Strategic Fixed-Points: The one-to-many relationship between practices and performance

Scott F. Rockart, Sloan School of Management

Introduction

Four sources of performance differences dominate the strategy literature; environmental factors, practice differences, resources, and positive feedback in systems (Porter, 1985; Wernerfelt, 1984; Arthur, 1989; Krugman, 1996). It is my belief that the system nature of firms, of which positive feedback is one aspect, is a promising and underdeveloped area of exploration to understand performance differences across firms. The theory explored here is that profit differences across firms in many cases may not be attributable to differences in firm practices. Instead, profit differences may exist among firms with the same practices, since a system of managerial practices may produce more than one locally-stable performance equilibrium.

These performance outcomes are characterized by an internally consistent set of firm attributes that are interlinked and self-supporting. Some of these outcomes will be unstable, and firms will quickly be knocked out of such performance states by even minute real world forces. Other equilibria will be locally stable - resistant to small shocks or managerial actions - allowing us to observe firms in those different outcomes for time spans of practical significance. Stable performance states need not be the polar extremes common in positive feedback literature. The interplay of positive and negative feedback may create equilibria that are vanishingly close together. The general point is that structurally identical firms, firms which are the same on all key practices, may exhibit different performance levels. A possible example, to be discussed later, is investment banking where a number of firms located within a few miles of each other and following similar strategies still perform quite differently.

This paper explores sufficient and realistic conditions for multiple locally-stable equilibrium performance outcomes at the firm level. It proposes examples of where such equilibria may be occurring in real firms, and establishes several normative insights of this theory for managerial practice.

Phenomenon of Sustained Excess Returns

The economic performance of firms is of central importance to the field of strategy. While economists generally assume that competition quickly equalizes returns on investment across industries, strategy scholars try to explain when and why differences persist. Empirical research suggests that a surprisingly large portion of firms manage to deviate substantially from average returns for long periods of time. Cubbin and Geroski (1987) found that one third of the firms in their 26 year sample of 217 British firms showed an ability to deviate from average returns "more or less indefinitely"(p.436). Mueller (1977 & 1986) had even stronger findings with about seventy percent of a 472 firm sample exhibiting statistically significant deviations from average profitability that showed no sign of decaying. These differences were not only statistically but economically significant. The top 100 firms, ranked on the size of their stable differences, were projected to continue earning thirty percent higher than average returns even after any transient advantages had died away.

Theory and Illustrative Model

 Strategy scholars have suggested that performance differences across firms arise from differences in firms' geographic environments, practices, and resources. While these traditional explanatory factors may be sufficient to explain profit differences, they are not necessary conditions and may not even be important factors in many settings. Firms using the same system of practices, in the same geographic environment, may still perform differently.

 A very simple model (Figure 1) is developed to illustrate that a system of firm practices which close a single positive feedback loop and two negative feedback loops may be sufficient to produce two stable performance equilibria. The practices here fit Forrester's (1961) definition of policies "...a formal statement giving the relationship between information sources and resulting decision flows." The practices in this simple illustrative model amount to the firm's decision to use bonuses to attract employees and to base bonus payments on firm profits. A more detailed model is being built for the investment banking industry, where a firm's practices include a far broader set of policies governing how the firm will compete and what activities it will undertake. The positive loop chosen for this illustration assumes that the firm's staff quality influences the profits, the profits in turn influence the bonuses, and the expectation of bonus size affects the quality of applicants the firm is able to hire to replace departing employees. The two negative loops represent the adaptive expectations of people toward future bonuses and the normal attrition of the workforce.
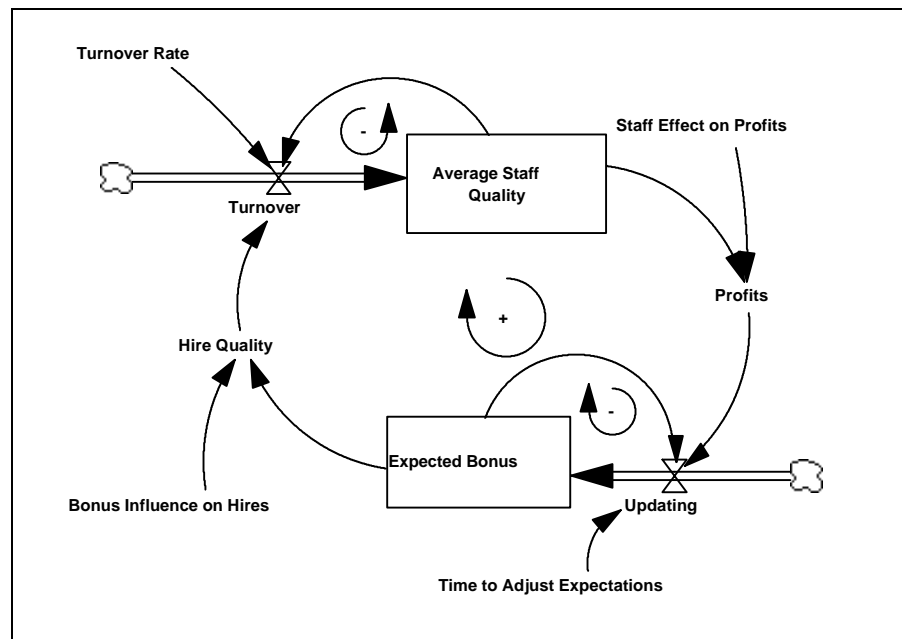

Figure 1: Model Diagram

 The key to producing more than a single equilibrium condition is the non-linear shape of the link from Average Staff Quality to the Expected Bonus. This relationship is created with a table function labeled Staff Effect on Profits (Figure 2). Firm profits are assumed to be fairly unresponsive to small changes in average staff quality when the staff is very poor. As staff quality increases, however, there is a range where improvement in staff quality can have a substantial positive effect on profits as a critical threshold of general competency is approached and passed.

Once the average staff quality has risen to a high level, additional increments in quality have a smaller effect on the firm's efficiency and effectiveness and therefore its profits. The intermediate range of large gains causes the positive feedback loop to be strong when the staff is of mid-range quality even though the feedback loop is weak when the staff quality is particularly low or high.
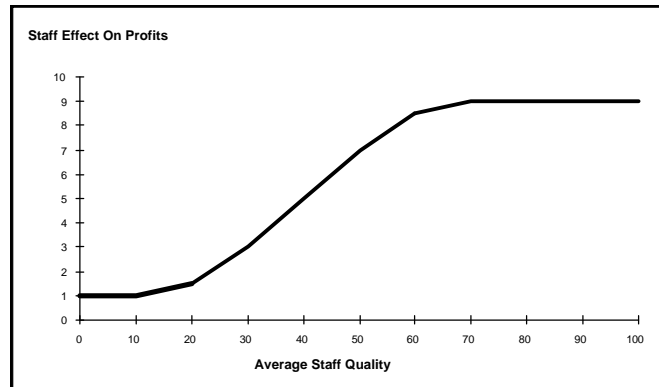
Staff Effect On Profits

Figure 2: Table Function - Staff Effect on Profits

The three equilibria for the system are represented in the Figure 3. The horizontal axis of the diagram shows the value of the first state variable (average staff quality) and the vertical axis the value of the second state variable (expected bonus). The importance of the figure is that it shows how the shape of the non-linear link creates the potential for multiple equilibria. The two lines in the diagram represent the equilibrium value of one state variable given the value of the other state variable (e.g. the curve labeled "EB" shows the equilibrium value for the expected bonus for each value of the average staff quality, its shape is directly determined by the link from staff quality to the expected bonus). Equilibrium points (A,B,C) exist at the three locations where the two lines cross. It is easy to see that if both links were linear (i.e. "EB" was a straight line), there would be either one single crossing point or no crossing points. Those familiar with phase diagrams will notice that equilibrium points A and C will be stable in the face of small changes, so that the staff quality and expected bonus will return toward those equilibrium points if they encounter small shocks (such as the arrival of a great group of new employees or a lawsuit that temporarily lowers the bonus pool).
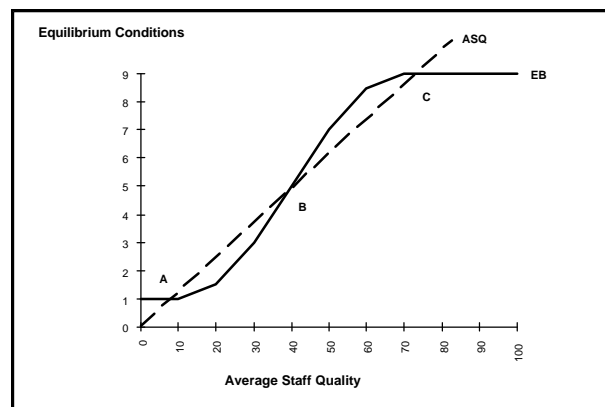
Equilibrium Conditions

Figure 3: Equilibrium Conditions

Since a single firm can achieve more than one equilibrium outcome, as illustrated here by the model, it follows that similar firms can be in different equilibrium outcomes at the same time. In this way, sustained performance differences across firms may exist without any corresponding fundamental differences in the practices or in the environments of those firms. Some evidence of multiple equilibrium firm positions already exists in the system dynamics literature.

Risch, Troyano-Bermudez, and Sterman (1993) modeled a company in the pulp and paper industry that attempted to enter the specialty paper products market. The company's initially poor quality and reliability in specialty papers kept the company from developing many relationships as a primary supplier to customers. Instead of receiving the relatively large orders and long lead times afforded to primary suppliers, the company usually received the relatively small rush orders which the primary suppliers did not want to fill. Small orders, and short lead times, limited the company's ability to combine orders to achieve longer production runs. The frequent production changeovers required for short runs on short notice kept costs high and quality low. With high costs and low quality the company found it difficult to convince customers to engage in primary supplier relationships. The very strong positive feedback loop - linking the cost and quality of production with the number of primary supplier relationships - acted to maintain the company's low performance state despite the comparatively high performance of competitors which followed the same basic practices.

My own exploration of financial services firms served as the motivation behind the illustrative model presented above. The number of candidate positive loops for creating multiple equilibria among investment banks, for example, is quite high. Many of these candidate loops link company performance with the many types of resources (e.g. people, investment capital, reputation, client relationships, market information) that financial services firms employ. While there is a rich group of possible causes of multiple equilibria for investment banks, the alternative theories for sustaining performance differences are fairly easily challenged here. There are certainly different practices that the firms follow, but following similar practices does not always translate to similar performance across investment banks. Many of the investment banks are primarily located within a few miles of one another, minimizing the explanatory power of environmental differences. Finally, many of the firm's individual resources are quite fluid (e.g. mass defections of people, rapid movements of capital, reputations that swing with chance events, and information that quickly becomes obsolete) and taken individually these resources are unlikely to explain sustained gaps in performance across investment banks in the absence of a larger system of interconnections.

Discussion

The theory presented here is still in the process of development and evaluation in specific industry settings. Still, one can begin to determine the normative implications of multiple equilibria as a source of sustained performance differences. While managers should not stop being concerned with their choice of practices, the influence of their environment, or the development of specific valuable resources, they should also not assume that permanent changes in performance require permanent changes in these factors.

Firms in low performance equilibria may be best off by returning to their initial practices once they have made the transition to a higher performance equilibrium state. The challenge for managers will be to try to understand the key elements of the system that create the potential for more than one equilibrium, and the leverage points in the system which might provide opportunities to move from one equilibrium state to another. In some instances, the notion that

strategy involves making long-term changes in a firm's practices may be misguided. Instead, in situations where multiple equilibria exist, the task of strategy may be to make temporary changes. These temporary changes, if they are successful, will propagate through the system to change the performance of the business for the long term even after the original policies guiding the business are restored.

Managers of firms in low performance equilibria, and strategy scholars, may accordingly wish to shift their emphasis from studying the "best practices" of high performing firms towards the study of the process by which firms shift from low to high performance. When comparing current high and low performers, scholars always risk identifying largely irrelevant practices, or superficial differences, as sources of performance discrepancies. When different equilibrium outcomes are responsible for performance differences, the risk of spurious findings from comparing high and low performers is heightened. Firms in different performance states will make different decisions even when they are applying the same practices (i.e. firms in different equilibrium states will have different information flows, causing them to make different decisions when using the same underlying policies). Studying transitions across equilibrium states, on the other hand, will provide valuable insight into the key elements of the structure that give rise to multiple equilibria and paths that firms can successfully follow to move across those equilibria.

References
Arthur, B. (1989). Competing Technologies, Increasing Returns, and Lock-In by Historical
        Events. The Economic Journal, Vol. 99 (March), pp. 116-131.
Cubbin, J., & Geroski, P. (1987). The Convergence of Profits in the Long Run: Inter-Firm and
        Inter-Industry Comparisons. Journal of Industrial Economics, Vol. 35 (4), pp. 427-442.
Forrester, J. W. (1961). Industrial Dynamics. Cambridge MA: Productivity Press.
Krugman, P. (1996). History and Industry Location: The Case of the Manufacturing Belt. The
        American Economic Review, Vol. 82 (2), pp. 80-83.
Mueller, D. C. (1977). The Persistence of Profits Above the Norm. Economica, Vol. 44 , pp. 369-
        380.
Mueller, D. C. (1986). Profits in the Long Run. London: Cambridge University Press.
Porter, M. (1985). Competitive Advantage: Creating and Sustaining Superior Performance. New
        York: Free Press.
Risch, J., Troyano-Bermudez, L., & Sterman, J. D. (1993). Designing Corporate Strategy With
        System Dynamics: A Case Study in Pulp and Paper Industry. System Dynamics Review,
        Vol. 11 (4), pp. 249-274.
Wernerfelt, B. (1984). A Resource-Based View of the Firm. Strategic Management Journal, Vol.
        5, pp. 171-180.