THE SIZE OF THE FIRM IN NEOCLASSICAL ECONOMIC THEORY

A Note by Kutlu Somel*

My purpose in this note is to bring out an unequivocal shortcoming of neoclassical theory of the firm. It is usually stated that under conditions of perfect competition the size of a profit maximizing firm is determinate only if the technical conditions of production imply rising long-run average costs. If long-run average costs are constant or falling, the size of the firm is indeterminate except for the case of a firm facing losses. I will briefly show that under conditions of perfect competition, a profit maximizing firm producing under conditions befitting the neoclassical conception of production technology need never face increasing long-run marginal costs. Consequently, it will be evident that the neoclassical approach to the analysis of the firm, given its theoretical framework fails to determine the size of the firm **under all conceivable circumstances.**

1. The standard assumptions of the neoclassical theory of the firm that are particularly pertinent for this analysis are :

   a. Production and factors of production are continuously variable and divisible.

   b. The firm tries to maximize profits.

   c. The firm is a price taker in output, input and factor markets. It cannot influence prices and it can sell as much product for the given price and utilise as much inputs and factors at the given prices. For the period of analysis these prices are stable.

2. In the long-run the firm varies all its factors of production, i.e. changes its plant size. Its equilibrium size is determined at the point of intersection of the given market price of the product and the long-run marginal costs. At equilibrium, the

(*) Instructor, Middle East Technical University, Department of Economics.

long-run marginal costs have to be increasing. This requires that at this equilibrium output long-run average costs be increasing.

3. Howovever, given assumption c, a firm can never face increasing long-run average costs due to any changes in prices because these prices are assumed to be given and constant. Hence, the only cause for increasing long-run average costs will be changes in technical conditions of production. Such changes are equivalent to "decreasing returns to scale".

4. Furthermore, given assumption b, the profit maximizing firm would be expected to try to minimize costs. Therefore, if long-run average costs increase due to technical conditions brought about by increased scale or plant size, the firm can resort to replicating the scale of production corresponding to minimum long run average costs.

5. Assumption a allows replication to be conducted at non-integral values. In other words, it is possible to maintain constant average costs for any variation of scale.

6. Hence, a profit maximizing firm need never face increasing long-run average costs. This implies that long-run marginal costs can never be increasing.

7. This implies that the firm can face either decreasing long-run average costs, or, at worst, constant long-run average costs. The former situation is equivalent to "increasing returns to scale" and the latter is equivalent to "constant returns to scale". Hence, a profit maximizing firm operating under perfectly competitive conditions can never face "decreasing returns to scale".

8. It is well known that under conditions of constant long-run average costs (constant returns to scale) or decreasing long-run average costs (increasing returns to scale) the size of the firm is indeterminate expect for the trivial case when under constant long-run average costs the price of the product is less than the average costs. In this case, as the firm need not face losses in the long-run, its size corresponds to zero level of output.

9. Given these conclusions that follow from standard neoclassical assumptions, these are no reasons why a firm should stop

producing at any level of production as long as it is not facing losses by expanding production. Hence, assumptions a, b and c, which theoretically allow replication, at the same time unequivocally eliminate the possibility of determining the size of the firm.

10. In the literature increasing long-run average costs are usually explicitly or implicitly taken for granted. The cases of constant or decreasing decreasing long-run average costs are usually treated with the cautionary remarks indicating the consequent breakdown of theory with respect to the size of the firm with some footnote or explanation that in the "real world" long-run average costs do eventually increase(1).

11. In the "real world" firms do have sizes, they expand or go bankrupt. The purpose of theory is to explain and analyse such behaviour. The neoclassical theory, as I have tried to explain in this note, fails to facilitate explanation or analysis by being absolutely unable to determine the size of the firm within its theoretical frame.

It is clear that the neoclassical theory of the firm cannot come to grips with all the manifestations of firm behaviour in the real world. However, it fails even in its internal logic and purpose. Graaf's general remarks about neoclassical theory appears particularly applicable to the theory of the firm, "The measure of acceptance ... (this theory) has won among professional economists would be astonishing were not its pedigree so long and respectable".(2)

---

(1) Richard G. Lispey and Peter O. Steiner, **Economics,** 3. Edition, Harper and Row, Singapore, 1972, Ch. 11 and Appendix to Ch. 11 is a very clear example of such an approach. Though indicating all the implications of the possibility of replication, the authors come up with the concept of "pecuniary returns to cost" which implies that as the firm expands it will exert an influence on the scarce factors causing their prices to rise. This, given assumption c, is theoretically inadmissible.

(2) J. de V. Graff, **Theoretical Welfare Economics,** Cambridge University Press, 1957. p. 142.

ÖZET

NEOKLASİK İKTİSAT KURAMINDA FİRMA BÜYÜKLÜĞÜ

Neoklasik iktisat kuramında uzun dönemde firmanın büyüklüğü için ortalama maliyetlerin artması gerekir. Oysa kuramın varsayımları firmaya yineleme (replication) olanağı vermektedir. Böylece, firma hiçbir zaman artan ortalama maliyetlerle karşılaşamaz. Dolayısıyla, kuram yalnız sabit ya da düşen ortalama maliyetlere olanak tanımaktadır. Bu durumlarda firmanın büyüklüğünün belirlenemeyeceği bilinen bir sonuçtur. Bu da neoklasik kuramın hiçbir zaman firma büyüklüğünü açıklayamacağını gösterir.