



## The new firm. A note on the changing character of the enterprise

By Allen Frankel  
CGFS Secretariat

The major economies have undergone radical transformations. The character of economic activity has changed: much more emphasis is now placed on finding ways to improve provision of technologically sophisticated services than on the manufacture of standard widgets.

Innovative service industries employ an unusually well educated labour force. This labour force composition is appropriate in light of the essence of these specialised problem-solving services employing sophisticated information technologies. Nonetheless, as documented in the Black-Lynch study discussed below, productivity in manufacturing at the plant level can be linked to the availability of computers to non-managerial workers.<sup>1</sup> This discovery lends support to the thesis that the greatest difference in the New economy is that firms are organised and incentives employed to motivate an educated labour force.

In a series of papers, Rajan and Zingales (R&Z) have developed interpretations of New economy phenomena, and these have in turn led to possible implications for the future organisation, management, and financing of business enterprises.<sup>2</sup> Through individually and jointly authored papers, R&Z have developed a notion of a new enterprise. A central premise of their work is that a crucial future element of competition among enterprises will be how effectively firms manage the processes through which they seek to motivate employees to enhance their firm-specific skills, rather than simply upgrading skills demanded in the open labour market.

Consider some possible implications of the R&Z framework. One such implication is the possibility that a country's financial policies unnecessarily limit its potential economic growth because they cannot accommodate the use of firm-specific labour incentives. For example, financial regulations that effectively discourage the use of equity incentive schemes limit the capacity of the firm to motivate employees to participate in in-house training programmes, rather than taking a university course. We might also explore the possible implications for enterprise financing. All other things being equal, the presence of equity incentive programmes shifts the burden of risk-bearing involved in firms' activities from external investors to employees' households. This can be restated as follows: if the firm experiences a poor outcome, its employees will earn less than they might in the open labour market. The opposite is true for a good outcome.

To clarify the concepts already introduced, we compare two hypothetical firms: Firm One, a traditional firm, and Firm Two, a not so traditional firm. Firm One pays its employees the market wage. The compensation of each employee is based on the results of a global wage survey employing standardised market classifications, such as whether an employee has completed recognised professional training programmes conducted by organisations such as the International Association of Technology Trainers (see <http://itrain.org>).<sup>3</sup> The firm's expenditure on wages and capital equipment is financed by bank loans or shareholder capital. Finally, profits (amounts earned in excess of wages and interest payments) are captured by the outside shareholders.

---

<sup>1</sup> See "What's driving the new economy: the benefits of workplace innovation" by Sandra E Black and Lisa M Lynch, *National Bureau of Economic Research (NBER) Working Paper 7479* (revised October 2000).

<sup>2</sup> Two examples are "The governance of the new enterprise" by Raghuram G Rajan and Luigi Zingales, *NBER Working Paper 7958* (October 2000) and "Corporate governance" by Luigi Zingales, a contribution to *The new Plagrave dictionary of economics and the law* (draft dated October 1997). A listing of R&Z's work is to be included in the bibliography being assembled for the Working Group.

<sup>3</sup> See <http://itrain.org>



Firm Two's employees receive revenue participation certificates. The allocation of certificates among employees is based on an assessment of each employee's direct, and indirect, contribution to the success of the firm. The firm's equipment is leased. At fixed intervals employees can redeem some, or all, of the certificates they hold at a price determined by an independent assessor. In good times, employees' households have access to easy credit to finance a high level of consumption prior to the redemption date. In bad times, these households face tighter credit conditions and therefore engage in lower consumption in the absence of accumulated savings from previous periods. R&Z argue that some employees will choose to work for Firm Two because they are inclined to take advantage of incentives on their own, some will choose Firm Two to benefit from positive spillover effects, and, finally, some will choose Firm Two for both reasons. Spillover benefits include the high productivity of those others who be willing to accept an employment contract at lower fixed wages but with performance-based incentives.

The remainder of this paper explores a number of topics from a new enterprise perspective. They are: corporate governance, venture capital financing, the employment of recognised brand names as a co-ordination mechanism, sources of residual risk, evidence on the effectiveness of incentive structures, a case study of one large firm's heavy reliance of an employee stock ownership programme and a set of discussion points.

## Governance

Over the course of the 1990s, stock-based incentive programmes from US companies increased in number. One recent estimate is that by 1998 almost half of US companies granted stock options to their exempt salaried employees.<sup>4</sup> This phenomenon is but one manifestation of the changes that have taken place in how US firms are organised and managed.

Observations on what has changed about the nature of firms should encourage us to re-examine what we have taken for granted in corporate governance. In particular, if the importance of human capital management has grown, what has it meant for how firms are governed? Questions have been raised about the relevance of models of corporate governance constructed to explore the implications of firm-specific physical assets.<sup>5</sup> Implicit in this line of argument is a challenge to the acceptability of the presumption that the value of an enterprise will always be maximised if the residual claims on it reside with the shareholders of the firm. Before proceeding, we thought it might be useful to outline important characteristics of old economy firms and new enterprises, respectively.

## The Old Economy Firm

An old economy firm pays its employees market wages differentiated by recognised skill categories.<sup>6</sup> The firm accommodates an interest of a diverse group of shareholders to jointly control physical assets and intellectual property. Such ownership matters, because it confers a right to manage jointly owned assets and contingencies not described by explicit contracts. For example, a contract scientist in an old economy pharmaceutical firm discovers a new drug, which is then patented and marketed by her employing company. The drug proves to be extraordinarily profitable, because it is fortuitously

---

<sup>4</sup> Exempt employees include professional and managerial employees. Another indicator of the spread of stock options is that in 1998, 12 percent and 10 percent of US companies awarded options to their non-exempt and hourly employees respectively. These prevalence data are reported in an unpublished paper by Brian J Hall and Kevin Murphy entitled "Stock options for undiversified executives" (November 2000). They were derived by Hall and Murphy from the results of a survey conducted by the American Compensation Association.

<sup>5</sup> One alternative has been explored by Diego Rodriguez Palenzuela. He considers the case of the imperfection of intellectual property rights as the central motivation for the organisation of firms. See "Sources of economic renewal: from the traditional firm to the knowledge firm", *ECB Working Paper* No 43 (February 2001).

<sup>6</sup> By illustration, for any given profession there would be different wage levels for masters, journeymen and apprentices.



discovered that it is an effective treatment for a disease. This favourable outcome has no effect on the compensation of the contract scientist, since she is paid a market wage determined by an authoritative survey of what other firms are paying scientists with her academic qualifications and years of experience. In this environment, the scientist has an incentive to make an investment that will increase her market wage; for example, through receiving a PhD. On the other hand, the scientist is offered no particular incentive to forgo seeking the graduate degree and instead to make an effort to increase the likelihood that she will make a second discovery.

Old economy firms are managed by owners' agents who have no endowed ownership interest in the firm they manage. The alignment of the interests of such managers with those of the providers of finance to the firm is the corporate governance problem. This is the case for both publicly traded firms with dispersed ownership, as well as for closely held firms in which owner families no longer actively participate in the management. Concentration of ownership does matter. For example, the dispersed owners of publicly traded firms have little incentive individually to monitor a firm's "hired" managers closely.

To develop an understanding of the new enterprise, we employ two scenarios. In the first scenario, a group of scientists has been discussing the possibility of developing a new product. The scientists have no previous experience in such an undertaking. They develop a business plan and are successful in arranging venture capital financing. To protect its interest, the venture capital firm requires the scientists to provide it with control rights over the intellectual property developed by the group until the time the firm is taken public through an initial public offering (IPO). Throughout the development period, the venture capital firm is involved with the group. It provides consulting advice, including contracting for specialised services. The venture capital firm also serves as a general information broker on behalf of the group.

At a point in time, the group of scientists successfully develops a prototype of its product. With the assistance of the venture capitalist, it makes contact with a number of banking firms. This leads to a contract with an investment banking firm to underwrite the public sale of stock.

Once the IPO is concluded, the venture capital firm relinquishes its control rights. The group of scientists, who retain a majority interest in the public corporation, acquires control thereof. The key features of this scenario are the ability of the venture capitalist to assess the potential for success of the development project, the interest of the group to contract in such a way that they can reacquire control if the project is successful, and the willingness of the investment bank to risk its reputational capital as an underwriter of stock on the basis of the information provided to it by the group and the venture capital firm.

In the absence of access to the investment bank's participation, it would have been more difficult for the scientists to enter into an arrangement which returned control to them if they (as a group) performed well.

The bottom line is the recognition that, without a well developed chain of relationships among financial firms, the group would not have been able to write the contract which accommodated long-term control of the firm by the founding group. This highlights how the overall structure of financial arrangement can matter for how firms are managed and organised.

The second scenario considers the case where a new economy firm has developed a valuable brand name, (for example eBay), which it has sought to exploit through the creation of independently managed and financed subsidiaries in a number of countries. The corporate governance problem for this organisation is to create an incentive mechanism that encourages employees in any one of the units to choose projects with the highest overall organisation returns, including positive spillover effects; as opposed to projects with higher locally captured benefits. This is a typical problem faced by various forms of partnership.

In the case of new economy firms, valuations in the public equity market can be used to assess the efficiency of their incentive programmes. For example, if the market valuation of the firm as a whole

were at a discount to the calculated sum of the values of the individual units, then one might conclude that the incentives had produced inefficient cross-subsidies among the units.<sup>7</sup> On the other hand, if the market value of the firm as a whole exceeded that of the sum of the individual independently valued units, then one might conclude that the incentive mechanism was well designed in terms of facilitating the capture of benefits of positive spill-over effects available to the organisation.

### **Bearers of Residual Risk**

A standard treatment of the organisation of a firm is to consider a nexus of contracts among the firm's stakeholders. The actual structure of contractual relationships can be said to matter for the governance of the firm when complete (state contingent) contracts cannot be written. That is, firms are said to govern only when there is scope for discretionary (not fully described by contractual provisions) actions, in which case control can be exercised over the firm's resources. Employing standard assumptions, the answer provided by economic theory is that the interests of all stakeholders (such as managers, employees, and suppliers) should be fully protected by their contracts. The sole exception would be shareholders.

Shareholders would be those who are the common contractual party of all of a firm's other stakeholders. Through their contracts, shareholders have accepted the risks involved in residual payoffs. That is, shareholders are those stakeholders who reveal a comparative advantage in terms of a willingness and capacity to deal with risky outcomes. Among all stakeholders, shareholders request the smallest premium for selling to all other stakeholders in which they bear residual risk.

R&Z has crafted an alternative definition of the firm, one that highlights the potential uniqueness of individual firms. They view firms as a combination of initiatives that cannot necessarily be replicated through arms' length (open market) financial contacts. The main advantage of their more inclusive definition is the recognition of enterprise value created through the capture of spillover effects. By lifting the restraint that the border of firms must be defined by legal contract, R&Z accommodates the possibility that the value of an enterprise will be maximised when a diverse group of stakeholders is accorded a discretionary role as opposed to limiting the exercise of discretionary behaviour to shareholders on the basis of their role as bearers of an enterprise's residual risks. This, in turn, led R&Z to consider the role of the board of directors as an enterprise's oversight body.

In a traditional firm, the board of directors is simply concerned with overseeing the appointment and compensation of top management. It is a mechanism through which shareholders can exercise discretionary control. In the R&Z firm, the board would be involved in the details of management and organisation design. The board of an R&Z enterprise would be responsible for developing, and periodically assessing, the means through control rights vis-à-vis the enterprise's resources are allocated among various stakeholders.

In this connection, R&Z emphasises the importance of the board's role in the creation and employment of equity-based incentives. They view such incentives as a primary means to coordinate initiatives of the enterprise's stakeholders.

This leads them in turn to make specific suggestions. For example, they advocate a system of delayed vesting of equity. This is because delayed vesting encourages employees to share in the benefits of spillover effects from development of firm-specific talents by employees, contingent on an employee staying with the firm. Equity stakes give employees a payoff contingent on firm success: they become co-conspirators in the success of the organisation.

We now turn to evidence that has been developed regarding the significance for the US new economy of workplace innovations, as well as a case study of how US Fortune 500 company Science Applications International Corporation motivates its employees.

---

<sup>7</sup> See "The cost of diversity: the diversification discount and inefficient investment" by Raghuram Rajan, Henri Servaes and Luigi Zingales, *NBER Working Paper* 6368 (January 1998).

## Motivation

The prediction that a broad cross section of employees can be effectively motivated by equity-based incentives has been recently considered in an empirical study by Black and Lynch. The Black-Lynch research considers the hypothesis that changes in the organisation of firms (that is, the workplace), in part accounted for the increase in US productivity. The study employs plant-level survey data collected in 1993 and 1996 from more than 3,000 US manufacturing establishments.

The researchers use the survey data to examine the presence of computers, the use of incentive pay (including stock options) and worker characteristics (such as education) on productivity. They find a significantly positive relationship between the proportion of non-managers using computers and productivity, but do not find a significant relationship for the proportion of managers using computers alone. They also discover that the presence of incentive pay mechanisms adds significantly to productivity. This result holds for stock option as well as for profit sharing programmes.

The results of the Black-Lynch work support the relevance of R&Z framework in developing an understanding of what is changing about the organisation of firms and of its possible significance. This support is buttressed by the researchers' interpretation of their findings, supporting the notion that in the "new economy" one finds increasing proportions of non-managerial workers serving as problem solvers in one way or another. With respect to stock options, the study's findings lend empirical support to the intuition underlying the R&Z framework, namely, that the outcome of business competition in the new economy is, in part, influenced by the relative effectiveness of equity-based incentive mechanisms.

## SAIC: A Case Study

At this point, it might be useful to consider the aggressive use of equity-based compensation at a large US firm. The case study is incomplete, because it concentrates on the objectives of the programme and how it is implemented. Nonetheless, we thought it would be useful to review this information on the basis that it reasonable to assume that lessons learned are incorporated in the structure of a programme that has been in place for more than 30 years. That is to say, we appreciate that it would be inappropriate to make any general observations based on this single case.

Science Applications International Corporation (SAIC) is ranked #296 among the Fortune 500 listing of the largest public companies in the United States.<sup>8</sup> SAIC has more than 40,000 employees. It is an information technology company employing a staff comprising scientists and engineers. For the most part, SAIC bars outside investors from holdings its shares. That is, almost all its the shares are held by current employees.

The stock programme provides three means through which employees acquire shares. Individual managers can award stock bonuses and stock options. Managers can make equity awards. Employees can invest in shares on their own. Finally, all employees have entitlement rights that ensure all gain some ownership

The management-discretionary methods are of considerable interest in view of our discussion of their potential role in a new economy enterprise. Awards may be based on performance, used as an enticement to bring in a new employee, or embedded in a contingent agreement for achieving a verifiable objective. Special emphasis is placed on vesting awards, because of their incentive effects vis-à-vis tying an employee to SAIC for an extended period. For example, stock options vest over four years and can be exercised over five years.

A separate policy exists for key employees. For this 5% of SAIC's work force, an objective has been set for them to achieve holdings equal to 2 – 2.5 times annual salary after five years of employment.

---

<sup>8</sup> The discussion of SAIC incorporates information from various items at [www.SAIC.com](http://www.SAIC.com). Because SAIC has a large number of shareholders, it is necessary for it to engage in standard disclosures required of a US public company even though its shares are not publicly traded.



The stated purpose of this objective is encourage these employees, in particular, "...to align their professional interest with those of the enterprise as a whole. A further objective is for a portion of an employee's ownership stake always to remain unvested, a rolling source of incentive to stay with the firm.

Bottom line: the SAIC stock programme employs incentive devices in a manner consistent with R&Z's prototype design for the organisation of a new enterprise. This outcome is interesting in the sense that it demonstrates the long-term sustainability of generating innovation through a performance-related incentive structure.

In considering the SAIC case, some other details could be of interest. Even though SAIC is a large public company, the stock is not listed on any exchange. The company provides a market for its stock at a price set by its board of directors using a formula that takes into account earnings, shareholder equity and a market factor. The market factor reflects the performance of comparable publicly traded shares and the economy in general. Finally, as required by US law, the company employs an independent appraiser who provides an opinion as to whether the set price is a fair market value.

In order to provide a market for its stock, SAIC established a wholly-owned broker-dealer subsidiary to administer quarterly trading. The company typically participates in this trading by serving as either the buyer or seller of last resort. Only once since 1987 has the company not stepped in to ensure that trades were fully subscribed.

The SAIC case is interesting because it combines new enterprise-type incentive programmes with non publicly traded equity. In the course of the 1990s, we have come to presume that a necessary condition for US firms to employ stock-based incentive programmes is the opportunity to benefit from access to public capital markets. In the wake of the global tech market correction, we may want to reconsider the role of public equity trading in shaping the organisation of new enterprises.

### Issues for Discussion

1. The character of labour contracts has been of perennial interest to central bank policy makers. The new enterprise brings with it radical changes in labour market contracting. Could this matter for how the economy responds to monetary policy? Has it in some cases already, in terms of modifying the behaviour of important statistical indicators such as the US employment compensation index (ECI)?<sup>9</sup>
2. Recent newspaper reports discuss a surge in personal bankruptcies among tech company employees in the United States. The employees in these cases had borrowed against collateral generated through the exercise of stock options in their companies. If these recent reports capture a quantitatively important phenomenon, what lessons should be drawn about the possible behaviour of the household sector of new enterprise economies?<sup>10</sup>
3. The reliance of new economy firms on stock programmes to provide worker incentives means that potential outside shareholders bear larger dilution risks. What is the experience concerning the effectiveness of equity markets in pricing stocks with substantial dilution risk? Is there evidence that the reliance on stock programmes by new economy firms has created special concerns about the quality of their public financial disclosure?
4. The case of Saatchi and Saatchi, an advertising firm, has been cited by R&Z as illuminating the consequences for corporate governance of changes in the nature of the firm.<sup>11</sup> They comment on the ill-considered effort of a number of institutional investors to oppose a motion

<sup>9</sup> In considering this question, it would be particularly useful to consider evidence reported in "The impact of employee stock options on the evolution of compensation in the 1990s" by Hamid Mehran and Joseph Tracy, FRBNY draft (January 2001).

<sup>10</sup> See "Salomon faces complaints over options at WorldCom" by Gretchen Morgenson, *New York Times* (April 24, 2001).

<sup>11</sup> The case is set out on pp 28-29 of the R&Z paper entitled "The governance of the new enterprise".



to give a generous stock option grant to the senior management of the firm. In response to these efforts, senior management left the firm and created a new firm, taking with them a number of the most important clients of the original firm. The consequence of this recruitment was a sharp drop in the market valuation of the original company. What lessons should one draw from this episode? Is one possible lesson that it is inherently more difficult to value a firm highly dependent on its ability to retain human capital? Are the standard methods of credit risk assessment appropriate for new enterprise firms? If not, what are the implications for the bank, as opposed to capital market financing of such enterprises? Finally, from the perspective of financial regulation, should there be special concern because financial firms must compete by motivating employees through incentives whose effect on the finances of the firm are difficult for supervisors to assess?