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by

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THE FIRM AS A COMPETENT TEAM

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Abstract*

Results from empirical studies of firm behavior are synthesized into a theory of the firm as a competent team. I demonstrate the existence of a tacit organizational competence exercising a leverage on the productivities of all other factors through selecting and allocating competent people, thus earning a monopoly rent in the capital market.

The competence identified can only be fairly compensated through sharing in firm value growth in the equity market, exhibiting undervaluation of prime assets. Policies aimed at firm efficiency should improve the market measurement function, including stimulating insiders to exhibit information through trades.

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1 Introduction

From a series of depth interviews with the managers and detailed surveys describing the cost and financial structure of Swedish firms (Eliasson 1976, 1984b, 1989b), a profile of modern business has emerged that is only partially recognized in economic theory but whose salient features must play an important role if we are to understand the forces currently shaping the world economy. In this paper I describe this profile and suggest its implications. In particular, I argue that insider trading and corporate take-overs are necessary for the effective working of capital markets.

Three basic concepts are central to my argument; those of (i) the business opportunity space, (ii) tacit knowledge, (iii) the experimental nature of competition. Before proceeding we need to understand what they are about.

Management assesses its business potential from the point of view of its particular, but limited capacity to orient itself successfully in a largely unknown business opportunity space that includes nature and the accumulated knowledge of all agents in the economy. So do all its competitors, and the business opportunity space depends on what they all plan to do on the basis of their perceptions of one another, and how all their plans are realized. The opportunity space is so large, compared with local (and heterogeneous) information processing capacity of firms, as to prevent all but a "fractional" penetration and understanding of each firm. Its content cannot be catalogued.

There is a top competent team of the firm, that will be more precisely defined below. The firm is organized such that this team exercises a top down "leverage" or scale effect on the productivities of the entire business organization.

The concept of tacit knowledge (see Polanyi 1967, Nelson – Winter 1982, Murnane – Nelson 1984, Pelikan 1989) is subtle. I will define it in terms of "limited communicability" of knowledge. It is an asset that is embodied in individuals or teams of individuals and can be traded only in the markets for management. Direct communicability is limited by the codability of the content of the knowledge base, the transferability of the code and the competence of receivers to read the code and to apply the so acquired competence to their own situation.[1] Tacit knowledge defies the notion of full information and optimization behavior. With it, economic filtering and experimental economic behavior enter.

In their pursuit of profits modern business firms operate in more or less free and experimentally organized markets, ranging from the international financial markets to markets with restricted competitive access, as in the Eastern planned economies, and the public sectors of the Western nations. By experimentally organized I mean that agents are free to enter markets in competition with incumbent producers. Engaging in competition is synonymous with testing a hypothesis about ones own competence through setting up an experiment in the market. Very frequently the hypothesis is rejected (Eliasson 1987a).

The "leverage" or scale effect on the productivities of all factors of the tacit knowledge "T" of the top competent team can be expressed (Romer 1986, p. 1015) by the production function,

$$Q = F(T,x) \tag{1}$$

assumed to be concave in <u>measured</u> factor inputs x for any fixed value of T. Romer demonstrates that F exhibits increasing returns to scale in T. For Romer T is the exogenous, aggregate level of knowledge available to all firms. I assume, however, that T is "tacit", or unique and incommunicable. Romer's results for the economy then hold for the individual firm. It is the factor T that receives the residual profit when all other factors have been paid.

Tacit knowledge means that T(I) of one firm cannot be transferred into competitor T(II). Such a transfer requires that the code in which T(I) is stored can be made explicit or communicable and that firm II can interpret the same code. The competence to interpret the code must also reside in T(II). The assumption about an intractable opportunity space above can now be exactly reformulated as large enough to include at least one firm that is not able to interpret T(I). This lack of receiver competence is sufficient for the existence of tacit T.

The more heterogeneous the local knowledge base, the larger the "tacit" element of the total knowledge base of the economy. Limited local receiver competence poses limits to the communication of information. The outcome of economic activity cannot be ascertained before it has been tried in the market. This establishes the experimental nature of economic activity. As a consequence, the state of full information is at each point in time unattainable, leaving individual agents, at each point in time partially and differentially informed. This also establishes the experimental allocation of organizational competence as the rationale for the firm.[2]

Section 2 accounts for the organization of management and decision making in the firm. This account is complemented in Section 3 with accounting data, showing the extent of knowledge based information use in manufacturing. Section 4 returns to the competence of the firm and the organizational techniques of reproducing and upgrading it through the selection (filtering) and on-the-job-learning of people through careers. Finally, Section 5 considers the instrument that measures top level business competence and the nature of its compensation, and discusses the reliability and precision of that instrument, namely the equity market. The incentive and compensation schemes that emerge must influence both the supply and allocation of competence.

2 Organization of Management and Decision Making

The top team embodies the organizational competence in measurable managerial categories. The exercising of top organizational competence is best illustrated when a badly managed firm is taken over by new owners and its top executive group replaced. The team at the top decides on the orientation of business, on its organization and on the hiring of (lower level) talent. This top competent team is responsible for the creation of residual profits, when all other factors have been compensated. [The top competent team, hence, as mentioned exercises the leverage effect associated with T.] It can only be adequately compensated through sharing in the residual profits.

The top competent team is best identified through its authority to exercise control. It is not well defined in organizational language. In Sweden it is made up of the dominant owners on the Board of Directors and the top corporate officers. The relative influence of outside directors and corporate officers varies between firms and over time. Certain national characteristics can be observed that are based on tradition and legal rules. The point is that the team is self-organized and cannot easily be described by legal positions, titles or organization charts. Nonetheless, it exercises the control function that links the internal financial accounts with the external capital market. Rate of return targets are confronted with the market interest rate, and used to coordinate all local decisions.

Schumpeter (1942, p. 123) called the invention of double entry accounting in medieval Italy a major technological innovation that made rational profit and cost calculation possible. He observed that it has become the central instrument for organizing, building and coordinating today's large

business organizations. This calculating device – a financial control function – to integrate the financial and real dimension of the business activity makes it possible for the firm to integrate profitably the financial and real dimensions of economic activity at the central level.

Decisions related to the entire firm are typically separately organized (very much as shown in Figure 1); the strategic level in charge of orientation, reorganization and the hiring of talent, the control level coordinating existing unit (divisional) activities and the local rationalization level in charge of performance upgrading of existing activities. Each draws on different bodies of tacit knowledge

At the rationalization level decisions are local, delegated, well structured and carefully prepared by experts. Observation is relatively easy. Most business administration literature is concerned with well defined problems at this level. Previously, such decisions focused on new machine investments (e.g. robotization in workshops). Today we find that rationalization decisions in manufacturing firms in a large measure involve information activities such as accounting, accounts receivable, software development, etc.

Existing, well structured activities of the entire firms are coordinated into an orderly, fast flow. "Budgeting" is designed to monitor and coordinate divisions of the entire business entity. Central coordinators deal with well defined elements in that flow process, relying on the language of targeting – budgeting – reporting and control to achieve flow efficiency. Middle management enters as communicators between the top executive level and the shop floor (Eliasson 1976, p. 219, 1989b). Also marketing and distribution belong here, connecting the production system with ultimate demand.

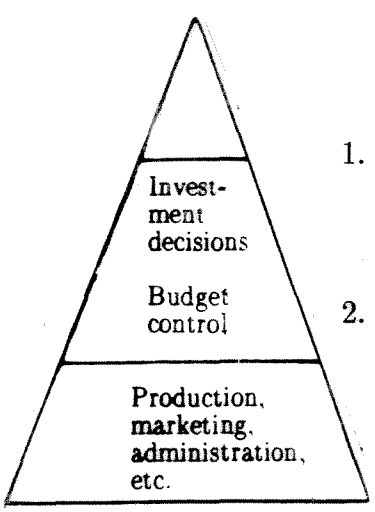
The situation is dramatically different at the top corporate (strategic) level where decisions are made by the competent team that affect the structure of the hierarchy, or the choice of control technique. At this level decisions are concerned with innovative organizational activities, the choice of decision model, the frame of reference, the direction and the business problem of the organization as a whole. These are not analytical activities, but a dialectical process among groups of competent people, bringing (often) inconsistent approaches together into a synthesis (Mason 1969, Mitroff 1971, Eliasson 1976, p. 87). The top competent team resides here.

Balancing the top level innovative and organizational decisions with the middle level coordination task of running production efficiently embodies a major organizing problem in large business firms. It involves applying competence vertically through the layers of management (the pyramid in

Figure 1). With tacit knowledge being the dominant input, individuals who aspire to be members of the top competent team must engage in on the job learning at all levels, eventually to be filtered to the top (see left column in Figure 1). The organization of these careers is also tacit. Hence the competent team currently in charge will be dependent on the preceding team, and so on, each firm being a separate path dependent entity, with an organizational memory.[3]

This means that a large number of different organizational forms have been tried and are currently practiced. Sometimes the innovative mode dominates, sometimes the conservative mode. It depends, which one happens to be regarded as most efficient. The tightly controlled U.S. conglomerate organizations differ clearly from the tightly, but differently controlled "banking groups" in West Germany and even more so from the more loosely structured Wallenberg Group of companies in Sweden.[4] The objectives of the top competent team, the dominant owners and/or the capital market agents that rule the firm ultimately have to be geared to the value that "the market" sets. At each point in time this value determines the liquidity of the tradable assets of the firm and the spot market value of the competent team. It also determines part of the team's compensation. The analysis of this market valuation is taken up below.

Figure 1 Levels of decision making within a business organization



	Type	Taken by and where	Answers question	Competence creation
1.	Strategic selection (affecting structures)	Top competent team CEO Board owners	What?	Selection Varied career Experience
2.	Control (Coordination)	CHQ Staff	In which order?	Education College, and University
	Operational (rationalization)	Locally	How?	Training Vocational

Source: Eliasson (1985, p. 14).

3 The Technology of Economic Information Processing and Communication

The outcome of competition, and the nature of the local market environments of each firm depend on how the total economic system is organized to coordinate individual action. Coordination takes place within firms, through administrative procedures and between firms in markets, through prices that are determined by the ongoing, combined actions of all agents.

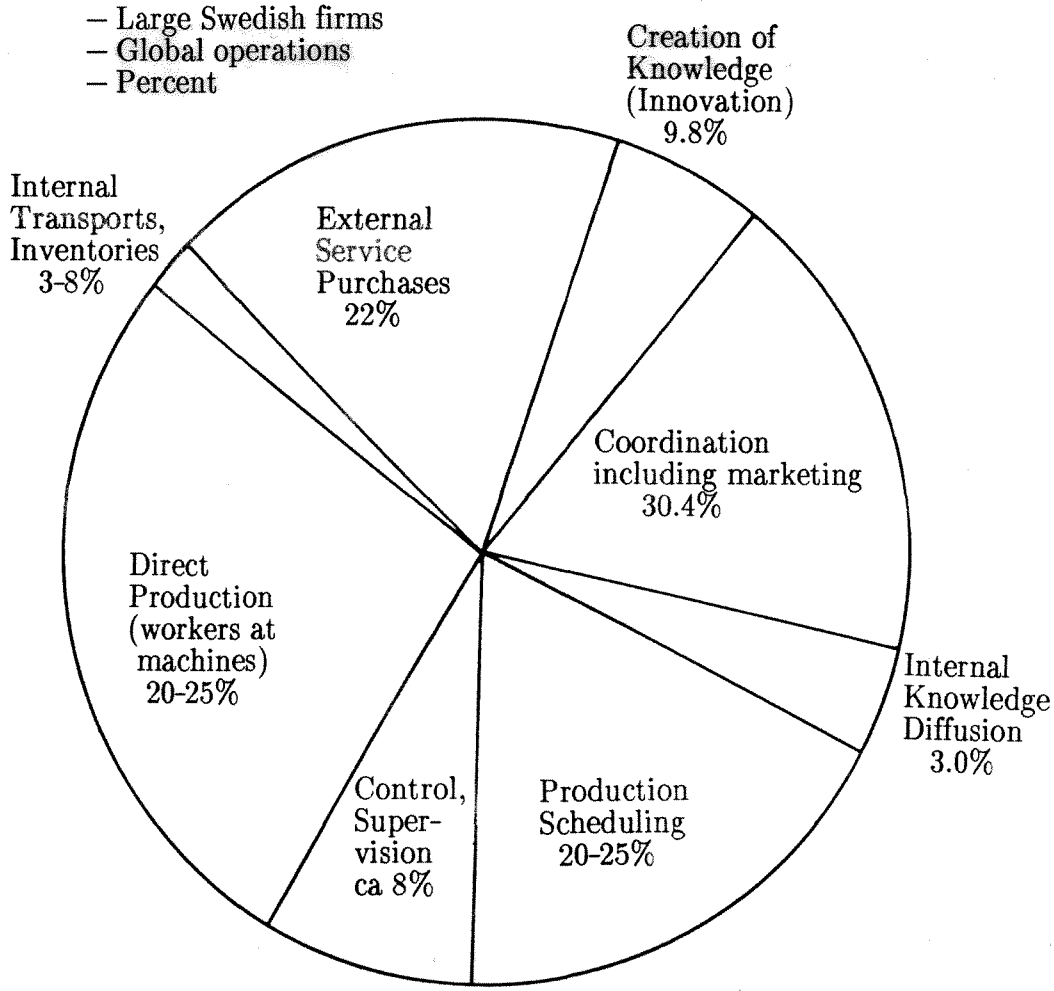
The firm exists on the basis of its management's competence to internalize the coordination of activities and to earn a positive return on assets over the market interest rate. The "asset" that accomplishes that coordination is the local knowledge base that we have called T. Its character – and thus the firm – is revealed when the control system of the firm has been defined. It relates the objectives of the top competent team to real operations via administrative technique. Since the knowledge base is locally embodied in individuals or teams and largely incommunicable the firm can be viewed as a hierarchy of ordered teams of people embodying the human competence needed to coordinate resources (machines, raw materials, labor, etc.) to generate economic value or profits. Managerial technique becomes the art of organizing competent people, such that maximum economic value is created. Obviously this has something to do with incentives. Long-run survival of each firm as a successful generator of economic value requires that team competence be constantly upgraded, and new knowledge effectively diffused through the organization.

The knowledge intensive information activities in which the firm beats competitors in the market are of four different kinds; innovation (or knowledge creation), knowledge transfer (learning), knowledge allocation (filtering) and coordination. Such internal information processing in firms is a dominant resource-using activity. Its efficiency determines the productivity of the economic system and the relative size distribution of firms. "Knowledge creation" associated with product improvement, product specification, technology, coordination, and marketing requires investment as much as, or more than all funds spent on machines and buildings in the large Swedish corporations (Eliasson 1987a, p. 12 and 58). We do not have good cost data on the transfer of knowledge within the firm, but evidence tells that some "advanced" firms devote resources not much less than resources spent on R&D on formal, "measurable", internal education programs. We know that the competence accumulated through these activities in a firm is learned through participation in market competition, or direct purchasing in the

markets. Until the competence has been diffused in the market it is a "tacit" or "unique" competitive advantage of the firm.

Not much more than 30 percent of internal labor costs in large Swedish firms can be characterized as direct production (see Figure 2). Some 8 percent is devoted to innovation, and some 3 percent to measured internal education.[5] Altogether some 60 percent or more of total labor input is devoted to coordination, filtering and the creation and diffusion of knowledge. Part of this goes into "on the job learning", enhancing the tacit knowledge base of the firm, an activity that cannot be separated in the cost accounts. Large resources moreover are devoted to attempts to acquire knowledge (purchasing of external services, acquisition of innovative firms etc.) an experimental

Figure 2 **Distribution of labor**
– Large Swedish firms
– Global operations
– Percent



Goods processing: 56.7%
Total: 122%

Source: Eliasson (1989c).

search activity that now and then leads to mistakes that should also count as learning costs. Strong diminishing returns in the creation of such tacit knowledge guarantees that a firm, once in a superior competence position, won't be able to systematically invest in learning to take over the entire industry.[6]

With knowledge-based information processing a dominant resource-using activity, technological change in the "innovative", "educational", "filtering" and "management coordination" activities will be the efficiency determining characteristics of the firm or of the whole economy. With this classification of various production activities "technological change" as we see it, measured in macroeconomic terms, is directly linked to how hierarchies and markets are organized to control economic activity.

4 Is the Firm a Planning or an Experimental Machine

Competition depends on the number, financial strength, aggressiveness and orientation of participating agents. With many competitors with different competence, behavior will be largely experimental, outcomes uncertain and the monopoly rent created by each Schumpeterian innovation temporary. The business positions may be suddenly upset by unexpected success of competing innovators. Firms that behave as analytical planning machines, carefully gathering relevant information needed for fully informed business decisions may do worse on average than daring firms that act prematurely on a trial sense of direction.

Because critical elements of industrial know-how are tacit and not communicable there can be no corresponding markets for "information". Agents have to experiment in order to acquire it. A slow or overly "academic" decision process gives time for competitors to come up with better ideas. Moreover, in markets with technological product competition the outcome of a new business idea will always be highly uncertain until it has been tried in the market. The more aggressive and competent competing firms, the larger the likelihood that "someone else" will be the first to cussed. As a consequence, decisions (including "inaction") are often premature and mistakes frequent and expected. The long-run survival of firms will depend on willingness of the competent team to change course and its ability to identify and correct mistakes.

The competence endowment of a firm can now be summarized by the following six characteristics;

(1) Sense of direction (intuition)
(2) Daring (risk-willingness)
(3) Efficiency in identifying mistakes (analysis)
(4) Effectiveness in correcting mistakes (activity)
(5) Effectiveness in managing ("coordinating") successful experiments
(6) Effectiveness in feeding acquired experience back onto (1)

The ability to sense the direction [item (1) in table] better than the market at large reduces the uncertainty that the firm is experiencing compared to outside market analysts, and allows it to act faster and more daringly. What the outsider may regard as non-calculable uncertainty, the executive team converts into an appreciable risk situation (a hypothesis, an experimental design) on which it acts. This conversion, however, is entirely subjective. Each actor imposes a simplified personal (subjective) theory on all the "facts" to achieve subjective order out of an immensely complex business situation. Such boundedly rational behavior (Simon 1955, Day 1971) is necessary to be able to act, to carry out the experiment. "Bounded rationality" hence incorporates important management technology, namely the competence to choose the right "theory" through which to filter the facts, to evaluate the business situation. No outsider can make the same "conversion" except by proxy, i.e. evaluating the team which has set up the business experiment. (Hence, outsiders will perceive risk neutral – or even risk averse – behavior on the part of the top executive team, as riskwilling.)

The more competitive the market setting, the more critical the filter that selects the competent team at the top that can take early and fast action on a sense of direction that is relatively better than that of other teams. In this sense the firm is setting up and enacting subjectively controlled experiments, based on hypotheses about opportunities in the market.[7] Each agent (competitor or market analyst) is an outsider in this game. Each individual actor may nevertheless act as if he appreciates his environment as a learnable, estimable process by imposing his personal interpretation. Hence, the agents can optimize on their perceptions of their environment even if the economy is experimentally organized. Behaving as if the economic environment is predictable in order to be able to optimize in a mathematical sense will, however, normally mean that you are making an error. Rational learners will, hence, eventually learn that they won't be right in expectation (Day 1975).

Making the competence to transform "uncertainty" into "computable" or "insurable risks" (Eliasson 1985, p. 315) the rationale for the existence of the firm is most adequately credited to Knight (1921).[8] [In a parallel paper (Eliasson 1989c) I have shown in detail how these boundedly rational

"interpretation" systems are organized in firms, and how firms manage the trade-off between long-term innovation efficiency and short-term coordination efficiency]. In Knight (1921) computable risks could be handled in the insurance market. The entrepreneur is not concerned with insurance or risk taking (Schumpeter 1954, p. 556) but with uncertainty, which by definition corresponds to a market failure (LeRoy–Singell 1987). The entrepreneur enters with local "tacit" competence to put the business on a rational, computable footing. He has chosen his "view", his theory, and faces uncertainty associated with choice of model, a "subjectively computable risk".

Confidence in the decision model chosen and willingness to act (prematurely) on its predictions are conditioned by the ability of the competent team to cope with mistakes, early and reliable identification of mistakes and effective correction of mistakes [type (3) and (4) competence in table above]. Firm management now faces a narrow and well defined analytical problem, that is more in line with the "decision theory" one learns at school. This is the management activity most easily observed by outsiders. Hence, it is also fairly well described in literature, however, not from the point of view of the purpose presented here.[9] Finally, if the experiment has been checked and cleared, an entirely new information technology clicks in, designed for efficient flow operation [item (5) of the organization and increased preparedness for future innovative, experimental and possibly disastrous action [Learning feedback, item (6)].

The long-term success of a large corporation (therefore) depends on its ability to organize its career system filter, to upgrade the tacit knowledge base of its top competent team. This team sets the direction of the firm, and mobilizes and directs lower level competence. The selection of this team is largely self-organized, but the dominant owners play a critical role, either as raiders in the market, if the corporate officers manage to form a closed shop – as is often the case in the U.S. – or through competence contributions via a varied, informal interaction with the CEO, which is more typical of Swedish groups.[10] Hence the knowledge of how to organize a firm is "tacit". It is no surprise that so little empirical literature on this exists. Those who know do not write articles. The design of this filter, however, means life or death for the firm in the long term.

The career has two functions; (1) to allocate people with competence on tasks and (2) to educate competent ("talented") people by giving them a varied job experience so as to accumulate competence for even more demanding tasks. The organization problem is to design the incentive system so that these tasks are well performed. Since the best characteristics of a top

executive person have no clear definition, the filter is designed experimentally to monitor people and eventually to determine that the track record of this person or this team makes him or it competent enough to be given higher authority and more responsibility.

Business opportunities arise stochastically, as you go on experimenting. Hence, competence includes both the ability to sense an opportunity, the willingness to grab it before somebody else does, and identify and brutally scrap it, if it turns out to be a mistake. The weathering of major mistakes is the universal "criterion" of a large, old and successful business firm (Eliasson 1980). The organization has to allow mistakes to happen both to experience successes and to learn to identify and correct mistakes. The absence of a trail of mistaken decisions in an individual's career signals that the person has systematically avoided mistakes, or done nothing. He or she lacks experience in identifying and correcting mistakes.[11] Provided the notion of an experimentally organized economy is empirically relevant, such persons should never be promoted beyond the coordination level.

Even so, monitoring is always needed. Competence will never be completely ascertained, and the leverage exercised on the firm of top business officers makes for very serious consequences of bad business judgment, or misuse of trust. Outside financiers or the analysts in the market will never be able to evaluate the business situation, only to take an outsider position on insider's decisions. Hence, it is often demanded of the top corporate team, very much as in small professional groups (see e.g. Gilson–Mnookin 1984), that the persons trusted with authority also chip in "hostage" equity stakes. Hence, the team will gain handsomely if it lines up with the profit objectives of the owners of the firm and performs with competence, and lose significantly if not. Such "hostage arrangements" make top corporate officers share or lose, together with the owners. With insiders as significant owners, they cannot unload bad assets much ahead of an efficient market (see below). With tacit competence and ownership merged at the top reorganizing the firm and changing its direction normally means changing the top executive team.

Tacit knowledge integrates the two operating dimensions of a business; the real and the financial. Separability of transactions into financial and real markets in a Fisherian (1907) sense cannot be maintained. The top executive team and the dominant owners not only carry the risks associated with equity but also contribute the non-tradable organizational know-how that exercises a scale effect on the performance of the entire firm. The size of this scale effect means that the competent team can never be fully compensated for its

contribution – if positive – through regular salary arrangements. Neither can they be made effectively responsible for incompetence.

Compensation in the form of capital gains corresponding to the equity stake is the efficient incentive arrangement for such contributions of tacit knowledge. Hence, the only way for an executive to get properly compensated is through becoming a part owner of the firm; and vice versa, a top executive who dares not take on a (for him) significant equity position is signaling a lack of confidence in his own competence, that is in itself a form of incompetence.

Let ε be the addition to net worth of the firm. ε is just the residual profit earned by the owners of the firm, net of costs for measured inputs. (For an exact definition see (3b) in Eliasson 1984a). Compensation for risk and tacit knowledge contributes to the size of ε. The present value of all expected future ε should somehow relate to the size of T. ε is composed of a random component ex post, representing the outcome of risktaking, and a systematic component representing inputs of top level, uncompensated organizational competence.

The competence input by owners depends on a number of factors:

(1) genuine organizational competence
(2) ability (sense of direction) to place the business in the right price environment (selection)
(3) ability to influence product and factor prices in one's favor.

Monopoly market power, including the ability to hire excellent managerial talent cheaply [item (3)] of course, is part of items (1) and (2) type performance. In fact, the salaries of an excellent top level executive team rarely comes close to their contributions to the flow of income (or ε). The only way for the team to be properly compensated is to hold equity in the firm. The less the equity stake of the competent team the more surplus value it generates for the "other" owners.[12] Inputs of competence, hence, cannot be regarded as independent of access to ε (that is of incentive arrangements). Suppose that the only task of the dominant owner is to monitor the <u>external</u> management market and the <u>internal</u> market (the career organization) for management talent, a principal-agent task, so to speak. If competence accumulation is largely of the "learning by managing" kind, the high performing manager will always be in a hostage relationship to the dominant principal, who knows more about him than any outsider. If the manager (the agent) is also risk averse, he is likely to be underpaid. He contributes (because

of asymmetric information) surplus profits to the owner principal. The only way of recouping those returns is for the manager to take on an ownership stake.

The natural thing would then be to define the top competent team exactly as the recipients of ε, treating management with no equity stake as hired hands, the ultimate competence having been exercised by owners in succeeding to hire such competent management for salary compensation only. Actually, however, the distinction between management and owners is not that important. A large group of "free riding owners" are not part of the competent team, and lower level executives within the firm do not belong to the competent group. But they could hold larger stakes than the members of the top team. My conclusions in this paper do not depend on an exact definition of a team the composition of which varies from firm to firm.

Given what has been said so far the only source of valuation of the top management team is valuation in the stock market. Let us turn to that subject now.

5 The Firm's Information System, Insider Trading and Efficient Markets

5.1 A Capital Measurement Design

Human competence carries economic value. Human capital theory assumes human competence to be reflected in wages and salaries. So why cannot top team competence in firms be valued similarly? Obviously the quality of this method of measurement depends on what you assume about the efficiency of markets.

Much intangible capital in a business firm can be measured and capitalized along the same principles as for machines or buildings. The efficiency of the labor, the stock or the investment goods markets in evaluating these goods defines the quality of measurement. Similarly, as long as production costs to recreate information, software or a machine tool are known, or the item can be purchased in the market, replacement values can be established. Any critique on how to measure the capital value of an investment in an educational program, or in new software to keep track of accounts receivable can be leveled at the evaluation of a piece of machinery. A good reason for making these assets explicit is to force firm management to pay attention to the associated capital costs, and demand a return also from these assets.

A first requirement of an efficient market valuation of a firm is that known, and measurable intangible assets have been accounted for. The ultimate innovative, organizational competence of "the top competent team", however, has no defined reproduction value. It is tacit and cannot be traded. It does, however, earn a rent (ε) and to the extent the top competent team can be associated with the equity contract that defines the firm, the value of that contract should be the present value of expected future rents.[13] Shares in that contract can be traded in the stock market.

Tables 1 list measured assets. The information needed to construct these measures is not proprietary and is available if analysts devote some effort to obtain it. An efficient or at least semi-efficient market should be aware of the nontangible assets (3) through (6) even though they are rarely specified in the accounts. The residual (12) is the market estimate of the present value of extra future profits expected to be generated by the top competent team. That residual may very well be negative if incompetence is known to rule at the top. The firm should then be a potential take-over target. A negative value could also be the result of an uninformed or incompetent valuation, or of a systematic risk aversion of all agents in the market, or of other price distortions, like taxes.[14]

Using information from a variety of IUI data bases (including those used in Figure 2) we have compiled Tables 1 for the 10 largest Swedish multinationals. These ten firms[15] dominate Swedish industry employing directly and indirectly some 30 percent of the domestic manufacturing labor force and as many abroad. They are generally regarded as the flagships of Swedish industry. When all the computations are done using reproduction values of measurable assets, we find a very large negative market valuation (before correcting for risks) of the contribution of the top competent team, an obviously absurd result for these 10 firms. Even with the highest estimate of assets in the denominator, the real rate of return (1986) of the group of ten of 6.9 percent is significantly above the real interest rate on industrial loans of 6.0 percent the same year. What is wrong with the capital market?[16]

One possible explanation would be in terms of a systematic <u>aversion to risk</u> on the part of all agents in the market. One would, however, expect an efficient market to filter out enough daring bidders to get the price right on the margin. The <u>second</u> explanation is more intriguing. With easily available data on book values of assets [column (4)] a positive residual valuation of about SEK 20 billions shows up. Not very much, but positive. Posit that this is all market analysts look at. As you dig more information out of the databases of firms, hidden values appear, and all of a sudden a large negative

residual value emerges, suggesting excessive incompetence in running these flagships of Swedish industry. But could this rather be a reflection of incompetence on the part of stock market analysts, commentators and trader to understand the proper value of the firm?

5.2 Access to the Value Growth and the Selection of Competent Teams

The discounted value of future profits generated by the competent team is available today:

– in cash through dividends
– in the market through growth in the price of the firm (capital gains).

The value to the owners of the contribution of the top competent team depends on what market traders think of the earnings capacity of the firm, i e on the competence of the market to evaluate future ε–flows. One would expect a competent management to add value to the firm above the sum of the reproduction value of its assets. The transfer of ownership entitlements (without selling assets), hence, depends on the competence of the capital market to assess the value of the firm. This valuation is critical for an innovating firm that is selling its know-how to a larger firm which intends to develop the innovation for industrial scale production. Without an efficient market for innovations and with many competent competitors (insiders) the innovators will not be adequately compensated (Eliasson 1986).

The competence rents ε are competed away through the innovative organizational knowledge creating new rents ε. The creation of rents affects the growth of the economy, by improving economic performance of the innovators, and eliminating (exit) low performers through increased competition. The first key to macroeconomic growth therefore is the incentive system that drives innovative behavior. Second is that path dependence (caused by tacit knowledge as discussed in Section 4) makes it impossible to estimate from current observations the future path of the economy. But this would be needed to transform the future distributions of rents onto a standard scale. It follows that economic growth cannot be represented by an estimable distribution function that is invariant of time. In experimentally organized economies individual firm rents are unpredictable and because tacit knowledge grows partly through failure. Past failures may be as good an indicator of future success, as past successes. Markets in the experimentally organized economy are not even weakly efficient, because the evolution of the

economy depends on how markets for corporate control are organized to stimulate experimentation and enforce targets. Markets are dependent themselves on the way the economy develops. Because they lack the requisite tacit knowledge outside (market) analysts cannot fairly assess the value of firms or industries. The efficiency of the market for corporate control will depend on how effectively insider knowledge is transmitted to the market. With this knowledge being largely tacit it can only be diffused indirectly through direct participation in the market of the competent teams. Thus compensation both for competence, and for the incentives to inform the market relate directly to how informed is the valuation of shares.[17] The efficiency of the stock market will critically affect the competence level of industry. But market analysts will be unable to value the tacit competence capital through analytical methods. Instead the efficiency of the capital market will depend on their ability to identify insider trades effectively.

5.3 Insider Trading and Market Efficiency

An important capital market function is to initiate change in fundamentals and in the composition of competent teams. While the efficiency of the market to value fundamentals hinges on its expertise in monitoring insider trading, the efficiency of the market to improve fundamentals, or upgrade the organizational memory requires competence of the same kind as that being evaluated. An efficient market therefore requires that a significant number of competent industrialists operate as insiders or "raiders".

There will also be an incentive for the top competent team – if having significant ownership stakes in the business – to influence the market valuation of the firm. While the efficiency of the market increases if it evaluates the competent team, rather than the entire business situation, this efficiency depends on how good and fast analysts are in identifying the trades of the insiders and their attempts to influence the market. The better they are the smaller the cost to other owners in the form of capital gains lost to the insiders. Getting asset prices right involves the "reshuffling" of wealth among shareowners, benefiting the early insiders until trades take place at "the right prices". The influence on industrial structures of raider activity has been increasingly discussed in the business journals during the 80s. At the same time firms like Electrolux, expanding through acquisitions, have done the same thing for years. The "synergistic effects" on the generation of ε of

raiding activities by dominant owners (according to Bradley–Desai–Kim 1983[18]) appear to dominate over the wealth reshuffling effects.[19]

Assessing people is difficult. The top team (1) knows best and (2) exercises a leverage on the future orientation of the firm's activities. Hence, the financial risk taken on by the top team, defines the credibility of its signals to the market. The "pilot ownership share" defines how much of future gains the top executive team will appropriate, or will lose from mismanagement. A competent team that is not entering a hostage relationship with the owners of the firm (taking on significant pilot ownership) not only does a disservice to themselves but also to other stock owners. Rules that do not allow members of the competent team to hold stock in their business, and thereby become rich in proportion to their ability to manage the corporation, in this view, prevents efficient allocation of competence in firms. At the same time a market that does not effectively identify and evaluate insiders as holders of competence is not an efficient market. Rather than prohibiting insider trades the legislators should be concerned about getting the information out quickly through reporting requirements etc. A reliable and identifiable market signaling system is needed. Three different forms of signaling are discussed in literature.

(1) through dividends
(2) through own stock repurchases
(3) through pilot and concentrated ownership.

The market evaluates the ability of the corporation to achieve a steady growth in dividends highly as a predictor of future dividends and of actual ε–generating capacity. Large and once profitable corporations, however, have an immense potential for fooling the market for a long time, while small or newly started firms are at a disadvantage. With uninformed analysts in the stock market, one would expect cautious, risk averse evaluations. Reliable signals would only come from trades of insiders. Stock repurchases are allowed in the U.S., not in Sweden. If the market does not understand, the firm can buy its shares back until "the market understands" better. In general, stock repurchases have been profitable. Similarly, direct insider trades of corporate officers on personal account are reliable signals. The more efficient the market, the lower the costs of insider trading to other owners, and the faster all later transactions take place at the "right price". Without active insiders, the stock market would be dominated by uninformed analysts, and share important properties with the used car market, the bad cars "the

lemons", determining the price, and the quality assets going for bargain prices. This market would be a boon to skilled raiders, and its valuations, and the rewards to pilot owners, as unstable as we can observe.

With the exception of Demsetz–Lehn (1985) and Morck-Schleifer-Vishny (1986) there are few empirical studies about pilot ownership. Since new empirical information is critical for understanding the interaction of capital markets and the restructuring of economies I hope to see more evidence forthcoming, and especially evidence that distinguishes capital gains due to the transmission of insider information from capital gains due to the signals of (insider) contributions of competence.

Finally a few words on the paradoxical finding that the contribution of the top competent teams of the best Swedish corporations may be negatively valued by the stock market. The market registers marginal transactions, and the competence we want to measure is an invisible "stock". In massive transactions it becomes visible, and allocated approximately to the right owner. Transactions in controlling blocks of stock normally command a premium, raising the value of stock to those who sell. Analogously, massive purchases by the "competent team" signal a significant, upward shift in prices, and vice versa for sales. When the market afterwards returns to "normal" and undervalues the competence contribution it serves the rational function of "locking in" the competence in the firm, very much as a computer user can be locked into the system of a particular vendor by the massive investment in learning needed to use it. The absence of an informed market, thus reinforces the hostage arrangements.

Table 1A Capital stock measurements of 10 Swedish corporations 1985
– SEK billion

		(1)	(2)	(3)	(4)
		Alt I Replace-ment val-uation	Alt II	Alt II Accord-ing to plan	Alt II Accord-ing to the books
Tangible Assets					
(1)	Machines, buildings and inventories	149.5	149.5	120.0	105.3
(2)	Financial assets	146.5*	146.5*	146.5*	140.6
Non tangible					
(3)	Software investments	na	na	na	0
(4)	Technical know-how (Accumulated R&D)	46.2	25.5	16.3	0
(5)	Market knowledge	54.6	20.1	12.9	0
(6)	Educational, human embodied capital	27.3	8.1	5.2	0
(7)	Total replacement valued (measured) capital [sum of (1) through (6)]	424.1	349.7	300.9	245.9
(8)	– debt	152.2	152.2	152.2	152.2
(9)	– concealed tax debt	44.8	44.8	36.4	29.0
(10)	= Net worth [(7)–(8)–(9)]	227.1	152.7	118.6	64.7
(11)	Corresponding asset values according to the market	84.0	84.0	84.0	84.0
(12)	Residual value [(11)–(10)]	–143.1	–68.7	–34.6	+19.3
(13)	Deduct for risks, including political risks	na	na	na	na
(14)	Deduct for lack of information or incompetence of equity market specialists	na	na	na	na
(15)	Residual value measuring executive and entrepreneurial competence	na	na	na	na
(16)	Real rate of return on total assets [=(1)+(2)+(4)+(5)+(6)], percent, (N.B.!) 1986	6.9	9.7	11.0	–**

* Adjusted upwards with SEK 5.9 billion for undervalued shares and hydro-electrical property.

** An analogous computation using book values would no longer give a comparable real rate of return.

Table 1B **The composition of investments (INV) and capital (K)**
– The 10 largest Swedish multinationals
– percent

		INV	Capital		
			Alt I	II	III
(1)	Machinery and buildings	39	39	61	100
(2)	R&D	22	22	19	0
(3)	Marketing	26	26	15	0
(4)	Education	13	13	6	0
TOTAL		100	100	100	100

ALT I: Depreciation: 5.6 percent for all categories

ALT II: Depreciation: 5.6, 15, 25, 35 percent, respectively

ALT III: Depreciation: 5.6, 100, 100, 100 percent

Note: Investments have been assumed to grow at a rate of 5.5 percent in volume, i.e. at the rate recorded 1976/1986.

Notes:

[1] Codability in this sense has an exact meaning in computer science, which is a useful reference for illustration. In my context the limits of codable, communicable competence are necessarily vague, and impossible to establish empirically. That is the meaning of tacitness. Each of us knows that we don't know how to walk, even though we do it. When the competitor sees that it can be done, but cannot acquire the instruction manual in the market, he has to start learning by experimenting. The knowledge is tacit.

[2] Even though this formulation breaks away from mainstream tradition, I have of course borrowed ideas not only from Simon (1955, bounded rationality) but also from Marschak–Radner (1972, "teams") and Alchian–Demsetz (1972). The notion of a team in the disequilibrium firm growth model of Penrose (1959) incorporates certain features of my firm model. I am grateful for the anonymous referee who reminded me of Penrose's book. Even though I once read it I missed that association.

[3] Historic studies (see e.g. Eliasson 1980, Jagrén 1986, 1988a) show the critical trade-off between dynamic (Schumpeterian) efficiency (see Eliasson 1985, p. 15 and p. 330) associated with innovative reorganizations of firms, and the (static) flow efficiency, achieved through middle level coordination of

existing activities; or the minimization of internal slack or waste. While innovative reorganizations decide the long-term survival of firms, coordination efficiency can generate superior performance for years.

[4] See Dahmén (1988) and Glete (1988). Dahmén's observation that the banks, the financial markets and the firms perform basically similar functions is interesting in this context. A broadly defined firm, the industrial bank can sometimes be organized to beat both the firm and the market in general in earning a systematically higher return to assets than the interest rate.

[5] This is a minimum figure, i.e., what has been recorded in firm cost accounts as "education". See Fölster (1988).

[6] This is related to Schumpeter's (1942) worry about the economic power of routinized innovative activity. The nature of organizational learning in large firms and the diminishing returns associated with such activities are explored in Eliasson (1988d). Granstrand–Sjölander (1990) show that a broad internal technology base makes the firm more efficient in acquiring and implementing new complementary knowledge. One way of doing this is through the acquisition of new innovative firms. This in turn illustrates the importance for competence upgrading in large firms of viable markets for innovations, or acquisitions of innovative firms (Eliasson 1986).

[7] The competent team so defined has all the characteristics of Alchian – Demsetz' (1972) jointness and the Marschak–Radner (1972) team. It is, however, not only the optimal design of incentives that matters, but the tacit competence of the top team to organize the firm so as to create a monopoly rent.

[8] ,even though I have found in discussions with colleagues, and from an anonymous referee that it is unclear whether Knight really argued this. It is still a good idea, however, to model the firm as an entity concerned with "subjectively computable risks".

Look at the probability distribution $P(x,\theta) = P(x|\theta)P(\theta)$. I am uncertain about which decision model θ to choose. Zellner (1983, p. 141 f.) argues that a rational decision maker first chooses θ as a drawing from a probability distribution $P(\theta)$. θ are "boundedly rational models" or parameters, even though Zellner doesn't use that term. Following Bayes'(1763) decision model the total decision problem can then be defined as a drawing from a simultaneous probability distribution $[=P(x,\theta)]$ of observations (decisions) and parameters (decision models). I may view my choice of decision model as a drawing from a distribution of "boundedly rational" models that I think I know. I can then integrate both into a simultaneous distribution of decisions and observations. The decision maker, however, is only interested in the expected utility of his decision. The probability distributions therefore cannot be integrated. The decisions become drawings from the conditional probability distribution $P(x|\theta)$, conditioned by the prior imposed by choice of model from $P(\theta)$. Subjective probability distributions, however, cannot simply be cumulated to single valued probability distributions (Hart 1942) and be made to look like a "regular risk situation"; not for outsiders, possibly for insiders.

A more general and Bayesian procedure is to weigh the distributions of "utilities" together to be able to choose from the simultaneous distribution of utilities of having chosen the correct model and the distribution of utilities from the outcome of the chosen decision. This is the only way to take in relevant information in the order it becomes known to the decision maker, i.e.

to handle risk aversion. This view is voiced in different ways by Hart (1942), Shipley (1975), Kahneman–Tversky (1979), Tversky–Kahneman (1981), de Bondt–Thaler (1985), Fishburn (1987) etc.

One should of course ask whether it is at all possible to represent tacit knowledge on measurable form. There is no good answer. You can use the assumption as a pedagogical device. You can also say that the ambition to decode the "tacit memory" means assuming that it can be decoded, which is very much the assumption of artificial intelligence approaches to management decision making. However, new results on so-called "neural networks" (Crick 1989, Maddox 1989) have demonstrated mathematically how complex systems with synaptic interconnections develop controlling memories. The output of these memories allows the observers neither to derive their logical origin, nor their organization such that their output can be predicted. Formally these structures are related to mathematical chaos.

9 [A small digression may be illustrative at this point. Even though the analytical signal that the firm is going under may be crystal clear, corrective action is not as simple as it may sound, especially in the modern welfare state. The information system used for identifying a mistake is increasingly put to use to convince employees, media and politicians that corrective action is "needed" (Eliasson 1976, 1984, 1989b). The difference between the profit making private firm and the state operated firm illustrates this. One cannot, on theoretical or empirical (scientific) grounds claim that the state, or the executive team selected by the state is less competent than a private business leader to sense the direction of markets and/or to identify mistakes early. A politically controlled business will, however, always be handicapped when it comes to correcting mistakes. The political platform and the political goals mean that state operated firms will be badly organized for the efficient corrective action that is so critical in the experimentally organized economy. I have argued elsewhere, that this organizational method of the capitalistically organized economy to override – in business decision making – the political value system is an important efficiency characteristic of the private market organization (Eliasson 1988c)].

10 This insight turns the ways of thinking in strategic literature from the 60s upside down. It was then thought that a management system separated from the people could be designed. People could enter and exit the system. The system and the firm would be invariant to its people. For a review of this literature see Eliasson (1976, Ch. IV).

11 Some would argue that the selection of competence in a firm cannot be explained but rather requires a stochastic explanation. This is, however, wrong if the efficiency of selecting competence is dependent on past successes in selecting competence (learning through experience), a very reasonable assumption I would say. The competence of the firm then becomes path dependent and the competent team of the firm is equipped with a tacit "organizational memory". The same memory of the entire industry depends on how the capital market responds to the clashing of all inconsistent plans in the market, affecting the structural reorganization of the economy, i.e. the market self-organization of the technological (organizational) memory of the entire economy. This is in essence the design of the Swedish micro-to-macro model (Eliasson 1977, 1985, 1989d).

12 There is a third ε-contribution that has to be mentioned, namely the excess ε flow resulting from badly functioning markets. This can be a natural resource rent, even though this would mean that the capital input ("the

natural resource") has not been properly measured. It could also be the result of a too low interest rate, a common situation in postwar Europe with regulated capital markets.

[13] Within the classical model with no risk and all markets, except the capital market, in equilibrium, the ε of an individual firm can now be seen as the imputed factor cost for inputs of knowledge, that exhausts total value added, an observation made already by McKenzie (1959). This is the same as to say that if there are increasing returns to tacit knowledge (T) inputs and if other inputs are paid their marginal products, the capital market can never be in equilibrium.

[14] In a tax free world a q-value of 1 would mean that the negative risk factor exactly offsets the contribution of competence. The fact that the q-ratio between market and replacement valued assets in Swedish industry stayed consistently well below 1 from 1970 to 1984 can be attributed to three facts only; (1) incompetence of executives in running manufacturing firms, (2) incompetence of traders in the equity market in evaluating the firms or (3) excessive macro (political) risks associated with Government and Labor Union ambitions to expropriate private wealth. As far as can be seen, development since the early 80s eliminates the first explanation. The fact that the U.S and U.K. stock exchanges exhibited a similar strong undervaluation during the same period apparently removes the political explanation, at least as the only one. The undervaluation in Sweden was much deeper. Could it be that traders in all three markets exhibit the same inability to assess fundamentals, and if so, why?

[15] They are Electrolux, SKF, Ericsson, ASEA, Volvo, Swedish Match, Sandvik, Atlas Copco, Alfa Laval, and AGA. For details of the data see Eliasson (1989a).

[16] It is no argument that the stock market evaluation may have increased relative to net worth since 1985 (year in the table). The valuation was wrong then and for years before, and the continued increase in the market valuation of equity, putting perhaps a positive value on the top competent team, is currently, generally interpreted as a warning, that the market may be too high.

[17] Note the difference between having access to valuable information about the corporation and contributing valuable competence to the corporation, and making it known to the market.

[18] The "synergy" vs. information effects of B–D–K (1983) should correspond roughly to what Schleifer–Summers (1987) mean by "efficiency" and "wealth reshuffling" effects.

[19] B–D–K (1983) are probably correct in that conclusion, even though Ravenscraft–Scherer (1987) doubt it. But all evidence rests on empirical analyses of models without the self-organizing property that is the essence of the synergies they discuss.

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