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IUI Yearbook 1986–1987

The Economics of Institutions and Markets

IUI RESEARCH PROGRAM

The Industrial Institute for Economic and Social Research

is an independent non-profit research institution, founded in 1939 by the Swedish Employers' Confederation and the Federation of Swedish Industries.

Objectives
To carry out research into economic and social conditions of importance for industrial development in Sweden.

Activities
The greater part of the Institute's work is devoted to long-term problems, especially to structural changes in the Swedish economy with emphasis on manufacturing industry.

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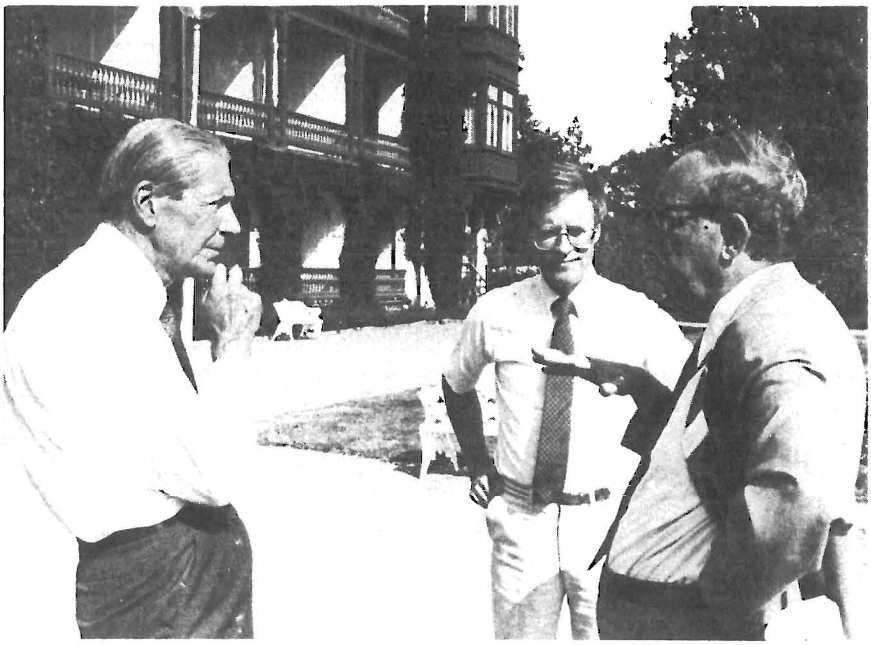
Editor
Gunnar Eliasson

IUI Research Program



The Dynamics of Market Economies was published in 1986. It includes updated papers from the 1983 conference at the Grand Hotel, Saltsjöbaden. The Schumpeterian theme manifests itself in several attempts to incorporate dynamics and institutions in classical economics. From the conference, from the left Dr. Erland Waldenström, then chairman of the IUI Board, Gunnar Eliasson and Herbert Simon.

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The organizers meet about something practical, from the left Gunnar Eliasson, Richard Day and Erik Dahmén.

During coffeebreak discussions became even more cr ative, from the left, Christian von Weizsäcker, Herbe Simon and Sidney Winter.

Mancur Olson introduces the final discussion, focussing on the equilibrium point

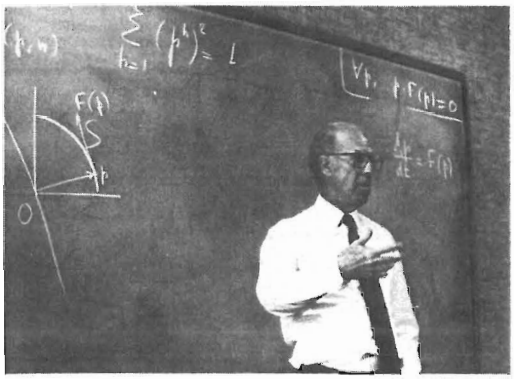
. . . with both Robert Clower and Bo Carlsson pond ring about their responses.

a)

Franco Modigliano giving the traditional Il lecture on "The European Economic Rec very. A Need for New Policies" June 2, a (b, right) at the traditional Glühwein morni on Dec. 13 with Lucia songs by a class fro the Adolf Fredrik Music School On his l Dr. Curt Nicolin, chairman of the IUI Boar

James Buchanan, 1986 prize winner in economics, visiting the IUI for the traditional Glühwein and Lucia singing. On his right, Birgitta Swedenborg, who has returned to the institute as deputy director.

b)



Gerhard Debreu giving the traditional IUI prize lecture, December 1983.

The international quest researcher program has been tensive. Ken Hanson and Richard Day pondering complex computer passage.

Israel Kirzner giving a seminar at the IUI. On his right, Ingemar Ståhl, Staffan Burenstam-Linder, Göran Albinsso Bruhner and Per-Martin Meyerson.

The Long-term Survey: Evaluating the 90s was published early 1986. Part of the research team presents the new boo From the left Enrico Deiaco, Tomas Pousette, Gunnar Eliasson, Lars Oxelheim, Nils Henrik Schager and Thom Lindberg.

The August meeting of the IUI Board is devoted to the research program and traditionally takes place at an industi site. During the last few years this board meeting has taken place in the Nordic countries in response to the joint Nor research activities the institute has been engaged in (see p. 166), in 1985 at Nokia, on the other side, on the Frigg fi in the North sea.

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CONTENTS

PART I.

Articles

1 THE ECONOMICS OF INSTITUTIONS AND MARKETS – the Organization of Research at IUI

by Gunnar Eliasson

Man has a consistent record of striving to achieve order, not only in his environment but also in his own mind. Thus he will consistently view his environment through perceptions – or theories – that are more organized, promise more predictive capacity and yield more clear advice, or decision capacity than is really possible. Scientists may be more inclined towards such idealizations than, for instance business men, who are constantly in direct confrontation with unpredictable environments and immediately suffer the losses from mistaken decisions. But whatever the glasses through which the world is viewed, they are all filters. Facts that do not fit theory or prejudice are rejected and misunderstanding arises. Hence, selecting the appropriate theory to deal with a chosen problem is scientifically more important than the later analysis.

Since predictability and straightforward conclusions are intellectual ambitions of man, simplification affects his decisions and, hence, to some extent also his environment. This introductory essay therefore discusses the ways man invents and designs institutions to control and modify his environment with a view to achieving environmental order and predictability, and to achieving political objectives. However, sometimes perceptions and institutions, on the one hand, and environmental reality on the other do not match, and enforcement of policies based on erroneous perceptions cause disruptions rather than order. The institutional superstructure of society is needed to intermediate this decision process. To achieve this the institutional superstructure has grown into a major resource using activity. Its organization and various functions are not well understood. The way it is organized is not only decisive for the efficiency in information and resource use. It also determines the incentive system in the entire economy and its social ability to cope with change. This is also a theme that runs through this introductory essay, and through the IUI research agenda.

1. Åkerman's Four Fundamentals of Economic Theory

In a rather unnoticed article in Ekonomisk Tidskrift (now The Scandinavian Journal of Economics) Johan Åkerman (1950) observed that economic theory was composed of the four core elements:

(1) interdependence,
(2) welfare,
(3) process,
(4) institutions.

This observation, made in passing, carries significantly more weight today than it did in Åkerman's days. The rich literary tradition of *institutional* economics from the late 19th and early 20th centuries that culminated with Schumpeter was a virtually forgotten item on the research and teaching agendas of western universities by the early 70s. Similarly, the notion of *the market as a process* was abandoned, even though the Stockholm School economists long ago had taken the first ambitious and fruitful steps towards developing process thinking in economics. Macroeconomics and the Walrasian tradition, represented by the first two elements of Åkerman's listing, came to dominate postwar economics. Even a Schumpeterian stronghold like IUI was then oriented towards macroeconomics and equilibrium theory.

Institutions, on the other hand, had been removed to other social sciences. This introductory essay argues for a revival of the economics of institutions on the research agenda of economics, and supports the arguments with illustrations throughout this yearbook from the IUI research program. I will use a broad definition of an "institution" as both a set of rules that guides and constrains behavior of an organization, or of agents and the organization itself[1].

Ongoing IUI research clearly demonstrates that technical advance and macroeconomic growth involve the constant change of organizations (called self-reorganization in Pelikan's essay), and that these changes are generated endogenously through attempts of agents to economize on the costs of interacting in markets (transactions costs). It is easy to agree that all these aspects of economic behavior cannot be practically dealt with simultaneously within one unified theoretical context. Hence, together with all social sciences, economics suffers from a fundamental dilemma. While natural sciences achieve transparency of problems, methods and results through simplification of theory, and benefit from the possibility of testing partial theory through experimental design, the same method is rarely applicable in the

[1] This makes "institution" the general concept. It is the (old) Austrian school usage and the dictionary definition of the concept, as it is understood in everyday language, and I see no reason to depart from that usage.

social sciencies. In fact all policy problems of any significance refer to the functioning of the *whole economic system,* and very few micro economic problems can be dealt with in isolation without risk of serious analytical biases. This, I will argue, means that the dominant resource using activity in an economy – the processing, interpretation and intermediation of information (see p. 173 f) – cannot be neglected. It is the essence of economic dynamics. Hence, institutional economics – istitutions being the intermediators of information – is primed for a renaissance.

Virtually all formalized economic theory developed and refined during the postwar period is restricted in its application to economic problems of interdependence and welfare, the first two items on Åkerman's list. Such theories represent ad hoc notions of economic behavior in the wider and more relevant setting advocated here. Developing methods which deal with issues pertaining to process and institution, the last two items on the list, is a high priority of research at IUI. They involve micro specified models and aggregation through dynamic markets. The choice of observation units becomes critical and always enters – in the form of choice of theory – economic analysis as a prior. This ultimately means that there is no clear dividing line between theory and application. Theory will have to vary with the empirical problem chosen. *Choice of proper theory becomes the art of economics,* not mechanistic analysis within a given theory. Furthermore, serious research must also become more sensitive to the ways in which political judgement enters analysis surreptitiously through the choice of theory or method. I will illustrate this by reference to the research agenda and reorientation of methodological paths of IUI research.

2. The Experimental Market Economy

The concept of macroeconomic behavior advocated by Johan Åkerman, and Schumpeterian economists in general, is that of dynamics from the micro level and up, involving also changing institutional rules (item 4 in Åkerman's listing). Only glimpses of the economic process can be captured by formal theory or quantitative methods. Hence, language, not only mathematics, must be an important means of communication in economics. Difficulties of language become acute when one attempts to explain phenomena like economic growth over a historic time span – a problem that has long been a priority concern of the research agenda of IUI.

Rather than oversimplifying the immense complexity of micro-macro interaction by looking only at aggregates, as in most growth theory, we accept the notion of complexity at the micro levels and organize a conceptual framework to deal with it.

Herbert Simon (1955) introduced the concept of "*bounded rationality*" to

convey the idea that decision makers used simplified models of reality to be able to form decisions in a complex world. Such models are ad hoc and only applicable in certain circumstances. Our argument is that bounded rationality is characteristic of all policy levels. And the art of choosing good decision models is not at all well developed by advisers to policy makers.

The early Joseph Schumpeter (1912), for instance, accepted the impossibility of predicting innovative activity at the micro level. Even though he later – in *Capitalism, Socialism and Democracy* (1942) – suggested the possibility of predicting the outcome of routine innovative behavior in large firms, current research at the IUI suggests otherwise. Routine research may be efficient, but the outcome in terms of the long-run economic consequences for micro agents is beyond meaningful prediction. One reason for this is that *economic opportunities* are *international* in scope, but the *competence* to exploit the opportunities is typically *local.* High level *competence* is normally *tacit* and vested in individuals or teams of people. Such critical, operating knowledge cannot easily be communicated or purchased in markets (see Pelikan's essay, and human capital project on p. 196). Furthermore, improvements in industrial technology are usually piecemeal. Each local improvement adds to the international opportunity set for future imitation and improvement. Innovative activities of one firm, therefore, mean important infrastructure capital accumulation for all firms. It is quite possible that this infrastructure capital grows faster in value than it is depreciated economically through imitation. But the potential for successful exploitation of such infrastructural knowledge capital – requiring competence – may be distributed quite unevenly across the economies of the world.

This understanding of technological change makes clear the *experimental nature* of innovative behavior, and of the market process. The inability to predict with any accuracy leads firms – and individuals – to rely on search and experimentation – determined by their local competence or knowledge base – at one end of an enormous opportunity set. They organize their information systems as filtering devices rather than prediction systems. The outcome of such experimentation at the micro level is hardly predictable. With this theory of the generation of technical change, the notions of full information and optimal decision making become fuzzy concepts, as does the entire idea of centralized policy making to achieve specified economic objectives. In the setting of the experimental economy it is not difficult to support arguments that public bodies are not organized to be efficient investors and producers (see e.g. Buchanan-Tollison 1972). What is most essential is to organize the market filters such that a large enough number of potential winners participate in the market game, and that the losers exit fast. The organization solution is an *incentive* system that maximizes the number of participants, and hence potential winners, and a social *acceptance* of enforced and fast competitive exit of losers that have tried but not succeeded. The insti-

tution of free, competitive profit seeking entry takes care of the incentive side. The exit side generated social problems that are more difficult to handle within standard economic theory. We will return to it in the context of the Swedish policy model below. The upshot of the experimental economy, however, is that fewer of the traditional policy functions, associated with Government become viable economic or social tasks.

3. The Role for Government – a Matter of Choice of Theory

Choice of economic theory determines the role assigned to Government. Standard economic theory presents us with an economic world in which a central policy body is always at least as good as the market (see the essays of Axell and Pelikan).

This is one extreme view but we can pit it against an alternative, also extreme view in which the ability to procure information is limited (bounded rationality, Simon 1955) and in which some critical knowledge needed to organize production efficiently is "tacit". Such knowledge cannot be communicated. In the broadened theoretical framework of the experimental economy the central economic controller needed for optimal decisions has a difficult time both understanding and deciding, and alternative market regimes are given a fair chance to compete in theoretical discussions (see Pelikan's essay and p. 183ff).

Carrying this argument leads further to confrontation with two extreme positions on the role of Government; the Walrasian central auctioneer model, in which a central authority by definition is the supreme arbitrageur, and a dynamic economic system in which the central controller is unable to understand what is going on and can easily disturb the economy. In this latter economy the only clearly defined role for Government is to design, interpret and enforce the institutional rules such that they contribute to stability and other social objectives. This is the Smithian notion of macroeconomic welfare achieved through the invisible hand of well designed markets. One aim of such efficiency promoting rules would be to guarantee – and fight all attempts to squelch – *free competitive entry* of all kinds and at all levels, since competitive entry appears to be the moving force behind productivity improvements (see p. 179) and hence, economic growth. Free competitive entry is the only regime feature that clearly sets the capitalist, free market regime apart from a socialist, planned economy (see Pelikan in this volume), in which planned or routinized innovative activity is the substitute arrangement for productivity growth. Since free innovative and competitive entry are clearly constrained within the public sector (see Murray's essay), while the classical models suggest optimal policies, the conclusions of the alternative models come out in favor of less explicit policy making, and much less Government.

It is interesting to observe – see Turner's essay – that the old Swedish policy model in its "working days" was clearly non-interventionist on the production side. It had a clear, free competitive entry specification, but this feature was restricted to a rapidly diminishing manufacturing sector exposed to free competition. As an even more rapidly growing public sector, protected from all kinds of competitive entry, began to dominate the economy, the old Swedish model gradually became inoperable. Both Ysander and Deiaco – in their papers – illustrate the values, attitudes and other forces behind this institutional self-reorganization of the Swedish economy, that is currently causing severe structural tensions.

Choice of theory is a political choice. Standard economic theory, as it now stands, has a built-in political bias in favor of central Government intervention. Any person who thinks less Government is good for economic welfare should not accept traditional economic analysis, calling for more central Government, because *in another theoretical representation of economic reality welfare may well be reduced.* An illustration of the inadequacy of received economic theory is that information, and the technology of using information as a factor of production is not explicit. Since information processing appears to be the dominant resource use in an advanced market economy (see p. 173 f) this is a serious deficiency. The choice between a "policy" or a "market" solution is nothing but the choice of the most efficient organization of the use of information to achieve a prespecified objective (welfare). This is exactly the issue of the time honored debate between von Hayek (1940, 1945) and Oscar Lange (1936-37), which was carried into various dead ends by many researchers, by allowing the original efficiency problem to be defined away.

4. Why is Institutional Economics Necessary?

In a traditional growth model technological change enters as an external force that upgrades the performance of a given production machine. However, once it is recognized that technological change is coupled with institutional change, and that institutional change is endogenously triggered by the ongoing market processes, one also has to recognize that the traditional dichotomy between short-term market behavior and long-term productivity expansion does not hold water. The set of papers in this volume has been organized to illustrate this.

Technical change, or innovative activity, is completely removed from static general equilibrium theory. Franklin Fisher (1983), on the other hand, observes that in equilibrium growth theory (steady state and macro production function analysis) economies are stable if, and only if there are no unperceived technological changes. Since the distinguishing feature of a capitalist

market organization is precisely free, competitive and innovative entry (and exit) technological changes are not only unpredictable, they are also an endogenous part of the ongoing market process. Hence, the growth analyst and the economic historian have a number of problems with received theory. Probably as a consequence of this theoretical dilemma, studies of microeconomic industrial processes – *industrial economics* or *organization* – go on in a very fragmented fashion[1].

For illustration take a look at the development of a cohort of 115 randomly chosen firms (in Jagrén's essay) over a 60 year time span. By the end of the period most firms had shut down or been acquired by other firms. The rest of the original group – with two important exceptions – had been leading a stagnant life for many years. The aggregate output of the group had, however, grown faster than total manufacturing production for the whole period. The reason was the exceptional growth of the two extreme performers Electrolux and Bofors. This naturally raises the question: how can we be sure that a sufficient number of success stories emerge from the ongoing entry and exit processes in an economy, to pull the aggregate along? Are there enough potential successes fermenting back stage to take over when the 30 to 40 old engineering firms (see p. 172), that currently dominate the growth engine of the Swedish economy, begin to wane.

The incorporation of innovative activity in theory yields a process representation of microeconomics, micro behavior being coordinated through explicit dynamic markets. This theoretical world (see Eliasson 1985, Day-Eliasson 1986) is entirely different from that of general equilibrium theory in terms of its predictions. At the macro process level, the shifting of the macro production function and the associated aggregation problems (see Jorgenson- Griliches 1967. Also see Åberg's study on p. 191) is the more familiar version of technical change. In both versions technical change is in-

[1] There is a whole range of attempts at developing a coordinated consistent theory of the dynamics of the production system; *from* engineering-oriented studies that more or less disregard standard economic theory, *to* principal agent type theories whose aim is to make known facts, such as limited or biased information and technical change, compatible with conventional general equilibrium theory. The middle ranges are occupied by the new Austrians, industrial organization theory etc. (I have altogether at least 30 schools of competing methods and theories on my personal list.)

Economics needs a good term to label the dynamic interaction of the long-term supply and demand processes through markets. *Industrial organization* has become the chosen term in teaching from the market side, based on Bain's (1959) concepts of market structure, conduct and performance, with a strong base in Chamberlinian oligopolistic theory and competitive market statics, and hence a normative, "antitrust policy" orientation. The literature on the dynamics of supply is very fragmented and "*industrial economics*" has on and off been the term used to cover certain aspects of it. The term as such is, in fact, very appropriate to cover both the supply and the demand side and I will be taking the liberty of using it accordingly. See further *Teaching at IUI* on p. 233. Also see p. 177.

troduced as an externality, or as a Deus ex machina, that moves the economic system as it is fueled by an inexhaustible, unspecified resource of new technologies.

The first set of essays illustrates this point. Fast, long term growth in aggregate output ultimately depends on the steady infusion of new technical and commercial solutions to production. However, the way the market regime is organized also matters, and stability of long term growth appears to depend on well balanced innovative entry that competes a tail of low performers out of business, such that a healthy diversity of structure is maintained (see Hanson's paper). The moving forces behind this innovative process are currently being investigated in the so-called "ownership project" (see p. 209ff).

Thanks to the disorderly economies of the 70s, economists are gradually and reluctantly being forced to think about the dynamics of micro-macro interaction. A simple, overriding empirical fact has forced this change. Technical advance is intuitively associated with institutional change through reorganization. Institutional change is intuitively associated with the market process (interdependence and process). Once this is accepted, institutional economics is back – and merged with general equilibrium theory – in a more difficult form than before and a better integration of theoretical and empirical research is achieved. Economics will not prosper without a consistent theoretical explanation of economic growth. In this way, empirical facts are currently forcing institutional economics back into theory. The new general theory will have to be "industrial economics", encompassing all four elements of Åkerman (1950). But this development is also methodologically disruptive, since it is slowly competing away a rigorously and nicely structured intellectual system, without replacing it with something of equal intellectual quality. The solution lies in the optimal choice of aggregation levels in analysis, or in the optimal combination of quantitative methods and old-fashioned verbal reasoning. (As we said above the choice of decision model or quantitative method may, however, be more important than the later analysis of the chosen model.)

5. The IUI Research Agenda

Industrial economics is what ties together the articles to be presented below. The first set of four articles (by Pousette and Lindberg, Klevmarken, Jagrén and Hanson) illustrates the heterogeneous and changing inner structures of agents in the market, and what this means for macro economic performance. Jagrén and Hanson, in particular, demonstrate how new competitive entry at all levels generates the changes in the business organization that are needed to achieve sustained macroeconomic growth. Maintaining diversity of

structure through entry is a necessary condition for stability of long term production growth. Free entry creates uncertainty, and information is needed to cope with it. Pousette and Lindberg also show statistically that information processing is a dominant production activity in the modern manufacturing firm.

The next set of articles investigates how institutions determine the incentives of the market process and the social acceptability of its adjustment consequences. The old Swedish policy model as an institutional monitor of markets is expounded in Turner's paper. The Swedish model was essentially characterized by free competitive entry, a full employment ambition and a matching indoctrination system to cope with the consequent social side of rapid structural adjustment (Eliasson-Ysander 1981, Eliasson 1986a, b). One could even say that the Swedish policy model was one of many institutions created to make uncompensated violations of the Pareto constraint socially acceptable. Deiaco in his essay demonstrates how the growth of the public sector has gradually undermined the viability of the old Swedish policy model through encroaching upon the market sector, notably prohibiting free competitive entry in a growing part of the economy. Both Schager (see p. 164) and Björklund in his essay illustrate how this institutional development has hindered efficient allocation in the labor market, causing overpricing of certain groups of labor, perhaps even forcing an excessive profit squeeze and a premature contraction on some sectors using unskilled labor. Self-employment seems to be on the increase at the expense of wage labor and the unobserved economy is growing faster than GNP. When production and distribution on the sizable underground economy (see Feige's article) is taken into account, Sweden's income distribution normally portrayed as highly egalitarian, (see e.g. Lindbeck 1983) may be as skewed as it is in other western economies. Furthermore, the distortion of the pricing of wealth objects and enormous capital gains for a few, caused by the combination of inflation and tax wedges have probably more than eliminated the eglitarian effects on the wealth distributions achieved through several decades of policy (see p. 166). Not only is economic policy being discredited. The consequent changes in institutional organization of the economy may be impairing its effciency.

6. The Pragmatic Methodological Approach

For a research institute engaged in industrial organization theory and the analysis of economic growth, the traditional dichotomy between institutional change and the market process is particularly bothersome. But it is there to make formal theorizing and quantification possible. At the same time, however, it violates the notion of the market process as an experimental activity

and it makes it impossible to analyze, rather than simply measure, productivity change.

IUI's answer to this dilemma is to lower aggregation of measurement and analysis to a level where reasonably autonomous decision bodies can be found and observed, that can also be coordinated dynamically through a network of explicit market processes. Where this can be achieved, research can be divided up into, on the one hand, modeling the market interaction of given, parameterized institutions through quantitative methods and, on the other, studying the internal organization and change of these institutions. A significant part of IUI research looks specifically into the internal behavior of business firms defined as financial institutions (see MOSES project, p. 179f and 175), and households (see HUS project, p. 215ff and Klevmarken's essay) and of local public decision bodies (see p. 204 and Murray's essay). Generally speaking, this division covers almost all types of economic activities. In terms of empirical inquiries, the coverage is of course much less. Several IUI studies – theoretical and empirical – are devoted to the nature of the market process (see pp. 179, 183ff, 129ff), together making up the whole of micro-macro economics.

Explicit modeling of micro-macro behavior (see p. 179) or even sector behavior (p. 177) helps to quantify the understanding of macro behavior, under the restriction that even the smallest autonomous unit studied (the division or firm, the household or its members, or the local community) is not really institutionally stable. The way the MOSES model is used in research illustrates these problems. As emphasized in Pelikan's paper, endogenous institutional change, or self-reorganization is critical for understanding the dynamics of macro economic behavior. Such features are currently beyond parameterization, and except for endogenous self-reorganization through entry and exit (see Hanson's paper) MOSES is a mechanistic model that quantifies a number of relationships in the economy. To account for the "externalities" associated with endogenous self-reorganization – the prime mover of productivity change (see p. 137) – verbal reasoning has to be added. It is usually bad practice, ad hoc and often simply wrong to use only one approach. For instance, general, static equilibrium models, or their derivatives – computable equilibrium models, contestable market theory, or the new economics of protection "industrial targeting" – are frequently used in policy analysis. But in all empirical applications such models are ad hoc and highly error prone. By assumption they allow the derivation of detailed policy advice on matters that a dynamic micro-based coordination model would tell us clearly cannot be carried out, since the effects cannot be policy controlled. Hence, as noted earlier, the use of language and well-rounded reasoning are necessary complements to support and explicate formal, partial analysis in social sciences. And argument through verbal reasoning is decisive in the choice of model to carry out analysis.

7. Final Note on the Economics of Welfare

The opening remarks of this chapter are overly ambitious for a research institution of the size of IUI. However, these remarks were formulated to link the diverse items on the IUI research menu together. We can now make a whole of the pieces. The research agenda of IUI has always been as diverse as the present one, because we are more concerned about how the bits and pieces come together to form a whole, than the bits and pieces themselves. The question raised in this yearbook, however, is whether we know enough about the whole (economy at work), to be as ambitious in policy making as we have been. At least this must be a critical question for all policy analysts (see Ysander's essay). This statement is an important conclusion. For economists to have anything to say on "welfare" (Åkerman's second element) the ability to consolidate existing knowledge and analysis is decisive.

When the economy becomes experimental, the Pareto criterion will not be useful since it will constantly be violated in order not to stop economic growth. Government must therefore give up on the control of details and limit itself to the support of institutions, values and attitudes that allow the experimental market economy to keep reorganizing.

Proponents of ambitious policies tend to like economic models that make ambitious policies feasible. An interesting observation is that the policy makers in Sweden recognized the need to overcome resistance to change and created an institution to facilitate it – the old Swedish policy model (Eliasson 1986a and b, also see Turner in this volume). When this policy model was both abandoned in the 70s and made inoperable through rapid public sector expansion, Swedish economic performance deteriorated dramatically. The complexity of the economic problem and its institutional superstructure is witnessed by political ambitions in almost all quarters to revert, furtively, to the old policy design.

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INSTITUTIONAL CHANGE AND MACROECONOMIC PERFORMANCE

2 MARKET AND NONMARKET SERVICE PRODUCTION IN SWEDISH HOUSEHOLDS[1]

by N. Anders Klevmarken

For many persons, work in the labor market is perceived as the dominant activity in ones life. For Sweden, low unemployment rates and high female labor force participation rates strengthen this conclusion. A survey jointly made by researchers from Gothenburg University and the IUI in the winter and spring of 1984 showed that about 80 percent of the working age Swedish population was employed or self-employed, about 4 percent was unemployed and the remaining 16 percent was not in the labor force. For males almost 85 percent had a job, while 3.5 percent was unemployed. There were fewer females employed but the figure was still as high as 75 percent. Between 4 and 5 percent of the females were unemployed.[2]

The average weekly working hours for employed and selfemployed in their main occupation were in 1984 estimated to 36.7 hours. In Table 2 we find the corresponding figures by age and sex.

Excluding those who are above the normal age of retirement, the average number of working hours is about 40 for males, independently of age. For females the number of hours declines by age from 33 in the youngest age bracket, to 27 in the oldest. These estimates are based on survey questions about current, weekly working hours and they include overtime but only in the main occupation.

[1] This article is based on data from the first three waves of the survey: Household Market and Nonmarket Activities (HUS), see Klevmarken (1984).

[2] These unemployment rates are somewhat higher than the official rates.

A time-use survey carried out at the same time gave lower estimates (see Table 3). Time-use data were collected in two interviews which were randomly allocated in the period February 1984 – February 1985. Table 3, however, only includes those who were employed (or self-employed) at the time of both interviews. In Table 3 results are given both for those who worked

Table 1. *Percentage employed, unemployed and not in the laborforce by sex in 1984 among those in the agebracket 18–64*

	Males	Females	All
Employed and Selfemployed	84.5	74.6	79.5
– fulltime (≥35 h/w)	–76.1	–35.8	–55.5
– parttime (<35 h/w)	– 8.4	–38.8	–24.0
Unemployed	3.5	4.6	4.0
Not in the labor force	12.0	20.8	16.5
All	100.0	100.0	100.0

Table 2. *Average weekly workhours in the main occupation by age and sex 1984*

Age	Male	Females	All
18–29	39.5	33.4	36.3
30–54	41.8	32.2	37.4
55–64	39.5	30.4	34.9
65–74	30.0	(26.8)	29.3
All	40.7	32.2	36.7

Note: These estimates are based on a survey question about current average workhours in the respondent's main occupation and they include both paid and unpaid overtime. This question was only asked to those in the labor force who had a job.

Table 3. *Total weekly workhours by sex 1984 for fulltime and parttime employd and selfemployed in the agebracket 18–74*

	Fulltime	Parttime	All
Males	38.0	27.0	36.6
Females	31.2	21.9	26.5
All	35.7	23.0	31.7

Note: The estimates in Table 3 include marketwork in the main job as well as in additional jobs. Overtime is also included. They were obtained from a time-use study. The sample is restricted to individuals with a stable labor force connection (see text). Fulltime is defined as a response of at least 35 hours to a question about current workhours in the respondents main occupation. This question was asked in an interview preceding the time-use interview.

full time and for those who worked part time. The grouping of respondents into full and part time work was done with the help of a question about current working hours in their main occupation (see Table 2). This "core" of employed males and females had market work of about 37 and 27 hours per week respectively. The time-use study thus gives lower and probably more accurate estimates of the number of working hours per week.

All these figures support the idea that market work is a dominant activity in Sweden. However, in a life cycle perspective only a small part of our time is used for market work. In the early years about one quarter of our life is used for schooling and training and during the last quarter most people are retired from market work. Even if we limit our interest to the age bracket 18-65, only an average of 16 percent of our time is used for market work, a little more for males – about 20 percent – and a little less for females (about 12 percent). In this perspective it is remarkable that so little research has been done to explain and understand time allocation to nonmarket activities, and how these activities influence economic well-being.

What Do We Do during an Average Day?

Tables 4a and 4b exhibit the time-use in 10 main categories of activities for Swedish households in 1984. The estimates in the table are estimates of the time allocation during an average 24 hours. By multiplication with 365 one obtains an estimate of the annual time-use.

The most time consuming activity is "Sleep and care". Ten and a half hours were used for this activity. Of these almost eight hours were used for sleep and rest and one hour and twenty minutes for meals at home. Second largest is "Pleasure and recreation", five and three quarters of an hour, which for instance includes watching TV and listening to radio and records. Market work takes three hours and twelve minutes, household work almost two hours and travel to and from various activities takes a little more than one hour.

For some activities there are quite clear sex and age differences. We have already seen that females use less time than males for market work. Swedish males contribute about 60 percent more to market work than Swedish women. However, females use almost three times as much time for household work as males. They also do more shopping and engage in care activities. They do not work as much as men with maintenance and repair of their houses and cars, they spend somewhat less time travelling, and have less time for pleasure and recreation.

Time-use in market work is inversely related to age. Older cohorts work less. They also travel less than younger people. Instead, they do more household work, spend more time sleeping and caring, in pleasure and recreation, and in maintenance and repair.

Table 4a. *Average time-use in hours: minutes for males by age in 1984*

Activity	18–29	30–54	55–64	65–74	All males
Market work and related activities	4:19	5:05	3:01	0:24	3:54
Household work	0:40	1:04	0:58	1:18	1:00
Sleep and care	10:02	10:00	10:22	11:37	10:19
Shopping	0:20	0:24	0:22	0:27	0:23
Maintenance and repair	0:32	0:44	0:49	0:61	0:45
Educational activity	0:26	0:05	0:01	0:02	0:08
Pleasure and recreation	5:57	5:04	7:01	7:49	5:57
Travel	1:31	1:20	1:08	0:55	1:17
Other communication	0:12	0:10	0:09	0:16	0:11
Other	0:01	0:04	0:09	0:01	0:06
Number of observations	194	661	188	168	1211

Table 4b. *Average time-use in hours: minutes for females by age in 1984*

Activity	18–29	30–54	55–64	65–74	All females	All males and females
Market work and related activities	3:05	3:06	1:55	0:07	2:31	3:12
Household work	1:49	2:56	3:22	3:34	2:50	1:57
Sleep and care	10:45	10:46	10:30	11:05	10:45	10:32
Shopping	0:34	0:31	0:32	0:39	0:33	0:28
Maintenance and repair	0:13	0:13	0:24	0:18	0:15	0:30
Educational activity	0:18	0:07	0:02	0:02	0:08	0:08
Pleasure and recreation	5:40	5:03	6:06	6:53	5:35	5:46
Travel	1:21	1:03	0:55	0:52	1:04	1:10
Other communication	0:13	0:14	0:13	0:15	0:14	0:12
Other	0:02	0:01	0:01	0:15	0:05	0:05
Number of observations	231	685	209	128	1253	2464

Investment, Household Support and Consumption

Another way to structure the activities of a household is in the following three main categories: (1) Investment and maintenance activities, (2) consumption activities for personal pleasure and (3) intermediate service production. There are of course no clear borderlines between these groups, but the following is indicative. Sleep and rest, personal care, regular meals and educational activities make up most of the group called investment and maintenance.

It is not obvious that having a meal should be called a maintenance activity. It could also be a pleasure activity. Here only meals in restaurants, in someone else's home and with guests are counted as consumption for pleasure. On average, investment and maintenance activities take a little more than ten hours per day.

Consumption for pleasure includes the group "Pleasure and recreation" and travel needed for these activities. Average time-use for these activities amount to a little more than six hours. Again it is not obvious that pleasure and recreation activities are "pure" consumption activities. These activities, like sleep, might be needed to "recharge the batteries" for future work activities.

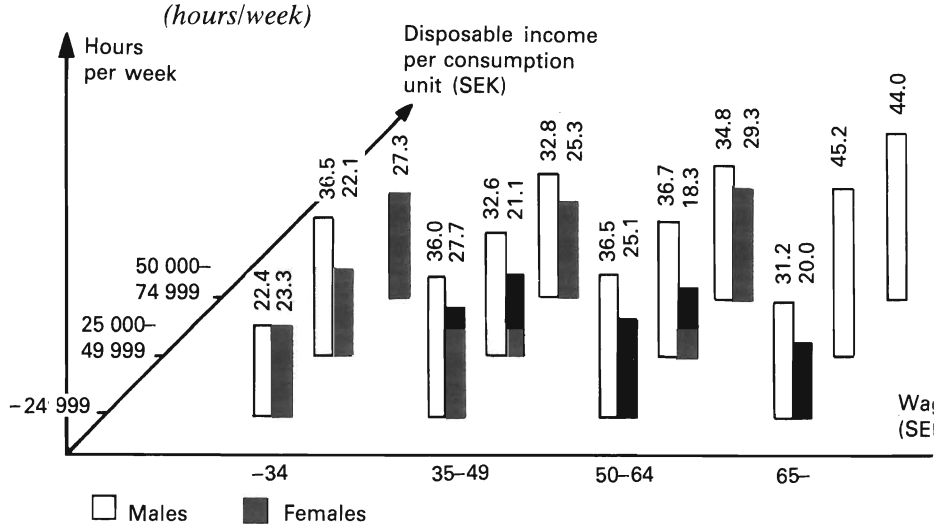
The final group includes activities which involve production of services needed for investment, maintenance or pleasure activities. Most of these services have market alternatives, i.e. at least in principle it is possible to buy these services from the market rather than to produce them within the household. Household work belongs to this group, as do child care, other care activities, shopping activities, repair and maintenance of one's house, car etc. Time-use in these activities amount to about 3.5 hours. Swedish households thus use as much time for service production within the household as they use time for market work.

The Theory of Time Allocation

What explains the allocation of time to various activities? Economic theory traditionally assumes that each individual has an utility function which depends on the quantities of consumed goods and on time used for leisure activities. This utility function is maximized, subject to a budget and a time-use constraint. The total budget is the sum of earned and nonearned income after direct taxes, and earned income is the product of the number of hours allocated to market work times an hourly wage rate (after tax). Total time-use cannot exceed 24 hours. This model "explains" how time is divided between market work and "leisure". It assumes that market work is only chosen because it generates incomes which are used to purchase consumer goods. On the other hand the more time used in market work, the less time will be free for leisure consumption. The time allocation between the two activities depends on preferences, the (marginal) wage rate (after tax) relative to the prices of consumer goods and on nonlabor income. *A priori* we cannot determine the effect of an increase in the wage rate. The income effect allows for more leisure, while leisure at the same time becomes relatively more expensive and the substitution effect will make us work more. An increase in nonlabor income, however, will tend to increase both consumption of goods and of leisure.

Figure 1 shows how market work depends on wage rate and disposable income for males and females. The income measure is the sum of the incomes of both spouses less taxes and then divided by the number of consumption units per household. The wage rate variable is the current wage rate before tax in the main occupation. Following each "row" in the figure and thus holding income constant we find, that except for the lowest income bracket men who have a higher wage rate work longer hours. No such relationship can be seen for women.

Figure 1. *Market work by sex, wage rate and household disposable income (hours/week)*



Note: Data were obtained from the 1984 HUS time-use survey.

Towards a More Realistic Model

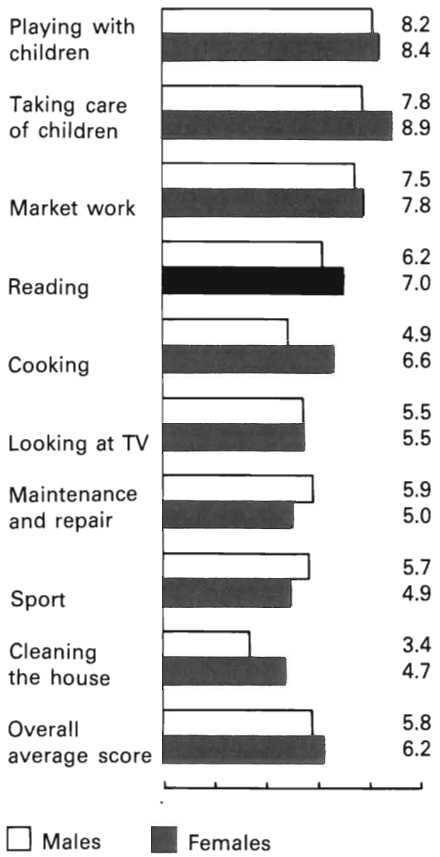
This simple model needs modification in several respects to become more realistic.

1. *Market Work Generates Utility*

Market work should not only be modeled as a means to earn an income which is spent on consumption goods. It might as well be a utility generating activity. If so, it implies that other characteristics of the job than pay will influence not only job choice but also the number of hours used on the job. It is likely that a person is willing to work longer hours on a job that is interesting, agreeable and enriching than on a job which is not, provided the pay is the same. Next to "playing with one's children", market work is the most preferred activity among most males and females (see Figure 2) which indicates that many people derive direct utility from market work. In future research we will have to supplement the collection of labor supply data with

data about job characteristics other than pay, to determine how important they are relative to pay for the labor supply decision.

Figure 2. *Preference rating of selected activities by sex*



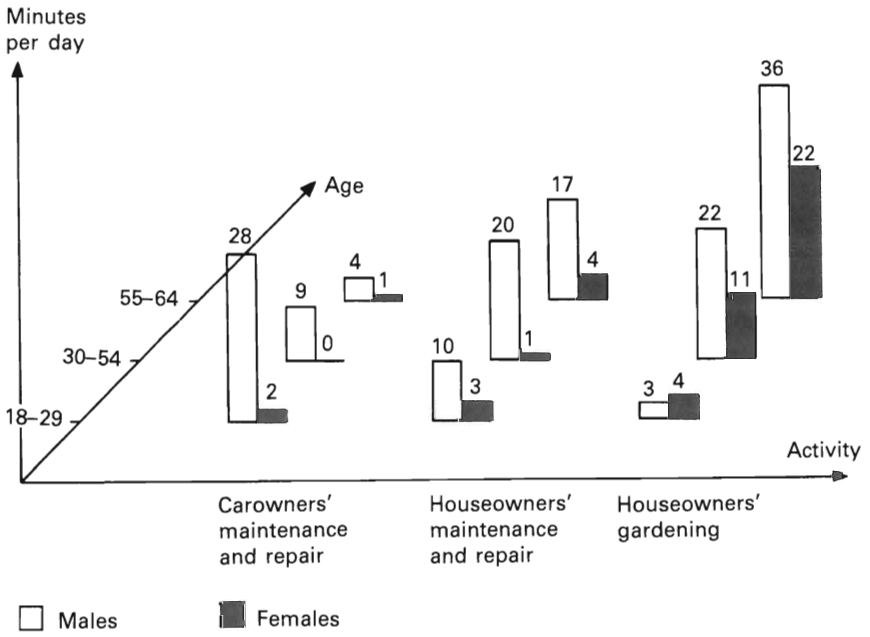
Note: The respondent was asked to set a score between 0 and 10 for each activity to indicate how much he/she enjoyed doing it independently of how useful the outcome of the activity was.

2. *Car and Home Owners Need Time for Servicing Their Assets*

Certain services can either be produced within the household or purchased in the market. The mix between these two possibilities depends upon how efficiently the demanded services can be produced which is a function of know-how and physical capital equipment in the household. For instance, to repair a car one needs to know something about the functioning of cars and one also needs the necessary tools. The mix between market and nonmarket solutions is also determined by the market price and the (marginal) net

wage. The higher the net wage the less is produced in the household; the higher the market price the more is produced within the household.

Figure 3. *Car owners' time-use in car maintenance and repair by sex and age (minutes/day)*



For car owners the first "column" of Figure 3 gives average time-use estimates in car repair activities by sex and age. For house owners the corresponding figures in repair and maintenance of the house and in gardening are given in the last two "columns" of Figure 3. To repair one's car is almost exclusively a male activity and it is mostly done by young men. The age effect could partly be the result of differences in human capital and partly an income and a wage effect. Older men are less experienced with cars and they also tend to have higher incomes and wages. That know-how is important for car repairs is seen in Table 5 which shows that those who have technical training use much more time repairing and servicing their cars than other groups. The fact that men with an academic training spend less time on cars than those with a shorter training might again be the result of their high alternative cost.

The maintenance and repair of an owner occupied house is also a typical male activity. Gardening is less so. Time-use in gardening is positively correlated with age, while middle aged men spend more time than other groups

Table 5. *Male car owners' time-use in maintenance and repair by schooling (minutes/day)*

Schooling level			
Type of schooling	Gymnasium and pregymnasium	Post gymnasium	All
General and unspecified	8	(0)	8
Educational	(0)	6	6
Social sciences	0	2	1
Technical	24	6	22
Farming	4	(8)	4
Other	11	1	6
All	14	4	12

Table 6. *Male time-use in maintenance and repair by disposable income and wagerate (minutes/day)*

Disposable income per consumption unit (SEK)	Wagerate (SEK/hour) –34	35–49	50–64	65–	All
A. Maintenance and repair of owner occupied house					
–24999	(21)	6	10	13	9
25000–49999	(68)	17	31	9	22
50000–74999	(99)	32	34	5	28
75000–	(0)	(0)	(0)	(6)	4
All	48	15	23	9	18
B. Gardening					
–24999	(4)	18	50	26	26
25000–49999	(11)	18	18	20	18
50000–74999	(0)	21	29	18	22
75000–	(0)	(112)	(0)	(5)	23
All	6	20	34	20	22
C. Maintenance and repair of car					
–24999	7	17	4	3	12
25000–49999	(13)	21	5	3	15
50000–74999	(14)	9	6	11	9
75000–	(0)	(0)	(0)	(0)	(0)
All	10	17	5	5	12

doing repair work etc. For these two activities the importance of the educational background is less clear, partly because of small samples. However, farmers and men with a basic general or unspecified education tend to use relatively more time for maintenance and repair.

The theoretically expected relation between the wage rate and time-use in sevice production activities within the household is not clearly revealed in Table 6. In some income brackets, but not in all, those who have a high wage rate use less time on maintenance and repair of their cars and owner occupied houses than those who have a low wage rage. But time-use in gardening appears to be completely unrelated to the wage rate.

3. *Children Take Time*

Time-use is influenced by certain ratchet effects which depend on previous decisions. For instance, couples who have decided to give birth to children have to spend time caring for them. Table 7 shows, that in families with one child the female uses almost 7 hours per week to care actively for her child. In families with two children, she uses 40 percent more time while still another child only adds another 10 percent. The pattern is about the same for the males although they spend about two hours less with their children per week.

Table 7. *Time-use by sex and number of children in the household (hours per week)*

Activity	Number of children				
	0	1	2	3	All
Males					
Market work	24.3	33.7	33.5	35.8	27.3
Household work	6.9	6.4	7.4	8.7	6.9
Maintenance and repair	5.0	5.3	5.4	7.0	5.2
Education	1.0	0.9	0.9	0.9	0.9
Pleasure and recreation	44.1	36.6	35.3	28.6	41.3
Travel	8.7	10.1	8.8	9.2	9.0
Other communication	1.3	1.3	1.1	1.2	1.3
Sleep and rest	55.9	52.3	51.6	49.0	54.5
Active child care	1.7	4.6	7.3	8.1	4.3
Females					
Market work	16.9	19.8	19.4	13.4	17.7
Household work	19.3	20.1	20.5	25.8	19.8
Maintenance and repair	2.2	0.9	1.0	1.7	1.8
Education	1.0	1.1	0.6	0.5	0.9
Pleasure and recreation	41.4	34.6	35.7	31.3	39.1
Travel	7.5	7.5	7.0	8.3	7.5
Other communication	1.6	1.6	1.4	1.6	1.6
Sleep and rest	56.6	55.9	54.3	52.7	56.1
Active child care	0.6	6.6	9.2	10.2	3.1

The number of children also influences other time-use decisions. One child or two children in the household does not influence the number of hours put into market work for either spouse (see Table 7). In families with three children, however, the female works less than the average while the male works more. In this case it is less profitable to use daycare services outside the household and the specialization of labor becomes more efficient. In families with many children both spouses work relatively more with household tasks and with maintenance and repair and have relatively less time for pleasure and recreation, and for sleep.

Although not irreversible, other decisions which influence time-use are those to acquire major durables like a house, a car, a yacht or a vacation house. It takes time to derive services from them and they also require time for maintenance and repair.

4. *A Constrained Set of Discrete Choices*

An analysis based on the assumption of marginal adjustments has only a partial validity. In the labor market there are limited possibilities to freely choose one's normal working hours. Most people might at best have a choice between fulltime, halftime and 3/4 of fulltime. One might, however, also influence normal working hours by taking more than one job. These decisions are usually more or less long-term decisions. The set of feasible choices depends both on the (local) labor market and on each individual's human capital.

For families with children, decisions to work in the market are also strongly related to the availability of childcare services. Supply of these services comes usually, but not always, in discrete bundles. A family is either able to obtain a place for its child or it is not. If there is a place, the number of hours can usually be adjusted to the needs of the parents. About 50 percent of all children in Sweden below 13 have their attendance at least for part of the day arranged outside their home; about 35 percent in the public daycare service. In families with two spouses, those who have more schooling are more likely to leave their children with a daycare home or a daycare mother than those who have less schooling.

An example of more short-time type of decisions is that of working overtime. These decisions may be of a more "continuous" character, but in most cases the initiative to overtime work comes from the employer and not from the employee. On many jobs it is also difficult to take a few hours off when needed. This means that neither a few additional hours of market work to generate the income needed to buy services such as car repairs – nor a few hours less of market work to get the time to fix the car at home – are feasible alternatives. Feasible alternatives are either to buy the services out of a given budget and give up something else or to use part of one's leisure to produce

these services. In both cases the wage rate and the marginal tax rate have no effect on the decision (cf. Table 6). It is influenced, instead, by the household's preferences for consumption and leisure, the price for these services in the market, the household's ability to produce them and its disposable income.

Would more flexibility in the labor market – permitting more variability in hours worked – result in more or less service production within the household? Theoretically both alternatives are feasible. This is an issue which needs empirical analysis in future research.

Additional Research Needed

This review of household market and nonmarket activities has indicated that "traditional economic incentives" do play a role in household time-use, but the relationships are not always very clearly demonstrated. As the examples indicate, important constraints on behavior exist but they are not recognized in traditional economic theory. Since many of these "new constraints" might significantly affect household responses to, for instance, tax policies, further and more precise analysis is called for. The new HUS data set that combines economic data with time-use data will prove useful for this purpose.

References

Klevmarken, N.A., 1984, "Household Market and Nonmarket Activities. The First Year of a Swedish Panel Study", *Proceedings of the American Statistical Association meeting in Philadelphia 1984* and *Vierteljahrshefte zur Wirtschaftsforschung,* Heft 4 1984. Also published as IUI Booklet No. 178, Stockholm.

3 CONCENTRATION, EXIT, ENTRY AND RECONSTRUCTION OF SWEDISH MANUFACTURING

by Lars Jagrén

Economic growth involves a constant reorganization of the business sector. Old, non-profitable companies are competed away from the market and resources are moved to the more efficient producers. New firms enter and older companies either adjust or die away.

Productivity growth at all levels comes about through institutional reconfiguration in response to the ongoing market process (Eliasson 1986). What is needed is a continuous creation of new technological and commercial solutions to production and marketing problems, exits of outmoded institutions, and maintenance in the diversity of economic structure. Innovative "activity" and entry cannot be treated as an exogenous force. It is an integrated part of the market process.

This paper focuses on the changing structure of Swedish industry and the role of entry and exit during the 20th century. Two main questions are addressed; what are the implications of (1) the trend towards increasing concentration and (2) the rate and quantity of innovative entry in the Swedish manufacturing sector during the last two decades. More specifically, is increased concentration good or bad for competitive vitality from a domestic base? How well does the entry and exit process of the Swedish economy work?

1. Today's Large Companies

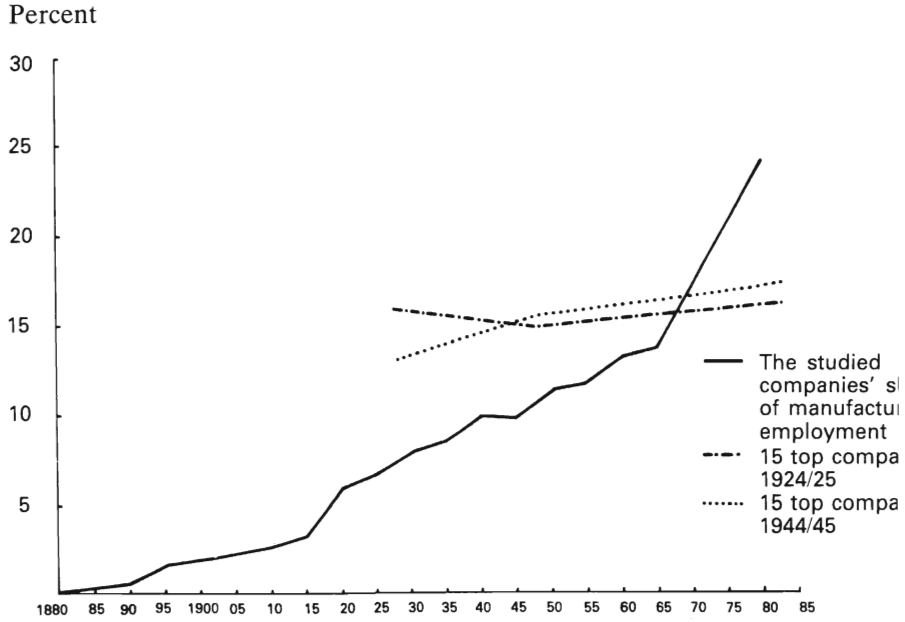
With few exceptions, today's largest Swedish companies are old, international, and operating in the engineering sector. I have studied the growth of the ten largest Swedish companies, ranked by number of employees abroad. The companies included in the sample would be very much the same, however, if I had chosen them according to other criteria. Due to availability of data, I use the number of employees as a measure of size and growth for these firms.

Figure 1 shows that the share of the 10 largest companies in total Swedish

manufacturing employment has increased steadily from approximately 0.5 percent in 1880 to 7.8 percent in 1930 and 25.5 percent in 1983. The growth rate was rather steady until the mid 1960s when it suddenly increased, mostly due to an intensified rate of acquisitions and mergers. Thus, these companies have achieved a considerably faster growth than the average manufacturing firm, especially during the 1970s when total manufacturing employment decreased.

Concentration in Swedish industry is higher than in most countries. If we look first at value added in total manufacturing, the share of the ten largest Swedish companies is nearly twice as high as that in Denmark, Finland, and Norway (Oxelheim 1984). Table 1 shows that a similar pattern characterizes employment. With the exception of Switzerland and the Netherlands, the degree of concentration – as we measure it – is more than twice as high in Sweden than in the other studied countries. Part of the explanation is the small size of domestic markets in Sweden, the Netherlands and Switzerland. Under these conditions, concentration may be needed in order to compete effectively in international markets. But since the other Nordic countries do

Figure 1 *The studied companies' share of total Swedish manufacturing employment 1880–1983*



Source: IUI.

not exhibit similar degrees of concentration, despite small domestic markets, more is needed to explain the large size of Swedish firms and the concentration of production in Sweden.

One important question is whether the high concentration in Sweden means special problems regarding production inefficiencies. Looking only at domestic competition, the high concentration ratio suggests a problem, but if the perspective is broadened and international markets taken into account, the picture changes. The large Swedish companies are in most cases not large compared to their international competitors, and market competition is intense in Sweden as well as abroad. At the individual plant level, Hjalmarsson (1977) shows that the welfare effects of increased economies of scale (following mergers and a higher concentration ratio) are in most cases higher than the corresponding costs. According to this rather simple model (strictly limited to homogeneous goods), the net allocative effect of mergers is positive.

2. A Structural Shift in Industry

The growth of the ten largest firms can be compared to the growth of other company groups to illustrate a structural shift in Swedish industry. Figure 1 displays employment growth in the ten largest firms of today, as well as in the 15 largest companies of 1924/25 and in the 15 largest companies of 1944/45. As can be seen, the employment share of the largest companies in 1924/25 fell from 16 percent in 1925 to 12 percent in 1945 but then increased again to 16 percent. The share of the 1944/45 top companies rose from 12 percent in 1925 to 16 percent in 1945 and 19 percent in 1983. In both cases the growth has been considerably lower than that of today's top companies. One explanation is that the sample from 1924/25 and 1944/45 includes a larger number of slowly growing raw material based companies.

Table 1 *The share of employment in the largest corporations compared to total manufacturing employment 1983*

Percent

	Sweden	USA[a]	Great Britain[b]	Italy	Japan	France	Germany	Canada	Switzerland	Netherlands[b]
5 largest	21.6	7.9	10.6	13.6	3.4	11.5	10.8	11.8	53.7	35.4
10 largest	36.2	11.2	16.8	15.3	5.2	17.1	16.5	16.7	73.2	
20 largest	46.4	15.3	25.5		7.2		21.6			
40 largest	57.0	21.4								

[a] 1984.
[b] Shell and Unilever excluded

Source: Fortune, Annual Reports, EEC Statistics.

Of the top 15 companies in 1924/25, 10 could be classified as raw material based companies. In 1944/45 the number had decreased to 7 and in 1983 to 5. Furthermore, the raw material based companies that remain among the largest are all on the lower part of the list. Instead, the engineering companies have grown rapidly. In 1924/25 engineering firms were ranked as no. 1, 5, 10 and 13; in 1944/45 as 1, 3-5, 12 and 13; and in 1983 as 1-6, 8-9, 11 and 13. This highlights the transformation of Swedish industry from companies based on raw material resources to knowledge intensive production.

There are several explanations for the rapid growth of the large companies;

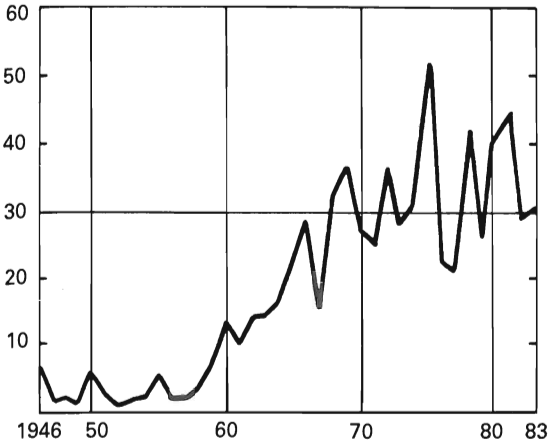
- early internationalization and operations within internationally expanding sectors or niches
- concentration on knowledge intensive and relatively price inelastic products
- continuous restructuring of internal organization – including mergers and acquisitions – to upgrade performance
- high investment in R&D
- high investment in marketing.

One important aspect of growth, which is easily forgotten when looking at aggregate figures, is that many of the companies at one point or another have been in serious trouble. Today's top companies survived these difficult periods, while others – perhaps with similar characteristics – have been forced to exit or have been taken over by other firms. Which companies survive depends critically on management and owner skills, but good luck also plays a role. For this reason it is virtually impossible to forecast the future developments of individual companies.

3. Mergers and Acquisitions

As noted above, external growth through mergers and acquisitions of other companies became increasingly important in Sweden during the 1970s (Figure 2). Data on internal and external growth in the 10 studied companies (in Sweden and internationally) is presented in Table 2. Between 1946 and 1968 these companies increased their employment by 150 000 persons, of which 41 000 in acquired companies. The picture is rather similar for the period 1968-75. Total employment rose by approximately 148 000, of which 52 000 was from acquired companies. Between 1975-1983 total employment in these companies decreased by 7 500 employees, despit an increase of 74 000 employees in acquired companies. Thus, the "internal" employment decreased by 81 000 persons.

Figure 2 *Number of employees in acquired companies in Sweden 1946-83*



Source: Örtengren (1985).

Table 2 *Internal and external employment growth 1946-83 in the 10 studied companies*

	Number of employees in end year	Internal employment growth	External employment growth through acquisitions	Total
All ten companies				
1946-68	283	109	41	150
1969-75	431	96	52	148
1976-83	423	-81	74	-7
1946-83	423	124	167	290

Source: IUI.

Why has this increase in acquisitions taken place? Among the most important explanations are:

- acquisitions are fast and inexpensive ways of acquiring knowledge in strategic corporate fields
- acquisitions are fast and inexpensive ways of acquiring marketing channels
- economic developments during the 70s provided a large supply of potential acquisitions, due to decreased profitability and inadequate financing.

4. Entry

The restructuring of the manufacturing sector involves entry, exit and reorganisation of existing firms. Entry in the restructuring process of Swedish industry will be discussed below. At first glance, the entry process may appear insignificant, since so many of todays largest companies were founded in the 19th century. For example, only one of Sweden's 25 largest exporters was established after World War II.

Nevertheless, I claim that new entrants play two important roles. First, as developers of new products and ideas which expose the existing firms to intensified competition; second as potential acquisitions for larger companies, which provide important complements to the knowledge base of these firms.

Entry is in most cases defined as the establishment of firms, new to the specific market as well as to the business sector in total. In some cases the definition of entry in a specific industry may also include companies previously active in other industrial sectors. However, even in these cases only new juridical organizations or new plants are normally included in the notion of entry.

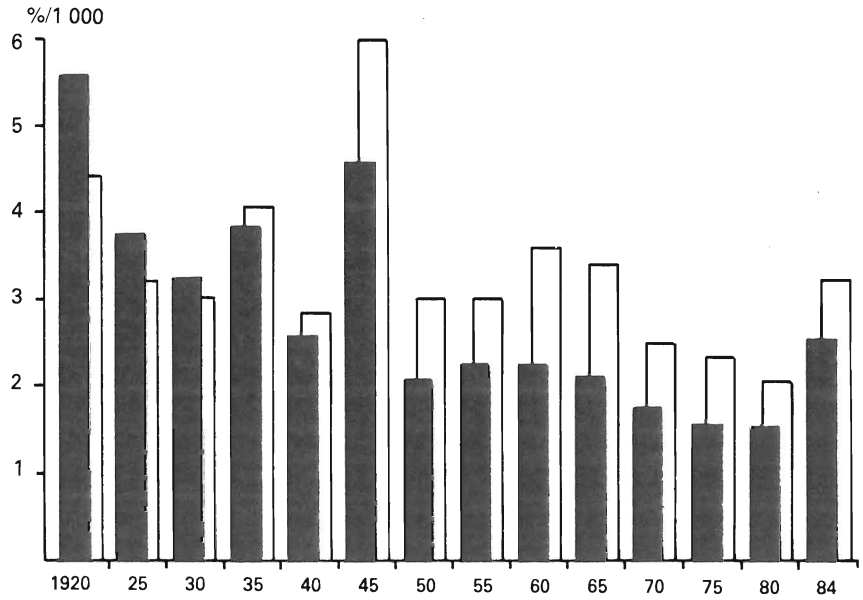
Innovations, reorganization of production, marketing and R&D and entry can to some extent be seen as substitutes for each other (see further Lindberg and Pousette in this volume). The restructuring of the manufacturing sector can be achieved either through new firms or through changes in the old ones. As shown in Eliasson-Granstrand (1981) the system for financing different kinds of investments plays a major role in explaining the actual outcome. Innovations and reorganization of existing firms seem to account for a major part of total Swedish "innovative entry" (Eliasson 1986).

According to Granstrand (1986) much of the innovative entry and exit processes occurs at a very low level of aggregation – notably at product levels – and goes on in markets as well as within firms. Of all major innovations in Sweden in the postwar period, more than 80 percent occurred in existing firms and only 20 percent in new companies. Thus, the process of entry and exit is much more intensive on the product market, than on the "market for companies".

Studies on *new firm entry* (Dahmén 1950; Du Rietz 1985) show that there was a large amount of new establishments of firms up to the first world war. The period 1919 to 1939 was also characterized by a large number of newly established firms (Figure 3). This level was maintained immediately after the war, but fell by almost 50 percent after 1950.

The rate of new firm entry fell further after 1960. After 1975, and especially since 1980, new firm entry seems to have increased once again. In 1984 the total number of entering, manufacturing firms was approximately 2 200 – 3 600 with some 3 500 employees. The total number of newly estab-

Figure 3 *New firms in percent of total stock and new employment in new manufacturing companies in thousand persons*



■ = new companies in percent
□ = number of employees in 1 000.

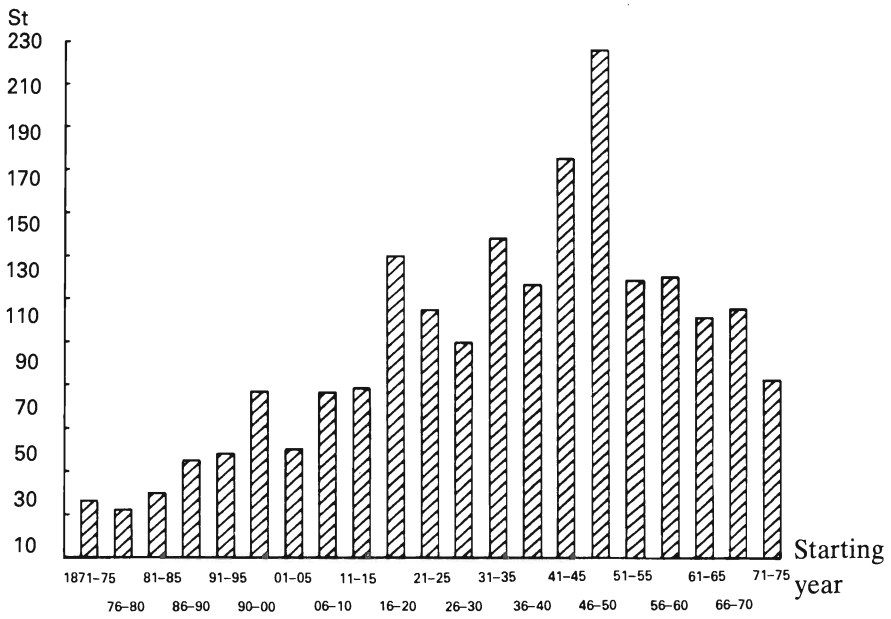
Source: Du Rietz (1985).

lished firms was about 15 000 – 20 000 in 1984. This indicates that a large majority of the new companies are operating in the service sectors.

A similar picture is obtained if we study the age of the manufacturing companies operating today.[1] The results (Figure 4) show that the existing stock of companies – in terms of starting year – is rather evenly distributed between 1916/20 to 1966/70 with 1941/45 and 1946/50 as absolute peak years. Notice also the large relative increases 1896/1900, 1916/20, 1931/35, 1941/45 and 1946/50 and the large decreases 1901/05 and 1951/55. The low number of companies started in the 1970s is due partly to the decreased number of entries, partly to the fact that a company in most cases is not (detected and) included in the list before it has reached a certain size (age). The number of young companies is therefore underestimated.

[1] According to the "Industrial Calender" – a list of all major manufacturing companies.

Figure 4 *Existing manufacturing companies 1982/83 distributed according to starting year*



Source: IUI.

So far, we have presented data regarding the number of new firms entering the market each year. The next question is whether these companies will be able to grow and become the large companies of tomorrow.

Studies of small, newly established companies in Sweden have shown that very few, if any, of these companies will ever grow to become really large. Furthermore, the fastest growing small firms are in most cases acquired by larger business groups. Takeovers are in most cases the result of a strained financial position in the small company, following fast expansion.

We have analyzed the growth of a sample of firms in the engineering and chemical sectors established between 1954-58. As is shown in Table 3, the companies which managed to survive as independent firms doubled their employment between 1958 and 1982, but the employment in the sample as a whole was almost exactly the same in 1982 as in 1958. Employment grew until 1969, after which time the increase in acquisitions and bankruptcies led to a rather fast decrease. Lack of information makes it impossible to separate acquisitions from bankruptcies.

Similar findings on the development of entrants can be found in a study by Reitberger-Utterback (1982) on technology intensive small companies. Their conclusion is that very few companies have managed to grow both rapidly and steadily for a long time. The successful firms are "the exceptions which prove the rule". Newly established technology intensive firms should be seen as potential acquisitions for the existing large firms, which often take over a small company when fast growth demands large financial resources. It is unusual that new entrents manage to become independent, medium sized or large companies. Therefore, the importance of the smaller companies is underestimated if the effects of acquisition are not taken into account.

Another study at IUI supporting these results has shown that out of 115 companies existing as independent firms in 1920, only 94 survived until 1925, 79 until 1941, and 35 until 1970 (Jagrén 1986). By 1981 the number had dropped to 21. The total number of employees increased from 27 000 in 1925 to 128 000 in 1980. However, total growth can be explained almost completely by the growth of two companies in the sample. The remaining 19 firms have grown very slowly, if at all.

In this respect, Sweden seems to differ from U.S. and Great Britain. For example, Birch (1979) has concluded that companies with less than 20 employees during 1969-76 accounted for more than 60 percent of total growth in business sector employment within the U.S.

Table 3 *Employment in small firm sample 1958-82*

	Employment			
	1958	1964	1969	1982
Companies existing 1958-82	1 525	2 310	2 768	3 204
Companies existing 1958-69	943	1 504	1 792	
Companies existing 1958-64	407	509		
Companies existing 1958	270			
Total employment	3 145	4 323	4 560	3 204

Source: IUI.

5. Exit

Regarding *exit* we see in Sweden a continuous decrease in the number of small firms and plants, and in the number of firms and plants within the raw material based sectors like mining, steel, wood-products and shipbuilding. In 1955 there were approximately 16 300 establishments within the manufac-

turing sector, in 1982 the number had decreased to 9 500.[1] Establishments with less than 50 employees account for almost 90 percent of the total decrease.

Industrial transformation slowed down during the 1970s, following a huge government subsidy program designed to rescue a number of companies within the steel, paper and pulp and shipbuilding sectors (Carlsson et al. 1981). This policy was reversed in 1982.

Size in itself seems to be a protection against exit. Of the top companies from 1924/25 only 4 have exited and disappeared as independent companies; of the 1944/45 sample, only 2 have disappeared. Larger financial resources mean a larger capacity to absorb sudden losses and business cycle downturns. Moreover, size often implies both product and market diversification and risk spreading. The company can transfer capital from stagnating to expanding areas, and sheer size may also give it a greater influence on general technological and market development. Size is also closely connected to the existence of different economies of scale. The most important economies of scale are to be found traditionally in the different production processes. Today, however, economies of scale in R&D, marketing and in the financial areas seem to be rapidly increasing (Eliasson 1986). For example, a certain size is needed to finance the huge R&D and marketing investments needed for maintaining the competitive edge.

Thus, an important factor behind the observed stability among the largest Swedish companies, is their investments in R&D and marketing, i.e., in activities aiming to change the existing orientation and organization of the company. The same can be argued regarding the many company takeovers. Stability at the top requires instability within the company.

6. Conclusions

(i) A high degree of concentration is necessary for long-run survival of advanced companies in a small open economy. One cannot use U.S. criteria of concentration in evaluating Sweden. The Swedish economy is dominated by a few old and large companies. Through continuous internal restructuring, and large investments in R&D and marketing, these companies have managed to maintain their position.

(ii) Entry is most commonly defined as entry of new firms. However, there are other important aspects of innovative entry such as new products, reorganisation towards more marketing and product development. These

[1] The number of working units corresponds closely to the number of plants and varies according to the number of companies. A company, however, may exist of several plants.

other aspects dominate the Swedish reality of innovative entry. However, "pure" entry has increased in importance during the last few years.

The Swedish economy is characterized by a very limited growth in new firms. Very few new companies manage to grow large and to remain independent. Instead, acquisitions occur early in the growth stage. As a rule, only a few companies out of several hundred account for growth in output of the whole group. This makes the economy vulnerable to decreasing rates of innovative entry in a broad sense.

(iii) The rate of exit in the economy has been high during the postwar period, apart from a period during the mid 1970s when large government subsidies kept a number of endangered companies in the market. The exit process has mainly affected small and medium sized firms; large firms appear relatively immune.

The restructuring of the Swedish economy is to a large extent taking place *within* the large companies – through take-overs, marketing and R&D – instead of those being competed away by new entrants in the market. This solution to the restructuring process seems to be different from that in many other industrial countries and makes the economy dependent on the competitive edge of a rather limited number of large firms.[1] Ongoing studies at IUI (see p. 211 – The role of owners in a historical perspective) focus on the role that owners play during the restructuring phases and aim at measuring the long run productivity and profitability effects of internal and external restructuring.

[1] It resembles the approach of Williamson (1975) who proposes – on analytical grounds – that it is preferable from an efficiency point of view to have a system with an innovative take-over mechanism from small to large companies in later stages of the innovation (entry) process.

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4 SERVICES IN PRODUCTION AND PRODUCTION OF SERVICES IN SWEDISH MANUFACTURING

by Tomas Pousette and Thomas Lindberg

1. Introduction

The share of the service sector has been increasing in most developed economies during the last 20 years. A general view is that the service content within the manufacturing industry has also increased. By this is usually meant the manufacturing firms purchase and internal use of services as well as their sales of services. In the last 10-15 years, some of the firms' service activities, e.g. research and development (R&D), have been intensively studied. But our knowledge about the scale of resources that manufacturing firms spend on other activities than factory production, and how much of manufacturing production is made up of services, is still very incomplete.

Several arguments have been put forward to explain the supposed increase in manufacturing service production. One argument is that industrial products in general have become more complicated and advanced. This has been the result of R&D-efforts, which have also increased the need for extensive marketing to inform customers about characteristics and use of complex and technically advanced products. Another argument emphasizes the increasing participation of firms in joint ventures. To coordinate these large, often international projects, a great variety of management services are needed.

This paper has two purposes. The *first* is to describe the purchase, internal use and sales of services in manufacturing. The statistics are based on surveys to Swedish manufacturing firms undertaken by IUI. These have been supplemented by information from other national and international sources in order to obtain a more complete picture. The *second* purpose is to test some hypotheses about the role of services in manufacturing. Hence, we will study the choice between internal and external production of services, the relationships between service intensity and profitability, and between input and output intensity of services.

At the *macroeconomic* level attention is directed to the blurred statistical borderline between the manufacturing sector and parts of the service sector.

Depending on how firms are organized, activities like finance, insurance and especially business services like technical and administrative consultancy, legal and accountancy services and advertising, may be provided either internally by the manufacturing firms or bought externally. Thus, observations on the size of the manufacturing sector are becoming less meaningful. The declining development of industrial production and employment in most countries during the last 10-15 years would probably look less gloomy if the sector "business services" were added to the industry statistics. This relationship between manufacturing and service sectors is important, since the size of the manufacturing sector is often regarded as a separate policy target. It also raises questions about how we should measure manufacturing investments, productivity, etc.

From a *microeconomic* point of view the service content in manufacturing production carries significant information about the ways firms are organized. Do firms buy services mainly because they are more efficiently produced in the market, or is this a way of acquiring specialist knowledge and modern technology, or is it just a way to smooth out a temporarily high work-load?

The way the paper is organized indicates how we attempt to answer these questions. In section 2 the definitions of services are discussed. The internal use of services in manufacturing is presented in Section 3. Industry's purchase and sales of services are evaluated in Sections 4 and 5. The paper ends (in Section 6) with a summary and conclusions.

2. The Surveys – Definitions and Coverage

The concepts of industry's purchase, use and sales of services are not all well defined. On the input side services are bought not only from the service sector but also from other manufacturing firms. Sales of services are, however, difficult to separate from sales of goods. Goods production is generally the dominant feature of manufacturing firm activities and services are often an integral part of goods' sales. Services provided by industry are more seldom sold separately from goods. It is also difficult to separate the functions within the manufacturing firms which should be considered as services from those which are mainly related to factory production. Even the factory production process itself requires a significant input of software activities like production planning, materials and quality control etc.

In the survey on the internal use of services, seven functions were separated, following closely the definitions in the firms internal accounting system. Throughout this paper internal services are defined very broadly as labor costs for all activities except direct factory production. In the other surveys, the firms were asked about their purchase and sales of services according to their own definition of the service concept, which may vary somewhat

among firms. This should of course be kept in mind when analyzing the results. It should also be observed that the surveys are based on a sample of about 270 large Swedish manufacturing firms and that only the domestic part of the companies is included.[1] Separate estimations have, however, been carried out on the size and service content of foreign subsidiaries. In spite of certain problems with representativity and definitions, the survey results, combined with information from other sources, probably give a good picture of the service content in manufacturing production in a highly industrialized country like Sweden.

3. Internal Production of Services

3.1 Services in Domestic Operations

In the survey on the internal use of services the firms were asked to divide the total labor costs for 1976 and 1982 according to seven functions, namely R&D; engineering design and documentation; work scheduling; factory production; marketing and distribution; administration; and other. The results (see Table 1) show that in 1982 as much as 36 percent of total labor costs could be assigned to other activities than factory production. The largest service functions were marketing and administration with about 10 percent each. R&D, engineering design and documentation, and work scheduling each made up about 5 percent of labor cost.

Defining services broadly as all labor costs applied except for factory production, we notice that the raw materials processing and intermediate goods industries had, as expected, the smallest share of labor cost in services, about 25 percent. The highest concentration of services is found in the investment goods industry, 45 percent, while the service share in the consumption goods and building materials industries is close to the average.

The investment goods industry spends almost 20 percent of labor costs on R&D, engineering design and documentation, while the corresponding figure for the raw materials processing industry is only 4 percent. The high marketing shares in the building materials industry can probably be explained by the inclusion of distribution in this item.

A further disaggregation of the results from sectors to subsectors show that the dispersion in the service share of labor costs is much larger at the

[1] The number of firms in the sample varies somewhat around 270 for the different surveys. The sample includes all domestic manufacturing firms with more than 1000 employees and about 100 firms in the group 500-1000 employees. The responding unit is divisions of production units for some firms and the total company for others. This means that for some firms, particularly large ones, the head office is not included in the response.

lower levels. For the wood, pulp and paper industry the service share is only 10-15 percent of labor cost, while for the chemical-technical industry and the electrical industry the corresponding share is more than 50 percent.

The change in the distribution of labor costs by functions during the period 1976-82 is presented in Figure 1. Factory production is the function which has changed most. For total industry the factory production share decreased by 3 percentage points. The decrease is largest in the investment goods industry, but also notable in the other industries. Marketing shows an increasing share in all sectors. The share of labor costs spent on R&D increased in 4 out of 5 sectors, and together with about 1 percentage point. Thus, the survey results clearly show the decreasing relative importance of factory production, and the increasing importance of marketing and R&D.

The trend from factory production to services is also shown by data on the number of salaried employees. In the period 1964-83 the share of salaried employees in Swedish manufacturing industry increased steadily from 25 to 31 percent. In the subperiod 1976-82, covered by the survey data, the share increased from 28 to 31 percent. All sectors separated in the survey show an increasing share of salaried employees (SOS, Manufacturing).

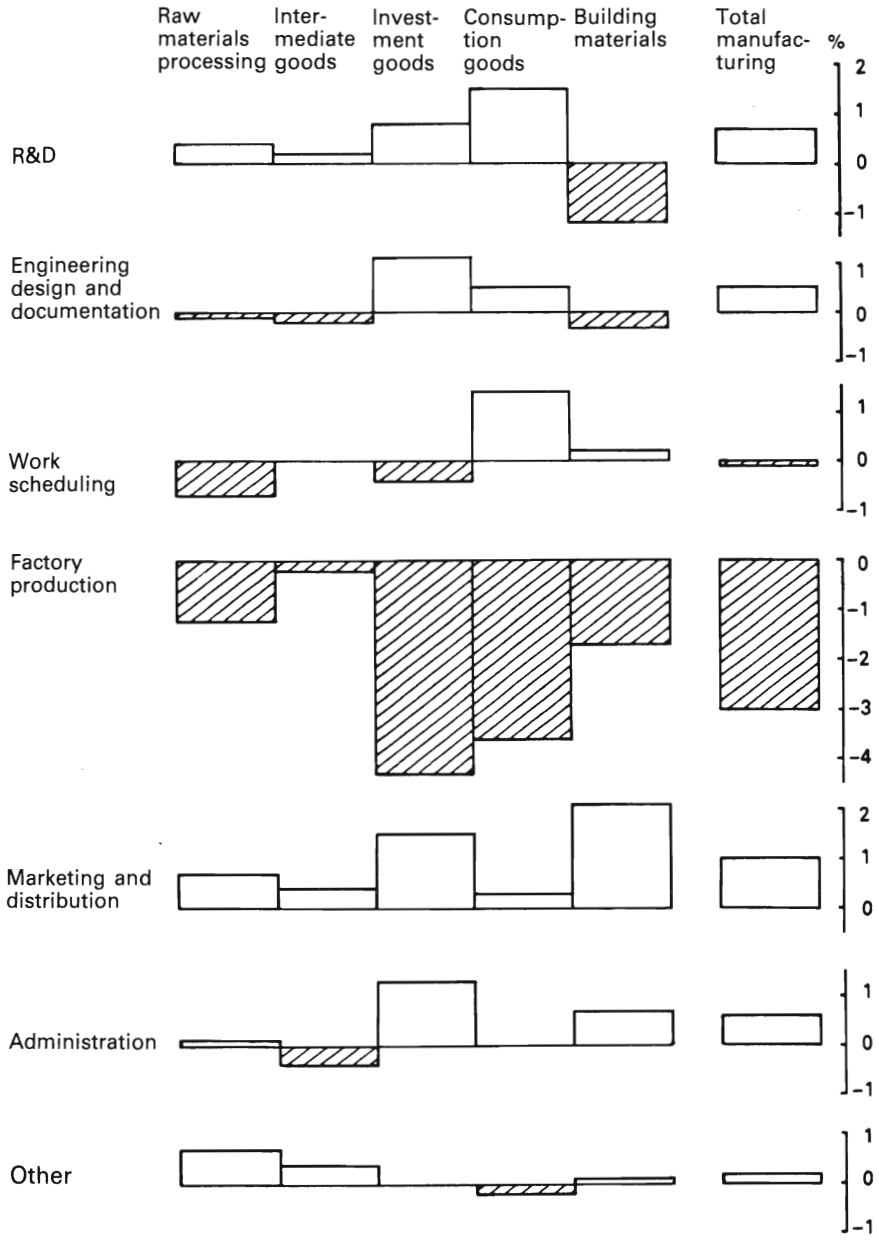
Table 1 *Labor costs in large Swedish manufacturing firms distributed by functions, 1982*
Percent

	Raw materials processing	Inter-mediate goods	Invest-ment goods	Consump-tion goods	Building materials	Total manufac-turing
R&D	2.4	4.0	9.0	5.9	3.8	6.0
Engineering design and documentation	1.4	2.0	10.2	3.1	2.5	5.3
Work scheduling	2.7	2.8	5.4	3.0	6.6	4.0
Factory production	77.5	73.8	54.7	65.6	64.2	64.4
Marketing and distribution	8.4	9.0	8.2	11.3	13.5	9.9
Administration	6.4	7.6	11.4	8.5	8.4	9.1
Other	1.3	0.8	1.1	2.6	1.0	1.4
Total	100.0	100.0	100.0	100.0	100.0	100.0

Note: The results, which are based on data from 135 firms, are weighted averages with labor costs in 1982 as weights.

Source: IUIs survey on industrial services 1983.

Figure 1 *The change in the distribution of labor costs on functions in large Swedish manufacturing firms 1976-82*
Percent



Note: The results, which are based on data from 115 firms responding 1976 and 1982, are weighted average with labor costs in 1982 as weights.

Source: IUIs survey on industrial services 1983.

3.2 Services in Foreign Subsidiaries

To get a better idea of total (domestic and international) firm activity, the survey presented in Section 3.1 has been supplemented with data on foreign operations. Table 2 shows employment in the 40 largest Swedish multinational manufacturing firms. Since 1974 the share of employment abroad has increased from 42 to 49 percent in 1982 and the number of persons employed in service subsidiaries abroad relative to total employment has increased from 10 to 13 percent.

If the foreign subsidiaries are added to the domestic part, the share of marketing in labor costs in 1982 can be estimated at 20 percent.[1] This implies an increase by 10 percentage points compared to only the domestic part (cf. Table 1). The relative size of the other functions is of course reduced in proportion. The factory production share falls from 64 to 56 percent. The increasing share of employment in service subsidiaries abroad in the period 1974-82 also means that the survey results on the domestic part underestimate the change from factory production to services in general and marketing in particular.

Table 2 *Employment in the 40 largest Swedish multinational manufacturing firms, 1974, 1978 and 1982*
Average number of employees

	1974	1978	1982
Abroad	276 700	285 500	320 000
of which:			
producing subsidiaries	209 100	212 300	238 000[b]
sales subsidiaries[a]	67 600	73 200	82 000[b]
Sweden	377 000	347 100	327 500
Total	653 700	632 600	647 500

[a] Including sales subsidiaries with no or small production and service subsidiaries.
[b] The share of employment in foreign producing and sales subsidiaries in 1982 is assumed to be the same as in 1978.

Sources: Bergholm and Jagrén (1985) and Eliasson (1985).

[1] Three assumptions are necessary for the estimation. Firstly, the distribution of labor costs on functions in foreign producing subsidiaries is assumed to be identical to the domestic parts, according to survey data, and total labor cost in foreign sales subsidiaries is regarded as marketing. Secondly, the distribution of labor costs on functions, from the survey, is applied to the number of employees instead of labor costs. Thirdly, the share of employment in foreign producing and sales subsidiaries in 1982 is assumed to be the same as in 1978.

3.3 Profitability and Service Intensity

An interesting question is how the marketing and research intensive firms distinguish themselves from other firms. Are they the most profitable ones? Our hypothesis is that there should be a positive relationship between the share of services and profitability since high service content in factory production generally means more sophisticated products.

The first test consisted of a simple correlation analysis between the gross profit margin and the share of internal services in 1982. It was carried out for a sample of 103 production units in the manufacturing industry. The expected positive correlation was weak, only 0.26. A somewhat stronger correlation (0.35) was found between the gross profit margin and the share of labor costs spent on marketing.

The 10 largest industry groups in Sweden were then selected, and their rate of return on total capital was compared with the service content in their constituent parts. The correlation between the change in profitability and internal service intensity in these 10 companies from the mid 70s to the early 80s was inconclusive. There was a positive relationship between the change in rate of return and service intensity for only 4 out of 10 companies. Thus, although it may be profitable to increase the service share in manufacturing firms this hypothesis is only weakly supported by our data. This is, however, not too surprising since the rate of return is determined in a complex way by many other factors than service intensity.

4. Purchase of Services

There is a flow of services to industry both from the service sector, including transports, and from transactions within industry. From national account and input-output statistics the first part of this flow may be estimated. In the period 1970-82 the provision of services from the service sector in relation to production in manufacturing increased from 5.5 to 6.7 percent (Ek 1985). A sample of large Swedish manufacturing firms were asked to estimate the total purchase of services (including transport) in 1981. For total manufacturing the purchase of services made up 6.2 percent of total sales (see Table 3), which is in accordance with the figures from input-output statistics.

The amount spent by industry on external services has also been studied by OECD (1983). For the seven countries studied, the services purchased made up 13.5 percent of the turnover in 1979.[1] The total spending on external services varied considerably between the countries, from France with

[1] The countries are Belgium, Denmark, France, Germany, Italy, the Netherlands and the United Kingdom.

20.0 percent to Belgium with 8.3 percent. A division of services into industrial and other (from the service sector) showed that the former made up 4.0 percent, and the latter 9.5 percent. Four of the countries also report data on the development 1975-80.[1] In this period the total purchase of services increased its share of the turnover from 11.0 percent to 12.0 percent. The purchase of services in Swedish industry, 6.2 percent of the turnover in 1981, seems to be on the low side compared to the other countries.

An interesting question is which categories of services firms choose to acquire in the market and what kinds they consider necessary to produce within the firm. This trade-off between internal and external production of services is of course primarily based on cost efficiency considerations, in the same way as for the production of goods. Another important aspect is probably business secrecy.

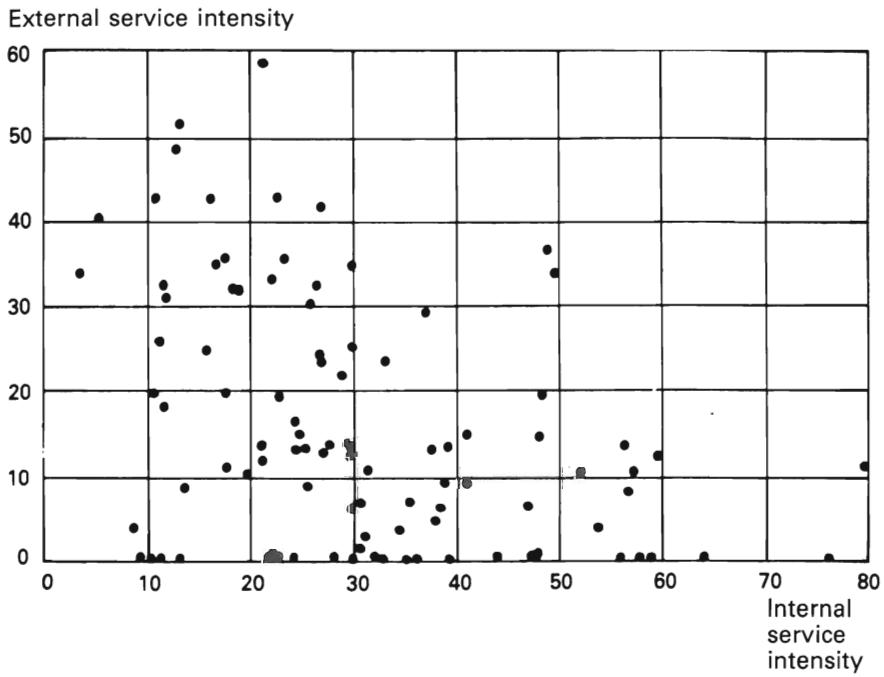
In manufacturing firms with a large share of internal services the service competence can be expected to be high and one can therefore assume that the propensity to purchase external services would be low. To test this hypothesis the correlation between the share of internal and external services in firms was analyzed (see Figure 2). It is clear from the figure that there is a negative relationship between the intensity of internal and external services. The negative correlation was strongest in the investment goods and consumption goods industries, -0.54 respectively -0.56. A plausible interpretation of this relationship is that internal and external services in manufacturing firms are primarily substitutes rather than complements. This view was also supported in interviews with a group of 13 service sales intensive firms (c.f. Section 5). According to these firms, services bought were very often of the same kind as those sold. At peaks one chooses to engage external service subcontractors. Further disaggregation of total services into different categories would clarify this issue in more detail.

5. Sales of Services

Industry's sales of services are, as mentioned, difficult to separate since the sales of goods is often the dominant activity. This means e.g. that the pricing of services seldom is explicit. According to survey data, the sales of services by Swedish manufacturing firms are of limited importance. For only 13 firms out of 210 did the sales of services in 1978 or 1983 make up more than 5 percent of the turnover. Sales of services is of greatest importance in the investment goods industry and of least importance in the raw materials processing and consumption goods industries. At lower levels the electrical in-

[1] The countries are Denmark, Germany, Italy and the United Kingdom.

Figure 2 *Internal and external service intensity in large manufacturing firms 1981*
Percent



Note: The data in the figure represents data from 103 manufacturing firms.
External service intensity = PS/(TS+PS)
Internal service intensity = IS/(TS+PS)
where: PS = purchase of services; IS = internal labor cost for non-production employees; TS = total internal labor cost.

Source: IUIs survey on industrial services 1983, the Federation of Swedish Industries and IUIs Planning Survey 1982.

dustry has a considerably larger share of services than other subsectors. For one third of the responding firms in the electrical industry, the share of service sales was larger than 5 percent.

For the 13 service intensive firms, the sales of services relative to turnover was unchanged in the observed period (1978-83). The type of services sold by these firms were also studied separately. According to interviews with the firms, the most common category was engineering know-how, like development and construction work. Other services reported by the firms were com-

Table 3 *Purchase and sales of services in large Swedish manufacturing firms 1981*
Percent of turnover

	Purchase of services	Sales of services
Raw materials processing	5.9	0.7
Intermediate goods	9.1	2.1
Investment goods	6.2	1.5
Consumption goods	2.9	0.6
Building materials	8.5	4.4
Total	6.2	1.4

Source: The Federation of Swedish Industries and IUIs planning Survey 1982.

missions, transports, rents, education in connection with sales, and service, assembly and installation work. The services were generally sold together with the products and seldom marketed separately. Services sold were often, as mentioned in Section 3.3, of the same type as those purchased.

The rather small share of direct service sales in manufacturing was also confirmed in an earlier survey (see Table 3). In 1981 the sales of services made up only 1.4 percent of the turnover in total manufacturing. The relative magnitude of services in total sales for the various sectors has remained rather constant between the two surveys, with a small share for the raw materials processing and consumption goods industries.

The industrial service sales by industry has also been studied by OECD (1983). For the five countries which have reported data services made up 2.5 percent of the turnover in 1979.[1] This is a somewhat larger figure than Sweden's 1.4 percent in 1981. Thus, compared to other OECD countries the service intensity in Swedish industry is low both on the external input side and on the output side.

As shown in the previous sections, service intensity both on the input side (external and internal) and on the output side varies significantly between sectors. Is there then any relationship between the use of internal and external services on the one hand and sales of services on the other? One would expect that firms with a high intensity of services on the input side would also

[1] The countries are Belgium, Denmark, Germany, Italy and the Netherlands.

be service sales intensive. To check this relationship a measure of the service input intensity was plotted against sales of services in percent of turnover for various subsectors. There was, however, no simple correlation between the input and output intensity of services. Instead we observed that for the investment goods, consumption goods and building materials industries the service input intensity was rather constant while the service output intensity was quite different.

6. Summary and Conclusions

In Swedish manufacturing, service production was shown to make up as much as 35 percent of total labor costs in domestic operations. In rapidly expanding sectors, like the chemical-technical industry and the electrical industry, more than 50 percent of total labor costs is devoted to the production of internal services. The shift from factory production to services in manufacturing is even more marked if foreign subsidiaries are taken into account. In that case the service share in total manufacturing was estimated at about 45 percent. The hypothesis about a positive relationship between service intensity and profitability was, however, only weakly supported by the data.

The purchase of services in manufacturing was shown to be in the order of 6 percent of the turnover. For firm data the correlation between the intensity of internal and external services was found to be negative, indicating that services purchased are mainly substitutes for services within the firm. On the output side, service sales were relatively unimportant and amounted to less than 2 percent of the turnover in total manufacturing. The hypothesis about a positive correlation between input and output service intensity was rejected at the subsector level.

Compared to other OECD-countries the service content in Swedish manufacturing was shown to be below the average, both on the external input and output side. This, of course, raises some questions about the comparability of international data on services in industry.

In the future, the increasing service intensity in manufacturing, observed from the data, will most probably continue. Hopefully, this important trend will soon be recognized by national statistics authorities and actions taken to improve the striking lack of data in the area. Otherwise the gap between the manufacturing statistics and the sector it describes will continue to widen. In the meanwhile data, like these presented in this paper, gives us some guidance about the structural changes within industry and manufacturing firms.

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5 ON NEW FIRM ENTRY AND MACRO STABILITY

by Kenneth Hanson

Some implications of firm entry are discussed. The role of entry is generally evaluated with reference to promoting price competition and efficiency. There can also be an impact on growth. Furthermore, I suggest that innovative new entry is important for macro stability. Whether firm entry can promote efficiency, stimulate growth, and maintain stability, given existing industrial organization and behavior, are part of a broader set of issues pertaining to competition as a dynamic process. I explore the impact of entry but not the extent to which entry will occur.

1. Dynamics of Industrial Organization: Some Issues

Competition is a dynamic process. It is a means of generating change in industrial organization through exit of low performers, new firm entry and reorganization of existing firms.

Competing firms make expenditures on capital structures, research and development, advertising, etc. to shift demand and cost schedules. These competitive investments and firm pricing strategy combine with market response into a dynamic feedback process of changing industrial organization. Four feedback issues are particularly important: (1) *whether* market concentration and monopoly power or diversity and further competition is a general tendency; (2) *whether* efficiency in resource allocation is promoted; (3) *whether* aggregate growth is stimulated; and, (4) *whether* macroeconomic stability is enhanced. Also of importance but not explored here are the motivating factors and conducive conditions for entry, in particular the types of entrants which lead to a socially beneficial impact on efficiency, growth and stability.

When looked at from the perspective of a national economy, these issues of competition as a dynamic process pertain to either a closed or an open economy. The industrial organization of an open economy such as Sweden is also influenced by foreign competition. For goods which a country exports

and for goods which a country both domestically produces and imports, foreign competition may stimulate or force change in industrial organization.

In this note I discuss how ongoing research at IUI, the micro-to-macro simulation model of the Swedish economy (MOSES) can be used to explore the impact of entry on efficiency, growth and stability of the aggregate economy. The model takes a dynamic perspective which brings out feedback effects which may go unnoticed in an approach that focusses on comparative statics between long run equilibria. The state of the economy is evaluated as one step in a dynamic process, rather than as a state of long-run equilibrium. To bring out the policy implications in a dynamic perspective and to contrast them to policy advice from a static long-run equilibrium analysis is an aim of work done in association with MOSES.

2. Entry and New Firms

There are several distinctions among entrants which I want to clarify for the following discussion (Granstrand, 1986). First, an entrant will either be a new establishment or an established firm diversifying. When I refer to entry the distinction is not needed, otherwise I will make reference to new firm entry.

A second distinction is between imitative and innovative entry. Innovation is used here in reference to a change in production technology, i.e. process innovation. I use imitation in reference to entrants using the same production technology as existing firms in a sector. Of course, imitation will often involve some modification to production technology and product, but I will treat the entrants as imitative as long as the change is minor relative to the purpose of analysis.

Product innovation is also an important means by which entry occurs. When the new product serves as a change in another firm's production process, the impact is to a large extent similar to a process innovation and is treated as such in MOSES. In a multisector model where product definition in a sector is fixed, new products are redefined as a cost reduction for producing an existing product. There is, however, a diffusion of the new product into the economy and a following of imitators which is not treated here (Granstrand, 1986).

3. Entry and Market Concentration

The evolution of industrial organization, the conditions stimulating and retarding monopoly power, and the role of entry by innovative entrepreneurs are issues Schumpeter addressed (Nelson and Winter, 1978). One might claim that Schumpeter, in his early view of a private enterprise economy,

upheld the merits of entry to achieve competitiveness in price and supply. The Austrian perspective of competition as a dynamic process also upholds the merits of entry (Kirzner, 1973).

Schumpeter's later view is less optimistic about the power of entry. Rather, 'the monopoly profits from one innovation become the means for developing another, etc., thereby offsetting the perennial gale of destruction that imitation brings' (Marris and Mueller, 1980, p. 57). The private enterprise economy to be a 'self-organizing process leading to persistently increasing concentration' at the national level (Marris and Mueller, 1980, p. 50). Evidence supports the contention of concentration of industry as a general tendency in industrialized economies (Jagrén, 1986; Caves, 1980).

An entry does not seem to prevent the size distribution of firms from becoming more concentrated.[1] What has increased is international competition. For a small industrial nation, national measures of concentration may not adequately represent world competition. The growing share of total production in manufacturing among a smaller number of firms is rather an indicator of potential instability (vulnerability) for the economy (Eliasson, 1986).

Simulation experiments with MOSES reproduce this empirical finding of industry concentration at the national level. The experiments suggest that high productivity entrants force the exit of existing low productivity firms such that 20 percent fewer firms remain relative to the no entry case. Normal productivity entry reduces the remaining firms even more, 40 percent less than the no entry case, suggesting that cut throat competition of many similar firms forces greater exit. Whether a reduction in efficiency, growth and stability are associated with the change in industry structure are relevant issues to be explored using MOSES simulation experiments with firm entry.

4. Entry and Static Efficiency

Competitive market theory argues that entry induces efficiency in the organization of production (Clark, 1961). Similarly, contestable market theory replaces actual entry with the threat of entry as a condition for efficiency (Baumol, 1982). Both theories argue that entry, through increasing competitiveness, lowers price-cost margins and costs of production which reflect gains in efficiency. These theories differ in that concentration indicates efficiency loss in the competitive market theory, whereas in the contestable market theory concentration is a mixed signal as to efficiency loss or not. The con-

[1] One caution in interpretation of entry data is that new firms introducing innovations often merge with a larger firm reducing the apparent importance of new firms (Jagrén, 1986).

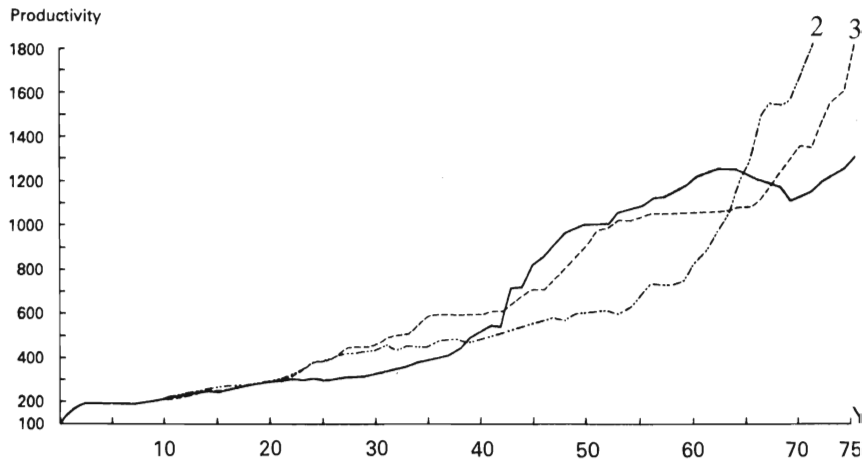
testable market theory allows for complications introduced by cost conditions inherent to the technology of industrialized economies, requiring a study of the causal mechanisms bringing concentration about.

Whether entrants are imitators or innovators is not a distinction made, nor needed for the efficiency role of entry. Of course, innovators will enhance efficiency by reducing cost of production, and innovation may even be necessary for entrants to overcome entry barriers. But for efficiency gains, entrants need not be innovative. Where slack in firm efficiency and excessive price-cost margins exist, imitators, or the threat of imitators, can induce efficiency gains through competition.

Several variations of an efficiency impact of an entry experiment are being performed using MOSES. For thirty years after the first ten years, both high and low productivity entrants are introduced into an economy with slack in efficiency. Firm efficiency is given by a productivity measure of value of output per unit of labor input. Slack efficiency is a dimension of firm behavior that is measured in terms of a deviation from a hypothetical firm production possibility frontier (Eliasson, 1985). Limited information keeps a firm from being on the production possibility frontier.

A first round of simulation experiments suggests that high productivity entrants improve efficiency relative to a base case of no entry, see Figure 1. With the high productivity entrants, efficiency gains arise from greater com-

Figure 1 *The impact of entry on productivity*



1 = No entry
2 = Normal productivity entry
3 = High productivity entry

petition forcing a reduction of slack efficiency in existing firms, from market share shifting towards the firms with the higher productivity technology and from the exit of low productivity firms. Normal productivity entrants do not improve efficiency through competition, see Figure 1. This suggests that it is not just entry that improves efficiency, but that the entrants introduce higher productivity technology.

5. Entry and Aggregate Growth

Entry may or may not stimulate growth. The economic circumstances and type of entrant matter. In discussing the impact of entry on growth, I want to distinguish between high productivity entrants and normal productivity entrants. Another distinction, but one relating to the state of the economy, is whether slack in the availability of resources exist. Also of importance is whether there is slack in firm efficiency.

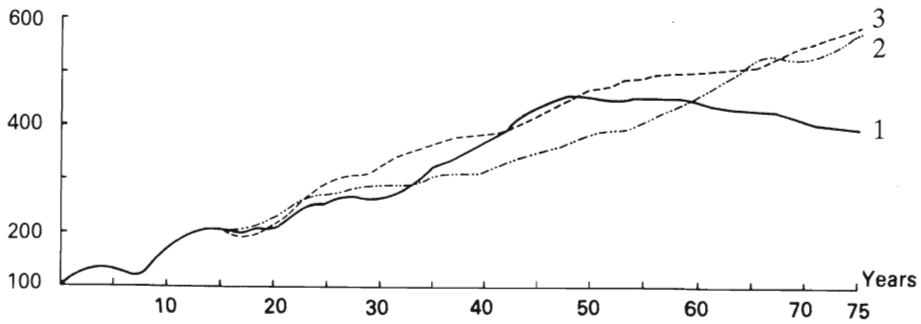
I expect aggregate growth to be stimulated by either type of entrant when slack in the availability of resources exists, notably in the availability of labor and finance for capital. Of course, higher productivity entrants can be expected to improve growth over the normal productivity entry case. The availability of resources allows entry to occur without crowding out effects which result in growth. Unfortunately, the availability of resources is a necessary but not a sufficient stimulus to entry. An anticipated profit incentive is still essential.

With little slack in the availability of resources, as in the simulation experiments, the stimulus of entry to growth is sensitive to the nature of entrants. In the simulation experiments, little or no improvement in growth is generated by the increased competition of normal productivity entry. They drive down prices, lower profits, and force exit, but they do not stimulate growth; see Figure 2. High productivity entrants, on the other hand, force exit of lower productivity firms, releasing resources and stimulating growth; see Figure 2.

6. Entry and Macro Stability

A two fold impact of entry on macro stability is to be addressed here. One pertains to the diversity of technology in a sector and the vulnerability of the sector to adverse shocks. Another dimension in considering the impact of entry on macro stability is the development of new products which take up slack in a depressed economy. With increasing world competition the reduction of demand for home produced goods can occur to the extent the macro economy is adversely affected. Below I discuss the rate of innovative new entry as a stabilizing influence in context of foreign competition.

Figure 2 *The impact of entry on production*



1 = No entry
2 = Normal productivity entry
3 = High productivity entry

When adverse unforeseen shocks move the economy into disequilibrium, it may be that innovative entry, which compensates for the new conditions, is crucial for maintaining stable macro dynamics (Day, 1984; Eliasson, 1984). I suggest that diversity through entry is important for flexibility in the organization of production, and hence macro stability as will be discussed below. See Figure 2 for an illustration, where high productivity entrants are able to sustain stable growth relative to the no entry case.

7. Entry and Some Dynamic Welfare Implications of Entry

Both competitive market theory and contestable market theory use efficiency as the criterion for assessing welfare gains in the reorganization of industry structure arising from entry. As a welfare criterion, efficiency takes a static perspective and needs to be supplemented with a dynamic criterion such as flexibility or adaptive efficiency (Marris and Mueller, 1980, p. 33).

The need for a broader welfare criterion depends on accepting the economic problem as involving agents 'responding to unforeseen changes in demand and supply conditions' (Nelson, 1981, p. 99). Under conditions of uncertainty, inadequate flexibility in the organization of production impairs macro stability.[1] Flexibility in the organization of production can be associat-

[1] There is 'system fragility' in the organization of production (Minsky, 1982).

ed with the stability of aggregate response to unforeseen change, and as a dimension of adaptive efficiency introduced by Marris and Mueller (1980) and Pelikan (1986).

A difficulty with introducing dynamic considerations into welfare analysis is to assess social costs and benefits over the long run. Static efficiency considerations are short run. They can be approximated with comparative statics from existing conditions. Assessing the social loss of a less stable response to adverse shocks requires anticipating future states of aggregate measures of social welfare such as unemployment, inflation and balance of trade. This is not an easy task, but still one which may prove useful.

If one accepts what is assumed in standard welfare analysis – that rapid convergence from one equilibrium to another is the inevitable response to an unforeseen change – then dynamic considerations are not necessary in welfare analysis of industrial organization. I take the perspective that we cannot assume rapid convergence and that the adjustment dynamics out of equilibrium is important. With such a disequilibrium dynamic perspective, adaptive efficiency is a desirable characteristic of an economy, a hedge against an adverse future outcome which may or may not occur. Can adaptive efficiency be maintained by new firm entry?

8. Macro Stability through Diversity from Entry

Firms in an industrial sector striving towards efficiency tend to invest in the same least cost technologies. As investments accumulate, the production technology among firms in the sector becomes similar. If and when adverse shocks in the price and supply of factors occurs, the response among firms will be similar and accumulate into an aggregate impact on the macroeconomy. I suggest that a high degree of similarity in production technology among firms in a sector increases the risk that an adverse shock will destabilize the macroeconomy. Conversely, I suggest that firm diversity in a sector will enhance flexibility, thereby stabilizing the macroeconomy (Eliasson, 1984).

The relevant form of diversity among firms in a sector depends on the types of adverse shocks which are considered. Of particular interest are price shocks to factors of production such as oil, and foreign competition with respect to consumer nondurable goods which are both domestically produced and imported, and with respect to exports.

Consider the case of a factor price shock. In the short run, the flexibility of a sector depends on potential substitution among factors given existing capital stocks. Over the medium to long run, the adjustment dynamics will depend on the potential for installing new capital which compensates for changes in anticipated relative factor prices. As the analysis extends into the long run the impact of induced innovation will appear.

Let us return to the short run impact of a factor price change where firm response arises out of a substitution among factors. If fixed factor technology prevails among firms with the same technology, then no substitution will occur. The impact of a factor price change will be on the firms' price and production. How individual firm adjustment accumulates into aggregate dynamics is being explored with the micro-to-macro simulation model, MOSES (Eliasson, 1985).

Substitution among factors requires either variable factor technology or firms with diverse technology, using different combinations of factors. Consider the firm diversity situation, maintaining fixed factor technologies. Production will shift towards those firms with technology favorably inclined to the change in relative factor prices. How the aggregate impact compares with the case of similar firms is being explored with MOSES.

I suggest that greater diversity in production technology among firms in the sectors of an economy, reduces the impact a factor price shock has on aggregate production, price and employment. Diversity will increase stability, due to the greater substitution possibilities. Stability through diversity in production technology is a characteristic of flexibility to the factor price shock situation.

When individual firms have factor substitution possibilities, then diversity of production technology among firms is less important. It is my feeling, though, that given technology firms have little substitution potential among factors of production in the short run. Rather, flexibility is best maintained by existing firms having alternative technologies, entrants introducing process innovation and multidivision firms using different technologies in different divisions.

Without innovative entry there may be a tendency towards homogeneity of technology, since competition forces the same least cost investments. For reasons of flexibility it may be useful to consider policies that support innovative activity and provide new technologies which serve as viable alternatives under changing factor price and supply conditions. Whether the innovative activity is carried out by existing firms or new potential firms makes no difference in this context. Though, an issue is whether existing firms or potential entrants will carry out the appropriate research and innovative activity (Kamien and Schwartz, 1975).

9. Macro Stability with Foreign Competition

An open economy, where exports compete in foreign markets and domestic goods compete with imports, is subject to a greater potential of influences which may destabilize aggregate growth. Changing foreign prices, fluctuating exchange rates and innovations from abroad can favor the balance of

trade toward foreign companies. As domestic firms compete for market share there will be repercussions throughout the domestic economy. The aggregate unemployment and inflation problems which arise during the traverse of disequilibrium adjustment are complex. One approach to the analysis of the traverse is through micro-to-macro simulation (Eliasson, 1985).

The entry and exit of firms is one dimension of the disequilibrium dynamics which is of interest here. As market shares are lost, low performers exit. In a responsive economy, innovative entry will be induced. Both process and product innovations may stimulate growth and stabilize the aggregate economy. Those firms which persist in the sector will have to develop technology which allows cost to be reduced and price to be competitive. An alternative method for making prices competitive is by government devaluation of the domestic currency. Such policy may have medium to long term repercussions which may not be desirable. The extent to which innovation can be relied upon to maintain viability of firms given foreign competition is an industrial policy issue. Export driven growth in an economy threatened by foreign competition, is maintained through viable product innovations and through innovative entry. The critical question is how and to what extent the innovative function can be influenced through policies.

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INSTITUTIONS AND MARKET PROCESSES

6 THE SWEDISH MODEL: WHAT WENT WRONG?

by Stephen Turner

1. An Introduction to The Swedish Model

Background

The Swedish model emerged as the product of a postwar "political settlement" between organized labor, business, and government. The fundamental objective of the model was to establish a social consensus on the appropriate balance between efficiency and equity. Each party to the general settlement recognized that without such a consensus, the pursuit of growth could itself fall victim to disruptive distributional conflict over the terms of economic adjustment (Lundberg 1985). Three areas of potential conflict were singled out for attention:

1. *Labor/Capital conflict* over the distribution of wages and profits

– The first objective of a trade union is to increase the real wages of its members. But in an economy such as Sweden's, in which almost 85 percent of the total labor force is unionized, unrestrained pursuit of this objective poses serious risks for national economic performance. Excessive growth in real wages damages competitiveness and profitability. A persistent decline in profitability leads, in turn, to lower rates of investment, growth, and employment.

2. *Inter-union conflict* over the relative wage structure

– The success of a union in advancing its members' interests is gauged to a large extent by its capacity to maintain or increase the relative wages of its own members. Union pursuit of this objective poses two potential threats to economic efficiency: (1) wage "leapfrogging", which drives up overall wage levels, yet leaves relative wages largely unchanged; (2) labor mismatches, which develop when the relative wage structure fails to adjust to changing market conditions.

3. *Conflict* over the *terms of structural adjustment*

– Creative destruction, the engine of growth in a capitalist economy, generates losers as well as winners. Outmoded firms are driven out of business; workers are displaced by changes in business organization, production processes, and by business failures; geographic regions suffer employment losses and economic decline.

Although such microeconomic transformations are essential for macroeconomic efficiency, potential losers have a powerful incentive to resist painful adjustments. Coalitions against change possess, moreover, two important advantages in their attempts to obstruct the adjustment process. First, inadequate understanding of the complex linkages between microstructural adjustment and macroeconomic performance serves to obscure the efficiency costs of resistance to change. And because the benefits of adjustment are widely dispersed, while the costs are highly concentrated, it is much easier to mobilize potential losers than to organize the disparate groups that would benefit from structural change (Olson 1982).

This paper has three main objectives: (1) to briefly describe the essential institutional features of the Swedish model of wage formation and structural change; (2) to evaluate the model in terms of its success in promoting a balanced development between the growth in real wages and productivity; (3) to suggest a few hypotheses to account for the disparity between the intended and actual performance of the Swedish model.

Wage Formation in the Rehn and EFO Models

In the early 1950s, economists from the LO (the Swedish Confederation of Labor) introduced an innovative model for regulating wage formation and structural change in an ambitious attempt to reconcile – and even improve – the tradeoff between union demands for greater equity and the economic requirements for greater efficiency. According to the Rehn Model, this dual objective could be achieved through the implementation of solidaristic wage policy and active labor market policy (Björklund 1984).

The concept of solidaristic wage policy implied, in its original formulation, "equal pay for equal work". Through centralized negotiations between LO and SAF (The Swedish Employers' Confederation) national wage rates would be established for each job category. These rates would then be applied throughout the economy, regardless of differences in productivity and profitability among individual firms.

Three main arguments were advanced in support of solidaristic wage policy. First, the elimination of wage disparities among comparable jobs would automatically promote greater equity through the reduction of income inequality. Second, by establishing a general principle for wage distribution,

solidaristic wage policy would reduce the scope for inter-union wage rivalry and the corresponding risk of wage leapfrogging.

Finally, it was argued that a uniform wage structure would promote productivity growth and economic efficiency by producing a differential profits squeeze among efficient and inefficient firms. In theory, this would promote economic efficiency in three ways: (1) by reducing x-inefficiency in existing firms; (2) by accelerating the scrapping of outmoded capital and the forced exit of inefficient firms; (3) by providing an extra margin for expansion in highly efficient firms.

Although solidaristic wage policy offered a normative principle for regulating inter-union wage conflict, it offered little guidance on how to manage the conflict over the distribution of wages and profits. Widespread concern over the risk of excessive wage growth led, in the late 1960s, to the development of the EFO model of wage formation.

EFO established the maintenance of international competitiveness as the fundamental criteria for gauging the scope for overall wage increases. The model divides the economy into two sectors: the exposed K-sector and the sheltered S-sector. According to the model, equilibrium levels of international competitiveness and profitability can be maintained as long as real wage growth remains within the margin provided by the combination of K-sector productivity growth and the rise in the international price of tradeable goods.

Entry, Exit, and Structural Adjustment

Most accounts of the Swedish model have focused almost exclusively on the labor market institutions established by the Rehn and EFO models. But a more comprehensive examination reveals that the norms regulating wage formation can work effectively only if supported and reinforced by norms promoting a rapid pace of structural change. It was this combination – of solidaristic wage policy and the free entry and exit of firms and technologies – that held out the promise of increased equity and enhanced efficiency. It was this combination that seemed capable of ensuring a balanced development between growth in real wages and productivity.

The entry of new firms and technologies – and of market competition to eliminate the outmoded ones – are essential conditions for ensuring adaptive efficiency in any economy (Pelikan 1985 and Hanson in this volume). But due to the impact of solidaristic wage policy, these conditions assume an even greater importance in the Swedish model. By driving up wages at the bottom end of the payscale, solidaristic wage policy accelerates the rate at which marginally efficient production techniques and business firms become unprofitable and thereby reduces the scope for economic adjustment through wage flexibility.

Every society must address the conflicts that arise between economic pressures for market-driven structural change and political pressures for state "control" over entry and exit. The Swedish model developed as a collective attempt to mediate these conflicts. At the core of the model was a political settlement that established the roles to be played by organized labor, business, and the state in shaping structural adjustment.

Extensive state intervention in production and investment decisions was ruled out from the start. Open competition in contestable markets – not state industrial policy – was to sort out the winners from the losers. State policy was designed to facilitate adjustment indirectly, in two ways. First, active labor market policy would ease the burden of adjustment – and thus minimize resistance to that adjustment – by providing retraining and job placement services to individual workers displaced by structural change. Second, rapid welfare state expansion growth would not only reduce the social costs of adjustment, but also promote a more equitable distribution of the fruits of growth. From the outset, therefore, rapid public sector expansion was seen as a way of reducing political resistance to adjustment (Martin 1984).

The Swedish model assigned to organized labor an indirect but essential role in the adjustment process. I have already noted the ways in which solidaristic wage policy promotes rationalization and structural change. Equally important, and less often discussed, is the critical role of the unions in facilitating the rapid introduction of new technologies, and in freely accepting a correspondingly high rate of labor mobility.

Primary responsibility for adjustment decisions was retained by the owners and managers of private business firms. This responsibility carried with it risks as well as rewards. The concept of the welfare state did not apply, at least originally, to the welfare of business firms.

2. An Evaluation of The Swedish Model

An evaluation of the Swedish model must begin by addressing a puzzle con cerning Sweden's economic performance. Economic theory suggests tha there is a positive causal relation between wage moderation, internationa competitiveness, and full employment. In examining Sweden's economi performance over the past two decades, however, we find considerable evi dence of excessive real wage growth and of a substantial decline in inte national competitiveness; yet throughout this period, Sweden's performanc on unemployment has consistently ranked among the best in the OECD. Be fore suggesting a potential answer to this puzzle, we must examine the ev dence on trends in wage formation and competitiveness.

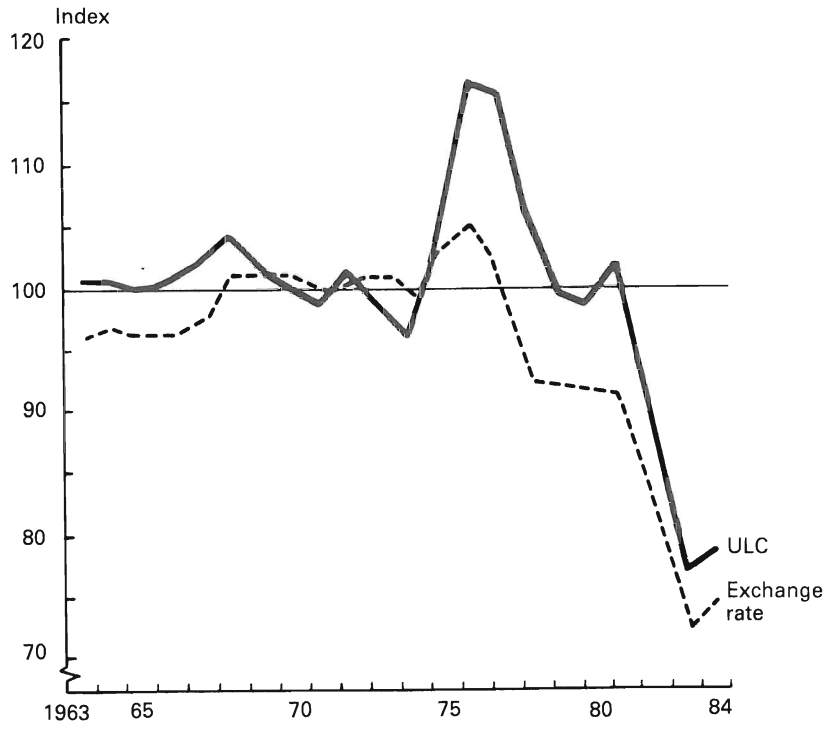
The most widely used indicator of the impact of wage pressure on comp titiveness is the measure for relative unit labor costs (ULC). The distinctiv

feature of this measure is that it not only captures the effects of relative changes in real wages, but also incorporates productivity growth and exchange rate movements. Figure 1 displays the trend in relative ULC for the period 1963-84. Three points deserve emphasis. Until the mid 1970's, Sweden's relative ULC were generally stable and exhibited no long-term tendency towards a loss of competitiveness. Second, relative ULC rose dramatically between 1974-77. Finally, due to the effects of repeated currency devaluations since 1977, Sweden's relative ULC have dropped sharply since that time. In 1985, they were almost 20 percent below the level of 1970 and about 35 percent below the peak of the "cost crisis".

Three Interpretations of the "Cost Crisis"

The explosive increase in relative labor costs in the mid 1970's is known in the Swedish debate as the "cost crisis" (Ds Ju 1979). The sharp rise in labor costs triggered a dramatic fall in Swedish competitiveness, as market share plunged by about 15 percent between 1974 and 1977. The cost crisis

Figure 1 *Sweden's Relative Unit Labor Costs (ULC) 1963-84*
Index 1970 = 100



Source: Calmfors et al. (1985).

marked the onset of a prolonged period of stagnation in Swedish industrial production and economic growth.

Many economists have argued that the cost crisis signaled the collapse of the Swedish model. According to this argument, the model worked relatively well in moderating wage growth in an era of rapid economic growth, but is ill suited to a period characterized by a slow productivity growth and worldwide economic stagnation. Under these changed conditions, the Swedish model has proven incapable of effectively regulating inter-union conflict over relative wage shares and the labor/capital conflict over wages and profits (Calmfors 1985).

Although this argument appears persuasive at first sight, it has been subject to two very different types of criticism. The first contends, essentially, that the Swedish model is alive and well; the second claims that the collapse of the model can be traced as far back as the mid 1960's. Let us examine each of these arguments in turn.

According to the first argument, the cost crisis is best seen as a single deviation from a well established pattern of moderate wage settlements. Furthermore, the much touted "wage explosion" had very little to do with the rise in Sweden's relative ULC. Although Swedish hourly wage rates rose rapidly during this period, the rise was only marginally greater than in competitor nations. The real problem was due to a combination of an exogenous productivity slowdown, a rise in the exchange rate, and a substantial increase in non-wage employer fees (SIND 1982). Proponents of this view argue, moreover, that widespread support for the equity provisions of the Swedish model has been essential in facilitating union acceptance of an unparalleled degree of downward real wage adjustment (Erixon 1985).

Advocates of the second, more critical view, adopt a long-term "structuralist" perspective in evaluating the impact of Swedish wage trends on international competitiveness and economic performance. Erik Dahmén and Pehr Wissén have been among the most forceful advocates of this position. They argue that since about the mid 1960's, Swedish real wage gains have persistently exceeded the rate consistent with long-term economic equilibrium. The deleterious effects of excessive wage gains were initially obscured, however, by an endogenous acceleration in aggregate productivity growth (Dahmén 1980, Wissén 1982, Bentzel et al. 1980).

The aggregate productivity figures improved in the late 1960's as a result of reductions in x-inefficiency and, more importantly, due to a sharp increase in the scrapping of machinery and the forced exit of the least efficient firms. The initial surge in productivity growth made it possible to maintain Sweden's relative ULC and to fulfill, ex post, the EFO guidelines for wage formation. But these aggregate indicators proved to be highly deceptive. They failed to capture the gradual erosion in Sweden's international competitiveness and the alarming contraction in the size of the K-sector.

The loss of competitiveness is reflected most clearly in a persistent drop in Swedish market shares that began about 1965, and in the emergence of balance of payments deficits towards the end of the decade (Carlsson 1981, Bergström 1982). Falling competitiveness gradually eroded K-sector profitability. The drop in profitability led, in turn, to a sharp increase in business failures and defensive mergers, and to a reduction in new business entry and investment in capacity expansion (Jagrén in this volume, Du Rietz 1975). In response to rising wage pressure and heightened international competition, firms shifted investment towards rationalization and cost reduction. This not only triggered a sharp drop in K-sector employment but also reduced the pace of K-sector capacity expansion (Calmfors 1979).

This structuralist perspective suggests that even in the period 1963-73 – which is usually regarded as part of the golden age of the Swedish model – the increase in real wages was incompatible with equilibrium levels of competitiveness and profitability. Although the cost crisis of the mid 70s clearly intensified the underlying structural problems, this was not the fundamental source of the severe stagnation in industrial output and economic growth that Sweden experienced in the late 70s. The cost crisis simply delivered the knockout blow, as it were, to a highly vulnerable Swedish industrial sector.

A Solution to the Puzzle

The structuralist analysis of trends in wage growth and international competitiveness appears to offer the most compelling interpretation of the effectiveness of the Swedish model in achieving a balanced development between wages and productivity. It also suggests a plausible solution to the puzzle noted above. In the short term, full employment could be maintained in the face of excessive wage increases due to a rapid elimination of x-inefficiency. As the scope for rationalization was gradually eliminated, K-sector employment fell quite rapidly, but this did not trigger a corresponding increase in unemployment. Indeed, even in the wake of the cost crisis, Swedish unemployment never rose above 3.5 percent.

This extraordinary record on unemployment is explained largely by the impact of massive government policy interventions. Among the most important were: (1) a substantial expansion in the use of active labor market policy; (2) industrial policy initiatives to shore up firms and sectors threatened by collapse and, perhaps most importantly; (3) an explosive increase in public sector employment. (See Deiaco and Murray in this volume on Swedish public sector expansion.)

3. What Went Wrong

As we have seen, the evidence suggests that the Swedish model proved incapable of limiting real wage gains to the margin compatible with stable pro-

fitability and international competitiveness. In one sense, this result is hardly surprising. Experience with incomes policies of all types have been generally disappointing throughout the European economies.

But the Swedish case is nevertheless unusual. A relatively small number of highly centralized unions represent the overwhelming majority of the Swedish workforce. Mancur Olson (1982) classifies such unions as "encompassing organizations". According to Olson, this type of organization differs in a key respect from more narrowly based collective interests. These organizations "not only have the incentive to at least consider the effect of its policies on the efficiency of the society, but also an incentive to bargain with other substantial organized groups in the interest of a more productive society".

Olson's claim is fully consistent with the readiness of Swedish labor unions to support institutional norms designed to increase economic efficiency and minimize the risk of excessive wage gains. Yet despite these unusually favorable organizational conditions, institutionalized wage restraint could not be maintained. What went wrong?

My preliminary answer is based on two general hypotheses, which are derived from my current research on the postwar evolution of the Swedish model. It suggests that the problems of the Swedish model can be traced first, to basic ambiguities in the institutional norms and second, to the breakdown of social consensus which supported these norms. These problems can be grouped in two main categories, which I will term "problems of interpretation" and "problems of enforcement".

Problems of Interpretation

The first problem of interpretation stemmed from the difficulties in defining "solidaristic". The original conception – equal pay for equal work – proved to be of limited value, due to intractable difficulties in establishing what actually constitutes "equal work". By the mid 1960's, solidaristic wage policy had acquired a second distinct meaning. In its new guise, it meant that overall wage dispersion should be substantially reduced, irrespective of differences in work requirements or worker qualifications (see Björklund in this volume).

Since the early 1970s, the concept has undergone a further transformation. "Solidaristic" has come increasingly to mean that wage settlements for any group of workers must apply to all workers. This implies that the relative wage structure, which is now characterized by an exceptional degree of wage compression, should not be altered in response to changing market conditions (Martin 1984).

What are the implications of this evolution in the interpretation of "solidaristic"? The central problem can be simply stated. The original balance be-

tween equity considerations and efficiency requirements has been altered in favor of the former. A compelling case can be made for the proposition that a policy of equal pay for equal work contributes to economic efficiency. But despite rhetoric to the contrary, a similar case cannot be made for these alternative interpretations of solidaristic wage policy. To the extent that it does not conform to changing market conditions, a sharp reduction in overall wage dispersion is likely to create serious problems of labor mismatches. And the "solidaristic" commitment to a preservation of such a wage structure prolongs and exacerbates the underlying problems.

The second "problem of interpretation" was in determining the sustainable level of real increases. We have already touched upon this problem in connection with the structuralist interpretation of Swedish wage formation. As we have seen, the EFO guidelines for regulating the distribution of wages and profits proved to be highly deceptive. Full employment and rapid aggregate productivity growth were interpreted, incorrectly, as indicators of wage moderation and economic stability. In the short term, each could be achieved despite an excessive growth in real wages and a persistent decline in competitiveness and profitability.

Problems of Enforcement

Closely related to these problems of interpretation were two problems of enforcement. A critical assumption in the Swedish model is that the norms regulating wage formation and structural change will be respected – or can be enforced – at the micro level. This has proven to be a dubious assumption. Local level actors – including labor unions, business firms, and regional governments – have often succeeded in circumventing the institutional norms of the Swedish model. High levels of local level "wage drift" have repeatedly contradicted the restraint exercised in centralized settlements; local opposition to rapid structural change has led to extensive political intervention in the entry and exit process.

Wage drift represents the portion of total wage increases that is achieved, not through centralized negotiations, but through subsequent local settlements at the level of individual firms and work establishments. It accounts on average for roughly half of total wage increases; in many years, it has far exceeded the centrally negotiated settlement.

A certain degree of wage drift is essential for economic efficiency, in order to adapt the centralized settlements to the highly diverse conditions at the micro level. Yet wage drift also introduces an unpredictable and potentially explosive element to Swedish wage formation. The Swedish model assigns to centralized representatives of LO and SAF the responsibility for ensuring a moderate rate of average real wage increases. But wage drift is a micro-level phenomenon, beyond the control of the central negotiators.

The most compelling explanation of wage drift is offered by Schager (Eliasson et al. 1985a). His recent labor market studies show that there is a direct relation between vacancy time and wage drift. The explanation is obvious: firms are forced to grant higher local level wage increases in times of relative labor shortages. What is thus far unexplained is why vacancy times – and wage drift – both increased sharply in the late 1960's.

Schager has himself suggested that the rise in vacancy times might plausibly be explained by the sharp drop in geographical mobility that also occurred at this time. In order to work as intended, the Swedish model requires that workers threatened by structural change are willing to accept an eventual job loss and are prepared to relocate in order to find a new job. What is needed, in other words, is a kind of geographically mobile reserve army of labor. If this reserve army is not available, wage drift cannot be sufficiently contained – and the centralized wage negotiations cannot be enforced.

The decline in the rate of geographical mobility was closely related to a second problem of enforcement – concerning the terms of structural adjustment. The Swedish model implicitly accepted market pressures as the final arbiter in determining the pace and direction of structural change. A broad social consensus on the benefits to be derived from free entry and exit formed a pivotal element in the model itself. This consensus extended originally to the "losers" in the adjustment process. Workers, firms, and regions that were displaced by structural change were expected to accept the verdict of the market – and not seek state protection from painful adjustment pressures.

This consensus was shattered in the late 1960's. Local level actors, alarmed by the accelerating pace of rationalization and the emergence of regional imbalances, began to actively challenge the institutional norms regulating the adjustment process. Unholy alliances – between unions, firms, and local government – emerged with a united demand for greater political control over entry and exit. The institutional norm supporting market-driven structural change came increasingly under attack.

Government responded with a variety of regional and industrial policy initiatives. Although the scope of policy intervention was initially quite limited, it expanded throughout the early 1970s and reached massive proportions towards the end of the decade (Carlsson 1983). These policy initiatives were invariably launched as programs designed to "pick the winners". The record indicates, however, that they have functioned primarily as a means to "bail out losers" (Eliasson and Ysander 1983).

Selective industrial policies did succeed, in combination with a rapid increase in public sector employment, in limiting the rise in unemployment. But this achievement extracted a high cost. Government intervention to protect stagnating firms and regions – and to provide alternative employment in public sector services – meant that the institutional norms regulating wag

formation and structural change could no longer be strictly enforced.

In the "old" Swedish model, government assumed no direct responsibility for maintaining full employment or for controlling the pace and direction of structural change (Eliasson 1985b). Indeed, both the Rehn and EFO models implicitly accepted a certain degree of (short-term) unemployment as an unavoidable feature of a dynamic economy. An increase in unemployment served, moreover, as an essential market signal indicating that real wages might be out of line. By breaking this institutional norm and assuming direct responsibility for employment outcomes, government intervention policy not only contributed to a decline in labor market mobility, but also eliminated an essential market signal and sanction needed for the smooth functioning of the Swedish model.

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7 WHY IS GOVERNMENT SPENDING OUTGROWING GDP?

by Enrico Deiaco

1. Extensive Government Spending – Why?

A side effect of the Swedish model of industrial relations is a high level of government spending to offset the negative effects of structural adjustment implied by the model (see Turner in this volume). The rapid postwar growth of public expenditure therefore makes Sweden particularly interesting for students of the interactions of economic development, income distribution, political processes, bureaucracy and tax rates.

In Sweden, IUI was among the first to collect and analyze data on long-term trends in government spending (Erik Höök 1962). There is, however, still little agreement about how to explain the size and growth of government. And there is even less consensus about the empirical evidence. In other words we lack a coherent theory to explain a set of "stylized facts" about government spending in Western societies.

To our knowledge, competing theories about the relative growth of the public sector have not yet been tested on Swedish data. That is the objective of this paper. After presenting and examining the competing hypotheses we will test them on Swedish postwar time-series data (1950-83). I will argue that among various models, those that emphasize voter demands for redistribution perform better than traditional public goods models. Among the former, the incentives for redistribution are increased by a more equal income distribution, and by the development of specialized interest groups such as the growth of the bureaucracy. The paper is organized as follows:

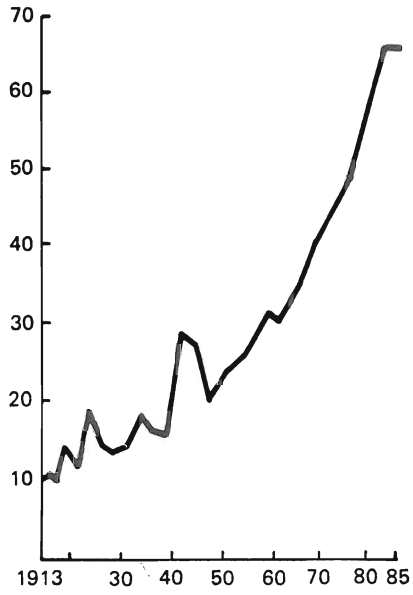
Section 2 describes long-term government growth in Sweden. Section 3 discusses some general explanations for the trends in spending. In section 4 we test four competing theories, originally tested by Fratianni and Spinelli (1982). Section 5 summarizes results and compares them with similar studies in the U.S. and Italy.

2. Highlights of Swedish Government Growth

By conventional budget and gross national product measures, government's role in the allocation of resources has increased considerably over the last century. As a result, everywhere in the developed world governments have moved from a sometimes trivial to a now considerable role in shaping national expenditures. This is exhibited for Sweden during the period 1913-1985 in Figure 1. During this period government spending increased almost four times faster than GDP, which made spending, measured as a share of GDP, increase from 12 percent in 1913 to nearly 70 percent of national value-added in 1985. In a comparative perspective Swedish government spending showed one of the highest growth rates and attained the highest level among the OECD-countries (Ysander 1979 and Lybeck 1984).

Although Sweden is on the forefront of this development the extent, similarity and durability of this trend in long-term government growth can be found in most Western countries (Gould 1983).

Figure 1 *Public sector spending in Sweden 1913-85*
Percent of GDP



Source: Höök (1962) and National Accounts, Statistics Sweden.

3. Some General Explanations for the Trends in Public Spending

The rapid public sector expansion in Western democracies has, of course, attracted much attention among scholars and given rise to several explanations.

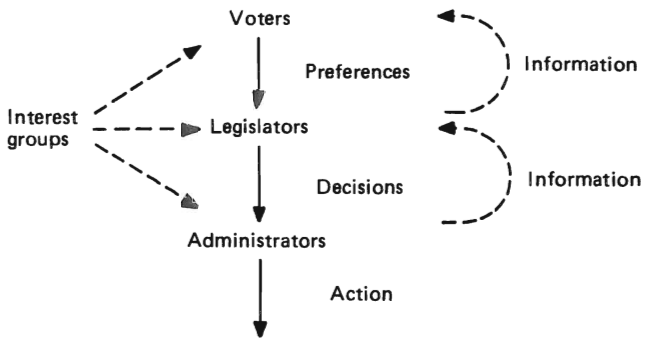
Many explanations emphasize the role of "suppliers" of government services, suggesting an element of monopoly power on the supply side. The limited control over many aspects of public decision making on the part of the electorate has been advocated as a contributing factor. With different goals between those who administer government policies and the voters, bureaucratic expansion takes over.

Another tradition emphases voters' demands and the existence of a market for public goods (see e.g. Borcherding 1985). Such demand models sometimes rely on a representative voter, who makes the decisive choice for society. With universal suffrage and majority rule, the well-known median voter is the decisive voter in a specific kind of single issue election.

What distinguishes all these models is, firstly, the ways that individuals play different political roles such as voters, legislators and administrators, and secondly, the role of information in decision making. This is illustrated in Figure 2. Depending on the form of government, voters express their preferences with regard to public decisions. These decisions are realized by administrators, who may be more or less interested in their execution and influenced to a varying degree by different interest groups. These groups may seek to influence voter behavior in order to modify the final administration of public policy.

In what follows we consider models that explore the interaction between preferences and decisions, such as public goods models and redistribution models and those (interest models) whereby different political pressure groups try to influence the final outcome of preferences, decision and action.

Figure 2 *Different political roles of individuals*



Source: Atkinson and Stiglitz (1980).

4. Different Models

The specific theories considered below differ both in functional aspects of public expenditures and the role of political institutions that shape the final spending decision. First, should expenditures be seen as a public good or as pure transfer? Since 43 percent of total public spending in Sweden consists of transfers this is a highly relevant question.

Second, does the organization of political institutions affect the size and growth of spending? The models differ in these respects in the following way: The *public good models* (see e.g. Bergström-Goodman 1973) focus on a market for government services, ignoring political institutions and transaction- and information costs in affecting expenditures. The *redistribution models* (Meltzer-Richard 1979 and Pelzman 1980) treat expenditures as pure transfers and allow political institutions (with perfect information) to affect the final outcome. Finally the *interest models* (Demsetz 1982 and Foley 1978) explore the relative power of different interest groups, under the assumption of asymmetrical information, on the growth of government spending.

Public Goods Models – a Market for Government Services

In the "public goods" literature, government expenditures are treated as the implicit or explicit outcome of a market for government services. That is, demand and cost conditions for publicly provided goods determine expenditures.

Redistribution Models – Government as a Redistributor of Wealth

Redistribution models emphasize changes in political incentives for redistributing welfare.

Pelzman (1980) makes the politician maximize votes for a given redistributive policy by transferring resources (property rights) from one segment of the population to another, in a "Robin Hood" manner, by taxing the rich and giving to the poor.

The hypothesis put forward by Pelzman is that a reduction in equality within the beneficiary group stimulates the growth of government, while a reduction of overall inequality retards it. The reasons are quite obvious, given the assumption of politicians having no preference of his own, except to maximize the probability of reelection.

A reduction in equality between taxpayers and beneficiaries means that as the poor get wealthier, the incentives for redistribution are reduced. The now wealthier have a larger stake in private transactions than those taxed before. If inequality is reduced within the beneficiary group, the marginally most wealthy now are less wealthy and would suffer a correspondingly small-

er loss to his private wealth, if taxes are raised so that the incentives for redistribution grow.

Meltzer-Richard (1979) model voters as demanding redistribution, and the median voter setting the tax share. The size of government spending depends on the relation between mean income and the income of the decisive voter (median). Any voting rule that concentrates votes below the mean provides an incentive for redistribution of income from upper to lower income groups. An increase in the number of low income voters simultaneously increases political pressure for redistribution policy, and therefore triggers government spending. An example of this would arise if the proportion of voters receiving social security benefit increases, raising the number of voters favoring taxes on wage and salary income to finance the same redistribution.

Interest Models – Specialized Interest and Class-Struggle

The redistribution models considered above suffer from two weaknesses. First they do not explain why public activities should grow, in contrast to merely persisting. These theories do not explain all the underlying trends in wealth distributions. Interest models of government spending claim to remedy these deficiencies. The formation of specialized interest groups or the outcome of class-struggle are examples. These models view the political arena as a market-place where interest groups can exert pressure on government. We will consider two different interest models.

Demsetz (1982) argues that the political market place probably favors the specialized interests, whether an industry or a union, over the more diffuse interest of customers. Demsetz argues that the gain to customers as a group from avoiding an increase in e.g. the tariff barrier, or the establishment of union power, generally exceeds the costs to share holders or to workers in the attached industry.

Following Fratianni and Spinelli (1982), our choice of specialized and diffuse interest groups fell firstly on the labor force in agriculture and salaried civil servants and secondly on the resident population from age 20 to age 59 as a fraction of total population. A positive coefficient in a regression equation means that the special interest group receives protection and accordingly collects a benefit. A negative coefficient means that they have to carry the cost of protection.

The Marxist approach of Foley (1978) and Korpi (1979) rests on the assumption that the agenda for state action and the major pressure on state policy, grows out of the conflict between the capitalist and working classes over the appropriation of surplus value. The testable implication is that countries, which have had a strong leftist government during the post-war period, ought to have a more rapid growth of government expenditure.

5. The Redistribution and Specific Interest Models Performs Better

Table 1 shows the results from testing the various theories on Swedish data (see further Deiaco 1984). The main independent variables in the various models are listed in the column headings of Table 1. Accordingly the most important variables in the public good model are real national income, the relative price of publicly provided goods and population densities. Three measures of a changing income distribution are listed, representing the inde-

Table 1 *Testing the models on Swedish time series. Hypothetical and actual signs (in brackets) of the various models, 1950-83*

	Income (Y)	Relative prices (P)	Population (POP)	
Public goods models	+(+)*	-(+)	+(+)	
	Income inequality:			
Redistribution models	Within benefitting group (IE)	Between benefitting and taxed group (IT)	Median/Mean income (MI)	
Pelzman Meltzer-Richard	-(-)*	+(+)*	-(+)	
	Specialized interest:			
Interest models	Agricultural employment (AG)	Public employment (RE)	Diffuse interest (RP)	Labor interest (WEP)
Demsetz	+(+)	-(-)*	+(+)	
Marxist				-(+)

* significant at the 5 % level

Note: The following variables have been used: Y = Real national income (National Income at current prices divided with consumer prices), P = Index of relative prices (Index of public produced goods price divided by an index of privately produced prices), POP = Resident population, IE = Income inequality in the benefitting group (Gross annual wage of highest paid civil servant/Gross annual wages by lowest paid Civil Servant), IT = Income inequality between benefitting and taxed groups (Industrial wages divided by wages of agricultural workers), MI = Household median income divided by mean income, AG = population in agriculture, RE = public employment, RP = Population in 20-59 year age group, WEP = Index of labor power in OECD (Korpi 1979).

The models were regressed in logarithmic form using first differences. Dependent variable was government expenditure as a share of GDP. In Marxist models the dependent variable was government expenditure in 18 OECD countries. For a complete description of models and results see Deiaco 1984.

Source: Deiaco (1984).

pendent variables in the redistribution models. These are income inequality in the benefitting group and between benefitting and taxed groups, and the relative development or median to mean household income. The independent variables in the interest models are two measures of specialized interests (number of employees in agriculture and public sector), one measure of diffuse interest groups and one of the relative power of labor interest.

Among the various models, the Pelzman and the specialized interest model explain the data better than other models. Hypothesized and actual signs are the same, although the significance is low.

The broad conclusion to which our diverse data point is that governments grow where groups which share a common interest in that growth, and can perceive and articulate that interest become relatively numerous. Two factors account for this: Firstly, the levelling of income differences across the population has been a major source in government growth, especially the growth of a large middle class. Secondly, it seems that the growth of public sector employment itself can account for a major part of government spending, being one of the most important specialized interest groups.

This seems quite plausible for Sweden. During the postwar period income distribution has certainly become more equal. Wage dispersion has declined, for example, between age groups, educational groups and between industries (see Björklund in this volume). Lindbeck (1985) argues that during recent decades "fragmented horizontal redistributions" between various minority groups have been the most important mechanism behind the dominant redistribution policy.

Public employment increased by 300 percent between 1960 and 1985, and currently amounts to 32 percent of total employment. This is almost as much as current employment in manufacturing. Certainly, homogeneous interests act as an important source of government growth.

6. Comparison with Other Studies

The study of Fratianni and Spinelli (1982) shows results similar to those presented in this paper. The Pelzman model explains the data better than the alternatives. The argument is that the size of government responds to the articulated interests of those who stand to gain or lose from politicization of the allocation of resources.

They also try to discriminate between two competing views of a politician; the value free median voter literature and the entrepreneur emphasized in the theory of agency costs. Italian evidence suggests an interpretation more consistent with the latter view. This also seems to be the case for Sweden. Ysander and Murray (1983) found local politicians more willing to use state subsidies than to alter local tax rates, which can perhaps be interpreted in the same way.

In a recent IUI-publication (1986) Gramlich's study of different competing theories in a U.S. perspective gave some mixed signals. Gramlich concludes that there is some evidence in favor of all investigated theories. Borcherding (1985), on the other hand, argued that the public good model is capable of explaining only about half of the U.S growth of government from 1902 to 1978.

This suggests that we still have a long way to go before our understanding of Government behavior comes even close to being satisfactory. In my opinion this means developing models where state behavior is endogenous, non-partial and dynamic. This means e.g. studying what the state really maximizes; a Leviathan that maximizes a social welfare function or a self interested collector that maximizes revenue. One can thus only agree with many other commentators (see e.g. Myhrman 1985) that the interesting task for future research is to compare the design of different political systems, in organizing the relationship between preferences, decisions and action, in order to understand how different constitutions work when filtering the true preferences of the voters into political decisions.

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8 THE DYNAMICS OF LOCAL GOVERNMENT BEHAVIOR

by Richard Murray

Public consumption in Sweden makes up close to 30 percent of GNP, private consumption slightly more than 50 percent. A little more than 70 percent of public consumption, or close to 25 percent of GNP is local government consumption.

The picture is similar in most other countries – whether industrialized or not, whether capitalist or planned economies. Local governments play an important role as producers of consumption services even if Sweden and the Nordic countries occupy the extreme end of the spectrum.

Local governments in Sweden manage schools, hospitals, old age homes, roads, parks, swimming pools, libraries, museums .... yes, even golf courses! And they do it in order – such is the argument – to make life better for their citizens.

The nature and importance of public economic activities have been on the research agenda of IUI for a long time, beginning with Eric Höök's (1962) major inquiry. During the last few years the focus of IUI research in public economics has been on taxes and on decision making in local public bodies.[1] This paper relates to a project (see p 206) concerned with local public service production.

1. Consumer Preferences Should Govern

One would think that the measuring rod in evaluating the performance of this multitude of public service producers should be the preferences expressed somehow by consumers, i.e. the households of the constituency, for whom the services are produced. Public service producers would then concentrate on activities where the market had displayed difficulties in coming

[1] Murray, R., 1985, *Central Control of the Local Government Sector in Sweden* and Ysander, B.-C. and Nordström, T., "Local Authorities, Economic Stability and the Efficiency of Fiscal Policy", both in Gramlich and Ysander (eds.), *Control of Local Government,* IUI, Stockholm, 1985.

up with good initiatives and solutions. But, more often than not, the supply of public services is regarded as a political matter to be judged by political collectives, according to ideological views. Market supplies of goods and services, on the other hand, are subjected to the judgement of household preferences. In fact, only in very few areas do services overlap and public and private suppliers compete. In general, private competition in "public markets" is prohibited or made impossible through subsidies. They are essentially monopoly institutions. This is why public production of services is the same thing as public consumption in the national accounts, even though the label is misleading.

Why this dichotomy? Why should consumer goods be judged by one standard if produced by the local government and by another standard if produced by a private firm? Why not judge the supply of public producers according to household preferences? Why not judge the supply of private firms by political standards? Shouldn't all types of consumer goods and services be evaluated by household preferences?

Attempts to answer this question reveal a mix-up of means and ends. What is mixed up is the *way* in which goods and services are supplied – by local governments or by private firms – and the *criteria* by which their performance are to be judged. If criteria are different and specific to each sector, of course, it will be impossible to compare performance, and to discuss what would be an efficient organization or division of tasks between the two sectors.

2. Distributional Problems and Merit Wants

Anyone familiar with cost-benefit analysis knows there are limits to its applicability. First is the problem of adding together various individuals' willingness to pay. Should the willingness of individual A to pay for a park count as much as that of individual B? What reason is there, moreover for comparing one individual's willingness to pay with that of another? This question concerns the welfare distribution and follows from the project under consideration. There are, of course, individual preferences for the welfare distribution too, but there is no known market process by which to achieve consensus on this matter. Therefore it has to be handled in a political process. Let us call this the *distributional problem.*[1]

In the second place there are instances in which it is thought appropriate to disregard individual preferences. This might concern the consumption of

[1] I follow the Musgrave (1959) terminology. In *The Theory of Public Finance,* 1959, R.A. Musgrave distinguishes between the Allocation Branch, the Distribution Branch and the Stabilization Branch of the budget.

alcohol or that of education. In either case households are forced to consume less, or more than they desire at the going marginal costs. Let us call this the *merit want problem.*

If distributional goals are very important, or if merit wants rule decisions then there is little room for a market test, and cost-benefit analysis will be difficult, if not impossible to perform even in principle. Everything has to be decided in a political process which can hardly be evaluated in any other way than through that same political process.

Since local governments supply such a vast number of consumption items it is not reasonable to presume that distributional and merit wants criteria dominate the decision process. In fact, most government programs were started with social welfare as the prime objective. Today, however, they have assumed a dominant role as general service providers and they have also managed to acquire the status of monopoly producers. Therefore, the efficiency problem of publicly organized production merits close attention on the same grounds as similar production organizations in the private sector. Public monopolies more often than not are protected by law and may also count on subsidies in case of financial difficulties. In consequence, they deserve an even closer scrutiny than their private counterparts.

Furthermore, the effects on the welfare distribution of zero price supplies of public education, for example, are today quite different than when public education began as a pure social welfare project in the mid 19th century. The early public schools were instituted both to keep poor children off the streets and to give them a better opportunity in life relative to the children of the well-to-do. Later on, the fair distribution of human (worklife) capital became the paramount objective of public education and has been the basic argument for continued expansion. Today's public schools and universities are in fact mainly used by the children of the well-to-do but are subsidized by all income earners. There are reasons to investigate whether in fact public education may not even contribute negatively to its original distributional objectives (also see p. 166). This observation questions the *feasibility* of government programs.

3. Why Should Local Government Be a Producer?

These considerations make it more than reasonable to subject public consumption to the test of household preferences – it is urgent. Yet, this opens up a Pandora's box of questions concerning the organization of public production, its financing and the ways of directing the supply of publicly produced goods and services to their end uses.

The reasons for public interference in the allocation of goods and services are well-known. I have already mentioned distributional considerations and merit wants as reasons for political control of production and distribution.

But even when there is no questioning of the supremacy of individual preferences beyond distribution and merit wants there is a third set of reasons for government interference: collective goods, external effects in production or consumption, natural monopolies etc., sometimes summed up under the term "*market failure*".

But concluding that public interference is justified on these three principal grounds is not enough to advocate that government should also produce public services. Why not subcontract private producers for publicly distributed services? There is a host of ways other than public production to correct market failures; taxes, subsidies, regulations, information etc. Furthermore, public production can be organized in a variety of ways: production can be performed by the national government, by local governments, by public enterprises and all of these organizations can be directed in various ways by grants and regulations. Hence, there is a whole array of organizational alternatives between total public control and a free market arrangement.

4. Efficiency

There are a few instances where the choice between private and public activity can be decided on the ground of *productive efficiency*. In that case we need not take account of allocative efficiency.[1] This, for instance, is the case of refuse collection. But when allocative efficiency motivates a public organization and productive efficiency speaks in favor of the private firm, there is a trade-off and a choice to be made.

For these reasons, the productive efficiency of public organizations merits close scrutiny. In many areas public enterprises and government agencies have acquired a monopoly role and should be expected to exhibit the same efficiency problems as those of private monopolies. What are the distributional or merit want objectives connected with public production of icehockey arenas? Are they important enough to justify a higher cost of production?

There are, however, two arguments against the public organization of production. The first refers to the *feasibility* of achieving stated distributional and merit want objectives, or corrections of market failures. Unintended adverse effects may be achieved instead[2], or are the negative effects too small

[1] Productive efficiency relates to the consumption of resources in production, regardless of its outputs and the value thereof. Allocative efficiency relates marginal costs and marginal values to each other.

[2] For instance, the authors of the IUI 1985 Long Term Assessment of the Swedish Economy (see p. 161) argue that egalitarian policies focused on income distribution may in fact – through distorting prices in markets for wealth objects – have made the wealth distribution more uneven, making the total lifetime consumption potential of individuals more uneven than it was when ambitious distributional policies were initiated in the late 60s.

to warrant a change in an inefficient organization of production. There is a case for using experiments and rearranging the supply of consumer services in order to gain information on efficiency and feasibility. The fundamental problem is the lack of information on alternative ways of organizing public production (cf. Pelikans essay in this volume). The information problem can be partly solved through experiments to find out, for example, the willingness to pay for public services. It is also of great help to be able to compare various institutional arrangements, for example, public, cooperative and private schools.

5. Competitive Entry

Competitive entry is a particular side of the dynamic efficiency of an economic system. What kind of competition takes place between local governments and between local government and private producers? Is there any scope for competitive entry in the fields of production dominated by the public sector?

If continued organizational change is the moving force behind productivity change in the private sector and if this force is predominantly sustained through free competitive entry in all private markets (see discussion on p. 19 in this yearbook), then there is no reason to believe that there should be any difference in this respect in the public sector.

Looking back over the past two decades the local government sector has exhibited tremendous growth. In that process it has broadened its product range. Local governments have undergone significant reorganization due to, on the one hand, the urgency to deal with perceived new tasks, like town planning and urban sprawl, and, on the other hand, the need to merge and cooperate with each other. The number of local communities today is a small fraction of what it once was. Garbage collection, sewage, water, electricity, roads and many other local government tasks demand cooperative arrangements. When it comes to growth, local governments have demonstrated a marked ability to adapt to change.

But specific lines of production within the local government sector are often characterized by a technology and an organizational form that has not changed since it was initiated. Sometimes services that are no longer wanted are still produced. But this can also be said of protected private production like the construction sector and that of the banking sector. The "scrapping" decision in particular is difficult to manage within a public body that reports to politicians. Could more intense competition between agencies within the public sector solve the obsolescence problem? Should public production activities even be allowed to be competed out of business by other public agents or by private agents? Is it reasonable to have public health organizations compete for the patients? There is some evidence from the health sec-

tor, from schools and from day-nurseries that such competition isn't enough to generate technological change. There also has to be competition from new entrants, most likely private ones.

6. Theoretical Foundations for Comparisons

Where can we find a launching pad for evaluating the current organizational set-up and responsibilities of local governments and compare it with national government and private firms? Public finance theory will take us some way in analyzing government interference in markets. But this theory gives us no answers to the questions of how government should handle this interference, in particular whether national or local governments should be responsible for production, for regulation of markets, for taxes and subsidies. Also it has little to say on the dynamics of regulation and government production and the effects on private production.

An essential ingredient in the theory needed to deal with the dynamics of Local Government behavior is that of public choice. Unless we have a clear picture of the allocative behavior of both national and local governments, as we have of firms, we cannot discuss the merits of various organizational alternatives.

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9 ASSESSING THE DECLINE OF WAGE DISPERSION IN SWEDEN

by Anders Björklund

During recent years more and more economists and politicians have become concerned about the functioning of the labor markets in the Western countries. When looking for causes of rising unemployment and low economic growth, the lack of flexibility of the labor markets has been put forward as one possible explanation.

Although Sweden has not experienced the same increase in unemployment as many other European countries, labor market flexibility has nevertheless been intensively discussed. One of the reasons for this is that sluggish economic growth and declining job mobility have coincided with decreasing *wage dispersion.*

For an economist the importance of wages for efficiently working labor markets is obvious. Wage differentials provide incentives to move from low-paying and inefficient firms to modern and high-paying firms. If wages in various industries deviate from the "market-clearing" levels, structural unemployment is likely to arise.

Strong reasons exist to believe that egalitarian rather than efficiency considerations have influenced the Swedish wage formation process. Most of the wage increases have been determined in central negotiations between the unions and the employers federations. In these negotiations unions have struggled hard to realize one of the aims of the solidaristic wage policy, namely general reduction of wage differentials between industries, firms and individuals. Even though the additional wage drift might have been more influenced by traditional market forces, the basic hypothesis remains that the flexibility of the Swedish labor market has deteriorated.

The solidaristic wage policy has become a central part of "the Swedish model" during the last decades. In a sense it has become one of the institutional rules governing the wage formation process. The EFO-model – see the contribution by Turner in this yearbook – is partly based on the principles of the solidaristic wage policy. The extensive labor market policy measures have been implemented by the government to mitigate the labor market problems caused by the wage policy.

Clearly the consequences of the reduced wage dispersion need to be examined. Despite a rather intensive political discussion little scientific effort has been devoted to such analyses. The purpose of this article is to take a first step towards more elaborate studies of the changing wage distribution in Sweden. Micro data bases of representative samples of the Swedish population from 1968, 1974, 1981 and 1984 will be used to describe the nature of the changes which have taken place in the wage structure. The Level of Living Survey – conducted by the Institute of Social Research at the University of Stockholm – is used for 1968, 1974 and 1981. The HUS-data – collected by IUI in cooperation with the University of Gothenburg – are used for 1984. Currently – spring 1986 – a second wave of interviews of the households belonging to the HUS-sample is in progress. Future research at IUI of the issues raised in this article will be based on the HUS-panel.

The Age-Wage Profile

A first dimension in which changes of the wage structure have taken place is age. This can be seen in Figure 1 where actual wages in various age intervals are presented for the four years.

Figure 1 *Wages in various age intervals*

The age profile has gradually become less and less steep from the 1960s to the 80s. In 1968, the hourly wage for prime-aged workers (30-45 years) was almost twice as high as the wage for teenagers, whereas the corresponding wage differential in the eighties had declined to around 50 percent.

Another noteworthy point is the gradual change in the relative positions of the prime-aged and elderly workers. In 1968, average wage levels peaked between 30 and 40 years of age followed by a decline for the elderly; in 1984, the peak could be found instead among the 61-65 years old.

These changes of the age-wage pattern can, of course, have many causes. It might be that age *per se* has been valued in a different way in the labor market. It might be that the accumulation of "human capital" by means of work experience has changed. In order to shed more light on the nature of the age-wage patterns, standard types of wage equations have been estimated on the data for the respective years.[1]

In these equations both age and work experience are allowed to have separate effects on wages, in addition to schooling and sex. The estimated equations can be used to predict the wage differentials between individuals of different age and with different amounts of work experience and schooling.

Figure 2 displays the predicted wages for individuals with continuous work experience – i.e. those who have worked continuously since the end of school at the age of 16 – and for individuals without any work experience. We start by looking at the lines describing the wages for individuals without any work experience. These lines describe the separate effect of age on wages. It appears that something has happened in this respect. Both in 1968 and in 1974 a peak could be found at around 45 years of age followed by a marked decline. In the 80s the age pattern has changed; in 1984 wages are increasing with age over the whole interval 16-65 years.

Obviously age *per se* has been valued in another way in the 80's compared to the 60's.

What about the separate effects of work experience? The wage differentials between workers with continuous labor force participation and workers without experience have also changed. This can be seen in Figure 2, but the relative differentials are explicated in Figure 3.

The most notable change is that the relative advantage of being an experienced worker has declined since the sixties. Another change is that the marked peak in the profile which could be found in 1968 has almost disappeared. As shown in Figure 3, the relative advantage of work experience reached a

[1] The following specification has been used:
Logarithm of
hourly wage = $\alpha_0 + \alpha_1$ (age) + α_2 (age squared) + α_3 (years of work experience) + α_4 (years of work experience squared) + α_5 (years of schholing) + α_6 (woman)

Figure 2 *Predicted wages for individuals with (i) 9 years of schooling and continuous work experience from the age of 16 and (ii) 9 years of schooling and no work experience*

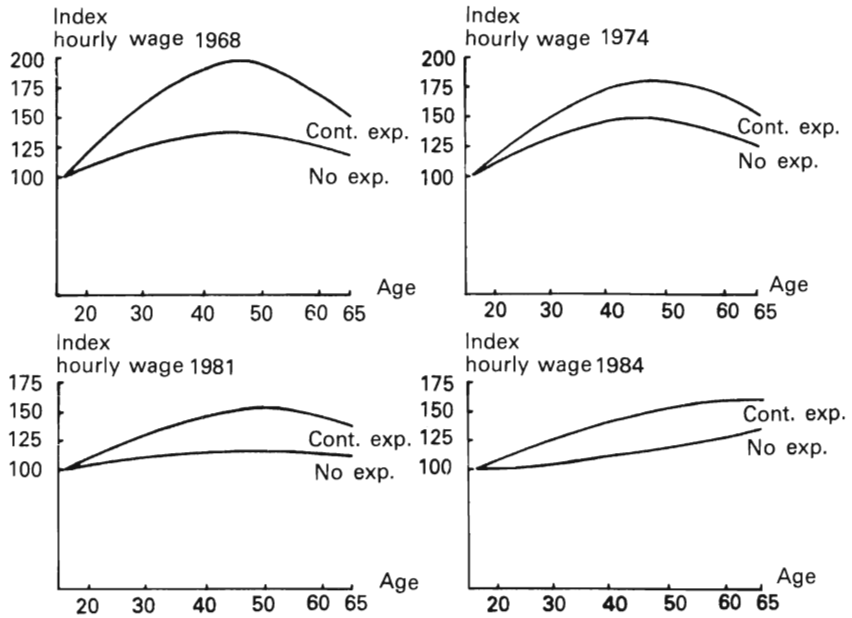
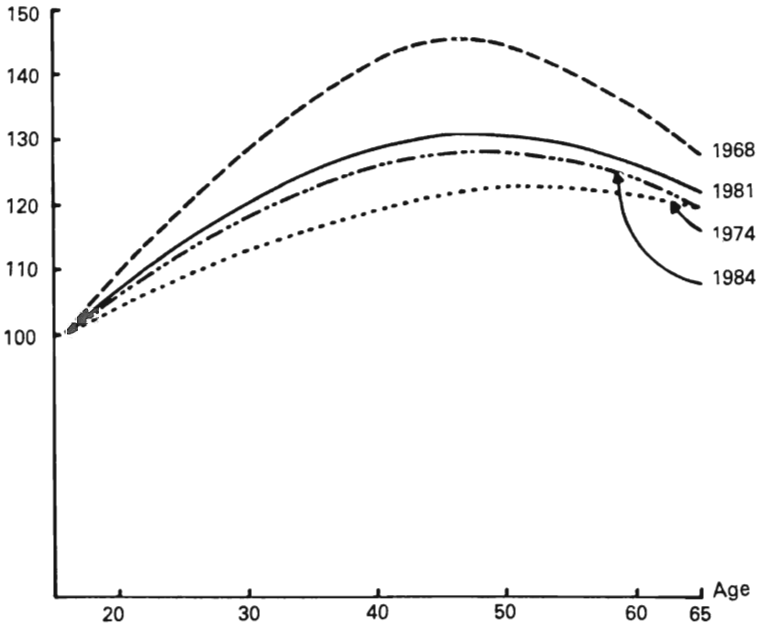


Figure 3 *Relative wages between workers with continuous labor force participation and inexperienced workers*



peak at approximately the age of 45 years, i.e., after about 30 years of work experience. The reason is that the estimated relationship between wage and work experience for 1968 implies that additional work experience has a positive impact on wages during the first 30 years and then turns into a negative one.

The traditional "human capital" or "learning-by- doing" interpretation of the effect of work experience on wages is that the effect should be unambiguously positive. Clearly our data contradict at least certain versions of this theory.

One way to explain this is that many jobs are physically demanding and therefore have a deleterious effect on the physical health and earnings capacity of the workers. If the number of physically demanding jobs has decreased since the 60s, this can explain the change of the wage experience profile which has taken place. This interpretation is in conformity with the conclusions in IUI's last long term survey[1], where it is argued that activities like marketing, research and product development are becoming more important in Swedish industry.

How can these changes in the structure of wages be interpreted in terms of equality and efficiency? In a mechanical sense equality has increased, because the changes demonstrated above have definitely contributed to reduced wage dispersion among all employees. On the other hand, it is not obvious that the flatter age-wage profiles have resulted in more equally distributed incomes over the life cycle.

It is hard to believe that these changes are compatible with market clearing wages for labor of various age and experience. In particular, it is hard to believe that the strong decline in the valuation of work experience is a result of traditional market forces. In general, it seems plausible that jobs and tasks have become more complicated during the last decades, and would therefore require more work experience than before. More detailed research is of course needed for reliable answers to these questions.

Educational Wage Differentials

It is a common opinion that wage-differentials between groups with long and short educations have diminished in Sweden. It has often been argued that those with university degrees have been the "losers" in terms of wage increases during the seventies. This opinion is confirmed by the information provided in Figure 4. The wages predicted by the wage equations for individuals with 9 and 15 years of schooling, respectively, are presented. In both cases continuous work experience from the end of school (16 and 22 years of age, respectively) is assumed.

[1] *Att rätt värdera 90-talet – IUIs långtidsbedömning 1985* (Evaluating the 90's), IUI 1985.

Figure 4 *Predicted wages for individuals with (i) 15 years of schooling and continuous work experience from the age of 22, (ii) 9 years of schooling and continuous work experience from the age of 16*

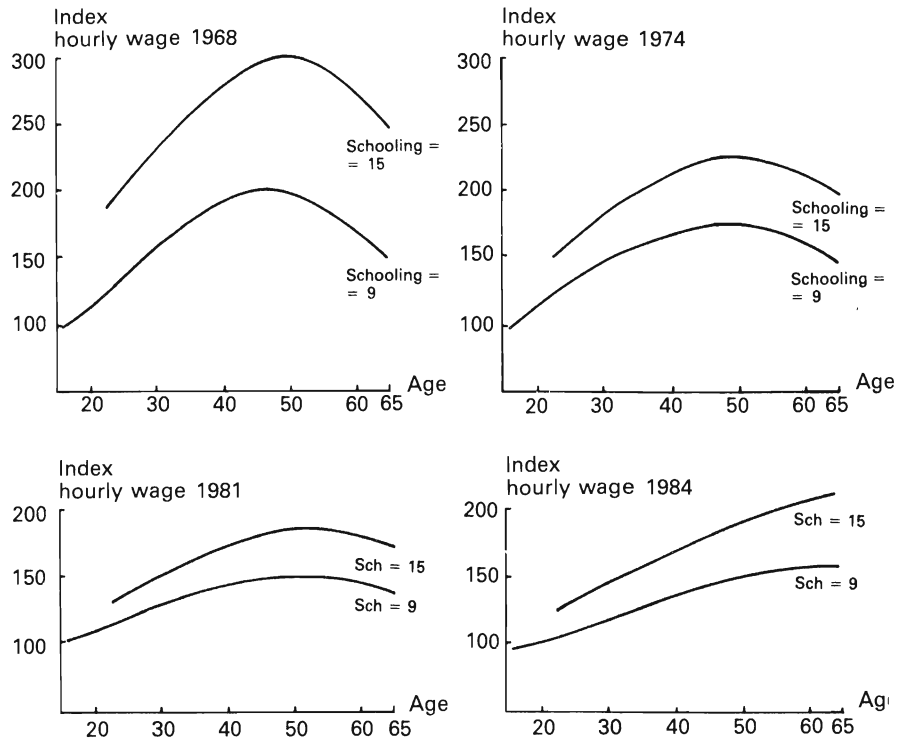


Figure 4 shows that a marked decline in wage differentials has taken place. Furthermore, it seems as if most of the relative improvement for those with low schooling took place between 1968 and 1974.

The first conclusion suggested by these figures is that the "returns to schooling" have declined sharply. Sweden experienced an "educational explosion" in the 1960s. The compulsory length of schooling was extended to nine years and higher fractions of each cohort continued to high-schools and universities. This development was stimulated by more generous financial support for students. The reduced wage differentials can of course be explained by the increased supply of highly educated labor.

The consequences of reduced returns to schooling are ambiguous. If highly educated workers in certain fields of the labor market were receiving "monopoly rents" during the 1960s, the "educational explosion" has doubtless had favourable distributional and allocational effects. If, on the other hand, the incentives to invest in schooling have become too small, the situ-

ation is more problematic. Probably a disaggregated analysis of various educational groups is needed to find out whether the consequences have been positive or negative.

However, some caution is in order before drawing too strong conclusions about decreased "returns to schooling". It is also important to emphasize that the selection of students has changed dramatically. For this reason, workers with a certain amount of schooling in the 1960s might not be comparable in terms of innate ability with workers who had obtained the same amount of schooling in the 1980s. Before taking the potential effects of changed selection into account, no strong conclusion about the development of the *returns* to schooling can be drawn. It is an important task to examine the Swedish data with the new methodological tools developed in modern labor economics.

Male/Female Wage Differentials

Wage differentials have also declined between men and women. As seen in Table 1, the index of male wages compared to female wages was 139 in 1968, 130 in 1974, 122 in 1981 and 121 in 1984. The differentials have fallen in most age groups.

A basic issue about wage differences between sexes is whether women are discriminated against. This is, of course, a very difficult and complex question and it will not be analyzed in any depth here.[1]

Table 1 *Actual wage differentials between men and women 1968, 1974, 1981 and 1984*
Index, female = 100

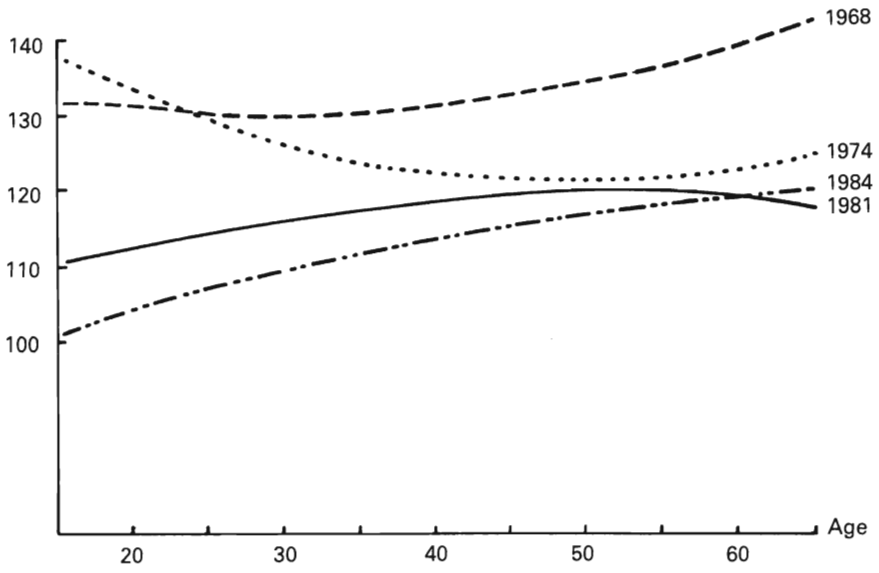
	1968	1974	1981	1984
18-65 years	139	130	122	121
18-20 "	124	141	115	113
21-25 "	123	119	111	104
26-30 "	127	128	115	107
31-35 "	144	125	119	116
36-40 "	131	139	126	120
41-45 "	142	128	126	128
46-50 "	148	135	131	130
51-55 "	149	127	118	118
56-60 "	127	135	124	122
61-65	143	122	122	130

[1] A more detailed description and analysis of the male/female wage differentials can be found in the IUI-study *Arbete och löner* (Employment and Wages) by Siv Gustafsson and Petra Lantz, published 1985.

However, a closer look at the wage differentials can easily be obtained by noting that women in general have accumulated less work experience. Although we have seen that the pay-off of additional work experience was negative after around 30 years in the late sixties, it seems plausible that parts of the differentials can be explained by unequal distribution of work experience between the sexes. In order to compare the wage differentials between men and women with equal experience and schooling, separate wage equations have been estimated for the two sexes with the same explanatory variables as above. The estimated coefficients have been used to predict the expected wages of men and women who stay nine years at school until the age of 16 and work continuously until the age of 65. The resulting wage differentials are displayed in Figure 5.

It appears that most of the wage differentials remain even when women and men with equal schooling and work experience are compared. At least three factors can explain these differentials. First, it might be that "work experience" is a poor measure of the total "human capital" obtained via job training. Part-time jobs have been much more common among women. Consequently, the real differences between the sexes are not captured by these variables.[1] Second, it might be that the work conditions differ between

Figure 5 *Wage differentials between men and women with 9 years of schooling and continuous work experience from the age of 16*
Female = 100



[1] The work experience variables only measure the number of years with *any* work experience.

the sexes. If, e.g., men have physically more demanding jobs and such jobs are compensated for with higher wages, differentials like those in the figure should appear. Third, it might be that women suffer from some kind of discrimination. By using better data on work experience and work conditions the analysis can be carried further. The HUS-data will give some opportunities to do this.

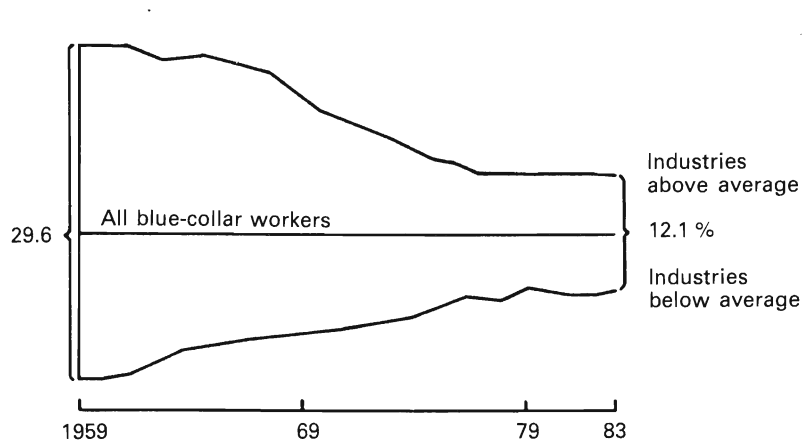
Although wage differentials persist between equally educated and experienced men and women, the differentials have declined markedly since the late 1960's. Furthermore, in 1984 the wage differential was very small among those below 30. A hopeful interpretation of this finding is that there is almost equality between the sexes in the young generation. It remains to be seen whether this equality will remain during their active careers.

The Industrial Wage Differentials

Wage differentials have also diminished among industries. One way to illustrate this is to use a figure displaying the average wage in industries above and below the average for all industrial workers. Such a figure has been produced by the Workers Trade Union (LO) and it has become famous for its "cone-looking" shape (see Figure 6). "Industry" is defined here as the branches of LO.

From the allocational point of view, it is not only the dispersion *per se* that is crucial. It is also important to know whether the wage structure is sensitive to changing market conditions. A given dispersion of wages – as measured for example by the coefficient of variation or as displayed by Figure 6 – is

Figure 6 *Dispersion of wages between industries, blue-collar workers*



Source: LO.

compatible both with a rigid and a flexible structure of industrial wages.

It is harder to describe the stability of the wage structure. The data in Table 2, which show the relative wages for blue collar workers in selected industries, do provide some information. The selected industries include some, which have been hit by serious structural problems during the seventies – like mining, basic metal industries and shipbuilding – and others, which have had very favorable demand conditions – like manufacture of motor vehicles and chemicals.

Has the structure been rigid or flexible? This is hard to say from these data and without some "standard" to compare with. Some changes have clearly taken place. A marked decline of the relative wage from 117 in 1972 to 105 in 1984 has occurred in the shipbuilding industry. In other "crisis industries", however, the relative wages have been surprisingly constant. It is also surprising that the motor vehicles industry has had a constant relative wage in spite of very favorable demand conditions and rapid expansion.

An international comparative study is needed to find out whether the Swedish institutional wage setting process produces extraordinarily rigid

Table 2 *Relative wages for blue collar workers in selected industries*
SNI 2+3 (Mining, quarrying and manufacturing) = 100

	1972	1976	1980	1984
Mining and quarrying (SNI 2)	115	119	114	117
Textile, wearing apparel and leather industries (SNI 32)	85	85	88	87
Manufacture of pulp, paper and paper products (SNI 341)	102	109	110	116
Manufacture of chemicals (SNI 35)	95	97	98	100
Manufacture of non-metallic mineral products (SNI 36)	99	98	101	101
Basic metal industries (SNI 37)	107	109	108	109
Manufacture of electrical machinery (SI 383)	96	96	95	96
Ship and boat building (SNI 3841)	117	111	105	105
Manufacture of motor vehicles and parts and accessoires (SNI 3843)	103	101	100	n.a.

Source: Statistics Sweden Wages, ("c-wage").

wage structures. Still, it is tempting to argue that the changes in the wage structure during the last 12 years have produced very small incentives – in terms of *wage gains* – to move from the declining industries (textiles, mining and shipbuilding) to the expanding ones (manufacture of motor vehicles and electrical machinery).

This is not to say that there have not existed any incentives at all to move between the industries. First, the studies by Bertil Holmlund have shown that movers in the labor market have received significant wage gains.[1] Second, the unemployment risks have, of course, differed between the industries. It might be that these so-called "push" incentives are the most important incentives for reallocation of labor in the Swedish labor market. However, the decline of job mobility and rising long-term unemployment motivates the critical question whether the incentives have been strong enough and of the "correct" nature during the last 20 years.

The HUS-data will provide innovative opportunities to analyze job mobility. Very detailed data about the causes and consequences of job changes are collected. In particular, the importance of "push-incentives" (unemployment risks) and "pull-incentives" (wage-differentials) can be examined.

To summarize, we have found in this article that wage dispersion has diminished in Sweden in several dimensions: between age groups, between experienced and inexperienced workers; between well-educated and less educated workers; between men and women; and among industries. In addition to this development of gross hourly wages, increasing marginal taxes during the 60s and the 70s have reduced post-tax wage differentials even further.

As pointed out above, this development raises a number of important issues. Has the reduction of wage differentials really resulted in more equally distributed life incomes? Have the rising relative wages for teenagers and the elderly been a major cause of the unemployment problems for these groups during the 70s and the 80s. Have the incentives to invest in "human capital" of various sorts been too low?

To what extent has the stable industrial wage structure reduced the incentives to move from the "crisis industries" to the expanding sectors of the economy? To what extent has the overall growth in the economy been retarded because of this?

One of the virtues of the micro data on households collected in the HUS-project is that such issues can be analyzed in a much better way than has previously been possible. In addition, one of the most important advances in modern labor economies has been the invention of econometrical tools to estimate models of labor market behavior from micro data. By combining these methodological tools and the HUS-data, future research efforts at IUI will be able to give more reliable answers on the issues raised in this article.

[1] *Labor Mobility,* IUI 1984.

10 SWEDEN'S "UNDERGROUND ECONOMY"

by Edgar L. Feige[1]

1. Introduction

This paper summarizes the results of a research project investigating the size, growth and implications of the "underground economy" in Sweden (also see p. 226 in this volume). The popular term "underground economy" is often used to describe two different, albeit related concepts. When the substantive issue is defined to be non-compliance with tax codes, the term *unreported* income is used to refer to the difference between the amount of income that ought to be reported to the tax authority under full compliance and the amount actually reported. On the other hand, when the substantive issue is taken to be the quality of aggregate measures of economic activity such as Gross National Product, the term *unrecorded* income is used to denote the amount of income that is inadvertently omitted from National Income and Product Account (NIPA) measures of aggregate economic activity.[2]

In the United States, recent discoveries of large amounts of unreported income (IRS 1983) have necessitated a comprehensive revision of NIPA accounts (BEA 1985) to more adequately reflect previously unrecorded income. Official Internal Revenue Service estimates of unreported income, derived from intensive audits of tax returns, suggest that unreported income in the U.S. was $283 billion in 1981. This figure amounts to 16 percent of the reported tax base in that year. Independent analysis of the Internal Revenue Service estimates (Feige 1986a) suggests that unreported income was closer

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[2] The exact relationship between unreported and unrecorded income is highly complex. It depends upon legal definitions of tax liabilities; accounting conventions defining the precise components of measures of aggregate economic activity and the particular manner in which NIPA accounts are empirically constructed. To the extent that NIPA measures depend upon data sources that are administratively collected for tax purposes or could be biased as a result of efforts by firms or individuals to falsify information reported to government agencies, and increase in unreported income will also increase unrecorded income.

to 25 percent of reported income. The most recent NIPA revision incorporates an adjustment to Personal Income for previously unrecorded income amounting to $100 billion, reflecting only official estimates of misreporting in tax source information.

The ability to revise NIPA estimates to reflect estimates of unreported tax income depends upon the availability of detailed reconciliations of the amount of income reported for tax purposes and the amount of income recorded in NIPA accounts. The Bureau of Economic Analysis (BEA) has developed a historical reconciliation between the tax base (Adjusted Gross Income) and the NIPA measure of Personal Income (Park 1981). No similar reconciliation is regularly published for Sweden. As such, it is difficult to specify the exact empirical relationship between unreported and unrecorded income in Sweden. We shall, however, maintain the distinction the two income concepts in order to avoid making false comparisons between the results of different methods employed to estimate different income concepts.

The suspicion that the "underground economy" may be an important phenomenon in Sweden is based on the fact that Sweden's high marginal and average tax rates provide strong incentives for non compliance with tax laws. On the other hand, the Swedish authorities have a well developed system for apprehending tax evaders. Moreover, the generous level of social services provided by the government may serve as an incentive to comply with an admittedly burdensome system of taxation and regulation.

The question of the size and growth of non compliance, and its consequent implications for the reliability of the nation's official information system is thus an empirical question that can only be resolved by appeal to relevant evidence. Given the inherent complexity of measuring a phenomenon whose raison d'être is to defy detection, one can at best hope to determine a plausible range of estimates of underground economic activity.

Section 2 briefly reviews and evaluates the evidence that has been cited as having a direct bearing on the size and growth of Sweden's unreported and unrecorded income. Section 3 develops a general currency ratio model (GCR) which is employed to obtain time series estimates of unrecorded income. Section 4 reviews a more extensive attempt to employ a Fisherian transactions framework to estimate the volume of unrecorded transactions and income in Sweden. The final section discusses some of the implications of the results for the Swedish Laffer curve and for fiscal policy.

2. A Review of Existing Evidence

a) Survey Data

Several Swedish studies of tax evasion and unreported income rely on evidence collected by survey methods.[1] These studies suggest that between 10 and 30 percent of the population admitted to being involved in some form of tax evasion. Given the intertemporal inconsistency of the questions asked, however, it is difficult to establish any evidence of the growth of admitted tax evasion over time. Hansson (1982) employs the survey evidence to make the weak inference that tax evasion does not exceed 1 percent of GDP. This inference, however, takes no account of self selection and reporting biased inherent in survey responses to sensitive questions, nor is it based on a representative sample that can support aggregative inferences.

b) National Accounts Discrepancies

A second source of evidence cited by Hansson (1981, 1982) for tax evasion is the NIPA discrepancy between the expenditure side estimates of household and personal firm income and the corresponding income side estimates. Figure 1 displays three variants of this discrepancy. The first (EXP - INC) shows the discrepancy between the GDP expenditure side estimates and income side estimates of the household sector. The second related discrepancy (INC-OUT) is based on the Income and Outlay household accounts discrepancy, and the third (NA - TA) represents the difference between entrepreneurial income and other income based on the NIPA accounts and the corresponding figures obtained directly from tax assessment statistics.[2] The reported discrepancies range between approximately 3 and 6.5 percent of GDP. Hansson (1982) reports adjustments and recalculations of the expenditure discrepancy measure suggesting a decade average of 6.4 percent of GDP. None of the discrepancy measures reveal a pronounced trend.

The intuitive rationale underlying the use of the expenditure income discrepancy as a measure of tax evasion is that the income side of the NIPA relies heavily on tax source data, whereas the expenditure side is independently constructed from household budget studies. These discrepancies will reflect unreported income if and only if:

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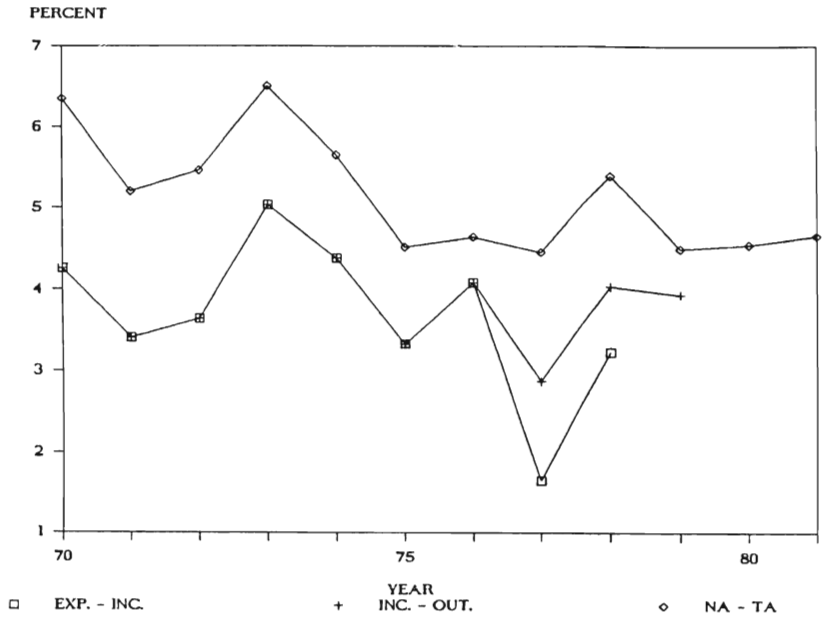
[1] Swedish Institute for Public Opinion Research (SIFO 1966, 1978, 1979, 1980, 1981) and Wärneryd, K.E. and Walerud, B. (1981). The findings of these studies are reviewed in Hansson (1982).

[2] The first and second discrepancy estimates have been provided by A. Tengblad (10/17/1980). With the exception of the years 1977-78, the two discrepancies have been reconciled to one another. The (NA – TA) discrepancy is based on data provided by Per Ericson in private correspondence (8/9/83).

Figure 1 *Discrepancy measures*
Percent of GDP



1) income side estimates are downward biased to the full extent of unreported income, and
2) expenditure side estimates fully reflect all income that should be reported to the tax authority.

In fact, neither of these necessary conditions are fulfilled. Although income side estimates are based in part on tax source data, they require considerable adjustments before they can be directly compared with expenditure side estimates.[1] The income side estimates that enter the discrepancy measure are contaminated by errors in these adjustment items. The second condition is even less likely to be fulfilled. Tax evaders would be reluctant to be respondents in budget survey studies. If they do respond, they are unlikely to fully report their true expenditures out of fear that honest reporting of expenditures will reveal income sources that have not been disclosed to

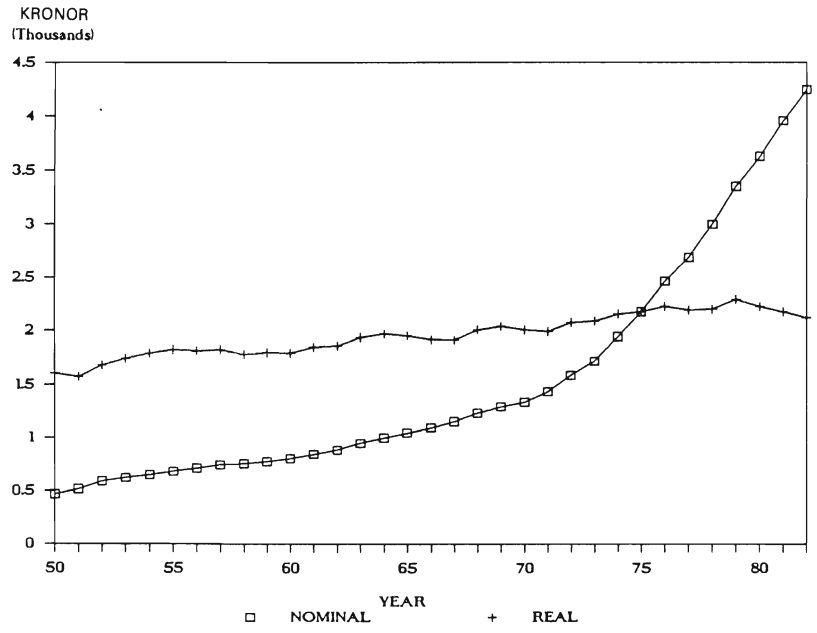
[1] The problem arises because NIPA income definitions do not exactly correspond to the assessment base for taxation statistics. Particular adjustments include such items as capital consumption and imputations for owner-occupied housing (Tengblad 1981).

the tax authority. These behaviors have two implications. First, the discrepancy measures will underestimate the size of tax evasion, and second, an increase in actual evasion will not be reflected as an upward trend in the discrepancy measures since expenditure side responses are likely to be downward biased in proportion to actual evasion. Therefore, the foregoing discrepancy measures simply reflect the final excess of NIPA expenditure estimates over NIPA income estimates of the net operating surplus of the household sector. Since both side of the NIPA accounts are likely to systematically exclude unreported income, the discrepancy cannot be taken as a valid measure of either the size or the growth of tax evasion.

c) Currency Data

Another source of casual evidence that has reinforced the suspicion of growing tax evasion is the surprisingly large amount of currency in circulation in Sweden and the changes in the denomination structure of its currency. According to this view, currency is a superior medium of exchange for the conduct of transactions that firms and individuals wish to hide from the scrutiny of tax or regulatory authorities. The superiority of currency over checks or giro transfers derives from the fact that currency transactions do not leave an audit or paper trail. Figure 2 displays the temporal trend in real and nomi-

Figure 2 *Per capita currency holdings*
Nominal and real

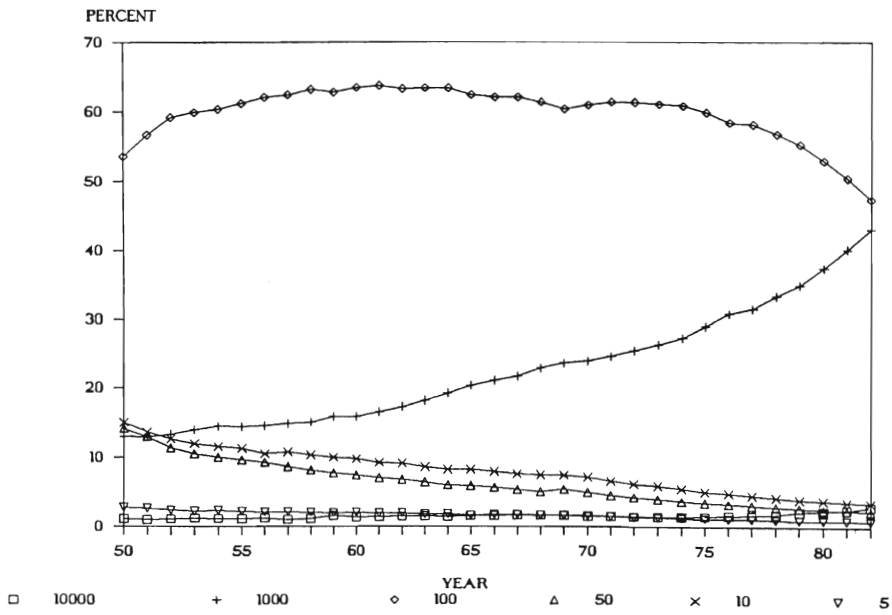


nal per capital currency holdings in Sweden 1950-1982. By 1982, nominal per capita currency holdings outside of the banking system approached 4 250 SEK and the average Swedish household held approximately 9 000 SEK in currency. These currency holdings are higher than those of any western nation other than Switzerland, whose currency is often used as an international medium of exchange to avoid detection by other government's fiscal authorities.

Sweden's large and growing nominal currency holdings run counter to economic predictions of currency trends. Economists have anticipated the onset of the "cashless society", induced by technological innovations in bank and post giro institutions. The growth of services offered to customers using check and giro facilities were believed to induce shifts away from currency toward these media of exchange in response to the decline in their relative cost. Moreover, Sweden's inflation experience imposed an implicit tax on currency holdings that individuals could have avoided by holding liquid assets in interest bearing form.

Equally surprising is the changing composition of the Swedish currency supply. As displayed in Figure 3, the share of 1 000 SEK notes rose from 13 percent in 1950 to 43 percent by 1982. Although higher prices will tend to

Figure 3 *Denomination shares of currency*
Sweden 1950-82



shift the entire denomination structure toward higher denomination notes, this explanation cannot account for the dramatic increase in the share of the 1 000 SEK denominations. A more plausible hypothesis is that these notes are being used for cash transactions which individuals wish to hide from government scrutiny.

3. A General Currency Ratio Model

If currency is regarded as a superior medium of exchange for transactions that are not reported to tax authorities, and may therefore also avoid inclusion in NIPA income estimates, then it is possible to obtain aggregate time series estimates of unreported and unrecorded income from observations on the temporal growth in currency holdings. The link between currency and underground income sources, however, requires the specification of a model of economic activity that relates currency holdings directly to income.

a) Model Specification

The specific assumptions required to implement the estimation of unrecorded income by means of a currency ratio method are clarified by reference to a particular model. The currency ratio model presented below is sufficiently general to encompass all previous currency ratio methods (Cagan 1958, Gutmann 1977, Tanzi 1982, 1983 and Klovland 1980, 1984) as special cases. Let

C = actual currency stock
D = actual stock of checkable and giro deposits
Y_o = recorded or official income
u = subscript to denote the unrecorded sector
o = subscript to denote the "official" or recorded sector
k_o = the ratio of currency to checkable deposits in the recorded sector
k_u = the ratio of currency to checkable deposits in the unrecorded sector
v_u = unrecorded sector income velocity
v_o = recorded sector income velocity.

The general currency ratio (GCR) model contains the following specifications:

$$C = C_u + C_o \tag{1}$$
$$D = D_u + D_o \tag{2}$$
$$k_o = C_o/D_o \tag{3}$$
$$k_u = C_u/D_u \tag{4}$$

$$v_o = \frac{Y_o}{C_o + D_o} \tag{5}$$

$$v_u = \frac{Y_u}{C_u + D_u} \tag{6}$$

$$\beta = \frac{v_o}{v_u} \tag{7}$$

Equations (1) and (2) decompose the actual stocks of currency and checkable deposits[1] into their unrecorded and recorded components. Equations (3) and (4) are definitions of the terms k_o and k_u which can be specified as constants or stable functions of other variables. Similarly, equations (5) and (6) define income velocity in the two sectors. To solve the model for Y_u,[2] we evaluate (6) in terms of the model's observable variables, namely C, D and Y_o. Repeated substitution and rearrangement of terms yields the general solution for Y_u as:

$$Y_u = \frac{1}{\beta} \cdot Y_o \cdot \frac{(k_u+1) \cdot (C-k_oD)}{(k_o+1) \cdot (k_uD-C)} \tag{8}$$

which expresses unrecorded income as a function of the observable variables Y_o, C and D and three parameters or functions: β, k_u and k_o.

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[1] The appropriate definition of the assets that constitute the money supply must be limited to those assets that function as a final medium of exchange. In Swedish practice, currency, checkable deposits and giro demand deposits in banks and the post giro comprise the final media of exchange. Travelers checks and credit cards are sometimes considered to be media of exchange, however, since the purchase of travelers checks or the settlement of credit card accounts requires the use of currency, giro or checkable deposits, to include these assets would amount to double counting. The same is true of time deposits which must first be converted into currency, demand or giro deposits before being used as a medium of exchange. Klovland's (1980) otherwise careful study makes the error of employing a broad definition of the money supply for the denominator of the currency ratio.

[2] If the object of the analysis is to obtain estimates of unreported income, the appropriate income variable is the amount of income actually reported to the tax authority, which in the case of Sweden would be tax assessment income. Since the conceptual reconciliation between reported income for tax purposes and recorded income in NIPA in Sweden is poorly documented, the analysis proceeds on the basis of attempting to estimate unrecorded income. To the extent that unreported income moves pari passu with unrecorded income, the analysis can also be interpreted as a rough estimate of unreported income.

The simplest variants of the (GCR) model employ the following restrictive assumptions:[1]

1) That currency is the exclusive medium of exchange for unrecorded transactions ($D_u \rightarrow 0$; $k_u \rightarrow \infty$).
2) That the amount of unrecorded income produced by a dollar of currency transacted in the unrecorded sector is the same as the amount of reported income produced by a dollar of currency transacted in the reported sector ($\beta = 1$).[2]
3) That the ratio of currency to checkable deposits remains constant except for changes induced by the growth of unrecorded income ($k_{ot} = k_o$ for all t). Imposing these restrictions on the GCR model, yields a simpler form of equation (8), namely

$$Y_u = y_o \cdot \left\{ \frac{C - k_o D}{(k_o + 1)\ D} \right\} \tag{8a}$$

b) Econometric Specifications of k_o

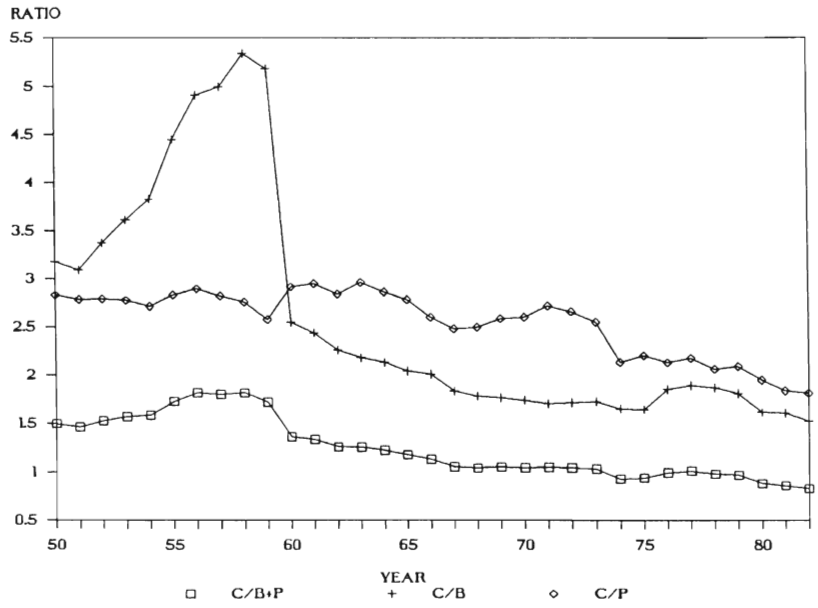
The simplest versions of the (GCR) model assumed that the benchmark estimate of k_o was a constant, rather than a function of other economic variables. In the spirit of Cagan's (1958) original investigation of the currency ratio, k_o is specified as a function to be estimated by econometric means. The advantage of this approach is that it takes explicit account of those economic factors that are belived to have affected observed variations in the currency ratio over time.

Figure 4 displays the ratio of currency to bank and post giro demand deposits (C/B+P) as well as the ratio of currency to each of the separate deposit components (C/B and C/P). The component series exhibit some important discontinuities, reflecting in part the introduction of bank giro sight deposit accounts. The overall currency ratio exhibits a gradual secular decline that reflects financial innovations such as the introduction of wage and salary accounts in Sweden. These innovations as well as other economic factors have

[1] These are the assumptions employed by Cagan (1958) and Gutmann (1977).

[2] Assumptions (1) and (2) are implicit in Klovland's (1980, 1984) approach. Klovland was forced to abandon the currency ratio version of the model because of the difficulty of constructing consistent time series data for Sweden's demand deposit series. The inconsistency problem which arises as a result of the reclassification of Swedish deposit accounts in various periods is addressed in Fegie (1985, Appendix B) and the calculations that follow are based on a newly derived consistent series of deposits.

Figure 4 *Ratio of currency to demand deposits*
Sweden 1950-82



brought about a decline in the use of currency relative to deposit and giro accounts in a manner consistent with the anticipations of a "cashless society". On the other hand, it is possible that this anticipated relative decline in the use of currency would have proceeded at a much more rapid pace in the absence of incentives to continue to use currency for unrecorded transactions. In short, what is required is the development of the counter factual case which asks, what would have been the pace of relative currency decline in the absence of unrecorded transactions? The answer to this question can be obtained by decomposing the observed currency ratio into two components. The first component (k_o) reflects the use of currency in the recorded sector, the second (C_u/D) reflects the use of currency in the unrecorded sector.

Since k_o is itself unobserved, it is necessary to derive an expression for k_o in terms of observed variables. Maintaining the simplifying assumption that demand deposits are never used for the payment of unrecorded incomes ($D_u \rightarrow 0$), it follows that the observed (C/D) ratio is defined as:

$$\frac{C}{D} = \frac{C_o}{D_o} + \frac{C_u}{D_o} = k_o + \frac{C_u}{D} \tag{9}$$

The ratio k_o can be approximated by a function such as:

$$k_o = f_1(y, r, p, g, \gamma) \tag{10}$$

and

$$\frac{C_u}{D} = f_2(\tau) \tag{11}$$

where y = real per capital recorded income
r = the opportunity cost of holding currency relative to an interest bearing deposit
p = the rate of inflation reflecting the implicit tax on currency balances
g = the government expenditure share of GDP reflecting the preponderant use of demand deposits in government transactions and
γ = a dummy variable reflecting the innovation of bank giro deposits.
$[f_2 (\tau)]$ reflects the tax rate (τ) incentive to use currency as a means of avoiding detection of unrecorded transactions.

Since the left hand side ratios in equations (10) and (11) are unobservable, an estimate of k_o must be obtained from a regression of the observed C/D ratio as shown in equation (9). Thus

$$\frac{C}{D} = f_1(y, r, p, g, \gamma) + f (\tau)_2 \tag{12}$$

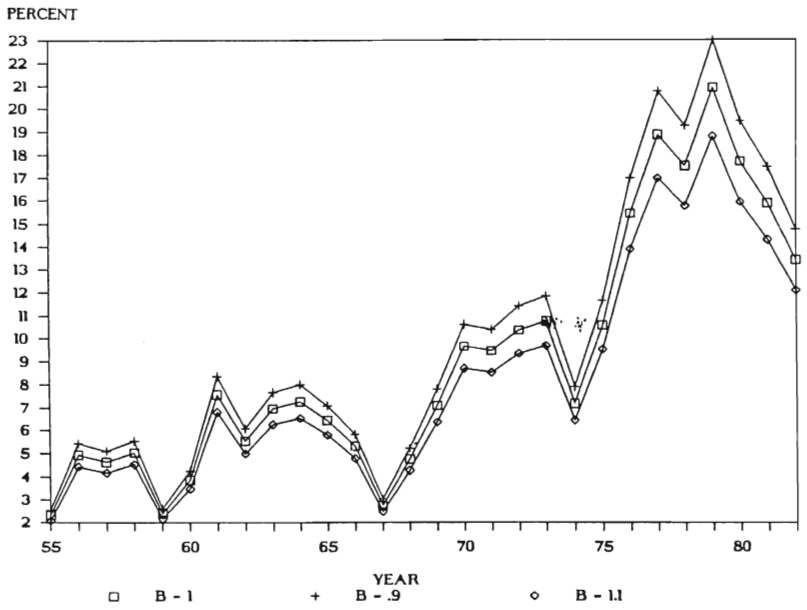
Equation (12) reveals that the observed currency ratio is the sum of two functions. Klovland (1980) following Tanzi (1982) chooses a multiplicative (log linear) functional form to estimate the currency ratio therefore violating the additive specification implied by equation (12). To derive the predicted counter factual time path of k_o, it is necessary to estimate equation (12) and then to obtain the dynamic forecast of k_o after setting $f_2(\tau) = r_b$ were r_b is the tax rate obtaining in some base period. For the calculations that follow, the base period was chosen to be 1950. The dynamic simulation of k_o therefore represents the predicted time path of the currency ratio that would have

taken place if tax incentives had remained at their 1950 level.[1] The forecast values of k_o are then substituted into equation (8a) in order to obtain a conceptually consistent estimate of Y_u/Y_o.

Figure 5 presents the estimates of Y_u/Y_o for the period 1955-82 that result from a dynamic simulation of the (GCR) model allowing for a variable k_o and assuming that $\beta = 1$. The results suggest that unrecorded income averaged about 3.5 percent during the late 1950s, rising to the vicinity of 6 percent during the 1960s and reaching a peak of 21 percent by the end of the 1970s. The estimates suggest that unrecorded income actually declined during the early 1980s. Several of the erratic movements in the estimated series may be the result of asset reclassifications affecting the original data series that could not entirely be removed in the attempt to construct consistent time series estimates.

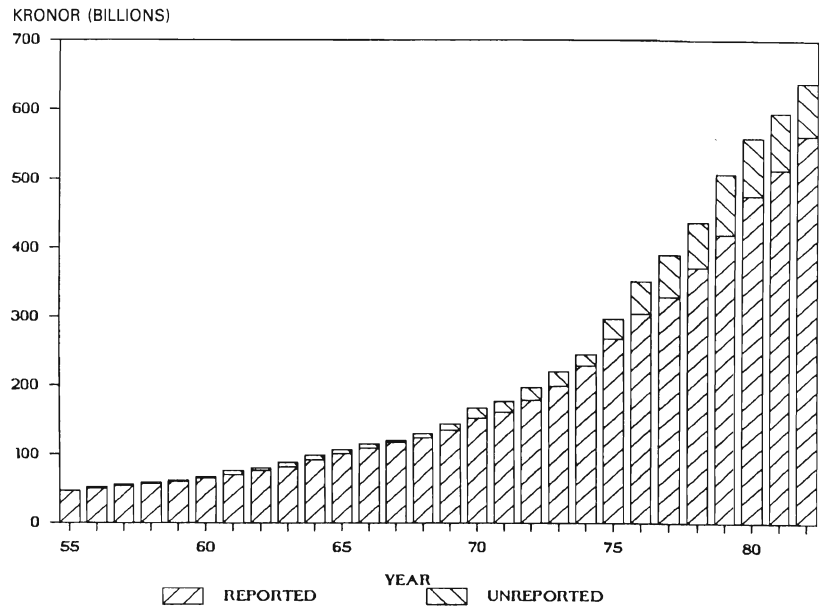
It is also possible to relax the restriction that $\beta = 1$. To the extent that unrecorded income is largely derived from the service sector, it is likely that $\beta > 1$, since the ratio of intermediate to final transactions in the service sector

Figure 5 *Ratio of unreported to reported income*
GCR model variable k_o



[1] The dynamic simulations are based on an estimating equation employing a lagged endogenous variable; a first order autoregressive disturbance and a single lag for τ .

Figure 6 *Estimated total GDP*
GCR model variable k_0



is likely to be lower than in the non service sector. On the other hand, a lower propensity to consume unrecorded income would imply that $\beta > 1$. The former assumption produces higher estimates of unrecorded income, whereas the latter assumption reduces estimated unrecorded income.

Figure 5 includes estimates of Y_u/Y_o for alternative values of β . While the value of β affects the estimated size of the unrecorded sector, it leaves invariant the temporal path of Y_u/Y_o.

Figure 6 displays the estimates of total GDP obtained by the GCR model with the variable k_o specification ($\beta = 1$). The estimates imply that per capita unrecorded income amounted to approximately 9 000 SEK in the early 1980s.

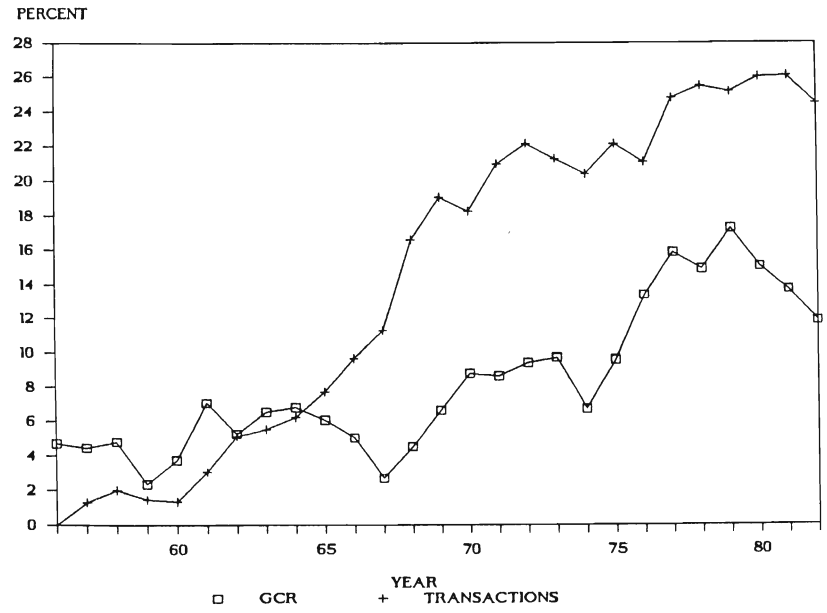
4. Transactions Estimates of Unreported Income

The foregoing estimates of unreported income are based on a conventional monetary model in which economic activity is specified as depending upon the stock of monetary assets rather than on the monetary transaction flows which actually underlie all economic activity. In a separate monograph (Feige 1985) the author has attempted to specify a general macroeconomic

framework based on Fisher's (1911) equation of exchange, which permits empirical estimation of both the payment side of Fisher's identity (MV) and the transactions side of the identity (PT). The measurement of total payments (MV) requires independent estimates of the payment velocity of each medium of exchange. The transactions side of the equation of exchange involves the aggregation of all current national accounting frameworks, including NIPA; Input-Output Accounts; Income and Outlay Accounts; Balance of Payment Accounts and Flow of Funds Accounts. The conceptual framework uses Swedish data in a pilot study to demonstrate the feasibility of replacing Keynes's (Y = C + I + G) identity with Fisher's (MV = PT) identity as the basis for macroeconomic accounting and analysis.

Independent estimates of aggregate payments in Sweden (MV) are shown to exceed estimates of total recorded transactions (PT). The discrepancy between estimated total payments and estimated recorded transactions has grown dramatically over time and this discrepancy is taken as an indicator of unrecorded transactions. Figure 7 displays the percent of total income that is unrecorded as estimated by the transactions method. For comparative purposes, Figure 7 also displays the comparable estimates derived from the currency ratio model. Both estimates suggest a secular increase in unrecorded

Figure 7 Percent of total income unrecorded
Alternate methods



income with the transactions method producing the higher set of estimates. This result is not surprising since the transactions approach is not subject to two of the restrictive assumptions implicit in the currency ratio approach. The currency ratio estimates limit all transactions in unrecorded income to currency whereas the transactions approach permits both checks and giro deposits to be used for some unrecorded transactions. The second difference in the approaches is that the transactions estimates take account of the different velocities of circulation of each medium of exchange.

The foregoing estimates of unrecorded income suggest that unrecorded income in Sweden grew substantially during the past two decades, with its growth subsiding during the early 1980s. On the basis of the available evidence it appears that unrecorded income now amounts to 12-25 percent of total income in Sweden.

5. Implications

As part of the research project on the Sweden's "underground economy" Feige and McGee (1983) developed a general equilibrium model of Sweden's long-run Laffer curve. The model was empirically implemented employing estimates of supply elasticities; the progressivity of the tax system and independent estimates of the unrecorded economy. The model was simulated for 1979 under various assumptions, and produced estimates of the revenue maximizing average tax rate for Sweden. The results of the simulations indicated that under the most plausible assumptions, an unrecorded sector between 10 and 20 percent of total output would imply a revenue maximizing tax rate for Sweden between .58 and .56. The average effective tax rate for Sweden in 1979 was calculated to be .62 suggesting that Sweden was the only country[1] which appeared to be on the downward sloping portion of its long-run Laffer Curve. The empirical evidence presented in this report supports the conjecture that Sweden can afford to cut its rate of taxation without fearing a consequent loss of revenues. Indeed, on the basis of the simulation experiments combined with the empirical findings on the size of the unrecorded economy, it appears that a cut in Sweden's tax rates can bring about the salutary long-run consequences of increased output, declining tax evasion and increased revenues for public expenditures.

[1] The Feige-McGee model was also simulated for the U.K; the Netherlands and the U.S. In each case these countries were found to have effective tax rates well below the revenue maximizing tax rate.

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CAN THEORY REALLY SUPPORT POLICY?

11 CAN INFLATION BE PROHIBITED[1] – A Study on Price Controls in Sweden

by Bo Axell

In recent years liberal economic-political ideas have experienced a renaissance. A fundamental liberal idea is that the resource allocation problem should be solved by means of market mechanisms and with a minimum of public involvement. On the other hand, many claim that the problems with high inflation and unemployment in Sweden and in many other western economies have to be solved with the help of precise fine-tuned public intervention.

Models of Market Pricing

Models of free market pricing have been developed at IUI within the project "Price Controls in Sweden" (see for instance Albrecht-Axell-Lang, QJE 1986). Other projects like the "Micro- macro Model project" (see Eliasson 1985) also provide a free market approach to macro modelling based on micro behavior.

These theories are presented together with other contributions in recent years to the economic theory of price- and wage formation. The book "*Can inflation be prohibited?*" therefore includes a survey of the different theoretical approaches during the seventies and eighties, especially the search theoretical approach.

To evaluate the effects of price controls, a "general" theory of inflation is needed as a reference. Such a theory, based on Knut Wicksell's ideas from the turn of the century, is used to explain movements of the general price level (inflation) and the distortion caused by price controls.

[1] Swedish title: *Kan inflation förbjudas? Om fri eller reglerad pris- och lönebildning,* IUI, Stockholm.

Regulation of Interest Rates and the Exchange Rate

The main conclusion is that price controls are useless as a means to contain inflation. Instead, they *cause* inflation.

There are three main sources of inflation: (1) investment in excess of savings, (2) export surpluses, and (3) public deficits. All three represent a form of price control where the "price" has been regulated to a level below the market level.

Investment in excess of savings is caused by a rate of interest, set – by the Central Bank – at a level below ex ante rates of return by investors, or what Wicksell called the natural rate of interest. Export surpluses are generated by exchange rates that are too low, because of devaluations or exchange rate controls. Public expenditure surpluses or budget deficits occur when the charges for public services are too low, and an excess demand situation is created. The charges on public services include both direct fees and tax rates.

These imbalances together determine the rate of inflation. Low tax rates can be offset by high interest rates and inflation is avoided. Welfare losses may then occur, however, because of insufficient investments.

Summing up, if the rate of interest, the exchange rate and/or price on public services and taxes are set too low by regulation, the combined effect is that they *cause* inflation.

General Price Controls

An econometric model based on the above principle has been used to study the five quarter long general price control of 1970-71. The analysis shows that prices in general increased at least as much as they would have increased without price controls. In addition, inflation was significantly higher than the model predicted two years after the price control period. The probable explanation is that the general price-control was interpreted as an announcement of a new policy. Earlier price controls had been restricted to emergency situations. The new policy made firms set prices higher than before. Hence price controls are more likely to *cause* inflation than to stop it.

The Allocation Effects of Price Controls

Can price controls of any kind improve welfare in the economy? The book demonstrates that this is possible, but not likely.

Only recently has theory been able to predict the outcomes with respect to resource allocation in an economy completely left to "itself" to determine *what* to produce and *how* to produce. The traditional general equilibrium solution with a single price is not obtained unless price-making is performed by an auctioneer or a central "price controller", or at zero information collection costs.

Rather we get a solution with price and wage *distributions* when there are information collection costs (see Albrecht-Axell-Lang, QJE, 1986). This implies that the optimality in the allocation of resources usually associated with the free market economy does not necessarily hold. The consumption of resources in the allocation process itself is large. If this resource use could be reduced by means of public intervention, then the market solution by definition is not optimal.

Price dispersion signals that the price system has not been able to transmit all information in the economy to market agents. Suboptimal economic performance occurs and should be interpreted as a cost.

Hence, price and wage dispersion is the cause of resource consumption. In principle, it should then be possible to improve resource allocation through intervention in the free formation of prices in a way that decreases the variances in the distributions, reduces resource-consumption in the allocation process (unemployment, for instance) and increases total production.

This conclusion, however, overlooks the fact that public interventions are also costly. Public controls, contrary to market search, draw resources directly. In addition, mistaken or mis-directed, public controls will cause distortions or allocation losses which may be quite large. A correct evaluation of the macro economic effects of price controls therefore requires that the relative efficiency of information use in a free market economy is compared with an administered (price controlled) economy. This is currently beyond the frontier of research.

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12 WHY PRIVATE ENTERPRISE? Towards a Dynamic Analysis of Economic Institutions and Policies

by Pavel Pelikan

1. The problem

The lack of consensus about the conduct of economic policy can often be traced to basic disagreements about the merits of private enterprise (capitalism), in comparison with various forms of socialism and government control. In part, the disagreements are due to differences in values about social ends, on which economic analysis has little to say. But in part they are due to differences of opinion about how efficient private enterprise is. While some see in private enterprise the pillar of productive efficiency, on which government intervention has little to improve, others claim that a properly designed system of government control or socialist planning could achieve superior results, through better coordination of production tasks. In principle, such differences of opinion could be reduced by analytical arguments, whose great merit would be to help society reach consensus on at least some policy issues.

For the search of such arguments two questions are central: Does private enterprise have some specific virtues, inimitable by socialism and government control, which endow it with superior production performance? If so, how should economic policy be conducted, in order to take full advantage of such virtues, rather than spoiling them?

Obviously, no definite answers to these questions can be found in such a short essay as the present one. All that I wish to do here is to indicate what I believe is a promising way to search for such answers. I shall first explain why existing theories are of little help in this search. I shall then outline an alternative research program, arguing that the key is in two closely related problems: *economic self-organization* and *allocation of tacit knowledge*. Finally, I shall indicate how these problems can be approached by analysis, and what knowledge relevant to this search such analysis can yield.

2. The Inconclusiveness of Conventional Theories

Since already Adam Smith was interested in the merits of private enterprise, it may appear surprising that modern economic theories have so little to say

about them. As Solow 1980 notes in his presidential address to the American Economic Association, even highly respected members of the profession can strongly disagree about what these merits are and whether private enterprise has any merits at all. Nelson 1981 shows in a systematic way that, contrary to what many economists seem to believe, existing theories provide no substantial support for the opinion that private enterprise is the right way to organize production. In Pelikan 1985 I push Nelson's argument a little further, showing that from the point of view of conventional theories, private enterprise has no particular virtues which a suitably designed system of socialist planning or government control could not imitate or even improve upon.

In order to show why this is so, I call attention to the fact that conventional theories – including the entire neoclassical analysis and most of its modern extensions – limit their attention to the question of how resources are allocated *among already given units, through already given markets.* In other words, these theories regard the organization of the economy as given and immutable. Only price and quantity adjustments are studied, while the essential question of how an economy organizes and reorganizes in the face of an incessantly changing world is simply ignored. Schumpeter was probably first to note this limitation of conventional theories when he said that "the problem that is usually being visualized is how capitalism administers existing structures, whereas the relevant problem is how it creates and destroys them" (1942; ed. 1976, p. 84).

According to my argument, economic systems differ less in their abilities to administer given structures, ideal by assumption, than in their abilities to organize, and keep in good shape, real structures. It is in the latter abilities that one can find the most important advantages of private enterprise and the greatest difficulties of all centrally planned or government controlled systems. All theories which neglect to examine these abilities are, therefore, bound to lead to an incomplete and distorted view of the merits of different systems.

3. Dynamic Studies of the Organization of Capitalist Economies

There is a growing number of studies which overcome this limitation by studying how a private enterprise economy organizes and reorganizes itself – that is, how it creates and destroys its structure. This branch includes the theory of economic development by Schumpeter 1934, 1942, the study of the evolution of firms' behavior in markets by Alchian 1950 and Winter 1971 and the evolutionary theory of economic change by Nelson and Winter 1982. Marris and Mueller 1980 survey this branch with an interesting contribution of their own. Much of the research conducted at IUI also belongs to this

branch. Eliasson deals with the organizational dynamics of capitalism on several occasions, 1984, 1985, 1986. This dynamics has also been the main subject of the symposium edited by Day and Eliasson 1986.

Although these studies overcome the main limitation of conventional theories, their help to the proposed search is limited for another reason. Their attention is exclusively focused on capitalism, which they try to describe and understand, rather than critically assess in comparison with some feasible alternatives. Consequently, they are as inconclusive about the respective merits of alternative institutions (systems) as conventional theories.

As an illustration, one can examine the few studies which do criticize capitalism for its ways of changing the organization of the economy (cf., e.g., Marris and Mueller). These studies are unconvincing precisely because they are not comparative. Consequently, they fall victim to what Demsetz 1969 calls the "nirvana fallacy", by assessing one real system from the point of view of an ideal norm – the "nirvana" – rather than by comparing it to feasible alternatives. In this way, one can be misled into rejecting an imperfect system, without ever noticing that all *feasible* alternatives might be even less perfect.

4. An Alternative Research Program

The great merit of Marris and Mueller is to introduce into economic analysis the concepts of *self-organization* and *adaptive efficiency,* which are particularly suitable for the present discussion. The former refers to the process through which an economy "... can and does modify its own structure and programming in the course of and as a result of its own operations" (p. 33). "Adaptive efficiency" denotes the abilities of an economy to self-organize – that is, to suitably modify its structure. It also closely corresponds to what Eliasson 1985b, p. 330, calls "Schumpeterian efficiency".

Using these concepts, one can say that conventional theories ignore the key problems of self-organization and adaptive efficiency altogether, whereas the studies which do deal with them are not comparative. Consequently, an alternative research program which appears particularly promising is to examine how alternative economic institutions (systems) solve the problem of self-organization, and how they compare in terms of adaptive efficiency.[1]

It is this program, which may be termed "comparative studies of economic self-organization", that I propose to follow. Having already taken a few steps in this direction (cf. Pelikan 1985a, 1985b, 1986, and forthcoming), I shall now outline my approach and indicate some of my findings.

[1] A similar research program is recommended by Kornai (1971).

5. Adaptive Efficiency and Policy Issues

In order to be adaptively efficient, the economy must, in essence, allow new production organizations to form, induce existing organizations to keep adapting to economic and technological changes, and force the organizations which cannot adapt to dissolve.

Of course, adaptive efficiency can hardly be counted among final social goals, immediately contributing to social welfare. On the contrary, efficient self-organization often causes short run social losses. These include the costs imposed on the firms which are forced to close down, and on the people who must seek new jobs, possibly in other professions and/or regions. In other words, these are the negative social effects of creative destruction, as Schumpeter saw them. It should be emphasized, therefore, that adaptive efficiency is nevertheless an instrument of social welfare, or a social subgoal; important in the medium run and decisive in the long run.

The instrumental nature of adaptive efficiency defuses much of the usual controversies about desirable objectives (values) of economic policy. It provides an additional justification to Nelson's 1981 proposal to focus policy analysis on the performance of production, while largely abstracting from the final demands which production should meet. The reason is that for a wide spectrum of policies concerning final demand – ranging from full consumer sovereignty to the extensive paternalism of a welfare state – adaptive efficiency of production is equally crucial.

Since adaptive efficiency is so important, but ignored in conventional analysis, there is a great risk that many policies approved by such analysis have hidden perverse effects. One purpose of the proposed search is to find such effects and suggest corresponding corrections of policy.

6. Institutional Rules and Organizational Structures

The first problem to be solved is the one of conceptual clarity and parsimony. In particular, good care must be taken of the concepts "institution", "organization" and "structure". The well- known difficulty with these concepts is that they have been interpreted in many different, not always clearly defined ways.

It seems that a clear and parsimonious conceptual framework, adequate for the problem at hand, can be built around two key concepts: "institutional rules" and "organizational structures".

Institutional rules constrain the behavior of economic actors – individuals as well as organizations – in a similar way as the rules of a game constrain the behavior of its players. Examples of institutional rules are property rights, the rights and obligations to inform and to be informed, and various norms constraining the conduct of economic policy.

Institutional rules consist of both written law and unwritten custom. Their common feature is that they are respected by all, or nearly all, economic actors. Consequently, they also help the actors predict each others' behavior.[1]

Each economy can be characterized by its list of prevailing institutional rules. It is according to this list that one can determine whether the economy is capitalist or socialist. Moreover, one can also read there the precise form of capitalism or socialism in question, including the precise forms ("norms") of admissible economic policy and/or planning. (One may think of recognizing the type of a game from reading the list of its rules.)

Formally, the concept of organizational structure refers to a collection of units, behaving in certain ways (e.g., maximizing or satisficing), and interrelated through a certain organizational design (e.g., a certain mixture of markets and hierarchies). The traditional microeconomic view of an economy as a collection of perfectly organized profit maximizing units, interrelated through a set of perfectly competitive markets, is a particular and simplified case of organizational structure. More realistically, the organizational structure of an economy is an organization of organizations, which can often be described as a mixture of markets and hierarchies.

If institutional rules are compared to the rules of a game, then an organizational structure can be compared to the configuration of the players actually playing the game. This comparison is helpful for a good intuitive understanding of the situation studied, for it clearly suggests the idea that a given game can be played by different and possibly changing configurations of players. It also indicates promising avenues for formal modeling.

An important advantage of the concepts "institutional rules" and "organizational structure" is that they can be applied to the internal organization of firms and agencies. A firm or an agency is then regarded as a subgame, with internal institutional rules and organizational structure of its own, related in certain precise ways to the rules and the structure of the economy.

7. Economic v. Institutional Self-Organization

Using the introduced terms, one can say that mainstream economics studies the allocation of resources within a given organizational structure, under given institutional rules. What I propose is not to abandon studies of resource-allocation, but to complement them with studies of self-organization. As will become clear shortly, resource-allocation and self-organization are inti-

[1] In the present discussion, I leave aside the question of how the respect for institutional rules is enforced. As will be explained below, the present focus is on the adaptive efficiency provided for by different sets of institutional rules, assumed given and respected.

mately interrelated and cannot be meaningfully studied without each other.

The entire self-organization of an economy can be visualized as taking place in two stages. During *institutional self-organization,* institutional rules are formed through cultural, political and legal processes (e.g., through "preconstitutional contracts" in the sense of Buchanan 1976, or through spontaneous formation of custom, as studied by Schotter 1980). During economic self-organization, organizational structure is formed under existing institutional rules.[1]

The focus here is on economic self-organization under different given institutional rules. To recall, it is the adaptive efficiency of different institutional rules – that is, their abilities to promote the formation of suitable organizational structures – which is to be examined.[2]

8. Modeling Economic Self-Organization

A model of economic self-organization must depart from the usual microeconomic view of an economy in several respects. The first point is to recognize, as already Schumpeter urged us to do, that the organizational structure of the economy is not exogenously given, but endogenously variable.[3] In other words, instead of postulating the presence of some given markets and/or hierachies, the model most depict the fact – and this is what economic self-organization is about – that markets and hierachies can form, reform, grow, transform into each other, diminish or dissolve.

Since no economic organizations are given, the model must start from a collection of individuals – the society – and show how these individuals combine and recombine into different organizations. Even if the collection of individuals does not change, the collection of economic units conducting resource-allocation is variable.

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[1] Logically, this division corresponds to the one made in biology between the evolution of species (cf. institutional rules) and the development of an individual (cf. organizational structure) of a given species. The great difference is, of course, that in biology the two stages of self-organization are neatly separated by substantially different time scales, whereas they are often closely intervowen in the history of societies. Typically, while an organizational structure is still in full development, the prevailing institutional rules are also being modified – e.g., by new laws or changes of custom – thus causing the organizational structure to continue its development under a more or less different set of institutional rules.

[2] As can easily be verified, it is indeed with what I call "economic self-organization" that Marris and Mueller, as well as Schumpeter, are concerned. In this respect, the only difference between their approach and mine is that they examine economic self-organization in capitalism, whereas I propose to examine it under different institutional rules – such as different forms of capitalism, socialism, and interventionism.

[3] On this point, see also Eliasson's introductory chapter in this volume.

This difference entails several other differences. The most fundamental one is that our view of microeconomic behavior must be widened. Economic agents must be regarded not only as exchanging (transacting) signals and resources along some already established channels – e.g., through existing markets or within existing hierarchies – but also as forming, modifying, or dissolving such channels, through *active and selective associating and dissociating*.

To explicitly recognize associative behavior as relatively autonomous from allocative behavior is essential for modeling economic self-organization. The failure to do so seems to be the main reason why theory has made so little progress in this direction.[1] Associative behavior involves its specific constraints and preferences – e.g., the constraints of limited span of control and limited trust, and the preferences for social contacts, friends, rituals, status and power. Such associative constraints and preferences influence individual behavior side by side with the traditionally considered allocative constraints and preferences. They can often surprise traditional analysis by leading self-organization towards structures which apparently violate all principles of allocative efficiency.

This view of economic behavior can no longer refer to the paradigm of mechanics, on which mainstream economics has been built, but invites us to turn to the paradigm of chemistry and biochemistry. Economic agents are no longer organizationally passive parts of a given "mechanism", but actively and selectively "react" with each other; they themselves form and reform the structures of which they are parts.

An important implication is that the form of an organizational structure is disclosed as impossible to perfectly plan by any central organizer, for it will inevitably be enriched, or disturbed, by spontaneous self-organization of all the agents concerned.

Economic self-organization will often require that some agents assume special roles, resembling the roles of catalysts in chemistry. In particular, most markets and hierarchies require initiative-taking *entrepreneurs* in order to begin to form. In a precise sense, entrepreneurship can thus be interpreted as *catalysis of self-organization.*

Another point on which the model must differ from standard microeconomics is that it cannot neglect the internal organization of firms and agencies. Both interfirm and intrafirm levels of organization must be depicted, for self-organization often involves both these levels simultaneously. For instance, vertical integration typically transforms a part of an interfirm market

[1] Economic literature comes close to dealing with such behavior in the writings on coalition formation, long-term employment contracts, and the issue of exit, voice, and loyalty, as formulated by Hirschman 1970.

into an intrafirm hierarchy. Similarly, the entry of a new multipersonal firm implies the formation of both a new intrafirm hierarchy and a new set of interfirm relations. It is here that the flexibility of the proposed conceptual framework proves particularly useful.

Finally, the model must be dynamic in a rather unusual sense. Besides showing how a given organizational structure allocates resources – the usual task of economic analysis – it must also take into consideration the fact that while resource-allocation is still going on, the organizational structure may change through self-organization. The above-mentioned intimate relationship between resource-allocation and self-organization can now be explained. Self-organization forms the organizational structure which determines how resources will be allocated. The resulting allocation of resources then becomes an important constraint on further self-organization.

The development of such a model, which must extensively rely on simulation techniques, is still far from finished.[1] But it is not necessary to wait until this is done. Some approximative but significant results can be reached by qualitative reasoning. It is to such reasoning that I limit the present discussion.

9. Economic Self-Organization under Different Institutional Rules

To understand the impact of different institutional rules on self-organization, we must begin with a microeconomic inquiry on their impact on the behavior of individual agents. In general, each set of institutional rules constrains, in its characteristic ways, the behavior of economic agents during both resource-allocation and self-organization. One can often distinctly see the two corresponding subsets of rules – for instance, the rules to be respected when signaling and trading, as distinguished from the rules to be respected when associating or dissociating. Typical examples of the latter rules are the antitrust law, the corporation law, the laws regulating entry and exit, and the laws and custom regulating the labor and stock markets – the places where most of the associating and dissociating of employees, managers and owners is done in capitalism.

But as has just been explained, self-organization and resource-allocation are closely interrelated. Therefore, both types of institutional rules will influence self-organization. The resource-allocation rules will do so indirectly, via their responsibility for the actual allocation of resources, determining which changes of organizational structure become economically feasible. The self-

[1] Important sources of inspiration for building such a simulation model are Nelson and Winter 1982 and Eliasson 1985b.

organization rules will then determine which of the economically feasible changes are also institutionally permissible.

The institutional rules of an economy are thus exposed as doubly responsible for the development of the economy's structure and performance – much as the genetic message of an organism is responsible for the development of the organism's form and abilities. Consequently, the habit of mainstream economics to assign an arbitrarily postulated organizational structure to given institutional rules – such as a set of perfectly competitive markets to capitalism, or a hierarchy of optimal planning to socialism – is disclosed as illegitimate. Although new institutional rules typically begin with the organizational structure inherited from their predecessors, their responsibility for the organizational structure will soon become decisive. Once institutional rules are given, they constrain, often in hidden and surprising ways, the set of compatible structures, making all *a priori* assumptions about structures subject to serious errors.

What this view implies for the present argument can best be shown by referring to the so called "convergence hypothesis" (cf., e.g., Tinbergen 1961). This hypothesis claims that, through increasing use of large hierarchies in capitalism and markets in socialism, the two types of economies are converging to similar organizational structures. To be sure, some socialist economic reforms – such as in Hungary, and recently also in China – do result in mixtures of markets and hierarchies which resemble those encountered in capitalist economies. But the resemblance can now be disclosed as only superficial, limited to the area of resource-allocation within given structures. In the area of self-organization, through which structures are formed and reformed, no true convergence is possible, unless socialism is transformed into full-fledged capitalism. *Only private ownership of capital allows for truly decentralized entrepreneurship with open entry to both product and capital markets.* As will be discussed later, it is precisely these features, inimitable by socialism, which appear to be necessary conditions for adaptive efficiency.

10. Tacit Knowledge

The above implication involves a puzzling point. It is admitted that different institutional rules, channeling self-organization in different ways, can nevertheless generate similar organizational structures. Yet it is claimed that, in spite of their similarities, the generated structures will perform differently, because of differences in their self-organization. But this can be true only if different ways of self-organization endow the structures with different abilities, important for the production performance, but difficult to observe from the structures' appearance. In other words, socialist markets and socialist

hierarchies may resemble capitalist markets and capitalist hierarchies, and yet not perform in the same way. The question, then, is which hidden factor of production, depending exclusively on self-organization, can make such a difference.

According to my argument, this factor is a particular type of information, ignored by standard analysis, but crucial in studies of self-organization. This is the information inherent to organizational structures themselves – similar to the "hardware" information inherent to the internal arrangement of a machine or an organism. It is this information which determines what the structure can do, which *other* information it can use. But unlike a machine which obtains its hardware once for all from an external constructor, the organizational structure of an economy can obtain this information only gradually, through its own self-organization.

To denote this information, a convenient term is "tacit knowledge", due to Polanyi 1967 and recently employed in economic analysis by Nelson and Winter 1982. In my interpretation, however, tacit knowledge is a property not only of individuals, but of organizational structures in general.[1]

Individual tacit knowledge can be visualized as the *competence,* which an individual must acquire through his own learning by doing, and the *talents,* which limit the competence he can eventually learn.[2] The main distinguishing feature of such knowledge is that it *can be freely used by its owner,* but *cannot be communicated* (directly transmitted) to someone else.

Besides not being directly communicable, individual tacit knowledge has a few other properties which are of relevance for economic self-organization. In particular, it is *not directly measurable, nor interpersonally comparable.* Only the particular results of its application in particular circumstances – such as the solutions of particular problems, or the performance in particular tests or tournaments – can be observed and compared. The frequent cases of overestimation or underestimation of one's own competence and talents show that one is even unable to directly measure one's own tacit knowledge, in spite of using it freely.

While some tacit knowledge is needed for all human activities, the present focus is on the tacit knowledge needed for economic behavior – that is, on what may be called "economic" or "business" competence and talents. By making the standard assumption of perfect (unbounded) rationality of all economic agents, mainstream economics implicitly assumes that such knowledge is always perfect. In contrast, the present point is to recognize such

[1] Without using this term, Eliasson 1976 convincingly shows, with the help of extensive empirical material, the crucial role of tacit knowledge within firms.

[2] The unity of the concepts used appears with particular clarity if learning by doing is interpreted as psychological, or even neuronal self-organization within individuals.

knowledge as scarce and unequally distributed. In other words, different people are to be recognized as endowed with different economic competence and talents. This point is equivalent to making the increasingly popular assumption of bounded rationality (cf., e.g., Simon 1955 and Williamson 1975) with the important addition that the rationality of different people is recognized as bounded in possibly different ways and degrees.

As to the tacit knowledge of an organizational structure – let me denote it "organizational" – it is made of all the individual tacit knowledge involved. But it is not a simple sum of individual contributions. The main idea is to give more weight to the individual knowledge employed in top positions – such as those of managers, investors, and entrepreneurs – than to the knowledge used by the rank and file. Consequently, when considering a given society, consisting of given individuals with given tacit knowledge, it is on their respective positions and interrelations that the organizational tacit knowledge of the economy's structure will depend.

This means that organizational tacit knowledge will depend on the *organizational arrangement,* which determines the network of individual positions and interrelations, and on the *selection of specific individuals* for these positions.

Two implications are of importance. First, the same individuals can form structures of different organizational tacit knowledge, if employed in different organizational arrangement. Second, the same arrangement can result in different organizational tacit knowledge, if it employs different, or differently selected, individuals.

The second implication is the key to the puzzle of organizational structures which look similar but perform differently: while their easy to observe organizational arrangements may be similar, their difficult to observe use of individual tacit knowledge may nevertheless differ.

11. Self-Organization as Allocation of Tacit Knowledge

The first idea which naturally comes to an economist's mind is to regard tacit knowledge as a particular factor of production, and to study its allocation in a formally similar way as the allocation of all other resources. Although this proves not to be a fruitful idea, it is instructive to attempt to follow it. Such an unsuccessful attempt can help exposing the fundamental differences between tacit knowledge and the traditional resources and, consequently, the differences between self-organization and the traditional resource-allocation.

Whereas all other resources, including communicable information, can change hands and flow across a given organizational structure, tacit knowledge is tied to individuals and structures, and can be allocated only through changes of the structure itself. Economic self-organization can be regarded

as a particular case of resource-allocation, quite different from the traditionally studied cases. While traditional resource-allocation leaves the organizational structure which conducts it intact, *the allocation of tacit knowledge ends up with another organizational structure than the one it started with.*

A "strange loop", typical for self-organization, is thus discovered.[1] The resource-allocating mechanism and the allocated resources, which traditional analysis keeps tightly separated, appear now to overlap. To visualize the situation, recall the usual view of scarce resources as allocated with the help of the rationality of the economic actors involved. Regard the actors with their rationality as the constituent parts of the resource-allocating mechanism (organizational structure). The problem is that traditional analysis assumes that economic rationality of all decision-makers is perfect – that is, that the underlying tacit knowledge is not scarce. Consequently, rationality itself is exempted from the need to be allocated. In contrast, the present view implies that economic rationality is based on scarce tacit knowledge, and must be, therefore, considered itself scarce. This poses the peculiar problem of how scarce rationality is allocated. What makes this problem most peculiar is the fact – and this is where the strange loop appears – that there is nothing else with which to allocate scarce rationality than scarce rationality.

The peculiar nature of this allocation process appears even clearer when we recall that besides being incommunicable, tacit knowledge (including economic rationality) is not directly measurable and interpersonally comparable. The upshot is that not only tacit knowledge is imperfect, but the knowledge about its actual allocation is imperfect as well. Only more or less qualified guesses about its allocation can be made, their quality depending on the tacit knowledge of their authors.

The difficulty of the problem of economic self-organization can now be fully appreciated. It is the difficulty of *allocating imperfect and imperfectly known tacit knowledge by the means of imperfect and imperfectly known tacit knowledge.*

12. From Theory to Policy Implications

The answer to the puzzle of similarly looking but differently performing organizational structures can now be completed. The crucial difference in organizational tacit knowledge must indeed be ascribed to differences in self-organization. Consequently, successful organizational structures can be shown to owe their success less to their static appearance than to the entire

[1] An inspiring reading for understanding the mathematico-logical problems of strange loops is Hofstadter 1979.

process of their genesis. This means that they are not directly imitable, unless their entire self-organization would be imitated as well.

An immediate implication is that, contrary to what standard analysis implies, the organization of successful capitalist firms cannot be imitated by socialist firms, nor by government agencies.

More general implications can be drawn by studying the conditions which different institutions with different forms of economic policy offer to economic self-organization. Decentralized entrepreneurship with open entry to both product and capital markets, and well-defined rules of bankruptcy, prove to be the essential conditions for adaptive efficiency. The main idea to follow is to examine different forms of institutional rules and economic policies for their constructive or destructive influences on these conditions.

As to private enterprise, the proposed analysis sees its most important merit precisely in its potential to provide the relatively best conditions for economic self-organization. And let it be emphasized that it is not claimed that markets always allocate resources more efficiently than hierarchical organization, as conventional arguments sometimes do. In good agreement with empirical facts, the proposed analysis can very well admit that hierarchies can, and sometimes do, perform better than markets. What is claimed is that such efficient hierarchies can be expected to form and to remain efficient only under the institutional rules of private enterprise.

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13 PUBLIC POLICY EVALUATION IN SWEDEN[1]

by Bengt-Christer Ysander

Auditing the Swedish Welfare Economy

Auditing a market economy normally means making sure that effective competition is maintained. Auditing a welfare state is a much more complex task. It means i.a. evaluating the efficiency of government monopolies by the use of hypothetical market analogies. At the same time, the equity considerations of the welfare state have to be observed. The outcome of auditing will depend on the choice of criteria for comparison – alternative government policies or market solutions, alternative taxes, lumpsum transfers etc. The more dominant and all-embracing the public sector becomes and the more ambitious the redistribution policies are, the more confused the Government objective function will be and the more difficult it becomes to do the auditing work. But the reason for doing it will be all the more pressing.

There are several pressing reasons for Sweden to be particularly concerned about the evaluation of public policy.

Tax rates and public spending shares are the highest in the world. More than 70 percent of total income is channeled through public budgets rather than through markets.

Compared to other West European countries the Swedish welfare strategy is based on the provision of free public services, implying both relatively more public employment and long-term and inflexible commitments of public funds.

The rapidly increasing Swedish public budgets are dominated by expenditure used for price subsidies in general, and public consumption in particular. The share of income for collective security has remained more or less constant around 10 percent over the whole postwar period. The dramatic

[1] Revised and shortened version of a lecture given at Colloque International "L'Evaluation des Politiques Publiques", Paris, 15-16 décembre 1983, published as "L'évaluation des politiques publiques en Suède", in Nioche, J.-P. and Poinsard, R. (eds.), *L'évaluation des politiques publiques,* Economica, Paris, 1984, and in IUI Booklet No. 215, Stockholm.

expansion of the public budget share is entirely due to social security expenditure, which has almost tripled its share during the last 30 years.

Most social security expenditures can be said to be ultimately concerned with redistributing real income. This may take the form of insuring against social and economic risks, redistributing resources over the individual's lifetime or shifting the levels of life income prospects between individuals. This means that policies have been focused on the distributive effects. One reason why policy makers so far have often been unappreciative towards attempts at economic policy evaluations may indeed be their preoccupation with feasible redistributions. Economists, on the other hand, often treat redistribution as a side-issue, or a restriction on their main concern with efficiency and/or macroeconomic stabilization.

Policy ambitions are mirrored by the perceptions or models of economic reality used in public economic analysis. One problem is that these perceptions have changed as a consequence of the economic events of the 70s.

Policy Evaluations in a Swedish Context[1]

Some kind of policy evaluation normally precedes policy making. The policy cycle begins with *policy analysis* – the ex ante evaluation of options on which the *policy decision* is based. Then comes implementation and finally ex post *evaluation* – the theme of this paper – hopefully operating as a learning experience for the next round of policy making (Edlund, and others, 1981, and Wildavsky, 1979).

What one ultimately wants to evaluate is the *social effectiveness* of the implemented policy, i.e. its effects on the welfare of individuals and groups in the community. In most cases this is the same as its impact on the size and distribution of real income.

A useful distinction can be made between, on the one hand, *policy effectiveness* and, on the other hand, *management efficiency*. The second measures the efficiency in implementing policies. A good deal can be learned by simply looking inside Government offices. Evaluating policy effectiveness, on the other hand, almost invariably requires "field studies" of the policy impact on private individuals and organizations (Farell, 1957, and Førsund, Lovell, and Schmidt, 1980).[2]

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[1] For an alternative resumé of the Swedish experience in public policy evaluation cf. Premfors, 1984.

[2] The reader will notice that, contrary to the practice among business economists, we here use effectiveness as a broader concept than efficiency, encompassing also distributional considerations. The simplified distinction used above thus disregards the fact that implementation decision on the management level may also have important distributional consequences. For an extensive discussion of efficiency concepts and their applications to public administration, cf. Jackson, 1982.

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In evaluating efficiency in the private economy, economists often argue that welfare losses due to misallocation are negligible compared to the losses due to inefficient resource use within each line of production (Leibenstein, 1966). There are reasons to assume that the opposite applies to the public economy. Apart from distortions due to taxes and subsidies, there are the problems involved in "filtering" preferences through a representative democracy and its bureaucratic machinery. Intuitively, one would therefore expect the "non-market failures" to be far greater than the "market failures".

At least in Sweden, public opinion tends to regard the problem of inefficient public administration as limited compared to the risks of ineffective policy choices. Inefficient public bureaucracy therefore appears as less of a problem in Sweden than in most other countries. Many factors have contributed to this, notably a long tradition of disciplined and incorrupt bureaucracy. An overgrowth of central administration has not yet occurred. Moreover, the public sector is mainly associated with health and education – status goods in expanding demand. Compared to most other countries public policy in Sweden is also more decentralized. The relatively independent local authorities, municipalities and counties are responsible for more than two thirds of all public consumption (Ysander-Murray, 1983). Even central Government power is decentralized; policies are mainly executed, and often also initiated, by independent national agencies.

Although the number of domestic policy-issues in Sweden is comparable to that of a larger country, a small country has less resources for specialized policy evaluation. Decentralization has often provided an excuse for not even trying. Conventional wisdom among politicians is that decentralized decision-making is a substitute for policy evaluation. Public attention to policies is more immediate, when decisions are made "closer to the market".

There are two additional features of Swedish postwar politics, that have tended to lessen the interest in evaluating policies.

Many of the political institutions – like Government Committees – have been designed to produce consensus decisions. At any time there are 200-300 of these committees at work, with an average lifetime of 3-4 years. [1] They

[1] 206 Govt. Commissions were at work in the autumn 1983. Efforts are being made to speed up the investigative process, aiming at a maximum lifetime of 2 years.

are composed of MPs and representatives of different interest groups. Their task is to prepare – and negotiate – major policy changes and new legislation. Committees contract outside experts to review the past or develop new options, but are usually narrowly constrained by Government directives. Consensus politics mean that decision-making takes time. It might even include evaluation of past policies. But once consensus decisions are taken, interest in reappraisal tends to vanish.

Major policy decisions usually represent a heavy investment in terms of political credit. A certain amount of indoctrination is usually required to ensure support and acceptance. Hence, enthusiasm among responsible parties for later checking policy arguments against facts is normally lacking.[1]

The very rapid economic growth in the 50s, 60s and early 70s furthermore focused political interest on policy expansion and incremental change rather than on policy restructuring and alternative options. This necessarily limited the possibilities of evaluation by narrowing the range of "experimental variation" in the available data.

From Program Evaluation to Problem Reappraisal

Before 1960 the Government made no systematic policy evaluation. Evaluations – if they occurred – were initiated by some Government Committees to develop arguments for new legislation. The monitoring of public administration by the National Audit Bureau was limited to safe-guarding the interest of fiscal regularity and public accountability – what is nowadays often termed *compliance auditing*.

The period from 1960 to the late 70s witnessed an expansion in *program evaluation*. Both the economy and the public sector were growing rapidly, particularly local authorities, which expanded almost twice as fast as GNP. How to organize a trebling of university students and yet accommodate an even faster growth of adult studies was a typical concern of Government. Health and welfare services and pension schemes had to be prepared for a doubling of the number of old-age people. Public child-care capacity "had to" double to facilitate female labor participation needed to replenish an overheated labor market. Ambitions expanded and began to include better labor market matching and retraining, an "improved" regional balance of manufacturing investments, etc. Not least important was the need to reorganize public administration to cope with all new tasks.

Contrary to what happened in the Anglo-Saxon countries, program budgeting, PPBS[1], was developed and introduced in Sweden not as an in-

[1] Tarschys provides a stimulating discussion of the waxing and waning of political interest in policy evaluation during different phases of policy-making (see Tarschys, 1983).

[2] Planning – Programming – Budgeting – Systems.

strument for central Government policy making but as a way of decentralizing the administration to increase efficiency at the agency level. Program budgeting became an accepted routine for an increasing number of agencies. A unified scheme for program cost accounting and internal program reviews were gradually introduced in the agencies. The National Audit Bureau transferred its resources to selective checks on agency decision-making and reviews of programs. However, the risk of "in-built" expansion, always inherent in the PPBS approach, still remains a problem, although endogenous expansion has been curbed through enforced plans for program reductions at agency level (National Audit Bureau, 1983a and b, SOU 1979:61).

At cabinet level, ad hoc Government Committees were subjected to competition when several large ministries initiated their own R&D committees, with a semi-independent and semi-permanent status, staffed with both experts and civil servants. These committees were authorized to monitor and initiate policy research. Most policy evaluation at the time in fact took place in these committees. The record of serious policy evaluation, however, is far from impressive. Methods were crude and efforts low keyed. A few pioneering attempts at statistical analysis of program effects can be noted from the early 70s (SOU 1974:29, Björklund, A., 1981, and Kjellman, S., 1975). These efforts, however, cannot match the steady outflow of studies and the rapid development of statistical evaluation methods achieved in the United States ever since the negative income tax experiments (Guttentag, Struening, 1975, and Premfors, 1984). Some experiments were carried out locally in the social welfare fields, but these experiments were seldom used as a basis for a full scale evaluation. Economic evaluations of medicines and medical treatments did, however, become increasingly frequent. A common problem which we have as yet done little to solve concerns the poor availability of relevant and reliable panel data. The lack of good data is also the excuse often used to explain the very small amount of evaluation work in the field of taxes and transfers.

Within university education, however, policy changes and reform evaluations have been frequent in the postwar years (Edlund and others, 1981; Neave and Jenkinson, 1983; and Premfors, 1983).

After 1976, the long period of postwar prosperity was succeeded by industrial stagnation. A bourgeois Government was elected after more than forty years of socialist hegemony. Policy evaluation from now on could best be characterized as problem reappraisals. The mounting economic and financial problems, and the frequent changes in Government made it both possible and necessary to reconsider basic policies and conventional wisdom (SOU 1979:61). The political consensus was breaking apart and the climate of opinion was undergoing drastic changes.

This led not only to a heightened interest in policy evaluation but also to a change of direction of the evaluation work. From having been mainly "pro-

gram-oriented", evaluation work has become increasingly "problem-oriented". Instead of starting at the top level with an individual program like labor market retraining, and following it down the line to its final execution, trying to measure its differential impact on individuals and firms, the tendency now is to go the other way around. One begins by studying the total impact on a specific target group, such as children in day care.

At the management level, this has meant new tasks for the National Audit Bureau, which is now allowed not only to look at individual agencies and programs, but also to reappraise the efficiency of program and agency structure. The National Audit Bureau has established routines for computing total public transfers for various types of households and firms, and is studying the effects of diverse licensing laws and of deregulation measures in progress.

At the policy-making level there is a new interest in evaluating whole policy systems by comparing them with radically different alternatives. The Treasury has recently established its own R&D-committee, using it as a sounding-board for new policy options. Its interest extends to the appraising of new transfer structures and new models for social insurance.

Table 1 presents the various modes of public policy evaluation mentioned above in a summary fashion. In terms of this table Swedish development

Table 1 *Different modes of public policy evaluation*[a]

Object of study	Method of approach	Program-oriented study of incremental change	Problem-oriented study of intramarginal change
Management regularity		Compliance auditing	Studies of budgetary control systems
Management efficiency		Management auditing. Cost-effectiveness studies	Studies of bureaucratic systems
Policy effectiveness		Effectiveness auditing	Social welfare studies. Total impact studies of public policy.
(Allocative efficiency, distributional effects)		Program evaluation Cost-benefit analysis	Studies of alternative modes of financing and distributing public services and insurance.

[a] For a more elaborate classification scheme for public evaluation cf. e.g. Ahonen, 1983.

since 1960 can be characterized as a shift of emphasis "downwards" – from management regularity to policy effectiveness – and "to the left" – from program-orientation to problem-orientation.

However beneficial reappraisals are, they cannot replace the painstaking work of analyzing program impacts. Unfortunately, such work has not progressed in late years, and no effort has been made to build the necessary foundations in terms of good panel data and trained analysts. In the case of labor market policy and social welfare policy very little has been done to continue the statistical analysis initiated in the early 70s.

Only in one field has there been a fast expansion of evaluation work during recent years, viz. energy policy. A deluge of energy research funding has been channeled into policy and project evaluation work (Andersson-Bohm, 1981; Vedung, 1982; and Ysander, 1983).

Development in policy analysis during the last decade has also been disappointing. Benefit-cost analysis has, so far, become an administrative routine only at the National Road Agency. Good benefit-cost work on public projects is rare. The same is true for policy analysis using large scale simulation models, although an increasing interest has been noticed in the last few years (Carlsson-Bergholm-Lindberg, 1981; Vedung, 1982; and Ysander, 1983). There is of course a close connection between developments in policy analysis and policy evaluation. Evaluating policy means evaluating a social experiment. It is then important to know, by policy analysis, the expected consequences of the experiment.

The Evaluation Bureaucracy

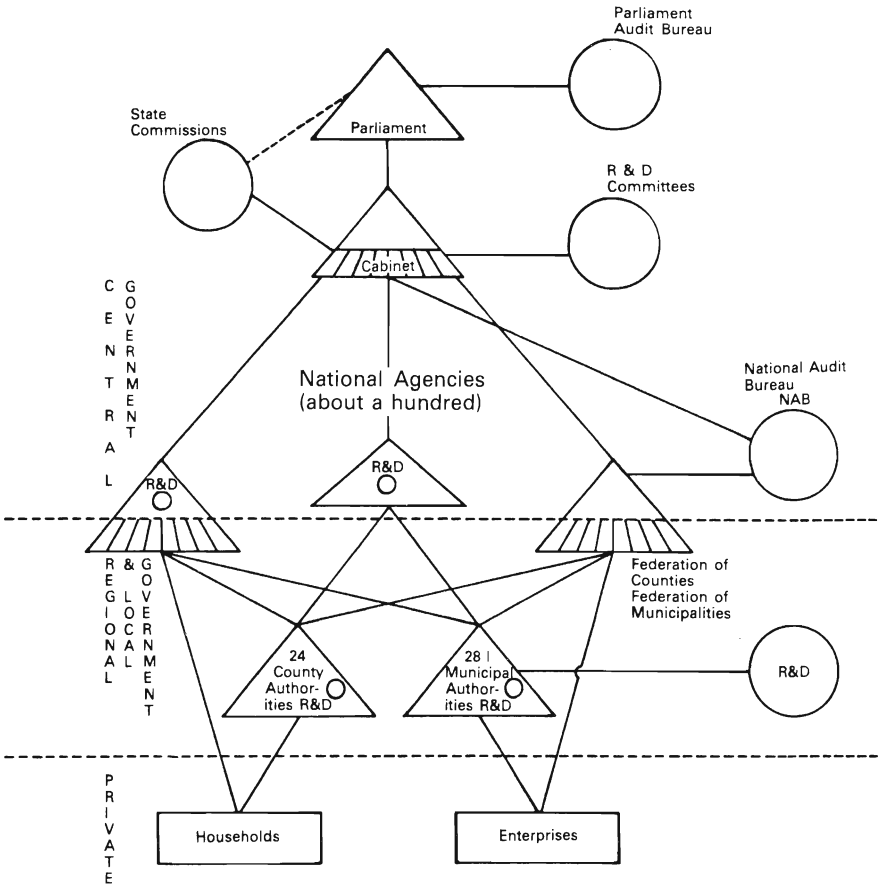
The organization of Swedish evaluation work is exhibited in Figure 1.

Parliament and Cabinet

The Parliament Audit Bureau is quite small and subordinated to a board of MPs. Its size and the political monitoring of its analysis have, so far, tended to reduce its role. This also reflects the weakened position of Parliament vis-à-vis Government during the last half-century. Frequent changes of government and the precarious parliamentary balance in recent years have not really changed that situation.

The traditional and dominant vehicles for policy evaluations in Sweden are the Government committees. Government directives and the tight time schedules of committee work narrowly limit the scientific ambitions of the evaluations. The most important function of the committee is to prepare the way for a consensus decision in Parliament. Hence, the expert arguments are often used more as political ammunition than as an objective support of decisions (Premfors, 1983).

Figure 1 *The Swedish organizational structure*



The second important source of policy evaluations at cabinet level are the temporary R&D committees, set up by ministries like Justice (BRÅ), Labor (EFA), Industry (ERU), Social Welfare (DSF) and Treasury (ESO).

National Agencies

A Swedish minister of state has a power position very different from, say, his French colleague. All cabinet decisions are taken collectively, and the minister's own staff rarely exceeds 40-100 people. Most executive work is

handled by the associated national agencies in accordance with a 300-year-old tradition. The national agencies enjoy a high degree of autonomy and protection from direct ministerial intervention. One hundred such national agencies and a couple of hundred minor national organs are responsible for current resource allocation and for the issuing of regulations and directives to local authorities and private organizations. Some of the major agencies also have a large regional organization.

Regional and Local Agencies

Even though relatively autonomous by international standards, the Swedish counties and municipalities are regulated by the state. Around 70 percent of local expenditures are somehow regulated and some 30 percent of these regulated expenditures are, on average, paid by the state. Comprehensive schools and highschools in the municipalities are subjected to particularly heavy subsidies and regulations. The same goes for medical services, which are the main responsibility of the counties.

Internal auditing and reviewing within local authorities therefore emphasizes management effectiveness. Since "municipal mergers" in the early 70s reduced the number of units to a third, better and more unified systems for cost accounting and financial management have been organized.

A number of counties, and some of the major municipalities in metropolitan areas do, however, have their own R&D units, for planning large investment projects and for monitoring labor market flows.

Decentralization and Fragmentation

The slow progress of policy evaluation in Sweden is best explained by its decentralized and fragmented organization.

The *decentralized* structure of Swedish Government has eased the political pressure for central government monitoring. Evaluations of policies, for which responsibility rests with the local authorities, may e.g. often be considered not only less urgent but even politically unsuitable for organs of central Government. Attempts in postwar years to have interest groups or client representatives directly involved at different levels of the National Agencies have been seen as a vehicle for faster and more direct feedback.

There is always a political tug-of-war between, on the one hand, the groups clamoring for centralized regulation and resources to protect their interests or the equality of standards and, on the other hand, the more general pressure for decentralization and deregulation in the name of efficiency and freedom (Tarschys, 1975 and 1983b). The last decade of Swedish politics has witnessed strong swings in both directions with restrictive labor market legislation and heavy industrial subsidies (Carlsson-Bergholm-Lindberg,

1981) on the one hand, and on the other, a flow of actual or proposed deregulation measures.

The Swedish organization of policy evaluation is also very *fragmented.* A major part of evaluation work is initiated and financed by temporary government committees and commissions with very limited budgets, tight time schedules and narrow political directives. In most cases they have been set up to investigate a specific proposal. Evaluations of past policies therefore tend to be not only limited but also superficial, relying in most cases on a review of already documented experiences. No individual commission has the right, the resources or the patience to conduct a full-scale statistical post mortem on important policy choices in the past. Neither will they plan their proposals in order to facilitate later evaluation (Premfors, 1983b). Even though references to evaluation requirements have become frequent in government policy documents, so far these requirements have been more related to management efficiency than to policy efficiency.[1] The fragmented organization also makes evaluation difficult in another way. There are increasing returns to scale in evaluation work in the sense that everybody can benefit from the production of good economic and social data, and from the building up of a common body of expertise within Government. Individual committees etc. can reap the benefits of such common resources but usually they can do little alone to produce them.

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[1] This conclusion has been drawn from a survey of the ministries, carried out in September 1983 by the Committee for Studies on Public Finance (ESO) on behalf of the author.

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PART II.

Current and recently completed research projects

1 Medium-Term Projections and Coordination Projects

1.1 Medium-Term Projections

Evaluating the 1990s – The IUI Long Term Survey 1985[1]

(published in Nov., 1985)

by Gunnar Eliasson, Anders Björklund, Tomas Pousette, Enrico Deiaco, Tomas Lindberg, Bo Axell, Hans Genberg, Lars Oxelheim, Nils Henrik Schager, Jan Södersten

The Swedish economy – this study concludes – is a classic case of overconsumption, price distortions, and a conflict between politics and markets. The remaining years of the 1980s can only be marginally affected by policies. The central issue for economic policy is how to get back on the right track in the 1990s.

Economic Balance Can Only Be Achieved through Faster Growth in Output

The balance of payments deficit and the budget deficit will be with us for at least the rest of the decade. The essential task now is to stabilize the industrial environment and guarantee the long term ground rules for the market. Only when this is achieved will the investments needed to promote faster growth be realized. Concretely, this will require a reduction in public sector consumption and transfers as a percent of GNP, as well as innovations in the ways of financing public sector activity.

[1] Swedish title: *Att rätt värdera 90-talet – IUIs långtidsbedömning 1985,* IUI, Stockholm.

Industry is Investing in Services and Skills

Industry operates as the growth engine for the Swedish economy. Up to the beginning of the 1970s, export of raw materials and basic manufactured goods financed a high standard of living. The new firms now taking over are characterized, instead, by a high degree of service production, in which special skills in product development and marketing determine the product's quality as well as value. Despite steady expansion over the past decade, the new industrial firms are not yet capable of generating the export income needed for long term external balance.

According to a company survey conducted by IUI, the firms' own plans for the remainder of the decade are highly optimistic; manufacturing production is planned to grow by 4.5 percent per year between 1984 and 1990. Model simulations tell a different story. An annual increase of even half this amount is considered unlikely, unless a strong and unexpected international investment boom takes place. A more likely scenario is that major problems in many of the crisis firms of the 1970s will reemerge during the coming business cycle slowdown.

Concentrate Labor Market Policy on Those Who Need Help

The capacity of the labor market to smoothly reallocate labor from declining to expanding firms – without generating inflation or higher unemployment – will determine not only the rate of economic growth, but also the severity of the social problems resulting from this type of adjustment.

The adjustment problems are confined primarily to the middle age and older work force, who have had the misfortune to work in the wrong industries. The younger labor force is still highly mobile and should be educationally prepared for the new types of jobs.

Over the past few years, the demand for labor has shifted towards those occupations that require higher education. IUI's company survey indicates that this development is likely to continue.

Attempts to retrain unskilled labor have not been particularly effective. Early retirement has been used increasingly as a labor market policy, and this type of policy is often viewed by the unemployed as highly desirable. Public labor market programs are, in fact, likely to backfire; prospective employers tend to screen out trainees on the assumption that participation in these programs signals a deficiency on the part of the trainee.

Wages Mean a Great Deal

One solution to the growing labor market problems is to increase after-tax wage differentials. A number of studies show that the decision to move and/or change jobs is sensitive to wage differentials and that job changes generally pay off. Labor market policy should therefore concentrate on the relatively small groups in the labor market who have significant problems.

A second possibility – that can be combined with wage flexibility – is an increase in expenditures on individuals affected by business failures. Experience shows that the concrete measures, in the form of retraining and labor exchange programs, are

effective only if they are seen as attractive by both individuals and companies. They also require a positive and active commitment on the part of the individual. One way to promote this objective is to rely increasingly on insurance fees which are used to help those individuals who lose their jobs as a consequence of structural change.

Break the Government Monopoly on Employment Agencies

Labor market programs will increase steadily in importance, especially for the small group with major problems. Despite the reputation associated with Swedish labor market programs the techniques needed to achieve good results are poorly developed. Both innovative thinking and individual solutions are needed for positive results. Free entry of private employment agencies – currently prohibited – is probably needed to revitalize the government monopoly that is currently responsible for all labor market programs.

Higher Flexibility in the Labor Market Gives Lower Unemployment

Future developments in Swedish economic performance will be determined in large part by the extent to which the *need* for low wage increases is matched by the labor market's *ability* to achieve low wage increases.

It is shown that the rate of wage increases is determined to a large extent by the employer's ability to quickly recruit labor, while business profitability has no clear effect on wage developments. 1974 and 1984 were both characterized by high levels of profitability, but while wage increases were very high in the first case, they were quite low in the second. The explanation is clear: employers had considerable recruitment problems in 1974 – but not in 1984.

The studies also show that the Swedish labor market has become far less flexible since the end of the 1960s. The current "price" for a favorable recruitment environment is a level of open unemployment among industrial workers that is far higher than that needed in the 1960s. Figure 1 shows that in the 1960s, a vacancy could be filled within 2 weeks when unemployment was only 2 percent. Today, an unemployment rate of 4-5 percent is needed in order to fill the vacancy in the same time.

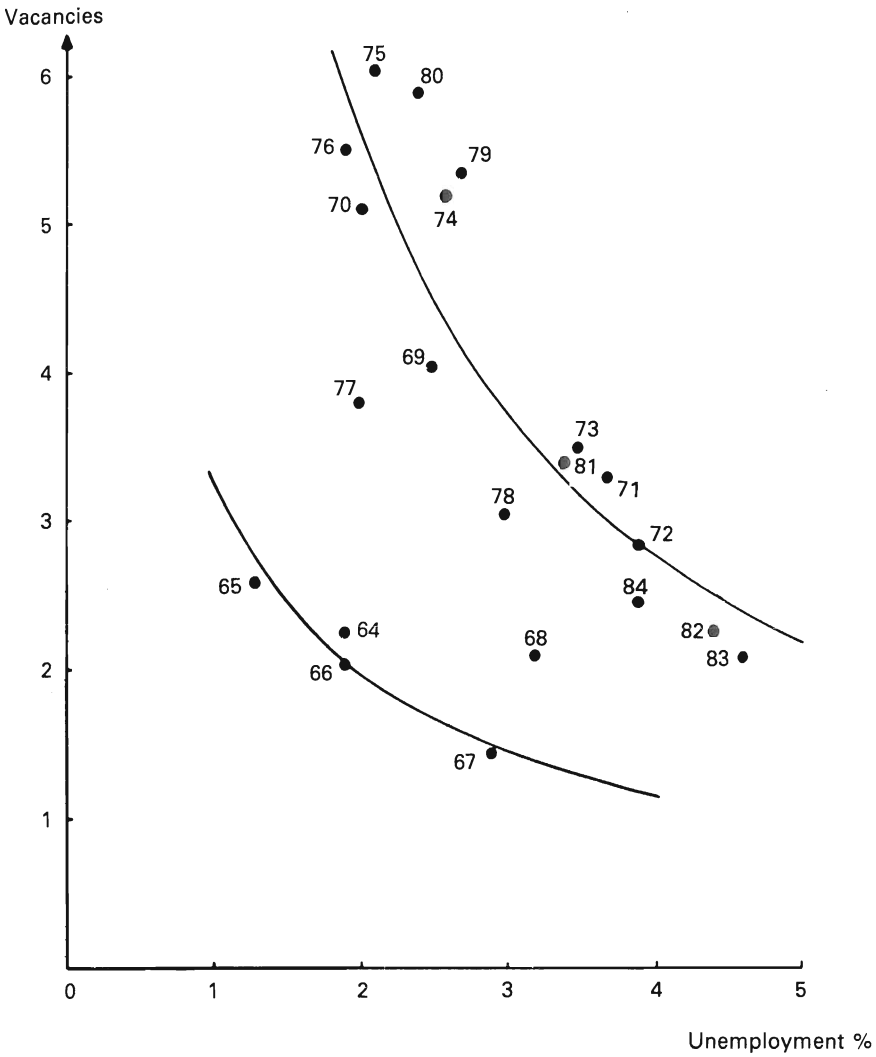
Labor Market Policy Immobilizes Labor and Fuels Inflation

This development reflects changes in attitudes as well as the cumulative effects of labor market and industrial policy (note that the curve in Figure 1 shifts outward sharply in the late 1960s). In other words, the low wage increases that are essential for Swedish competitiveness are achieved today through higher unemployment. Yet an alternative is available: an increase in the degree of labor market flexibility.

Profitability is Neither High Enough nor Secure Enough to Restart the Growth Engine

Swedish industrial production accelerated in 1982 after 10 years of stagnation. This break in the trend is the result of structural change as well as the devaluations of 1981

Figure 1 *Duration of vacancies (weeks) and open unemployment in percent, 1964-84*



and 1982. A return to the stable growth rates of the 1960s, however, requires both a higher level of industrial savings and a reallocation of resources from stagnating to expanding firms.

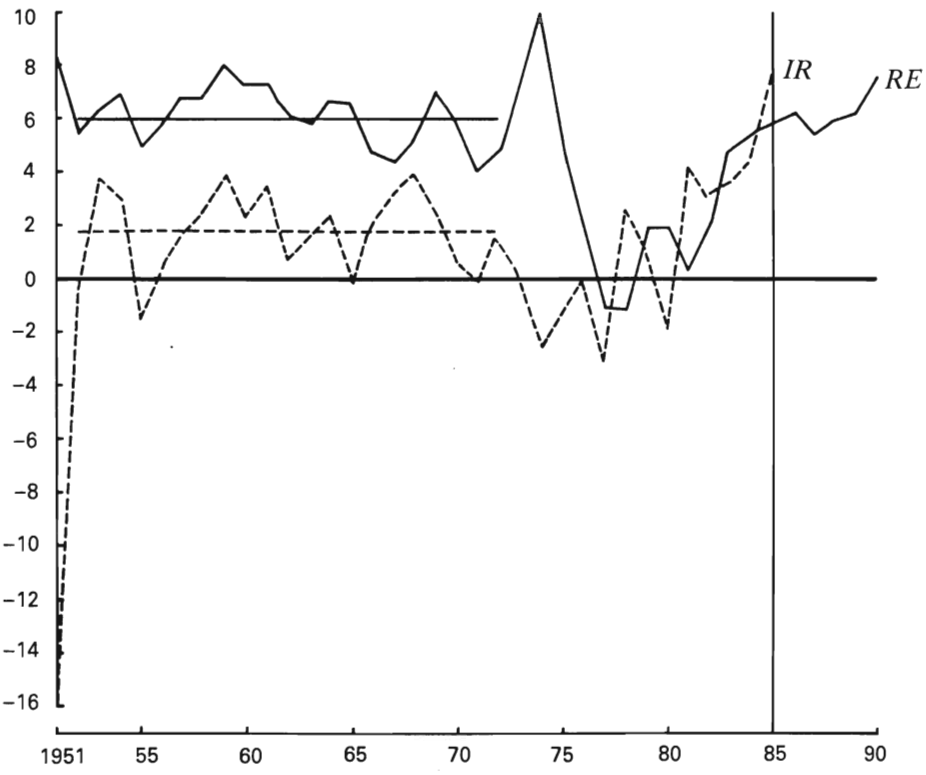
Many of the large crisis firms are still operating on a much larger scale than would have been the case without subsidies. They absorb scarce resources. Since crisis industries pay the highest wages is manufacturing, their very existence supports a higher factor price level across industries and hence they indirectly restrict growth among the healthy firms. Furthermore, even at the peak of the business cycle, the real rate of profit still remained at, or just below, the average level for the whole postwar pe-

riod (see Figure 2). This is very close to the real (Fisher deflated) long term loan rate. It is not sufficient to support the higher level of investments needed to promote faster growth in manufacturing output and long-term "balanced" growth.

New Forms of Capital Require a More Efficient Markets for Finance

Expanding industries, however, appear to base their competitiveness more on product development and marketing than on factory processing. For this reason, new forms of capital are gaining in importance relative to investment in machinery and buildings. Investment in new products demand ever increasing resources, while the product life-cycle grows ever shorter. This dual process increases the total risks for the firm. The existing capital market is not well organized to provide for the new types of financing that this development demands. Hence the new forms of investment increase the importance of equity finance among manufacturing firms.

Figure 2 *Real rate of return in industry (RE) and the real interest rate (IR), 1951-90*



Note: The horizontal lines are averages for the period 1952–72.

The Social Insurance System: Privatization through the Back Door

Policies to Promote Equality have Generated New Inequalities in Wealth and Income

The inability of politicians to restrict public sector consumption growth in the 1970s has undermined public sector finances. The reduction in living standards of low income groups – that would have occurred through decisions to lower transfer payments – is now occurring instead as a result of lower benefit levels in the social insurance system. Taxation and public sector growth have been central elements in income equalization policies. In the initial period, these policies gave small but expected effects. It is now generally agreed that such policies have become increasingly inflationary.

The combination of inflation, taxes and expectations about arbitrary expropriations of private wealth has generated, since the early 1970s, marked price distortions in the real estate and equities market. For a small group of informed professionals, this has offered exceptional opportunities to earn rapid and very large capital gains. As a paradoxical consequence, egalitarian policies of the 50s and the 60s appear to have created new disparities in the distribution of wealth. Since attempts to change this new tendency threatens economic recovery, the study suggests that it is only a matter of time until income and wealth distributions in Sweden will be back where they were when ambitions welfare policies began. If policies are not well designed, the future economic situation – with the much larger current public involvement in production and perhaps combined with persistent stagnation – will be unfavorable for future ambitious welfare efforts. Such a situation will have strong, long-term political consequences, concludes the study.

The Rest of the Century Will Favor Savers

While income and wealth distributions develop adversely for low wage groups and the distribution of wealth shifts in favor of upper income brackets, the public sector deficit has to be financed at a rate of interest established in international markets. In order to finance the deficit with domestic savings, private savers must be guaranteed an attractive rate of post-tax return on their savings. According to all reasonable calculations, the rest of the century will favor private savers. Private wealth will increase significantly as a factor in the total household insurance protection against sickness and retirement. This development represents a form of disguised privatization of the social insurance system, and should be seen as the market reaction to several decades of overambitious redistributional policies that aimed at precisely the opposite effects.

Economic Growth in a Nordic Perspective

(published in May, 1984)

This book was jointly authored by IUI, ETLA in Helsinki (Finland), IØI in Bergen (Norway), Det Økonomiske Råd and IFFF, both Copenhagen (Denmark). Emphasis is placed on differences in policy responses among the four countries during the

70s and the first part of the 80s and the consequent growth, unemployment and inflation experiences.

This was the first in a projected series of biannual reports from a joint project on Nordic medium term surveys. Forecasts up to 1987 were presented. The survey examines such problems as the uncertain oil wealth of Norway, the economic tension and need for changing priorities in Denmark, the stagnation problems of the Swedish economy and the slowdown of Finnish economic growth. Recent events, like the dramatic drop of crude oil prices, the substantial fall in the U.S. dollar rate and the downward trend in the international interest rates and inflation are among the most important factors that call for revisions of the "conservative" forecasts.

One issue of crucial importance for growth among the Nordic countries is the ultimate decrease in oil prices. In Finland, the whole price reduction on crude oil will probably be passed onto consumers, while in Denmark a flexible tax will keep the price to the final consumers more or less constant. Norway and Sweden tend to place themselves somewhere in between these policy extremes.

Regardless of which assumptions and expectations are used, growth perspectives appear to have improved during 1986. Yet growth prospects differ significantly among the four countries. Norway as an oil producer and Finland because of its barter-trade with Russia are affected negatively by the oil price reduction, while Denmark and Sweden experience positive external influences.

Growth Policies in a Nordic Perspective

This project updates the earlier analysis in *Economic Growth in a Nordic Perspective* (see p. 166) and prolongs the forecast horizon to 1990. The dynamics of resource allocation is still in focus, and particular emphasis is placed on the markets for finance, notably the equity market.

The policy discussion of the Nordic analysis will be concentrated around four themes: (1) Policy control of the Nordic economies' factor markets, (2) Deregulation of Nordic markets, notably the markets for finance, (3) The loan rate, returns to investment and investment growth, and (4) Fiscal restraint in the Nordic economy to reduce inflation tendencies and to achieve a correction of distorted relative prices.

The first issue relates to how a Nordic policy strategy of risk dispersion vis-à-vis erratic raw material prices, notably oil, can be designed on a Nordic base. The second issue relates to the diffusion of industrial knowledge throughout the Nordic economy; how are rents to be shared, how should costs and risks be shared; notably how is Norwegian oil resources of unstable future value to be transformed into industrial knowhow? The third and fourth issues are more conventional. First, to what extent does it appear profitable for firms to engage in volume expansion, especially on borrowed money? This problem relates in turn to the outlook for inflation and interest rates. How should a temporary infusion of disposable income, due to a lowering of oil prices, be prevented – in Denmark, Finland, and Sweden – from becoming a permanent increase in private and public consumption? And how should Norwegian private and public demand be trimmed to match long-term feasible income generation. The last two issues relate directly to the problem of demand control in advanced wel-

fare economies. In addition to the policy discussion analyses and forecasts up to 1990 for all four economies are presented.

The main conclusion for the Nordic economies of the 1984 report is still valid. The industrial potential is impressive, but regulations and policies associated with the advanced welfare economies prevent this potential from developing. Regulation of the capital market, in particular, restricts potential cooperation among Nordic producers and appears to hamper economic growth.

Investigators at IUI: Enrico Deiaco, Lars Jagrén and Lars Oxelheim.

1.2 Productivity in Large Business Organizations

The IUI is currently engaged in a major research program aimed at an improved understanding of the changing nature of the modern business corporation, and the ways these changes affect the nature of information use and decision making at the micro level. Two publications are ready and are presented below (see below and p. 171). Two more publications are in progress; *one* on service production in manufacturing industry and the development and use of human knowledge production (see p. 173), *the other* on the reorganization of firms and the importance of the way ownership and markets for corporate control are organized (see p. 175). These publications will all be in Swedish. However, much of the material is being prepared for publication in English and some is currently available in Working Paper form.

How are Large Business Groups Managed?[1]

(published in Nov., 1984)

by Gunnar Eliasson, Harald Fries, Lars Jagrén and Lars Oxelheim

This is the first in a series of studies on the internal organization of modern manufacturing firms. It focuses on the ways the activities of heterogeneous business groups are coordinated and the use of new information technologies in managing them. The book was produced for the Swedish Computers and Electronics Commission – and highlights the changing nature of production in the large multinational corporations that form the backbone of Swedish industry. Electrolux, ASEA, Sandvik and Beckers are specially analyzed with a view to understanding the structure of their internal information systems. Separate studies are devoted to the effects of high interest rates and inflation on the organization of work in a large construction project and the ways

[1] Swedish title: *Hur styrs storföretag – en studie av informationshantering och organisation,* IUI, Stockholm.

exchange risks are handled in large Swedish firms. The large exchange losses during recent years makes the latter special study particularly interesting.

The study *concludes* that

(a) Economies of scale in factory production has diminished in importance compared to the development of new product technologies and innovative marketing.
(b) The modern manufacturing firm has moved its competitive base from cost efficient factory production of simple products towards a product technology.
(c) The growing service element of production reflects the increasing use of information and human capital in manufacturing production (see next project).
(d) Forecasts and central corporate headquarters for planning are no longer the important management tools they were in the early 70s. What matters is the ability to monitor the current position and state of the company against targets and to adjust to unexpected events. Foresight has been replaced by control and flexibility in formalized management procedures. To some extent this reflects the shortened horizons caused by the increased environmental uncertainty of the 70s. Top management has drawn two important conclusions: foresight cannot be delegated to formalized staff analysis and uncertainty was present and flexibility needed long before the "unexpected" oil crisis materialized.
(e) Computers and new information technologies appear to be shifting technical change in a relatively more capital saving direction.

Mass Production of Simple Products is No Longer the Dominant Orientation

This reorganization of manufacturing production has transformed the firm from a process cost efficient factory towards a knowledge intensive service producer, the service control predominantly manifesting itself in the form of product quality. In many large firms product value more than doubles through marketing and distribution after the product has left the factory. Product development, marketing, "banking" in a broad sense etc. are important internal manufacturing activities. This development has made the manufacturing firm an increasingly heterogenous and complex entity to manage. Increased uncertainty in the international business environment in the 70s, and a growing complexity of business operations have radically changed the ideas about how firms should be efficiently run. The long-term planning and notions of scientific management methods at top levels have all but vanished.

Improved Central Profit Control Makes Delegation in Complex Organizations Possible

As case studies demonstrate, modern information technologies make possible more efficient central profit control and coordination of heterogeneous business organization. More reliable central profit control allows management to delegate operations management.

High Interest Rates have Promoted Capital Saving Technical Change

Modern information technologies make improved overview of complex activities possible. A better overview and improved flow coordination improve capital ef-

ficiency. High interest rates have also provided increased incentives to save capital. This is illustrated in the study of construction work at the nuclear power plant Oskarshamn III. Faster construction due to a more costly organization of work got clear power generations on stream faster. This meant a higher production value of construction work and hence improved productivity, even though conventional productivity measurements showed exactly the opposite result.

The Limits of Management Control

Formalized information and management systems all represent ambitions to move calculation and exact presentation – in short grammar – to higher decision levels in complex organizations. The limits of this are reached somewhere between repetitive routine lower level decisions and decisions related to the restructuring of the organization. In the latter case, decision information from past operations of the firm – the base of all information systems – is no longer useful. Hence, a conflict exists between routine management of operations – which is typically conservative – and higher level ambitious to reorganize the company. The latter decisions create the largest advances in productivity and profitability. Hence, efficient information systems at lower level coordination management may at times be detrimental to long term business viability in the sense that such systems may make high level management more prone to resist change.

Exchange Losses are Significant

The turbulence in exchange markets has been an important element of uncertainty during the last 10 to 15 years. In 1981-82 exchange losses reduced operating profits in Swedish industry by about one third. In order to reduce the risk of such losses in the future, it is essential to develop a comprehensive risk management system, based on changes on inflation, interest rates, and exchange rates. These external variables depend on one another. Hence a simultaneous approach will make total risk management more efficient. No Swedish multinational currently attempts to coordinate these management activities with a view to obtain overview and reduction risk exposure. However, work in that direction is in progress.

It is also observed

- that Swedish firms normally restrict attention to the Swedish part of group operations
- that the 1981 and 1982 devaluation of the Swedish krona alerted top management to the importance of improved central exchange risk control
- that the correct use of the term "exchange loss" for something means that what often should be calculated as a capital cost is mistakenly thought of as a "failure".

The Giant Swedish Multinationals
– a Study of Macroeconomic Consequences of Internationalization[1]

(published in Jan., 1985)

by Gunnar Eliasson, Fredrik Bergholm, Eva Christina Horwitz and Lars Jagrén

A group of technologically advanced and highly internationalized business groups have replaced the earlier, dominant role of basic industries. Originally a study for the Government Medium Term Survey[2], this new book introduces the large Swedish firms in a macroeconomic perspective. It concludes that:

- The value added of a few larger firms accounts for a significant proportion of total manufacturing production in Sweden, giving the false idea of extreme market concentration. It is instead the case that all large Swedish firms operate in comparative world markets. Even though some of them command significant shares of their markets, the issue is not market concentration, but dependence of the entire Swedish economy or a small number of producers, a problem more appropriately called vulnerability.
- For the rest of the decade Swedish manufacturing and the Swedish economy will remain critically dependent upon the economic development of some 30 large manufacturing corporations. Most of them have weathered the structuring problems of the 70s exceptionally well. This would not have been possible without their extensive international operations.
- Swedish industry of today stands on *three legs; product development* that accounts for almost all R&D, an *international market organization* that accounts for most foreign investment and *efficient factory production.*
- The myth that firms invest abroad instead of at home is wrong. Foreign subsidiaries are predominantly engaged in market activities. Such investments create a demand pull for manufacturing and product oriented R&D at home.
- The adjustment problem of the 70s was mostly a problem for the hardware capital intensive, mass production firms based on simple product technologies. An international perspective suggests that without an extensive global network of subsidiaries, Swedish engineering firms would not have adjusted to the new competitive situation as efficiently and rapidly as they did.
- The idea that industrial policy making can be improved through political participation and representation in the internal dialogue of firms is badly misguided. Consequent decisions will be resistant to structural change; simple short-term gains on the employment side will then become relatively more important than the long-term considerations that normally dominate at higher decision levels. This is likely to increase vulnerability in the longer run.

[1] Swedish title: *De svenska storföretagen – en studie av internationaliseringens konsekvenser för den svenska ekonomin,* IUI, Stockholm.

[2] The 1984 Medium Term Survey of the Swedish Economy.

Old firms dominate

In a ten year perspective Swedish economic development will be critically dependent on a group of 30 large manufacturing firms. All of these, except one (Tetra Pak), were founded before the second world war; two thirds, in fact, before the turn of the century. The composition of this group, however, has not been stable. In the mid 60s large basic industries constituted the core, but they have been replaced – predominantly as a result of the 70s – by a group of engineering firms.

A characteristic feature is that they have been subjected to constant internal reorganizations throughout their life span, often being on the verge of bankruptcy.

Business Success Is Not Only a Matter of Technology

The problem associated with these observations is that it is virtually impossible to predict "who" will be in the group of the top 30 by the turn of the century. It is concluded that it is wrong to focus attention only on "technology". Management, business know-how and new commercial business skills related to product design and markets are equally important elements of business success.

Table 1 *Investments in the 5 and the 37 largest Swedish manufacturing groups, 1978*
Percent

	The 5 largest groups		The 37 largest groups	
	All group only	Foreign subsidiaries	All group only	Foreign subsidiaries
R&D	25	10	21	6
Machinery and buildings	45	41	52	42
Marketing	30	49	27	52
Total	100	100	100	100

Note: Firms have been ranked by foreign employment. Investments in Marketing and R&D have been estimated from cost data.

Table 2 *The 10 largest Swedish multinationals account for:*

of Swedish exports	ca 30 percent
of industrial R&D spending	47 "
of total manufacturing employment abroad	more than 70 percent
of total manufacturing employment in Sweden (directly and indirectly)	ca 30 percent

The Manufacturing Firm as an Information Processor and Service Producer

– a Study of the Industrial Knowledge Base of a Country and the Transformation of Manufacturing Firms into Service Producers[1]

(published in Nov., 1986)

by Gunnar Eliasson, Bo Carlsson, Enrico Deiaco, Thomas Lindberg and Tomas Pousette

Information processing broadly defined is the major resource using activity both in society as a whole, and in the typical, goodsproducing sectors of manufacturing industry.

Knowledge-intensive and information demanding goods production have turned manufacturing firms into service producers, technical and marketing service inputs often more than doubling the value of the product compared to factory process costs.

The softer production, the more knowledge intensive production, concludes Gunnar Eliasson in his summary chapter. The most important part of individual knowledge accumulation appears to take place in the form of acquiring complex, tacit knowledge on the job or through varied careers. Indirect evidence suggests that the formal education provided by public schools and university systems have not properly captured the nature and complexity of the knowledge used and demanded in modern manufacturing firms.

One particular problem is that both industrial knowledge and the institutional superstructure of the economy are rooted in the traditional goods production structure of past industries. The provision of skills rather than knowledge permeates lower level education. And in the variable environment of higher level professionals in industry, the scholastic training for an academic research career may not be the most efficient way to provide desired talent and skills.

To compensate for this deficiency, firms are beginning to organize their own internal schooling. The "firm" and the "market" as a school are terms frequently used. The size of the public educational systems in western industrial nations make this not only a question of how the production of total educational service is best designed and organized, but also an important cost issue. Because of the non-market sheltered conditions of public educational production, the latter has taken a long time to surface as a problem.

Much service production is aimed directly for consumption or is complementary to goods production. Most service production, however, has to do with information processing, communication and intermediation in society to make the economy tick. This includes the political machinery and the welfare system that has been largely removed from the performance control exercised by market competition. Much of

[1] Swedish title: *Kunskap, information och tjänster – en studie av svenska industriföretag,* IUI, Stockholm.

this intermediation is necessary for economic production in general to be operational. However, the design of intermediation at large means that while some of it is efficient and positive, other parts may become extremely costly, that are at times directly welfare reducing.

In general, concludes the new book, the orientation, scope and efficiency of total service production in society is becoming a major production cost problem in advanced industrial nations.

Thomas Lindberg and Tomas Pousette report on data on the composition of production for a separate survey to all large firms in Sweden. They show that on the whole only about half of total manufacturing costs are associated with factory processing costs. If one looks deeper into the composition of factor costs for growth processing, in turn, less than half of these are related to the actual manning and operation of machines. The rest is information oriented service jobs related to work scheduling, administration costs, monitoring, and quality control etc.

Enrico Deiaco concludes in his chapter that with long educational production periods to provide for unpredictable demands for skills, the lack of engineers currently discussed may not at all be a problem of an undersized schooling system. It is rather a matter of allocation and inflexibility. Skilled people are getting stuck in the wrong jobs and abstaining from their most important schooling experience, a varied professional career.

Bo Carlsson, finally, compares the overall size of the service content of production in the U.S. and in Sweden. Of particular interest is the information content of official statistics, dependent as it is on a classification system developed at the turn of the century.

Flexibility in Firms
– a Study of the Labor Market Conflict 1985[1]

(published in April, 1986)

by Lars Jagrén and Tomas Pousette

At the request of The Government Board for Economic Defense (Överstyrelsen för ekonomiskt försvar) IUI has analyzed the flexibility and vulnerability of firms during the labor market conflict in May 1985. The study is based on interviews with firms from different industries, of different size and located from different areas. The conflict primarily affected international transports and led to delays and cost increases in incoming as well as outgoing deliveries.

Economic defense in Sweden is to a large extent based on the commercial inventories of companies and incentives to adjust. It was therefore interesting to see how firms had in fact reacted in an actual crisis situation.

[1] Swedish title: *Flexibilitet i företag. En studie av arbetsmarknadskonflikten 1985,* IUI, Stockholm.

The study focused on the individual firm and its particular objectives. The most important results of the study are:

- In the short term, firms were generally more flexible than assumed by defense planners.
- The firms had taken very few prior precautionary measures. They also were reluctant to enact precautionary measures during the conflict on the expectation that the conflict would only last for about a week.
- Only minor transport delays and cost increases occurred. Transport methods and routes were successfully changed and rescheduled.
- The impact on production was minor.
- No change in planning strategies occurred.
- Total "extra costs" increased by the conflict were small.

Decentralization Increases Flexibility

To a much higher extent than anticipated the companies managed to adjust smoothly to the new situation. A decentralized organization of the economy and of the firm clearly increased the efficiency of adjustment.

The analysis of relationships between organizational form of the firm, the hierarchical structure of decision making, and the non-existence of centralized operating knowledge, especially as regards substitution possibilities suggest that too much central planning of crisis adjustment of the economy would be detrimental to flexibility.

The Firm; Objectives, Controls and Organization

Development of more efficient and more comprehensive information systems for corporate control continues. Modern electronics based information technology has spurred far reaching speculations on the "automation" of high level management and great ambitions to develop advanced and comprehensive business information and strategic support systems. This study, which concludes this series of industry studies, investigates the communication and use of information throughout large business organizations. A decision model for the large firm is developed, the aim being to identify the nature of the comprehensive management and control problem. Our research on actual information system in use is summarized, and the potential for the ultimate, universal decision support system is evaluated through interviews with users and designers of the new "information product". This study in fact transfers the knowledge accumulated in the industry project in compact form to the new project on the economies of industry organization, efficiency, ownership and corporate control (see further p. 209 f).

Investigator: Gunnar Eliasson.

1.3 Large Scale Model Building at IUI

Large scale modeling began at IUI in the mid 70s. During this period, large scale macro models came into disrepute and many modeling projects were abandoned. Yet, at that time, IUI research on very large scale models increased significantly. The rationale for this contrary orientation of research efforts was that the critical policy problems of the disorderly 1970s could not be handled without large scale models. Lack of good methods to deal with important problems is no excuse for shifting attention to less important problems. The question has never been whether large scale models should be developed or not. It has been *what* large scale models should be developed and how economic method should be improved.

The institute has developed three large scale models. The *first* model, ISAC, is a 36 sector demand based, Keynesian-Leontief model with certain dynamic feedback loops. Work on this model was initiated in the early 1970s[1], and the model has e.g. been used in the first two medium term surveys of IUI and in the large study on energy adjustment and policy (see p. 186 f). The model is currently used by the Treasury in modified form. A report on ISAC has just been published (see p. 177).

Second, the micro-macro (M-M) model called MOSES – initiated by IBM Sweden and the Federation of Swedish Industries in the mid 70s – is currently being reestimated for more advanced empirical applications (p. 179 f). This model represents a new and somewhat controversial methodology in which the theory of business decision making is merged with traditional economic theory into a macroeconomic systems explanation in which aggregation is explicit through dynamic markets. The M-M model is seen as a dynamic version of general equilibrium theory with individual price and quantity setting behavior at the micro level. A description of the model, with emphasis on the financial markets, has recently been published (see p. 179).

Finally, the *third* model is a pure macro model with a monetary orientation. It was first developed and used for the 1979 long term survey of the institute.[2] Work is currently being resumed on this modeling project in cooperation with the National Institute for Economic and Social Research (Konjunkturinstitutet).

The three modeling projects differ in their purpose. While the *sector model* was developed to serve as forecasting support for the first IUI long term survey in 1976, the *M-M model* was originally seen as an attempt to bring more behavioral micro information to bear on macro analysis. Hence, understanding the nature of the capitalist market growth process and the limits of policy making were prime concerns. The *monetary model* came about as a tool for analyzing inflation, notably for assessing the effects of price controls (see p. 226). The three models have been developed to deal with different economic problems. They define three different degrees of elaboration in specifying the dynamics of long time supply. Notably the M-M model

[1] See Jakobsson, Ulf, "En beskrivning av IUI-modellen", in *Bilagor till IUIs långtidsbedömning 1976* (Special Studies for the IUI Medium Term Survey 1976), IUI, Stockholm.

[2] See Axell, B., "Inflation och resursutnyttjande" (Inflation and Resource Utilization), in *Utrikeshandel, inflation och arbetsmarknad. Specialstudier för IUIs långtidsbedömning 1979, del I,* (Foreign Trade, Inflation and the Labor Market. Special Studies for the IUI Medium Term Survey 1979, Vol. I), IUI, Stockholm.

goes a long way in endogenizing structure through entry, exit and micro investment behavior. The ambition is to overcome some of the static limitations associated with current theorizing in industrial organization (see further p. 233 on teaching at IUI). All three models have focused on policy analysis and stayed away from forecasting. However, the three models not unfrequently give different answers to the same questions. This illustrates the ad hoc character of the current state of economic theory (see p. 17 f). Perhaps this will always be the case, and if so it pin-points both the limits and the reliability of information available for policy makers.

Two Models of an Open Economy

(published in July, 1986)

by Bengt-Christer Ysander (editor), Lars Bergman, Tomas Nordström and Leif Jansson

The postwar development of the Swedish economy is reflected in the history of its medium-term macroeconomic models. The 1950s and 1960s were periods of fast growth and relative price stability. Medium term policies were focused on distributing the gains of industrial productivity growth and international trade through a fastly expanding public welfare system. The main task of the government's medium term survey was to check on the consistency of allocative schemes and to provide a framework for long term public expenditure plans.

During the 1970s the focus of medium term problems changed drastically. Increased price and exchange rate instability and uncertainty, initiated by the oil price hikes and reinforced by public policies, gave rise to dramatic swings in industrial production and investment activity in Sweden during the latter part of the decade. Shifts in world market demand also revealed a seriously deteriorated position for many of the basic industries on which Swedish exports had been traditionally based. Interest focused on the need for structural adjustment in industry to eliminate a mounting balance of payment deficit. The rapid expansion of local government consumption and central government transfers, partly used as a means of "bridging" the employment problems during international recessions, had simultaneously created a domestic budget deficit which locked fiscal policy into a "debt-trap".

These problems meant new challenges for macromodelling. It became essential for medium term models to take explicit account of the price uncertainty and to measure the propagation and impact of changes in world market prices and in Swedish competitiveness. It thus became of strategic importance to integrate price and wage formation into the models and to be able to use the models for tracing the effects of price changes on industrial profitability and investment in different sectors.

The two models documented in this book take on these challenges. They are based on widely different modelling concepts but were developed as a cooperative effort.

They incorporate several common dynamic mechanisms, exploit the same data-base and share econometric estimates. They were used to analyze the same problems, namely the impact of oil price shocks on the Swedish economy and the policy option to ease the adjustment to unexpected, dramatic changes in world market prices. The results of that study have already been extensively documented (see p. 186).

The first model, ELIAS, is a six sector multiperiod equilibrium model developed by Lars Bergman at the Stockholm School of Business.[1] Like the other model, ISAC, it incorporates price and wage formation and explicit links with world market. It treats capital accumulation in terms of vintages and determines consumer demand by linear expenditure functions. Apart from these elements it does not however – unlike ISAC – recognize any other sources of market inertia or rigidities. The market for both products and factors are thus assumed to clear by price adjustment in each period.

The second model, ISAC, is a 36 sector disequilibrium model, developed by Ysander, Nordström and Jansson at IUI, building on an earlier static model at the institute. By incorporating various kinds of rigidities in price and wage formation it allows for disequilibria both in foreign trade and in the factor markets. The behavior of local governments, who employ about a quarter of total labor in Sweden, is endogenously determined by way of an integrated submodel. A fairly detailed treatment of central government taxes and transfers makes it possible also to use the model for simulating various kinds of fiscal policies and stabilization regimes.

The ISAC model has been used for several different kinds of policy evaluation studies. The studies concerning energy policy have already been mentioned. A medium term macroeconomic forecast was carried out through model simulations in 1979.[2] The long term interrelation between industrial structure change and government expansion was analyzed in a study in 1980.[3] Finally the efficiency of fiscal policy and wage policy in controlling local governments has been analyzed through model simulations.[4]

The Swedish Treasury has also recently raised its ambitions in regard to medium term models. Partly based on the experience of the ISAC model and with the aid of two of its authors, an aggregate dynamic model, incorporating for the first time price and wage formation, was developed within the Treasury during 1982 and used for the 1984 medium term survey.

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[1] Bergman, L., "A System of Computable General Equilibrium Models for a Small Open Economy", *Mathematical Modelling,* Vol. 3.

[2] Ysander, B.-C., Jansson, L. and Nordström, T., 1979, "Utvecklingsvägar för svensk ekonomi 1978-85" (Economic choices for the 80s), in *Kalkyler för 80-talet* (Forecasts for the 80s), IUI, Stockholm.

[3] Nordström, T. and Ysander, B.-C., 1980, *Offentlig service och industriell tillväxt. Perspektivskisser av svensk ekonomisk utveckling 19507-2000* (Public Service and Industrial Growth – Alternative Paths of Development for the Swedish Economy 1950-2000), IUI Research Report No. 11, Stockholm.

[4] Ysander, B.-C. and Nordström, T., 1985, "Local Authorities, Economic Stability and the Efficiency of Fiscal Policy", in Gramlich, E.M., and Ysander, B.-C. (eds.), *Control of Local Government,* IUI, Stockholm.

The Firm and Financial Markets in the Swedish Micro-to-Macro Model

– Theory, Model and Verification

(published in Dec., 1985)

by Gunnar Eliasson

The book presents the main ideas behind dynamic micro-macro theory. It features the firm as a processor of limited and biased information, searching the markets for products, labor and capital to attain improved, expected profit positions. A detailed account of the model and theoretical analysis is presented, with emphasis on the firm as a financial decision unit.

The micro-macro model features individual firms as price and quantity setters in dynamic product, labor and capital markets. The joint behavior of all firms determines market prices and economic growth, making aggregation endogenous through markets under an exogenous technological constraint. This Schumpeterian inspired micro-macro model has been empirically implemented to investigate the macroeconomic consequences of technological change, different dynamic resource allocation mechanisms, market regimes, different tax systems, etc.

Within this market based economic regime, long term growth can be demonstrated to be critically dependent upon the ways markets are organized. Technology appears as an upper constraint and the part of the knowledge pool that firms can tap depends on their local competence. Stability of macroeconomic growth in the long term appears to be dependent on diversity of structure, being in turn dependent on innovative new entry and an efficient exit mechanism, bad performers being competed out of business by new, superior entrants. Such Schumpeterian type competition generates a Wicksellian disequilibrium at the micro level that fuels the investment and growth process. Industrial subsidies and other kinds of tax wedges promote a less efficient allocation of resources, and hence a slower growth in output.

A summary of calibration methods, database work and empirical applications concludes the book. The bibliography contains a complete listing of all published material related to the project (see further next page).

The Swedish Micro-to-Macro Model (MOSES)

The first phase of the Swedish Micro-to-Macro (M-M) Modeling project is close to completion. In the recent IUI economic evaluation of the Swedish economy (see p. 161 ff), the M-M model was used for the first time for comprehensive policy analysis. A second round will be attempted in a forthcoming analysis of the Nordic countries. A complete documentation of the model is in progress, and the first overview book has just been published (see above).

The project is currently carried on under three separate headings

- Development of the model
- Database work
- Development of M-M theory

The MOSES model is operational for comprehensive policy analysis. A consistent micro-to-macro database on the format of MOSES has been assembled. It is being updated and enriched to shed more light on the internal life of firms, which are treated in MOSES as *financial decision units.*

The M-M project was initiated in the mid 70s as an empirically oriented modeling project. The aim was to study the micro dynamics of market price transmission, inflation, rate of return determination and the macroeconomic growth process. The model as it now stands is a Schumpeterian type system of general monopolistic competition. The model is closed in the sense that incomes generate endogenous demand feed back. Firms set their own prices under the constraint of total domestic and foreign demand and exogenous foreign prices and interest rates. Exogenous technical improvements at the micro level create innovative rents and a Wicksellian type of disequilibrium adjustments through investment that create long term macroeconomic growth. Markets are dynamically coordinated by a Smithian invisible hand of independent self regulating pricing and quantity decisions at the micro level. *Agents' search for improved positions* in the market can be interpreted in terms of a *process of learning and use of information.*

Innovative rents are competed away by new innovative rents through new entry, investments and exit. In a broad sense the M-M theory means putting *dynamics* or *process thinking* into the Walrasian system.[1] This approach is capable of pedagogical refinement and formalization, and such theoretical work is in progress.

Work on the MOSES project is altogether focused on improved estimation and database quality. A database book, an instruction manual and a code book are currently in progress. The recently published documentation on the model also includes a complete bibliography of MOSES publications.[2]

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[1] Cf. the four fundamentals of the Åkerman taxonomy of economic theory, introduced on p. 16. The MOSES theory handles *interdependency* and *process,* together with entry and exit. It is, however, mechanistic on institutions (cf. discussion on p. 20 ff).

[2] A few of the recent publications are listed below.

Albrecht, J. - Lindberg, T., 1983, *The Micro Initialization of MOSES,* IUI Working Paper No. 72.

Bergholm, F., 1982, *The MOSES Manual,* IUI Working Paper No. 75.

Carlsson, B., 1983, "Industrial Subsidies in Sweden: Simulation on a Micro-to-Macro Model", in *Microeconometrics, IUI Yearbook 1982-83.*

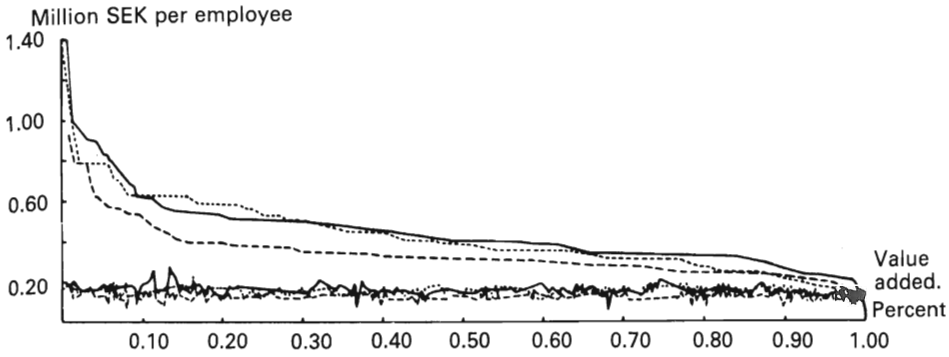
Eliasson, G., 1983, "On the Optimal Rate of Structural Adjustment", published in Eliasson-Sharefkin-Ysander (eds.)*Policy Making in a Disorderly World Economy,* IUI Stockholm.

Eliasson, G., 1984, "Micro Heterogeneity of Firms and the Stability of Industrial Growth", in *Journal of Economic Behavior and Organization,* Vol. 5, Nos. 3-4, *also* in Day-Eliasson, 1986, *The Dynamics of Market Economies,* North-Holland and IUI.

Eliasson, G., 1985, *Dynamic Micro-Macro Market Coordination and Technical Change,* IUI Working Paper No. 139.

Eliasson, G., 1986, "The Swedish Micro-to-Macro Model: Idea, Design and Application", in Orcutt-Mertz-Quinke (eds.), *Micro Analytic Simulation Models to Support Social and Financial Policy,* North-Holland, Amsterdam; also published in IUI Booklet No. 206.

Figure 3 *Productivity and wage distributions – initial 1982 and real 1985 state from MOSES database, and simulated 1985 state*



Note: The upper curves show distributions of value productivities, ranked in decreasing order over firms and weighted by value added. The lower curves show the matching nominal wage cost distributions.

The simulation began on the 1982 initial database (– – –). The outcome of the simulation (· · ·) can be compared with the real 1985 state from the database (——).

Source: Eliasson and Lindberg (1986).

Database work involves the systematization of several different data sources. The model is based on separate statistical surveys – questions being formulated to fit the model – carried out jointly since 1975 between IUI and the Federation of Swedish Industries. Test data are complemented by external analysis of company reports. Furthermore, an extensive macro database has been compiled and the IUI databases of Swedish foreign subsidiaries are currently being integrated with the other databases to allow an improved analysis of the determinants of export behavior.

Wage determination is a problem of current concern in Swedish economic policy debate. Figure 3 highlights the wage determination problem and also gives an idea about what kind of data that are processed in the model. The figure shows the labor (value) productivity and wage cost distributions over divisions and firms for 1982, the year of the large devaluation of the Swedish krona, and for 1985. One set of productivity and wage cost distributions for 1985 has been simulated in the M-M model starting from the real data for 1982. Simulation results can be compared in Figure 3 with actual data for 1985, recently collected in the IUI/Federation of Swedish Industries Planning Survey. It is interesting to observe that wage costs per unit of labor input have increased only marginally, while value productivity has increased significantly. Neither the model simulation nor real data so far exhibit any tilting of the wage cost distributions in response to the overall increase in profit margins between 1982 and 1985.

Project leader: Gunnar Eliasson.
Investigators: Fredrik Bergholm, Charlotte Fries, Ken Hanson, Christina Hartler, Göran Johansson, Thomas Lindberg and Tomas Nordström.

A Business Cycle Model

This project aims at developing an econometric business cycle model. The project is supported by the National Institute for Economic Research (Konjunkturinstitutet). An early version of the model was used in the 1979 IUI Medium Term Survey.[1]

The model consists of five blocks.

I. Determination of *prices and wages.* We distinguish here between the determination of the price- and wage-*level* on the one hand and the determination of the relative price on the other hand. The price level (inflation) is determined from lagged money supply. Relative prices and wages are determined from relative productivity changes and changes in the share of profits.

II. Determination of the development of *financial variables.* Here we focus primarily on the development of money supply. The determinants are fiscal and monetary policy and the trade- and capital balances.

III. Determination of *capacity utilization,* or actual vs. potential production. Potential production is determined exogenously from factors like the capital stock and labor supply. We study the deviation (slack) between actual and potential production. One hypothesis is that this slack, manifested as open or hidden unemployment, depends positively on inflation and negatively on "inflation surprises".

IV. Determination of *export income.* Our basic hypothesis is that exports are determined according to a "supply-demand" model where export demand is a function of export price and world income and export supply is a function of export price and unit labor cost in Swedish production.

This block is estimated in reduced form, i.e., one equation for the export quantity and one equation for the export price, both functions of world income and unit labor costs.

V. Import expenditures are determined in a way analogous to exports.

Investigators: Bo Axell and Harald Lang.

[1] *Att välja 80-tal. IUIs långtidsbedömning 1979* (Choosing the 80s. IUI Medium Term Survey 1979), IUI, Stockholm.

2 Productivity, Technology and Resource Use

The Dynamics of Market Economies

IUI Conference Reports 1986:1

(published in Sept., 1986)

by Richard H. Day and Gunnar Eliasson (eds.)

Economic Dynamics in an industrial organization setting was the theme of this IUI conference organized jointly with the *Journal of Economic Behavior and Organization* in 1984, sponsored by the *Marcus Wallenberg Foundation for International Cooperation in Science*. The contributions to this volume cover the whole range from the origin of innovative behavior and technological change, the way institutions are formed and markets organized, to the ultimate synthesis in theory and models of dynamic systems.

1983 marked the hundredth anniversary of Joseph Schumpeter's birthday. It was a fitting occasion for a major consideration of the dynamics of market economies because, more than any thinker of this century, Schumpeter was concerned with this topic. As for sponsorship of the Marcus Wallenberg Foundation, it was appropriate for several reasons. First, the group included many nationalities and the topic is of concern to many, if not all, nations. Second, Schumpeter was himself a world citizen whose career began in Austria-Hungary, and continued in Germany and the United States. Schumpeter's influence extended around the globe and has persisted until now. And, third, Marcus Wallenberg was, if any, the industrialist-entrepreneur that Joseph Schumpeter described, who initiated and reorganized large and small companies on a global scale, and who chaired for many years companies with a worldwide employment of several hundred of thousands, employing a large percent of the entire Swedish manufacturing labor force. He was also the chairman of IUI for 25 years.

The activities of the conference reflect the central mission of the Industrial Institute which is to enhance understanding (1) of the workings and growth of decentralized economies and (2) of how their performance can best be improved by public policy. The conference also provided a forum where issues central to JEBO's scope and purpose could be explored. This was particularly appropriate in a celebration of

Schumpeter's life and thought because he is among the first, if not the first, to emphasize the importance of micro behavior in a macro context and to describe in a coherent fashion bounded rational behavior, a fact of cognitive life that was the journal's initial organizing theme. Also in the Schumpterian spirit was the involvement by representatives of the Swedish industrial community in the general discussion.

Some of the papers presented at the conference were published in various issues of JEBO as they were revised and edited. They are now brought together under one cover together with supplementary pieces developed from the discussion and an edited transcript of the discussion itself. For reasons that are described in the editor's introductory essay, the papers, as a group, while independently authored and representing distinctly individual views, contribute to the development of a broad, yet coherent framework for understanding the dynamics of market economies.

We do not think our book presents this new framework of thought in a complete form. What it does is present some insights into how the market economy works, why it works in disequilibrium, how disequilibria are perpetuated, why economic structure evolves, why new institutions of production, market exchange and government regulation must continually emerge and evolve. It illuminates, in short, the micro-macro dynamics of a market economy.

Contents

Energy and Economic Adjustment

(published in Oct., 1983)

by Bengt-Christer Ysander (editor), Lars Bergman, Karl-Göran Mäler and Tomas Nordström.

Since the mid 70s stabilization problems have been particularly connected with uncertainties concerning energy prices. The long-run cost effects of the increased energy prices have not constituted the most serious consequences of the "energy crises", the accompanying adjustment problems were more important.

There are widely different opinions about how this uncertainty associated with the adjustment problems should be handled. Energy taxes to stabilize long run energy prices have been proposed by the Swedish Government. The key question, however, is whether we possess enough understanding of the dynamics of a macro economy to carry out such policies. Should policy attempt, instead, to increase the structural adjustment capacity of the economy?

Flexibility ...

Lars Bergman and Karl-Göran Mäler study the adjustment problems from the point of view of insufficient technological and market flexibility. They conclude that a policy aiming for increased flexibility is a workable proposition in preparation for a possible new energy crisis.

... or Insurance

Bengt-Christer Ysander and Tomas Nordström, on the other hand, are more pessimistic about the endogenous ability of the Swedish economy to cope with the adjustment problems on its own. They argue that stabilization policy has to compensate for adjustment deficiencies of a market economy. Experiences from the 70s, however, show that policy making itself is characterized both by rigidities, lack of flexibility and lack of knowledge about the economy's reactions. Hence, policies have to be a natural part of the incentive system of the economy. Oil dependence can be reduced (1) by not allowing lowered international oil prices to be reflected in domestic energy prices and (2) by preventing rising oil prices from rapidly being reflected in domestic policies. Variable energy taxes that are kept totally separate from public budget procedure would be such a policy.

Energy in Swedish Manufacturing

(published in Nov., 1983)

by Bengt-Christer Ysander (editor), Joyce Dargay, Lars Hultkrantz, Leif Jansson, Stefan Lundgren and Tomas Nordström.

The price elasticity of factor use in various manufacturing activities are studied with particular emphasis on energy consumption. Model simulations are used to generate scenarios.

The Legislated, Future Close Down of Nuclear Power Will Cause Dramatically Increased Electricity Prices

The excess supply of electrical power of the 80s will change into a rapidly increasing scarcity in the 90s, when current plans to close down nuclear power are realized. A dramatic increase in electricity prices will occur followed by a slowdown of manufacturing productivity increase.

Oil Consumption in Manufacturing Will Decrease Rapidly Until the End of the Centur

Not even a rapid increase in manufacturing production will prevent a decrease in oil consumption of 20 percent. Oil consumption per unit of value added will be halved by the turn of the century. Oil savings primarily depend on the use of more energy efficient techniques and on structural changes towards less energy intensive industries.

Manufacturing industry will not shift toward significantly coal or domestic fuels. The longer the close down of nuclear power can be postponed, the larger are the possibilities to find good substitute energy forms.

Power Plants Fired by Wood Cannot Compete With the Wood Industry

A special study of the energy use of Swedish wood industry shows that only dramatic changes in the price of oil relative to prices of other energy inputs will make power plants fired by wood competitive to the wood industry in the markets for Swedish timber.

O III – Organization, Costs and Safety.

A Study of the Productivity Developed in a Large Construction Project[1]

(published in Jan., 1984)

by Lars Jagrén

The cost (in constant prices) of constructing the third reactor at the nuclear plant at Oskarshamn, Sweden, was 2.5 times higher than that of the second reactor, if differences in size are taken into account. The study discusses the question of why this large cost increase occurred and analyses the development of different cost and productivity measures.

Safety Regulation

As shown in the study, 70 percent of the cost increase (550 MSEK) is explained by new, tougher safety standards following the Harrisburg accident. Among the new rules could be mentioned a quadrupling of different safety systems and an improved earth quake resistance.

More Expensive But More Profitable?

The second most important factor explaining the cost increase was the ambition to limit the construction time schedule. Due to rapidly accumulating interest costs (compared to the second reactor) one method was to shorten the time schedule through more costly construction techniques in order to get electricity production on line faster. At total project level it was optimal to pay the price of higher construction costs in return for an earlier start. These increases explain 20-25 percent of total cost increases in construction. Thus, the lowering of construction productivity has resulted in an increase in total project productivity (and profit-ability) that did not show up in traditional productivity measures and internal cost control systems. Standard measures did not pick up the extra value added created through an earlier start of electricity generation.

The study also discusses – on a more theoretical level – differences in dynamic and static productivity between the "project organization" form of production and the "ordinary" forms of organizing production in firms that aim for a long life.

[1] Swedish title: *O III – Organisation, kostnader och säkerhet. En studie av produktivitetsutvecklingen i ett stort anläggningsprojekt,* IUI Research Report No. 23, 1983, Stockholm.

The Long-Term Development of Electricity Intensive Industries[1]

(published in Nov., 1983)

by Bo Carlsson and Enrico Deiaco

This study was commissioned by the 1981 Energy Committee whose main task was to investigate the implications of dismantling the Swedish nuclear power program by the year 2010.

In 1980, 2/3 of electricity used in Swedish manufacturing was consumed in the iron & steel, pulp & paper, and chemical industries. These sectors are expected to grow relatively slowly over the next 30 years regardless of the electricity supply.

Two projections of electricity use in manufacturing were made. In the slow growth scenario, output of manufactured products was assumed to grow at 1.2 percent per year from 1980 to 2010, resulting in an increase in electricity consumption from 39 TWh in 1980 to 45 TWh in 2010. In the higher growth scenario, manufacturing output was assumed to grow at 3.5 percent per year, resulting in 75 TWh of electricity being consumed in 2010.

The study also indicates that future electricity consumption is more heavily influenced by structural change within sectors and within manufacturing as a whole, than by electricity conserving measures.

Datacommunication in Firms[2]

(published in Jan., 1984)

by Tomas Pousette

Computers and datacommunications systems are becoming important means of competition in a large and growing number of firms. The advantageous cost development has increased the demand for datacommunications services very rapidly. Demand has also increased due to the increased use of mini- and microcomputers, improved standardization and the establishment of public data networks. Moreover, the users benefit from faster and more flexible information.

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[1] Swedish title: *Den eltunga industrins långsiktiga utveckling,* IUI Research Report No. 22, 1983, IUI, Stockholm.

[2] Swedish title: *Datakommunikation i företag,* IUI Research Report No. 24, 1983, Stockholm.

This book investigates the importance of computers and datacommunications systems for the management of firms. The study is mainly based on interviews. Ten cases are presented, where advanced solutions have been used. In these examples the reasons for the introduction of the systems, and the effects on firms are described. Conclusions are drawn about the direction of future development (Figure 4).

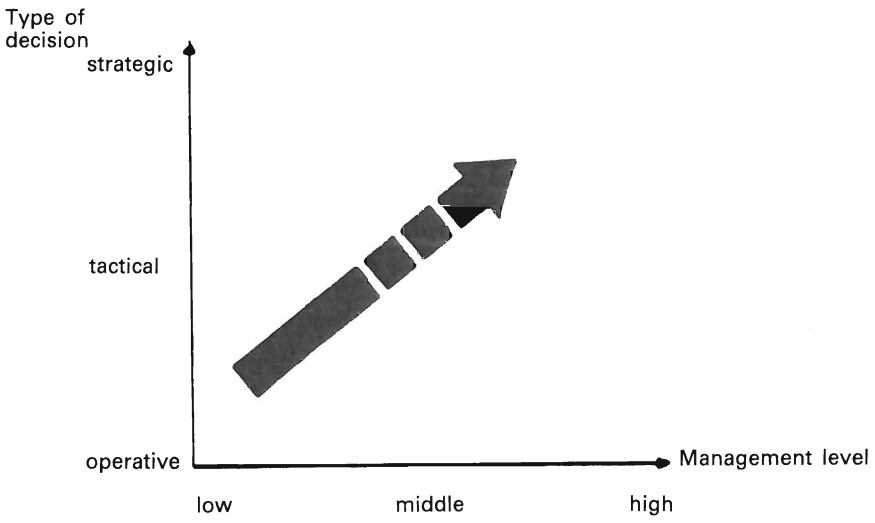
Computers and datacommunications technology have had significant productivity effects in manufacturing firms. The effects can be divided into:

- capital saving
- labor saving
- customer service
- quality of information.

The administrative staff of one firm was reduced by 15 percent after the introduction of a new computer system. Another firm could increase its purchase volume five times without changing the number of employees in the purchasing department. The inventory level was reduced by 50 percent when computers were introduced for inventory control etc. It is harder to measure the improved customer service of, e.g., increased reliability of delivery or faster order handling times. The increased quality of information is still more difficult to quantify. It is a matter of earlier warnings, more rapid management measures, new possibilities for analyses etc.

Computers are used in functions at increasingly higher levels in the firm (see Figure 4). Purchasing, stock control, order handling and other operative activities are no longer the only functions where computers can be used effectively. They are also becoming useful at more strategic levels, e.g., in group consolidated account systems. Another example of high level applications is the use of economic simulation

Figure 4 *Tendencies in the use of computers and data communications systems in firms*



models as decision support to top management. The case studies also show that there is an increasing integration of computer systems between, e.g., buyers and sellers or producers and subcontractors.

Technical development in the area of computers and datacommunications has opened up new possibilities for firm management. The increased demand will also put the flexibility and power of action of the Swedish Telecommunications Administration to a severe test.

Productivity Changes in Different OECD Countries 1953-1980[1]

(published in April, 1984)

by Yngve Åberg

Most OECD countries have experienced a productivity slowdown during the 70s. Higher energy prices and unusually low capacity utilization are found to be significant explanatory factors.

Research Method

Macro production functions for manufacturing industry in the OECD countries have been estimated on time series data for the period 1953-80. This period has been divided into sub-periods to make comparisons over time possible.

Measuring the capital contribution to production has caused the most difficult problems. A measure of the volume of capital installed is not enough. One must also know its rate of utilization.

To solve this problem adjusted capital income is entered as a measure of utilized capital. This requires the assumption of a constant real return to capital at unchanged capacity utilization. Hence, at constant prices changes in the return to capital will express changes in the degree of capacity utilization.

The Findings

The value of the elasticities of capital are found to differ between the OECD countries (see Table 3). These differences are explained by differences in production technique and structure of industry between the countries.

[1] Swedish title: *Produktivitetsutvecklingen i industrin i olika OECD-länder 1953-1980,* IUI Research Report No. 25, 1984, IUI, Stockholm.

Table 3 *Estimates of the production function for manufacturing in certain OECD-countries*

Country	Elasticity of capital	Rate of income in total factor productivity				
		1953-1965	1965-1973	1973-1980	1976-1980	1953-1980
Canada	0.4	1.5	1.8	1.2	0.7	1.3
United States	0.4	1.4	1.2	1.2	0.8	1.3
Japan	0.5	2.6	4.7	1.9	1.7	3.1
Denmark	0.3	2.5	4.0	2.2	1.5	2.9
France	0.4	2.2	3.1	2.6	2.1	2.7
Germany	0.4	3.4	2.9	2.7	2.5	3.1
Italy	0.5	3.0	3.8	1.2	0.3	2.9
Netherlands	0.4	2.8	4.0	1.8	1.3	3.1
Sweden	0.3	2.9	3.0	1.6	0.9	2.6
United Kingdom	0.4	2.0	2.2	1.5	1.6	2.0

If the estimated value of the capital elasticity is multiplied with the relative change in capital intensity, the contribution of this factor to productivity development is obtained. These contributions differ a great deal between the OECD countries. It is also clear that the decline in growth of productivity during the 70s was dependent that the slow down of the rate of increase of capital intensity.

Table 3 shows that total factor productivity growth has varied a great deal between the countries and over time. However, after the oil price shock of 1973, total factor productivity growth fell in all countries and this decline has continued after 1976.

The main explanation for the productivity slowdown was found to be the decrease in capacity utilization.

The Development of Swedish Industry during the Post-war Period

This study investigates the sweeping industrial changes which occurred side by side with slow growth, after the mid 60s. The preceding decades had been characterized by unusually fast growth. Technological and technical development during the 60s had significantly changed the competitive situation among industrial nations and in ways that had not been expected. Fast internationalization, changes in the social environment and policies associated with the growing welfare economies have had a profound influence on the condition of industrial activities.

Micro analysis in support of understanding macroeconomic development is the method which will be used. Historical studies will complement this micro-macro

analysis and particular emphasis will be placed on industrial dynamics[1], an approach consistent with the Schumpeterian research tradition of IUI. (Some of the results of this study has already been published in the conference volume: The Dynamics of Market Economies, see p. 183.)

Investigator: Erik Dahmén.

Economic Growth in Sweden

Technological change in Swedish economic growth 1870-1975 makes up the theme of this study. A simulation using capital vintage of different technical specification serves as the basic tool of analysis. In particular, the model endogenizes depreciation and hence the life of equipment.

By analyzing the interaction between changes in capital stocks, investment and potential production growth during the last hundred years, we find that technological change progressed at a faster rate in the post-World War II period than before. This has caused a sharp decrease in the life-span of capital. The difference in productivity between old and new plants has thus diminished. This, in turn, implies that the amount of investments per unit of output has increased significantly since World War II.

Investigator: Ragnar Bentzel.

Industrial Structure, Technological Development, and Efficiency

Various aspects of industrial structure, technical change and efficiency are analyzed in different industries. The analysis is based on two types of production functions:

(1) The frontier production function
(2) The short-run industry production function.

The studies are both theoretically and empirically oriented. On the theoretical side new tools have been developed to analyze productivity and structural change within different sectors of the economy; industry sectors, service sectors and agriculture.

[1] The theoretical basis of my analysis has already been accounted for in Dahmén, E., 1980, "Hur studera industriell utveckling" (How to study industrial development), in Dahmén, E. and Eliasson, G. (eds.), *Industriell utveckling i Sverige* (Industrial Development in Sweden), IUI, Stockholm, and in Dahmén, E., 1986, "Schumpeterian Dynamics: Some Methodological Notes", in Day, R. and Eliasson, G. (eds.), *The Dynamics of Market Economies,* North Holland and IUI. A brief summary of some of the results has been published in Dahmén, E. and Carlsson, B., 1986, "Den industriella utvecklingen efter andra världskriget" (The industrial development since World war II), in *Sveriges Industri* (Sweden's Industry), Sveriges Industriförbund (The Federation of Swedish Industries), Stockholm; also published in IUI Booklet No. 204.

On the applied side these tools are used in the analysis of specific sectors. All studies are based on micro data. Particular emphasis is placed on productivity growth and productive efficiency. The possibility of intercountry comparisons using the same methods give novel insights.

Investigators: Finn Førsund and Lennart Hjalmarsson.

The Performance of Machine Tool Manufacturers and Users in Sweden and the United States

At the end of the 1970s there was much concern, both in Sweden and elsewhere about what seemed, at least superficially,to be a sudden decline in international competitiveness and in the rate of growth of industrial output and productivity. This triggered a number of studies, including some at the IUI. While most studies focused on the macroeconomic, social and political aspects of the problem, a large part of the work at the IUI was more oriented towards exploring the underlying long-term technological forces.[1]

While it has been obvious for a long time why Sweden's traditional dependence on raw materials in its exports and industrial structure will continue to diminish, it is far less well understood what it is that constitutes international competitiveness in the engineering industries which have had to absorb an increasing share of the export burden. Given the complexity of the products and processes in these industries, it is difficult to explain more than a small share of, say, export performance by resorting to traditional comparative advantage theory. The large role of multinational enterprises in these sectors militate against such simple macro explanations. Instead, the explanations must be sought not only among countries but also within firms. Yet, there may be some general explanations having to do with certain dimensions of firm behavior and performance which conventional economic theory tends to ignore.

In order to explore such issues, the present study was initiated. It was felt that by focusing on technological change in machine tools (i.e., the power-driven machines used to cut, form or shape metal) which constitute a large part of the production technology in the engineering industries, it would be possible to obtain a better understanding of the changes in international competitiveness and the location and ownership of industry currently taking place. It was also felt that it would be beneficial to study two countries whose engineering industries are at opposite ends of the size spectrum.

Thus, the first part of the study has dealt with the supply side of machine tools. It

[1] See for example Carlsson et al., 1979, *Teknik och industristruktur - 70-talets ekonomiska kris i historisk belysning* (Technology and Industrial Structure – the Economic Crisis of the Seventies in Historical Perspective), IUI, Stockholm. See also Carlsson et al., 1981, *Industrin inför 80-talet* (Swedish Industry Facing the 80s), IUI, Stockholm, and Dahmén, E., and Carlsson, B., 1985, "Den industriella utvecklingen efter andra världskriget" (Industrial Development after the Second World War), in *Sveriges Industri* (Swedish Industry), Sveriges Industriförbund, Industriförbundets Förlag, Stockholm.

has resulted in several papers: one on the historical development of machine tools since the Industrial Revolution;[1] one on the current situation in the machine tool industry in the United States and Sweden in both international and historical perspective;[2] and one on the strategies chosen by machine tool firms in Sweden and the United States to deal with the difficult competitive situation posed by declining demand, increasing foreign competition (particularly from Japanese firms), and new technology.[3]

The second part of the study is oriented towards the *users* of machine tools, i.e., the engineering industries. One of the main conclusions of the historical survey of machine tool development is that there is a revolution taking place in manufacturing technology today. Whereas for about 150 years the technological trend was towards larger scale and increased (static) efficiency, thus benefitting large volume, commodity-like production, the advent of numerical control in the 1950s and the subsequent widespread application of computers in manufacturing have made small-scale, "sophisticated" production much more viable than before. The economic turbulence of the late 1970s and 1980s, following upon a long period of relatively rapid but stable growth, has further increased the importance of the flexibility (dynamic efficiency) which the new technologies offer.

Among the chief questions in the second part of the study are the following: What are the relevant dimensions of flexibility in the manufacturing operations of firms, and how do they relate to the overall structure and strategic behavior of firms? With greatly increased use of computers for integration and flexibility of manufacturing operations, there seems to be a clear trend towards purchasing entire systems of production as opposed to individual, stand-alone machines. Can this be verified, and where does the required engineering capability come from? Given an entirely new scale and degree of complexity of investment decisions, what are the characteristics of the processes firms use to reach these decisions? In particular, what documentation is required, and to what extent are non-conventional aspects of modern technology taken into account? What inter-firm and international differences do we observe?

This part of the study is of necessity exploratory in nature. Its main purpose is to formulate more clearly, on the basis of case studies, what the main issues are, and how they can be integrated with the existing theoretical framework. The hope is that the resulting research agenda will stimulate further work.

This study was initiated while the principal investigator was a Visiting Scientist at the Center for Policy Alternatives at the Massachusetts Institute of Technology. The project has been funded by the Swedish National Board for Technical Development

[1] Carlsson, B., 1984, "The Development and Use of Machine Tools in Historical Perspective", *Journal of Economic Behavior and Organization,* Vol. 5.

[2] Carlsson, B., 1983, *The Machine Tool Industry – Problems and Prospects in an International Perspective,* IUI Working Paper No. 96.

[3] Carlsson, B., 1984, *Firm Strategies in the Machine Tool Industry in the United States and Sweden: Responses to Technological Challenges and Global Competition,* RPIE Working Paper 1984:2, Case Western Reserve University.

(STU), the Institute for Economic Historical Research at the Stockholm School of Economics, and the Marianne and Marcus Wallenberg Foundation. Current work on the study is conducted at Case Western Reserve University in Cleveland, Ohio, USA.

Investigator: Bo Carlsson.

Education, Skill Formation and Technical Development

The importance of different forms of schooling for success on internal and external labor markets are widely recognized. However, we lack both theoretical and empirical research explaining the costs, revenues and determinants of individual and firm investment in different forms of human capital; particularly schooling, on-the-job training and information.

One neglected aspect is that the use of skills in firms, the demand of different skills and individual and firm returns to these investments is a simultaneous decision. Hence research has to integrate both the demand and supply side to capture the formation of human capital.

This project studies different broad aspects of skill formation in Sweden, partly by using new theories such as signalling, contract and assignment theories, partly by using existing data-bases such as HUS and by collecting new micro data on employee training, assessing mainly the employers point of view on skill formation. Some of the results have already been published in the exploratory study: *The Manufacturing Firm as an Information Processor – a Study of the Industrial Knowledge Base of a Country on the Transformation of Manufacturing Firms into Service Producers* (see p. 173. Also see the article of Lindberg and Pousette on p. 51).

The project will proceed in three steps: The first step is to test traditional human capital stories, such as the development of rate of returns of schooling and differences in a life-cycle perspective. In the second step different competing theories in the human capital literature will be tested, e.g., signalling, dual and assignment theories. An important question to answer is to what extent the educational system of Sweden acts as a screening device. The third step will emphasize the development of skills inside the firm. What explains individual and firm investments in on the job training?

Table 4 accordingly shows some original data concerning the duration of on-the-job training of newly hired blue and white collar workers in different branches of the Swedish manufacturing industry.

Investigator: Enrico Deiaco.

Table 4 *On-the-job training (months) of newly hired blue and white collar workers in different sectors*

Sector	Months	
	Blue-collar workers	White-collar workers
Raw materials processing	3.3	3.9
Intermediate goods	1.6	3.7
Investment goods	3.2	8.1
of which		
Machinery	2.4	5.0
Electrical machinery	4.3	12.7
Consumption goods	3.7	2.0
Building materials	1.1	3.5
Total	2.9	4.8

Source: IUI Planning Survey and MOSES Database.

3 Taxes and Public Finance

Control of Local Government

IUI Conference Reports 1985:1

(published in Febr., 1986)

by Edward M. Gramlich and Bengt-Christer Ysander (eds.)

In recent years the control of local government has been a focal point for public debate in the U.S., in the U.K. and in Sweden. In this Conference Volume eight economists analyze and discuss the post-war experience of local government finance in the three countries.

"Local government" represents rather different decision entities in the three countries. Differences between the countries are even greater when it comes to defining the problems and the instruments of "control". Although few common policy conclusions can be drawn, the richness of experience tells a good deal about i.a. the interaction between institutional structure and public policy.

Large Structural Differences in Local Organizations and Tasks

Marked differences can be found in regard to the autonomy, scope, size and rate of growth of the local public sectors. A rough ordering of the countries in terms of the importance of state and local public spending would have Sweden on top, the U.S. at the bottom, and the U.K. somewhere in between. This outcome is of course partly due to the fact that many "local" goods and services – e.g. health and various housing services – are to a large extent privately produced and distributed in the U.S., while they are managed by public authorities in the other countries. In addition attitudes towards local government differ between the small country of Sweden and the large countries.

In Sweden, a tradition of relatively autonomous local communities historically preceded the emergence of a strong central government, while in the U.K. the rights and limitations of local government have been successively defined and dispensed by an already established central power.

Swedish Local Athorities More Autonomous

The relatively unified and self-financed local authorities in Sweden can be contrasted with the local governments in the U.K. and U.S., which tend to be more diverse in structure and more dependent on central government for finance and instruction. While in Sweden the major part of the income tax is levied with a roughly proportionate, but independently set rate by each local government, the rate on real estate is still the main source of finance for local authorities in the U.K. and U.S. The pattern of expenditure of local governments is probably also important in determining their public image. The explicitly redistributive transfers of locally administered social welfare have increased in all countries, but their relative importance in regional government budgets tends to be large for the U.S. authorities, with their more limited scope, and small for the Swedish authorities, with their broader spectrum of activities. Taken together these diverging traditions and budgetary patterns may go some way to explain, why local government in Sweden, compared to the other countries, tends to be less censored by public opinion for the common evils of tax distortions and public mismanagement.

U.S. Tax Payers React Faster to Taxes

Various forms of fiscal containment of local governments have been suggested during the 70s and tried in the U.K. and U.S. The main concern in Sweden, in contrast, has been the lack of flexibility of local governments and their difficulties in adjusting to changing macroeconomic conditions. Yet, the local government expenditure in Sweden has doubled its share of GNP over the preceding two decades and the share is now above 30 percent. The major part of Swedish local expenditure corresponds to claims on real resources. The same share in the U.K. is only about two thirds of that in Sweden, and has increased very slowly since 1960 – declining in fact during the latter part of the 70s – and less than half are claims on real resources. The U.S. share, finally, is far below the British share and has risen very little in the past twenty years.

However, the most vigorous complaints about excessive and fast growing local government spending have been voiced by the U.S. public. In the U.K. the unsatisfactory macroeconomic performance has most often been attributed to local governments, acting as a "black hole" in the economy, rapidly absorbing scarce real resources.

The differences in attitudes and perception are reflected in the different orientation of the conference papers.

The four papers dealing with local government in the U.S. are all concerned with the risk of excessive government and the means of containing any immoderate public resource claims. The two British papers evaluate the attempts of central government since the middle of the 70s to contain and control local government expenditures by financial means. The two Swedish papers, finally, both focus on the problem of macroeconomic flexibility and the means available to central government to ensure sufficient flexibility.

Saving, Consumption, Labor Supply and Taxation[1]

(published in Febr., 1986)

by Lennart Berg

The Problem

The effects on savings and labor supply from changing the tax system towards an expenditure tax system are studied. Cross-section data on a sample of households are used and the change in the tax-system is defined as removing the taxes on capital income and increasing taxation of income and consumption.

The Method

The effects of a change in the tax-system can then be expressed in terms of elasticities for savings, consumption and labor supply. The substitution effect is assumed to be negative and savings are assumed to increase with the rate of interest even after tax if income remains stable. If leisure becomes cheaper as a result of a fall in net wages, the supply of labor ought to decrease, if total income is unchanged.

Even if the qualitative effects are known from economic theory nothing can be said about the quantitative effects of a change in the tax-system. The magnitude of the price elasticities must be known together with the magnitude of cross-price elasticities. When we know the magnitude of both the direct and the indirect effects of changes in prices, the total result of the tax reform can be calculated.

The literature offers little help in estimating cross price elasticities. Most cases are based on the experience of other countries than Sweden. Another problem is that the effects of a change in the rate of interest and the net wage have always been estimated separately, not simultaneously.

This study uses an intertemporal model. The household adjusts its total consumption, savings, leisure and net wealth considering the wage, rate of interest and taxes. We assume that the individuals can freely choose how much labor they want to supply. Estimation is simultaneous of a seven equations model. Utility is represented by a translog function with homothetic preferences.

Data

We have used a yearly income distribution survey carried out by the Bureau of Statistics in Sweden (SCB) for the years 1978 and 1979 (the so-called HINK-database). This data base covers about 5000 households for two consecutive years. In the panel for 1978 and 1979 we had access to roughly 500 variables for each household. After removing some, due to our definition of a household, we ended up with a sample

[1] Swedish title: *Sparande, konsumtion, arbetskraftsutbud och beskattning. En empirisk analys av hushållens beteende,* IUI Research Report No. 28, 1985, Stockholm.

with more than 400 observations. We define a household as consisting of a man and a woman where both are working.

Empirical Results

Table 5 exhibits the uncompensated marginal tax elasticities for labour supply and consumption reported. Elasticities for labor supply are negative and greater than minus one. Hence a decrease in the marginal tax-rate will, ceteris paribus, decrease tax- revenue. Elasticities for consumption are in the 0.5 range. If the marginal tax-rate goes up consumption will follow. An increased marginal tax-rate decreases the after-tax interest rate. When the after tax interest rate decreases the savings rate will be reduced.

Table 5 *Uncompensated "total" marginal tax elasticities for labor supply and consumption for two periods*

Labor supply				Consumption	
Female		Male			
1:st period	2:nd period	1:st period	2:nd period	1:st period	2:nd period
-0.48	-0.47	-0.55	-0.29	0.63	0.52

Our econometric model allows us to calculate the effects on tax-revenue when the marginal tax-rate is lowered by five percent. To compensate for this loss in tax-revenues we have increased the value-added tax on consumption with five percentage points. The main reason for this increase in the value-add tax is that the labor supply is fairly inelastic.

Tax Reforms and Asset Markets

(published in Dec., 1985)

by Jonas Agell

The Issues

A popular area of inquiry during recent years has been the potentially distortionary effects of the varied and inflation sensitive tax treatment of different assets on portfolio choice and asset markets. In several countries major reports have been initiated advocating tax reforms designed to eliminate the diverse treatment of different forms

of savings. Proposed reforms range from comprehensive schemes of personal expenditure taxation to different ways of indexing the personal and corporate income tax.

This book investigates the effects of alternative tax regimes at both personal and corporate levels on the short-run general equilibrium of asset markets. This short-term impact of tax changes on portfolio choice of investors and the development of asset prices are of central concern for macroeconomic policymaking. First, the induced revaluations of existing stocks of physical capital on asset markets serve as signals to reallocate capital between different production sectors of the economy. Since governments aim at stimulating productivity and capital accumulation in certain sectors, the behavior of asset prices reveals the appropriateness of implemented fiscal policies. Second, the distributional considerations which policymakers face underline the need to assess various policy measures in terms of their impact on asset markets. Price formation in asset markets is in fact one of the primary determinants of the economy's wealth distribution.

The Method

The effects of tax reforms on portfolio choices and asset markets are examined using a numerical simulation model. Four distinct building blocks are formulated. The first is a balance sheet framework identifying the assets and liabilities of different sectors of the economy. The second is the assumption that asset preferences of investors can be derived from maximization of their expected utilities. The third is an explicit recognition of different sources of risk facing investors, with due regard to the risk- sharing facilities provided by the tax system. The fourth building block is a detailed modelling of the tax system at both the personal and corporate levels, incorporating various inflation induced non-neutralities of the tax system.

The complete nonlinear general equilibrium system is parametrized and calibrated to make it replicate a rough version of the Swedish capital market, tax system and portfolio structure of 1980. This numerical framework is then used to simulate the impact of various alternative tax systems, like introducing expenditure taxation, indexing the personal and corporate income tax, etc. The simulation experiments allow us to examine the effects of tax reforms on asset prices, the level and distribution of wealth, capital income and risk-bearing across investors, the incentives to accumulate physical capital in production sectors, and government expected revenue from different taxes.

The Results

The results clearly illustrate the importance of using an interdependent multimarket framework when analyzing the financial repurcussions of alternative tax systems. For instance, in earlier literature based on partial equilibrium reasoning, it is frequently argued that increased inflation in an economy with a nominal income tax system will depress corporate share prices, since inflation increases the return on alternative assets such as real estate. However, in our multimarket framework (allowing for wealth effects and the possibility for real estate to be complementary to corporate shares in investors' portfolios) the opposite result prevails: Increased inflation stimulates demand for corporate shares as well as for real estate.

The investigated tax reform proposals include, first, elimination of personal capital income taxation (which in its effects is equivalent to introducing a personal expenditure tax); second, indexation of the personal income tax; third, various reforms of the corporate income tax; and, finally, reforms consisting of combined changes of the personal and corporate income tax. Some of the main policy conclusions to be drawn from these simulation experiments are:

- Both the elimination of personal capital income taxation and indexation of the personal income tax can be expected to cause substantially reduced prices of corporate shares and residential real estate. The reason is that the existing system of taxation of personal and corporate capital income favors – especially at high inflation rates – portfolio investments in real estate and corporate shares at the expense of nominally taxed assets such as bank savings. Since a large part of these tax asymmetries is eliminated by the investigated tax reforms, household investors will reduce holdings of residential real estate and corporate shares.
- The reduced prices of owner-occupied housing will produce a sharp fall in the value of total household wealth. The mirror image is that an increased share of the economy's productive wealth will be owned indirectly through various financial institutions.
- Compared to reforms of the personal income tax, reforms of the corporate income tax will not to any considerable extent alter the distribution of asset prices and wealth.

The Taxation of Income from Capital[1]

(published in June, 1984)

Editors: Mervyn A. King and Don Fullerton.
Swedish authors: Jan Södersten and Thomas Lindberg

Taxation – both corporate and personal – has been put forth as one important factor behind the low investment and productivity growth rates experienced in many industrialized economies during the last decade. This book, a comparative study of income from capital in the United States, the United Kingdom, Sweden and West Germany, for the first time establishes a common framework for comparison of tax systems. It represents a collaboration of the National Bureau of Economic Research, the IUI and the IFO- Institut in München, West Germany. It is the most comprehensive study to date of incentives afforded by the tax system.

[1] King, M.A., and Fullerton, D, (eds.) 1984, *The Taxation of Income from Capital. A Comparative Study of the United States, the United Kingdom, Sweden and West Germany,* The University of Chicago Press.

The study compares the effective tax rates levied on capital income in the non-financial corporate sector in four major economies. In so doing it supplies the reader with detailed information about the structure of the corporate sector in each country. The striking variation in effective tax rates on different kinds of saving and investment categories, raises important questions about the direction of tax reform.

A summary in Swedish of the main results of the study was published by the IUI in 1983, in a research report entitled "*Skatt på bolagskapital*" (The Taxation of Income from Capital).[1] This research report also contains new information on the effects of some recent changes in Swedish tax legislation. The new estimates indicate that the average level of the tax burden rose by as much as one fifth between 1980 and 1984, whereas the variance of tax rates on different kinds of saving and investment was somewhat reduced.

Controlling Local Governments[2]

(published in June, 1983)

by Bengt-Christer Ysander and Richard Murray

The local government sector has increased rapidly in the postwar period. Expansion was particularly marked during the 1970s, as local government employment rose from 15 percent to 25 percent of total employment. The vast scope of local government activities means that decisions on expenditures and taxation play a decisive role for macroeconomic stability. Prior to the 1970s, local government activity served as a stabilizing force. Not surprisingly, this interpretation of local government activity became the conventional wisdom in the postwar economic debate.

Local Government Destabilizes the Business Cycle

This pattern of stabilizing activity was reversed in the 1970s. Instead of counteracting cyclical variations in the business cycle, local government activity actually reinforced the cycles. The peaks of local government activity, in 1970, 1974-75 and 1979-80, coincided with cyclical upturns in the economy. The slowdown in expansion in 1971-72 and 1977-78 occurred at the same time as the economy slid into recession. Local government expansion ceased to function as a counter cyclical force.

These are the conclusions of a recently published IUI study by Bengt-Christer

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[1] Research Report No. 20, 1983, IUI, Stockholm, by Jan Södersten and Thomas Lindberg.

[2] Swedish title: *Kontrollen av kommunerna. En översikt av svenska erfarenheter under efterkrigstiden av statlig kommunstyrning,* IUI Research Report No. 18, 1983, Stockholm.

Ysander and Richard Murray, Controlling Local Government. The book offers, first, an overview of local government expansion and control problems over the past three decades. This is followed by a systematic evaluation of the various methods with which the state has attempted to control local government. It concludes with a discussion of new forms of state – local government coordination.

Time to Review Local Government Budgeting and Expenditure Procedures

Local government budgets reflect the race between today's wage costs and yesterday's wages. The latter, together with employment levels, determine tax revenues. Prior to the 70s, employment and inflation were closely linked; business booms and inflation were normally followed, after about two years, by recession and deflation. For this reason, the two year lag between local government taxation and expenditure served as a countercyclical force. During the stagflationary 70s, however, this same pattern led to sharp swings between periods of cost crises and overliquidity. Local government activity acted to reinforce cyclical savings instead of moderating them.

Drawing on the experience of the 70s, Ysander and Murray argue for a reform of the local government budgeting and expenditure process. The main objective of such a reform is to eliminate the two year lag between taxation and expenditure.

A second, more general conclusion is that the attempts of central government to use local government spending as a countercyclical force will be ineffective unless the rigidities in expenditure planning can be substantially reduced.

Taxes, Wages and the Rate of Interest[1]

(published in July, 1983)

by Göran Normann

The early notion of taxes was that of a source of income for the public sector, and a means of policy manipulation, including the control of inflation. During recent years taxes have been discussed, instead, as a source of inflation. This book finds that taxes in fact are inflationary, and that union behavior based on perceptions, of future taxes and prices contribute to the inflationary outcome.

Higher tax rates mean that the tax base diminishes and that tax income eventually diminishes. This currently appears to be the case over a broad range of incomes for an increase in marginal tax rates.[2] Other IUI studies suggest that this is also the case

[1] Swedish title: *Skatter, löner och räntor – en analys av skattesystemets inflationseffekter,* IUI Research Report No. 21, Stockholm 1983.

[2] See Jakobsson-Normann, 1981, "Welfare Effects of Changes in Income Tax Progression in Sweden", in Eliasson, G., Holmlund, B., Stafford, F. (eds.), *Studies in Labor Market Behavior: Sweden and the United States,* IUI Conference Reports 1981:2, Sweden.

for the total tax rate (see Feige's article). As a consequence, a lowering of total tax rates will eventually generate increased tax income. The time profile of that outcome, however, is unknown.

The Economics of Expenditure Taxation

High inflation and rapidly increasing fiscal needs during the seventies placed heavy strain on the nominal income tax system in many countries. The attention of tax-reformers focused increasingly on various forms of expenditure taxation as a way of solving some of the most pressing problems of the present income tax system. The treatment of inflation and of capital gains has been a particularly disturbing factor in current tax systems.

In Sweden a Royal Commission was set up to investigate ways of changing to an expenditure tax system. The institute has been asked by the commission to make a survey of the economic pros and cons of expenditure taxation, as indicated by the international discussion in recent years. Part of the analysis is concerned with an evaluation of the change-over problems in a country like Sweden. The result of this work will be published in 1987.

Investigators: Bengt-Christer Ysander and Agnar Sandmo.

Studies in Local Government Service Production

The analysis of local government has a long tradition at IUI. In 1962, the Institute published a study by Erik Höök on the expansion of the public sector 1913-58, including a detailed analysis of the development of local government expenditure. Local government finance in Sweden and its dependence on central government was the subject of studies at the institute by Murray and Ysander in the late 70s and early 80s. A conference volume in 1985 reported on a comparative study of the same problem in the U.S., the U. K. and in Sweden (see p. 204).

This project has two main aims. The first is to develop an econometric model of local government behavior and to use it e.g. to test various received assumptions about local government behavior and expansion during the post-war years.

The second purpose is to develop methods for measuring productivity and testing technological assumptions concerning local government service production.

Investigators: Erik Mellander and Bengt-Christer Ysander.

Organization and Efficiency of Local Public Production

The study of which the essay on p. 95 is a part will confine itself to looking at the allocative behavior of local governments. Do local governments really respond to household preferences and in what way? How do regulations affect the allocation of resources by local governments? How effective are national government grants in

influencing the allocation of local governments? Are local governments at all sensitive to changes in factor prices?

The research program under this heading will start with a public choice inquiry into the field of local governments. We will attempt to build a model of local government allocative behavior, based upon econometric studies of Swedish local governments. The next step will be to set the criteria for comparisons of different organizational solutions. A significant part of the analysis will deal with the choice of an appropriate governmental arrangement for various tasks, e.g. whether national government, local governments or private organizations are most suitable agents to handle the tasks. The capabilities of local governments in correcting market failures and the possibilities and efficiency of national government to control local government in the field of resource allocation will be of particular interest. Finally, in the light of the emerging service economy, we will analyze dynamic characteristics of the local government system, with special reference to the possibility of competitive entry in the public sector. What are the real and fictitious obstacles to competitive entry? Are regulations, or the zero price of publicly supplied services the most important obstacle?

Investigator: Richard Murray.

The Impact of the Swedish Tax System on Incentives and Efficiency

The incentive effects of the Swedish tax and transfer systems have attracted much attention in the economic debate during the last decade. For instance, earlier research at IUI has documented the varied and inflation sensitive tax treatment of different types of capital investments and analyzed the effects of capital taxation on portfolio choices and the behavior of asset markets.[1]. The purpose of this project – carried out jointly at the Trade Union Institute for Economic Research (FIEF), IUI and the Department of Economics, Uppsala University – is to extend this work in a number of directions. In particular, the long-run effects of the overall Swedish tax and transfer systems will be examined using an econometrically estimated general equilibrium model of the economy.

There are three main questions at issue. The first objective is to quantify the total long-run efficiency costs associated with the present tax and subsidy system. This will involve an examination at the micro level of the incentive effects of different "tax wedges" on household decision making, as well as a macroanalysis of the implications for long-term growth and allocational efficiency. The second objective is to examine the incidence across different types of households of the existing tax and subsidy systems. The final objective is to use the applied general equilibrium framework as a reference point for a discussion of optimal tax design. Thus, how can the

[1] Södersten, J. - Lindberg, T., 1984, *Skatt på bolagskapital, Sverige i jämförelse med Storbritannien, USA och Västtyskland,* IUI Research Report No. 20, Stockholm.
Agell, J., 1985, *Tax Reforms and Asset Markets,* IUI Research Report No. 27, Stockholm.

present tax and transfer systems be redesigned so as to enhance economic efficiency while leaving the distribution of welfare across households unchanged?

Investigators: Jonas Agell, Department of Economics, Uppsala University
Jan Södersten, IUI and Department of Economics, Uppsala University
Bengt-Christer Ysander, IUI and Department of Economics, Uppsala University.

4 Profitability, Financing and Capital Market Analysis

Inflation and Growth

IUI has received a two years grant from the Bank of Sweden Tercentenary Foundation to study the effects of inflation on the growth prospects for the firm. The project is now being completed and a summary of findings will be published in 1987.

An important part of the project has been to evaluate the effects of inflation on the incentives to save and invest in the corporate sector. This analysis includes both a theoretical study of how inflation, via the tax system, effects the real cost of capital and realistically specified numerical estimates of the effective marginal tax rates on corporate profits. Particular emphasis has been placed on demonstrating the sensitivity of real capital costs and effective marginal tax rates to changes in the rate of inflation.

The study also includes empirical estimates of the impact of inflation on the short-run adjustment of firms to changes in the size of the long-run optimal capital stock. These problems are dealt with by, e.g., constructing empirical investment functions using variables such as liquidity and retained earnings, which are specified to explicitly capture the effects of inflation on short-run behavior.

Investigator: Jan Södersten.

The Role of Owners in Industrial Development

Entrepreneurs Move the Macroeconomy

This project studies the linkage between innovative and entrepreneurial activity, micro economic growth, and the organization of ownership and control. One project, already well under way[1], links entrepreneurial activity to macroeconomic growth.

[1] A publication with the working title: *Expansion, Contraction and the Market Valuation of Firms* (Swedish title: Expansion, avveckling och företagsvärdering i industrin) is currently being edited. Also see essays by Eliasson, Jagrén, Hanson and Pelikan in this volume and Eliasson, 1986, *Innovative Change, Dynamic Market Allocation and Long Term Stability of Economic Growth,* IUI Working Paper No. 156. The recently (1986) published IUI and North-Holland Conference Volume (see p. 183 on The *Dynamics of Market Economies* (Day-Eliasson eds.) provides a well oriented theoretical background on the project. The capital market and the ownership problem was also under a central issue in the recently published IUI Long Term Survey *Att rätt värdera 90-talet* (Evaluating the 1990s) in Chapter II entitled Capital and Knowledge as Moving Forces in the Market Economy.

The other part, currently being phased in, studies the relationship between successful innovative entrepreneurial activity and the organization of ownership and control. Since ownership in a broad sense bridges two forms of competence – innovative and entrepreneurial on the one hand and financial on the other – both being jointly evaluated in markets for control of firms, the third project is concerned with the question how the rent for innovative activity is distributed. Great attention is being paid to the importance of stable and reliable pricing in equity markets in facilitating the bridging of the two other functions.

Several IUI publications demonstrate the importance of innovative activity and industrial restucturing as the moving force behind economic growth. New firms must enter, old firms change their internal structure or exit. Non profitable firms must exit from the market and resources be moved to more efficient producers. The effects of this restructuring and reorganisation within and between firms account for a major part of total productivity growth in the economy.

The study of entrepreneurial activity and economic growth draws to a large extent on early IUI research and external material. The Micro-Macro Model is used to quantify the links (see p. 179). In this project a summary of the state of knowledge is attempted.[1]

The Organization of Control and Ownership Affects Innovative Activity

The other part of the study is based on the hypothesis that innovative activity and decisions to restructure are closely linked to the existence of competent and efficient owners. In small firms the relationship is direct in the form of new entry or through self employment. In the large firms more complex relationships in the form of dominant owners and equity market processes emerge. Thus, the role of owners in combining financial and industrial knowledge, to achieve long term macroeconomic growth, is the core of this project. We expect the importance of the organization of ownership and control to be at its peak when industries are subjected to external competitive pressure to restructure.

Swedish industry is to a large extent dominated by a relatively small number of old, internationalized engineering firms. Their long history of continuous business operations makes it possible to collect long run micro panel data to highlight what roles owners have played and how important they are during the different phases of a company's development. Among the questions to be answered are:

- Have the owners been important for the innovativeness of the company or for its ability to change structure?
- How essential has the ownership structure been for the growth of the company?
- How important has the ownership structure been for the companys' ability to avoid or to cope with crises?

[1] See for instance Eliasson, G., 1986, *Innovative Change, Dynamic Market Allocation and Long-Term Stability of Economic Growth,* IUI Working Paper No. 156.

Given this broad approach, the study must also examine the organization of the equity markets and the real economic effects of the changing nature of markets for control, mergers and take-overs.

The critical question, however, will be to understand what combination of ownership and management has led historically to the highest profitability and efficiency. To answer this question, the project cannot avoid addressing problems related to the function of asset markets in general, and the distribution of personal wealth. Hopefully, the HUS project (see p. 215) will eventually generate data on family wealth compositions that will be useful inputs in this project.

The study, which will be based primarily on interviews, monographs and other microdata for some ten large companies, will be essentially empirical and microoriented. A first publication aiming at problem formulating function is in progress. One section of that book – the historic study of growth and ownership in large corporations – has become so large that it has been defined as a separate project (see next project). In addition, the theoretical base for studies of this scope and depth pushes at the foundations of economic theory, particularly its treatment of dynamic market processes and institutions. Hence, a new project on the role of *private enterprise in production and the Swedish policy model* will be a natural part of this broad based project (see p. 228).

Investigators: Gunnar Eliasson, Erik Dahmén, Per-Olov Bjuggren, Lotta Björklund, Jan Glete, Ove Granstrand, Christina Hartler, Lars Jagrén, Thomas Lindberg, Per-Martin Meyerson, Pavel Pelikan, Steve Turner, Clas Wihlborg and Johan Örtengren.

Historical Studies of Micro Growth Processes

Today a relatively small number of old, internationalized engineering firms account for a dominant share of production and employment within the Swedish manufacturing sector. The purpose of this project has been to describe and analyze the growth process of these companies, and to compare it with the development in other groups of companies. Thus, we have collected data on four different samples of companies: i) ten large old companies, ii) 115 randomly selected companies founded before 1918, iii) 256 small companies established between 1954 and 1958 and iv) the fastest growing medium sized companies 1969-84.

The main question addressed is what factors lie behind long-term growth and profitability. Have the different factors (supply of labour, supply of raw materials, process efficiency, marketing and R&D) changed in importance during the last decades?

Some of the results are presented in the article "Concentration, Entry, Exit and Reconstruction of Swedish Manufacturing" (see p. 39). The most important findings are:

- The ten largest companies have grown very fast, compared with the other groups.
- Up until the end of the 60s internal growth in output dominated total growth. Since the 70s acquisitions and mergers have become more important.

- The fast growing companies are characterized by large investments in marketing and R&D. They were all internationalizated early.
- Most companies will never grow large. The fast growing companies are exceptions from the general rule. Most firms in a cohort of firm established in some period of the past will remain small, will be acquired by a large firm, or exit.
- The development since the Second World War, especially in the financial area, has benefitted the already large companies. Financial economies of scale have become much more important. This makes it harder for small, newly established companies to compete with existing large firms.

The data collected in this project will be used in the ownership project, evaluating the role of owners in a long term perspective.

Investigator: Lars Jagrén.

Industrial Finance and the Transformation Process in Sweden

In this project the transformation of Swedish industry in an historical perspective is studied from the point of view of the role of industry finance.

Emphasis is on the postwar period and the purpose is to provide a deeper understanding of the problems facing Swedish industry since the middle of the 70s. As a consequence, industrial subsidies and the partial deactivating of the exit process has been studied separately.[1]

The period following World War I confronted Swedish industry with a severe crisis. This was in fact the most severe crisis that Swedish industry has gone through so far, in terms of production, employment and industry finance. A 50 percent deflation halved the value of material assets, but left the value of debts untouched. A financial crisis occurred, from which Swedish industry emerged financially weak and heavily dependent on the merchant banks. Out of this crisis came the concern for financial consolidation that characterized Swedish industrial firms for thirty years. Financial consolidation continued through the 30s. This decade is the only period with positive net saving, despite rapidly increasing investments. World War II and the first years of peace meant no interruption.

Thirty years of financial consolidation left Swedish industry exceptionally strong at the beginning of the 50s. During the postwar period, on the other hand, the financial position has weakened considerably. Several factors explain this development, among them a fall in profitability. During the same period, interest rates in Sweden have more than doubled. The result has been a dramatic reversal in the relative profitability of manufacturing vis-a-vis financial placements. At the beginning of the 50s rates of return in the manufacturing sector were more than 50 percent above the effective rate of interest on industrial loans. whereas they were 65-80 percent below at the beginning of the 80s.

[1] *Krisföretagen, industristödet och staten som företagare* (Crisis firms, industrial subsidies and the government as manager) to be published in the first volume of the ownership project (see above). Some results for this project have also been published in *Företag, entreprenörer och ägare i svensk industri* (Firms, entrepreneurs and owners in Swedish Industry), *Sveriges Industri,* Federation of Swedish Industries 1986; also published in IUI Booklet No. 202, Stockholm.

One obvious consequence has been a decrease in the relative attractiveness of long-term investments in manufacturing compared to short-term financial placements. A second effect has been the reinforcement of the negative effect on corporate debt leverage.

The key problem of linking real activities with finance is to measure the stock of capital. The standard way to do this, through cumulating investments under an assumed rate of depreciation is questionable under conditions when relative prices have shifted considerably, as in the 70s. What capital values should be assigned to Swedish shipyards at the end of the 70s?

Investigator: Johan Örtengren.

Business Decisions under Financial Uncertainty

Uncertainty in the business environment increased during the 1970s. This is widely interpreted as a result of the shift to flexible exchange rates. Many observers, however, would also argue that increased uncertainty was instead a consequence of macroeconomic developments, oil price uncertainty, economic policy and central bank behavior in the late 1960s and during the 1970s. The increased macroeconomic uncertainty underlines the importance of research about how to handle all contributing factors, exchange rates, inflation and interest rates simultaneously, at policy levels and in firms. The many channels through which macroeconomic uncertainty in general and financial market uncertainty in particular may affect the general level of welfare and business activity must be examined, along with more specific variables like exports and the stock market valuation of individual firms.

Any firm, whether multinational or domestic based, is exposed to risk emanating from the macro-environment, which can be distinguished as:

1) *Country risk* (including political risk) – the uncertainty about the "rules of the game" in a country in which a firm is operating.
2) *Financial risk* – the uncertainty about interest rates and costs of different sources of capital.
3) *Currency risk* – the uncertainty about exchange rates and inflation.
4) *Commercial risk* – the uncertainty about relative prices of the firm's output and input as well as the uncertainty about volume of sales.

Of these four risk-categories, exchange rate risk has received the most attention. The corporate choice of a management system often seems to be of ad hoc character and designed to deal only with exchange rate fluctuations. A major point in this analysis is that managing exchange rate exposure per se is not meaningful if the interdependence between the exchange rate and other macro variables related to the exchange rate, such as inflation rates and interest rates, are not considered. Thus the aim of the project is to develop a comprehensive management system to handle all types of risk emanating from the macro-environment.[1]

[1] Discussed in Oxelheim, L. and Wihlborg, C., 1986, *Exchange Rate and Related Economic Exposures - A Theory for Management Strategy and Information Needs,* IUI Working Paper No. 162.

In order to understand corporate arguments about such elements as the length of the planning horizon, the target variable, the risk attitude, and the firm's view of goods and financial market adjustments, an extensive investigation based on interviews with top-management in the 19 largest Swedish multinational firms has been carried out. This investigation not only provides information about the key elements of risk exposure noted above, but also shows how firms form expectations about the development of its macroeconomic environment.[1]

Another part of the project is to study the nature of different risks in order to develop an adequate system to handle the fluctuations creating these risks. Fluctuations also mean opportunities to increase profits for a firm which is not totally risk-averse. Thus the system has to capture the trade-off between risk and return. In this project returns on different financial markets are analyzed as well as the degree and speed of transmission of changes in international interest rates to Swedish interest rates.[2]

Investigator: Lars Oxelheim.

[1] Some results have been presented in Oxelheim, L., 1985, *International Financial Market Fluctuations – Corporate Forecasting and Reporting Problems,* John Wiley & Sons,Chichester.

[2] The results of this study will be presented in Oxelheim, L., 1987, *Finansiell integration och räntetransmission – en studie av svenska marknaders internationella beroende,* (Financial Integration and Interest Rate Transmission – A Study of the International Dependence of Swedish Markets), IUI, Stockholm.

Some results have already been presented in "Styrsystem för riskreducering - Hur hanterar de största svenska företagen valutarisker?" (Systems for Risk Reduction – How do the Large Swedish Companies Handle Exchange Risks?) in *Hur styrs storföretag?* (How are Large Business Groups Managed?), IUI, Stockholm, 1984, and in"Finansiell integration och räntespridning" (Financial Integration and Interest Rate Dispersion) in *Att rätt värdera 90-talet, IUIs långtidsbedömning 1985* (Evaluating the 90s – The IUI Long Term Survey 1985), IUI, Stockholm 1985.

5 Household Economics

Household Market and Nonmarket Activities (HUS) – a Comprehensive Study of Household Economics

The HUS-project was started with the ambition to analyze and understand household resource allocation and resource accumulation. A household controls resources in the form of human capital, wealth and time. They are used

- in the labor market to earn money incomes and to invest in human capital (experience)
- in the commodity markets to purchase commodities
- in the financial markets to accumulate wealth
- during leisure time to acquire direct utility, and to invest in human capital
- to obtain services from the public sector, which are not sold in markets.

All these aspects of household behavior are more or less interrelated. To understand household economic behavior one has to take all factors into account. For instance, demand for goods and services do not only depend on incomes and prices but also on the number of household members who have a market job, what kind of job they have, and how they spend their leisure time. The amount of leisure time depends on each household member's job, the household composition, their stock of durables, etc. Labor supply depends primarily on the choice between leisure and income for consumption but also on market work of other household members, on the supply of daycare services for children, etc. Without access to information of this kind we cannot expect much success in quantifying the determinants of (for instance) labor supply or saving – vital pieces of information for any policy maker today.

Hence, a study with the ambition to understand important aspects of household behavior *needs a comprehensive data set.* In Sweden cross-sectional surveys cover partial aspects of this data set. For instance, data on household expenditures, savings and labor supply can be obtained from three different sources based on different samples of individuals. There is no single data source which includes all important aspects of the economic behavior of households for the analysis of the HUS project.

Data Collection

The data collection has been carefully prepared by various pre-tests of questionaires. The first wave of interviews was conducted during spring 1984. Around 1500 households including more than 2600 adult persons were interviewed.

The basic questionaire included the following sections:

1 Family composition
2 Social background
3 Schooling
4 Marital status
5 Childcare
6 Health status
7 Labor market experience
8 Employment
9 Job search of unemployed
10 Not in the labor force
11 Housing and housing costs
12 Tenants
13 Real estate ownership
14 Cars
15 Boats
16 Other durable consumer goods
17 Incomes and assets.

In addition questions about time-use during two randomly selected days were asked by telephone.

The experiences from the pre-tests and the first wave of interviews have been summarized by Anders Klevmarken in two published articles.[1]

The second wave of interviews was conducted during the spring of 1986. The same households have been reinterviewed. The questions covered basically the same areas as 1984 excluding time use. An additional sample of new households including those who did not respond in 1984 was also interviewed.

The HUS data set will provide unique opportunities for analyses of household behavior and the effects of government policies on households. The research which has recently started will be done both at IUI and at other institutions. IUI projects in progress focus on mobility (see p. 220) and female participation (see p. 221) in the labor market.

[1] "Collecting Data for Micro Analysis: Experiences from the HUS-Pilot Study", in Orcutt, G., Merz, J., Quinke, H., (eds.), 1986, *Microanalytic Simulation Models to Support Social and Financial Policy,* Elsevier Science Publishers B.V. (North-Holland); also published in IUI Booklet No. 207, Stockholm.

Household Market and Nomarket Activities. The First Year of a Swedish Panel Study. Paper presented at the Annual Meeting with the American Statistical Association in Philadelphia 1984, IUI Booklet No. 178, Stockholm.

Project leaders: Gunnar Eliasson and Anders Klevmarken.

Researchers:

From IUI: Anders Björklund
Siv Gustafsson

From other institutions:
David Brownstone (University of Irvine, California)
Peter Englund (University of Stockholm)
Lennart Flood (University of Gothenburg)
Bertil Holmlund (Trade Union Institute for Economic Research).

6 Foreign Trade, International Specialization and Multinational Business Activities

The International Growth and Investment Decisions in Large Swedish Companies

This project has been integrated with the large industry study coordination project on p. 168 ff. This particular project was completed with the publication of the book *The Giant Swedish Multinationals* by Gunnar Eliasson, Fredrik Bergholm, Eva Christina Horwitz and Lars Jagrén in January, 1985 (see p. 171).

Earlier publications from this project include:

(1) *Swedish Multinationals and the Swedish Economy* by Gunnar Eliasson (published in March 1984)[1] and

(2) *Swedish Foreign Investments in Construction and Machinery 1974-1978* by Fredrik Bergholm (published in May, 1983)[2]

Exports and International Competitiveness of Swedish Manufacturing

This project consists of two parts: (1) the analysis of Swedish market shares in industrial trade and the price elasticity of exports and (2) a study of the micro economic explanation of international competitiveness of firms. The first part has been completed with a set of publications[3] and was extensively reported in the earlier year-

[1] Swedish title: *De utlandsetablerade företagen och den svenska ekonomin,* IUI Research Report No. 26, Stockholm. Also published as supplement to: *LU 84, bilaga 8 i bilagedel 2, Särskilda studier, SOU 1984:6.*

[2] Swedish title: *Svenska företags investeringar i maskiner och byggnader i utlandet 1974-1978,* IUI Research Report No. 19, Stockholm.

[3] Horwitz, E.C., "Price Elasticities in Foreign Trade" in *Policy Making in a Disorderly World Economy,* IUI Conference Reports 1983:1, Stockholm.
Horwitz, E.C., "Export Performance of the Nordic Countries 1965-82 - a Constant Market Share Analysis" and Horwitz, E.C., "Intra Nordic Trade", both in *Economic Growth in a Nordic Perspective,* ETLA, IUI, IØI, 1984.

book. The second part has been phased in gradually, to allow for the completion of micro panel data on firms and divisions of firms. It includes firms' decision regarding investment, growth, and the allocating of resources to domestic and foreign markets. Hence the project is intimately linked with the question of internationalization and with a long research tradition at IUI.[1]

The second part of this study has recently been expanded by the decision to carry out a new survey of Swedish foreign manufacturing investments for the year 1986. (The two earlier surveys covered the years 1965, 1970, 1974 and 1978.) This study will also include in the analysis product development, marketing and distribution, and associated investments emphasized in *The Giant Swedish Multinationals* (see p. 171. A final concern is with the dynamics behind the firm's growth decisions and the composition of total investment.

Project leader: Birgitta Swedenborg.
Researchers: Magnus Blomström, Göran Johansson and Robert Lipsey.

[1] Beginning with Swedenborg's, 1973, study *Den svenska industrins investeringar i utlandet* (Swedish Direct Investment Abroad), IUI, Stockholm, and her 1979 study: *The Multinational Operations of Swedish Firms,* IUI, Stockholm.

7 Labor Market Studies

Labor Mobility.

Studies of Labor Turnover and Migration in the Swedish Labor Market

(published in August 1984)

by Bertil Holmlund

The past two decades have witnessed a trend decrease in various indicators of labor mobility in Sweden. Quit rates, job mobility and migration have all declined.

In this book observed changes in aggregate mobility rates are explained by econometric analysis on a number of different micro data sets. The problems addressed include (i) the determinants of job search and quit behavior, (ii) the determinants of family migration decisions, and (iii) the relationship between mobility and subsequent earnings.

The weakened demand for labor during the 70s is identified as a major explanation of the decline in mobility rates during the same period. Significant reductions in new hire rates have occurred. Since workers with short tenure often are those who are most likely to quit, any reduction in hirings produces a subsequent fall in quits.

The steady increase in average plant size in Swedish industry during the 60s and 70s, suggests a growing importance of internal labor markets and weaker incentives (for workers) to external job changes. The empirical evidence presented shows that quit rates in large plants are substantially below those in small plants, holding constant a number of characteristics of the plants and the local labor markets.

Evidence of an increasing importance of firm-specific human capital is offered. The wage payoff to male workers of "inside training" (i.e., training within the current firm) has increased relative to "outside training". This obviously means stronger incentives to avoid repetitive job changes.

Female workers were found to be more quit prone in the 60s than in the 70s and early 80s. Most likely, this reflects a stronger labor force attachment on the part of women, resulting in less frequent labor force transitions.

The growing number of two-earner households has also affected the frequency of locational changes. It is shown that family migration probabilities are lower if the

wife is working; the higher female participation ratios, accordingly, have contributed to a reduction in migration rates.

Workers are likely to move in response to perceived higher wage growth rates, and rates of wage growth are affected by mobility. The econometric analyses indicate that job movers during the period 1968-74 on average obtained about 4 percentage points higher real wage growth compared to a situation when they had decided not to move. There is also some evidence consistent with the hypothesis that self-selection in the labor market is efficiency improving; the excess wage growth from job changing is higher for movers than for stayers. It is interesting to note that mobility gains fall rapidly over the life cycle.

Disincentives to mobility may have been strengthened by legislative changes. Employment security legislation is an obvious example. The effects are partly of opposite directions. They show up in the behavioral equations for permanent layoffs and unemployment. Layoff rates have declined and so has unemployment inflow. Simultaneously, however, firms have become more choosy in their recruitment behavior, presumably because of higher layoff costs. It is quite likely that the legislation has resulted in a substitution of quits for layoffs. Workers who have been offered advance notice of future layoffs have strong incentives for on-the-job search and may change jobs prior to the layoff date. This effect, however, is compared by the loss of seniority associated with job changes among those not threatened by layoffs and the resultant increase in the cost of moving.

Wages and Work

– Economic Theories and Facts about Sex Differentials in the Swedish Labor Market[1]

(published in July, 1985)

by Siv Gustafsson and Petra Lantz

This book sums up several years of research in the field of sex differentials in the Swedish labor market. It presents the theories and methods in a text book format available to persons not trained in economics (an extensive statistical appendix presents relevant trends on sex differentials in the labor market).

The past 20 years have exhibited an explosive increase in female labor force participation in Sweden. Sweden now has the highest female labor force participation in the western world. It amounts to 81.3 percent for mothers with children under 7.

[1] Swedish title: *Arbete och löner – Ekonomiska teorier och fakta kring skillnader mellan kvinnor och män,* IUI, Stockholm.-

Even for the age group of 50-59 years the female labor force participation rate is currently at 78.8 percent. Neither grandmothers nor mothers are housewives anymore. This development has been stimulated by separate taxation of man and wife. Explanations include social benefits in connection with childbirth and increased opportunities to work part time. Women make up one third of the fulltime working labor force and just under half of the total labor force.

A model is tested in which the woman chooses between three uses of her time: household work, market work and leisure.

The most characteristic development regarding the wage and salary structure of female to male differentials is the *diminishing gap between female and male job compensation.* The hourly wage of a female industrial worker currently averages 90 percent of male wage. A female white collar worker earns 74 percent of the male fulltime salary. We find that women are much more likely than men to be in the lower job grades; as much as half of the total earnings differential between men and women is explained by different job levels. Controlling for education, age, branch of industry, size of company occupation etc., we find that 6 to 11 percent of the wage differential still remains to be explained.

Human capital differentials between men and women appear to mean more for younger persons than for older persons, and more in narrowly defined data sets than in data sets representing the whole labor market. The differential in average human capital accumulation between men and women as measured by i.e. length of education and number of years worked in the labor market has also narrowed. But the human capital variables explain only a minor part of the diminishing differential over time.[1]

Labor Market Dynamics: Individuals, Institutions and Efficiency

The importance of a flexible labor market for economic growth in the economy has always been emphasized by economists. Reallocation of labor from declining to expanding firms and industries is crucial in the growth process.

The actual flexibility of a labor market is determined by a complicated interplay between the behavior of individuals, institutions and the policies implemented by the government. The Swedish approach to structural change in the labor market is unique. In particular, the emphasisi on labor market policies is unusual in an international perspective. Current research under these headings at IUI can be divided into three subprojects.

[1] Some of the econometric earnings analyses are available in English in Gustafsson, S., 1981, "Male-Female Lifetime Earnings Differentials and Labor Force History", in Eliasson, G., Holmlund, B., and Stafford, F. (eds.), *Studies in Labor Market Behavior: Sweden and the United States,* IUI, Stockholm.

a) Effects of Labor Market Policies

Taking into account that almost 4 percent of the labor force is engaged in various labor market programs, the need for policy evaluation is obvious (see also Ysander's paper in this volume).

A study of manpower training investigates the impact on the future earnings and unemployment risks of participants. The analysis is based on panel data of employment and earnings before and after training for participants and "control-groups" of non- participants. The first articles from the project have been mainly concerned with methodological issues.[1] Preliminary results, however, indicate that the programs were overdimensioned during 1976-80.

Another set of data contains detailed information about the labor market behavior of 800 youths, who were registered as unemployed in the Stockholm county in 1981. The impact of temporary jobs ("relief works") will be studied using this data set.

A survey article, which summarizes the experiences of the "Swedish Labor Market Model" has been written for an international project about structural change in the labor market.[2]

b) Unemployment Insurance in Sweden

The Swedish government has been actively involved in subsidizing unemployment insurance since the mid 30s. The government is also responsible for the system of "cash assistance" (KAS) to new entrants in the labor market.

The current study reviews the Swedish system for unemployment insurance. An evaluation of the system is done in the light of the literature on the economics of insurance.

The effects on unemployment, wage formation, industrial structure and income distribution are studied. The properties of an "optimal" unemployment insurance program is discussed.

A book – jointly authored by Anders Björklund and Bertil Holmlund – will be published during 1987. The book will include results from other projects at IUI.[3]

c) Studies of Individual Behavior

Microecoometric studies of individual behavior in the labor market have been an important area for IUI in recent years.

This tradition will be continued. The HUS-data set (see page 216) will provide new opportunities for analyses of the causes and effects of job mobility. Studies of the behavior of unemployed are also planned.

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[1] Björklund, A. and Moffitt, R., "The Estimation of Wage Gains and Welfare Gains from Self-selection Models", *Review of Economics and Statistics,* forthcoming, 1987; also IUI Working Paper No. 105.

[2] Björklund, A., 1986, "Policies for labor market adjustment in Sweden", in Hufbauer G., and Rosen H. (eds.), *Domestic Adjustment and International Trade,* Institute for International Economics, Washington, 1986; also IUI Working Paper No. 163.

[3] E.g. Axell, B. and Lang, H., 1986, *The Effects of Unemployment Compensation in General Equilibrium with Search Unemployment,* IUI Working Paper No. 159.

Investigators: Anders Björklund, sections b and c together with Bertil Holmlund, now at the FIEF (Fackföreningsrörelsens Institut för Ekonomisk Forskning).

Wage Formation at Plant Level in Swedish Industry

The research project aims at ascertaining which factors influence the rate of wage increases at plant level in Swedish manufacturing industry. The hypotheses that are to be tested are derived from models of a firm's optimal wage behavior which have been developed by the author. The data consist of a large volume of figures on individual earnings, turnover rates, registered job vacancies and financial data on plants or firms.

The theoretical analysis of optimal wage behavior is based on models of search in the labor market. Unlike the traditional models of this type, which have a deterministic structure, the present analysis applies stochastic control methods, such as Markov decision processes, in establishing the optimal wage policy of a recruiting firm.

Besides confirming the expected influence on the optimal wage level of such factors as the value added of the firm, the model is elaborated in order to shed light on the influence on wage formation of labor market conditions. It is demonstrated that the speed of the recruitment process – or, equivalently, the expected duration of an unfilled job vacancy – at a given wage offer reflects labor market conditions as they are perceived by the firm. The author has earlier shown that vacancy durations explain empirically much of the aggregate wage drift in Sweden[1] and he has recently demonstrated theoretically that they are indeed uniquely (and inversely) related to the unemployment rate as long as the efficiency of the aggregate hiring process is structurally stable.[2] It is one of the important tasks of the theoretical analysis to clarify under what conditions wage increases are an optimal response of the firm to increased vacancy durations; the standard search models do not necessarily have such an implication.

The implications of the analysis are tested against data from three sources. From the wage statistics of the Swedish Employers' Confederation quarterly data on individual earnings, working hours, occupational status, sex and age have been gathered for several thousand blue collar workers, employed at sixteen firms within engineering industry in the Stockholm area during the years 1970-80. From the local public employment exchange offices, the reported vacancies of the same firms have been collected and registered as to duration and occupational category. Finally the Central Bureau of Statistics has supplied detailed financial data on the firms. The data material is consequently quite comprehensive. Applied to the refined hypotheses of the

[1] Schager, N.H., 1981, "The Duration of Vacancies as a Measure of the State of Demand in the Labour Market. The Swedish Wage Drift Equation Reconsidered", in Eliasson, Holmlund and Stafford (eds.), *Studies in Labor Market Behavior: Sweden and the United States,* IUI, Stockholm.

[2] Schager, N.H., 1985, *The Replacement of the UV-curve with a New Measure of Hiring Efficiency,* IUI Working Paper No. 149. Cf. also Schager's "Specialstudie II" (Special Study II) in the IUI Long Term Survey, Stockholm, 1985 (in Swedish).

model it should make it possible to identify the factors influencing wage increases at plant level, an object that has defied earlier research efforts.

Investigator: Nils Henrik Schager.

Public Policy Female Labor Force Participation and Fertility

The choice between work and family is a difficult one for women. Women in the western world increasingly want both a career and a family. These "demands" are clearly visible in the trends of fertility and female labor force participation. In Sweden female labor force participation exceeds 80 percent, even for mothers with children under 7. Fertility in Sweden dropped below the replacement rate in the 60s. Sweden is ahead of other industrial countries in terms of female labor force participation, but fertility is not the lowest. It has in fact decreased more in West Germany though female labor force participation has stagnated around 50 percent during the past decade. The United States has the highest fertility rate, 1.9, and its female labor force participation is about the size of West Germany's. The total fertility rate is currently 1.6 in Sweden and 1.4 in West Germany. International comparisons do not show negative relationship between female labor force participation and fertility. On the other hand numerous studies have shown negative relationships within countries in the sense that women with small children exhibit lower participation rates when their wage and their husband's income has been accounted for.

Why do we find such inconsistent results comparing countries that are so similar in standards of living and household technologies? One hypothesis is that different public policies towards women and fertility explains the variation. Sweden, for instance, has a policy of separate taxation of earnings of husband and wife whereas Germany and the United States have joint or split taxation. Another difference is government subsidized child care. Gustafsson, Brownstone (University of California at Irvine) and Stafford (University of Michigan) propose a project with the purpose of investigating the effects of child care on female labor supply within the context of the IUI HUS project (see p. 215). For the first time micro data will soon become available on a standardized format for Sweden, the United States and West Germany. It will be possible to estimate similar relations on data for the three countries. It will also be possible to simulate policies from one country on relationships estimated on data for another country, and compare results. This project will be run in cooperation with Arbetslivscentrum, Stockholm, Wissenschaftszentrum, Berlin, University of Michigan and University of California at Irvine.

Investigator: Siv Gustafsson.

8 Other Research Projects (Institutions and Markets)

Can Inflation be Prohibited?
A Study on Price Controls in Sweden[1]

(published in Sept., 1985)

by Bo Axell

This book surveys modern theories of free market pricing and applies these theories to the case of price controls. The study also includes an empirical evaluation of the general price control in Sweden 1970-75 and concludes that it caused more, rather than less, inflation. A more elaborate summary presentation of the book is given in Axell's article on p. 129.

A Study of the Size and Implications of the Unobserved Sector in the Swedish Economy

The unobserved sector consists of those economic activities (legal or illegal, market or non-market, monetary or barter) which escape the purview of the society's statistical measurement apparatus. A large and growing unobserved sector can have important consequences for public finance and macroeconomic policy insofar as official government statistics on national income, prices, productivity, unemployment and taxable income become distorted as a result of the omission or understatement of the unobserved sector.

Growth of the unobserved sector is believed to be encouraged by high rates of taxation, increased costs of regulation and compliance, and by a growing sense of social and political alienation from constituted governmental authority. Given Sweden's high rates of taxation and its extensive regulatory system, it is clear that significant economic incentives exist for the development of an unobserved economy. A

[1] Swedish title: *Kan inflation förbjudas? – Om fri eller reglerad pris- och lönebildning,* IUI, Stockholm.

counterweight to these economic incentives is the traditional cohesion and sense of social responsibility historically manifested by the Swedish citizen.

The purpose of this study is twofold: First, to develop a conceptual framework of analysis capable of describing the implications of an unobserved sector for public finance and macroeconomic policy and second, to undertake alternative empirical measurements of the unobserved sector's size and growth.

To date, the study has produced a model of an economy containing both an observed and unobserved sector. This model is used to simulate the shape of the Swedish Laffer Curve and to determine where the Swedish economy is located on its Laffer Curve under different assumptions concerning the size of the unobserved sector. Under the most plausible parameterization of the Swedish economy, the results suggest that for unobserved sectors ranging between 5 percent and 20 percent of the total economic activity, Sweden has already surpassed the peak of the Laffer curve; this reduces total tax revenues as a result of both supply side effects and shifts of unobserved activity to the observed economy. Not only could tax revenues be maintained, but total income could be increased between 10 and 15 percent as a result of across the board tax decreases.

Empirical estimates of the amount of unreported taxable income and the amount of unrecorded income in the national accounts are constructed by the use of different methods. A general currency ratio (GCR) model described in Feige (1986)[1] produces estimates suggesting that Sweden's unreported income rose from approximately 6 percent of reported income in the 1960s to over 20 percent by the late 1970s. In the early 1980s Sweden's per capita unobserved income was calculated to be in the neighborhood of 10,000 SEK, and the average Swedish household held approximately 9,000 SEK in currency.

A second method (Feige 1985)[2] employs the payments-transactions approach. This procedure estimates the total volume of unrecorded transactions as the difference between total payments (MV) and total transactions (PT). The results imply that Sweden's unrecorded income has grown secularly and by the early 1980s approached 25 percent of total income.

Investigator: Edgar L. Feige.

Price Formation in Transportation Services

The purpose of this project is to examine the principles that should guide the decisions of public utility pricing, for instance railroad transportation, when railroads compete with, for instance, truck transportation, a market governed by "genuine" competition.

During the last decade information and transaction costs have been integrated in

[1] Feige, E., *Sweden's "Underground Economy"*, IUI Working Paper No. 161, Stockholm.

[2] Feige, E., *The Swedish Payments System and the Underground Economy,* IUI Working Paper No. 153, Stockholm.

market theory. As a consequence, the market equilibrium solutions are radically different from those obtained from classical theory. The analysis of pricing strategy in transport services under various market regimes is the primary purpose of this project. The theoretical foundations are based on the theories for decentralized non-walrasian pricing that have been developed during the last decade partly at the institute.[1]

Empirical data on price distributions in truck transportation will support the theoretical analysis. Traditional econometric methods will be applied to estimate transport price functions and to isolate price distributions for "homogenous" transport services. This analysis will be performed on SCB's survey of truck transports from which data are available for the second and fourth quarters 1984.

The project, which was started up 1985, can be characterised as an empirically oriented welfare analysis of the trucking (transport) industry.

Project leaders: Bo Axell and Harald Lang.

The Dynamics of Organizational and Institutional Change

This project has two objectives:

(1) To develop a theoretical framework for analyzing the organizational dynamics of different economic systems.
(2) To analyze the institutional dynamics of the Swedish model of industrial relations.

These two objectives means that the project is organized as two subprojects that naturally support each other; one theoretical project and one "empirical" application.

a) The Role of Private Enterprise in Production: an Organizationally Dynamic Analysis

In this part we develop a theoretical framework for comparing different economic systems from a dynamic point of view. The specific task is to assess *private enterprise* as a system of production, in comparison with various forms of socialism and interventionism (also see Pelikan's article on p. 133).

The theoretical framework is developed on two key notions:

- *institutional rules* comparable to the rules of a game;
- *organizational structure* referring to the network of individuals and organizations actually playing the game.

[1] See e.g. Axell-Albrecht-Lang, 1986, "General Equilibrium Price and Wage Distributions", *Quarterly Journal of Economics,* Nov.

Each economic system is characterized by its institutional rules which govern two types of processes:

- *allocational processes,* consisting of exchanges of resources; which are traditionally studied by economic analysis;
- *organizational processes,* consisting of the formation, modification and dissolution of organizations – such as markets or hierarchies, which call for some theoretical innovations.

The dynamics of economic systems then naturally falls into the following three branches:

- *functional dynamics* which studies how given markets change prices and quantities through various adjustment processes;
  organizational dynamics which studies how markets and/or hierarchies are established, enlarged, or dissolved;
- *institutional dynamics* which studies how one type of economic system is transformed into another type (e.g., through changes of custom and/or legislation).

Our analysis focuses on organizational dynamics. It seeks to determine the economic performance of different variants of institutional rules – corresponding to different forms of private enterprise, interventionism, and socialism – by examining their effects on the formation, evolution and dissolution of market and non-market organizations. Tacit knowledge, as an unusual, scarce resource which calls for an unusual allocation process, is demonstrated to play a central role in this analysis.

b) Industrial Relations and Economic Adjustment in Post-war Sweden

This part of the project is concerned with the continuity and change in the Swedish model of industrial relations (also see Turner's article on p. 73). Swedish experience since the mid 60s serves as a case study for examining changing patterns of conflict and collaboration in a "corporatist" system of industrial relations. Corporatist systems are distinctive in two respects: (1) collective bargaining is carried out at the national or industrial level between highly centralized unions and employers' associations; (2) government participates as a formal or informal actor in the bargaining process in an attempt to minimize industrial conflict and facilitate settlements consistent with national policy objectives.

The study is divided into two parts. Part I calls into question the theoretical foundations and empirical support for what is termed the "corporatist thesis of national economic adjustment". This thesis, whose proponents include economists as well as sociologists, holds that nations characterized by highly corporatist industrial relations systems have been particularly successful in responding to the economic challenges of the post OPEC period.

Part 2 is devoted to a detailed analysis of the evolution of Swedish industrial relations. Three main questions are addressed. (1) What have been the most important changes in the Swedish model of industrial relations over the past 15 years? (2) What have been the principal sources of change in the system? What is the relative importance of exogenous forces (the massive shift in the structure of employment, pro-

longed economic stagnation, and heightened international competition) and endogenous forces (the strategies employed by unions, business, and the state in attempting to advance their specific interests)? (3) How have these changes affected the relative power and authority of the major actors in the industrial relations system?

Investigators: Pavel Pelikan (a) and Stephen Turner (b).

PART III.

Other activities

Teaching at IUI

Traditionally IUI is a research organization, not a teaching institution. Although there are no formal linkages between IUI and the universities, IUI staff frequently teach and attend university courses. During the last decade university teaching programs have not provided the composition of educational services needed for the applied industrial economics orientation of IUI research. *Industrial economics, microeconometrics* and related mathematical techniques have been largely absent from graduate teaching agendas. To remedy this deficiency we have organized several inhouse graduate courses together with universities (see earlier IUI Yearbook; *Microeconometrics,* IUI, Stockholm 1983).

Industrial Economics

Economics has been subjected to increasing criticism during recent years, both externally and internally. Theory has been criticized for its unrealistic assumptions, especially when the time dimension of economic processes is concerned. Critics have also charged that theory fails to incorporate the dynamics of organization of production. Some even argue that economics lacks an acceptable theory of economic growth.

The subfield in economic theory that covers this area of inquiry is *industrial organization.* Even that field has recently been subjected to increased criticism. The static foundation of industrial organization theory, the lack of connection between theory and empirical applications, and other shortcomings have been pointed out. The lack of a good theory for economic development has caused an extensive fragmentation in the field of industrial organization. The graduate course in *industrial economics* initiated this autumn (1986) aims at remedying this situation. Its main objectives are to:

(1) survey the variety of theories (in particular) and also empirical applications in industrial organization

(2) sketch a dynamic version of industrial organization theory.

The latter we call *industrial economics.*

The aim of the course is to make students familiar with the whole range of theorizing and to create an awareness of both the art of choosing theory and method according to problems, and the skills needed to analyze models. Standard, static versions of industrial organization theory – like contestable markets and principal agent theory etc. – provide only a starting point. These are supplemented with the varied menu of semi formal, semi verbal theory addressing economic development, mergers and take-over activity, the theory of the firm and institutional change in general. The dynamics of micro behavior and macroeconomic performance (micro-macro theory) is the focus of interest. The approach emphasizes teaching the critical choices of theory and methods, not the technical analysis of theory and application of method.

The course has been organized jointly with IUI as a graduate course in economics at the *University of Uppsala,* during the autumn of 1986.

Responsible: Gunnar Eliasson.

Mathematics

Economic method has long had a strong foundation in optimization theory. Two developments in economics are making this a language constraint for theoretical development. *First,* by attempting to incorporate endogenous change in the organization of the production system and to view price-quantity adjustment processes as guided by an ongoing gradient search for improved positions, rather than optimization, economic theory has been pushing at the very foundations of the mathematics of calculus.

Second, some of the problems encountered in process modeling can be overcome by recourse to computer simulation models, and numerical analysis. Large steps forward in that area have already been taken in other fields, notably applied sciences like engineering.

Numerical analysis alienates economic method from traditional economic theory built on basic behavioral postulates. It also alienates groups of researchers from one another because of the differences in language and method.

This course is an attempt to bring the two fields closer, partly by explicating the foundations of traditional mathematics used in economics, partly by thrashing out the conceptual content in various approaches to economic analysis.

The course does not aim at teaching standard mathematical methods for economic theory.

The course will be organized jointly with IUI as a graduate course in economics at the *University of Uppsala* during the spring of 1987.

Responsible: Harald Lang.

Foreign Guest Researchers

On the resignation of Dr. Marcus Wallenberg as chairman of the Institute's Board of Directors in 1975 IUI received a donation from the Marianne and Marcus Wallenberg Foundation to enable the Institute during ten years to invite foreign researchers to IUI. This donation was renewed in 1985 for another five year period.

Within this program the following persons visited IUI 1983-86.

1983

Dennis Aigner, University of Southern California, Los Angeles
Jim Albrecht, Columbia University
Dean Amel, MIT, Cambridge, Massachusetts
Ernst Berndt, MIT, Cambridge, Massachusetts
Richard H. Day, University of Southern California, Los Angeles
Yannis Ioannides, Boston University
Thomas Juster, University of Michigan
Robert E. Lipsey, National Bureau of Economic and Social Research (NBER), New York
Cathrine Morrison, Boston University
Mark Sharefkin, Resources for the Future, Washington
Thomas von Ungern-Sternberg, Universität Bern
Sidney Winter, Yale University, Connecticut

Participants in the symposium on The Dynamics of Market Economies

Jean-Pascal Benassy, CEPREMAP, Paris
Robert Clower, University of Southern California, Los Angeles
Richard H. Day, University of Southern California, Los Angeles
Gerhard Mensch, Case Western Reserve University, Cleveland
Franco Modigliani, MIT, Cambridge, Massachusetts
Richard Nelson, Yale University, New Haven, Connecticut
Mancor Olson, University of Maryland
William Parker, Yale University, Connecticut
Tad Rybczynski, Lazard Brothers & Co., London Mark Sharefkin, Resources for the Future, Washington

Herbert Simon, Carnegie-Mellon University, Pittsburgh
Dean Spinanger, Institut für Weltwirtschaft an der Universität Kiel
Thomas von Ungern-Sternberg, Universität Bern
Christian von Weizäcker, Universität Bern
Sidney Winter, Yale University, Connecticut

1984

Jim Albrecht, New York University
Vsevolod Altaev, CEMI, Moskva
Dagobert Brito, Tulane University
David Brownstone, Princeton University
Richard H. Day, University of Southern California, Los Angeles
Hans Genberg, Institut Universitaire de Hautes Études International, Genève
Kenneth A. Hanson, University of Southern California
Yannis Ioannides, Boston University
Michael Intriligator, UCLA
Mervyn King, University of Birmingham
Daniel Mazmanian, Pomona College and Claremont
Jim Morgan, University of Michigan
Alexej Semjonov, CEMI, Moskva
Aijit Singh, Cambridge University
Michael Spence, Harvard University
Frank Stafford, University of Michigan
David Wise, Kennedy School
Christian von Weizsäcker, Universität Bern

1985

Jim Albrecht, University of New York
Barry Bosworth, The Brookings Institution, Washington
William Branson, National Bureau of Economic and Social Research (NBER), New York
David Brownstone, University of California Garry Burtless, The Brookings Institution, Washington D.C.
Gary Burtless, The Brookings Institution, Washington
Richard H. Day, University of Southern California, Los Angeles
Hans Genberg, Institut Universitaire de Hautes Études International, Genève
Edward M. Gramlich, University of Michigan
Kenneth A. Hanson, University of Southern California, Los Angeles
Charles Holt, University of Texas
Robert Lawrence, The Brookings Institution, Washington
Nikolaj Machrov, CEMI, Moskva
Joachim Mertz, J.W. Goethe Universität Frankfurt und Universität Mannheim
Aleksej Pomanskij, CEMI, Moskva

Frank van der Duyn Schouten, Free University, Amsterdam
Stephen Turner, Harvard University
Yoram Weiss, University of Tel Aviv

1986

Jim Albrecht, University of California, Irvine
David Brownstone, University of California, Irvine
Bo Carlsson, Case Western Reserve University, Cleveland, Ohio
Richard H. Day, University of Southern California, Los Angeles
Edgar L. Feige, University of Wisconsin, Madison
Kenneth A. Hanson, University of Southern California, Los Angeles, California
Axel Leijonhufvud, UCLA, Los Angeles, California
Robert E. Lipsey, National Bureau of Economic and Social Research (NBER), New York
Franco Modigliani, MIT, Cambridge, Massachusetts
Xavier Richet, University of Paris
Clas Wihlborg, Claremont Graduate School and University of Southern California, Los Angeles, California
Clas Wihlborg, Claremont Graduate School and University of Southern California, Los Angeles, California
Robert Willis, University of Chicago

Conferences Arranged by IUI

The Dynamics of Decentralized (Market) Economies

In August 1983, IUI and the Journal of Econonomic Behavior and Organization (JEBO) jointly organized an international conference on the theme *The Dynamics of Decentralized (Market) Economies*. The conference was sponsored by the Marcus Wallenberg Foundation for International Cooperation in Science. Papers presented at the conference are listed below.[1]

I. Background on Schumpeterian Economics

Erik Dahmén: **Schumpeterian Dynamics**
Discussants: Richard Nelson
Gerhard Mensch

William Parker: Social Dynamics in Schumpeter's Century (1840-1940)
Discussant: Tad Rybczynski

II. The Theory of Economic Dynamics

Herbert Simon: On the Behavioral and Rational Foundations of Economic Theory
Discussants: Robert W. Clower
Mark Sharefkin

Robert Clower: Pricing and Disequilibrium
Discussants: Franco Modigliani
Jean-Pascal Benassy

Gunnar Eliasson: A Dynamic Micro-to-Macro Model of an Industrial Economy
Discussants: Sidney Winter
Christian von Weizsäcker

[1] The papers and discussion have been published in Day, R.H. and Eliasson, G. (eds.), *The Dynamics of Market Economies,* IUI and North-Holland, 1986 (see page 183).

J-P Benassy: A Non-Walrasian Model of the Business Cycle
Discussants: Franco Modigliani
Hans T:son Söderström

III. Adaptive, Evolutionary Modelling

Richard Day: Disequilibrium Economic Dynamics - A Post-Schumpeterian Contribution
Discussants: Mark Sharefkin
Ingemar Ståhl

Christian von Weizsäcker: Adaptive Preferences
Discussants: Richard Day
Bengt-Christer Ysander

Sidney Winter: Schumpeterian Competition in Alternative Technological Regimes
Discussants: Gunnar Eliasson
Thomas von Ungern-Sternberg

Richard Nelson: Technological Change and Productivity Growth in an Evolutionary Model
Discussants: Herbert Simon
Bo Carlsson

IV. Empirical Inquiries and Special Problems

Tad Rybczynski: The Industrial Finance Systems; Europe, U.S. and Japan
Discussants: Dean Spinanger
William Parker

Thomas von Ungern Sternberg: Technological Progress in an Industry with a Single Innovator
Discussants: Hans T:son Söderström
Ove Granstrand

Bo Carlsson: The Microeconomics of Organization and Productivity Change - the Use of Machine Tools in Manufacturing
Discussants: William Parker
Gerhard Mensch

Dean Spinanger: Quasi Monopoly Profits, Barriers to Entry and the Welfare State - Their Impact on Labor Markets in Industrialized Countries
Discussants: Karl-Olof Faxén
Per-Martin Meyerson

The Dynamics of Decentralized (Market) Economies

Grand Hotel Saltsjöbaden, August, 28-31, 1983

Participants

Jean-Pascal Benassy, CEPREMAP, France
Bo Carlsson, IUI
Robert Clower, UCLA, USA
Erik Dahmén, Stockholm School of Economics, Sweden
Richard Day, University of Southern California, USA
Gunnar Eliasson, IUI
Harald Fries, IUI
Ove Granstrand, Chalmers University of Technology, Gothenburg
Gerhard Mensch, Case Western Reserve University, USA
Per-Martin Meyerson, Federation of Swedish Industries
Franco Modigliani, MIT, USA
Richard Nelson, Yale University, USA
Mancur Olson, University of Maryland, USA
William Parker, Yale University, USA
Tad Rybczynski, Lazard Brothers & Co., England
Mark Sharefkin, Resources for the Future Inc., USA
Herbert Simon, Carnegie-Mellon University, USA
Dean Spinanger, Institut für Weltwirtschaft an der Universität Kiel, West Germany
Ingemar Ståhl, University of Lund
Hans T:son Söderström, Institute for International Economic Studies, Sweden
Thomas von Ungern-Sternberg, Universität Bern, Schweiz
Christian von Weizsäcker, Universität Bern, Schweiz
Sidney Winter, Yale School of Organization and Management, Yale University, USA
Herman Wold, University of Uppsala
Bengt-Christer Ysander, IUI
Johan Örtengren, IUI

Other Activities

Anders Björklund was visiting scholar at the University of Wisconsin, Madison, during 1982-83. He is associated with the Expert Group for Labor Market Research at the Swedish Ministry of Labor. Since 1984 he is secretary to the Swedish Economic Association.

Gunnar Eliasson is a member of the Advisory Committee to the Swedish Government's Long-Term Survey, of the monetary committee of the International Chamber of Commerce (ICC), of the Royal Swedish Academy of Engineering Sciences (IVA). He is also associate editor of The Journal of Economic Behavior and Organization (JEBO) and of the European Economic Review. He is a member of the executive committee of the EARIE, of the scientific committee of the International J.A. Schumpeter Society of the scientific advisory committee of the Association of Computer Users (Riksdataförbundet), and a member of the board of Sparbankernas Aktiesparfond AB (The Savings Banks' Trust Fund).

Lars Oxelheim visited the National Bureau of Economic Research, N.Y., the Claremont Graduate School and the University of Southern California during 1984 and 1985.

Birgitta Swedenborg, who joined the Institute as Associate Director in November of 1986, is a member of the Advisory Committee to the National Swedish Board of Universities and Colleges. She is also chairman of the Liberal Economists' Club.

IUI Publications

For a complete list see IUI 40 years, 1939–1979. The Firms in the Market Economy. IUI Research Program 1979–1980.

Books

Kunskap, information och tjänster. En studie av svenska industriföretag (The Manufacturing Firm as an Information Processor and Service Producer – a Study of the Industrial Knowledge Base of a Country and the Transformation of Manufacturing Firms into Service Producers). Gunnar Eliasson, Bo Carlsson, Enrico Deiaco, Thomas Lindberg, Tomas Pousette. IUI, Liber, Statens Industriverk. 1986. 250 pp.

The Dynamics of Market Economies (eds. Richard H. Day, Gunnar Eliasson). IUI and North-Holland. IUI Conference Reports 1986:1. 512 pp.

Flexibilitet i företag – en studie av arbetsmarknadskonflikten 1985 (Flexibility in Firms – a Study of the Labor Market Conflict 1985). Lars Jagrén, Tomas Pousette. IUI and ÖEF. 1986. 104 pp.

Two Models of an Open Economy. Lars Bergman, Leif Jansson, Tomas Nordström, Bengt-Christer Ysander (ed.). 1986. 161 pp.

Att rätt värdera 90-talet – IUIs långtidsbedömning 1985 (Evaluating the 90s – The IUI Long Term Survey 1985). G. Eliasson, A. Björklund, T. Pousette, E. Deiaco, T. Lindberg, B. Axell, H. Genberg, L. Oxelheim, N.H. Schager, J. Södersten. 1985. 411 pp.

The Firm and Financial Markets in the Swedish Micro-to-Macro Model – Theory, Model and Verification. Gunnar Eliasson. 1985. 419 pp.

Control of Local Government. Proceedings of a Symposium at IUI, Stockholm, June 9–13, 1981 (eds. Edward M. Gramlich, Bengt-Christer Ysander). IUI Conference Reports 1985:1. 398 pp.

Kan inflation förbjudas? – Om fri eller reglerad pris- och lönebildning (Can Inflation be Prohibited – About Free or Regulated Price and Wage Formation). Bo Axell. 1985. 142 pp.

Arbete och löner – Ekonomiska teorier och fakta kring skillnader mellan kvinnor och män (Wages and Work – Economic Theories and Facts about Sex Differentials in the Swedish Labor Market). Siv Gustafsson, Petra Lantz. IUI, Arbetslivscentrum. 1985. 235 pp.

De svenska storföretagen – en studie av internationaliseringens konsekvenser för den svenska ekonomin (The Giant Swedish Industrials – a Study of the Consequences of Internationalization for the Swedish Economy). Gunnar Eliasson, Fredrik Bergholm, Eva Christina Horwitz, Lars Jagrén. 1985. 229 pp.

Hur styrs storföretag? En studie av informationshantering och organisation (How are Large Business Groups Managed? A Study of Information Handling and Organization). Gunnar Eliasson, Harald Fries, Lars Jagrén, Lars Oxelheim. IUI, Liber. 1984. 242 pp.

The Taxation of Income from Capital. A Comparative Study of the United States, the United Kingdom, Sweden and West Germany (editors: M.A. King, D. Fullerton. Swedish authors: J. Södersten, T. Lindberg). NBER, IUI, IFO. 1984. 344 pp.

Verksamhetsberättelse 1983–1984 (IUI Yearbook 1983–1984). 1984. 148 pp.

Labor Mobility. Studies of Labor Turnover and Migration in the Swedish Labor Market. Bertil Holmlund. 1984. 279 pp.

Economic Growth in a Nordic Perspective. ETLA, IUI, IØI. 1984. 373 pp.

Energy in Swedish Manufacturing. B.-C. Ysander (ed.), J. Dargay, L. Hultkrantz, L. Jansson, S. Lundgren, T. Nordström. 1983. 260 pp.

Energy and Economic Adjustment. Lars Bergman, Karl-Göran Mäler, Tomas Nordström, Bengt-Christer Ysander (ed.). 1983. 247 pp.

Microeconometrics. IUI Yearbook 1982–1983. 1983. 178 pp.

Policy Making in a Disorderly World Economy (eds. G. Eliasson, M. Sharefkin, B.-C. Ysander). IUI Conference Reports 1983:1. 417 pp.

Lönebildning och lönestruktur. En jämförelse mellan Sverige och USA. (Determination and Structure of Salaries. A Comparison between Sweden and USA.) N. Anders Klevmarken. 1983. 93 pp.

Studies in Labor Market Behavior: Sweden and the United States. Proceedings of a Symposium at IUI, Stockholm, July 10–11, 1979. IUI Conference Reports 1981:2. 442 pp.

Svensk industri i utlandet (Swedish Industry Abroad). Birgitta Swedenborg. 1982. 299 pp.

Industrin inför 80-talet (Swedish Industry Facing the 80s). Bo Carlsson, Johan Örtengren, Petra Lantz, Tomas Pousette, Lars Jagrén, Fredrik Bergholm. 1981. 495 pp.

Industripolitik och samhällsekonomi. Verksamheten 1981. (Industrial Policy and Macroeconomics. Activities 1981.) 1982. 127 pp.

Business Taxation, Finance and Firm Behavior. Proceedings of a Symposium at IUI, Stockholm, August 28–29 1978 (eds. G. Eliasson, J. Södersten). IUI Conference Reports 1981:1. 435 pp.

On the Complete Systems Approach to Demand Analysis. N. Anders Klevmarken. 1982. 91 pp.

Industristödspolitiken och dess inverkan på samhällsekonomin (Industry Subsidy Policy and its Macroeconomic Impact). Bo Carlsson, Fredrik Bergholm , Thomas Lindberg. 1981. 153 pp.

Företagsetableringarna i Sverige under efterkrigstiden (Establishments of New Firms in Sweden in the Post-War Period). Gunnar Du Rietz. 1980. 194 pp.

Byggmarknad, sjöfart och varuhandel. Specialstudier för IUI:s långtidsbedömning 1979 Del 3. (Construction, Shipping and Retail Trade. Special Studies for IUI Medium-Term Survey 1979.). Göran Normann, Olle Renck, Folke Larsson. 1980. 239 pp.

Engineering Trade Specialization of Sweden and Other Industrial Countries. A Study of Trade Adjustment Mechanisms of Factor Proportions Theory. Lennart Å. Ohlsson. Published by North-Holland. 1980. 284 pp.

Industriell utveckling i Sverige. Teori och verklighet under ett sekel (Industrial Development in Sweden. Theory and Practice during a Century), (eds. E. Dahmén, G. Eliasson). 1980. 407 pp.

The Firms in the Market Economy. IUI 40 years. IUI Yearbook 1979/1980. 1980. 150 pp.

Micro Simulation – Models, Methods and Applications. Proceedings of a Symposium in Stockholm, September 19–22, 1977 (eds. B. Bergmann, G. Eliasson, G. Orcutt). IUI Conference Reports 1980:1. 409 pp.

Booklets

215. *L'évaluation des politiques publiques en Suède* (Evaluation of the Swedish Public Sector). Bengt-Christer Ysander. Reprint from L'évaluation des politiques publiques. Edited by Jean-Pierre Nioche and Robert Poinsard. Economica. Paris, 1984. 1986. 20 pp.

214. *Företagets flexibilitet vid kriser* (Flexibility of Firms in Crises). Lars Jagrén, Tomas Pousette. Reprint from Kungl Krigsvetenskapsakademiens Handlingar och Tidskrift 3/86. 12 pp.

213. *Marknadsföring – en fråga om organisation* (Marketing – a Question of Organization). Gunnar Eliasson. Reprint from Kundorienterad Företagsstyrning. Bratt Publishing, 1986. 4 pp.

212. *Mjukvaruinvesteringarnas storlek och betydelse* (The Significance of Soft-Ware Investment). Fredrik Bergholm, Lars Jagrén. Reprint from Ekonomisk Debatt 4 1986. 8 pp.

211. *Sweden's International Development: Driving Forces and Present Structure.* Gunnar Eliasson. Reprint from Manage Your Business Abroad. Edited by S. Söderman. Swedish Trade Council, Stockholm 1986. 15 pp.

210. *Comparative Advantage and Development Policy 20 Years Later.* Anne O. Krueger. Reprint from Economic Structure and Performance. Essays in Honor of H. B. Chenery. Edited by M. Syrquin, L. Taylor and L. E. Westphal. Academic Press Inc., New York, 1984. 1986. 22 pp.

209. *Effect of the Swedish 1983–85 Tax Reform on the Demand for Owner-occupied Housing: A Microsimulation Approach.* David Brownstone, Peter Englund, Mats Persson. Reprint from The Scandinavian Journal of Economics. Vol 87 (4) 1985, 1986. 22 pp.

208. *Equal Opportunity Policies in Sweden.* Siv Gustafsson. Reprint from Sex Discrimination and Equal Opportunity. The Labour Market and Employment Policy. Edited by G Schmid and R Weitzel. WZB-Publications. Gover Publishing Co Ltd. 1986. 24 pp.

207. *Collecting Data for Micro Analysis: Experiences from the HUS-Pilot Study.* N Anders Klevmarken. Reprint from Microanalytic Simulation Models to Support Social and Financial Policy. Edited by G Orcutt, J Merz and H Quinke. Elsevier Science Publishers B V (North-Holland), 1986. 32 pp.

206. *The Swedish Micro-to-Macro Model: Idea, Design and Application.* Gunnar Eliasson. Reprint from Microanalytic Simulation Models to Support Social and Financial Policy. Edited by G Orcutt, J Merz and H Quinke. Elsevier Science Publishers B C (North-Holland), 1986. 34 pp.

205. *Unemployment and Mental Health: Some Evidence from Panel Data.* Anders Björklund. Reprint from The Journal of Human Resources, Vol. XX, No. 4, Fall 1985. 16 pp.

204. *Den industriella utvecklingen under 1900-talet* (The Industrial Development during the Twentieth Century). Erik Dahmén, Bo Carlsson, Reprint from Sveriges Industri, Sveriges Industriförbund, 1985, 38 pp.

203. *Transportmedelsindustri* (Transport Equipment Industry). Jonas Gawell, Tomas Pousette. Reprint from Sveriges Industri, Sveriges Industriförbund, 1985. 18 pp.

202. *Företag, entreprenör och ägare i svensk industri* (Enterprises, Entrepreneurs and Owners in Swedish Industry). Johan Örtengren. Reprint from Sveriges Industri, Sveriges Industriförbund, 1985. 13 pp.

201. *Mekanisk industri* (Mechanical Industry). Lars Jagrén. Reprint from Sveriges Industri, Sveriges Industriförbund, 1985. 17 pp.

200. *Quit Behavior under Imperfect Information: Searching, Moving, Learning.* Bertil Holmlund, Harald Lang. Reprint from Economic Inquiry, Vol. XXIII, No. 3, July 1985. 11 pp.

199. *Comment on J. Pencavel, "Wages and Employment under Trade Unionism: Microeconomic Models and Macroeconomic Applications".* Bertil Holmlund. Reprint from The Scandinavian Journal of Economics, Vol. 87 (2). 1985. 6 pp.

198. *Expectations and the Neutrality of Money: A Comment.* Harald Lang. Reprint from Journal of Economic Theory, Vol. 36, No. 2, August 1985. 2 pp.

197. *Information som produktionsfaktor* (Information as a Factor of Production). Gunnar Eliasson. Reprint from Informationsstrategi. Sundsvall 1985. 5 pp.

196. *Sibling Position and Achievement: the Case of Sweden.* Bertil Holmlund. Reprint from Scandinavian Population Studies 7, Report from the Seventh Nordic Demographic Symposium June 13–16, 1984 in Paimio, Finland. Editor: Jarl Lindgren. The Scandinavian Demographic Society, Helsinki. 9 pp.

195. *On Measuring the Impact of Unemployment: Benefits on the Duration of Unemployment Spell.* Harald Lang. Reprint from Economics Letters 18. Nos. 2–3, 1985, North-Holland. 5 pp.

194. *En modell för kommunalt utgiftsbeteende* (A Model of Local Goverment Expenditure Behavior). Tomas Nordström. Reprint from Årsbok 1984. Nordisk Økonomisk Forskningsråd, Universitetsforlaget, Norge. 7 pp.

193. *Trends in Female Labor Force Participation in Sweden.* Siv Gustafsson, Roger Jacobsson. Reprint from Journal of Labor Economics. Vol 3, No. 1, 1985. 19 pp.

192. *Företagsorganisation och styrsystem* (Business Organization and Management). Gunnar Eliasson. Reprint from Ekonomistyrning, Sundsvall 1985. 4 pp.

191. *Problem och alternativ i beskattningen av bolagsvinster och annan kapitalavkastning* (Problems and Alternatives in Corporate Taxation and Other Capital Income Taxation). Jan Södersten, Bengt-Christer Ysander. Reprint from Ekonomisk Debatt 8 1984 and 2 1985. 27 pp.

190. *Så utvecklas en effektiv valutariskhantering* (The Development of an Efficient Exchange Risk Management). Lars Oxelheim. Reprint from Balans 3/85. 8 pp.

189. *Rights and Relations in Modern Economic Theory.* Carl Christian von Weizsäcker. Reprint from Journal of Economic Behavior & Organization, Vol. 5, No. 2, June 1984. 27 pp.

188. *Nödvändig arbetslöshet* (Necessary Unemployment). Anders Björklund. Reprint from Forskning och Framsteg 2/85. 6 pp.

187. *Do Tax Allowances Stimulate Investment?* Villy Bergström, Jan Södersten. Reprint from The Scandivian Journal of Economics. Vol. 86 (2), 1984.1985. 25 pp.

186. *Industrial Structure and Country Risks in a Nordic Perspective.* Lars Oxelheim. Reprint from Economic Quarterly Review Unitas. Vol. 56. No. 4, 1984. 1985. 13 pp.

185. *Lifetime Patterns of Labour Force Participation.* Siv Gustafsson. Reprint from Human Resources, Employment and Development. Volume 3. The Problems of Developed Countries and the International Economy. B. Weisbrod and H. Hughes (eds.). The MacMillan Press Ltd, London. 1985. 19 pp.

184. *Organisation och styrsystem i ett modernt storföretag* (Organization and Control in a Modern Corporation). (Gunnar Eliasson. Reprint from Management 84/85. Liber Förlag. 1985. 16 pp.

183. *Micro Heterogeneity of Firms and the Stability of Industrial Growth.* Gunnar Eliasson. Reprint from Journal of Economic Behavior & Organization. Vol. 5 Nos. 3–4, 1984. 1985. 28 pp.

182. *Schumpeterian Competition in Alternative Technological Regimes.* Sidney G. Winter. Reprint from Journal of Economic Behavior & Organization. Vol. 5. Nos. 3–4. 1984. 1985. 36 pp.

181. *Industrial Finance System in Europe, U.S. and Japan.* Tad M. Rybczynski. Reprint from Journal of Economic Behavior & Organization. Vol. 5. Nos. 3–4. 1984. 1985. 14 pp.

180. *Longitudinal Lessons from the Panel Study of Income Dynamics.* Greg J. Duncan, James N. Morgan. Reprint from Review of Public Data Use 10. 1982. 1985. 6 pp.

179. *Differential Patterns of Unemployment in Sweden.* Linda Leighton, Siv Gustafsson. Reprint from Research in Labor Economics. Vol. 6. 1984. 1985. 35 pp.

178. *Household Market and Nonmarket Activities. The First Year of a Swedish Panel Study.* N. Anders Klevmarken. Paper presented at the Annual Meeting with the American Statistical Association in Philadephia 1984. 1985. 15 pp.

177. *Entry, Industry Growth, and the Microdynamics of Industry Supply.* John C. Hause, Gunnar Du Rietz. Reprint from Journal of Political Economy. Vol. 92. No. 4. August 1984. 1985. 25 pp.

176. *Ekonomistyrning från VDs utsiktspunkt: Sanningen ändrar sig hela tiden.* (Economic Control from the Viewpoint of the Managing Director: The Truth Changes Constantly). Gunnar Eliasson. Reprint from Ekonomistyrning. Sundsvall 1984. 1985 6 pp.

175. *Income Prospects and Job Mobility. The Case of Sweden.* Bertil Holmlund. Reprint from European Economic Review. Vol. 24 No. 3. April 1984. 18 pp.

174. *Growth, Entry and Exit of Firms.* Göran Eriksson. Reprint from The Scandinavian Journal of Economics. Vol. 86 (1). 1984. 16 pp.

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