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Firms: A Dynamic Reading of Corporate Behaviour

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Abstract: This study proposes to re-examine a dynamic managerial model. Its aim is to highlight the ambivalence of the dynamic approach regarding a firm's behavioural strategies for optimisation.

Key words: Corporate Behaviour, Dynamic Economics, Firms, Managerial Strategy, Rational Calculation

INTRODUCTION

Static economics is essentially defined as a field of economics where change is considered as exogenous from the system and where corporate behaviour is considered *ex-ante*.

The main critique of this field of economics is that it structurally considers market shifts as rigid variables. However, works such as those of Baumol [1] and Williamson [2] showed that depending on the size and importance of a firm, the market structure could be greatly determined by the internal strategies of a particular firm.

The temporal dimension when taking corporate strategies into account is of great importance. As such, time weakens dominant positions. The dynamic aspect of corporate economics is crucial in a firm's strategic viability. Although Schumpeter [3] had already explained that industrial strategy is a bid to understand the behaviour of new organisations, it is only in the 1960s that firms began to take centre stage in expansion activities and exert pressure on their environment. According to the dynamic analysis, and with time, firms change their strategies regarding optimality in order to adjust the offer, demand and costs that may be incurred. This study shall attempt to put forth the idea that market structures are determined by the proposed managerial strategy.

Modelisation: The model proposed here is transitive and determinist. It distinguishes between market structures and managerial strategies in order to clearly highlight the dynamic nature of economics. The reasoning used here is mainly one based on movement.

As such:

$$\pi = \int_0^{\infty} e^{-\omega} \quad \Psi(P, \quad M, \quad E) \quad dt \qquad (1)$$

With π: maximal value of the movement of profit, ω: the rate of modernizing under the constraint that $\omega > 0$ and ω constant, P: production cost and E: strategic expenditure having an effect on the structure of market M.

If we distinguish P, E on the one hand and M on the other, stating that:

$$\dot{M} = \chi E - \delta M \qquad (2)$$

we notice a depreciation of structures in time. With δ as the rate of depreciation.

χ: positive and constant coefficient, shows the impossibility of decreasing income for the rate of change in the industrial aspect.

It is important to determine the conditions of optimality so as to ensure that π is at its minimum. Hamilton's equation will assist us in this purpose:

$$H = e^{-\omega}\begin{bmatrix} P(P, E, X) - g(P, E, M) \\ -E + \lambda(\chi E - \delta M) \end{bmatrix} \qquad (3)$$

λ: user value of a supplementary market unit at time t.

If we take the classical hypothesis that marginal income stabilizes according to marginal cost, we could then state that:

$$P \frac{\partial r}{\partial E} + \chi \lambda = g \frac{\partial r}{\partial E} + 1 \qquad (4)$$

If we develop the idea that the marginal cost of opportunity of expenditure meant to modify the market structure should be equal to the marginal profit in user value of these structures for the firm, then we come to the following equation:

$$\frac{\partial r}{\partial E} + \dot{\lambda} = \lambda (\omega + \delta) \qquad (5)$$

In terms of elasticity and according to the optimal way:

$$(P - g) = \frac{-r}{\frac{\partial r}{\partial P}} \quad (6)$$

Let us consider the following ξ: elasticity of quantity to price:

$$\frac{P}{\xi} \cdot \frac{\partial r}{\partial E} = 1 - \chi\lambda \quad (7)$$

And ζ: elasticity of expenditure to quantity, we have:

$$\frac{\zeta}{\xi(1 - \chi \lambda)} = \frac{E^*}{\Pr} \quad (8)$$

The optimal expenditure added to the total expenditure is proportional to the elasticity of quantities related to expenditure and hence inversely proportional to the numerical value of price elasticity.

Moreover, it is important to bear in mind that M^* cannot vary in constant proportion to the total income since M, taken as a usage value, is highly sensitive to time.

The following system could then be proposed:

$$\dot{M}=\chi E-\delta M$$

and:

$$\dot{E} = \frac{-\left(\frac{\omega+\delta}{P-g}\right)+(\omega+\delta)\frac{\partial r}{\partial E}+\frac{\partial r}{\partial M}}{\frac{\partial^{2r}}{\partial E^2}} \quad (9)$$

It could also be stated that the slope of the curve for stationary M is positive while that of the stationary curve E is negative.

Let us now proceed to the following calculations that show that the point of equilibrium for $\hat{E}$ and $\hat{M}$ is a saddle point:

$$\Phi = \frac{Q \pm \sqrt{Q^2 + 4W}}{2} \quad (10)$$

with:

$$Q = \left(\omega + \chi \frac{\partial^2 r}{\partial M \partial E}\middle| \frac{\partial^2 r}{\partial E^2}\right) > 0 \quad (11)$$

and:

$$W = \begin{bmatrix} \delta(\omega+\delta)+\chi\frac{\partial^2 r}{\partial M\partial E}\middle|\frac{\partial^2 r}{\partial E^2}+\chi^2\frac{\partial^2 r}{\partial M^2}\middle|\frac{\partial^2 r}{\partial E^2} \\ +\delta(\omega+\delta)\frac{\partial^2 r}{\partial M\partial E}\middle|\frac{\partial^2 r}{\partial E^2}>0 \end{bmatrix} \quad (12)$$

We are thus faced with a saddle point.

It could then be deduced that it is in the early stages that the firm could first influence the market through its expenditure and secondly, progressively decrease its effort until it reaches $\hat{M}$. As such, a firm would not have a short-term maximisation of profit in its early stages. The model presented here implies that economic policy could have important effects.

CONCLUSION

There are however certain weaknesses inherent to the objective function. These could include aspects such as maximisation of profit, income or even an increase in the firm's growth rate. Hence, there is real uncertainty in relation to the dynamic analysis directly affecting the arguments of the objective function. Pure rational calculation underestimates a firm's real evolution by not sufficiently taking uncertainty into account. It is thus possible to further this approach though the use of other schools of thought such as that of the behaviourists [4-7].

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