1 Introduction

In *The Economics of Imperfect Competition*, Joan Robinson (1969, p.70) wrote:

An increase in wealth is likely to make the demand of the individual buyer of any particular commodity less elastic. Thus an increase in demand due to an increase of wealth is likely to reduce the elasticity of the demand curve, and may reduce the elasticity so much that the slope of the curve is increased.

While the idea that higher individual income implies lower price elasticity of the *individual* demand curve is an assumption on preferences,[1] the relationship between an overall increase in income and *market* demand hinges on some assumption on how income is distributed across consumers. Indeed, increases in aggregate income rarely take place without affecting how income is distributed – and, according to most accounts, income growth over the last decades has occurred together with 'increasing inequality', or 'income polarization' (see, e.g., Gottshalk and Smeeding, 2000). In a partial equilibrium perspective, if an increase in the consumers' aggregate income is associated with changes in the elasticity of the market demand curve, this should in principle affect the behaviour of firms and market structure (Benassi *et al.*, 2002a): Joan Robinson herself argues that such a shock would affect the mark-up levels and the co-movement of prices and quantities in monopolistic markets.

Clearly, any statement about the behaviour of market demand elasticity following a change in aggregate income generally requires some assumption on the individual demand curve; however, one would like to know whether the aggregate reaction to an aggregate shock depends *only* on such assumptions at the individual level. Relying on the above quotation, one may call 'Robinson effect' the idea that the sign of the relationship between aggregate income and market price elasticity is the same as that of the relationship between individual income and the price elasticity of the individual demand curve.

This paper asks what restrictions on the shape of the income distribution are sufficient to ensure that a negative (positive) relationship between indivual income and individual price elasticity translates into a negative (positive) relationship between mean income and market demand elasticity. A natural way to model increases in mean income is via first-order stochastic-

[1] The idea that the price elasticity of demand decreases as individual income increases is arguably more reasonable than the converse. For some empirical evidence on the relevance of the elasticity-income link, see e.g., Gertler *et al.* (1987).

dominance (FOSD) shifts of the income distribution. Hence, our model provides sufficient conditions for the Robinson effect to hold when income distribution is hit by a FOSD shock – it being the case (as shown in section 3) that such a shock may not in general lower market elasticity, even though the price elasticity of the individual demand is decreasing in income.

The paper is organized as follows. In the next section a simple general framework is developed to study the relationship between income distribution and the elasticity of market demand. In Section 3 the main result of the paper is presented, which identifies sufficient conditions on the income distribution for the 'Robinson effect' to take place, when the income distribution is hit by shocks in the first-order stochastic-dominance sense. These conditions are satisfied by a wide range of commonly used distributions. Section 4 offers some concluding remarks.

2 Income distribution and demand elasticity

In this section we present a partial equilibrium framework to assess the role of income distribution and the effects of distribution changes on market demand, when income is the only source of heterogeneity.

Consumers differ only in income, and their behavior is described by a continuous standard Marshallian demand curve $q(p, y)$, where the prices of commodities other than q are held fixed throughout. Each agent is accordingly identified by his income $y \in Y = (y_m, y_M)$, where $0 < y_m < y_M \leq \infty$. The good q is normal, that is (letting subscripts denote derivatives) $q_y(p, y) > 0$ and $q_p(p, y) < 0$, for all $(p, y) \in P \times Y$, where P is a subset of non-negative reals. A natural specification might be $P = (0, p_M)$, with p_M satisfying $q(p_M, y_M) = 0$: it would be the choking price for the highest income consumers (in the limit, if $y_M = \infty$). For any $p \in P$, one clearly has $\lim_{y \to y_M} q(p, y) > \lim_{y \to y_m} q(p, y) \geq 0$.

Income is continuously distributed according to the density $f(y, \theta) > 0$, where $\theta \in \Theta$ is a real parameter of the distribution. In the next section it will measure a FOSD shock. The income distribution $F : Y \times \Theta \to [0, 1]$ is obviously defined by

$$F(y, \theta) = \int_{y_m}^{y} f(x, \theta) dx \tag{1}$$

Clearly, $F_\theta(y_M, \theta) = 0$, since by definition $F(y_M, \cdot) = 1$ for all θ. Aggregate (mean) market demand is

$$Q(p, \theta) = \int_{y_m}^{y_M} q(p, y) f(y, \theta) dy \tag{2}$$