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THE MICRO FRUSTRATIONS OF PRIVATIZING EASTERN EUROPE

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Abstract¹

The opening of Eastern Europe to Western competition creates new challenges for the proponents of free markets. Expectations in Eastern Europe are high regarding the capacity of the free market to deliver fast. This paper makes privatization a part of the general deregulation of markets needed to take decisions down to the micro levels where the appropriate competence resides. A general theme is that macro-economic performance depends on the efficient activation and allocation of competence through markets. For that to occur the incentive systems has to be appropriately organized. Among other things this requires that entitlements to future rents of such competence be sufficiently well defined to be tradable. The paper, hence, concludes that privatization in a broad sense is a necessary condition for, and a part of the successful deregulation of Eastern Europe. When ownership of corporate assets is sufficiently well defined, markets will be capable of identifying and directing resources to existing, competent producers, of removing resources from incompetent producers and of facilitating optimal and fast learning of agents to cope with Western competition. If speedy transition to a market economy is desired, such deregulation cannot await the committee work of Government bureaucrats. Nobody can design the optimal institutional arrangement ahead of its implementation. It has to be achieved through experimentation in markets and self organization to create the appropriate institutions. Privatization, hence, comes first.

The main function of the financial market is its potential to force reorganization and unpleasant change that would otherwise not occur. Since competence to produce profitably under the competitive conditions of

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international markets appears to be generally very scarce in Eastern countries, the creation of free financial markets is not sufficient to generate growth, only to destroy obsolete structures. To create fast transition and an improving standard of living new competence also has to be rapidly brought into place. The only feasible way to accomplish this within a reasonable time is through various forms of foreign direct investment, deliberately accepting a reduction of national policy authority over the economy. There is, however, no principal difference between this solution and privatization of markets in general. In both cases the goods, services or assets to be traded have to be sufficiently well defined to ensure identification of ownership, allowing (for the benefit of efficiency), central policy authority to be replaced by free decisions of micro agents in markets. The difference is that a viable solution requires that foreign micro agents possessing the needed competence will also be allowed to invest and earn hefty rents in the local markets of Eastern Europe. This, however, is an even more genuine form of privatization than discussed in literature. The situation in Eastern Europe is in large measure the same as that in the underdeveloped world; it does not help to send money or machines. The dominant capital needed is the human embodied competence of individuals and organizations. In order to succeed, markets have to be not only liberated from obstructions that prevent competition, but also organized such that there will be incentives for industrial competence to be brought in and allocated efficiently. Free capital and labor markets are instrumental in the realization of this task. This is the essence of successful privatization.

The necessity to organize the economy such that rapid learning and/or efficient import of competence is achieved is illustrated through comparisons of two East European with a similar Swedish firm.

1. The problem

It is frequently argued that as soon as the limits to free market exchange (regulation) have been removed, economic performance will dramatically and immediately improve. When the expected effects do not occur frustration develops. The problem is failure to understand the nature of markets, the time dimension of economic growth, and the frequently forgotten fact that human embodied competence is needed to exploit globally available economic and technological opportunities. The problem of this paper - the economic circumstances of growth - is very general, and not specific to Eastern Europe, even though Eastern Europe provides an interesting experimental setting for economists to study the nature of economic growth.

Indeed, when Lundell (1846) at the time of the industrial revolution observed the ongoing deregulation in Europe, he also observed that some countries took off the lid, and others did not. Ex post, we now observe that those nations that took off the lid (deregulated) experienced the industrial revolution and became industrialized countries. Those that did not deregulate lid, did not industrialize. As it happened, Hungary, Czechoslovakia, and East Germany put the lid back again, and slowly ceased to be advanced industrial nations (See Eliasson 1991a).

History also supplies other interesting perspectives. Deregulation may be a necessary policy to get the growth machine of a nation moving. But it is not sufficient. Does the necessary legal and institutional framework exist that makes it possible to define goods, services and property such that ownership entitlements and tradeability is made possible? Furthermore, is there sufficient competence among the producers of Eastern Europe to make them competitive in the new market environment of the West? Will reorganization of financial markets help? Will private ownership help to create fruitful mergers of competence and finance? And whose money is going to do it? The less developed world provides numerous examples of failed attempts to

centrally regulate an economy to growth. Successful industrialization experiments, however, usually signal the presence of a needed prior, basic human competence endowment, or the effective external acquisition of the same competence through foreign investment, or immigration of competent labor. One critical feature of the industrialization process, hence, is time. We are talking in terms of several decades, not the next year, to give people and firms time to learn (Eliasson 1990b) and to do the (for them) new things. Will the current (West) German aid to former East Germany create the same growth response as The Marshall aid did in postwar Germany? Will the Eastern European countries together, and protected from Western competition behind a Fortress Eastern Europe be able to do it alone by simply privatizing their internal financial markets? And how long will it take? A salient question unfortunately is how large an advantage the once industrialized Eastern European countries still have over the less developed world. Will the comparative advantages of the Eastern European economies be sufficient to earn its current generation of inhabitants a real income (expressed in international currency) in the neighborhood of prevailing expectations?

This paper, hence, is primarily concerned with the problem of how to make Eastern European firms competitive by Western standards. I make the privatization of financial markets a critical vehicle in the learning process needed to take decisions and learning down to the micro market levels where it should occur. There will be "three steps of deregulation". The first step is to do it alone within Fortress Eastern Europe by privatizing the internal capital markets and through free internal markets for goods and labor. The second step involves opening East European markets for direct competition with internationally operating firms, without prior protection, to give the East European firms time to learn. The third step involves opening East European

capital markets for direct foreign investment². Deregulation of markets is the overriding theme. Privatization figures importantly in the first and third step. Privatization is not an altogether well defined concept. I will use it in the perhaps unconventional meaning of creating the institutions needed to ensure ownership to, and tradability in entitlements to future rents created by the acquisition and application of competence contributing to competitiveness and economic growth. Privatization in my sense, hence, means the creation of an appropriate incentive system that links private effort to private return. A necessary condition from that incentive system, hence, is the existence of free prime and secondary markets for all kinds of securities, notably entitlements to future profits and the associated control of the use of these assets, including also free entry of "owners". Privatization³, hence, becomes an instance of deregulation. To be viable, however, it also requires the presence of certain institutions, such as private ownership and a corresponding legal framework. Privatization of financial markets, hence, by definition is exactly contrary to the policies which have, during a half century or so, destroyed previously viable industrial economies. I will argue that the privatization of the first strategic policy step is a necessary, but not sufficient, condition. Privatization in the third step is needed for the expected growth result to materialize in pace with the expectations of this generation. The time dimension of the reindustrialization process of Eastern Europe will therefore figure importantly in the discussion.

² To be workable the steps have to be taken in that order, or simultaneously, each additional step signaling an improvement. The ordering is reversed compared to Lipton-Sachs (1990) who begin – after having enforced an austerity program to eliminate excess demand, which is OK – with the opening up of the economy to western competition, and conclude with privatization. I concur with Rybczynski (1991) by arguing that privatized capital markets are required prior to western product competition, to occasion the necessary reallocation of competence to be able to cope at all. Sachs (1991) appears to have changed his mind on the ordering.

³ My definition of privatization is somewhat broader than the formal definition of a transfer of ownership from the state to private hands. To make economic sense privatization also requires tradability, which in turn requires the existence of more than one trader, and above all the right to enter the market privately to compete with public incumbents.

It is not altogether clear how to define Eastern Europe. I am inclined to restrict my attention to the pre-war more or less advanced industrial nations Hungary, Czechoslovakia, East Germany and possibly Poland. On that count, however, also the now autonomous Baltic States could be included (Graham-Königson 1991). In practice my paper could be said to concern economies that already have, or have had, some industrial experience.

During the last few years I have had the opportunity to discuss the "revitalization" of planned economies with many concerned economists and industrial experts. I have also visited East European firms. It is obvious that macro policy is needed, but no such policy will work, if not based on an understanding of what goes on at the micro level. The right micro environment will have to be created, and it will determine the possibilities of speeding up reindustrialization through policy. The particular policy that I will discuss concerns the innovative use of private ownership and foreign investment. Before that I will elaborate on the dynamics of deregulation or privatization (section 2) and then (section 3) I will show, by way of examples (interviews) what kind of competence that matters for success, that is lacking in Eastern Europe, notably the experience of agents to deal with dynamic, experimentally organized markets.

2 The New Competitive environment of East European firms

The Salter (1960) curve representation of potential and actual labor productivities in Figures 1A to C provide a convenient analytical framework for illustrating the new competitive market environment of East European firms, when their economies are integrated with the European, or world market environment.

The solid bars in Figure 1A represent the position of some firms among all other Swedish firms in 1990. Firms in a market or a manufacturing sector⁴ can be represented by a distribution of potential performance characteristics, such as the rate of return, labor productivity, and total factor productivity. Each firm is represented in this figure by a ranking on the vertical axis, the width of the column measuring the size of the firm in percent of all firms. Figure 1B shows that even though the firm indicated has increased its actual productivity between 1982 and 1990, it has lost in ranking. Together the shape and the position of one firm in a selected set of such firms, representing a particular market can be said to represent its potential, competitive situation to pay a high interest rate to attract funds, or to outbid other firms in hiring labor. The steeper the curves and the wider the spread, the more intense potential competition (Eliasson 1991c).

Each firm also has its own potential productivity frontier, under which it is operating to position itself on the productivity and the rate of return rankings. The shaded area tells how much each firm could have (in 1983 and 1990) increased its labor productivity through increasing its capacity utilization. This is still actual *ex post* performance. The dynamics of markets, on the other hand, is controlled by a second set of *potential ex ante* distributions that capture the planned actions of all other firms, including new entry.

There is a third set of Salter curves that show how *each firm sees itself (expects itself to be) positioned relative to other firms*. A significant part of total firm resource use is spent on figuring out (learning about) this position (Eliasson 1990a,b). The real world shows large *divergencies between actual, potential and perceived positions*. Those distributions together indicate the inclination of, and the potential for a given firm to outbid all other firms in wages, or in paying a higher interest rate, but also the potential for each firm to commit errors.

⁴ and in the Swedish Mico-to-Macro Model, where each firm operates in an endogenously determined Salter "landscape" of such curves. See Eliasson (1991c).

The firm learns directly if it is mistaken, and if competitors can do better than it expects. Management then knows that it had better improve in order not to be pushed down along the Salter distribution, and, perhaps, out. Similarly, when the firm finds itself close to the top, it knows that close competitors are taking action to improve their positions through innovation or imitation. If potential Salter distributions are sufficiently steep in the top left-hand group, firms attempt to improve their positions on the Salter curve through innovative activity, or through entry. This moves the entire economy through a self-perpetuated competitive process.

The Salter curves of each market are constantly upgraded through investment and through competitive exit ('creative destruction') and entry. Only firms which have acquired superior performance characteristics through learning in competitive markets and through interior process efficiency survive in the long run. Learning through competing, hence, is a combined selection and innovation process, innovations being enforced by constant comparison with the best producers in the market. The best producers will set the upper standards of the market which will only be reached by those which are sufficiently close to be able to learn (Eliasson 1988, 1990b, c, d).

On the basis of profit expectations, firms constantly reshape the Salter curves. In the short term, the large effects are achieved through rationalization and improved productivity performance. The large short-term effects are occasioned by exit. In the medium-term new investment reshapes the Salter landscape, notably through shifting its upper left hand parts upwards. The effects of new entry become sizable only in the long-run (20 years or so, Eliasson 1991a). This structural adjustment may become turbulent in some particularly innovative markets, like electronics. But normally it is smooth and slow.

It can, however, be disruptive under particular circumstances, like a sudden opening up of a market to foreign competition, or drastic internal deregula-

tion. This is the "plan" of EC 92 and the huge "economic experiment" we are currently observing in Eastern Europe. If local competence exists the new situation should create both growth and exit (creative destruction). If local competence is lacking there will be only "destruction" of structures until prices (like the exchange rate) have adjusted to make some local production with comparative advantage viable.

The opening up of Eastern Europe in fact means that two entirely different Salter structures are suddenly merged and that the conditions for competition are suddenly and dramatically changing for the "low end" competitors of the East (see Firms A and B in Figure 1A).

The merging of the two sets of Salter curves is exactly what happens when protection is lowered, when foreign suppliers enter the market or when foreign investors open up production facilities. After some time a new set of prices will be established, constituting a change in the competitive situation of most producers. The difference between EC 92 and the opening up of Eastern Europe is the magnitude of the merger.

Unfortunately, the data needed for this kind of analysis are only available for Sweden. I do, however, have a set of data for two East-European firms. In the next section I will present these data and discuss what will happen to these firms if placed in a Swedish competitive market environment. This is the kind of experimental analysis that can be performed on the Swedish micro to macro model. Such experimental work on the model is currently under way at the IUI and also at the Central Economic-Mathematical Institute (CEMI) in Moscow.

Standard trade theory predicts that in the new situation, after the mergers each region would have its comparative advantage, and trading would produce the optimal situation. What will happen, however, depends significantly on what is assumed about factor mobility, notably labor mobility and the mobility

of competent labor in particular. East Germany here faces a situation that is very different from that in the other East European nations. One might perhaps say that Poland, Hungary and Czechoslovakia are positioned somewhere between the strategic policy steps one and two. It is being discussed whether the upgrading or industrial learning process can be both smoothed, facilitated and controlled by protective measures, aimed at reducing a devastating technological product competition and takeover activity from the West, giving the firms time to learn. Such policies are in principle the same as the idea of Fortress Europe or "strategic industrial targeting" of the US policy debate. East Germany is entirely in policy phase three. In Germany mobility of labor will soon force an even wage level onto the entire economy. Former East German producers will have to be able to pay Western wages, which might mean that it is commercially more advantageous to expand production in the West, drawing on "immigrant" labor. In the other East European nations trade might generate some wage equalization, but the critical question is whether eastern producers will be able to pay the wages established, and whether sufficient production capacity will be left to produce value added, expressed in international currency, up to expectations. The answer is a matter of time and the dynamics of the destruction and reindustrialization responses to the new incentives of the deregulated and/or privatized markets.

3. The Nature of the Lack of Competence in East European Firms

Facts being presented in a rapidly increasing flow of studies on the state of industrial performance in Eastern Europe show;

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- a) that infrastructure of importance for production is outdated and has seriously deteriorated

- b) that the branch structure of industries has not changed (at all) for a very long time
- c) that equipment used in industry is "dismally" obsolete by Western standards
- d) that products are being manufactured according to designs and technical specifications of the pre-war, or immediate post-war period
- e) that firms have been isolated from direct customer contacts ("markets") for decades.

By closing themselves off from western market competition, eastern producers have not had the gradual learning experience of the western firms. Part of this lack of experience depends on the absence of, or outright destruction of important market institutions that are needed to make trade possible. If a product or a service cannot be defined in ownership terms, trade in that product or service cannot occur. The most elaborate such institution of Western markets is trade in future expected profits, that occurs in financial markets. Innovative reorganization and learning of firms are the critical techniques of industrial revival in the East. Such innovation and learning leads - if successful - to long-term profits, and entitlement to these profits is the main incentive from such innovation and learning. Hence, the legal institutions that guarantee such ownership entitlements are critical. This is the same as to say that privatization must come before and/or simultaneously with other measures to stimulate trade and growth to establish the incentives needed for Eastern firms to acquire lacking Western market experience and product and process knowledge, which at many locations is at the level of the developing world. The above appears to be the general situation. Are there positive exceptions? How do the Salter structures look? Nobody knows, and nobody will know until a viable financial market has been created and the possible

excellent players have been identified by its agents and financial resources directed to them.

Experts knowledgeable about East European, once industrialized economies maintain that there exist pockets of skilled labor and even of entrepreneurship. This might mean that the Salter structures are very steep, exhibiting in some markets, when the exchange rates have been properly set, some excellent players at the upper left (cf Figures 1 and 2). The rôle of privatization will then be to facilitate the identification of these pockets of excellence and direct resources there. The experts also point to the high rate of literacy of the labor force in those countries, even compared to the rich welfare economies of the west, a circumstance that should facilitate learning. Viable financial markets are synonymous with open markets for trading in ownership titles to industrial firms, i.e. to privatization of industry.

The way I have presented the situation in Eastern Europe, financial markets will serve two critical functions (1) identifying already existing competent producers, and directing financial resources to them and (2) bringing competence into the economy if, and when competence is lacking (read foreign investment). As pointed out by Rybczynski (1991) the creation of viable financial markets is a necessary change that has to come before other policy action. Since efficient financial markets will attempt to save existing resources from incompetent management through removing them from commercially defunct production sites, the creation of such markets will speed up both learning at the firm level and the structural "destruction process" and hence requires that the immediate social consequences have been accepted.

Even though positive exceptions in the form of pockets of excellence exist, they would have to represent significant volumes of activity to have any immediate macroeconomic consequences. Evidence suggests that very little in the form of modern industrial competence exists in Eastern Europe. Studies from the west, furthermore, reveal the long time dimension involved in

restructuring laggard firms or industries, or changing their business direction (e.g. from weapons to civilian production), and that it is often less costly to close down plants, and rebuild elsewhere, than to fix up the old establishments with the old, obsolete staff.

The costly adjustment needed to restructure and update old and failing steel plants experienced in the west requires a time perspective of some 20-30 years. The gestation periods of new products/technology easily go beyond 30 years or so. The time dimension needed for a small and newly established firm to grow - if successful - into a big company normally is 50 years or more. It should also be recalled that the NIC countries, even though growing rapidly, nevertheless have taken several decades to significantly raise their GNP per capita in percent of OECD GNP per capita. For a country that starts at one quarter of the GNP per capita level of the OECD countries and grows at a rate of 10 percent per annum, compared to a 5 percent average for the OECD, it will still take 15 years to reach half the OECD GNP per capita level. This would mean that if the Eastern economies are looking for ways to solve their own problems through new start ups, new product innovations and restructured old firms, the solution - even if they have the in-house competence to be innovative by western market standards, and are successful - will need more than a generation to come about. This means that authorities of the East European countries are on the look out for faster policy solutions, a question to which I will return in the last section.

During the last year I have talked to a number of industrial experts from Eastern Europe and visited several firms in Eastern Europe for an extended interview and inspection; this is particularly so for one electronics component and equipment producer, and two machine tool manufacturers. Two of these interviews were conducted together with a group of Swedish industrial experts under the auspices of the Swedish Academy of Engineering Sciences.

In two of these interviews, including one of the most sophisticated machine tool manufacturers of the country visited, management very generously provided us with all the data on the plants and the firm that we asked for. It was furthermore possible, on the site, thanks to the Swedish experts (production and R&D executives from large Swedish manufacturing firms) to get a fairly complete "revamped" set of data the same firm would have in Sweden, in order to survive in international competition in the Swedish cost environment. Hence, it is possible for me to present here the data on two of the most sophisticated machine tool manufacturers in an East European country, the same set of data for the corresponding Swedish firm⁵, and to place some of the performance variables of these firms in the Salter curve landscape of all Swedish firms or divisions with more than 200 employees in 1989.

I will use this case presentation to obtain a standardized set of productivity and rate of return estimates for the three firms to insert in the Salter structures of Swedish manufacturing in Figures 1 and 2. I will assume that the Swedish Salter curves represent the world market setting of competing firms. I will then interpret the differences that I find, and attempt to say something about what will happen to these firms if the world markets are let loose on them in different ways (the three policy steps). A particular question refers to the capital value of lacking product and marketing competence. Another problem is how to measure the value of capital in the rate of return comparisons.

4. The cases – competence and work organization is what matters

Two machine tool manufactures were visited during the same period. Even though I have a full set of data for only one of them, I will report on both.

⁵ This time in a not so viable product market

Firm A makes semi-sophisticated machine tools of various kinds; numerically controlled lathes being the largest product group.

The average price obtained for a machine, being delivered to western markets through an Austrian firm was \$32 thousand. The Austrian firm later resold the equipment with some extra accessories for ca \$80 thousand, capturing a hefty 150 percent margin on purchase costs. 400 machines were produced annually, by 200 blue collar workers and 260 white-collar workers, i.e. altogether 460 people. This was a targeted figure for 1990. The year before (1989) 600 employees produced slightly less.

It was observed by the Swedish experts that these were not precision machines. They were produced in rather primitive circumstances; dirty floors and messy localities which made the production of precision machines impossible.

Firm B was a more sophisticated operation, with a well ventilated and air conditioned plant and painted and clean floors. The most sophisticated machine produced, was a precision CNC lathe, with a dimension accuracy of 1.0 micron. It was produced on a Swiss licence.

This machine sold for \$300 thousand, "leaving the factory", and was delivered in the market with an extra 10 percent margin. Altogether the firm produced 400 machines at two different locations, which of 36 (1989) of the sophisticated kind. The rest fetched an average price of 15 percent of the sophisticated machine. A value added of 60 Million DM was produced by 1500 man-years of labor input.

As for the corresponding Swedish firm the Swedish experts saw no reason to expect any economies of scale in this type of machine tool production. The Swedish firm, on the other hand, would have much fewer people in the factory, not more than 300 compared to 600 in Firm B and at most 300 more

in the offices,⁶ compared to 900 in Firm B, or altogether not more than 600 people to produce the 60 M DM, (\$ 39 Million) of output of Firm B. Such labor saving is achieved through more efficient work organization, a faster production flow and a reduction of overstaffing.

Labor productivity and wage costs

This means that we have the following labor productivities of the three firms in 1989;

<u>Labor productivity</u>	<u>Wage cost per employee</u>
Firm A; 111 SEK per employee and year	n.a.
Firm B; = 148 SEK	20 thousand SEK
Swedish Firm; = 367 SEK	250 thousand SEK

DM has been converted to SEK at a rate of 3.7.

These data have been inserted in Figure 1A

The difficult part, however, is to account for capital inputs needed to achieve these productivities.

⁶ The largest Swedish Machine tool company had less than 400 employees in 1989.

Capital inputs

The facilities of Firm B were more sophisticated than those of Firm A. Above all they were ventilated, airconditioned and painted etc. and easy to keep clean. If I understood our accompanying industrial experts correctly, the machines were also more sophisticated, but not as sophisticated as would have been needed in a Swedish factory.

I asked the accompanying experts to give the relative sizes of replacement valued hardware capital stocks of the three firms (machines and buildings) and then to estimate the money value of new investment in a state of the art Swedish facility.

In that comparison one has to remember that a Swedish factory would never be commercially viable using the old fashioned and old equipment of the East European factories. At the same time, the age of the equipment of the East European factories means that (in a Swedish firm) it would by now have been completely written off. I wanted to compare rates of return in each factory on capital correctly valued at what it would cost to replace the equipment at the time of the comparison. The Swedish firm, however, would have to acquire state of the art machines. The East European firm would acquire new machines produced to old fashioned specifications, since its labor costs are dimensioned for such low grade technology. Such machines may not be available in the market, except as used machines and then probably at lower prices than I will use. But we have to hypothesize that such a valuation is possible.

If the Swedish firm would invest to build the factory for 1 500 employees of Firm B the hardware investment in state of the art factory and office buildings would be in the neighborhood of 500 M SEK.

On the other hand, a Swedish firm would have much fewer people in the factory, not more than 600 people. The needed hardware capital, hence, is reduced to some 350 M SEK. Such labor saving is achieved through more efficient work organization, a faster production flow and a reduction of overstaffing.

The capital data represented do not include in- and outgoing inventories and work in progress or net financial capital (receivables, payables etc).

The estimated hardware capital intensities in the three firms were:

Firm A; 550 thousand SEK per employee

Firm B; 250 thousand

Swedish Firm; 580 thousand

The problem now is how to interpret these figures. The lower capital intensity in the more sophisticated Firm B has to do with a relatively larger non-factory work force, with more people in product development, design etc. Apparently this creates more value added per employee, than in Firm A, which is more product oriented, with less sophisticated products, that – in addition – are distributed within Eastern Europe, and, if not, sold through foreign agents, that take most of the rent. The more efficient use of capital in the Swedish firm reduces capital intensity. The estimates given above are replacement valuations, i.e. what it would have cost the firm to reequip the firm with buildings and machines of comparable quality under today's open market circumstances. This comparison may not be fair to the East European firms, which have equipped themselves under a regime that looked at capital and capital costs very differently from western practice. On the other hand, the Swedish firm appears (see below) not to be a fully viable operation, that if reinstated afresh, after a fire, might look very different. Such circumstances

cannot be considered in the computations to follow, only in the interpretations.

Let me now assume a depreciation rate of 10 percent and a real interest rate of 10 percent, applicable to all three firms. I also assume that the net financial assets and inventories in all three firms are of the same order of magnitude as the hardware capital. The Swedish firm is assumed to generate a total value added of the same magnitude as Firm B.

Wage carrying capacity

Assume that each firm pays a 10 percent real interest on all capital (this is on the high side), then compute, for each firm, the maximum wage cost carrying capacity of each firm, at which net profits are zero (see appendix).

Firm A; - 500 SEK per employee

Firm B; 72 thousand SEK per employee

Swedish Firm; 192 thousand SEK per employee

Apparently, Firm A is a loss operation, if capital costs are properly imputed. It can, however, carry on as long as the old equipment works, and still produce a positive operating profit over other costs than capital. The situation for Firm B is much better by western standards.

The Swedish firm is a loss operation if the situation persists over time. It breaks even at a zero real rate of return to equity capital if equity capital amounts to 50 percent of total capital (replacement valuation). The Swedish firm would have to live by a "steady state" calculation of the above type. In "the old days" the calculation would have been different for the East European

firms, however, not in the future. It is therefore interesting to carry out the same computations for Firm A and B.

The large productivity differences between the Swedish and the East European firms are largely absorbed by higher wages in Sweden. The three times higher labor productivity in the Swedish firm is reflected in a wage cost, which is many times larger; SEK 30 thousand in Firm B compares with SEK 250 thousand in the Swedish firm. Firm B was said to pay the highest wages in the East European country for its most skilled labor, therefore the large differences in average wage costs between the two East European firms. But even so the difference is much larger than between Swedish firms (see Figure 1A). While the Swedish firm is at the very low end of the Swedish Salter curve, the two East European firms have no counterpart at all. It is therefore of interest to see how the difference in domestic factor prices and capital productivities combine in a comparison of rates of return, using the same "market interest rate" for reference.

Rate of return

The next step is to compute a rate of return measure for the three firms and compare with a chosen reference rate and the corresponding distribution for Swedish firms. I do this by defining an excess rate of return over the market interest rate \bar{e} .

Assuming wage costs to be the same in the two East European firms⁷ and charging a five or a ten percent real interest rate on all capital (for details see Appendix). Thus:

⁷ I never obtained the average wage cost for Firm A.

Rate of return over interest rate ($= \bar{\epsilon}$)

	<u>real rate of interest</u>	
	<u>10 percent</u>	<u>5 percent</u>
Firm A;	- 3 percent	- 1
Firm B;	+ 4 percent	6
Swedish Firm;	- 5 percent	0

Apparently the rate of return ranking reverses the productivity rankings. Firm B earns a 4 percent real rate of return premium above the market interest rate, while the Swedish firm "earns" a corresponding loss of 5 percentage points. When placed in the Salter $\bar{\epsilon}$ rankings in Figure 2A this places the Swedish firm at the middle of the ranking of small Swedish firms and subcontractors while Firm B would operate at the upper end of the ranking, provided it does not have to pay more than a fraction of the average Swedish wage.

Four observations should now be made. First, capital and capital costs have been measured to fit into a western type firm decision situation. It is unlikely that the East European firms would use the same computations to figure out their positions. They would, however, have to if they were placed in the western (or Swedish) price environment. Then a number of additional things would happen. The East European firms (second) can exhibit reasonable rate of return figures only because of their extremely low wages. This situation would not persist in an open market setting with open product competition from the west, and definitely not in the German situation, where wages will soon be fairly equal across the entire "new economy". In all cases, however, (third) the comparison concerns firms that aim at long-term survival, having to refinance their capital expansion at market costs. If the firm plans to shut down after it has run down its capital the analysis would look very different.

In an open competitive setting (fourth) the East European firms would in fact have to look over their internal productivities, including their use of capital. In the above computation I have applied a fairly high real rate of interest. Assuming 5 percent, instead of 10, the Swedish firm "breaks even", i.e. it earns $\bar{\epsilon} = 0$ instead of earning a negative return below the interest rate ($\bar{\epsilon} = -0.05$). Capital apparently matters. The positions of Firm A and B are only slightly changed.

A number of things can be learned from this simple analysis.

First of all, the Swedish firm operates in an unsophisticated product environment and cannot earn a satisfactory rate of return over capital in the Swedish factor price environment. For the firm to survive, superior competence has to be added to raise performance to make it possible to pay the high Swedish wages. The solution normally is to do something else, internationalize the firm to gain economies of scale or to focus on sophisticated niche products, again for international markets. The situation of the "Swedish firm" corresponds to that of the subcontractor to a large Swedish manufacturing firm, whose existence is threatened if exposed to competition in the new Europe, from European subcontractors, Japanese subcontractors or possibly (they believe) East European firms, exploiting cheap labor. Like the East European Firm A the typical Swedish subcontractor has to market its product through the global production, product development and marketing organization of the large multinationals (Braunerhjelm 1991). Since the core competence of the large Swedish multinationals resides in the synergies created in integrating these three capacities, notably product development and marketing, the rent of the entire production chain is captured in the multinational. Even though the Swedish firm has acquired marketing and product competence over the years, through competition with Western producers, it suffers from a problem, namely the high factor costs, notably wages that are being pulled up by the sophisticated producers at the upper far left end of the Salter curves in Figures 1. The high wage paying capacity of

these firms is based on a combination of superior product, marketing and process know how in which product and marketing competence is the dominant competence input (Eliasson 1985, 1990b, Eliasson-Braunerhjelm 1991). The East European firms lack that dominant competence. If Firm A, in particular, had been able to sell its products through its own marketing organization (rather than through the Austrian agent) at the same efficiency, its costs for that activity, including product development would have been at least 20 percent higher (Figure 3), but value added would have increased even more. Even in an integrated market environment with high wages this would have meant a significant improvement in its now lackluster profitability performance. Firm B exports some of its more sophisticated machines on their own, notably to other Eastern European countries, and can charge higher prices and obtain better performance rates. The problem is that marketing and distribution competence is lacking. The corresponding efficiencies would, hence, be considerably lower. Similarly, the unsophisticated products of Firm A in particular would never "carry" even normal marketing costs for such small volumes. Hence, the deal with the Austrian agent might very well be a fair deal, even though it looks rather unfavourable for the firm. The lack of western marketing and product competence is, on the whole, a very real thing. It cannot be acquired in the local environment of the East European firms and if hired from the west, also western salaries would have to be paid, at least for that particular operation. Hence, the large margin charged by the Austrian firm might illustrate the relatively higher value added contribution of its marketing effort, compared to the simple process competence contribution of its Eastern European subcontractor.

The kind and character of the manufacturing business competence that is lacking among the East European firms of course determines how different policies to improve competitiveness works, a problem to which I now turn.

5. Is there a better policy strategy?

Summing up from the above presentation, we can conclude that even the best East European producers of semi-sophisticated products are hopelessly behind by modern western product and marketing standards. The situation is as bad when it comes to modern process technology, but this may not matter as much since western producers also use old and obsolete equipment, even though their competence to organize production is normally far superior. The comparative advantage for Eastern Europe may be a highly literate work force with skills in metal working processing and the possibility of being competitive in western markets in existing, less sophisticated production. One important question is to what extent the advantage of very low paid, skilled labor in fact exists and is sufficient to make the worries of Swedish subcontractors about new East European competition come true (Braunerhjelm 1991).

It is illustrative to remember that employees of the public sectors of Western Europe in a large measure will be finding themselves in a situation analogous to the employees of manufacturing firms of Eastern Europe, as the public sectors of the west are privatized. Exposing public production both to the vagaries of private demand and to open competition to anyone who is qualified and may want to establish a business in health care will be a challenge to firms and labor previously inexperienced in having to worry about who would be prepared to pay for their services.

Strategic policy options

It may be possible to acquire the physical production equipment needed to become competitive in a short period, if financial resources can be arranged. To send money or machines, however, won't help if the receiver competence to implement these resources commercially and technically is not there. The lacking receiver competence among East European firms is the result of 40

years of isolation from the West. Even if learning can be speeded up, this is still a matter of about a generation if the countries are not willing to take some very radical steps; steps that the underdeveloped world has usually been reluctant to take because it means giving up a large part of so called national sovereignty, hence, effectively preventing industrialization.

The above discussion supports the hypothesis that doing it on their own will take a very long time, creating tremendous social adjustment problems immediately. On speeding up policies, I will briefly discuss;

Step I (Privatization)⁸

- (1) creating institutions required (a) to establishes ownership to and tradability in entitlements to future rents created by entrepreneurship (incentive system) and (b) for the existence viable capital markets (local privatization).
- (2) organizing a functioning domestic credit system, that will create the necessary, immediate demand to bolster local industry, to induce employment and stimulate growth.

Step II (Trade Liberalization)

- (3) restricting, or opening up access to local markets for western producers (Fortress Eastern Europe or strategic industrial targeting versus free trade).

⁸ Please recall my definition of privatization on p. 6, which establishes the incentive system needed to achieve effective learning of domestic firms to be competitive by Western standards.

Step III (International privatization)

- (4) allowing for significant western foreign ownership of industry to import competence
- (5) inducing foreign immigration of competent people, through the granting of generous privileges
- (6) inducing foreign firms to exploit cheap skilled labor through subcontracting arrangements that allow faster learning.

My argument will be, that if not done simultaneously, the steps should be taken in that order. The first Step I lays the foundation for later steps. It apparently is a cumbersome operation to judge from the literature on the matter. It means a complete break with the ideological past, it requires a thorough revision of existing legislation, notably on transactions in property rights and there appears to be significant political reluctance to take a full scale Step I at once.⁹ Step I, above all, requires political legislative action. It has to come first, according to Rybczynski (1991) and I concur. All three steps will force significant change, that will cause hardship if the domestic responses of firms and individuals are not well conceived. On all scores, East Germany will be in the best situation by far compared to its Eastern European neighbors.

The critical competence problem

The critical competence on which western, notably Western export oriented or internationalized firms earn their rents, resides in a combination of

⁹ For an overview, see Åslund (1991). To get a feeling for the enormous complexity associated with routine commercial transactions in the west, see *First Privatization Program 1990* of the Hungarian State Property Agency.

product, marketing and process know-how that makes the achievement of scale economies or synergies possible. Some of this internal resource allocation is reflected in the distribution of expenditure over the various categories in Figure 3, or in the composition of total capital in some of these firms (see Table I). This know-how is, however, fundamentally embodied in human beings or in the organization of teams of competent people. The know-how is in a large measure proprietary; it cannot be diffused through imitation, and firms do their best to protect it. Internally, within the firm, however, such know-how can be reallocated through the reallocation of people. This is also one of the methods through which large international firms exploit their proprietary competence, without diffusing it to competitors. I am not restricting these comments to sophisticated technical things. The most important competence has to do with the capacity to organize large scale production and international marketing of fairly simple products. The Western firms will never willingly part with that know-how, but they may be open to mutually profitable deals, involving the establishment of foreign subsidiaries, especially deals that give them access to future growth markets for their products. Such deals can naturally be arranged over the market, through acquisition or direct foreign investment. This is already a common and growing form of international integration among economies of the West. National authorities are only sometimes part of such transactions. Hence, multinationals have increasingly knitted the western production and financial systems together over the last decades, to the mutual benefit of involved nations, even though national policy authority has been drastically reduced as a consequence. The difference this time is the uneven distribution of competence, meaning that ownership of such across border transactions will go from West to East (at least in the beginning), instead of both ways.

But what, if none of the above occurs? The development following the opening up of Eastern Europe to Western competition has been discussed, and is currently taking place. The above discussion supports the prediction, that it will be dramatic with a transient period of high open unemployment.

My discussion is concerned with the long term solution to the growth problem only. The short and intermediate terms is of no concern for the analysis to follow.

The three strategic policy steps outlined above included as a first necessary step (1) the creation of a local viable financial system through privatization, (2) trade liberalization to expose local producers to international comparison and competition. The consequent change may, however, also cause devastation and destruction, if local competence is not in place and/or has not been created in step one. Hence, (3) the import of competence through foreign direct investment may help. Let me elaborate each step.

Step I (Privatization)

Dynamic financial markets are lacking in most Western countries. It is sometimes argued that the creation of such financial markets, including privatization of industry and venture markets will be sufficient to create a rapid reindustrialization of Eastern Europe. The opportunities existing because of the industrial backwardness in Eastern Europe and the economic incentives created will release expansion. This is probably correct in principle. The problem is how long the revival process will take if each country, or the Eastern economies together, attempt to do it on their own, and what will happen in between. My argument above, to some extent documented, is that the creation of viable financial markets, including privatization, is a necessary condition for East European revival, but not a sufficient condition, if fast reindustrialization is desired. The main reason for this seemingly negative conclusion is that the industrial know-how required is largely lacking and not available locally in "magnitudes" needed to create visible fast results at the macro level. The success rate, hence, depends on the rate at which firms learn to be competitive by Western standards. This in turn requires an appropriate incentive system that allows private entrepreneurs and fast learners to capture

the rents they create privately. Obviously this incentive system requires that all the financial arrangements of a capitalistic market economy be instituted, notably a free stock market free entry and rules that see to it that all firms compete under similar conditions. As I have argued early in the paper this is a broad definition of a privatized economy.

A general observation on the competence situation is that pockets of local manufacturing process competence exists, notably in the form of skilled workers used to operate (very) old equipment in badly organized facilities. The effective mobilization of these skills in the first round requires western production organizing competence, then the introduction of competitive product designs and marketing organization. Modern production equipment comes later. It should also be remembered that the creation of dynamic financial markets also requires competence and that the right institutions be set up. Also this know-how can of course be imported. This, however, means that I do not fully buy the proposition that privatization and the liberalization of financial markets are enough. It is sufficient only if the population has the patience to wait very long to see the expected results.

There are at least three basic conditions that have to be satisfied, to see privatization occur. The incentives to engage in production and to acquire the necessary competence (learning) are directly linked to the confidence investors have in their rights to the future profits created by their innovative action. This is a true economic problem, but its solution is facilitated by the existence of certain formalities. First, the proper legal institutions should be set up, notably to establish property rights. Second, appropriate accounting standards to define the property rights to be traded in markets will contribute to market performance. Third, the right to free entry of new "owners" has to be established as well as free trading in entitlements to future profits in secondary markets. The last clause doesn't rule out state ownership, but the rules have to guarantee that Government operated firms are exposed to the same discipline in the mergers and acquisition (M&A) market as any other

firm. This means that free entry must exist and that tax finance or similar finance of state owned firms have to be prohibited. It is important to observe, however, that many of these prerequisites (institutions) can very well develop endogenously in markets. And if politicians cannot pull their act together fast and finally create the necessary institutions, the important thing is to remove the power of the bureaucracy to prevent the endogeneous creation of the necessary institutions. The establishment of free entry is probably the most important such change.

The whole issue of competence comes down on the analysis exactly here. The prime function of the markets for corporate control is to allocate high level organizational competence, to direct financial resources to the potentially most competent organizations and to remove resources from defunct operations (see Eliasson 1990b). This merging of financial resources and industrial competence is the ultimate accomplishment of the capitalist system. The problem is extra difficult in our setting, since both financial and industrial competence are more or less lacking, leaving little to merge. I would agree with Lipton-Sachs (1990b), that perhaps the East Europeans should avoid the US financial organization. Whether this means taking up the Japanese organization of financial markets or the German or Swedish "Industrial Banking" configurations (Eliasson 1990b, Glete 1989) is an open question. The particular circumstances of East Europe, their economies suddenly being opened up to sophisticated global competition, might suggest an entirely novel organization of financial markets, that can only be learned through experimentation (Eliasson 1990c, d). Our part of this organizational learning experience includes teaming up with foreign multinationals. I will discuss this under Step III.

One privatization measure proposed has been to distribute Government wealth (ownership of production capital) to everybody in the form of vouchers. Hungary was, however, very reluctant to try this novelty, but Czechoslovakia and Poland began discussing vouchers, only to get cold feet when it was

realized that trading in secondary markets would lead to rapid concentration of ownership. The problem is currently proposed to be "solved" by prohibiting trading of such stock in secondary markets. Several economists of western mainstream tradition, including Stiglitz (1989) and Lipton-Sachs (1990a) have been willing to accept various forms of state ownership, and centrally planned business decisions as long as (Step II) local firms are exposed to western competition. They, including the Czech were wrong in worrying about secondary trading. They should stimulate it, argues Pelikan (1989, 1991). The whole idea of vouchers, like the stock market in general, is to make the market identify and reallocate scarce competence. Speculators might come in first and then sell at a profit. The ultimate aim of privatization is to achieve concentration of ownership of industrial resources in new and more competent hands.

The little competence that exists has to be mobilized and effectively allocated. If the necessary organizing competence is lacking, superior western products will simply flood the eastern markets and force local producers out of business, creating growth only in those rare circumstances, where producers come up with viable solutions, and "destruction elsewhere". This is the slow growth scenario I discussed above, that will take a generation or two to bring East European economies up to western standards. The critical scarce factor is competence and the first critical policy is to mobilize competence locally. A successful solution requires an adequate incentive scheme, namely a scheme that allows the competent innovators to keep the rents they create.

The prime function of viable financial markets in an industrialization perspective is to facilitate secondary trading in ownership certificates. One would therefore think that there is also a need for efficient financing of industrial activities in general, notably for investment purposes, and perhaps also to support consumer demand. The latter proposition is, however, refuted by Lipton-Sachs (1990a). The first task of reindustrialization in Eastern Europe, they argue, is to eliminate the inflationary excess demand situation

through an "austerity program". On this, one has to observe, however, that any secondary trading in stock and other financial assets will have liquidity effects. The trading in vouchers might very well increase the money supply, and create excess demand for consumption goods. It is therefore important that such liquidity be directed towards long term saving, or to bolster demand directed at those domestic industries that should be part of reindustrialization. No country has been able to deliberately design its credit system to be capable of that, and in principle it is impossible.

If, on the other hand, local demand is supported, as in Germany, and local production is not rapidly brought up to standards the artificially boosted demand may only create an even larger influx of imports and worsen the situation.

Step II (Fortress East Europe – or not?)

The Salter analysis of section 3 might suggest that any exposure of local producers to western competition should be done softly, to prevent entire industries from crashing and also the social hardship that would follow. Local firms and people should be given time to learn. Therefore Eastern European producers, like EC Bureaucrats might think in terms of a common internal market, protected from Japanese and external Western competition by a protective wall. Internally they could trade their bad products. Only when they have learned to be better should the walls be pulled down. This argument has been around in the US as a brushed up infant industry program called "industrial targeting". The Fortress Europe discussion is also about protection of badly managed firms from superior foreign competitors. But how should learning take place if the "students" are not immediately exposed to the standards of the market that they will soon meet? The problem is that learning will be slowed down under these circumstances, and reindustrialization may never catch up with the industrialized world. Hence,

Steps I and II are most effectively taken in one step. The fast track to industrial prosperity is entirely incompatible with "industrial targeting" type policies. However, to prevent complete collapses of local producers, in confrontations with international competitors, international producers can be signed on to the local reindustrialization process. Otherwise only the very slow, do it alone process remains.

Step III (Global privatization)

If profit opportunities are large the free entry of foreign capital in local markets for control is the fastest road to prosperity for the Eastern European nations, if done right and if the policy system will accept a foreign capitalistic dominance. Success, however, depends on the ability of foreign capital to capture its expected rents, something that requires that an orderly legal system of the Western type be rapidly instituted. This, however, is a requisite for any market solution to the growth problem that the eastern economies are facing. It is probably also important not to make the investment process overly cumbersome by imposing a multitude of restrictions related to employment in acquired firms, of the kind that are imposed by Treuhand in Eastern Germany.

The most important contribution of foreign investment is the rapid learning process at all levels that it will induce locally, and the creation around the foreign subsidiary of a local subcontracting industry. To receive that possibility something has to be offered in return, for instance cheap labor. It should be recalled, however, that such arrangements and benefits are not restricted to low income economies. It is all a matter of relative factor prices. In the 60s Sweden had a relative abundance of (relatively low paid) skilled workers, compared to the US. US manufacturing firms, possessing at the time superior product development and international marketing skills established foreign subsidiaries in Sweden making US designed products with the input of

relatively cheap, skilled Swedish labor. As the Swedish Government lost control of the internal cost situation in the 70s and 80s this comparative advantage disappeared, and the US multinationals shut down these particular operations. It is also worth recalling that the current distress in US manufacturing industry has been gainfully exploited by Japanese industry, establishing both assembly plants and subcontracting configurations in the US, through the exploitation of (apparently) superior organizational competence on production and delivery systems. This organizational competence, and particular attention to quality are in turn being "learned" by US firms. The potential for the East European economies to reindustrialize fast this way should be great.

Inducing competent people to immigrate has been tried before, but is a very long term solution, since the number of competent people immigrating will always have to be relatively small. There is, however, an intermediate possibility between the first two "solutions", in the sense that foreign direct investment will necessarily entail at least a temporary allocation of foreign human capital on the investment locations. In any respect, however, the volume results will be slow in coming. Moving an industrial facility to an East European site will for a long time (even after the legal and institutional infrastructure has been brought up to western standards) be very much like making the chief officer of a manufacturing firm enthusiastic about investing in a facility in a remote, regionally distressed area, say northern Sweden.

Subcontracting arrangements is a feasible arms length variation of direct investment. It should be an attractive solution for areas where skilled labor (still) exists and the retraining of workers will entail minimal costs, but management, product and marketing know how is lacking. I have been told that pockets of skilled and very literate labor exist in Hungary, Czechoslovakia and East Germany. Such labor would be very cheap by western standards, and a long term contractual arrangement with an East European firm, rather than a direct investment might be a good arrangement for a large western firm.

Again the problem is the need to organize production facilities such that they can meet western product quality and delivery standards. Can this be done without significant investments on site, and who is going to do it and pay for it?

Summing up under Step III, I see no simple, liberalization policy resolving the economic dilemma of the East European nations within the time limits talked of and accepted by their inhabitants. Sufficient local competence to do it fast, alone doesn't seem to exist, even in the once industrially advanced East European economies. My argument therefore is that a rapid reindustrialization of Eastern Europe will not be accomplished unless generous incentives are created for direct foreign investment and/or western manufacturing firms are finding it profitable to organize their subcontracting networks in East European countries. The latter is no academic idea. It has been done in isolated cases for many years.

For the natural reindustrialization process to occur, in addition, proper incentives have to be institutionalized at the micro level to ensure maximum learning (catching up) efficiency. Those incentives have to be oriented towards guaranteeing access (ownership) to future profits, created by the new acquired competence. Hence, privatization and functioning financial markets come before other measures.

As already mentioned, there are three catches to this solution, in addition to its pro western capitalist content. National policy authority (first) will obviously be reduced. This is, however, no real argument against Step III, if the authority over an economy in distress sees as its first priority to take the economy out of the same distress. The second catch is more real. If the nationalistic authorities don't solve the industrialization problem locally, the competent people that exist will soon leave for economies that are solving or have solved their problems. The third catch is both real and frustrating. A successful reindustrialization of East Europe will rapidly compete low end

western producers out of business. It will be resisted by unions in the rich industrialized world and by governments worrying about unemployment. Therefore, the only viable solution for the East European countries will be to remove political authorities from the micro decision process, and leave it entirely to the agents in the market to identify and realize business solutions. This can in fact be done unilaterally by the East European countries through allowing its firms full freedom to team up with the other free firms of the world, the multinationals. And the long term benefit to such privatization of economic decision making may be great indeed, since the East European nations that venture such bold policies may come out in the long term with a more viable and competitive industrial structure than that of the old industrial nations, being unable to privatize as much at home and hence also to restructure efficiently. This is the true privatization of Eastern Europe that may even work well.

SUPPLEMENT

This supplement gives the details of the computations of performance rates of the East European firms and the reference Swedish firm.

Firm A makes semi sophisticated machine tools of various kinds; numerically controlled lathes being the largest product group.

The average price obtained for a machine, being delivered to western markets through an Austrian firm was \$32 thousand. The Austrian firm later resold the equipment with some extra accessories for ca \$80 thousand, capturing a 150 percent margin on purchase costs. 400 machines were produced annually, by 200 blue collar workers and 260 white collar workers, i.e. altogether 460 people. This was a targeted figure for 1990. The year before (1989) 600 employees produced slightly less.

Hence targeted sales amount to $400 \cdot 32 = \$12.8$ million with component and materials inputs varying between 20 and 40 percent, depending on the machine, or ca 30 percent on the average. Hence value added of the firm is about $\$0.7 \cdot 12.8 = \8.96 or = \$9 million or 13.8 million DM.

Firm B was a more sophisticated operation, with a well ventilated and air conditioned plant and painted and clean floors. The most sophisticated machine, a precision CNC lathe, was produced on a Swiss licence. This machine sold for \$300 thousand, "leaving the factory", and was delivered in the market with an extra 10 percent margin. Altogether the firm produced 400 machines at two different locations, whereof 36 (1989) of the sophisticated kind. The rest fetch an average price of 15 percent of the sophisticated machine. Total sales were 85 million DM. Assuming again 30 percent components and material inputs, this means a value added of $0.7 \cdot 85 = 59.5$ Million DM.

Total employment was 600 in the factory and 900 elsewhere, thereof 140 at the drawing boards or in product design i.e. altogether 1 500 man-years of input at on the average 5 500 DM + 43 percent (social charges) or 7 865 DM per year. This wage cost, I was told, was three times the average for an industrial worker in the same country.

Labor productivity

A labor value productivity in 1989 of $\frac{59.5M}{1\ 500} = \text{ca } 40\ 000 \text{ DM}$ per employee and year in Firm B hence, compares with a wage cost of ca 7 900 DM/year and a labor value productivity in Firm A of $\frac{\$9M}{460} = \$19\ 600$ or $\text{DM } 19\ 600 \cdot 1.53 = \text{DM } 30\ 064$ per year.

The Swedish firm, on the other hand, would have much fewer people in the factory, not more than 300 compared to 600 in Firm B and at most 300 more in the offices, compared to 900 in Firm B, or altogether not more than 600s people to produce the 59.5 M DM of Firm B. Such labor saving is achieved through more efficient work organization, a faster production flow and a reduction of overstaffing.

This means that we have the following labor productivities of the three firms in 1989;

Firm A; $30\,064 \cdot 3.7 = 111.2$ SEK per employee and year

Firm B; $40\,000 \cdot 3.7 = 148$ SEK

Swedish Firm; $\frac{59.5 \cdot 3.7M}{600} = 367$ SEK.

Capital inputs

Make K the production and office ("hardware") capital of the Firm A factory. Then an estimate of Firm B capital should be valued at 1.5 K and a corresponding Swedish factory, with more modern machines at $2 K^{10}$.

If the Swedish firm would invest to build the factory for $600 + 900 = 1\,500$ employees that Firm B employs, the hardware investment in a state of the art factory and office buildings would be in the neighborhood of 500 M SEK.

This corresponds to an estimated replacement value of $500/2 = 250$ M SEK or $\frac{250}{3.7} = 68$ M DM in Firm A and $1.5 \cdot 68 = 101$ DM in Firm B.

This is the value of the capital input in factory production that the two East European firms have to replace and to maintain continuously as their capital depreciates. On the other hand, a Swedish firm would have much less people in the factory, not more than 300 compared to 600 in Firm B and at most 300 more in the offices, compared to 900 in Firm B. For these 600 people the needed hardware capital, hence, is reduced to some 200 M SEK for factory buildings and machinery and some 150 M SEK for office buildings and inventory, i.e. altogether some: 350 M SEK.

The capital data represented do not include in and outgoing inventories and work in progress or net financial capital (receivable, payable etc).

¹⁰ Another estimate made by an accompanying expert was rather K, 1.2 K, and 1.5 (1.2 K) = 1.8 K respectively.

This means that hardware capital intensities in the three firms are:

$$\text{Firm A; } \frac{68 \cdot 3.7M}{460} = 550 \text{ thousand SEK per employee}$$

$$\text{Firm B; } \frac{101 \cdot 3.7M}{1\ 500} = 250 \text{ thousand}$$

$$\text{Swedish Firm; } \frac{350M}{600} = 580 \text{ thousand}$$

Wage carrying capacity

I assume a depreciation rate of 10 percent, a real interest rate of 10 percent, applicable to all three firms and that net financial assets and inventories in all three firms are of the same order of magnitude as the hardware capital. The Swedish firm is assumed to produce a total value added of the same magnitude as Firm B.

A 10 percent real interest (r) on all capital (this is on the high side), then gives the maximum wage cost carrying capacity of each firm, at which net profits = 0 ;

$$PQ - Lw - \rho K - r(2K) = 0 \quad (1)$$

P = value added price

Q = deflated valued added

L = Labor input

w = wage costs per unit of L

ρ = depreciation factor on K

K = capital valued at reproduction costs

r = an appropriate market interest rate

Please note that this calculation imputes an interest charge on all capital. The formula above (see below) hence, sets the real rate of return equal to the real interest rate.

Swedish firm (same size (value added) as Firm B)

$$59.5 \cdot 3.7 \cdot 1000 - 600 \cdot w - 0.1 \cdot 350 - 0.1 \cdot 2 \cdot 350 = 0$$

$$w = \frac{(220-35-70) \cdot 1000}{600} = \frac{1\ 150}{6} = \text{SEK } 192 \text{ thousand}$$

We estimated the average blue collar worker wage costs per year in Sweden 1989/90 to 225 th SEK, and for the salaried worker to 275 SEK, which corresponds to an average annual wage cost per employee of $\frac{225 + 275}{2} = 250 \text{ SEK}$.

The Swedish firm, hence, is a loss operation if the situation persists over time. It breaks even at a zero real rate of return to equity capital if equity capital amounts to 50 percent of total capital (replacement valuation). (The Swedish firm would have to live by a "steady state" calculation of the above type. In "the old days" the calculation would have been different for the East Europe firms, however, not in the future. It is therefore interesting to carry out the same computations for Firm A and B.)

Firm A

$$13.8 - 460 \cdot w - 0.1 \cdot 68 - 0.1 \cdot 2 \cdot 68 = 0$$

$$w = \frac{(13.8-6.8-13.6)1000}{460} = \frac{-66\ 000}{460} = -140 \text{ DM per employee.}$$

This is the break even wage, after depreciation and interest on all capital has been paid; that is, when the firm earns a real return to all capital equal to the interest rate. If depreciation charges and interest are removed the wage carrying capacity increases to:

$$w = \frac{13.8 \cdot 1000}{460} = 30 \text{ thousand DM per employee}$$

Firm B

$$59.5 - 1\ 500 \cdot w - 0.1 \cdot 101 - 0.1 \cdot 2 \cdot 101 = 0$$

$$w = \frac{(59.5-10.1-20.2)1000}{1\ 500} = \frac{29\ 200}{1\ 500} = 19.5 \text{ thousand DM}$$

to compare with an average employee annual wage cost of 7.9 thousand DM.

Apparently, Firm A is a loss operation, if capital costs are properly imputed. It can, however, carry on as long as the old equipment works, and still produce a gross operating profit over other costs than capital. The situation for Firm B is much better by western standards.

The large productivity differences between the Swedish and the East European firms are largely absorbed by a many times higher wage cost; SEK 30 thousand, (= 7 900 DM · 3.7) in Firm B compares with SEK 250 thousand in the Swedish firm. Firm B was said to pay the highest wages in the East European country for its most skilled labor, therefore the large differences in average wage cost between the two East European firms.

Rate of return

The next step is to compute a rate of return measure for the three firms and compare with a chosen reference rate and the corresponding distribution for Swedish firms. I do this by defining an excess rate of return over the market interest rate $\bar{\epsilon}$. First, using equation (1) I compute:

$$\epsilon = PQ - Lw - \rho K - rK \quad (2)$$

as residual, before tax profits when all factors have been paid. All capital has been compensated by the market interest rate r . I then define:

$$\bar{\epsilon} = \frac{\epsilon}{K} \quad (3)$$

as the excess rate of return over the interest rate r .

This computation gives the following results, charging a ten percent interest rate on all capital. Thus:

Swedish firm:

$$\begin{aligned} \bar{\epsilon} &= \frac{59.5 \cdot 3.7 \cdot 1000 - 600 \cdot 250 - 0.1 \cdot 350 \cdot 1000 - 0.1 \cdot 2 \cdot 350 \cdot 1000}{2 \cdot 350 \cdot 1000} \\ &= \frac{220 - 150 - 105}{700} = \frac{-35}{700} = -0.05 \end{aligned}$$

Firm A*

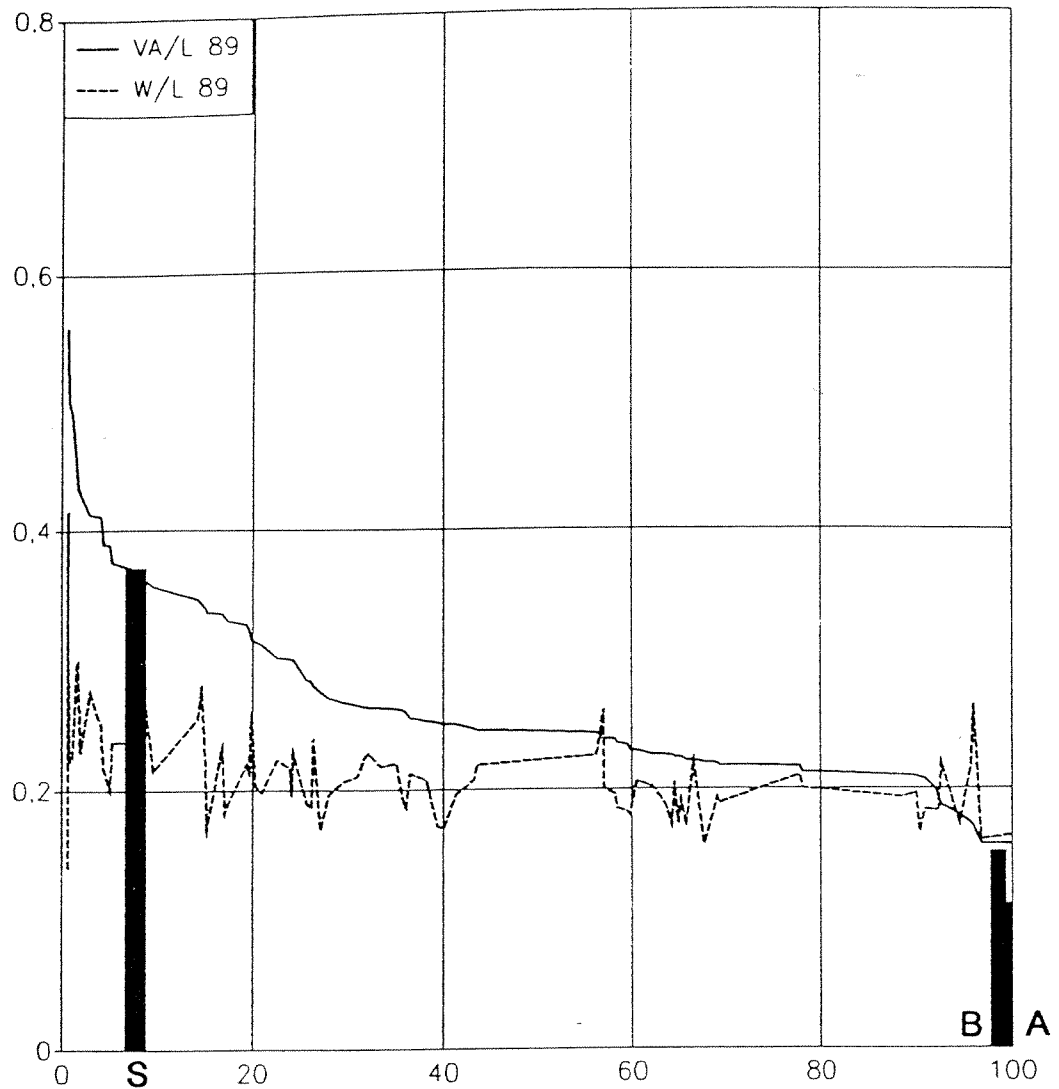
$$\begin{aligned}\bar{\varepsilon} &= \frac{13.8 \cdot 1000 - 460 \cdot 7900 - 0.1 - 68 \cdot 1000 - 0.1 \cdot 2 \cdot 68 \cdot 1000}{\frac{2 \cdot 350}{2}} \\ &= \frac{13.8 - 3.6 - 20.4}{350} = -0.03\end{aligned}$$

Firm B

$$\begin{aligned}\bar{\varepsilon} &= \frac{59.5 \cdot 1000 - 1500 \cdot 7900 - 0.1 \cdot 101 \cdot 1000 - 0.1 \cdot 2 \cdot 101 \cdot 1000}{\frac{2 \cdot 350}{1.5}} \\ &= \frac{59.5 - 11.9 - 30.3}{467} = \frac{17.3}{467} = 0.04\end{aligned}$$

- *) We never obtained the average wage cost for Firm A. I have simply entered the same average wage as in Firm B. This means a too high wage cost and a too low rate of return. I have in my notes that firm A pays half to one third of the average wage of firm B, which to me appears a bit on the extreme side. If the lowest estimate is entered in the formula above i.e. a wage cost of ca SEK 10 000 per year (or DM 2 650) the corresponding $\bar{\varepsilon} = -0.02$. Wage costs appears to be an insignificant item in the computation, a circumstance that forebodes serious problems in an open market situation.

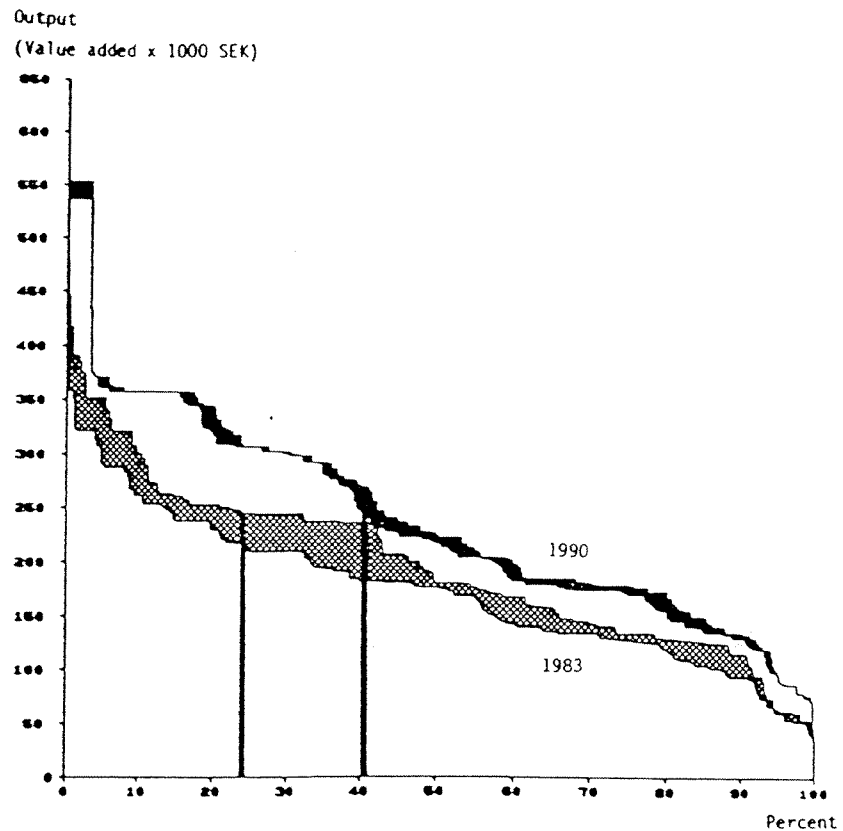
Figure 1A Labor productivity distributions in small Swedish manufacturing firms and subcontractors 1989



Note: Two east European firms (A and B) and one "comparable" Swedish machine tool manufacturer (S) are indicated. See further, the text.

Source: MOSES Database

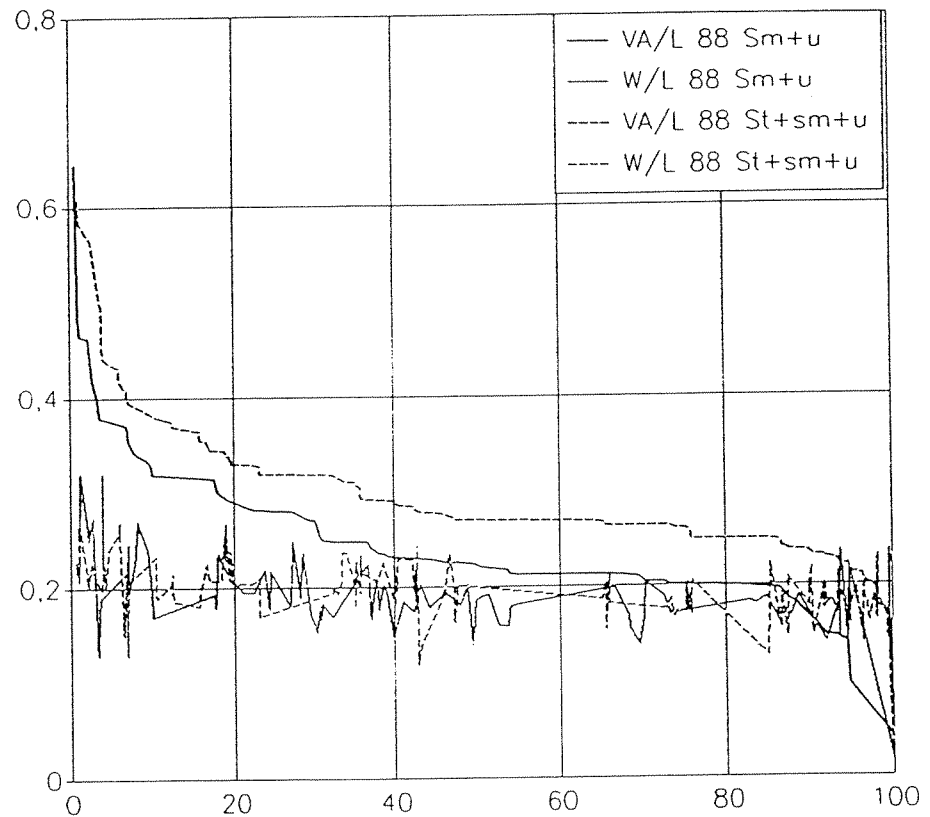
Figure 1B Potential and actual value productivity distributions 1983 and 1990 in Swedish manufacturing



Note: Shaded areas show the difference between potential and actual productivity

Source: Eliasson (1991c)

Figure 1C Labor productivity distributions 1988 for all types of firms and for small firms and subcontractors only



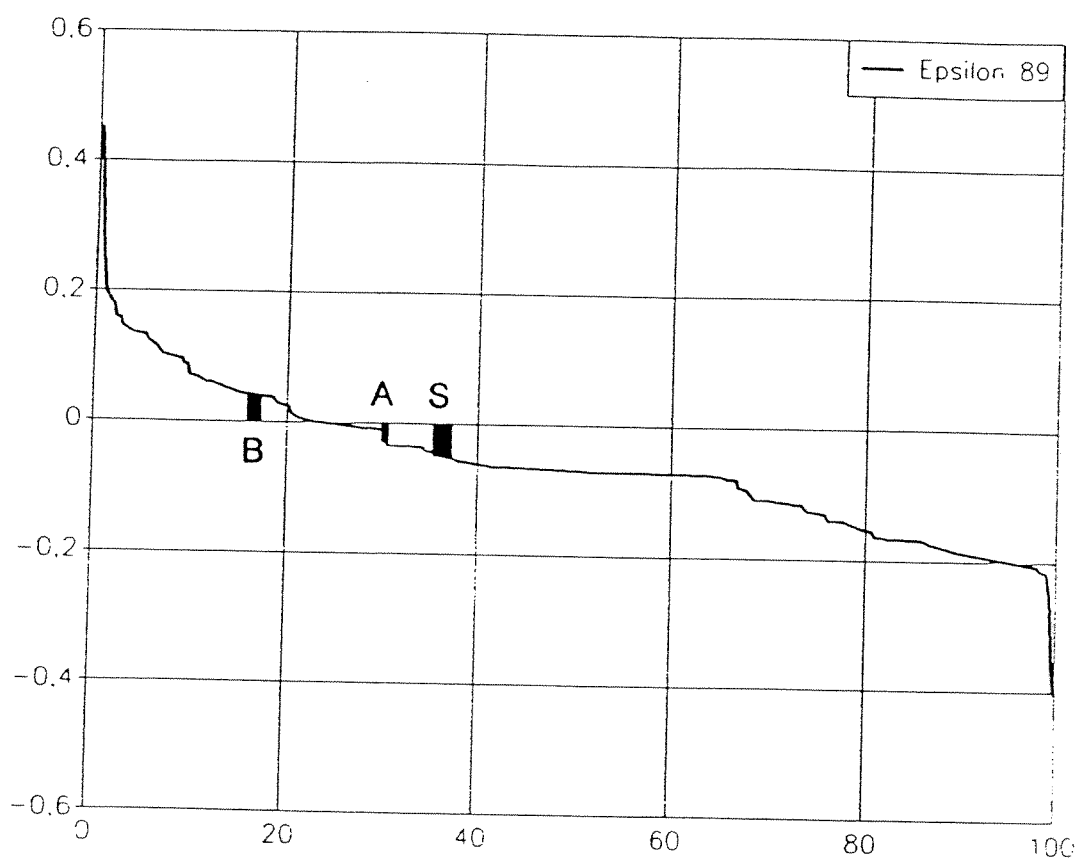
— labor productivity, small firms and subcontractors

- - - ditto, including large firms

Note: The lower jagged lines show the corresponding wage cost levels per employee, 1988.

Source: MOSES Database

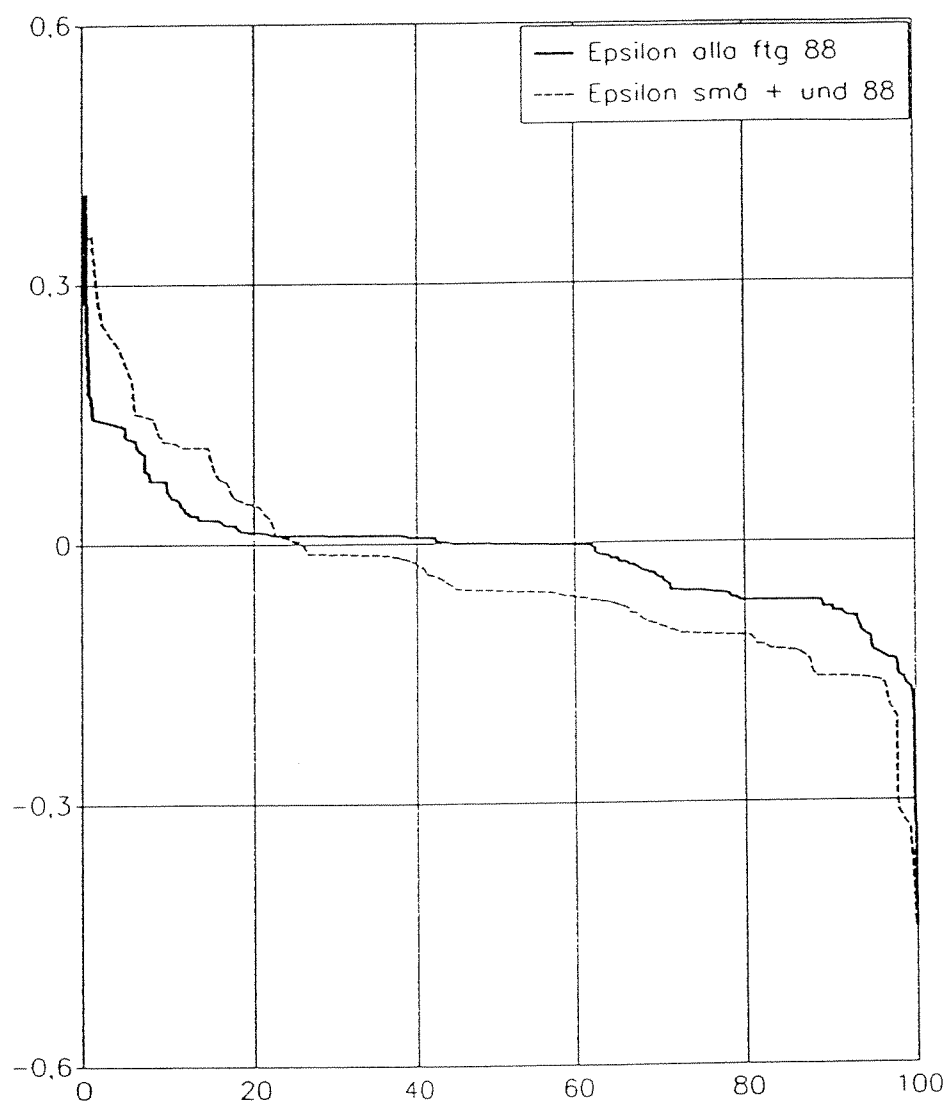
Figure 2A Rates of return over the interest rate ($= \bar{\epsilon}$) in 1989 in small Swedish manufacturing firms and subcontractors



Note: Two East European firms and one "caparable" Swedish machine tool manufacturer are indicated. See further, the text.

Source: MOSES Firm Survey. See Braunerhjelm (1991b).

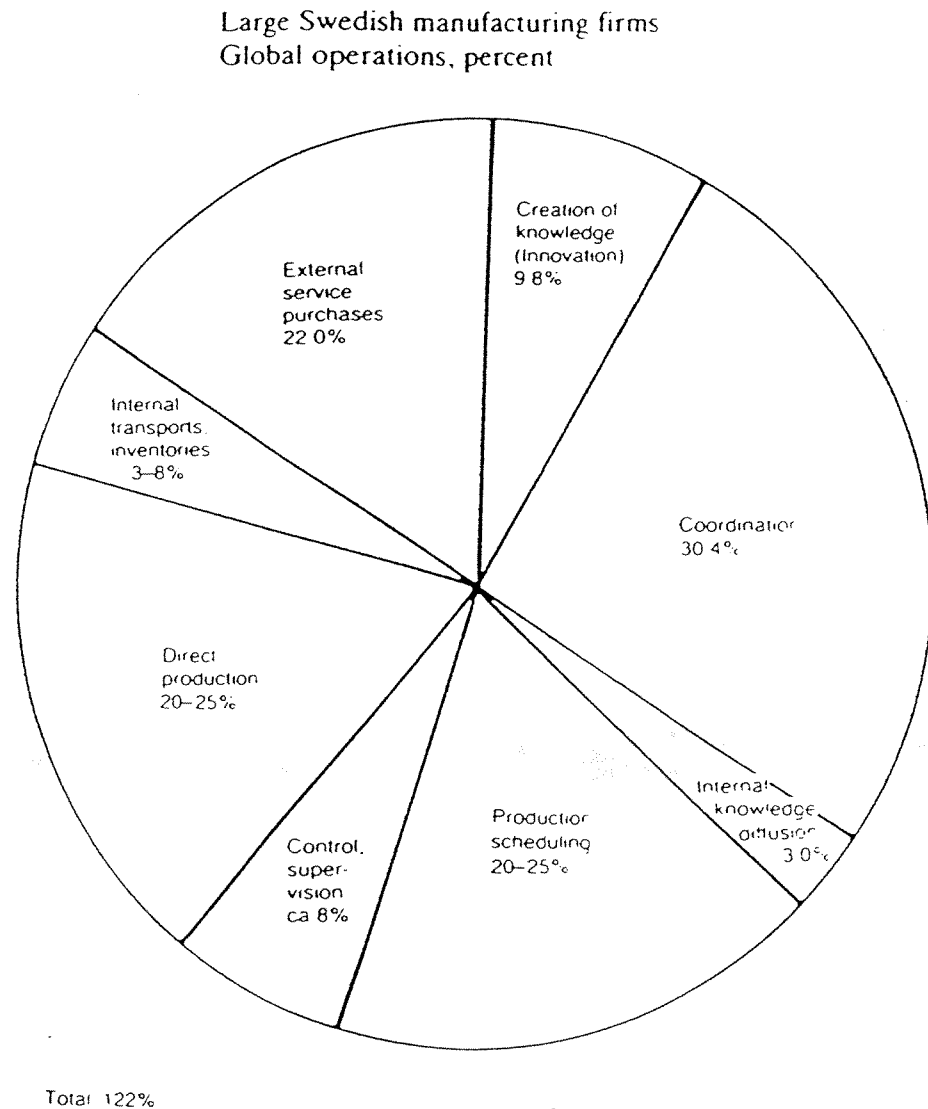
Figure 2B Same $\bar{\epsilon}$ distributions as in Figure 2A for 1988, including also large firms



Note: — $\hat{\epsilon}$ for all firms
 - - - $\hat{\epsilon}$ for all firms, except large firms

Source: MOSES Database

Figure 3 **The content of production in Swedish manufacturing firms**



Source: Eliasson (1990a, p. 68).

Table 1 The composition of capital in Swedish manufacturing firms

	9 largest firms end of		17 largest firms end of	Planning survey firms end of 1988		
	1985	1988	1988	all sample	sample of subcontractors (SNS 38)	sample of small firms (SNS 38)
1 Machines and buildings	54	50	70	62	89	80
2 Software	n.a	7	6	5	2	4
3 Technical know-how (R&D) capital	17	16	13	21	4	11
4 Marketing capital	20	19	6	10	3	3
5 Educational capital	10	8	5	2	2	2
6 Total (percent)	100	100	100	100	100	100

Source: MOSES Data Base.

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