What have we learnt about Loss Aversion and Endowment Effects?
Still an anomaly?

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Abstract

This paper presents an insight into the theoretical and empirical literature of Loss Aversion and Endowment Effect. The definition and conceptualisation of both ideas is introduced in order to define a framework for further analysis. Their presence implies a radical change in some of the basic standard postulates of microeconomic foundation. These concepts robustly predict a divergence between Willingness to Accept and Willingness to Pay, even in a perfect-market framework and invalidate the standard assumptions of transitivity and reversibility of preferences under the neoclassical theory of consumer choice. Twenty years of successive positive evidence on Loss Aversion and Endowment Effect support the theoretical implications showed in this paper. I conclude that Loss Aversion and Endowment Effects truly matter and their existence must not be taken into account just as an anomaly or puzzle, but as part of a new theory in itself, leading to new questions and challenges for future economic research.

What have we learnt about Loss Aversion and Endowment Effects? Still an Anomaly?

"If economists want their propositions to qualify as science, and if they wish not to be vulnerable to attack, then they must reformulate their theories so that they say something about 'how people do in fact behave'." [Hutchison 1938, p.134]

Introduction

Since the 19th century, a long tradition of criticism of the rationality assumptions in economics has existed. In the last twenty years, cognitive psychologists and experimental economists have been testing rationality assumptions and found that even relatively simple implications were refuted. A growing body of research, called Behavioural Economics, is currently seeking to develop alternative theories, which meet the empirical evidence and explain many aspects of economic behaviour. Most economists are sceptical about this approach, arguing that psychological discoveries in human behaviour are only curiosities of life but they do not affect our economic-world modelling (according to "the parsimony principle"). Nevertheless, the assumption that a rationalistic model of human decision-making (*homo economicus*) explains economic behaviour seems even less convincing.

In this paper I shall address one of the best-known "anomalies" studied in the literature of behavioural economics: Loss Aversion (LA) and Endowment Effect (EF). I will assess their possible significance for economic theory by answering to some key questions: are endowment effects relevant to economics? What could be the possible implications of their existence? Which are some of the most significant issues to rise in a reconsideration of microeconomic theory based on these new ideas? According to this purpose, I will present some of the main implications of LA and EF and illustrate the changes to some basic standard postulates of the microeconomic foundation that these entail. A particular attention will be devoted to the explanation of the disparities between Willingness to Accept (WTA) and Willingness to Pay (WTP) by means of LA and EF. This analysis will allow me to show the importance of Loss Aversion for economics and the numerous and interrelated implications, which need to be taken into consideration, once it

is introduced. On the basis of my preliminary answers and of the analysis of past empirical evidence in the literature, I will sustain that these concepts should be no longer regarded as an anomaly but rather taken seriously into account as a starting point for the development of a new and more appropriate microeconomic paradigm.

The paper is organized as follows. Section 1 introduces the definition and conceptualisation of LA and EF in economic theory, in order to set the framework for further analysis. Section 2 presents some of the main theoretical implications of LA and EF. A selective review of the extensive evidence on the existence of LA and EF, provided by the experimental economics literature, is conducted in Section 3. Section 4 concludes and offers suggestions for further research.

Section 1 - Definition and conceptualisation of Loss Aversion and Endowment Effect

1.1. Definition

In conventional consumer theory each individual's choices are determined by a preference ordering over consumption bundles; this ordering is independent of the individual's endowment. However, Kahneman and Tversky's (1991) general theory of reference-dependent preferences showed that preferences are conditioned on current endowments, and that individuals are typically "loss averse". This notion contradicts the conventional consumer theory's transitivity assumption and the reversibility of preferences. Thaler (1980) had already observed this pattern and dubbed "*endowment effect"* the fact that people often demand much more to give up an object than they would be willing to pay to acquire it. Samuelson and Zeckhauser (1988) also worked on this, dubbing "*the status quo effect*[1]*"* a preference for the current state that biases agent preference. All of these effects are manifestations of a value asymmetry that Kahneman and Tversky (1984) call *loss aversion* - the disutility of giving up an object is greater that the utility associated with acquiring it[2].

The notion of Loss Aversion arises from the insights given by Kahneman and Tversky's (1979) Prospect Theory[3], developed as an alternative theory of choice under uncertainty. As Kahneman and Tversky (1991) stated, "a central conclusion of this study has been that such choices are best explained by assuming that the significant carriers of utility are not states of wealth or welfare, but changes relative to a neutral reference point. Another central result is that changes that make things worse (losses) loom larger than improvements or gains. The choice implies an abrupt change of slope of the value function at the origin". [p. 199]

[1] Status Quo effect is one implication of Loss Aversion.
[2] It is important to distinguish Loss Aversion from Diminishing Marginal Utility (DMgU). Loss Aversion predicts that if we have 100 units of x, the reduction to 80 units will be considered a greater decrease in the utility than an increase in x from 80 to 100. However, DMgU implies that if we have 80 x and we increase it to 100, the change in the utility will be greater if we increase the same 20 units from 100 to 120.
[3] Prospect Theory is a critique of expected utility theory as a descriptive model of decision-making under risk.

The natural extension of this idea to riskless choice is that attributes of options in trades and other transactions are also evaluated as gains and losses relative to a neutral reference point. Intuitively, this can be illustrated and explained as follows[4]:

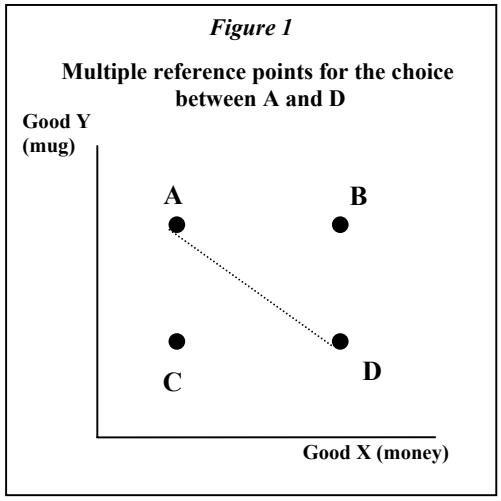


Figure 1 states the choice that a decision-maker has between state A, where she has more of good Y and less of good X, and state D, where she has more of good X and less of good Y. The figure also shows four reference points. The individual faces a positive choice between two gains if the reference point is C; a negative choice between two losses if the reference point is B, and two different exchanges if the references are A or D, respectively. To use the example seen in most experiments, if good Y is a mug and good X is money, the reference points for the sellers and the choosers in the mugs experiment are A and C respectively. Loss Aversion implies that the difference between the states of having a mug and not having one is larger from A than from C, which explains the different monetary values that subjects attach to the mug under these conditions.

In general, a given difference between two options will have greater impact if it is viewed as a difference between two disadvantages than if it is viewed as a difference between two advantages.

[4] This analysis is based on Kahneman, Knetsch and Thaler (1991, p.201)

To formalize this notion, Kahneman and Tversky (1991)[5] present a reference-dependent theory of consumer choice. KT explain the fact that the change of reference point leads to preference reversals by a deformation of indifference curves about the reference point.

In what follows, a basis for the reference-dependent model will be introduced, since it will facilitate further analysis of its implications.

1.2. The reference dependence model and Loss Aversion

In order to interpret the reversal of preference, KT follow the fashion of the classical theory of consumer choice, but introduce the assumption of reference dependence, while removing the implicit assumption of reference independence of standard theory alternative.

(i) A choice *set* $X = \{x, y, z...\}$ is defined in the R^+. Each option, $x = (x_1,x_2)$ in X, $x_1,x_2 \geq 0$, is interpreted as a bundle that offers x_1 units of good 1 and x_2 units of good 2, or as an activity characterised by its level on two value dimensions .

(ii) A *reference structure* is introduced as a family of indexed preference relations, where $x \geq_r y$ is interpreted as x is weakly preferred to y from reference state r. The relations $>_r$ and $=_r$ correspond to strict preference and indifference, respectively.

(iii) The standard assumptions of the classical theory about the preferences are maintained.[6] Specifically, each $\geq_r$, $r \in X$, is complete, transitive, and continuous; that is, $\{x: x \geq_r y\}$ and $\{x: y \geq_r x\}$ are closed for any y. Furthermore, each preference order is strictly monotonic in the sense that $x \geq_r y$ and $x \neq y$ imply that $x >_r y$. Under these assumptions, each $\geq_r$ can be represented by a strictly increasing continuous utility function U_r.

(iv) The individual choice is described by a family of indexed preference orders $\{\geq_r : r \in X\}$, rather than by a single preference order[7].

[5] Hereinafter referred to as KT.
[6] Except for the fact that preferences are not necessarily convex
[7] Note that r, s denote reference states and x, y denote options, although they are all elements of X.

(v) X is assumed to be a definite reference state[8] where the individual will evaluate between options.

(vi) A reference structure satisfies Loss Aversion (LA) if the following condition holds for all *x, y, r, s* in *X*.

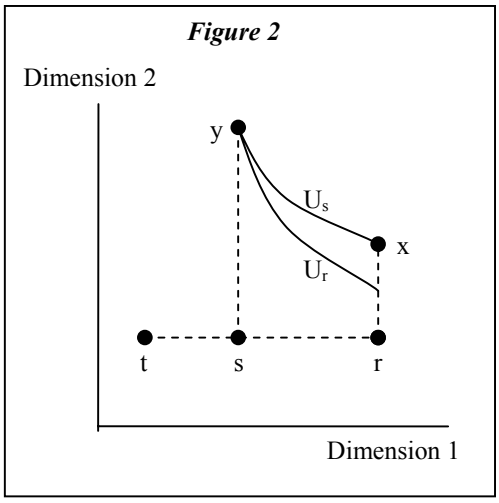
Supposing that:

$x_1 \geq r_1 > s_1 = y_1$

$y_2 > x_2$

$r_2 = s_2$ (see Figure 2, KT)

Figure 2



Then $x =_s y$ implies that $x >_r y$; the same holds if the subscripts 1 and 2 are interchanged throughout. (Note that the relations > and = refer to the numerical components of the options; whereas $>_r$ and $=_r$ refer to the preference between options in reference state *r*). Therefore, Loss Aversion implies that the slope of the indifference curve through *y* is steeper when *y* is evaluated from *r* than when it is evaluated from *s*. In other words, $U_r^*(y) > U_s^*(y)$, where $U_r^*(y)$ is the marginal rate of substitution of U_r at *y*.

[8] The reference state could be the decision maker's current position or his current aspirations, expectations, norms and social comparison.

Section 2- The significance of Loss Aversion for Economic Theory

Are Endowment Effects important for economic theory? What could the possible economic implications be if we assume their existence?

Once we have the basic framework of reference-dependent theory, we can consider the implications that a theory, which argues that the disutility of giving up an object is greater that the utility associated with acquiring it, could have. The most direct implication that might come to the reader's mind would be that this notion predicts the disparities between Willingness to Accept (WTA) and Willingness to Pay (WTP), thus entailing many other implications. This issue will be addressed in what follows.

2.1. The divergence between WTA and WTP

One of the most interesting features of this theory, among several, is that it offers a possible explanation of the frequently observed divergence between willingness-to-accept (WTA) and willingness-to-pay (WTP) valuations. Indeed, the Endowment Effect, together with the degree of substitution between goods (Hanemann, 1991), has produced a big debate in the literature as alternative explanations for this divergence.

Intuitively, it is simple to observe that if people's preferences depend on their reference position, their WTA will be different from their WTP, since both concepts imply the valuation of a good relative to its implicit property right. This right alters the reference endowment affecting preferences. In other words, if a consumer must pay for a good, since this good is not in her reference endowment, she values it as a gain. But if she has the right to get a compensation for giving it up, her reference endowment does now include this good and consequently, she values it as a loss. Therefore, loss aversion necessarily implies a divergence between WTA and WTP.

But what does standard neoclassical theory (in particular Hicksian theory) of consumer choice say about this disparity? Why is such an explanation necessary?

Tackling this analytically, we shall now briefly consider the way that both (theory of conventional consumer choice - Hicksian Theory - and reference-dependent) measure

WTA and WTP[9]. Changes in quantities (endowments) rather than in prices will be considered for this explanation, since they will easily allow us to comparatively observe the divergence in the measuring of WTA, WTP, Equivalent Variation (EV) and Compensating Variation (CV), of both approaches.

2.1.1. Change in welfare. The Hicksian approach

The neoclassical theory of consumer choice assumes that the individual has preferences over all nonnegative bundles of consumption goods: these preferences have the properties of transitivity, continuity, increasingness, and convexity, and can be represented by a utility function.

Given these preferences, a rational individual's behaviour can be thought of as a dual approach: either maximising her utility level, given a set of positive prices and a budget constraint (*constant income*) – achieving the *Marshallian demand* function - or taking a *utility level as given* (rather than income) and minimising the level of expenditure on goods needed to achieve this utility. In this case, the *Hicksian Demand* is achieved.

Since the *Hicksian Demand* assumes a constant utility level, it is more appropriate to use it when a measuring of utility changes is undertaken.[10] Utilising the *Hicksian Demand*, we can obtain the two measures of welfare change: CV and EV.

2.1.1.1. Compensating Variation (CV)

The compensating variation measures the net revenue of a planner who must **compensate** the consumer for the change in price [endowment] of a good she consumes, **after the change occurs**, bringing her back to her **original utility level**. Hence, the compensating variation is negative if the planner would have to pay the consumer a positive level of compensation because the price [endowment] change makes her **worse off**. (Mas-Colell, 1995, p. 82). For example, if the price rises or her initial endowment is **reduced**,

[9] I will base my analysis on Mas-Colell et al (1995), Bateman et al (1997), Randall and Stoll (1980) and Morrison (1997).

[9] If we want to evaluate changes in the welfare with the Marshalian Demand (change in consumer surplus), we should assume that the utility is quasilinear.

the CV would be the amount of money that the planner should **give** the individual to bring her back to her original utility level. Notice that since the CV has the effect opposite to the event in terms of its welfare consequences, the CV will be the WTP if the event betters the consumer's welfare or it will be the WTA if the event worsens the consumer's welfare.

2.1.1.2. Equivalent Variation (EV)

The equivalent variation can be thought as the amount of money which the consumer **would be indifferent** to accepting in lieu of the price [endowment] change; in other words, EV is the change in her wealth that would be **equivalent** to the price change in terms of its welfare impacts. (Mas-Colell, 1995, p. 82). Notice that this measure would leave the individual as if the event had occurred, but in fact **it does not occur**. It is measured by the final utility level (rather than using the initial utility level as in CV). In this case, since the EV has the same effect on the event in terms of its welfare consequences, the EV will be the WTA if the event betters the consumer's welfare or the WTP in case the event worsens the consumer's welfare.

2.1.1.3. A diagrammatic exposition of both (CV and EV)

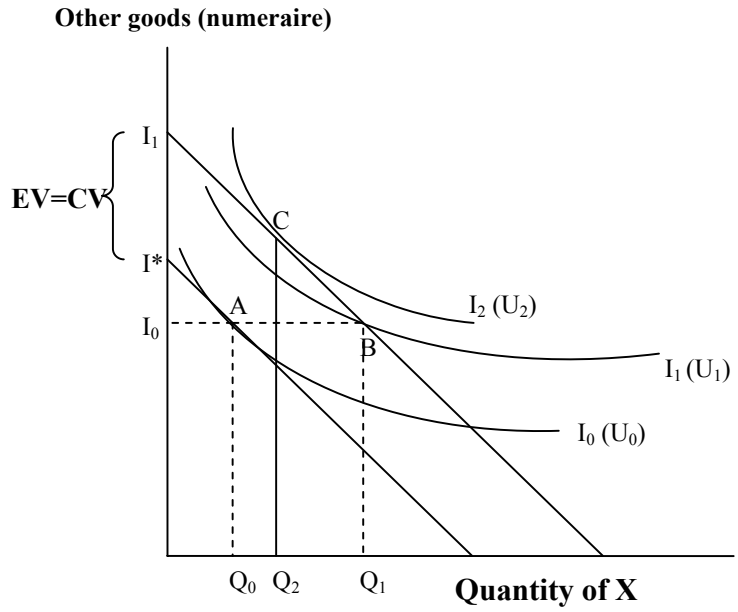
To get a better understanding for further discussion about the divergence of WTA and WTP, it is useful to separate the analysis into two extreme sub-cases:[11] a) when there is a market for the good[12] affected by the event; b) when there is no market for this good.

a) When there is a perfect market for the good on which the event occurs. (Figure 3)

Let us consider that the individual consumes Q_0 and I_0 in the initial condition (point A), where I* is her initial total income and she spends (I* - I_0) in Q_0. Now let us imagine an event that increases her endowment of good X from Q_0 to Q_1. Initially, the utility level would increase from U_0 to U_1, but the existence of a market will allow the individual to sell some quantity of the good (Q_1-Q_2) in order to maximise her utility level in U_2 (point C). How could we measure the change in the individual's welfare?

[11] This analysis is partially based on Randall and Stoll (1980) and Simonson (1997).
[12] The good should be perfectly divisible.

Figure 3 (perfect market exchange situation)



Returning to the concept of CV, we will recall that it is the additional amount of money that, in addition to the event, has to be given back in order to maintain the U_0 constant. If the amount (I_1-I_0) is taken away from the individual, she will go back to her initial situation. Therefore, the CV is the vertical subtraction of both budget constraints (VC=I_1-I*)

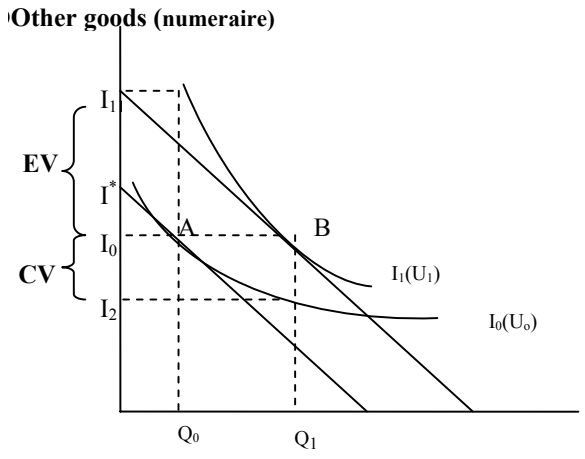
On the other hand, we also know that EV means the amount of money that substitute for the event. So, in this case, it would be the amount of income necessary to achieve utility level U_2, without increasing the endowment of good X (as happened in the event). Notice that if the individual receives an additional amount of money from I* to I_1, she will go to the market of good 2 and will achieve the U_2 in point C. Therefore EV=I_1-I*.

Consequently, we observe that if a perfect market exists for good X, CV must be equal to EV and in that case (being a positive event) CV=WTP and EV=WTA.[13] Thus, taking into account changes in quantities, it was shown that in the Hicksian framework, WTA is equal to WTP if there is a perfect market for good X. Of course, as Randall and Stoll (1980) conclude, "a good traded in an infinitely large market at a constant unit price with zero transaction cost, has all the characteristics of money." [p. 452]

b) When this good does not have a market (Figure 4)

Let assume the same initial condition as before (point A) and the same increment in the amount of X. However, in this case, there is no substitution in the market because this market does not exist. Therefore, the CV will be (I_0-I_2) since after the increase of X, the individual keeps the same level of utility (U_0). On the other hand, the EV will be (I_1-I_0), since with this additional amount of money (keeping X constant) the individual can get the same level of utility (U_1).

Figure 4 (non market situation)



[13] Willig (1976) shows that the difference between CV and EV is less than 5%. This difference depends on the relative importance of the good (income effect of the change) and on the variability of its income elasticity. Hanemann (1991) proves that if the goods are perfect substitutes, EV=CV, whereas in the case of a good without substitutes, the difference between EV and CV could be infinite.

2.1.2. Comparison between both approaches (Hicksian and Reference-dependent theory)

It was shown graphically how WTA, WTP, CV and EV are measured in the Hicksian framework when a change in endowments is made. The analysis was intentionally separated into two extreme sub-cases, with a market and without one, to implicitly observe how Loss Aversion would come up as a cause of WTA and WTP divergence. In fact, the subjectivity value the individual adds to the object given works as if there were no market for this object (at least at the price she is WTA to give it up), although there could exist a competitive market for this object. For instance, let us think of our first childhood toy as an example. This good does not have "substitutes" and furthermore, its use is not complementary to the use of other goods. Therefore, if we lose the toy, the consumption of the other goods will continue giving us the same level of utility as before the loss. In this case, although there could be an infinite market for it, our WTA to give it up tends to be infinite. This extreme case is easy to understand and maintain because this is a very special kind of good. However, the most impacting feature of LA is that it shows up instantaneously in experiments where all kinds of objects are used (mugs, pens, lottery tickets, trees, jugs, money), and all the conditions of a perfect market are set. Even in this context, and with goods that have a high level of substitution with other goods, the experiments reject the hypothesis of WTA=WTP.

Let us now see how this divergence of WTA and WTP can be showed graphically using the framework we just have seen of Reference-dependent theory.

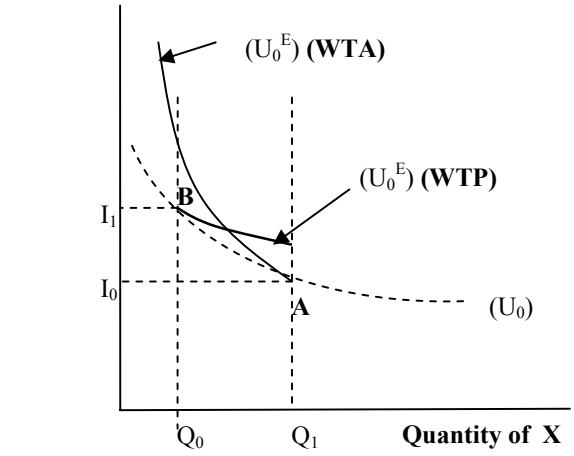
2.1.3. The WTA and WTP with Loss Aversion[14]

As Kahneman and Tversky (1979) hold, with Loss Aversion, alternatives are viewed in terms of gains or losses relative to the current endowment. This endowment effect can be illustrated (see figure 5) as a pivot on the indifference map, in the relevant range, from a reference point (the point of endowment) – a clockwise pivot from point A for WTA values and a counter clockwise pivot from point B for WTP. Two bundles

[14] The illustration was taken from Morrison (1997, p 237-238). See also Bateman et al (1997) for an in-depth demonstration and confirmation of Loss Aversion predictions.

yielding an individual the same utility level when she holds neither, yield different utility levels after the individual is endowed with one and presented with the opportunity of foregoing that endowment. This could explain how the different indifference maps suggested by Knestch and Sindem (1984) might come about.

Figure 5 (the endowment effect - WTA and WTP)



Referring to Figure 5, the dotted line, U_0, represents the *preendowed* utility an individual associates with bundles A and B – that is, it shows the utility level the individual would ascribe to bundles A and B before she has acquired either. If the individual is endowed with bundle A and asked how much she would be WTA to reduce her consumption from Q_1 to Q_0, her reluctance to give up something she holds is illustrated by the clockwise pivot of U_0 from reference point A, thereby placing point B on a lower indifference curve than point A. If on the other hand, she is endowed with bundle B and asked her WTP to increase her consumption from Q_0 to Q_1, then her reluctance to part with some of her money will effectively cause an counter clockwise pivot from reference point B, thereby putting bundle A on a lower indifference curve than bundle B. This realignment of preferences in relation to the initial endowment ultimately leads to the stated WTA exceeding WTP: WTA > $(I_1 - I_0)$ and WTP < $(I_1 - I_0)$. With this analysis, Morrison (1997) shows that the Endowment Effect is independent of the degree of substitution between goods.

The implications of this divergence are really enormous. As Knetsch and Sinden 1984, p. 14 says, "any sizeable difference between the two measures could lead to ambiguity in the assessment of losses and in judging the desirability of changes in policies of resource allocations […]. The disparity also seems to bring the normal easy presumption of reversible movements along indifference curves into question."

2.2. Other implications of Loss Aversion[15]

One of the first lessons in microeconomics is that two indifference curves can never intersect. Therefore, the rate of commodity substitution at a point on an indifference curve is the same for movements in either direction. This result depends on the implicit assumption that indifference curves are reversible. That is, if an individual owns *x* and is indifferent insofar as keeping it or trading it for *y*, then when owning *y* the individual should be indifferent about trading it for *x*. If Loss Aversion exists, however, this reversibility will no longer hold.[16] Knetsch (1989, p. 1277) sustains that, "the asymmetric evaluations of gains and losses imply that the presumed reversibility may not accurately reflect preferences and that people commonly make choices that differ depending on the direction of proposed trades." That presence of irreversibility would imply that fewer trades will be made than predicted by standard assumptions […] and suggest that common presumptions of the potential gains from trade may often be overstated." [Knetsch, 1989, p.1283]

Loss Aversion could also have implications for a firm. If WTA>WTP, that implies that firms will respond less to the incentives than what neoclassical theory predicts. The market could have problems to efficiently distribute resources, since optimal equilibrium depends on who initially has the property rights of the resources. In that sense, the Coase Theorem lost predictive power since LA breaks with one of its assumptions: "The valuation of the resources is independent of the property rights."

[15] As the scope of this essay is limited, the possible implications covered here are only a small fraction of all that might arise whenever basic general assumptions about individual behaviour are modified.
[16] Knetsch (1990) demonstrated this point.

Invalidating the Coase Theorem, Kahneman et al. (1990, p. 1339) argues: "…if the marginal rate of substitution between one good and another is affected by endowment, then the individual who is assigned the property right to a good will be more likely to retain it."

Likewise, LA could also imply greater supply elasticity to increases in prices than to decreases. That could be an innovative explanation for price rigidities, being a new alternative approach to be used by Neo-Keynesian economists.

Similarly, the existence of LA produces inertia in the economy because potential traders are more reluctant to trade than is conventionally assumed. This could be one of the causes of the real effect of changes in nominal variables, having vast implications for macroeconomic analysis.

Section 3 - Empirical evidence for the existence of Loss Aversion

If the implications are so essential, we must check if there is enough empirical evidence for the existence of Loss Aversion. All the debate in the literature to verify or reject its existence is centred on testing Loss Aversion as a significant cause of the divergence between WTA and WTP. Some economists, such us Hanemann (1991) and Shogren et. al. (1994) and others, argue that the explanation of this divergence is explained by the degree of substitution between goods, rejecting the existence of Loss Aversion. On the other hand, Knetsch (1989) and Kahneman, et al. (1990), and others, maintain that the principal explanation for the divergence between WTA and WTP comes from the Endowment Effect. To be objective, this section will show evidence for and against Loss Aversion.[17]

Before delving into this discussion, I would like to address a methodological consideration. Most of the evidence I shall consider has been obtained by researchers working in laboratories, using scientific methods. Some economists sternly reject this method as proof of evidence. However, and especially in what respects our interests now, if an experiment is successful, we can be surer of not rejecting the hypothesis of Loss Aversion, since if we can prove that - in the cold context of a "laboratory" - people instantaneously prefer keeping the object which was received a few minutes ago to selling it, we can positively assume that the same behaviour will take place in a more subjectivity-favourable context (e.g., when this individual has to sell his/her house). Therefore, the evidence given by a well-conducted experiment is considered proper here.

3.1. Evidence for Loss Aversion

Knetsch and Sinden (1984) conducted five experiments, randomly distributing lottery tickets of two colours among groups of students participating in each experiment. Each experiment offered a prize consisting of either merchandise vouchers for different amounts in each experiment, redeemable at a local variety store, or, at the winner's choice,

[17] There is much more evidence proving the existence of Loss Aversion, but this essay will only introduce the most renowned.

cash[18]. One-half of the participants were asked to pay $x to keep their ticket in the drawing for the prize, having the option of paying or refusing to. The other half were allowed to take part in the lottery without any cost, but they were each offered $x to abstain from their entering. If individuals valued the ticket for the drawing more than $x, they would refuse to give up a chance for this sum or, given the alternative option, would pay this amount to acquire it. If they valued it less than $x, they would then refuse to pay this amount, or, if faced with the other choice, they would accept $x to give it up. All the results obtained with the experiments were in sharp contrast to the expectation of no difference in the value individuals placed on the ticket, since a far larger proportion of those having the ticket refused to give it up than were willing to spend $x given to them to acquire it. Therefore, the experiments led to two main conclusions. First, the WTA was significantly greater than WTP in all the tests. Second, when the students were asked how they would advise a classmate confronted with identical options, the WTA converged to WTP. Thus, when acting on behalf of others, these people seem to see no difference in the value of the ticket. Those results are not due to the income effect, since it is almost insignificant in a lottery ticket. The other conclusion is that the indifference curves depend on the initial endowment and the maps of different endowments over cross each other. Kahneman and Tversky (1991) argue that such anomalies arise because of Loss Aversion.

Similarly, Samuelson and Zeckhauser (1988), proves the existence of the Status Quo bias in all fields (Public Policy, Marketing, etc) with a survey done on 140 students.

Knetsch (1989)[19] proves the irreversibility of the indifference curves. A group of students was asked to complete a questionnaire, and they were given a coffee mug (y) as compensation. After the questionnaires, the experimenter showed the participants a 400 gram Swiss chocolate bar (x) and told them they could have one in exchange for their mug. In a similar experiment, they were offered money instead of x. All the results showed that the initial entitlements heavily influenced the participants' valuations of the two goods. Good y was strictly preferred to x by 89% by those students receiving y.

[18] The stakes changed among the experiments done, but all the results were consistent among them.
[19] The author performed two more tests, getting similar results.

Hartman, Doane y Woo (1991) investigate the existence of Status Quo effects in the consumer's valuation of the reliability of residential electrical service. A survey of 2200 households in the US showed that WTA was greater than WTP (33% vs. 25%).

Boyce et al. (1992) investigate the notion of intrinsic[20] values for environmental commodities. They show a small pine tree to a group of individuals, who were asked their WTA and WTP for the tree. They were then informed that the pine tree would be killed by the experimenter if they failed to purchase the tree or sell the tree back to the experimenter. The result they obtained was that WTA was greater than WTP, with a significance level of 5%.

Simonson and Tversky (1992) prove that context effects are both common and robust, representing the rule rather than the exception in choice behaviour[21]. They did surveys with different prices and qualities of commodities where the subjects had to choose which commodity they would buy. In all the examples the relative preference of a good (x) over another good (y), was affected by the existence of a third good (z). The authors observed that people's preference depended even on the non-preferred alternatives when they are used as alternatives. They concluded arguing: "the systematic failure of value maximization undermines the standard theory of consumer choice and calls for an analysis that explains the effects of context on choice." [p 293]

Bateman et al. (1997) did the most resounding confirmation of Loss Aversion theory predictions. Conducting tests by eliciting individuals' valuations of private goods in an incentive-compatible experimental setting, they proved that the theory has implications for a range of valuation measures, of which WTP and WTA are just two. A distinguishing aspect of the Bateman op. cit. design is that it controls for all income and substitution effects that are compatible with conventional theory. As they point out, highlighting this

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[20] The attributes that they associate with intrinsic values include non-substitutability (uniqueness), irreversibility (replication of the specific commodity is impossible if it is destroyed), feeling of sentimentality, and a sense of moral obligation.

[21] In this paper, they also introduce a consumption choice model that explains the context-dependence attribute.

feature, "…we look for certain patterns of behaviour that are predicted by reference-dependent theory but which contravene conventional theory" [p. 480]. They identified eight alternative methods for eliciting preferences between money and consumption good. Two of these are standard WTA and WTP measures. These methods differ with respect to the reference point used and the dimension in which responses are expressed. Then, they prove the existence of systematic differences between the preferences elicited by these methods, confirming the Loss Aversion hypothesis of the reference-dependence preference theory.

3.2. Evidence against Loss Aversion

Coursey et al. (1987) directly criticized Knetsch and Sinden's (1984) experiments, arguing that they were inconsistent because they concentrated on individual responses to questions solicited outside market situations, and they did not allow people to learn from their "mistakes." They thus built a controlled experiment adopting the Vickrey auction and multiple trials and concluded that as individuals evaluate the consequences of their decisions over a series of reiterative trial auctions, they more fully learn both their "true" preferences and, therefore, the disparity between WTA and WTP shrinks.

Knetsch and Sindem (1987) examined Coursey et al. op. cit. experiment results, criticising the methodology used by the authors.[22] Moreover, results in the work of Kahneman, Knetsch and Thaler (1990) do not support the alternative that the discrepancy would be eliminated by learning. The authors allowed for learning effects and market discipline, but there was no indication in their experiments of the convergence of buying and selling prices over repeated markets trials. Furthermore, Kahneman et al. (1990) remark that "the endowment effect can persist in a genuine market setting." [p. 1343]

Along the same lines as Coursey et al., op. cit, J. F. Shogren et al. (1994) also reject the endowment effect in one experiment, concluding that once people "learn," WTA and WTP would converge for substitute goods. However, Morrison (1997) demonstrates that Shogren's op. cit. results are insufficient to reject the Endowment Effect.

[22] They criticise very precise aspects that are beyond the scope of this essay.

As we can observe, the evidence for Loss Aversion is much more robust than that against it, moreover considering that this paper only picked a sampling of some of the evidence for and all of the evidence found against LA. The experiments have sufficiently proved that Loss Aversion exists even when perfect market conditions are assumed and with different kinds of goods, although Loss Aversion is more expected to primarily affect goods that had been bought for use rather than for eventual resale.

Section 4 – Conclusion

This essay has shown that the presence of Loss Aversion and Endowments Effects generates a vast number of implications that radically change some basic standard postulates of the microeconomic foundation. They predict the existence of the divergence between WTA and WTP and invalidate the standard assumptions of transitivity and reversibility of preferences of the neoclassical theory of consumer choice, which would imply fewer trades, inertia in the economy and sticky prices, among others. Therefore, they are two concepts that do really matter for economic analysis.

Evidence for and against LA and EF shows extensive support in the experimental economics literature for their existence. Furthermore, during the last twenty years, experiments to test for LA an EF have been further improved so that they can now substantially overcome all the criticism of those economists who were sceptical about them.

I can therefore conclude that, considering Loss Aversion's and Endowment Effects' implications to economic theory, and bearing in mind the extensive evidence in their favour, these concepts should not be taken into account as just an anomaly or puzzle, but as a break in some fixed structures of the current microeconomic paradigm. An anomaly is some special feature that conventional theory cannot explain. Nevertheless, evidence that proves that some strong assumptions of the theory are successively invalidated should not be called "an anomaly," but new theory in itself. Twenty years of consecutive evidence should be a period long enough to consider their plausibility.

What is next? The amendments to the standard theory are not trivial. Nevertheless, Kahneman and Tversky (1991) have already done a significant part of the work, with the generalisation of preference theory to indifference curves indexed to reference level. Yet, I believe that a lot of work remains to be done to continue developing this approach. In particular, I think there is scope for further research on individual differences in Loss Aversion, as much of the work up to now has been focused on individual differences in temporal discounting and risk aversion, but there seems to be nothing done on the Loss Aversion side. Obtaining this knowledge would be vital to characterise the propensity different types of individuals have for Loss Aversion and to know how they might react to

different economic policies. As a further extension of these results, I would also regard the assumption of Loss Aversion in the micro-foundation of macroeconomics models an interesting advance since it could explain sticky prices, inertia in the economy and hence provide a possible explanation of why some recessions last more than expected.

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