Economics without Entrepreneurship or Institutions: A Vocabulary Analysis of Graduate Textbooks

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Abstract: A teacher's words reflect the theory and methods he uses. Words reveal theoretical structures, the problems identified as relevant, and how those problems should be analyzed.

I investigate whether entrepreneurship-rich and institutions-rich theories are represented in Ph.D. programs in economics. I analyze textbooks for the presence of terms that fall naturally into two sets. One set deals with the knowledge and discovery: *entrepreneur*, *innovation*, *invention*, *tacit knowledge,* and *bounded rationality*. The other deals with social rules: *institutions, property rights,* and *economic freedom*. When the words appear I examine the meaning.

I examine the textbooks used in required courses in microeconomics, macroeconomics and industrial organization in all Ph.D. programs in economics in Sweden. The investigation is not specific to Sweden, however, because Ph.D. programs in Sweden are virtually identical to programs in the United States. The same textbooks are used, and nearly all of the textbooks examined are written by economists in the United States.

I find that (i) all programs are in the tradition of "mainstream" economics; (ii) by and large, the eight expressions scarcely appear in the textbooks; and (iii) when they do appear, their meaning is diluted or distorted, compared to their meaning in theories where the idea is more central. In my judgment, the results constitute powerful evidence that today's doctoral programs do not train young economists to identify and analyze important economic issues in a relevant way.

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1. Introduction

Today, many view entrepreneurship and economic freedom as the remedy for unemployment and low economic growth, not least in the European welfare states with permanently high unemployment and lagging economic growth. Economists have an important role to fulfill as policy advisers and civil servants. Do today's Ph.D. programs in economics give researchers adequate training in analyzing questions concerning entrepreneurship?

Economics is a heterogeneous discipline with numerous traditions, each based on a cluster of theories. Each theory uses ideas, schemes, and assumptions. Different theories often give rise to opposing views on the importance of a problem, how the problems should be formulated, what methods should be applied, and what policy judgments to make.

Theories are presented in textbooks. A textbook's index includes key words that indicate the structure of the theory, its method, and which problems it identifies as important. Words not appearing in a textbook's index are words not important in the theoretical structures within the book. We get an idea of what the textbook's theories do *not* consider to be important or have not yet captured. What is *not* written could be at least as telling as what is written.

My purpose is to investigate whether entrepreneurship-rich and institutions-rich theories are part of Ph.D. programs in economics. I investigate whether key words appear in the index of the textbooks used in Sweden's Ph.D. programs in economics.

The investigation covers all Ph.D. programs in economics in Sweden for the academic year 2003-04. The investigation is not specific to Sweden, however, because Ph.D. programs in Sweden are a lot like programs in the United States. Nearly all of the textbooks examined are written by economists in the United States. The textbooks in Sweden are books

familiar to Ph.D. students in the United States and elsewhere. So the Swedish aspect of this investigation is inessential. The investigation treats the dominant mainstrain style of Ph.D. program, regardless of where on the globe it is situated.

The investigation covers the required courses in microeconomics and macroeconomics and courses in industrial organization (I/O). The required courses in microeconomics and macroeconomics present the theoretical foundation that everyone is supposed to know. Industrial organization is about industrial structure, competition, and development, so here especially students ought to encounter theories involving entrepreneurship and institutions.

Textbooks represent received theory, while articles are developments of theory and may or may not be fully received at a later point in time. Thus, articles are not included in the investigation.

2. The Dual Lacunae: Entrepreneurship and Institutions

The terms naturally break down into dual sets. One deals with knowledge and discovery: *entrepreneur*, *innovation*, *invention*, *tacit knowledge,* and *bounded rationality*. The other deals with social rules: *institutions, property rights,* and *economic freedom*.

A. Entrepreneurship

In the history of economic thought, the entrepreneur and entrepreneurship have often been at the very center of analysis. Entrepreneurship was already discussed during Antiquity. The French 18th century economist Richard Cantillon was the first to integrate the entrepreneur

into economic theory. Cantillon defined the entrepreneur as the one who took on business risk and took initiative to exploit business opportunities (Hebért and Link 1989). It was in connection with the growing dominance of the mathematical approach that the entrepreneur was removed from "mainstream economics". This disappearance has been much noted. Just a few of the authors who explore the eradication the entrepreneur, usually indicting modern economics for it, include Schumpeter 1942: 86, Baumol 1968, Casson 1982, Barreto 1989, Hebért and Link 1982, Kirzner 1973: 26-26, Blaug 1986 (chap. 12), and Machovec 1995.

The entrepreneur plays a fundamental role in Austrian, Institutional and Schumpeterian theory, theories outside the mainstream paradigm. However, there is no universally accepted definition of the entrepreneur or of the entrepreneurial function. Seminal contributions have been made by Knight (1921), who defines the entrepreneur as the one who takes on genuine uncertainty,[1] and Kirzner (1973, 1997), who defines entrepreneurship as the faculty of discovering pure profit opportunities.

But, perhaps, Schumpeter has had the largest influence on today's research on the role of entrepreneurs. For Schumpeter, entrepreneurs generate and use new knowledge about how to better satisfy consumers in more efficient ways, driving economic development. He distinguishes between *invention* (coming up with a novel idea) and *innovation* (putting the invention to work). The entrepreneurial function is realized in innovation, actually introducing the invention into the economic system. This function is fundamental. Schumpeter (1934, p 66) defines five broad categories of innovations:

> (1) The introduction of a new good - that is one with which consumers are not yet familiar - or of a new quality of a good.
>
> (2) The introduction of a new method of production, that is one not yet tested by experience in the branch of manufacture concerned, which need by no means be

[1] Risk is defined as a random event with a known distribution, while genuine uncertainty is a random event with an unknown distribution. The critical difference is that risk is insurable, while uncertainty is not.

> founded upon a discovery scientifically new, and can also exist in a new way of handling a commodity commercially.
>
> (3) The opening of a new market, that is a market into which the particular branch of manufacture of the country in question has not previously entered, whether or not this market has existed before.
>
> (4) The conquest of a new source of supply of raw materials or half-manufactured goods, again irrespective of whether this source already exists or whether it has first to be created.
>
> (5) The carrying out of the new organisation of any industry, like the creation of a monopoly position (for example through trustification) or the breaking up of a monopoly position.

Schumpeter stresses the importance of the organizational innovations bookkeeping and the stock company for the growth of the West. In fact, the more or less spontaneous development of private property rights in the West, which laid the foundation for its leading position (e.g. North and Thomas 1973; Rosenberg and Birdzell 1986), can be regarded as institutional innovations (a subset of organizational innovations). It can be argued that institutional innovations are fundamental for technical ones. The actions of the entrepreneurs induce, in Schumpeter's (1942) words, creative destruction; old businesses are challenged by, and eventually replaced by, new ones.

According to this tradition, the entrepreneur can be seen not only as a factor of production, but as the most important factor of production. The reason is that he or she allocates all factors of production, including his own energy, attention, and vision, which makes it very special (Pelikan 1993). It works as a lever on the rate of return of all factors of production.

The entrepreneurial faculty is scarce and unequally distributed among the population, in quantity as well as in quality. Every entrepreneur is *boundedly rational*, i.e. he has a limited capacity to analyze and act on information (Simon 1955, 1990). Important parts of the faculty are *tacit*, impossible to articulate (Polanyi 1967). There are a limited number of entrepreneurs who can carry out a limited number of entrepreneurial activities.

B. Institutions

It matters whether entrepreneurship is active, and if so, whether it is used productively, unproductively or destructively (Baumol 1990, Bhagwati 1982, Murphy *et al* 1991). The vitality of entrepreneurship relates directly to our second set of terms: *institutions*, *property rights*, and *economic freedom*.

Society's institutions – the rules of the game – largely determine the incentives of the entrepreneurs and thereby guide their actions. Private property rights are one of the most important institutions. The institutions to a large degree correspond the degree of economic freedom, for instance freedom of enterprise, the right for an individual to be an entrepreneur at all.

The strongest, clearest exponent of institutional theory and the importance of economic freedom is probably Adam Smith. The principal policy answer Smith gives to his query about the causes of the wealth of nations is economic freedom and the security of property rights. Boiled down to a single message, Smithian growth theory says freedom causes growth.[2]

There are many strands of institutional theory in the Smithian vein. Here I mention just a few. In the tradition of Ronald Coase, Armen Alchian, and Harold Demsetz,

[2] Smith identifies various factors that cause growth, and explains, in terms of other factors, *why* freedom causes growth, and even says that in some exceptional cases freedom should be contravened. But the main theory is that freedom causes growth.

many property-rights economists like Terry Anderson and P. J. Hill interpret economic developments with the logic of property rights. Many economic historians like Robert Higgs and Douglass North make property rights and institutions the cornerstones of their historical explanations. Many policy economists like Sam Peltzman do serious empirical research on how regulations attenuate property rights and affect activity. Many Austrian, Public Choice, and New Institutionalist economists interpret economic topics with the logic of property rights and freedom of contract. These economists use words like *property rights* and *freedom*, not as policy judgments but as *analytic categories*.

Institutional theory looks upon growth as a process of knowledge creation driven by entrepreneurs, whose behavior are conditioned by institutions in general and by private property rights in particular (Kasper and Streit 1998). Recent empirical support for the importance of institutions comes from the fall of the planned economies and other full-scale "experiments" where countries have applied different growth strategies, systematic analyses of the question why economic growth does not take off in some developing countries (e.g. De Soto 2000), and extensive economic-historical studies (e.g. North and Thomas 1973, Rosenberg and Birdzell 1986, Mokyr 1990).

C. The Duality between the Lacunae

It is no coincidence that dominant mainstream economics has the dual lacunae of entrepreneurship and institutions. Equilibrium thinking is essentially a system of mathematical functions. The mathematical representation of the theory rests on a number of axioms. Barreto (1989) writes:

> The confrontation between the basic axioms and the entrepreneur leaves two possibilities: to accept the entrepreneur and reject the modern theory of the firm,

> or to reject the entrepreneur and maintain allegiance to the modern theory of the firm. . . . Simply put, entrepreneurship is above 'formalization' – it cannot be neatly packaged within a mechanistic, deterministic model. Importantly, the choice is an 'either-or' proposition; there is no happy medium. The corner solution which economic theory has chosen is consistency and for this reason the entrepreneur disappeared from microeconomic theory" (Barreto 1989: 115, 141).

Analytically, all options are fully specified within a closed system, and the whole terminology of property rights is out of place. Entrepreneur-rich and institutional-rich traditions allow for actors to come up with creative action, interpretational breakthroughs. In this context, it is important to be able to speak of kinds of rules that constrain behavior (rules against stealing, for example) yet leave the door open for creative developments. Market entrepreneurship is transcendent action within a social framework of property rights. When economics cast its fate with equilibrium analysis, it made analysis of both entrepreneurship and institutions difficult.

3. Universities and Textbooks

The investigation covers the 14 economic departments evaluated by Sweden's National Agency for Higher Education (*Högskoleverket* 2002): Göteborg University, Jönköping International Business School, Linköping University, Luleå University of Technology, Lund University, Stockholm University, Stockholm School of Economics, Swedish University of Agricultural Sciences (two departments, one in Uppsala and one in Umeå), Umeå University, University College of Dalarna, Uppsala University, Växjö University and Örebro University.

Several departments are too small to give the required courses in microeconomics and macroeconomics or courses in industrial organization. The students at the small departments are provided with the opportunity to take them at larger departments.[3] Stockholm School of Economics and Stockholm University have a joint program, Stockholm Doctoral Program in Economics, Econometrics and Finance (SDPE).

Hence, it is the large universities in Lund, Göteborg, Stockholm, Uppsala and Umeå that offer a complete course program. Jönköping also has a complete program. The requirements for a Ph.D. degree are similar for the different universities. The requirements encompass 160 credits ("points" in Swedish). Each credit is said to correspond to one week of full-time studies. With the exception of Lund, the credits are divided entirely between course work and writing the dissertation.[4] Generally, the students begin by taking the required courses, thereafter the rest of the courses, and finally they write the dissertation.[5]

Half of the courses, 40 credits, are required: 10 credits in microeconomics, macroeconomics, econometrics and mathematics, respectively, except in Lund where 30 credits are required (10 credits in microeconomics, macroeconomics and econometrics, respectively).[6]

The studies are focused on mainstream economics, which has the natural sciences as its model. The theory is expressed in mathematical terms, the analysis is technical, and the students are trained in expressing the theory in mathematical form and to solve systems of equations. The empirical analysis focuses on econometrics and formal methods. It

[3] The University College of Dalarna cooperates with Uppsala University, Linköping University cooperates with different universities, Luleå University of Technology cooperates with Umeå University, Swedish University of Agricultural Sciences cooperates with Umeå University and with Uppsala University, and Örebro University cooperates with Uppsala University.
[4] In Lund, the courses comprise 70 credits and the writing of the dissertation 90 credits.
[5] In Jönköping, the students start to write the dissertation at the same time they start to read the required courses.
[6] In Lund, there are additional 15 credits in mathematical and statistical methods, which practically all Ph.D. students take. Together the 45 credits comprise the core courses. It is also possible for the students in Lund to exchange 5 credits in macroeconomics or econometrics for courses more relevant for the dissertation. In Jönköping, the obligatory credits in mathematics and macroeconomics are reduced with two credits each to create room for a required course in the history of economic thought (4 credits).

generally uses aggregated data and existing data sets. Surveys, case studies and interviews are uncommon. The examination of the Ph.D. students and the career of the new Ph.D. depend on their ability to command and use the mathematical or econometric techniques. The requirements are high and competition is intense. Students can ill afford to pursue socially relevant applied research or to participate in or even follow current policy debate (Boschini *et al* 2004).

In total, 20 textbooks (different editions are counted as one book) are covered by the investigation, covering more than 11,000 pages. The texts are listed in Table 1. A few books dominate the education. Mas-Colell *et al* (1995) is the most commonly used textbook in microeconomics and is used in all courses in Micro I as well as in Micro II, Jönköping excepted. Varian (1992) is the second most used textbook in microeconomics. Romer (different editions), Barro and Sala-i-Martin (different editions) and Obstfeld and Rogoff (1996) dominate macroeconomics. Tirole (1989) is the main textbook in industrial organization. Although I have not done a study of Ph.D. programs in the United States, it is my strong impression that such programs have these same books as leading texts.

Table 1 Universities, courses and textbooks, for academic year 2003-04

Ph.D. Program	Micro I	Micro II	Macro I	Macro II	I/O
Lund	Gibbons (1992) Mas-Colell *et al* (1995)	Mas-Colell *et al* (1995)	Romer (1996)	Romer (1996) Obstfeld and Rogoff (1996)	-
Göteborg	Jehle and Reny (1998) Mas-Colell *et al* (1995) Varian (1992)	Jehle and Reny (1998) Mas-Colell *et al* (1995) Varian (1992)	Barro and Sala-i-Martin (1995) Romer (2001)	Barro and Sala-i-Martin (2004) Romer (2001)	Tirole (1989)
Jönköping	Luenberger (1995)	Chambers (1988) Pollak and Wales (1996)	Obstfeld and Rogoff (1996)	Obstfeld and Rogoff (1996)	Buckley and Michie (1996) Schmalensee and Willig (1989)
Stockholm	Mas-Colell *et al* (1995) Jehle and Reny (2001)	Mas-Colell *et al* (1995) Laffont and Martimort (2002)	Barro and Sala-i-Martin (1995) Blanchard and Fischer (1989) Ljungqvist and Sargent (2000) Obstfeld and Rogoff (1996) Romer (1996) Sargent (1987) Stokey and Lucas (1989) Walsh (1998)	Barro and Sala-i-Martin (1995) Pissarides (2000) Ljungqvist and Sargent (2000)	Tirole (1989)
Uppsala	Mas-Colell *et al* (1995) Varian (1992)	Mas-Colell *et al* (1995) Varian (1992)	Barro and Sala-i-Martin (1999), Romer (2001)	Romer (2001)	-
Umeå	Varian (1992)	Mas-Colell *et al* (1995)	Barro and Sala-i-Martin (1995), Blanchard and Fisher (1989)	Blanchard and Fisher (1989)	-

Note: Textbooks recommended as useful complementary literature are included. The exception is the course in industrial organization in the SDPE, in which several undergraduate textbooks were suggested. Industrial organization in Göteborg University was moved to the Fall 2004. The textbook refers to last time the course was offered. Macro II in Uppsala University refers to single chapters in other textbooks as literature. Those textbooks are not included. Macro I in Umeå University was postponed one year because of a shift in the course program. In this case, the textbook refers to the academic year 2002-03.

4. Presence and Meaning: A Vocabulary Analysis

A reference to an expression is counted in the following manner: "Innovation, 64", one reference, "Innovation 64-67", one reference, "Innovation, 37, 64-67", two references etc.[7]

[7] Include all variants, like *entrepreneur*, *entrepreneurial* and *entrepreneurship*. Several textbooks refer to *Technological innovation*. I have counted *technological innovation* as *innovation*. I have also included references to *process innovation* and *product innovation* under *innovation* (this applies to Tirole 1989). I have not included

Table 2 Textbooks, concepts, presence, the academic year 2003-04

Textbook	Total Pp.	Total number refs.	*Knowledge/discovery ideas*					*Institutions/freedom ideas*		
			Entrepreneur	*Innovation*	*Invention*	*Bounded rationality*	*Tacit knowledge*	*Institution*	*Property rights*	*Economic Freedom*
Barro and Sala-i-Martin (2004)	654	9	0	9	0	0	0	0	0	0
Blanchard and Fisher (1989)	650	0	0	0	0	0	0	0	0	0
Chambers (1988)	331	0	0	0	0	0	0	0	0	0
Gibbons (1992)	267	0	0	0	0	0	0	0	0	0
Jehle and Reny (2001)	543	0	0	0	0	0	0	0	0	0
Laffont and Martimort (2002)	421	2	0	0	0	1	0	0	1	0
Ljungqvist and Sargent (2000)	701	1	0	1	0	0	0	0	0	0
Luenberger (1995)	486	1	0	0	0	0	0	0	1	0
Mas-Colell *et al* (1995)	981	1	1	0	0	0	0	0	0	0
Obstfeld and Rogoff (1996)	804	0	0	0	0	0	0	0	0	0
Pissarides (2000)	252	1	0	0	0	0	0	0	1	0
Pollak and Wales (1996)	217	0	0	0	0	0	0	0	0	0
Romer (2001)	651	5	1	0	0	0	0	0	4	0
Sargent (1987)	510	0	0	0	0	0	0	0	0	0
Schmalensee and Willig (1989)	1555	64	0	60	0	3	0	1	0	0
Stokey and Lucas (1989)	588	0	0	0	0	0	0	0	0	0
Tirole (1989)	479	16	0	16	0	0	0	0	0	0
Walsh (1998)	528	4	0	0	0	0	0	4	0	0
Varian (1992)	548	1	0	0	0	0	0	0	1	0
Total:	11,166	105	2	86	0	4	0	5	8	0

Note: Buckley and Michie (1996) is a compilation of articles that does not include any index. It is therefore excluded from the analysis. Schmalensee and Willig (1996) is not a textbook but a compilation of papers that illuminates particular themes. It is unclear whether it should be included or not, but I chose to include it because it contains an index. Several editions of Barro and Sala-i-Martin (1995, 1999, 2004), Jehle and Reny (1998, 2001) and Romer (1996, 2001) are used in the courses. The table only shows the latest editions. This does not affect the results.

Of the 19 leading textbooks, 16 contain five or fewer references to any of the entire set of eight terms. Eight of the leading textbooks contain no reference to any of them. Among the 19 books, only 2 references are made to *entrepreneur*-, only 5 to *institutions*, only 8 to property rights, and not a single reference to *economic freedom*, *invention*,[8] or *tacit*

knowledge, knowledge accumulation, research and development, technical change, technological change or *technology*. I have also excluded terms that may be regarded as synonymous, for instance *innovators* (one reference in Romer 2001), which could be interpreted as a synonym for entrepreneur, because of the indeterminacies involved in looking for synonyms.

[8] Barro and Sala-i-Martin (2004) make one reference to *invention* under the topic of innovation. They use the terms synonymously, so I classify it as *innovation*.

knowledge. It is quite obvious that economists have eradicated entrepreneurship and institutions from core Ph.D. training.

Moreover, in the textbooks where references are made, the references are usually few,[9] and the meaning and significance of the ideas are lost, diluted, or distorted, compared to the entrepreneurship-rich and institution-rich theories. The reference to *entrepreneur* in Mas-Colell *et al* (1995) – one of two references made to the concept entrepreneur – is speaking. On page 475 the concept entrepreneur is referred to in a question:

> 13.C.6 Consider a market for loans to finance investment projects. All investment projects require an outlay of 1 dollar. There are two types of projects: good and bad. A good project has a probability of p_G of yielding profits of $\Pi>0$ and a probability $(1- p_G)$ of yielding profits of zero. For a bad project, the relative probabilities are p_B and $(1- p_B)$ *respectively*, where $p_G > p_B$. The fraction of projects that are good is $\lambda \subseteq (0, 1)$.
>
> Entrepreneurs go to banks to borrow the cash to make the initial outlay (assume for now that they borrow the entire amount). A loan contract specifies an amount R that is supposed to be repaid to the bank. Entrepreneurs know the type of project they have, but the banks do not. In the event that a project yields profits of zero, the entrepreneur defaults on her loan contract, and the bank receives nothing. Banks are competitive and risk neutral. The risk-free rate of interest (the rate the banks pay to borrow funds) is *r*. Assume that ...

The entrepreneur is not mentioned at all in the fundamental function she undertakes in Schumpeterian or Kirznerian theory, but could be any borrower at all. The same is true for the other reference in Romer (2001: 394-398). The reference is made to *Entrepreneur-investor*

[9] The exception is Schmalensee and Willig (1989) with 60 references to innovation. On the other hand, this textbook makes no references to *entrepreneur* or *invention*.

contracts, i.e. a loan contract between a borrower (the entrepreneur) and the lender (the investor). In this case, it could also apply to any borrower and the entrepreneurial function is absent. The reference is made in a chapter entitled *Financial-Markets Imperfections*, since the actors in the model that is developed in the chapter are assumed not to possess perfect information. This stands in sharp contrast to the traditions that have a developed theory about the entrepreneurial function. These theories, probably most accentuated in the Austrian tradition, designate the success of the market economy to its ability to more effectively than competing economic systems generate and use new knowledge. It is in the nature of things that it is impossible for new knowledge to be available for all people at the same time. It is created in individual persons' brains. The entrepreneurial function is to identify and introduce new knowledge into the market, which is disseminated through imitation throughout the economic system. The adjustments of the economic actors to the new knowledge lead to creative destruction and economic transformation. It is the profits that in a first phase go to the entrepreneur that are the driving force behind economic development and economic growth. Competition and the process of the market economy may, according to this tradition, be compared to a procedure for the discovery and use of new knowledge (Hayek 1937, 1945, 1978).

Bounded rationality is referred to in two books, Laffont and Martimort (2002: 393) and Schmalensee and Willig (1989: 109-110, 138-139, 170-171). Only the latter uses the concept in its original sense.

Innovation is referred to in four textbooks and then tantamount to technical innovations, caused by research and development.[10] Organizational and institutional innovations are absent from the analysis. In traditions focusing on the entrepreneurial function, innovations are not driven narrowly by research and development, but by

[10] Several of the textbooks make a reference to *Research and development* and/or *Technological innovation* under the concept *innovation*. Ljungkvist's and Sargent's (2001) reference to *innovation* is made to *in time series representation*.

entrepreneurs pursuing new business opportunities. Furthermore, the textbooks do not distinguish between invention and innovation, which, according to Schumpeterian theory, is erroneous. Research and development give raise to inventions, not innovations. It is only when an entrepreneur commercializes the invention that it is proper to talk about innovations. The distinction has important implications for economic policy. Increased funding to research and development need not increase employment and economic growth if commercialization mechanisms function poorly, for example because the environment is unfavorable to entrepreneurship. In that case, an increased return on research and development can be achieved by improving the environment of entrepreneurship, e.g. by decreasing taxes and removing restrictions. This can be one explanation of the poor return on investments in research and development in Sweden (Henrekson and Rosenberg 2001).

Only five textbooks refer to *property rights*, and in those cases just in passing. This is a bit surprising considering the last few decades' research, especially in economic history and in institutional economics, showing that Smith was right about the establishment and protection of private property rights as a central factor in economic growth (e.g. Acemoglu *et al* 2001, 2004, Hall and Jones 1999, Mokyr 1990, North and Thomas 1973, Rosenberg and Birdzell 1986, Gwartney and Lawson 2004). Moreover, it is not the fundamental role of property rights for the working of the economy that are examined. Instead such rights are discussed in connection with market failures and external effects, i.e., not the general importance of property rights, but only in the case of environmental pollution etc (Luenberger 1995: 321, Romer 2001: 36-39 and Varian 1992: 435). Romer (2001: 116, 120, 121) also discusses property rights in connection with the creation of knowledge. Pissarides (2000: 194) mentions property rights in connection with job matching. Laffont's and Martimort's (2001: 373) reference is only a reference to others.

The results for *institution* are similar. Schmalensee and Willig (1989: 63-64) mention that institutions strive to reduce transaction costs. Walsh (1998: 160-162, 375-381, 380-381, 371-375) discusses the institutional set up for governing central banks. No textbook discusses institutions in terms of the "rules of the game" of society that govern the actions of economic actors and hence affects overall economic performance. The most commonly used textbooks in microeconomics (Mas-Colell *et al* 1995 and Varian 1992) and macroeconomics (Barro and Sala-i-Martin 2004, Obstfeld and Rogoff) do not refer to, for instance, North and Thomas (1973), Rosenberg and Birdzell (1986) or Mokyr (1990) who all, in comprehensive and well-known economic-historical studies, show that the economic success and political dominance of the Western World is due to the establishment and protection of private property rights and other market-conforming institutions.[11, 12] A book like Barro and Sala-i-Martin (2004), entitled *Economic Growth*, hence, does not make any reference to entrepreneurship, institutions, private property rights, or to the economic-historical studies that have documented the importance of private property rights and other institutions for long-run economic growth. Tirole (1989), probably the most used textbook in industrial organization in the World, contains no references to *entrepreneur*, *institution* or *property rights*.

In the 19 books there are many references to Nash equilibrium, Bertrand equilibrium, Cournot equilibrium, Concave utility functions, Euler equations etc; concepts that on the other hand are not used at all in, e.g., Austrian, Institutional or Schumpeterian traditions. In these traditions, the concept of equilibrium is hardly seen as relevant or useful. Instead, they emphasize that actors have *disjoint* knowledge (that is, not merely asymmetric information, but asymmetric interpretations), the economy is a dynamic open-ended process

[11] North received The Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel in 1993.
[12] Romer (2001) refers to North (1981).

in continuous change, and the scope and motivation for discovery is conditioned by the social rules.

5. Swedish Reflections on the Problem

There are researchers who worry that today's Ph.D. programs in economics educate researchers unable to identify and analyze economically interesting problems with great relevance for society. Assar Lindbeck (2001) wants "two-leg" economists, i.e. economists commanding the formal mathematical analysis as well as being able to define and investigate interesting issues in an adequate way. Lars Calmfors (1996, p 239-240) is of the opinion that the focus on mathematics and statistics makes new researchers untrained in solving real-world problems. He sees it as a risk that students interested in real-world problems are not going to succeed in the academic competition, being beaten out by those talented in technical crafts rather than relevant, meaningful knowledge and analysis. Lennart Erixon (2001, p 317) regards this as a problem, not just for the economics profession, but more importantly for democracy: "The lack of new generalists is not just an internal problem but also a threat to democracy, if it prevents an independent professional elucidation of political decisions with great importance for the citizens' wealth".

Still, many researchers, e.g. both Calmfors and Lindbeck, think that mathematics and the training in formal methods provide a good, even necessary, basis for the Ph.D. students. Other researchers think otherwise and are of the opinion that it is the mathematical model-building dominating today's research that causes the problem. Professor emeritus Erik Dahmén is of the opinion that mathematically oriented economists are "prisoners of the tool shed". Their theory and method make them incapable of defining and

analyzing economically relevant problems; they choose problem according to what their mathematical "tool-box" can handle and not according to what is important for society. Gunnar Eliasson writes:

> From the classical [equilibrium] model only firms that do not belong to this world can be derived. This makes it useless as a theoretical foundation for studying management and information problems of firms. . . . I would propose to get the classical model removed from organization theory, from the theory of the firm, and as a foundation of macroeconomics. (Eliasson 1996: 23, 37)

This investigation implies that the theory underlying all Ph.D. programs in economics in Sweden excludes what chiefly explain economic growth and general wealth—entrepreneurship and private property rights. Then it is not a surprise, but rather natural, that the younger generation of economists do not participate more in the public debate. Their education is founded on theories and methods often useless in analyzing real-world issues.

Researchers who study technological development stress that development is carried out within, and are limited by, the design space of individuals from where they "get" ideas (Stankiewicz 2000). Similarly, if concepts like entrepreneur and property rights are missing in the design space of economists, then those concepts will be excluded from the analysis. But is it possible for researchers to describe and analyze, for instance, the progress of the furniture industry or the progress of the computer industry, in a credible way, without taking account of the entrepreneurs Ingvar Kamprad or Bill Gates and the entrepreneurial function they have carried out, manifested in the founding and expansion of IKEA and Microsoft? Is it possible to grasp the development of Sweden's industry excluding the inventors and entrepreneurs who once founded and developed the big firms that today

comprise the country's economic backbone? And in understanding the prominent Schumpeterian stories like Kamprad's IKEA, we come to understand entrepreneurship in the general process of economic betterment, including all the small Kirznerian stories. We learn something that cannot be learned from a system of equations. Is it possible to analyze total employment and economic growth that are the aggregated outcomes of the actions of individual persons and firms, without a theory of entrepreneurship? In what way does omitting the entrepreneurial function from the analysis influence our understanding of enterprising, economic development and economic growth? Schumpeter (1942: 86) famously compared leaving the entrepreneur out of economic theory to leaving the Prince of Denmark out of *Hamlet*.

6. Concluding Remarks

James Buchanan pointed out the same lacunae in equilibrium economics. In the Postscript of *What Should Economists Do?*, he included these two items in a list of points of what economics was failing to get right:

> *Economics involves actors.* Without actors, there is no play. This truism has been overlooked by modern economists whose universe is people with passive responders to stimuli. If all are price-takers, who sets price? If all behavior is rationally responsive, how can change occur? How can entrepreneurship be modeled? Increasingly, I have come to the view that the role of entrepreneurship has been the most neglected area of economic inquiry, with significant normative implications for the general understanding of how the whole economy works. (Buchanan 1979, p 281; italics in the original)

> *Economics is about a game within rules*. Choices are made by actors, by traders, constrained within specifically determined 'laws and institutions,' a central emphasis of Adam Smith and one that has been lost to modern minds. (p. 281-82)

Buchanan's assessment of an economics lacking these insights is rather bleak:

> I see a continuing erosion of the intellectual (and social) capital that was accumulated by "political economy" in its finest hours. I look at young colleagues trained to master regression routines who are totally uninterested in, and incompetent to examine, elementary economic propositions. . . . I see them compelled to utilize their considerable mental potentials resolving the escapist puzzles of modern mathematics. (pp. 279-280)

Inspection of the leading textbooks confirms Buchanan's remarks.

Speaking of industry in Sweden, Erik Dahmén says that the problem is not the industry we do have, but the industry we do *not* have. Similarly, the problem with economics education is not the training we do have, but the training we do *not* have. My conclusion, therefore, is that there is a need for economics Ph.D. training based on theories that incorporate entrepreneurship and institutions.

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