly' create the conditions for the realisation of a certain outcome, which, incidentally, almost coincides with that predicted by economic theory (Gode & Sunder 1993).

Not only, therefore, individual choices are not quite as neoclassic economics presents them (i.e. it fails descriptively), neither can they be (i.e. it fails normatively), nor should they (i.e. it fails prescriptively); but there is even no need that they be: sometimes it may be the market that plays the game. Actual economic agents seem to be led by an invisible hand to bring about a collective result whose characteristics are the same as those it would have if each of the agents were a homo economicus.

Scott Gordon (1991), in his monumental work on the history and philosophy of social science, recognizes this as a methodologically delicate issue called 'emergent properties,' according to which, at every level of inquiry new properties emerge that cannot be entirely explained in terms of the lower level elements. One traditional example is that of hydrogen (H) and oxygen (O), whose combination in certain proportions results in H_2O, or water. The properties of water somehow transcend those of H and O, whose separate characteristics are inadequate to explain those of their joint offspring. If we were to further combine H_2O with carbon and nitrogen, amino acids would appear, whose combination results in a protein, joint proteins make cells, joint cells make tissues, tissues make organs, organs make organisms, and organisms sometimes happen to make societies. At each level new properties 'emerge' that are different from those of the constituent parts and that cannot be fully explained in terms of those parts. Admittedly "[t]here is a bit of mystery,

perhaps even mysticism, about the idea of emergent properties" (ibid., p. 48). But scientists often have to be pragmatic and content themselves with focusing on certain levels of explanation, without providing a steady foundation to their claims.[5] As a consequence, the method of inquiry follows from the level of study, which in turn follows from the questions asked.

Real world economic agents seem to be led by an invisible hand to bring about the same collective result as if each of the agents were a homo economicus. These collective phenomena, moreover, may be easier to explain (and can certainly be described in a more elegant fashion) through economic men than through more psychologically elaborate, and more complex, agents. When analysing collective phenomena, one may thus disregard the accuracy of one's agents and simply use homo economicus because, for instance, the predictions afforded by such theoretical tool are sufficiently good, and by some accounts even the best available.[6] To understand individual behaviour, instead, different methods seem in order. Perhaps one would do best by employing some "facts, models, and methods from neighbouring sciences" which are "deeply rooted in empirical findings" (Camerer & Loewenstein 2004, p. 5), as Behavioural Economics does.

A BRIEF OVERVIEW OF BEHAVIOURAL ECONOMICS

Even though neoclassical economics does not always provide strong and pointed predictions about individual behaviour and it is often criticised for being essentially compatible with any behaviour, sometimes it is possible to directly expose evidence which conflicts with it or is otherwise anomalous.[7] Indeed human life is rich in odd behaviours as we presently try to show with a few examples appropriated from the Behavioural Economic literature.

If you have experienced the feeling of being reprimanded by your boss when you perform badly and not congratulated when you do especially well, know that he is not being unnecessarily cruel. He is doing his best to guarantee that you indeed always do well. How so? He may have noticed that praising you for some commendable achievement triggers a worse performance on the next occasion and *vice versa* reproaches are followed by improvements. So is this your fault? Not. More simply, on average you perform at your average skill level. On occasions, however, you perform exceptionally well (or bad): that is when he praises (criticizes) you. It is extremely likely that the next time your performance will revert to average, and therefore that it will be worse (better) than the previous, regardless of your boss' comments. If he is not well trained in statistics, your boss will come up with his own cynical theory of how to improve individual performance under the manifestation of the 'phenomenon of regression,' which in this case is an ungrounded belief that applause backfires whereas scolding motivates. And this may help

[5] Scott (1991, p. 48) comments that "there would be little effective biological research done if every biologist felt compelled to explain the physical chemistry of the phenomena he studies."
[6] Behavioural economists, too, have given up criticizing mainstream economics, although it is not clear why.
[7] On the impossibility to gather evidence that disproves economic theory, see Boland (1981).

explain why the company does not perform any better even if he is being so little beloved. Your boss' behaviour – it seems – is not only unpleasant, but also ill advised. Luckily, unwise behaviour may sometimes turn out to be nice. For instance, economic theory denies any rationale to giving away money without any obligation to do so, after the beneficiary has completed his side of a deal and without any expectations to interact with him again. In practice, however, we do so every time we tip. We most probably do so without thinking, because it is expected of us, but hardly because it maximises our expected utility.

Even when we reflect, however, we make decisions that conflict with SEU. The money we earn, for instance, is accounted for in separate 'Mental Accounts,' and these are treated differently. Consider two individuals who earn $60,000 per year: Mr. A, who receives $5,000 every month, and Mr. B, who is paid twelve monthly instalments of $4,000 plus a bonus of $12,000. Though they may be imagined identical under every other respect but the way their checks are paid, their actual savings will differ markedly. More specifically, Mr. B will save more because his 'regular' income is lower – and he will adjust his spending to that value – and because his 'extraordinary' income is higher – and he will save a large proportion of it.[8] This is in contrast with the theories of economics heavyweights such as Franco Modigliani (1988) and Milton Friedman (1957), who constructed models based on saving decisions made by agents who treat all money as equal, after a balanced discount of accurately predicted amounts which will be earned any number of years later.

If we were so good with managing money, we would not miss as many gains as we in fact do. For one instance, in spite of our presumable desire to make the most out of our financial investments, we keep putting money into government bonds – which in the long run hardly make any profit to compensate inflation – and do not invest in much more remunerative stocks. This oddity, called the 'Equity Premium Puzzle' (Mehra & Prescott 1985), could be due to a combination of factors: Mental Accounting and, a theme we discuss at much greater length below, Loss Aversion – i.e. people suffer from losses more than they benefit from comparably sized gains.[9] Loss Averse decision-makers are more likely to run risks if they evaluate the outcome of these risks infrequently… the less they know about their portfolios, the better! Because stocks are volatile, that is their value goes up and down quite often, and because they suffer from losses more (twice as much, some evidence indicates) than they rejoice for equal gains, the overall performance of their investments might make them sorry even as they earn healthy returns, should they check their portfolios too frequently.

When we have "a theory that makes crisp predictions" (neoclassical economics) and come across "facts that contradict those predictions" (the evidence above), we have found an "anomaly" (Thaler 1992a, p. 2). When this

[8] On Mental Accounting, see Thaler (1992b).
[9] Though this is not universally confirmed, we shall below assume the value is 2, unless differently noted.

happens, there immediately opens room for an alternative explanation to step in. On such occasions, we would ideally welcome a new explanation that covers the ground covered by the old one, and that left exposed by the anomaly. SEU, for instance, has called for corrections in the lights of the finding that individuals require a premium above expected value to accept a fair bet – i.e. a gamble offering an even chance of gain or loss. In their presentation of Prospect Theory (PT), Daniel Kahneman and Amos Tversky (1979) note how people exhibit several effects that are inconsistent with SEU, but which can be accounted for with their new theory. And Colin Camerer (1995, p. 159) agrees that "[p]rospect theory is a suitable replacement for expected utility because it can explain anomalies […] and can *also* explain the most basic phenomena expected utility is used to explain." One theory upholding several explanations is good because it is parsimonious; and parsimony is often easily translatable into mathematical formalisation – both properties economists hold in high esteem in judging a theory.[10]

The basic tenets of PT illuminate how it is in contrast with SEU in a way that matters for the theme we are discussing. PT still describes individual choices among alternative gambles (i.e. prospects) as the maximisation of a weighted sum of values. The weights, however, are not the same as probabilities. People instead give zero weight to extremely unlikely events, they exaggerate the weight of very unlikely (not extremely so) events, they underestimate the weights of very likely (not extremely so) events, and finally they treat extremely likely events as virtually certain. But the weights are subjectively assigned.

The values, moreover, do not have the standard properties of preference functions. Instead their properties are (Tversky & Kahneman 1991, p. 1039):

> *REFERENCE DEPENDENCE*: The carriers of utility are gains and losses defined relative to a reference point.
> *LOSS AVERSION*: The function is steeper in the negative domain than in the positive domain; losses loom larger than corresponding gains.
> *DIMINISHING SENSITIVITY*: The marginal value of both gains and losses decreases with their size.

These are incompatible with the common concave utility function employed in economics and may be graphically represented by means of asymmetric and S-shaped value functions, which furthermore are concave in the positive and convex in the negative, and with a kink at the current endowment (or reference) point (Knetsch 1992, Tversky & Kahneman 1991).[11] The current endowment point must be determined on a case-by-case basis, as it depends on the subjective perceptions of what is 'normal' compared with the subjective perceptions of what is a gain or a loss (Novemsky & Kahneman 2005a, p. 127). Because the disutility afforded by a loss is larger in absolute terms than the utility afforded by a gain of comparable size, this asymmetry should translate in behaviour that steers away from losses

[10] In the philosophy of science parsimony is usually called (theoretical) unification; see below.
[11] We do not elaborate on this aspect on the present occasion, but it is worth noting that the exact definition of what counts as a reference point is problematic.

more decidedly than it heads towards gains. For this reason it has been dubbed 'Loss Aversion' (Camerer 2000; Kahneman & Tversky 1979, 1984; Tversky & Kahneman 1991).

PT's model of choice under risk rests on two other pillars: framing effects and heuristics and biases. For one, people tend to passively accept the defining characteristics of a given situation, without deliberately constructing a canonical representation of each state of affairs (Tversky and Kahneman 1981, 1987). Moreover, one of the tricks we use to face the complexity of a choice context is to substitute a target attribute with a more tractable heuristic attribute (Kahneman & Frederick 2002). So that human behaviour is not as carefully thought out as neoclassical would have it. External stimuli processing, decision-making, and behaviour generation therefore call into play two families of cognitive operations commonly labelled System 1 and System 2 (Kahneman 2003: 1450ff.). System 1 is responsible for intuitive, fast, automatic and effortless responses, called 'heuristics', which have an emotional origin (Damasio 1994) and do not require conscious deliberation. Most thoughts, actions, and judgements spring from System 1. Yet, not every impulse is immediately acted upon, because System 2, which is reflective, slower, self-aware, calculative and effortful, monitors the activities of System 1 and empowers reason to override guts; though "the monitoring is normally lax" (Kahneman 2003: 1450). A large number of the actions prompted by System 1 are often both appropriate and successful, so that there is typically little need for double-checking their response but sometimes they backfire, leading to systematic and predictable errors, or biases (Gilovich et al. 2002). Some of these biases are so well known that they have truly achieved a celebrity status in the economics literature.

ENDOWMENT EFFECT, STATUS QUO BIAS, AND LOSS AVERSION

If a given good has a more or less clearly defined value, its buying and selling prices should be nearly the same. This is, at any rate, what economic theory maintains and what people generally believe (Van Boven et al. 2000). In practice, however, sellers often demand more money than buyers are willing to part with. An early study (Knetsch & Sinden 1984), for instance, showed that the participants given a lottery ticket and those given $ 2,00 prefer whatever they are given and, when offered the opportunity, refuse to exchange it. One would expect either the lottery to be of higher value than the cash or vice versa.

When they approach a trade, instead, most people seem to value whatever they already possess more than they value what they may obtain in exchange, regardless of the fact that the two goods are roughly equal in value and equally desirable. This price gap has been dubbed Endowment Effect (Thaler 1980). A related observation that most people would refuse to sell a good they own at a given price and yet refuse to buy additional units of the same good at the same

price resulted in the identification of a tendency for not changing a given situation, which has been labelled the Status Quo Bias (Samuelson & Zeckhauser 1988).

In a formal investigation of the Endowment Effect (Kahneman et al. 1990), half the participants (sellers) were assigned a number of 'induced value tokens,' and told how much money each was worth to them. The other half (buyers) were given no tokens, but told their subjective value. In this way it was possible to compute supply and demand curves for tokens. Subjects alternatively took the role of buyers or sellers, and were given varying amounts of tokens as well as different token value in each of three repetitions of the market. After each round, the experimenters announced the market-clearing price and the number of trades, randomly chose three buyers and three sellers, and paid them on the basis of their stated preferences and of the market price for that round. On each trial, remarkably, "the market-clearing price was exactly equal to the intersection of the induced supply and demand curves, and the volume of trade was within one unit of the predicted quantity" (Thaler et al. 1992: 65). Neoclassical economics at its very best.

Immediately after the three early turns, four new rounds of market exchanges were conducted with coffee mugs to replace the tokens, and four more with ballpoint pens. Surveys about the desirability of the pairs of goods typically employed in experiments of this kind reveal that about half of the subject sample prefers each good (one mug and some money, or one pen and some money). This should mean that, as noted above, when the two goods are assigned at random, about half of the subjects receive the good they prefer and about half receive the other one. According to the so-called Coase Theorem, in the nearly total absence of transaction costs and income effects (as is the case in these experiments) individuals freely interacting in a competitive market should produce a Pareto-optimal allocation, in which nobody could be made better off without at the same time making someone else worse off. In other words, at the end of the trading period almost everybody should have what he or she prefers. The dynamics of such end-state can be expected to feature about 50% of the subjects trading their least-favoured goods for their favourite ones.

In this specific experiment, 22 mugs (and later pens) were distributed, with an expected 11 trades per turn. The mug-markets, however, staged but 9 such exchanges over four turns (somewhere between four and five trades occurred each turn in the pen market). The total is less than one third of the expected number of trades. The reason why so few exchanges took place is that the median selling price for the mug was $5.25 and the median buying price fell in the $2.25 - $2.75 bracket, while in fact the market price varied from $4.25 to $4.75. Many subjects probably did want to trade, but on terms others found unacceptable. A different version of the experiment compared the willingness to buy and sell mugs with the preference for a mug over different amounts of cash. Now the median selling price is $7.12, the median buying price is $2.87, and the median 'choice equivalent' is $3.12. The comparison between sell and choice prices overcomes the (yet small) income effect from the previous experiment, because now the chooser and the seller

are in the very same conditions. Nonetheless, their estimates differ sharply. This manipulation suggests that the reluctance of sellers (rather than that of buyers) is responsible for the low volume of trading.[12] In an unpublished study (Loewenstein & Kahneman 1991, reported in Thaler et al. 1992), 56% of the students endowed with a pen preferred it to two chocolate bars. Only 24% of the students not endowed with the pen made the same choice. When asked to rank the attractiveness of six gifts that could be won in subsequent experiments, the students endowed with pens did not rate them as more attractive. Perhaps, therefore, the initial endowment does not impact on one's tastes, but on one's pain of giving up something.

It appears that people like something simply because they have been given it. In a similar way, people seem to prefer something for no other reason than that it had already been selected or because it is proposed as the default option. Organ-donation rates in Europe could alone show the point (Johnson & Goldstein 2003). Some countries offer their citizens a choice to sign up for organ donation schemes with mixed results. For instance, only 4.3% participate in Denmark, 12% in Germany, 17.2% in the UK, and 37% in The Netherlands. Other countries 'presume' their citizens consent to donation, and allow the possibility to opt-out upon request. In these countries donation rates range from 77.7% (e.g. Spain) up to virtually 100% (e.g. Portugal, France, and Austria). It would be a very long shot to explain the huge gap in the data as a manifestation of national cultural differences. Another example: upon the introduction of new health-care plans, faculty members at Harvard University were offered the choice to switch from their old plans to the new ones. Few of the faculty joined the new options and they decided to stick to the old plans. Recently employed faculty members, in the face of the same choice, largely joined the new plans (Samuelson & Zeckhauser 1988). Aside from field data just mentioned, Samuelson and Zeckhauser (1988) document a similar effect in a range of hypothetical decisions about car colour, policy proposals, and jobs. In another study, too, evaluations of public policies were more favourable for the options presented as default (Moshinsky & Bar-Hillel 2005). For an example on financial investments, when asked how would they invest a large inherited sum among a moderate-risk company, a high-risk one, T-bills and municipal bonds, most subjects choose whatever is presented as the default option – e.g. the inheritance is already invested in medium-risk stocks – regardless of the financial instrument and despite the fact that tax and broker commission were said to be absent (Samuelson & Zeckhauser 1988). This propensity towards what is already present or what seems as the default option is the Status Quo Bias.

These and many more similar observations are hardly compatible with a rational characterization of individual agency (but see below); and both Endowment Effect and Status Quo Bias have been interpreted as manifestations of a loss aversive asymmetry in the subjective valuation of utility.

[12] The buyers and the choosers are both to obtain the good, but the ones must surrender money in exchange for it while the others needn't. The small difference between the values each assign to the mug seems thus attributable to the fact that giving up money is a 'routine transaction,' and as such does not suffer from Loss Aversion (see below).

The existence of Loss Aversion is perhaps the strongest point of agreement in behavioural economics. It is such a breakthrough and well-established finding that the presumably most cited paper in the field is the one that introduced Loss Aversion to the economics academic community (i.e. Kahneman & Tversky 1979). Even some sceptical commentators (Dupont & Lee 2002, p. 87) recognize that Loss Aversion, Status Quo Bias, and Endowment Effect are "well documented and robust results," and they acknowledge that "a large empirical literature […] confirms the existence of those effects." Behavioural economists thus cheer for these findings (Camerer 2005): they are convinced that they "are both robust and important" (Kahneman et al. 1991, p. 205) and, more specifically, they celebrate Loss Aversion not only as a "useful phenomenon in explaining field data" (Camerer & Loewenstein 2004, p. 16), but even as a "seemingly ubiquitous phenomenon" (Novemsky & Kahneman 2005a, p. 119). But when the reader tries and dig in these 'results,' 'effects,' 'phenomena,' or what have you, she cannot help but wonder: what kind of results-effects-phenomena are these? Are they observations of empirical regularities, theoretical concepts, or established facts about human psychology? *What* are the Endowment Effect and Loss Aversion, really?[13]

SOME PROBLEMS WITH THE ENDOWMENT EFFECT

Elaborating on the notions derived from the experiments reported above and from the literature, one could note that the collective outcome achieved by a number of traders, of which some are randomly endowed with some goods, can be expected to result in a [1.] lower than optimal number of trades. This phenomenon, both observed in a variety of experiments and significant in its own right from an economic theoretical standpoint, does not have a name. All we know is that it constitutes an anomaly because it goes against the predictions of the Coase Theorem. We also know that it is often associated with the Endowment Effect and it may sometimes be confused with it. But the Endowment Effect usually refers to [2.] the disparity between the demand price and the supply price for a given good (Thaler 1980). Quite obviously, however, [1.] and [2.] are not the same observations. To make the problem thornier, the Endowment Effect has also been interpreted as [3.] a difference in value attribution or as [4.] a form of "reluctance to trade" (Novemsky & Kahneman 2005a, p. 119).[14] The nature of all these definitions is diverse: [1.] and [2.] are observed empirical regularities, but the others are hypotheses about human psychology. Obviously we should avoid calling different things with the same name, otherwise, when someone uses that name, it is not clear what she is talking about.

The relationship among these concepts is not straightforward. Perhaps [1.] – [4.] are causally connected in such a way that some of these are responsible for some other. The case can be plausibly advanced by saying, for instance, that [3.] a difference in value attribution explains [2.] the disparity between buying and selling prices; this in turn

[13] Though on the present occasion we shall focus mostly on Endowment Effect and Loss Aversion because these are the most commonly employed concepts and those for which clarification would be most important, most of our argument can easily be extended to Status Quo Bias as well.
[14] But couldn't also the Status Quo Bias be characterised as a difference in value attribution or as a reluctance to trade?

provokes [4.] a reluctance to trade, which results into [1.] a lower than optimal number of trades. If they are indeed strictly connected, one may be excused for the simplification of calling each of these distinct observations and hypotheses with the same name, while in fact referring to all of them or to some element in the causal chain just reconstructed. One could thus say that [3.] causes [1.] in a way similar to saying that pressing the button makes lights and sounds come out of a TV set, disregarding all the intermediate physical and chemical processes that make it work. Here we are mixing observable empirical events and unobservable mental states, and these are connected, too, as in: someone turns the TV on (by means of pressing the button, etc.) because she wants to know what is news. Yet, it is a mistake to merge distinct concepts like turning on the TV with the interest in the news unless these phenomena are co-extensive or, in other words, unless they must manifest themselves together, so that when one is present, the others are always present as well.

The confusion becomes especially problematic when different concepts are treated as synonyms, so that reluctance to trade and a gap between buying and selling prices become interchangeable. If we use the same name for various stadia or elements of a phenomenon and the same name for distinct phenomena, especially when these are not completely understood, we pave the road for a bunch of problems. For instance, the definitions of Endowment Effect above are not co-extensive because it is possible to imagine a trade in which a lower than optimal number of trades is or is not accompanied by a difference in subjective valuations of goods.[15] It is also possible to imagine reluctance to trade accompanied or not by a gap between buying and selling prices.[16] To call both cases of few observed trades or both forms of unwillingness with the same name would be problematic: it would be like calling 'turn on the TV' every pressing of a button, including those buttons that open doors, call elevators, or terminate phone calls. This confusion reflects the presently insufficient understanding even of concepts usually hailed as milestones and should also serve as a warning that advancing our understanding requires greater clarity: nobody thinks that 'the TV is on' demonstrates that 'people want to know what is news', but it has been common to invoke the existence of the Endowment Effect as proof that economic agents are Loss Averse.

Finally, if indeed Behavioural Economics improves economics by, among other things, "suggesting better policies" (Camerer & Loewenstein 2004, p. 3), we should be especially wary of equating, say, 'want to know what is news' and 'terminate phone calls'. The reader can easily speculate on what kind of policies may originate in such imprecision. In the lights of a quickly growing emphasis on policy advice, especially from the field of Behavioural Law

[15] E.g. both the owner and the prospective buyer of an autographed copy of *The Handbook of Behavioural Economics* may value it at some price X, but the current owner will not sell it at X if she (incorrectly) believes that it is worth 3X to the buyer.
[16] The pen with which a writer signed his first contract may be worth an incredibly high price both to himself and to a fanatic collector, yet the writer may not want to sell.

and Economics (e.g. Jolls et al. 1998, Sunstein 2000), it is therefore both urgent and important to better understand these concepts.

THE NATURE AND ORIGIN OF THE ENDOWMENT EFFECT AND LOSS AVERSION

The Endowment Effect (as in [1.] and [2.]) is a stylized fact, which may be observed in a variety of repetitions. But there have also been experiments that failed to replicate the usual findings (e.g. Singh 1991, Ortona & Scacciati 1992, Bateman et al. 1997, Plott & Zeiler 2005, Gal 2006) and suggestions that observations compatible with the Endowment Effect require more scrutiny before being submitted to as verified.[17] At any rate, even if they were regarded as confirmed empirical findings, the nature and the origin of Loss Aversion and of the Endowment Effect would benefit greatly from increased clarity. Above we proposed a plausible story going from [3.] the difference in values to [1.] the little number of exchanges. But this does not resemble the solution of a riddle: instead, a difference in the values attributed to identical goods by owners and non-owners is a riddle in its own right.

The prevailing account in Behavioural Economics maintains that the valuation gap is a consequence of Loss Aversion. Just like other properties of preferences, however, Loss Aversion is not an empirical finding because it cannot be directly observed and must instead be inferred from related empirical observations. Though some forerunners have already tried to uncover Loss Aversion's micro-foundations (Bar-Hillel & Neter 1996, Carmon & Ariely 2000), a better understanding of these concepts remains unaccomplished and some of the leading figures in the field are recently turning their attention to this question (Camerer 2005, Novemsky & Kahneman 2005a, Johnson et al. 2006).

Camerer (2005) suggests that an agent may be loss-averse because he does not like to incur a (potential) cost or suffer a (potential) painful consequence from a decision, either when it is too high a cost or too severe a pain, or when they may be long lasting. Such preference for avoiding negative feelings would be both legitimate and sensible, and – if it were the actual preference of an agent – any decision following from it would be rationally made by the agent in question. Loss Aversion needs not be some fast track towards irrationality. If the cost or pain to be undergone is very small or temporary, however, avoiding it and thereby foregoing the (potential and potentially large) benefits of a decision is probably a mistake. This happens when "the brief transition of utility from one state to another is highly emotional, and even though brief, may prevent a good long-run action" (p. 132). He then proposes his intuition of Loss Aversion as "often an exaggerated emotional reaction of fear, an adapted response to the prospect of genuine, damaging, survival-threatening loss," but people "overreact to small losses in their long lives that are not truly life-threatening."

[17] We do not on this occasion enter the thorny methodological questions of what would be the requirements for the rigorous empirical verification of a phenomenon, nor whether that is possible at all, which most philosophy of science makes us inclined to deny.

Nathan Novemsky and Daniel Kahneman explore some limits of Loss Aversion and observe that it is not precisely ubiquitous. For one example, experienced traders are less subject to loss aversion even with very different goods from those they are used to handling and exchanging (e.g. List 2003, 2004). More generally, individual intentions are key in the determination of whether Loss Aversion manifests itself (Koszegi & Rabin 2004, reported in Novemsky & Kahneman 2005a, see also Ariely et al. 2005 and Novemsky & Kahneman 2005b). Agents may treat a good "as an object of exchange or as an object of consumption," and this determines "whether giving up that good is evaluated as a loss or as a foregone gain" (ibid., p. 127). The differential weighting of gains and losses in terms of subjective utility, therefore, is not enough to explain Endowment Effect, unless the source of loss/disutility is recognized as such by the agent. The subjective frame of an exchange is central in the emergence of Loss Aversion, and this may hinder any attempt at establishing it as a general feature of human psychology.

Eric Johnson, Simon Gächter, and Andreas Herrman (2006, p. 12), too, comment that considering Loss Aversion constant across people and attributes is an "oversimplification."[18] They further reject the interpretation of Loss Aversion as a trait, in the sense that if an agent has it, she will manifest it for a variety of (or all) attributes of an economic good (i.e. the attributes she considers important as well as those she deems not so). They also find little support for the hypothesis that Loss Aversion is a characteristic of some attributes, which would mean almost everybody manifest it for certain attributes (e.g. safety in a car), but not for others. Specifically, when an attribute is ranked 'important' it is indeed associated with Loss Aversion, but there is no clear indication of what happens to Loss Aversion when an attribute is 'hedonic,' nor there is a coherent list of important attributes. The best account of Loss Aversion seems to be the hypothesis that it is the "outcome of the way values are constructed" (p. 6), though the exact dynamics of value construction are still in part tentative (Slovic 1995). One candidate explanation for value creation is an account based on the interplay between memory, experience, and knowledge, which in fact is found significant in the experiment (Johnson et al. 2006, p. 16ff.).[19] According to this account, individuals valuate a good according to what they remember about the attributes of that and of similar goods and according to their personal knowledge and direct previous experience. Unfortunately hypotheses on this matter are by necessity investigated in a very indirect fashion: memory is investigated by means of age, which is then interpreted as a proxy for biological cognitive decay, with elderly people having less efficient memory. This seems a really coarse generalisation. Personal experience and knowledge, instead, are assessed through self-rating questionnaires and the methodological weaknesses of surveys are well known.

[18] At the time of our writing, this research is available only in the *IZA Discussion Papers* series, which "often represent preliminary work and are circulated to encourage discussion" and therefore "citation […] should account for its provisional character" (p. 2).
[19] Another account of value creation revolves around the role of affects and emotions but is not investigated (see previous note).

It is unfortunate that these papers discuss experimental evidence on the observed gaps between buying and selling prices and not the nature of individual preferences. These investigations do not really mark a departure from the uncritical acceptance of "loss aversion as both a description and an explanation of the phenomenon being studied" (Novemsky & Kahneman 2005a, p. 120), instead they seem to get along with it. By confusing Loss Aversion and Endowment Effect, the explanation becomes tautological: in order to explain the Endowment Effect, agents must have preferences that result in the Endowment Effect, call them Loss Averse. In order to prove that agents have these Loss Averse preferences, they have to bring about the Endowment Effect.

Ulrich Schmidt and Stefan Traub (2002) observe that the reason why Loss Aversion has never been directly tested may be that it has been developed as an element within the PT framework, which is a descriptive theory.[20] Loss Aversion therefore is but one plausible explanation of several empirically observed phenomena or, more simply, a hypothesis. Before claiming the status of psychological fact for Loss Aversion, one would feel safer in temporarily counting it as a theoretical concept to be submitted to more extensive testing. It is true that several findings have suggested the adequacy of Loss Aversion to explain several empirical observations, but there may still exist evidence that is in conflict with the predictions that must follow from Loss Aversion or, more modestly, evidence that cannot be made compatible with it.

SOME PROBLEMS WITH LOSS AVERSION

There are indeed situations in which one does not observe Loss Aversion and for which it is not easy to make a Loss Averse prediction. For one instance, one ought to predict that all gambling venues shall close down any time, because Loss Averse citizens who refuse fair bets must abhor bets that are unfair to their disadvantage. Gambling, nonetheless, is a flourishing industry. For another instance, one ought to predict that everybody refuse to give four ¢25 coins in exchange for a $1 bill, because the loss of $1 counts twice as much as the simultaneous $1 gain. Coins and bills, however, are commonly exchanged on the basis of a fixed evaluation, regardless of who gives and takes them. There are several other situations in which Loss Aversion does not occur or in which its parameters are altered. In their recent paper, Novemsky and Kahneman (2005a, p. 120) review findings from previous investigations showing, for instance, that "the endowment effect is reduced when the endowed and unendowed items are similar," that "a shorter duration of ownership decreases loss aversion," that "the availability of expendable resources mitigates loss aversion," that "focusing buyers on benefits of the object and sellers on alternative uses of money attenuates the endowment effect,"

[20] Schmidt and Traub also note (2002, p. 234) that Loss Aversion "has not been defined in terms of preferences initially but as a property of the utility representation" by means of a value function steeper in the losses than in the gains region. This is also because PT, qua descriptive, lacked an axiomatic foundation.

that "exchange goods of fixed value show no loss aversion," and that "people who experience disgust do not show the endowment effect."

These warnings, however, may not only draw the borders of Loss Aversion, but also falsify its general significance. A large body of evidence has been gathered to reject the behavioural foundations of neoclassical economics, by showing that the types of preferences it presumes are not (and perhaps cannot be) found. Mainstream economists thus backed to a weaker position, claiming that actual economic agents behave 'as if' they possessed those preferences. One could expect the same for human agents with Loss Averse preferences: a sound, but modest claim would be that real world economic agents behave 'as if' they were Loss Averse on some occasions, but obviously not all.

Another problem we identify in the quoted excerpts (which we report in the same order as they appear in the original and which appear within a single paragraph) is how Endowment Effect and Loss Aversion are treated as synonyms, to be alternated at will, possibly for stylistic reasons, and which do not identify distinct concepts. But they should: Endowment Effect and Loss Aversion do differ both conceptually and in their nature – the former being either an empirical phenomenon or a mental state, the latter being a property of individual preferences. Such confusion is one major aspect of the problems we lamented above. David Gal (2006, p. 24, emphasis added) seems therefore justified in his complaint.

> Remarkably for a principle that is so pervasive, the principle of loss aversion is not derived from any theory of behaviour or more basic psychological principles, but it is an ad hoc principle introduced to account for a range of phenomena involving tradeoffs between losses and gains that are anomalous in the context of the classical choice paradigm. The absence of an accepted psychological account for loss aversion has led to a paradoxical situation: *loss aversion is cited as the explanation for phenomena associated with loss/gain (e.g. the endowment effect, status-quo bias, risky bet premium) and, circuitously, the same phenomena are cited as evidence for the existence of loss aversion*.

Truth be told, elaborating on the axiomatic definition of Loss Aversion in terms of a preference condition elaborated by Peter Wakker and Tversky (1993), Schmidt and Traub (2002) conducted and experiment that directly tests the existence of Loss Aversion and not some derivative phenomenon. They conclude that the importance of Loss Aversion "should be taken with some caution" (ibid., p. 244). They show that Loss Aversion can be observed at the aggregate level thanks to the fact that people who are Loss Averse are very much so, and not thanks to its high frequency. Indeed they classify only 15 out of 45 participants as being Loss Averse.

Waiting for superior explanations for the observed anomalies, one could still regard Loss Aversion and the Endowment Effect as precious theoretical resources, while being aware of their limits, just like one could decisively employ homo economicus to account, if not for all, for quite a number of economic problems. But some alternative

explanations have been proposed: in fact, the riddles at hand have proved so challenging and fascinating that they attracted literally tens of explanations.[21]

The simplest account would be that the allegedly biased behaviour actually reflects genuine (conservative) meta-preferences to favour whatever there is above whatever there would happen to be instead if they chose otherwise, and it may even be possible to characterise these meta-preferences as a form of risk aversion. On the other hand, the experimental setup may produce income or substitution effects. The attempt has also been made at explaining the Endowment Effect as a greater desire for one's property than that of one's neighbour which humans have learned in the course of evolution, because this reduces conflicts (Carmichael and MacLeod 2006), or as a form of respect for private property when there are no legal institutions to guarantee third-party contract enforcement (Gintis 2007).

Though some explanations have been sketched on rational or on evolutionary grounds, most accounts invoke some degree of bounded rationality either as individual mistakes or as incomplete information. Therefore, perhaps the Endowment Effect is the result of the mistaken application of some sensible bargaining rules, namely overstate the minimum acceptable price and understate one's willingness to pay in the attempt to buy low and sell high (Knez, Smith, & Williams 1985). With sufficient experience, however, participants seem to learn and the effect may be diminished (Coursey, Hovis, & Schultze 1987), though it does not disappear altogether (Knetsch & Sinden 1987). Charles Plott and Kathryn Zeiler (2005) propose that subjects' misconceptions of the experimental situation explain the Endowment Effect because by using all the procedures known in the literature to avoid ambiguity (i.e. anonymity, incentive-compatible elicitation, practice, training, and binding outcome experience) they effectively 'turn off' the price gap.

On the other hand, it is perhaps not mistakes that account for the Endowment Effect, but uncertainty. An imperfectly informed trader who believes her co-trader has more information than she must expect the better-informed co-trader to only agree to exchanges he benefits from. In reaction, she incorporates the information-gap into the prices at which she is willing to buy or sell goods. In this way the Endowment Effect can be explained rational choice (Dupont and Lee 2002) or with regret-avoidance (Inder and O'Brien 2003). Rankin (1990) suggests instead that individuals compare the consequences of every action as in Regret Theory (e.g. Loomes and Sugden 1982) and each is compared to the reference point as in PT. For any end state worse than the starting point, individuals feel increased regret, while 'rejoicing' is assumed to be zero. Alternatively to regret, Gerrit Roth (2004) argues that a sort of 'aversion to risk changes' exists for any deviation from the reference point.

Because the phenomena attributed to Loss Aversion are also characterised by a trade-off between the status quo and change, it is possible that a theory that targets departures from the reference point suffice to explain them. If

[21] An complete review, an extensive examination, and the assessment of the relative merits of alternative explanations is beyond the scope of this paper. See also Hoffman and Spitzer (1993).

individual behaviour is motive-driven and individual preferences are ill defined, the combination of these two "basic, well-founded psychological principles" (Gal 2006, p. 24) implies that people tend to inertia.[22] Gal (p. 25) advocates a 'Psychological Law of Inertia', according to which "[a] person will tend to maintain the status-quo unless impelled to alter the status-quo by a psychological motive to do so." The 'Corollary' further refines the prediction of individual behaviour as it foresees that "[t]he possibility of becoming better off – but not equally as well off – can provide the necessary motive to impel a person to alter the status-quo." Gal corroborates Psychological Inertia with two experiments in which nearly 80% of the subjects are willing to accept a fair bet: "a finding which challenges the most basic prediction of loss aversion (i.e. that people are unwilling to accept even bets)".[23]

At the current state of the debate, we are inclined to agree with Schmidt and Traub (2002, p. 247) that some competing explanations, both those of psychological inspiration and those in line with standard theory, probably "play a role as well and, therefore, should not be disregarded."

TAKING STOCK OF BEHAVIOURAL ECONOMICS

Born in sharp contrast with neoclassical economics, after the early attempts at dismissing the mainstream (and presumably taking its place), Behavioural Economics is now claiming a position within its ranks. In the light of the problems mentioned above, we doubt that the ranks should be opened without questions.

We do not mean to equate Behavioural Economics with Prospect Theory (though they largely overlap), nor Prospect Theory with Loss Aversion (though it somewhat hinges on it). To do so would be both an excessive simplification and a mistake we cannot be excused for, after having complained against imprecision. Our discussion, we believe, is limited, but emblematic of Behavioural Economics at large: we chose to focus on PT because it is, by several accounts, the most successful portion of Behavioural Economics and on Loss Aversion and the Endowment Effect because they are generally regarded as a milestone achievements.[24]

For instance, Camerer (1994, p. 158, emphasis suppressed) reports that "[l]oss aversion can explain the extra return on stocks compared with bonds (the equity premium), the tendency of cab drivers to work longer hours on low-

[22] However, contra Gal, the fact that behaviour is motive-driven does not exclude the possibility for some actions to be caused by "unintended motivation" (e.g. Bargh and Barndollar 1996).
[23] Note that Psychological Inertia only replaces Loss Aversion and not all of PT.
[24] We believe other areas of Behavioural Economics offer the grounds for compelling investigations of this kind. One example is the relationship between 'Overconfidence' and 'Herding.' In a survey, 90% of the interviewed described themselves as above-average drivers and in another survey 68% of the lawyers believed their side would win the case, while obviously only 50% can win a trial and slightly below that figure can be above-average drivers. These are some data showing that people are overconfident about themselves. Conversely, they seem to be persuaded that others know better. For instance, from 1984 to 1995 the average bond mutual fund paid returns of 9.7% a year, while the average stock mutual fund paid returns of 12.3% a year. During the same period the average investor in bond mutual funds earned 8% a year, while the average investor in stock mutual funds earned 6.3%. This happened because most people follow the crowd and buy the fund when it is publicly acclaimed for having performed well (but when it already has), but then they sell it when it is censured for having performed poorly (again when it is too late). This way they buy high and sell low: precisely the opposite of what makes one rich in the financial markets. Can both overconfidence and herding simultaneously be true facts about individual psychology? This would require many qualifications – to be proposed after profound investigations – which are still lacking and which we wish for.

wage days, asymmetries in consumer reactions to price increases and decreases, the insensitivity of consumption to bad news about income, and status quo and endowment effects." That Loss Aversion exists (but does it?) does not mean it has to be universal, and that it satisfactorily explains (but does it?) some phenomena does not mean that it has to explain the Endowment Effect. Perhaps human preferences are Loss Averse with respect to some goods (or features of goods) for which value elicitation has some properties (to be investigated), and these can or cannot generate an Endowment Effect (depending on some other factors that need be investigated). On the other hand, the Endowment Effect may arise also in conjunction with the trading of goods for which agents' preferences are not Loss Averse, and it would therefore have to be explained otherwise. Instead, virtually all economists seem to tacitly share the belief that agents should be portrayed, in some important respects, as being all alike, and that our task is to unearth the ultimate principle of human nature – what may be called a 'will to generalisation.' Humans, however, are much less homogeneous than it is apparently hoped for. Many of the experiments mentioned above can be indeed interpreted as evidence that human behaviour reveals large individual differences and is essentially idiosyncratic.

It is true that theoretical unification (economists' parsimony), or the development of a theory capable of accounting for a large set of phenomena, has been often regarded as a desirable achievement in the history of scientific knowledge. The aim seems to be – as it were – explanatory efficiency: to explain a maximum of facts and regularities by recurring to a minimum of theoretical concepts and assumptions. This goal follows from the belief that various phenomena may be the manifestation of common underlying structures and that exposing such basic principles would empower us with a better explanation, which might lead us "closer to true knowledge:" realisticness, once again (Sappinen 2003, p. 71; Friedman 1974; see Mäki 2001c for critical discussion). This is what we observe with rational choice theory, which is proclaimed "applicable to all human behaviour" (Becker 1976, p. 8) because "all human behaviour can be viewed as involving participants who maximise their utility from a stable set of preferences and accumulate an optimal amount of information and other inputs in a variety of markets." It surely can be *viewed* that way, but we are suspicious that this view may lead us closer to the truth or that it always help us understand why and how people behave as they do. Nonetheless it seems to us that fluctuations in international commodity prices are presently best explained with self-interested rational agents making the most out of scarce resources and we doubt that their being or not Loss Averse makes a noticeable difference. The same way, maybe the Endowment Effect is best explained with Loss Aversion on some occasions or maybe Loss Aversion would be better employed for explaining other phenomena. It should not be a cause of embarrassment for a theory to be apt for explaining some economic phenomena, but not all.

We believe that Loss Aversion should indeed be celebrated as a very important finding, but this should depend on how it is employed. Therefore an evaluation of the status it is assigned and the type of tasks it is invoked to accomplish ultimately permits an assessment both of the absolute merits of Behavioural Economics and of its standing relative to neoclassical economics.

What is Loss Aversion: a psychological regularity, so that people *are* Loss Averse, or an *ad hoc* theoretical concept, so that some people behave as if they were Loss Aversion some of the time? If we regard Loss Aversion as a psychological regularity, we must discount it against challenging counterevidence that falsifies it. There is, however, no need to fall that far back. Even the evidence gathered in experiments in which the Endowment Effect does not appear or that Loss Aversion does not show may not unavoidably proclaim the utter refusal of Loss Aversion as psychologically sound. It may, however, require a deeper understanding of its underpinnings. Perhaps Loss Aversion is a tendency, that may be overridden under certain circumstances, perhaps it is not a feature of individual preferences proper, but the outcome of (the interaction among) several lower-level psychological events. Loss Aversion could represent an intermediate step that results or not in a higher-level empirical observation depending on other phenomena that affect its founding elements. One can then reconstruct a chain of causal connections providing a plausible account of how they are caused by the lower-level phenomenon and how they cause the higher-level one.

At any rate, a warning is in order that ever-deeper psychological investigations could perhaps not produce more realistic explanations, but simply make these explanations more elaborate and burdensome. Think of the attempt to explain the results of Presidential polls starting from the insights of the neurochemistry of human brain cells: challenging, inspiring, fascinating, but how speculative would that need to be? We are not saying that an extensive understanding of several interconnected phenomena should not be welcomed, but that it is not the size or the scope of a theory that should earn its reputation nor establish its elements as truthful. To honour Loss Aversion as an established general property of human psychology, we turn a blind eye on the evidence that two thirds of the people do not have it.

For these reasons, investigations such as those recently being carried and mentioned above seem especially necessary and praiseworthy: we need to dig out the origins of Loss Aversion. Does it have an emotional origin, does it express genuine preferences, or does it simply reflect a judgement failure? And, more importantly, can it be made compatible with some account of individual rationality? To say that people are Loss Averse because that is a property of their preferences seems an account that can be accommodated within the neoclassical framework. Not so, the account that Loss Aversion is "an exaggerated emotional fear reaction" (Camerer 2005, p. 132). The more modest claim that Loss Aversion is an 'as if'-like construct may be easier to defend, at least temporarily and until a more thorough exploration of its underpinnings dispels some legitimate doubts, and it still saves its great theoretical usefulness. This

quite plausible interpretation, on the other hand, raises the question of whether the Behavioural enterprise adds anything in terms of realisticness to mainstream economics.

Although it has been suggested (Angner & Lowenstein 2007, Hansen 2006) that it is not necessary to invoke the problematic philosophical issue of realisticness as a defining element of Behavioural Economics, it is quite obviously among its top goals (Rabin 2002, Camerer & Lowenstein 2004). Matthew Rabin (2002, p.), for instance, recognizes as "the underlying premise of this movement" the idea that "*ceteris paribus*, the more realistic our assumptions about economic actors, the better our economics" and he prescribes that "economists should aspire to making our assumptions about humans as psychologically realistic as possible."[25] We discussed above how the unrealisticness of neoclassical economics is not necessarily the root of all evil, but we intuitively agree with behavioural economists that many of the problems mainstream economics has been charged with can be solved by means of increased realisticness. We find it regrettable, however, that they remain silent on what counts as realistic or as more realistic and on why should we strive to achieve it. Perhaps they have in mind something like the following.

Realisticness is not merely a matter of personal taste or of technical opportunity to address some practical questions: it serves certain explanatory functions in its own right. Richard Langlois and László Csontos (1993) comment that the assumptions of economic theory should meet a requirement of mapping onto the real world to the minimal extent of being understandable to other human beings. Realisticness in this sense evokes Max Weber's notion of *Verstehen*, which refers to "understanding from within by means of intuition and empathy, as opposed to knowledge from without by means of observation and calculation" (Blaug 1980, p. 43; Machlup 1955). This would result in the requirement for economic theory to be realistic qua understandable through introspection. Entirely abstract 'as if's' may help accomplishing certain tasks, but they may not be all a theory needs. "Only when behavioural postulates make the world more intelligible to us do they go beyond their role as purely instrumental elements in the explanatory process; only then do they 'explain' in a sense richer than that in which simple empirical generalisations explain" (Langlois & Csontos 1993, p. 116). As the philosopher of science Wesley Salmon (1984, p. 133) put it, "[t]o understand the world and what goes on in it, we must expose its inner workings. To the extent that causal mechanisms operate, they explain how the world works. Therefore causal questions (why?) are dependent on descriptive questions (how?). In Salmon's words (ibid., p. 132) "[c]ausal processes, causal interactions, and causal laws provide the mechanisms by which the world works: to understand *why* certain things happen, we need to see *how* they are produced by these mechanisms." One may thus conclude that "[t]here is a sense in which adequate explanations *are* adequate descriptions of the goings-

[25] The use of psychology, in itself, is obviously neither guarantee of realisticness nor of better economics (Rabin 2002).

on in the world" (Mäki 2001b, p. 372). Descriptive accuracy at the individual level, however, seems to us to require a critical departure from several assumptions of the mainstream.

Nonetheless neoclassical theory remains a normative benchmark against which Behavioural Economists measure behavioural deviations and from which they find inspiration for null hypotheses to be submitted to testing, also the methods and techniques employed are in some measure derived from the toolbox of the mainstream. In other words, Behavioural Economics strives to become good mainstream economics: 'mainstream' in that its models often "modify one or two assumptions in the standard theory […] that are not central to the economic approach" (Camerer & Loewenstein 2004, p. 3); and 'good' in that it pursues realisticness and it "increases the explanatory power of economics by providing it with more realistic psychological foundations."[26] We have already commented on realisticness. Let us now discuss whether Behavioural Economics is mainstream.

Though the goal of Richard Thaler's (1992, p. 5) early collection of Behavioural Economics essays was to reveal anomalies and paradoxes normal science is ill suited to account for, which is the first step towards switching paradigm (*à la* Kuhn, 1962), this view has allegedly been abandoned. Camerer and Loewenstein (2004, p. 42) stress their ambition to establish Behavioural Economics as "a school of thought or a style of modelling" within the mainstream, and Rabin (2002, p.) emphasises that Behavioural Economics "is based not on a proposed paradigm shift in the basic approach of our field, but rather is a natural broadening of the field of economics." Indeed, he underlines, it is "built on the premise that not only mainstream economics *methods* are great, but so too are most mainstream economic *assumptions*" (p. 659).

Yet, this is hardly a point. Behavioural Economics evidently rests on the belief that psychology methods and assumptions are as great as, or greater than, those of economics. Does this make it mainstream psychology as well? Appreciation is no membership: for example, feminist economics (Nelson 1996), Buddhist economics (Schumacher 1973), and the historical school of economics – though they hold (or held, in the latter case) in high esteem gender studies, Buddhism, and history and sociology – have not been integrated in the mainstream of these other disciplines.

The issue could be seen best the other way around: do mainstream economists think behavioural assumptions and methods great? So far, they haven't. Rabin believes that the objections raised against Behavioural assumptions are flawed, and maybe he is right. But Rabin's take is not very soft. Every account of individual behaviour presumes that individuals have goals, desires or preferences; that they hold beliefs about the choice environment; and that, given the latter, they pursue the former according to some decision-making procedure. Rabin (1998, 2002) declares that economics' assumptions about goals, beliefs, and decision-making are great, but then he casually dismisses each as

[26] One common strategy to salvage mainstream economics is to treat it as a special case of behavioural theories (Angner & Loewenstein 2007).

inadequate. In a joint paper with Thaler (Rabin & Thaler 2001, p. 230), besides calling SEU "a dead parrot" and an "ex-hypothesis," he expresses his disagreement with those who had dismissed Tversky and Kahneman's "devastating […] demonstrations." How can one side with the devastators and feel as one with the devastated?

Moreover, when it comes to the methods, one cannot forget that a large part of Behavioural Economics is based on the observation of verbal behaviour in the form of choices among verbally described, fictitious alternatives, without any practical consequence for the subject, which economists have an easy time ridiculing on methodological grounds. Some daring new evidence is retrieved observing the behaviour of trained animals, on whose rationality we decline to comment, and from functional neuroimaging techniques that are methodologically very weak.[27] Indeed, the very experimental basis of Behavioural Economics may still be cause of suspicion among some neoclassicals.

Behavioural Economics can therefore be interpreted to (possibly) mark a minor improvement over standard microeconomics with respect to realisticness, but a major deviation with respect to methods and assumptions. This would effectively classify Behavioural Economics as heterodoxy (whence it came). Perhaps this would be a problem for the many behavioural economists who nowadays market themselves as contributors to the mainstream, but we mean it neither as a flaw nor as cause of embarrassment.

We do not wish that some enlightened methodologists started handing down the rules of the trade to economics practitioners.[28] We agree with Rabin (2002, p., emphasis in the original) that economists should spend time on "the nitty gritty of the phenomena being studied" instead of "<methodological>" issues. And we also agree that consensus among the practitioners is an important basis on which to assess the contribution of some innovative approach or method. But we do not believe it is the only basis. We doubt, therefore, that "[b]ecause this approach is clearly gaining acceptance, [methodological essays] should soon become anachronistic" (Rabin 2002, p.). (Need we remind that eugenics research had gained broad acceptance in its own time?) Instead, precisely because it is becoming increasingly influential and its normative proposals are turning into policies (Camerer et al. 2003, Thaler & Sunstein 2003), we hope a close methodological scrutiny over Behavioural Economics will be increased and not diminished in the future.

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[27] Functional neuroimaging consists in scanning a subject's brain several times and then making a so-called statistical parametric mapping to analyse differences in brain activity recorded over a period of time. During this period of time the subject is given some experimental treatment(s), so that it is possible to estimate which areas of the subject's brain became involved with the experimental task. Because of the huge costs involved, the subjects' sample is typically tiny.

[28] In principle, however, if the division of labour means anything, perhaps methodologists could be of some help.

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