Effectiveness of Some Welfare Fiscal Instruments in Case of Inelastic Supply under Economics of Scale

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ABSTRACT

Under the studied peculiar case of price inelastic supply within dominant economies of scale, both the consumer surplus and governmental earnings change in the same direction in response to either taxation or price subsidization. Different from the case characterized by a steeper demand curve, any non-price action undertaken in order to rationalize consumption of certain semi-necessary goods might face an awkward dilemma of contracting consumption via demand expansion encouragement. Counteraction lies in adoption of non-fiscal actions targeting supply discouragement.

Key words: Fiscal instruments, Economies of scale, Price elasticity, Price subsidies, Taxation.

Introduction

Neo-classics and modern economists revealed the validity of variant fiscal policy tools tending to improve welfare conditions under economies of scale (Awh, R.Y. 1976; Cole, C.L. 1977). The validity assessment relied upon the estimated difference between the consumer's surplus gain (loss) and the governmental earnings (expenditure). It was approved that where price subsidization is availing, taxation is not.

The study tends to theoretically investigate the special case of prevalent economies of scale where supply is less price elastic than demand. This may hold in agriculture for kinds of fruits as semi-necessary commodities. This case is graphically represented by a supply curve steeper than the demand curve. In this respect, the study tends to pinpoint the major differences from the situation of a more price responsive supply. It is worth mentioned, that the studied case features marketing equilibrium stability under economies of scale according to "Walras" (Henderson, J. M. & R. E. Quandt. 1980).

Methodology:

The study tends to theoretically discuss and analyze, mainly graphically, the implications, impacts and validity of either specific taxes and/or retail price subsidies, on theoretical bases. It shall also shed light upon the differences occurring when undertaking non-price actions socially intending to influence consumption level, compared to the case of a more responsive supply. The Marshallian analysis of consumers' surplus shall be principally adopted (Jhingan, M.L. 1975).

Results;

Major implications of economies of scale in market equilibrium:

Economies of scale imply a long-run negatively sloped curve. This stems from the fact that expansion of production via scale enlargement would cause drop of average costs by rates higher than those of price decreases, if any. Such factors leading to diminishing costs may relate to storage and transportation, beside capital-saving practices of certain production operations.

Taxation impact upon society's welfare:

Fig. (1) presents a graphic illustration of the impact of imposing a specific tax raising the retail price from \( (op) \) to \( (op_1) \). Accordingly, demand will diminish to \( (OQ_1) \), and the consumer's surplus loss is equal to the area \( (PABP_1) \). But to supply the quantity \( (OQ_1) \), sellers would not accept less than \( (op_2) \), which is higher than the price the consumers are willing to pay \( (op_1) \). Subsequently, sellers must be subsidized by \( (BC) \) per unit, and the total burden on the government equals the rectangle \( (P_1BCP_2) \). Hence, through taxation both the consumers and...
the government lose. The first loses by wasting the consumer's surplus, and the second through drain of governmental budget. Accordingly, under the presented conditions taxation becomes futile where the society's welfare is concerned.

![Diagram](image1)

**Fig. 1:** Taxation implications for a steeper supply curve

![Diagram](image2)

**Fig. 2:** Consumer's price subsidization implications for a steeper supply curve

**Impact of retail price subsidization upon the society's welfare:**

Price subsidies are imposed to enable low income bracket consumers to have access to certain necessary goods. Fig. (2) presents implications of price subsidies under conditions concerned in the study.

The price subsidy will reduce the retail prices by \( PP_1 \), and in response the quantity demanded extends to \( OQ_1 \). As such, the consumer's surplus gain equals the area \( PABP_1 \). On the other hand, sellers (or producers) are willing to supply \( OQ_1 \) by a lower price \( op_2 \), and provision of \( OQ_1 \) is ensured even if the government taxes the suppliers by an amount reaching \( BC \). Hence, instead of drawing subsidization funds from the public budget, they are more than covered through sellers' taxation.

**Non-fiscal measures of consumption rationalization:**

The government may tend to influence consumers' preferences and alter their priorities for sake of more necessary goods, savings, investments or any other reasons. As revealed above, taxation would be a highly expensive tool. Accordingly, Non-fiscal measures may be sought for such purpose. Anti-publicity influencing taste negatively may be effective in this respect.

Fig. (3) presents the downward shift of the demand curve resulted by discouraging measures for steeper (part a) and less steep (part b) supply curves. In part (a), which represents the studied case, a negative excess demand would occur at the initial price \( OP \). Hence, price would continuously fall till equilibrium is established.
at coordinate (OP_1), (OQ_1) where the last is greater than (OQ). Hence, the mechanism may end with an undesired situation quite opposite to the one initially intended.

The case of a more responsive supply, i.e. a supply curve greater in absolute value than that of the demand curve, is entirely different (fig.3-b). That is where non-fiscal measures curtailing consumption achieve their desired target.

As remedy for the first case, fig.4 shows that measures for discouraging production (supply) would be effective for reducing demand (consumption). That is since the marketed quantity at equilibrium would be (OQ_1), which is less than (OQ) accompanied by a slight price increase to (PP_1).

Fig. 3: Effectiveness of non-fiscal measures demand in consumption rationalization

Fig. 4: Effectiveness of supply influential measures in consumption rationalization under a steeper supply curve

Summary and Conclusions:

In view of the previous respects, whether supply is more responsive (curve less steep) to price changes than demand or less responsive taxation is futile and price subsidies are availing under economies of scale. However, while this conclusion relies on the difference between welfare gain represented by increase of either consumers’ surplus or governmental earnings, and its loss, represented by decrease of consumers’ surplus or governmental transactions payments, subsidies are fruitful and taxation is harmful all the way in case of less responsive supply. That is since taxation raises prices paid by the consumers, and hence reduces the consumers’ surplus, but prices received by the sellers increase more, drawing from the public budget. On the other hand, subsidies reduce prices paid by the consumers, and hence the consumers’ surplus gains. In this case, the sellers would accept less prices, and the public budget would gain the difference.

Another difference occurs in non-fiscal tools applied to reduce consumption for sake of other expenditure items. While actions shifting the demand curve downward through taste influential intervention would be
effective in case of a more responsive supply, it may end with a controversial result under the studied case. Ironically, the desired target may be achieved through an action shifting the demand curve upward, or in other words, awkwardly reducing consumption by encouraging it. To face this dilemma, supply (production) should be the variable subject to intervention, and not demand. Input quotas, production ceiling boundaries and other legislations may be suitable tools in this respect.

References