



# Analyzing discrepancies between willingness to pay and willingness to accept for freight transport attributes



María Feo-Valero<sup>a</sup>, Ana Isabel Arencibia<sup>b</sup>, Concepción Román<sup>c,\*</sup>

<sup>a</sup> *Instituto de Economía Internacional, University Jaume I de Castellón, Spain*

<sup>b</sup> *Institute of Tourism and Sustainable Economic Development, University of Las Palmas de Gran Canaria, Spain*

<sup>c</sup> *Institute of Tourism and Sustainable Economic Development, University of Las Palmas GC, Facultad de Economía Empresa y Turismo, módulo D, Campus de Tafira, 35017 Las Palmas G.C., Spain*

## ARTICLE INFO

### Article history:

Received 4 June 2015

Received in revised form 18 January 2016

Accepted 4 March 2016

Available online 29 March 2016

### Keywords:

Freight transport

Discrete choice experiments

Stated preference

Prospect theory

Reference alternative

Asymmetric preferences

Willingness to pay

Willingness to accept

## ABSTRACT

In this paper we use discrete choice data to analyze asymmetries in the preference for freight transport attributes. A reference dependent utility specification allowed us to test for the existence of substantial asymmetries in perception of the transport cost. Hence, the re-estimation of our models in the WTP/WTA space helped us to quantify significant discrepancies between the WTP and WTA for the attributes included in the choice experiment, namely transit time, service frequency and delays in delivery time. Results are deemed essential to define alternative services to road capable to attract substantial volumes of freight.

© 2016 Elsevier Ltd. All rights reserved.

## 1. Introduction

There are more and more authors that question the validity of the neoclassical theories of consumer behaviour to analyze individuals' preferences. In this regard, the incorporation of elements of the prospect theory to model situations that involve decision making has contributed to a better understanding of the aspects that govern individuals' decisions.

The prospect theory was developed by [Kahneman and Tversky \(1979\)](#) and establishes that when people have to make a decision under risk, gains and losses are valued in a different way. In choice situations under risk, they demonstrate the existence of loss aversion, implying that decision makers are more concerned about losses than gains. In other words, individuals prefer to avoid a loss rather than obtain a gain of the same magnitude. [Kahneman and Tversky \(1979\)](#) suggest that the expected utility theory is not a good descriptive model when individuals have to make decisions under risk. They support this statement by showing different choice situations in which preferences do not accomplish the postulates of the expected utility theory.

In a more recent work, [Tversky and Kahneman \(2011\)](#) presented the reference dependent utility specification to explain consumer choices in riskless situations, demonstrating that decision making depends on a reference level or status quo, which affects preference formation. The idea behind this theory is also that losses have larger effect on preferences than

\* Corresponding author. Tel.: +34 928 45 17 96.

E-mail addresses: [maria.feo@eco.uji.es](mailto:maria.feo@eco.uji.es) (M. Feo-Valero), [aarencibia@acciones.ulpgc.es](mailto:aarencibia@acciones.ulpgc.es) (A.I. Arencibia), [croman@daea.ulpgc.es](mailto:croman@daea.ulpgc.es) (C. Román).

gains. In this way, they broaden their former approach to model choices under uncertainty or risk (Kahneman and Tversky, 1979). Therefore, the utility function considered is asymmetric and is based on three fundamental aspects: (i) reference dependence, (ii) loss aversion and (iii) diminishing sensitivity. Thus, Tversky and Kahneman (2011) consider that the significant discrepancy observed between the minimum amount a person is willing to accept for the loss of a good and the maximum amount he is willing to pay for getting it, is due to loss aversion, among other aspects. In fact, the existence of loss aversion in the perception of all the attributes is sufficient to ensure that the willingness to pay (WTP) is less than the willingness to accept (WTA) (Masiero and Maggi, 2010). Both WTP and WTA measures represent an important input in the social appraisal of different projects and policies.

The analysis of transport mode choice has been traditionally based on the estimation of models that consider the specification of symmetrical preferences. In the particular case of freight transport we can find significant contributions in the works of de Jong (2013), Brooks et al. (2012), Samimi et al. (2011), Arunotayanun and Polak (2011), Puckett et al. (2011), Cascetta et al. (2009), Train and Wilson (2008), García-Menéndez et al. (2004), Bolis and Maggi (2003), Shinghal and Fowkes (2002), Abdelwahab (1998), and Jeffs and Hills (1990); among others. As a common characteristic, all models presented in these works give an identical treatment to the effect of increases and reductions in the level of service. These effects are represented by the marginal utility of each attribute and in the case of linear utility functions they correspond to the parameter accompanying this attribute. One of the most important implications of this approach is that the WTP to improve the quality of service is identical to the WTA compensation when quality is reduced.

The paper by Hess et al. (2006) is the first reference found in the transport literature which incorporates an asymmetric specification for the utility function. In the freight transport context, the work by Kurri et al. (2007) considered a similar specification when obtaining estimates of the value of time in Finland. In a more recent work Masiero and Hensher (2010, 2011), Masiero and Maggi (2010) and Masiero and Rose (2013) use reference dependent utility specifications to test for different aspects of the prospect theory such as, loss aversion and diminishing sensitivity, comparing results with that obtained when the traditional symmetric model is used. A similar approach is used by Hess et al. (2008), De Borger and Fosgerau (2008) and Rose and Masiero (2010) in the field of passenger transport. In all these papers, choice experiments are created in order to allow for the specification of gains and losses as positive and negative variations with respect to the attribute values in the reference alternative; obtaining, in most cases, a better fit when the asymmetric specification is considered. In this regard, an important issue is how to define the attribute levels in the experiment as this influences responses of the interviewees. Also, a shift in the reference point may affect individuals' preference formation, producing behavioural reactions to gains and losses. Thus, Masiero and Hensher (2010) found increases in loss aversion for cost and time attributes when negative changes in the reference alternative are produced.

Li and Hensher (2012) propose the use of an *attribute-specific extended Rank-Dependent Utility Theory* framework that allows integrating risk attitudes into freight behaviour modelling. Indeed, traditional freight distribution models work under the implicit assumption of risk neutrality although freight transport decisions are made in a context of uncertainty – this is specially the case for travel time – and are therefore subject to risk. The application of their proposed modelling framework to a sample of road route decisions in Australia shows that freight transporters and shippers have risk-taking attitudes with regard to travel time.

An important implication resulting from the asymmetric specification is the ease to derive estimates of the WTP and WTA figures that can be obtained from the ratio between the corresponding marginal utilities. This in turn, allows quantifying the gap existing between these two figures.

As many authors have concluded (see e.g. Hess et al., 2008; de Borger and Fosgerau, 2008; Grutters et al., 2008; Masiero and Hensher, 2010, 2011; Masiero and Maggi, 2010; Masiero and Rose, 2013), the obvious differences observed between the WTP and WTA measures, show that the monetary value attached to losses (WTA) is higher than that attached to gains (WTP). In this sense, the assumption of symmetric preferences would lead to overestimate the WTP and to underestimate the WTA, with the corresponding implications for social appraisal.

Horowitz and McConnell (2003) indicate that the discrepancy observed between WTP and WTA measures can have two possible interpretations. On one hand, they consider that this difference can be seen as a deficiency of survey methods such as contingent valuation (in contrast with Hanemann, 1991), adding that “a weak version of this interpretation is that willingness to pay questions measure preference but willingness to accept question do not”. On the other hand, they establish that the discrepancy may exist because individuals do not have neoclassical preferences, “a conclusion which presumes that the experiments do capture “true” preferences in both WTP and WTA responses”.

In this paper we contribute to this body of literature by analyzing the existence of discrepancies between the measures of WTP and WTA for the most relevant attributes that define modal choice for freight transport. The analysis is focused on long distance corridors that involve the competition of road with more sustainable modes of transport, as recommended by the European transport policy. Our models use data obtained from a discrete choice experiment where decision makers were faced to the choice between road (the current mode) and an intermodal alternative which simulates the transport service by rail or a motorway of the sea service in the corridor linking the regions of Madrid with the Netherlands/Belgium/Northern France/West Germany.

The specification of an asymmetric utility function with respect to the reference values provided by the current level of service perceived by freight forwarders helped us to test for the existence of substantial asymmetries in perception of the transport cost, but not in the rest of the attributes. This fact prevented us to directly obtain significant discrepancies between the WTP and the WTA, due to the lack of appropriate statistical tests. However, given that cost parameters for gains and losses appear in the

Download English Version:

<https://daneshyari.com/en/article/1022986>

Download Persian Version:

<https://daneshyari.com/article/1022986>

[Daneshyari.com](https://daneshyari.com)