The Global Organic Food Market and Transformation

A Conceptual Theoretical Framework

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Preface

The present study is part of the project *"Public Policies and Demand for Organic Food: An International Comparison of Policy Effects and Policy Determinants"* (COP). It is carried out in WP II that concerns the supply-side policies and demand. In the WP it is an initial task to formulate a theoretical approach as the conceptual framework to be used in comparative studies. The present study will be the foundation for the conceptual framework. It investigates contributions from various economic theories and extracts core theoretical fragments into a framework suitable for analysing the evolution of organic agriculture. In the conclusion the study is presenting a basis for indicators that can be used for comparative studies. It is underlined that the indicators are tentative and that they have to be tested and adjusted in future studies.

The report is written by Ole Horn Rasmussen that for four month has been attached to the WP as research assistant. A great part of his theoretical contribution here is based on his former PhD studies on structural change and transformation related to the evolution of organic agriculture.

Aalborg in December 2007-12-21

Jan Holm Ingemann, head of WP II

The Problem

The aim of the COP-project is to solve the problem related to how politics may assist to increase the demand for organic food?

How may public policy contribute to a transformation of agriculture and system of food production towards organic agriculture and organic food?

The motive for this research report is construction of a theoretical model of reference for the study. The research report seeks to answer two questions:

1. *What kind of empiric indicators may contribute to an answer to the problem in the COP-project?*
2. *What is the adequate theoretical model from the perspective of economics for the COP-project?*

Basis for the answer is selected elements from my Ph.D. dissertation "Evolution of Organic Agriculture within theoretical frameworks of Structural Change and Transformation (Rasmussen, 2007). *It is assumed that the evolution of the market for organic food is a result of a social process of structural change.* The key-words in the process of selection of elements from the dissertation are: Politics, market, transformative capacity, organic agriculture and empiric indicators.

Background

The primary agricultural sector is not a static and once-and-for-all defined concept. In 1985, the official figures for the number of organic farms and organic area was about non-existent. After a slow beginning, however, both farm numbers and organic agricultural area have grown significantly. Ingemann contributes with analyses of organic agriculture as a historic phenomenon. (Ingemann 1998: ; Ingemann 1999: ; Ingemann 2000a: ; Ingemann 2001c: ; Ingemann 2003: ; Ingemann 2006). His primary focus is Denmark. We are going to describe three different approaches in which he analyses organic agriculture.

The first approach (Ingemann, 2006) is based upon inductive research in which Ingemann defines different milestones that he claims are crucial for the evolution. He defines five époques:

1. The pioneers or **grassroots** – 1970s. Milestone = the first organic farms are established.
2. The process of **rallying** – expansion – 1981/82. Milestone = establishment of organic organisation and the national organic farming school.
3. **Inclusion** – expansion – 1987. Milestone = governmental authorisation scheme and labelling (1990).
4. **Absorption** – 1992 – consolidation, decreasing rate of expansion. Milestone = supermarket chains increase marketing efforts.
5. **Funky business** – 2002. Milestone = ?

Ingemann's empirical description stops with 1999.

The next example in his work refers to the theoretical universe of the product life cycle, which Ingemann tests in another work (Abrahamsen 1998). The empirical reference is international, covering the countries of western Europe, together with Japan, Australia, New Zealand and the USA. He introduces organic food as an innovation and categorises the food-producing agents in four groups that appear during the evolution of organic agriculture: first, the pioneers; second, the sprinters; third, the average; and finally, the afterthought agents. Ingemann illustrates this process by placing time on the x-axis and amount on the y-axis. The curve is well known for innovations with a slow introduction and a slight increase when the sprinters become involved in the process. When the average enters, the curve increases rapidly. The curve then flattens and the afterthought agents enter. Ingemann's idea is to identify the "first movers" among countries based upon the supply of and demand for organic food products. The conclusion is that they expect an increased demand for organic food in the years to come, and because Denmark is the only country among the sprinters with the production capacity and an institutional set-up with export focus, their possibilities to win market share receives a positive assessment.

In the final example, Ingemann considers how organic farming may develop under pure market conditions. In order to answer the question, Ingemann first states that he must know which institutional framework the organic sector must deal with. Second, he must know how the organic actors will exploit this framework. Part of this premise is the condition under which organic agriculture is going to compete with conventional agriculture. To discuss these two questions, Ingemann first argues that the market is an abstract notion. In practice, the market must be understood in connection with politics: "… it must be concluded that the market and state – and parallel to this, the economy and politics – do not mutually exclude one another; rather, they mutually condition one another" (Ingemann, 2000: 43). Moreover, there are actors who, independent of the market and state, make decisions of importance for the development. Second, Ingemann points out that a crucial element for the future of organic agricultural is whether conventional agriculture will "make its political, market-related and production-related expertise available for organic agriculture, or do the organic farmers need to 'start from the beginning', e.g. by establishing jointly owned processing companies" (Ingemann, 2000: 44)[1]. There will be a number of decisive political choices within society, the EU, international institutions and within the agricultural sector. The main reason for making these choices is that the supply and demand for food is a zero-sum game.

These observations bring up a crucial and initial question concerning the demarcation of the project. Is it possible to research organic agriculture as a sole and isolated object? Of course it is possible; the real question is the quality of the result this provides. As indicated especially in the later examples of Ingemann's work (Ingemann, 2000), we have an inherent element of competition between the different farm systems. Such competition may be assumed to influence how the primary agrarian sector evolves. Consequently, an approach based upon general knowledge of agriculture and its historical development in which organic agriculture appears as an integrated part of agriculture represents a potential framework for a study. The appearance of organic agriculture

[1] Ingemann indirectly states that the predominant actor in agriculture, the conventional and chemical-dependent agriculture, today works in order to favour themselves and not organic agriculture.

illustrates the change that the agrarian sector has undergone and this leads us to the conclusion that we are going to study organic agriculture as an element in the process of the structural change of primary agriculture. What is an appropriate apporach?

The first example of, what we have named the main-stream or neoclassical approach, is The Ministry for Food, Agriculture and Fishery in Denmark (The Danish Ministry for Food 1998). They do not use a formal model; however, the logic in their contribution points in the direction of a main-stream approach. They define agricultural structural change as a mixture between the development of macroeconomic importance (part of the aggregate economy and export), number of farms, size of farms and specialisation of production[2]. The reasons why the number of farms has decreased in number, increased in average size[3] and increased in specialisation primarily refer to the economy of size. The definition of economy of size consists of three elements: 1. the ability of management; 2. the opportunity to obtain discounts; and 3. the advantages of large-scale production. The Ministry stresses that economy of size has been achieved because larger farms are better able to exploit technological advances in agriculture[4]. Second, the large farms employ relatively less input in the form of labour. In addition to these reasons for the experienced structural development, there are four further elements of special importance: 1. agricultural law, 2. economic subsidies, 3. environmental politics and 4. taxation rules. These four elements can influence the structural development in order to accelerate the process of increased concentration or slow down the same process. The conclusion of the Ministry is that "Despite this somewhat mixed impression of the various actor's influence on the structure, as a rule, several of these factors will influence the stuctural development in interplay with the development of productivity" (The Danish Ministry for Food 1998: 12). This quote indicates that the Ministry implicitly treats the process of structural development as if there is no – as viewed from the perspective of economic theory and technology – upper limits for the economics of size. If there is a limit, it is a political limit. Structural development becomes something akin to a natural law of the economy. The process of structural development becomes even stranger when the Ministry writes:

> The general tendency in the structural development in agriculture must thus first and foremost be assessed to be linked to the tendencies in the general economic and market forces and with the productivity pressures these forces release, both in agriculture and other business sectors (The Danish Ministry for Food 1998: 143).

The conclusion must be that the Ministry considers the structural development of agriculture to be the result of the economic "rules of the game" in a market economy. The "rules of the game" are implicitly assumed to be like a natural law and thus static. The rules, however they are defined, create pressure for increased agricultural productivity. Concentration and specialisation offer the means.

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[2] Their description of structural development covers eight different variables: number of farms, number of part-time and full-time farms, composition of production (specialisation), number of animal units, organic agriculture, ownership and change between generations, rural development, and structural development in other countries. In the conclusion, the Ministry reduces these eight variables to three variables plus the macroeconomic figures.

[3] The number of farms over 50 hectares has increased dramatically. The number of farms between 5-50 hectares has decreased dramatically, while the number of farms less than 5 hectares has increased. This tendency – the growth of larger and larger farms – continues in the period 1996-2005.

[4] There is no definition of technological advance. However, the Ministry explicitly mentions machines and buildings.

Nedergaard et al. represent another example within the main-stream approach (Nedergaard 1993). Their focus is not directly on structural development; rather, it is on EU agricultural policy. However, they argue that structural development is a consequence of the interplay between the function of the market and the political initiatives concerning regulation. Their model can therefore be treated as a model for explaining structural development. They develop a model for investigating this topic. Like other theoreticians on this subject, e.g (Kyed 2001) and (Zobbe 2001), the theoretical foundation is neoclassical economics and welfare economics, on the one side, and public choice on the other. At the micro level of the economy, market failures influence both the supply and demand sides. The assumption is that market failure leads to political regulation. The character of these acts of regulation is a result of an equilibrium between the supply of the decisions made by bureaucrats and politicians and the demand for decisions from agriculture (the producers) and the consumers. The demand side is asymmetrical, because the organisation of agriculture is much stronger than the organisation of the consumers. This process has a dual effect at the macro level: first, there is a loss of economic welfare in the agrarian sector and in the social economic effectiveness; second, there is a coordination problem with national interests versus common EU interests[5].

The final example is the former head of the Danish Economic Council (Kærgård 2002). With a 250-year time horizon, he evaluates the reasons why the evolution of Danish agriculture has turned out as it has. His first focus is on the agrarian reforms of the late of 1700s. His next focus is about 1880. He points out that it is transparent that organisation, technology and the microeconomic conditions "go hand-in-hand". His third focus is the change from 1950 to the present. This change occurred due to the combination of technological opportunities and the economy. Because of increasing wages, new technology is introduced and the advantage of large-scale production increases. Because of chemistry, the dependency between animal production and plant production decreases, and specialisation becomes possible. This leads Kærgård to conclude:

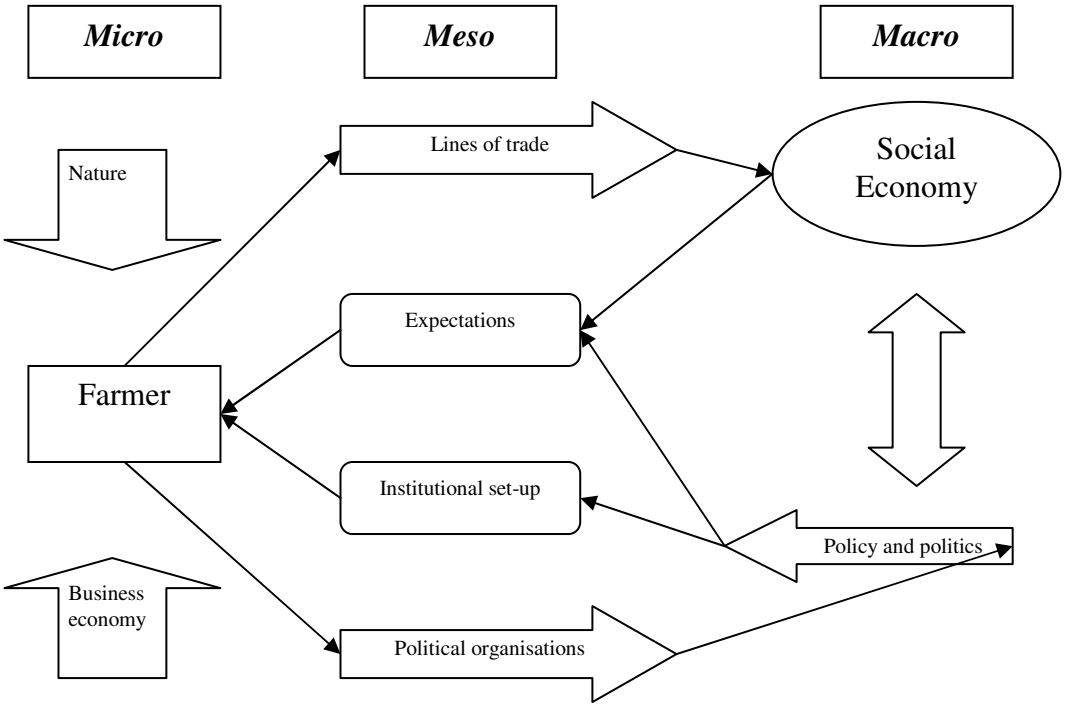
> The right push at the right time can promote or change a development trend, but one must realize, that a very significant part of the changes are directed by underlying economic and technological conditions. As politicians one shall not overestimate the possibilities in order to drive the development (Kærgård, 2002: 152).

[5] The theoreticians are well aware of the critique directed against their theoretical foundation. They summarize the critique of welfare economics: 1. Welfare economics assumes that politicians and bureaucrats are immune to their own interests. 2. Welfare economics ignores the political process. 3. Welfare economics assumes a rational, science-based political process. 4. In most cases, it is impossible to assess which political instruments are best. 5. Welfare economics assumes equilibrium in the market and, in practice, ignores externalities. 6. Welfare economics assumes perfect information, which is not the case for politicians and bureaucrats. 7. Analysis of opportunity cost is often ignored in the political process. 8. In welfare economics, there is focus on the analysis of alternative political instruments, but the realism of these instruments is often ignored because political behaviour is regarded as irrational. Consequently, research based upon economic rationality cannot be used. Political behaviour is only rational if it suits the economic models. Because of the different interests, this is never the case. This critique is the reason why rational choice enters their model. Their idea is that the individuals operating in the market also act in the political arena as voters, members of an interest group, politicians, bureaucrats etc. They want to combine behaviour in the market and behaviour in the political process.

The reason for agricultural structural change is the economics of scale and the availability of new technology. This has been and will remain a process in which the political influences are limited. The law of economics and the external input from technological progress are decisive.
To sum things up, then, all of the three theoreticians base their arguments upon neoclassical mainstream economics, and their explanations end up being rather simple, reflecting economic nature-like laws. With the exception of one of the theoreticians, organic agriculture does not enter their work. In that case, organic agriculture is only described with reference to size, numbers and examples of organic products. Elsewhere, we must conclude that the theoreticians treat organic agriculture as an integrated part of agriculture. By this, we obtain support for our initial decision to study organic agriculture as a part of agriculture.

For more than 25 years, Ingemann has been involved in agricultural economics research and especially Danish agriculture. Precisely the potential within the coordination process is crucial in Ingemann's agricultural economics. This potential is not new. In fact, it was the motive behind the establishment of the co-operatives in 1882. Another way of presenting the model is with reference to the figure below:

Figure 1: The Ingemann reference model – Economy, politics and behaviour



Source: Ingemann (1998: 23, own translation)

There are two dimensions of praxis: economic praxis and political praxis. Ingemann combines these dimensions with the three societal levels: micro, meso and macro. His model makes it relevant to discuss a total of six cells in which the dynamic interplay is going on[6].

What are Ingemann's theoretical foundations? It would seem as though Ingemann is pluralistic. Ingemann's general position is that any idea of a "natural" structural development or development due to the market mechanism does not make sense. The history of Danish agriculture is one of negotiations. The private and public sectors have since become intertwined. The answers to questions about who is responsible for policy and authoritative decisions become murky. Ingemann's second theoretical dimension involves his use of neoclassical economics, on the one side, via Cochrane[7]; on the other side, he is firmly critical towards the theory concerning economics of size or economics of scale (Ingemann, 1998). The point of departure is his questioning of the notion of the efficient farm. Ingemann's third dimension deals with political regulation and subventions or subsidies. Ingemann points out that the reason why reflects two notions, which must influence the agents within the agrarian sector[8]:

1. The notion of incentives
2. The notion of legal frameworks

While the first category is primarily economic, the second category reflects political orders and bans. Both categories deal with an interest for particular behaviours. Within these categories, the economic and political creation of expectations is essential in order to understand structural development. "Something must tie the actions together and form a common basis for human actions individually as well as socially. This 'something' will here be conceptualised as notions" (Ingemann 1999: 25) . Ingemann argues that material conditions can never be sufficient in order to understand evolution; however, material conditions must be considered. Based upon preferences and expectations, the notions create actions. In order to understand evolutionary change, we must focus on the competition between different and competing notions. This competition is an indicator of social and evolutionary change. With his invention of "The Two-dimensional Concept of Quality" (Ingemann, 1998b) and an explicit link to organic agriculture, Ingemann demonstrates how a new competing notion has entered Danish agriculture[9]. Ingemann's reference to his understanding of notions creates a certain focus. This focus is institutional **and** organisational.

Methodological reflections

We have presented a concise analysis of how different theoreticians interpret agricultural structural change. Based upon these insights, we find that a long-term perspective is the tentative most promising choice as framework for our own analysis. Moreover, we tentatively find that changes in

[6] The reference to six cells is explicitly stated in his 1998 work. In the book section from 2002, he explicitly incorporates two new dimensions: the material and immaterial dimensions. The potential of cells thus expands to twelve.
[7] Cochrane's work is dealt with in a separate chapter.
[8] We must note this shift of focus. After a macroeconomic focus, he returns to a microeconomic focus.
[9] Very briefly, the concept of the two-dimensional concept of quality states that quality is no longer narrowly related to the product itself (taste, appearance and smell). The new concept takes into account the process by which the product has been produced (animal ethics, sustainability and health). The concept of quality has evolved from one to two dimensions. In the case of organic food, the labelling with the ø-brand and the royal crown symbolize this dual quality.

agriculture are connected to changes in the steering system of the general economy, where the process of agricultural coordination is central. The organisation of the economy matters for structural change. We have now made our first choice about our frame of reference to our study.

Because the research question focuses on transformative capacity the idea of "transformation" is central. Polanyi (Polanyi 1944 (1957)) places the concept of transformation as a main pillar in his theoretical work. The term refers to a specific situation in a particular economic system, the market economy, where a radical shift occurs in relation to the fundamental steering mechanism. Polanyi does not explicitly define the term "transformation"; however, he uses the term in order to characterise the outcome or result of a societal process. The important issue is our tentative assumption that the involvement of a transformation perspective may contribute to our study of organic agriculture as a phenomenon. The idea of using the term "transformation" will, from a methodological point of view, contribute to maintaining focus on the definition of the fundamental steering mechanisms or the idea of steering mechanisms within the process of the structural change of primary agriculture. Within these considerations, we make a *preliminary definition of transformation*: transformation of agriculture occurs when we experience a radical change in at least one of the central rules of the game within agriculture; transformation results. The game is defined dually as agriculture, which is the static dimension, and as the process of agricultural structural change, which is the dynamic dimension. This is our point of departure.

As a matter of definition, there are two general perspectives in economy when referring to economic theory. We have macroeconomics and microeconomics. "Microeconomic theory … analyses the behaviour of individual units, while macroeconomics focuses on the behaviour of the economy as a whole" (Asimakopulos 1978: 10). Because we are dealing with the development of a sector, the *meso-perspective* must be introduced. Consequently, reference to economy must at least consider these three perspectives. The second key element, politics, may also refer to at least three different perspectives (Heidenheimer 1986: ; Dalsgaard 1992): the first political perspective refers to the content of politics, i.e. *policy*. The second refers to the process of making policy, i.e. *politics*. The third and final perspective is about the structural framework within which politics are formed, i.e. the *polity* . Consequently, instead of using the single term "regulation" as being analogous to politics, the idea is to search for a more subtle contribution by subdividing politics into three perspectives.

Despite the global importance of the agrarian sector, there is a weak historical, continual, agricultural tradition for a broader, pluralistic theoretical economics within the international research community. Agricultural economic research in the 20th century has been marked by an increased tendency to choose a fragmented focus as represented by e.g. discussions related to politics (Sheingate 2001: ; Coleman 2002), technology (Sanderson 1985: ; Lansink 2002), the environment (Andersen 2001) or management (Schjønning 2003: ; Ménard 2005). One of the exceptions is discussions related to developing countries, where a more pluralistic approach can be identified (e.g. (Lehman 1986: ; Shanin 1988: ; Das 2001: ; Sivakumar 2001). The weak international tradition combined with a lack of any economic agricultural theoretical debate with reference to a "transformation perspective" leads us to the ambition to write up against the idea of an uninvented future *New Research Programme of Agricultural Transformation.* The initial hypothesis is that an answer to the problem is a complex function of the identified and unidentified empirical observations and theoretical explanations. A contribution to clarifying this function is supposed to lead to an improved understanding of the problem in question.

We are inspired by the methodological idea of Lakatos. He does not lay down standard procedures for solving scientific problems. According to Latsis, his position is; "… It is concerned with the 'logic of appraisal', that is, the normative problem of providing criteria for scientific progress … As a normative methodology of science, it is empirically irrefutable because it is a definition" (Latsis 1976: 155). Lakatos rejects the usefulness of the appraisal of isolated individual theories. He talks about clusters of interconnected theories or scientific research programmes (SRP). Our theoretician points out that no individual scientific hypothesis is conclusively verifiable or falsifiable. This is because we always use auxiliary statements in the test of the particular hypothesis, and we can never be sure whether we have confirmed or refuted the hypothesis itself.

Economics is about models and the question of choosing a model with the potential to be the tool capable of contributing an answer to the research question. This is a statement from Keynes. He underlines this alternatively:

> The object of our analysis is, not to provide a machine, or method of blind manipulation, which will furnish an infallible answer, but to provide ourselves with an organised and orderly method of thinking out particular problems; and after we have reached a provisional conclusion by isolating the complicating factors one by one, we have to go back on ourselves and allow, as well as we can, for the probable interactions of the factors among themselves. This is the nature of economic thinking. Any other way of applying our formal principles of thought (without which, however, we shall be lost in the wood) will lead us into error (Keynes 1936 (1973): 297).

Dealing with agriculture means dealing with a theme of great complexity. The search for economic theoretical approaches is part of our methodology, which initially is "hybrid". Inspiration is drawn from different theoreticians. The most influential theoreticians are Roy Bhaskar and Tony Lawson (Lawson 1997: ; Lawson 2003a: ; Lawson 2003b), Jon Elster (Elster 1983: ; Elster 1986: ; Elster 1989), Gudmund Hernes (Hernes 1978: ; Hernes 1984) and Lakatos. While Elster's universe is the micro-foundation of the economy and a general neglect of anything other than the micro-universe, the philosophy of Tony Lawson as based upon Bhaskar points in the direction of the meta-universe.

Reader's guide

First, we have chosen from among the classical economists. Second, we have chosen to supplement the above-mentioned agricultural economic approaches with a former leading Russian and former leading American agricultural economist. The latter theoretician makes Hvelplund relevant. As the representative for Institutional and Evolutionary economics, we have chosen one of the founders, the American economist Thorstein Veblen. The latter category is ecological economics. Here we find contributions from a former leading economist, the Romanian born Georgescu-Roegen. From the inner circle of the journal "Ecological Economics", we first select the American co-evolutionary economist Richard B. Norgaard. Robert Costanza, another economist within the inner circle of "Ecological Economics", uses the theory of social traps, which finally inspire us to look closely at this theoretical apparatus.

Having all the different theoreticians from classical economics, institutional and evolutionary economics, agricultural economics and ecological economics, we make a compilation and draw a conclusion. The research report is structured in the following order:

1. Section one: Chayanov, Cochrane and Hvelplund
2. Section two: Quesnay and the French physiocrats, Adam Smith, Malthus, Ricardo and Von Thünen
3. Section three: Veblen
4. Section four: Bioeconomics (Georgescu-Roegen), Co-evolutionary economics (Norgaard) and Social Traps
5. Section five: Compilation and search for empiric indicators within the theoreticians with reference to agricultural structural change, the phenomenon organic agriculture, organic agriculture and transformation, and empiric indicators.
6. Section six: Conclusion – model for Conceptual Framework

Section One

Chayanov

Introduction

Chayanov provides a new perspective on agricultural economics. He never completed his work, but the elements we claim to contribute to his initial paradigm are three pillars:

1. A theory of the co-existence of different types of farms
2. An organisational theory of the peasant family farm
3. A contribution to a dynamic theory of agricultural structural change

These pillars will now be outlined.

The theory of co-existence

The point of departure and first cornerstone are based upon his definition of eight different economic systems (Chayanov 1925 (1966)).

1. Capitalism
2. Family economy 1 – commodity economy
3. Family economy 2 – natural economy
4. Slave economy
5. Quitrent serf economy
6. Feudal system 1 – landlord economy
7. Feudal system 2 – peasant economy
8. Communism

Chayanov's aim was to produce a realistic analysis of agriculture and the food production system. Instead of the original orthodox Marxist interpretation of the developing phases of society – linear – Chayanov argues for the co-existence of different economic systems at the same time in history[10]. This represents a discussion of contemporary as well as historic relevance, where the point of departure must relate to discussions about the possible dominance of one of the systems. In order to illustrate the relevance of dealing with the co-existence of different systems, Chayanov draws on an example from real life:

> … neglecting these distinguishing features of the family farm and extrapolating the economics of Smith and Ricardo onto it led the British to make a number of bad mistakes in their Indian economic policy (Chayanov 1925 (1966): 221).

This quote precisely illustrates the crucial links between economic theory and policy. If the economics are incorrect, the choice of policy may also turn out to be wrong. The central issue is the definition of the rules of the game in the economic system. Because of the co-existence of systems and because each of the eight systems are individual in nature, Chayanov finds it problematic to cover all eight systems with a generalising universal theory leading to a general doctrine. The theoretical economics ought to establish a particular national economic theory for each economic regime. We find this as the key in Chayanov to understanding agricultural structural change. In order to illustrate the potential relevance, we may draw a contemporary line to e.g. the EU, where we can argue for the co-existence of at least four of the eight systems: Capitalism, Family Economy 1, Family Economy 2, and Communism. A discussion about a possible Serf Economy is relevant according to tenancy.

Chayanov's "paradigm" is grounded in a dualistic analysis of the agrarian economy. Drawing inspiration from both neoclassical economics and Marxian economics, Chayanov divides the agrarian economy into two different systems: the industrial capitalist farmer and the family farmer. Chayanov attacks the hardcore of classical and neoclassical economics, homo economicus, in a Lakatos' sense. He simply finds it inadequate in order to reflect real life. Chayanov uses two different meanings of rationality. The orthodox meaning related to the capitalist farms searching for and steered by the incentive and interest in profit maximisation, on the one side, and on the other side a kind of human, habitual rationality as defined by the non-reflective protection of the family and the non-reflective interest in being together with the family[11]. Chayanov constitutes a theory, where the limitation of labour because of a certain, defined need for consumption marks the fundamental hypothesis in the theory.

The theory of the Peasant Labour Farm

Chayanov's aim is to describe a single unit and the differences between single units. Chayanov's method is to analyse the peasant labour farm – or, as he states, "the peasant farm production

[10] The idea of the co-existence of different types of farms is not a unique Chayanovian perspective, see e.g. Hicks, J. (1969). A Theory of Economic History. Oxford, Clarendon Press.
[11] The present relevance of this kind of human rationality in the economic theoretical discussion is e.g. illustrated in an article about the Norwegian fishery and the incentives of fishermen to work. Brox, O. (2002). "Hvor bliv det av grunnrenten i norsk fiske?" Stencil, May 2002.

machine" – as the equivalent to a description of a modern steam engine "consisting of 39 percent Fe, 31 percent Cu, 16 percent H2O and 14 percent various organic substances" (Chayanov 1925 (1966): 118).

Chayanov defines three general sequences of organisational considerations (Chayanov 1925 (1966): 127):

I. Choosing the profile of the farm based upon available information
II. Organising the individual sectors and making subsidiary estimates
III. Verifying the balances

The second general sequence consists of:

1. Account of the family labour force and its consumer demands
2. Account of land held and possible land for use
3. Organisation of field-cropping
4. Organisation of draft (workhorses)
5. Organisation of feed-getting
6. Organisation of commercial livestock
7. Organisation of manure
8. Organisation of kitchen gardens, orchards and other sectors
9. Physical organisation of area
10. Account of all work in agriculture
11. Organisation of equipment
12. Organisation of technical production, cottage industry, and crafts and trades away from home
13. Organisation of buildings
14. Organisation of capital and money circulation

All of these elements constitute the foundation of the economy of the individual farm. Within any element, there are decisions for each farmer to take. The third general sequence and the final balance will be based upon:

1. The balance and organisation of labour
2. The estimation and calculation of income

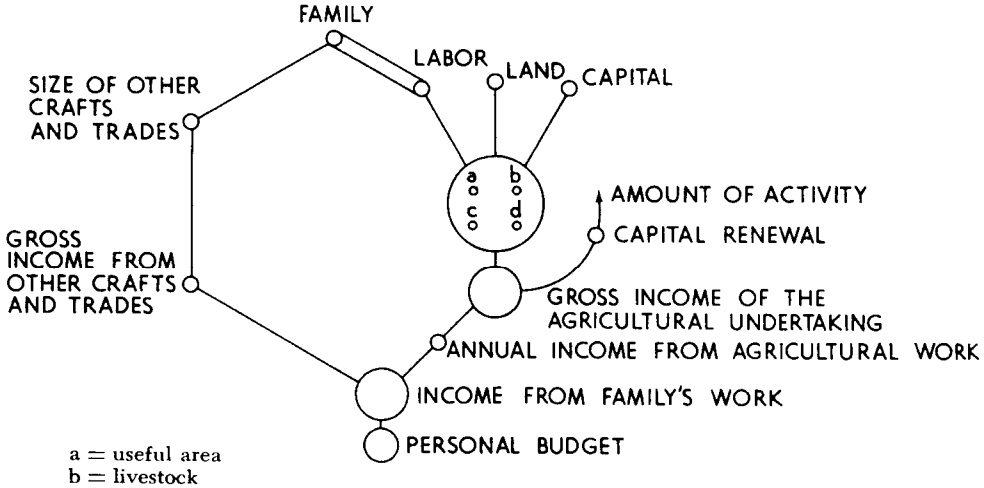
In practice, the process in the peasant family farm goes from sequence I to sequence II and to sequence III. Having produced a result, the farmers may return to sequence I in order to make adjustments and repeat all of the considerations until the final decision is made. "Only by means of gradual and repeated amendment of the calculations can one finally balance up all the farm sectors into an entire system" (Chayanov 1925 (1966): 127). At first glance, the above-mentioned sequences and elements look like "the methods for drawing up organizational plans in capitalist agriculture" (Chayanov 1925 (1966): 128); however, this is not the case. The criteria by which the considerations are affected differ. The reference is "The Chayanovian Rationality".

Instead of an entrepreneur seeking profit, the rule of the game in the peasant farm system is assumed to be the family and "… the motivation of the worker on a peculiar piece-rate system which allows him alone to determine the time and intensity of his work" (Chayanov 1925 (1966): 42). From this single hypothesis, the whole theory of the peasant farm organisation is constructed using the capitalist farm as the alternative. While the concept of the peasant family farm is independent of any of the eight economic systems, the situation is contrary to the capitalist farm. Consequently, the ability to organise (the rules of the game) is broader for the peasant family farm. In the mind of Chayanov, this is a less fictive and simpler hypothesis.

According to Chayanov, understanding changes in the agricultural economy must take into account the work of the two different systems each having their own rationality, including different principles or rules of the game regarding the three basic items: land, capital and labour. Chayanov's task is to develop an understanding of "… the machinery for achieving economic equilibrium among these factors" (Chayanov 1925 (1966): 51). We have here a reference to the former section and the question of the decision of the peasant farms to calculate their "balance".

Initially, the contemporary relevance of the Chayanovian concept can be connected to Denmark – and other countries as well – through the aspect of family-driven farms as the traditional organisation form. Furthermore – and this might be more crucial – nearly all Danish farmers are self-employed; family members, including wife and children, are often involved in the daily work. Here it is possible to introduce a postulate of treating the farmers as parallel to Chayanov's peasant family farm[12]. Finally, a recent empirical study concerning the structural change of Swedish agriculture 1992-2000 (Djurfeldt 2002) firmly supports the Chayanovian concept. We illuminate Chayanov's model in the figure below.

Figure 2: The Chayanovian model of the peasant family farm



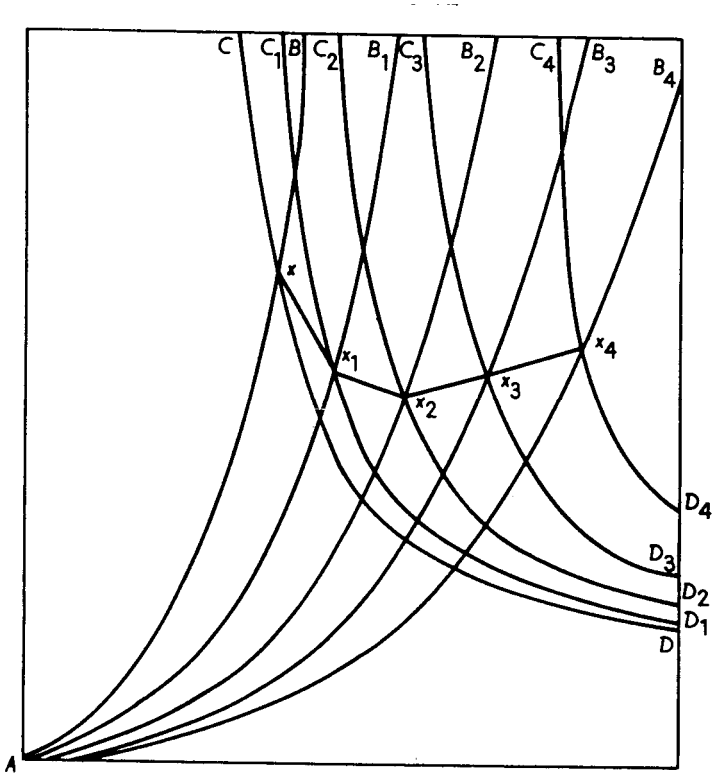
[12] Calculations for 1999 and 2003 support this postulate with a distribution between family members, managers and foreign labour force with respectively 78%, 1%, 21% (2003) and 82%, 1%, 17% (1999). Source: Danmarks Statistik. A comparison between family members versus managers could be argued as a more precise measure than Chayanov's idea.

A Dynamic Theory of Agricultural Structural Change

Chayanov explains the basic economic balance determining income and the peasant farm structure as the equilibrium between marginal utility of Russian rubles – income – and the degree of drudgery required to acquire the marginal ruble: The underlying assumption states that "the quantity of values that become available to the person running the farm agrees with the quantity of physical labor he has expended. But the expenditure of physical energy is by no means without limit for the human organism" (Chayanov 1925 (1966): 81). Furthermore, "the greater the quantity of work carried out by a man in a definite time period, the greater and greater drudgery for the man are the last (marginal) units of labor expanded". At a certain point, equilibrium will be established. The precise point depends on the marginal utility of the family. Since the marginal utility falls with the growth of the total sum values that become available, there will occur a point at which rising labour income through drudgery equals the "subjective evaluation of the marginal utility of the sum obtained by this labor" (Chayanov 1925 (1966): 81). So any labour farm has a natural limit to its output "determined by the proportions between intensity of annual family labor and degree of satisfaction of its demands" (Chayanov 1925 (1966): 82). One of the results – and an important result at that – is that while in principle – theoretically – there is no maximum limit to the size of a capitalist farm, the size of *the peasant farm does have a limit* as defined by the equilibrium between the family consumer demand and its work force.

When he analyses agricultural structural change and in fact becomes dynamic, both positions in the family must be better off: drudgery must decrease and satisfaction must increase. The investment of capital must also fulfil the two conditions: "It is clear that the application of capital which we have analysed will be acceptable to our farm only when the new equilibrium is established (1) *with less drudgery of marginal labor expenditure*, (2) *with greater demand satisfaction*" (Chayanov 1925 (1966): 209). We claim that Chayanov's implicit arguments rest upon the following reasoning: when a new situation occurs in the course of making an investment, it is simply not possible to compare apples (drudgery) and oranges (consumption), weighing the two and subsequently arguing for the establishment of an advantageous situation. Consequently, both situations – less drudgery and more consumption – must be fulfilled. We now see that Chayanov is an elegant user of curves. He combines static and dynamic thought on the one side; on the other side, he combines absolute and relative thought. Chayanov thinks in four dimensions, which he illustrates in one figure. The figure below illustrates the limits for advantageous capital investment on the family farm.

Figure 3: The limits for the advantageous investment of capital



Source: Chayanov 1925 (1966): 213

The x-axis counts for two variables: level of investment in capital, K, and the level of gross income in the family. The y-axis measures the level of drudgery from work. The optimal situation is x_2. In x_2, the drudgery is at a minimum and the income is better off than in the initial x and x_1, while in x3 the drudgery exceeds the potential of x_2. Thus far, it has been demonstrated that an increase in capital intensity due to e.g. new technology has upper limits for the family farm. Chayanov's approach focuses on factors impacting capital formation, labour intensity and the individual peasant family budget. The determination of these figures depends on "a complex system of social relations and frequently determined to a great extent by quotations on the London stock exchange rather than by the local rainfall" (Chayanov 1925 (1966): 228). The situation in the family farm must take the limit of working hours into consideration. This means that the capitalist principles of bookkeeping must be supplemented by *an upper limit of drudgery*. Any investment or growth opportunity must be assessed with respect to the actual given need for consumption. The next question concerns how the on-farm equilibrium influences the capital formation and renewal.

Inspired by the development of Russian agriculture before the revolution, Chayanov brings the discussion of "the idea of a differential agricultural program that, other than recording semiproletarianized and semicapitalist farms, would differentiate recommended improvements for different scales of labor farm at different phases of development" (Chayanov 1925 (1966): 254). On the basis of the recognition of differentiation and with special attention to the capitalist exploitation on the one side and the proletarianisation of the farmers on the other side, Chayanov brings politics into the arena: "We must hope that the labor farm, strengthened by cooperative bodies, will be able to defend its positions against large-scale, capitalist type farms as it did in former times" (Chayanov

1925 (1966): 256)[13]. He stresses the existence of two counter-forces. The first force is driving farms into capitalism and strengthening the dynamic processes of agricultural proletarianisation. The second force "strengthened the position of the small farm" (Chayanov 1925 (1966): 257). On the other hand, he emphasises the farmer as being an ever more intensive partner in a global capitalist system aimed at reducing agriculture to a commodity. In both respects, Chayanov involves the position of politics and the aim of the creation of state capitalism based upon cooperatives, both horizontally and vertically. The policy concept of horizontal and vertical is the exact subject for the following aspects in Chayanov.

When Chayanov changes his perspective from micro to macro, he introduces a new concept. He operates with the idea of the economy as the structure of a trading machine initially described as "The system of local rural bazaars". The bazaar site is a concentration of all local trading, cooperative, business and spiritual life in the region. The bazaar as a whole is part of a greater system ending with the stock exchange in London or New York. The structure of the trading machine is discussed with reference to "the journey" of a commodity through five steps:

1. From producer to buyer or dealer number one
2. Sorting and transport to local trade centre
3. Sorting and distribution for onward transmission
4. Transferring to local consumer wholesale centres
5. Distribution with the help of trade distributive networks

The position of financial capital as the turning point for the accumulation of agricultural capital is underlined as a fact, and the potential of financial capital as a determinant of the direction of economic structural change is implicitly announced. One of the consequences of the machine is its concern about a standard quality of the commodity and the following interference at the level of agricultural production. Further, and drawing on experience from America, Chayanov points toward the case of credits and the financing of the farmers' circulating capital. This brings new ways for the capital to penetrate agriculture. "It is not without cause that, according to Professor N.P. Makarov only 35 percent of farmers incomes coming from America´s wholesale exchange goes to the farmer; the remaining 65 percent is taken by railway, elevator, irrigator, finance, and trading capital" (Chayanov 1925 (1966): 262). This leads forward to the following point from Chayanov: *Vertical concentration might be more profitable than horizontal concentration!* According to Chayanov, the rise and development of cooperative elements can only in certain phases take place and take over this vertical exploitation[14].

Chayanov's theoretical work reflects an ambition to develop a theoretical apparatus corresponding to the real life of Russian farmers in the beginning of the 20th century. This context may appear useless when dealing with the evolution of the organic food market. Following

[13] His "ought to be" attitude is interesting as compared with the present situation in Denmark, because Danish agriculture as a sector can be postulated to have fulfilled the aims of Chayanov's recommendations for Russia in the form of state capitalism.

[14] It is in a situation where the local capital is relatively weak. This was e.g. the situation in Denmark in 1882 Ingemann, J. H. (1989). Det Økonomiske og Politiske Råderum i relation til den danske landbrugssektors udvikling 1880-1980 - Licentiate thesis. Roskilde, Roskilde University Center.. Generally, the contemporary situation may be stressed as a tendency towards a multinational vertical cooperation, where e.g. the Scandinavian dairy Arla spreads from Denmark and Sweden to other countries.

Chayanov, we must change our interpretation of agriculture with reference to the different rules of the game within the different co-existent systems. The rules of the game in capitalist agriculture differ firmly from the peasant farm system. It becomes more complex when we must integrate some of the other systems, e.g. communism, serf economy and natural economy. When many systems infiltrate, it becomes difficult to ignore that Chayanov's contribution makes the question of structural change complex. What exactly determines the process of change within and between the systems? Because of the definition of the peasant farm, Chayanov is able to keep his theory intact. If the farmer hires external labour, the farm per definition becomes a capitalist farm, and the capitalist farm is not part of his theory.

1. The family farm as a self-employed unit of agricultural production operates with a different rationality compared to a capitalist unit of agricultural production, where the number of consumers and the idea of "Family Satisfaction" represents the primary mechanism in any micro-decision process.

The first part is a combined "demand-pull/demand-stop" theory of the peasant family farm. To some degree, it rests upon the demographic development of the peasant family farm, the migration process and the assumption of the reproductive capacity of the peasant family farm from generation to generation. The theory opens up for a complex set of discussions in which the definition and determination of rent, land-prices, investments and the accumulation of capital create the concrete structural change of the agrarian sector. The second part allows us to establish a link to the existence of organic agriculture. The definitions of drudgery and family satisfaction are central, because work must be understood as a combined quantitative and qualitative item. The assumption is that the quantitative work on an average organic farm exceeds the work on an average conventional farm. With reference to Chayanov's definition of drudgery, this ought to imply an impossible existence of organic agriculture. The fact that organic agriculture exists, even though it is a niche agricultural production, demands a deeper understanding of the terms "drudgery" and "Family Satisfaction". One way of analysing this could be with reference to the Norwegian anthropological study of the motives behind the choice of the transition from conventional to organic agriculture (Østergaard 1998). This study illustrates that different and non-economic reasons, e.g. moral issues, are part of the decision-making. Another position interacts with the principal position of organic agriculture and its dynamic definition (DARCOF 2000: ; Ingemann 2001c: ; Ichihara 2002: ; IFOAM 2002: ; Ingemann 2003). Knowing that definitions change over time and adding the dynamic rules and regulations – concerning e.g. animal protection and environmental questions which, other things being equal and from a rationalistic capitalist point of view represent an unnecessary cost – we may have a phenomenon infected with another kind of rationality than a pure capitalist rationality. The hypothetical idea is that this kind of rationality reflects rationality similar to the "Chayanovian rationality".

2. Chayanov, politics, structural change and transformation

The next element in Chayanov is the link between structural change, transformation and politics. The contribution here is double: the *first element* is an implicit consequence of co-existing systems. Chayanov finds that the policy of a nation must actively integrate a multiple understanding of

agriculture. This is his position on differential agriculture policies. In order to avoid farmers being converted into a proletariat, the political focus must support the peasant family farm structure. Chayanov's recommendation is the idea of the vertical integration of agriculture. In a Chayanovian perspective, this increase in horizontal concentration is an erroneous policy, because the consequence is a transformation of family farms into a farming proletariat. However, if such a structural change and transformation becomes fact, the only reason why, from a Chayanovian perspective, has address to a one-sided political focus on one – and only one – of the co-existing farm systems. The focus is on the capitalist farm.

3. The idea of structural change in the agrarian sector becomes a question of the concrete and context-dependent interaction within and between different modes of agricultural production; the development of the market prices for the products; the general development of the stock-market; and the ability to obtain financing.

It is a fact that different modes of agricultural production have existed and continue to exist. Moreover, organic agriculture cannot be defined as a sole system. The existence of "hardcore" and "softcore" organic farmers has been a well-established discussion. This implies that any simple conclusion versus the micro-foundation of decision making may be interpreted cautiously. Generally, the question of prices counts for the support for the existence of organic agriculture. When the family farm makes their calculations, the market prices play an important role. On the one side, we know that the prices for organic products have been higher than conventional products. This should be an indicator for why organic agriculture exists from Chayanov's point of view under the assumption that the higher price comes to the benefit of the organic farmer and not the retail- and distribution system. On the other side, the family farms must take into account the question of the general lower yield of products as compared with conventional production. The general situation in the stock market may be interpreted as a mechanism which either favours, disfavours or acts neutrally in the process of the occurrence and establishment of organic agriculture. Little can be said without further empirical investigation. This is similar as regards the question of credits. Chayanov's theory appears rather complex, combining the macro, meso and micro perspectives. This combination is similar to Ingemann (Ingemann 1998a: ; Jørgensen 2002); when we include Chayanov`s theory of the co-existence of different agricultural systems, it emphasises the contemporary relevance of the Chayanovian perspective.

Willard W. Cochrane

The general descriptive framework

Willard W. Cochrane represents a direction in American agricultural economics in which historical insights play a major role in order to understand agricultural evolution. Cochrane identifies two watersheds in the history of American agriculture, and he is open to a third, ongoing watershed. Watershed and our concept of transformation are subjects for discussion. The first passed during the period 1763-85. The existence of "free" land sparked an entirely new situation. Labour was scarce, capital was expensive, and land was cheap (Cochrane 1993: 184). The function of production was a

question of making the right combination of these input factors. The farmers expanded their estates, and the method of production was extensive farming. The result was poor land use. As of around 1900, the situation regarding free land changed. As of that point, all land was in a form of cultivation and a process with three elements evolves:

1. Substitution of labour with machines
2. Increased productivity due to new and improved plants and breeds
3. Increased use of capital in the form of e.g. fertilisers and pesticides

"The agricultural development process from 1920 to 1970 was the product of science and technology (Cochrane 1993: 377-378). From 1950-80, the general development was a story of the rapid adoption of the technological opportunities on farms. The less efficient, less aggressive farmers went out of business while larger and more productive farms were established. The 1980s were different; exports stopped increasing, prices levelled off, declined and then ultimately rebounded. Interest rates increased. "In this context highly credit leveraged farmers, *large* (our accentuation) and small, went out of business in large numbers" (Cochrane 1993: 379). We suddenly have a situation where the definition of being ineffective must incorporate the farmers with large credits. Due to the continued substitution of labour with capital, the price of capital becomes an issue of vital importance to the concept of productivity and efficiency. Ceteris paribus, larger is not always better. Large-scale production appears to have a limit. Cochrane does not follow this track, focusing instead on aggregates.

Cochrane documents the development in productivity from 1948-1989 and focuses on the era of the 1980s. Here, for the first time, inputs in all factor categories decline. His hypothesis for this change differs from his general approach to the technological influence on agriculture. Instead of addressing the change to the adoption of technology, the reason for the discrepancy is better management and the controlled use of the productive resources. According to Cochrane, we have entered a new age – *the age of a mature, industrialised agriculture.* Cochrane is open to a watershed starting in the 1980s focusing on the world market and the mode of food production and distribution. Proceeding deeper into the watershed and combining the situation with the ability to finance, Cochrane states that the financial control of the enterprise may not always be in the hands of the farmer. Cochrane mentions that banks often exercise financial control over a farm, but they are not inclined to provide the innovative leadership that leads to a modern industrialised farm. Other enterprises do have this expertise, however. Feed companies and processing companies have entered the poultry-producing units. This is also occurring in vegetable and pork production and meat-processing enterprises. In addition to the financial control, the control over production itself increases, leaving the farmer as a kind of employee of the controlling the company. This is the central element in "The Mature Industrial age". This is Cochrane's general, long-term description and explanation of agricultural structural change and transformation.

The specific descriptive framework

In his complex, descriptive explanation, Cochrane identifies 10 forces he regards as being important to explain the historic change in American agriculture. The 10 forces represent what can more or less be regarded as his guess about which forces must have been important. There is no

argumentation or reference to any selection process. We have systematised the forces in three categories:

1. The main force is technological development.
2. This force is supported by other forces defined as the input industries, research and education, the world trade, the environment issue[15] and the role of government.
3. The third force is a residual consisting of three additional forces.

The causal connection between technological and structural change is a firm part of Cochrane's analysis. *Technological advance* is his central concept. The basic assumption in the theory is the definition of farming as an atomistic industry. The output of the single unit is too small compared to the total output of the industry, meaning that the units become price takers. If the individual unit wishes to improve its economy, the means for doing so is the reduction of unit costs. By reducing unit costs, losses are reduced or profits possibly raised. The means for reducing unit costs is the adoption of new technology. New technology offers the solution to the individual farmers' problem of reducing unit costs. Consequently, the incentive for adoption is latent. The main mechanisms in this technological adoption process is represented by the theory of treadmills and the cannibalism process. The substitution of labour with capital made farmers more dependent on off-farm sources. The increasing dependence on credit and financing from external partners placed the farmers in a new and more complex position: "… it means the farm operator, if he is to be successful, must be an expert not only in the complex modern technology of farming but also in credit and finance" (Cochrane 1993: 205).

Cochrane states: "Development of the agricultural sector without the services that flow from the required infra-structural elements is impossible" (Cochrane 1993: 210). He illustrates the development of this structure with a focus upon:

1. Systems of transport, roads, bridges, canals, railroads, highways, water resources and rural electricity.
2. The input industries[16] including marketing industries.

In the second part of the physical infrastructure, the direct reference for Cochrane is the long term change in agricultural inputs of capital from 17-58% of all inputs. "For this transformation to occur on farms, a development had to take place in the complementary input industries" (Cochrane 1993: 228-229). Cochrane mentions that the industries – the petroleum, tractor and farm machinery industries, the fertiliser industry, the pesticide industry and the livestock feed industry – "had to develop the production plants and the distributive organization – the infrastructure – to permit and facilitate the capital transformation on farms" (Cochrane 1993: 229).

On the basis of the marketing industry, the concept "Marketing Bill for domestically produced farm foods" is introduced. "The marketing bill is the difference between the farm value

[15] The inclusion of the environment as a special issue is new in the second edition compared with the first edition from 1979.
[16] If we should follow the theoretical universe of neoclassical economics, there should be a profit motive. This motive is not mentioned by Cochrane, and we must ask whether this can cause any bias for Cochrane's general theory?

and consumer expenditures for these foods both at food stores and away-form-home eating places. Thus, it covers processing, wholesaling, transportation, and retailing costs and profits" (Cochrane 1993: 232nc). The marketing bill[17] increased nearly eight-fold over a 30-year period. With reference to the entire physical infrastructure, his conclusion is: "It is (their role, our remark) *to provide farm operators with favourable economic options*" (Cochrane 1993: 233). The physical infrastructure provides opportunity for farmers to make economic progress. It is up to the farmers to make use of the opportunities.

The first professors of agriculture at Yale date back to 1845. Since then, education and research relating to agriculture and food production have increased. There is a division of labour between public and private R&D. Public research is primarily about carrying out basic research and the training of scientific personnel, while private research concentrates on the development of technologies for sale to farmers. Consequently, this infrastructure is an integrated aspect of the structural change in the agricultural sector. The importance of research and development is hardly a new phenomenon. As Cochrane points out with special attention to part of the general infrastructure for knowledge support to farmers: "In this organizational arrangement the extension service is providing farmers with essential the same service in the 1990 as it did in 1917, but the new organizational arrangement recognizes the increased specialization in science and technology" (Cochrane 1993: 251). The general historic skills to create a system of knowledge support underpin the farmers' organisational power and political influence as an historical factor and context-independent.

American agriculture depends on the world market and the existence of the world market because of "overproduction", e.g. 30 percent of its annual crop production is exported. While exports are generally important for agricultural structural change, the importation of agricultural products has no particular influence. Cochrane's perspective generally appears to hold the existence of world market dependency as a fact. From then on, it becomes a question of politics.

With reference to Clayton Koppers, Cochrane summarises the three notions or principles behind the American use of nature.

- Abundance of unclaimed nature
- Natural resources were inexhaustible
- Immediate use of resources was best

Beyond these principles, there is and has been:

- A judicial system providing support
- A political philosophy of maximising freedom
- An economic system in which the market is the determinant

Cochrane concludes the following about the American system: "… with some minor exceptions, they had completed this task by 1890" (Cochrane 1993: 283). How has it evolved during the last 100 years, and what is the relationship between the environment and agricultural development? The short answer is: the politics in the United States have more or less remained the same over 200

[17] These costs could be discussed in relation to farmer income. This is not an issue for Cochrane.

years. Over a 100-year period, environmentalism first took shape as a movement in the period 1960-80. "Carson's 'Silent Spring' signalled the beginning of the movement" (Cochrane 1993: 294-295). However, the various laws, commissions, programmes and agencies focusing on the environment were implemented and the ecological crisis continued to deepen. "By the end of the 1970s, and in spite of the many corrective actions taken by the federal government … problems of environmental degradation and pollution in the United States appeared to be increasing" (Cochrane 1993: 300). Cochrane addresses the reason: "A whole new set of problems that had their origin in the massive and careless disposal of industrial chemical and wastes were beginning to show up across the nation." This quote may be the most direct link between agricultural structural change and environmental change in Cochrane's analysis. Agriculture is indirectly seen as an industry partner. The Reagan and Bush period in the 1980s was a period in which the principle of taming nature nearly totally returned to the principles listed above. "The free market can solve environmental problems better than government regulation" (Cochrane 1993: 302). By the end of the 1980s, the so-called third generation of problems became reality: the greenhouse effect, global warming, thinning of the ozone layer, acid rain, tropical deforestation, extinction of species, and ocean and coastal pollution (Cochrane 1993). In his second-last essay, these problems are placed in a general concept in which the entire economy of the United States is analysed. From this general diagnosis, Cochrane claims that the environmental problems have become an obstacle and a threat against the entire American community; a solution related to sustainability must therefore be implemented. The proposed environmental program is one of the eight programmes constituting Cochrane's policy proposal, and the elements include e.g. a stop on the sale of public land and a general concept in order to protect the biological diversity via management in "an ecologically responsible manner" (Cochrane 1997: 20). *This is the closest Cochrane gets to organic agriculture as a phenomenon*.

What is Cochrane's explanation for this historical development? "It came about through the developmental activities of man" (Cochrane 1993: 303)[18]. Instead of dealing with a further explanation, Cochrane turns attention to a solution. His answer with address to the agricultural sector is a question of right management and the means is "sustainable agriculture".[19] In general, the solution is a question to be solved by national and international political leaders (Cochrane 1993: 306). In conclusion, Cochrane may be claimed to have developed a "natural law of the human exploitation of the earth." If problems arise, the law must be regulated; it is a question of political leadership.

Governments in the United States and western countries in general have been closely involved in agricultural structural change. State intervention in agricultural economics counts four principal categories:

[18] The interpretation of this sentence may go in two directions: first, and cutting to the bone, this is an analogical answer to "It happened because it happened". Second, it happened because of the nature of man. If the focus is on the latter interpretation, "Homo Economicus" has entered the stage without being mentioned directly.

[19] We are not going to elaborate on the definitions of "sustainable agriculture" presented by Cochrane or others. The only comment is: The definition of "Sustainability" depends on the concrete context (se e.g. Norgaard, R. B. (1994). Development Betrayed. The end of progress and a coevolutionary revisioning of the future. London and New York, Routledge, McNeill, D. (2000). The Concept of Sustainable Development. Global Sustainable Development in the Twenty-First Century. A. Holland, McNeill, D. Edingburgh, Edinburgh University Press.)

1. Economic subsidies via price support
2. Economic subsidies via money, banking and credit
3. Regulation aimed at changing the structure of the market
4. Regulation aimed at changing the trade policy

The history of agricultural development is also a history of politicians providing support in order to avoid farm crises and to protect their own political interests due to voters and lobby groups. American agricultural policy has never been laissez faire. To the contrary, this policy has always, more or less, been actively seeking to secure the economy of the farmers; however, it has not served all farmers equally. Cochrane's conclusion is that the system has favoured the largest farmers.

In conclusion, the role of government is crucial in explaining the direction of structural change in the agricultural sector. When a major economic crisis occurs, the government has provided economic support. When the world market has failed, the government must purchase the residual products; otherwise, too many farmers would go bankrupt. On the one side, this is a threat against the consumers; on the other side, the farmers and their communities are voters. Policy and politics matter in Cochrane's universe.

According to Cochrane, three other forces may be taken into account. They are:

1. Prosperity and Depression
2. Belief and Value
3. Energy Availability

These three elements operate at a different level of abstraction and represent both material and immaterial dimensions in Cochrane's analytical framework. Without arguments, Cochrane concludes:

> Other observers of the process of agricultural development in the United States might well identify still additional forces, and they almost certainly would categorize those forces somewhat differently from the way it was done in this volume. But the discussion in this chapter will focus on the three additional forces noted above (Cochrane 1993: 335-336).

His concept of agricultural development is multidimensional. "It is a mistake to view the process of agricultural development in the United States as the product of a single, or monistic, cause, or force." All of the forces are important, and the absence of "any one of them would have operated to slow or cripple the process of agricultural development" (Cochrane 1993: 347)[20]. The confusion about the ranking or non-ranking of the Cochrane-forces can be further illustrated. His statement is very clear in the beginning of his discussion about ranking; ranking is impossible. "It would be nice in a work such as this to rank the various forces of agricultural development in their order of importance. The author will not do this, however for one important reason: he does not know how to do it" (Cochrane 1993: 341).

[20] Note that Cochrane's argument is similar to co-evolutionary economics. We pursue this direction of economics in the chapter dealing with ecological economics.

The reason for the limitation can be discussed from his own perspective and on the basis of his own definition of structure. Cochrane writes the following about "structure":

> This term refers to the form and characteristics of an industry or a sector of the economy. It is concerned with the size, number, and location of business firms in an industry, with the essential technological and resource characteristics of an industry and with the basic organizational and institutional characteristics of an industry (Cochrane 1993: 6).

On the one hand, Cochrane's idea of structure deals with at least three dimensions. First, he has a "physical dimension I" relating to observable facts defined as size, number and location. Second, there is a "physical dimension II" relating to the mode of production defined as the use of technology and resources. The definition of resources remains unspecified. The third and final dimension refers to the institutional landscape within the industry. The definition of – and differences between – organisation and institution remain unspecified. Furthermore, any possible connections and dependence between industries or sectors are not discussed. Consequently, the definition of structure is both quite broad and limited; it is open for interpretation and the definition generally lacks the precision normally characteristic for a definition.

We have *rewritten Cochrane's definition of structural development*; or, in our terminology, structural change:

1. *The first dimension regarding change in the concentration and location of production*
2. *The second dimension regarding change in the technical mode of production*
3. *The third dimension regarding change in the organisation of production*

With the establishment of this definition, the Cochrane description of the structural change in American agriculture must be based upon these three dimensions and a more firm framework may appear.

The general theory of agricultural structural change

Cochrane has constructed an index of average per capita food consumption for the period 1910-1990. Based upon prices and quantity, the index captures changes in both. The index reveals three important things about the demand for food: first, the income effect is modest; second, demand for food has varied directly with population; and third, demand is highly unresponsive to price. Generally speaking, the demand for food is highly inelastic. There are two explanations: first, the size of the human stomach limits the capacity of human digestion; second, food has very few substitutes. What is true for the aggregates is not true for individual food products. The demand for individual products varies with shifts in e.g. personal income and advertising. Cochrane does not make it possible to generalise about the behaviour of food demand for individual products before single case studies of each product have been analysed.

Because of the high inelasticity for both supply and demand, even modest changes in demand cause considerable changes, e.g. a 5% increase in demand generates a 25% increase in farm product price levels. The conclusion is that:

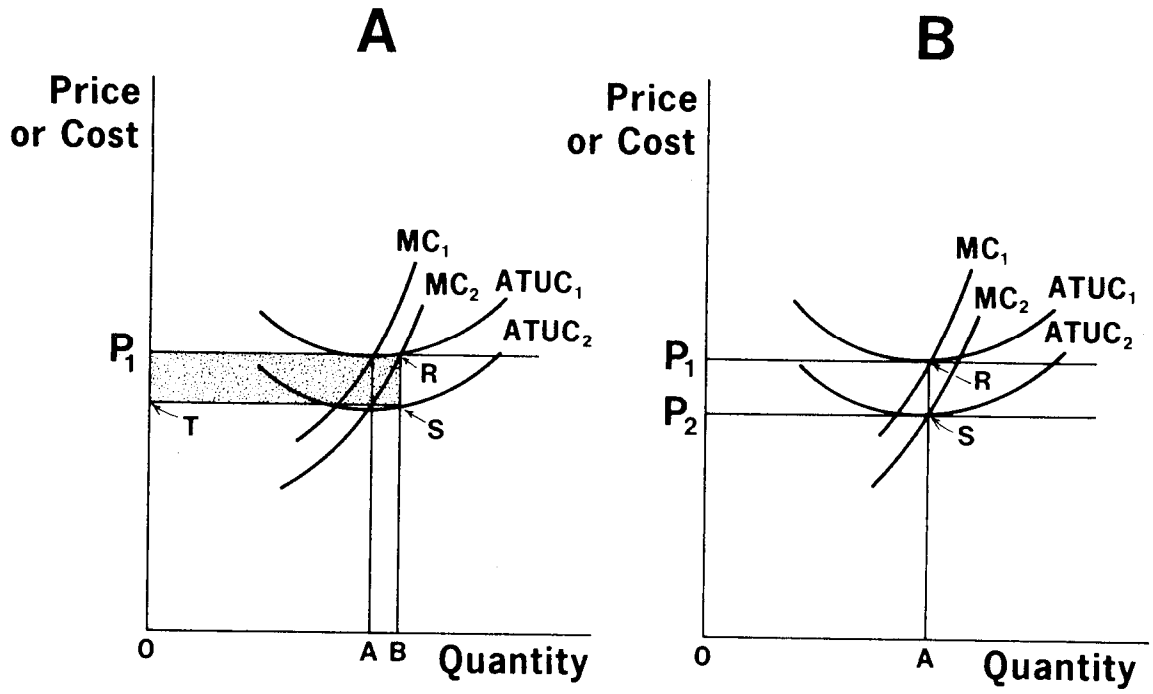
> The food producing sector of agriculture, which is most of the industry, is basically an unstable industry. In a free market situation any small change in demand relative to supply, or in supply relative to demand, must produce wide swings in the farm food product price level and as a consequence give rise to large fluctuations in the gross returns to the producers of food (Cochrane 1993: 411).

This was the theory; in practice, the story has been different. This is why Cochrane concludes that a free market model cannot be used to explain the history of American agricultural development in the post-WWII era. Government intervention must be included in the model.

Some products have highly unstable prices, whereas other products have greater price stability. However, the variations are not random because of the process of substitution between products, both from the point of view of the farmers and the consumers. "The force substitution, like the force of gravity, works continuously to pull individual food commodity prices towards the food commodity price level. But it never succeeds completely" (Cochrane 1993: 415). This creates a moving farm food product price level. Dual instability results. First, there is the general price instability. Second, there is the commodity price instability. The general unstable price level can make farmers rich; or the opposite. It therefore leads to government intervention. The unstable commodity prices lead to inefficiency and resource allocation problems. And as Cochrane comments, "(it) seems to tantalize economist and command their almost complete attention, to the neglect of the consequences of the former [the general price instability]" (Cochrane 1993: 416).

We are in the position to demonstrate Cochrane's 1958 theory (Cochrane 1958), which has never been empirically tested. However, "Much of the evidence since then has supported the theory" (Cochrane, 1996: 550). The point of departure is chart A. We have an aggressive farmer named "Mr. Early Bird", who adopts a new and improved technology. As a result, his marginal cost reduces from MC_1 to MC_2.

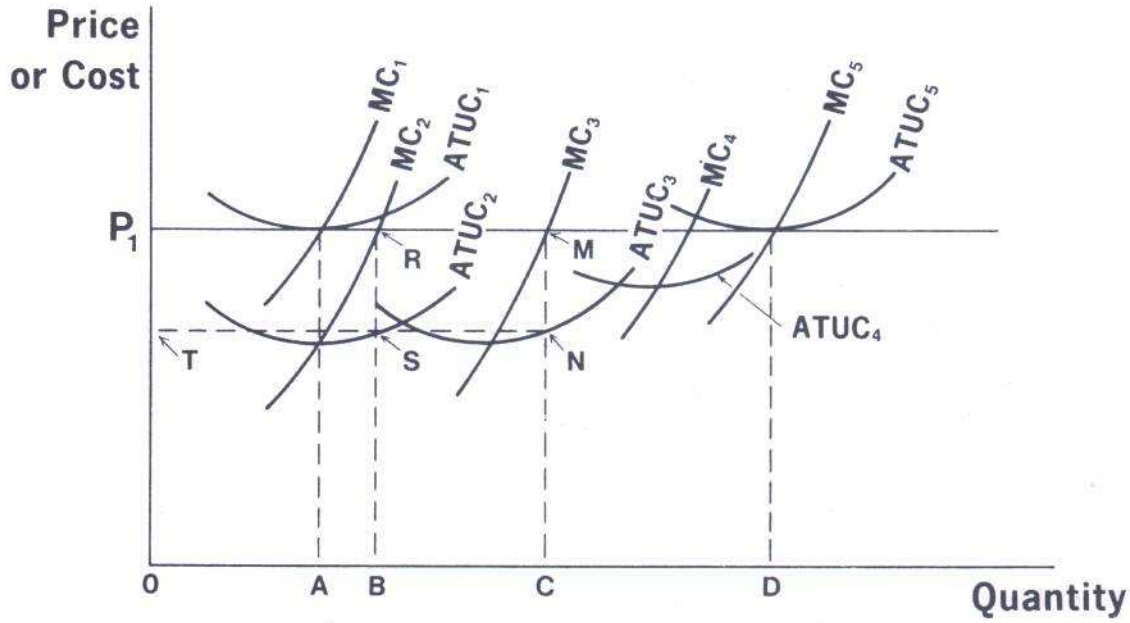
Figure 4: The theory of the treadmill. Firm and industry solutions in a free market



With a fixed price exceeding the price he is able to compete against, he will bring a larger quantity to the market (OB instead of OA) defined by the point at which his new marginal cost equals the average cost (R). As a result, he is able to produce more and earn a profit: the area P_1RST. Other farmers will follow "Mr. Early Bird", and they too will gain profit. In chart B, the process achieves a new equilibrium and expresses the situation where more farmers have adopted the new technology and total market supply has increased. In a free market economy, this increase will cause the price to fall to P_2, and the economic gains to all of the adopters of the technology are eliminated. In the long run, the winners are those consumers who acquire the same amount but at a lower price. The losers are "the laggard farmers" who fail to adopt. At the new price P_2, their cost structure remains $ATUC_1$ and their losses equal the rectangle P_1RSP_2.

However, the fall in prices is the logic of a free market; reality operates differently. Cochrane has U.S. politics in mind when further expanding the theory of the treadmill.

Figure 5: The treadmill solution with government intervention and cannibalism



Source: (Cochrane 1993: 430)

In his example, quantity will grow – from A to B to C and finally D – but the price will not fall due to the fixed government price P1. To acquire greater profit, farmers want to expand production. Under constant return to scale, farmers expand to position 3. With given technology, the only means of expanding is the purchase of new land. The competition to acquire new land thus increases, which leads to increasing land prices. Already at this point, the number of farmers must have declined, because all land is already in use. Given a higher price of land, the cost structure changes until marginal cost and average cost are in equilibrium. This is the case at the fixed government price P1 at quantity D. Each of the involved firms has expanded output, and the farms have become larger. The land value has increased; so has the production unit cost. The process can now be repeated with the introduction and adoption of new technology. Cochrane concludes: "Thus we see that cannibalism is an integral, and indeed a necessary, part of farm technological advance with fixed prices" (Cochrane 1993: 431-432).

Consequently, the theory of the treadmill is adequate, both in the case of free competition as well as a government-steered economy with public subsidies for farmers. And as Cochrane underlines, the "product market" treadmill has been replaced by the "land market" treadmill. Or stated alternatively: cannibalism is possible because of public subsidies to farmers. The economic subsidies are used to press land prices upwards.

> In the main, the landowners who have benefited from government programs of price and income support have been the larger, aggressive, innovative farmers in each farming community, who have used the income assistance from government to acquire additional land (Cochrane 1993: 433).

The fundamental reason for the existence of the entire process is due to the scarce and limited production factor: land.

Before proceeding to the issue of land, we have a number of comments. First, Cochrane's theoretical concept is directly borrowed from Schumpeter. His theory of economic development has merely been transplanted to the farm scene (Cochrane 1993: 452). Despite the missing empirical testing, our hypothesis or speculation is that the theory of the treadmill, developed on the basis of the prices works in the same way, whatever the government support is called. The same logic of argumentation is possible if we substitute the price P_1 in the figure with a measure named "economic subsidy". The process of change in politics from subsidies on product prices to subsidies on e.g. exports or subsidies for owing acres does not provide a reference to alter the theory. Why? Because it still provides incentives to direct the production process into a specific kind of order. In the case of export subsidies, the aggressive farmers will allocate resources to the area with assistance from new and improved technology, and the process will be the same as shown. If the question of subsidies refers to owning land, then the subsidy will be capitalised into the land prices.

While Cochrane's treadmill theory from 1958 has been well adopted into agricultural economics, one of the last of his articles, "The treadmill revisited" (Cochrane 1996), has been rather neglected in both the theoretical and practical national and international agricultural economics debate. This is a rather peculiar situation, as the article introduces further refinement of the 1958 theory. If the theory refers to reality, then the economic consequences work towards one – and only one – limit: *the limit is monopoly and a situation with one – and only one – landowner.* Such an economic perspective may involve political implications and forward a potential challenge to the general institutional agricultural set-up.

We now go a little step further and make Cochrane's contributions more explicit than the theoretician himself. As demonstrated by Cochrane, it may be far more appropriate to talk about two kinds of *interacting* treadmills. While the first treadmill is well developed in the literature, the second is rather ignored. However, the second treadmill is more fundamental to agrarian change than the first, because it goes deeper and beyond the institutional set-up established with the recognition of the property rights. Cochrane's contribution establishes the concept of property rights as a dynamic concept, which involves non-farming actors. First, Cochrane demonstrates that the financial sector and landowners represent the directly relevant institutions. These institutions are the long-term winners in the game of agrarian structural change under the assumption that the concrete and historic continuous rise of land prices continues. Secondly, the innovators and producers of new technology become winners, while, generally speaking, the losers are the public and the farmers, taken as a unit. Thirdly, the treadmills are in favour of the living generations at the expense of the coming generations. Cochrane's contribution has introduced the price and land market treadmills. Where the price treadmill finds its *winner among the farmers*, the land market treadmill finds its *winners outside of the productive agricultural sector*. These results are important, but they also represent a theoretical and practical "breakthrough" in the discussion of the understanding of agrarian structural change.

We could claim that the treadmills represent a social trap[21]. In that case, it becomes relevant to investigate how to escape from the trap. Is it possible to escape from the two treadmills?

[21] The theory of Social Traps is part of ecological economics introduced later in the thesis.

Cochrane discusses this subject, and the general conclusion is negative in relation to escaping from the treadmills. The treadmills operate outside of or within a free market. The single farmer may be able to remain ahead of his competitors, but the treadmills will remain in function. There is only one case in which the treadmill may be modified or even disappear; this is the case of uniqueness, which can relate to management, technology or the product itself. Theoretically, the situation is linked to monopoly, and Cochrane uses the term "quasi monopolist" in relation to the producer. However, that which is possibly a natural law – the natural law of treadmill and cannibalism – is open to another, competing "natural law": the law of price formation under a situation with monopoly or monopolistic elements.

Themes from Cochrane to the general theory

We have identified a number of themes which, for whatever reason[22], are either poorly represented or missing from Cochrane's general theory from 1993. The themes are related to:

1. Free competition and the input industries
2. Politics as good or bad
3. Economic subsidies, taxes and their effect
4. Politicians as farmers and their economic interest
5. Politicians as farmers and their lack of democratic interest

> I have sometimes thought that the shortest possible economic history of U.S. agriculture during the twentieth century would be this: non-farmers learning how to make money from farming … In any event, Cochrane's prediction that the profits from an industrialized agriculture would go to non-farm investors, not to farmers, was right on the mark. This in turn, led rise of economic superpowers in the food system (Levins 2000 (2003): 8).

The rather narrowed focus on the input industries in Cochrane's main work stands in contrast to the above quote. His perspective casts light on the absence of free competition and critique is directed at the simplified division of the world in terms of the producers and consumers of food.

> There are people who grow food, and there are people who eat food … John Deere, Monsanto, Pioneer, and Cargill fit into neither theory. Invisible both to theory and to those who developed policies based on those theories, nonfarm corporations thrived while agricultural economists of both schools wring their hands over low returns in agriculture (Levins 2000 (2003): 42).

With reference to why the best known economist of the age could not tell about the corporate profits of the day, Cochrane replied: "It never occurred us to look … You might as well have asked

[22] The most likely reason must be that Cochrane's main book and his general theory is from 1979. His publication from 1993 is the second edition of his 1979 work, and he possibly concentrated on his new chapter of e.g. the environment and neglected the revision of different themes.

us the diameter of Jupiter" (Levins 2000 (2003): 42). Consequently, the evolution of monopolies and oligopolies in the western and global economy versus the general notion of free competition must represent a perspective for further discussion in order to bring theory and real life closer to each other.

The coherence between politics, economy and structural change is outlined in a discussion between Cochrane (Cochrane 1985) and the deputy staff director of the U.S. Committee on the Budget (Hoagland 1985). Cochrane's general conclusion is: "Looking back over fifty years of farm price and income policies and programs, it would seem that the more things has changed the more they stayed the same" (Cochrane 1985: 1004). The analysis concludes that the policy has favoured the large and wealthy farmers, while the arguments for the policy refer to the millions of threatened farmers who are struggling to remain in business. This paradox becomes clear as the process continues from decade to decade. This is Cochrane's argument to eliminate the price and income support "as quick as possibly" (Cochrane 1985: 1007). Cochrane does not propose a laissez-faire farm policy. To the contrary, he focuses on the issues defined as "the critical problems of the food and agricultural sector" (Cochrane 1985: 1007). These problems are listed as:

1. The crisis of credit
2. Survival of the thousands of moderate-sized farms
3. The impact of the unstable currency on export
4. Trade barriers
5. Price and income instability
6. Soil erosion
7. Pollution from farming
8. The import of foreign workers
9. Tax policy supporting expansion and resource concentration in farming
10. Hunger and malnutrition in general

It is possible to identify a range of different theoretical references as the source of these ten problems. Cochrane's general theory is represented in four of the problems (numbers 1, 2, 5 and 9); Management theory is represented in four of them (1, 6, 7 and 8); The general economic politics mechanism is represented in five of the ten problems (3, 4, 8, 9 and 10). The nature of the system of technology for conventional farming is addressed by two of the ten (6, 7)[23]. In his article, Cochrane concentrates on the mechanisms belonging to his general theory[24]. Which conclusions does Cochrane himself draw?

> In sum, I am not arguing to get government out of agriculture as a general ideological proposition. I am arguing to get government out of agriculture where it is helping one group of farmers do in another group. I am arguing to keep government in agriculture where it operates to make the competitive game of farming more fair to all concerned, hence, a more acceptable game for all concerned (Cochrane 1985:1009).

[23] Cochrane here indirectly presents a need for policy for reducing the negative consequences of the industrialised farming technology system.
[24] This is a shame, because the development of this policy proposal reflects a holistic perspective. On the other hand, and as Cochrane himself remarks, the article would need to be expanded to more than one article.

Cochrane's position is to use politics to bring fairness into the process of treadmill and cannibalism. Hoagland (1985) is unable to critique Cochrane's analysis technically. Instead, he claims the need to deal with the reality behind the political process. The number of lobbyists has grown, the fragmentation process has increased, and the chance to arrive at consensus has decreased. A change in the analytical perspective is required. The need for focusing on different interests and a more differentiated concept of politics is one of Hoagland's central contributions. On the other hand, these perspectives are actually an implicit aspect of Cochrane's article.

On the background of the theories of the treadmills, it can be argued that because of the inherent law of the struggle to buy land, land becomes what we may refer to as "an internal product of the agricultural logic of production". The product is produced without the input of labour, capital or raw materials. The value added to the product is a result of the development itself. The theoretical background of the discussion of this value-added process as a result of a social development can be traced back to the doctrine of Henry Georges. We follow this perspective briefly and relate it to the recent reform of the EU. The Commission argues that they have proposed and implemented a decoupling of the subsidy away from the production process. This must be incorrect according to the optic of Cochrane's general theory; land has been and remains a product for trade. The subsidy structure has changed, but the results are the same as earlier. This conclusion is strictly in accordance with Cochrane's assessment in his 1985 article.

We will now follow Hoagland's critique against Cochrane and make a simple illustration; it deals with politics understood as polity and involve the concrete politicians who are responsible for the legislation; and within this, the agricultural policy. We wish to make the following observations on the interaction between the EU subsidy and the selected, institutional players involved:

1. There has been a general tendency towards maintaining the EU-subsidy system as is. The position towards transparency and democratic insight has been and remains a slow-moving historical process. As an illustration, it must be stressed that in the majority of the EU countries, insight into the files of how much subsidy each person and company get, as e.g. in the case of Denmark, has been and continues to be denied by the public authorities.
2. It is not unusual for farmers to be disproportionately represented among politicians. This has been a pattern throughout history, nationally as well as internationally. It is worth noting that nearly all of the involved Danish farmer politicians employ the conventional, agricultural technology system.
3. It is not unusual that the large farmers, including the old monarch system, as landowners have received public subsidies. This also has been a pattern throughout history, nationally as well as internationally. And again it must be noted that nearly all employ the conventional, agricultural technology system.
4. It is not unusual that members of the highest agricultural institution have received public subsidies. This too has been a pattern throughout history, nationally as well as internationally. The interesting data is that the subsidy e.g. to Danishs members from the EU in 2003, vastly exceeded the general average for the farmers. This underlines the institutional structure in the most influent agricultural organisation, where it can be concluded that in the beginning of the 21st century, the large Danish farmers constitute the

board of director with a "president" as chairman of the board[25]. Once again, it is worth noting that all of the directors of the board employ the conventional, agricultural technology system.

The question is: what should their motive be to work for cutting or reducing the subsidies? This question can be related to at least three kinds of motives:

1. A microeconomic motive
2. A mesoeconomic motive
3. A macroeconomic motive

The first perspective deals with the nature of mankind; in Cochrane's universe, this is a question of maximising the profit of the farm. Consequently, would it not be contrary to the theory if the involved politicians were to work towards eliminating their privileges and money? The second perspective refers to the interest of the farming organisation. Cochrane deals with this perspective in his discussions about the influence of lobbyism, where the aim of the farmers is to obtain as much money and protection as possible. We assess that Cochrane's position is likely the first perspective. The means for acquiring this aim deal with the nature of politics and the level of power. The third perspective is the only complex issue. However, we can state that the macroeconomic motive is a question of policy, politics and polity.

All three perspectives directly influence "The Rules of The Game" and the role of the politicians, who are also involved in farming, must be judged to have status as a stabilising and preserving factor, meaning that "The Rules of the Game" do not change with the help from those politicians. Generally, the existence of a subsidy system constitutes a context that cannot be ignored as an existing mechanism in agrarian structural change and transformation. In this context, the element of policy and politics can be argued to be up against the existing polity structure. With this conclusion, the question of dealing with structures of power becomes an unavoidable aspect of any theoretical and empirical analysis of agricultural structural change and transformation.

Cochrana and Organic Agriculture

How is it possible to use Cochrane's theories to understand the origins and establishment of organic agriculture? We investigate this question from two different approaches:

1. Organic agriculture as a "natural" result of the social evolution with focus on the introduction of new technology and research and development activities.
2. Organic agriculture as uniqueness – organic agriculture as quasi-monopoly.

Ad.1: Within Cochrane's apparatus, it appears difficult to explain the appearance of a new phenomenon without reference to the introduction of new or improved technology. Anything else in his system is part of an evolutionary process in which the forces at any time have influence on the

[25] The lack of representative democracy in the institutional framework and the under-representation of organic farmers is part of the organisational story of Danish Agriculture.

direction of the structural change. The roots of the organic technology system may be claimed to relate to the Rudolf Steiner concept from the 1920s. In Denmark, experience with the biodynamic concept was acquired in the 1930s (Jacobsen, 2005). Both concepts were nearly non-existent in the commercial market, and the scope of production at the macro level was nearly non-existent. In the 1970s, organic agriculture was established by grassroots (Ingemann, 2006). This means that the distance in historical time between the introduction of the technology system and the diffusion of the technology system has been a long-term history. How is Cochrane's apparatus able to argue that this new technology was the initial source of the origins and establishment of organic agriculture? Cochrane would focus on the second half of his technology concept and talk about the improvement of existing technology. Ingemann (2006) and Jacobsen (2005) both state the importance of the establishment of the first educational system specialised in organic farming in 1982. Moreover, Jacobsen (2005) selectively focuses on the long-term struggle since the end of the 1970s until 1985 for the implementation of both education and R&D activity. Jacobsen (2005) discusses the introduction of publicly financed research as a struggle between enthusiastic individuals and the existing system. This gives us the sense that the establishment of organic research may be claimed to occur *despite* public institutions rather than *because of* public institutions. This may also form part of the explanation as to why organic agriculture was a slow starter as an alternative system. If this argument is accepted, the question of organic agriculture as a niche rather than an alternative to the conventional technological system may be due to a low level of R&D and institutional barriers and resistance.

Here we must refresh the general idea that the "early birds" adopt new and improved technology, make a profit and expand their business. The next step ought to be for the average farmers to follow and adopt the technology. From a Cochrane-inspired position, we should argue that the increasing numbers of organic farms and organic use of land provides the empirical evidence. In the 1990s, the expansion of organic agriculture became a reality. If we assume this position, however, we have created a new problem: why did all farmers not convert from conventional agriculture to organic agriculture? The first conclusion within this perspective must be that the explanatory power of Cochrane's apparatus appears weak.

However, the Cochrane apparatus enjoys support once we introduce another perspective to support the above argumentation. The perspective refers to the interpretation of Cochrane's notion of time versus the introduction of new and improved technology. What happens if we assume that the technological system of organic farming is so complicated that the notion of "new and improved technology" must be interpreted on the basis of a decades-long time frame rather than one or two years? This is speculation, but the presented idea may be relevant in order to maintain technology as a main mechanism instead of an inherent and supporting mechanism.

The next perspective also deals with technology. If we split up the Cochrane definition of technology in parts, the first part can refer to the technical machinery and technical infrastructure of the farm. The second part relates to the "seed in a broad sense" of the production and process from "seed to product". In many ways – but not all – the technological systems are different for conventional/chemical agriculture and organic agriculture, respectively. The main difference is the idea of productivity. The conventional neoclassical 'Cochranian' system refers to scale, unit costs and price. The organic agricultural concept of productivity is broader and based upon the principles of organic farming, where e.g. ecological balance and improvement (or unchanged) soil quality is part of the concept. We have different productive systems; only parts of the systems are similar. The

literature tells us that the unit cost for production is generally higher in the organic system. This is the general idea to date. But what about their productivity? In Cochrane's universe, their productivity must be the same. Elsewhere, capital from one of the systems would flow to other systems; only the most productive system would survive. The co-existence of the two systems is a fact. In such a situation, Cochrane must introduce supply and demand for food. Generally, Cochrane does not regard the supply and demand for food and the question of food prices as a particularly influential factor. In our case, we have two different products sharing something in common: both products are named "food". How do the demand and supply curves react? In its totality, the demand curve is inelastic in terms of price, but we have demonstrated the existence of the substitution of different food products. In a situation with two apparently similar products, the consumer will demand the product with the lowest price. The consumer will choose the higher-priced product only when:

1. The consumer prefers the product, for whatever reason.
2. The consumer only has access to the expensive product, for whatever reason.

It is a fact that organic food is generally more expensive than conventional food. We therefore assume that the expensive product always represents the organic product. If we take the latter explanation first, then our claim is that this situation will always be covered by the former issue, the function of preference. If the market you visit only contains organic products, it is because the consumer has chosen this market because of preferences. On the other hand, it is more likely that the consumer might have difficulties gaining access to the expensive organic products. Because of the difficulties gaining access to alternatives to conventional food products, we will reduce the above two situations to the situation of preferences. The consequences of argumentation are two different products, each with their own demand and supply curves. How they co-exist may vary from product to product for whatever reason. The conclusion of both the demand and supply curve must relate to consumer preferences. This means that as long as the concept of productivity rests on Cochrane's definition, we will only be able to understand the existence of organic agriculture with reference to consumer preferences. In order to understand the weakness in such an explanation, we must imagine a shift in the concept of productivity to that of organic agriculture. The externalities from conventional agriculture and the externalities from organic agriculture must now be incorporated in the price. Assume that the conventional prices increased and become higher than organic food. This may shift all of the preferences towards organic food. However, is this because of preference or price? The point is that any institutional set-up affects the concept of productivity; however, it is not possible to capture this point in Cochrane's apparatus.

The third perspective deals with the core of Cochrane's theory: the treadmills. When we have two systems, does this mean that we must deal with an organic agricultural technical price treadmill and a ditto conventional? And further, does this also mean that we must deal with an organic agricultural land market treadmill and a ditto conventional? If an organic farmer wants to expand, he is competing with other farmers; both organic and conventional. As demonstrated above, we have two agricultural systems, both in equilibrium. Elsewhere, capital would move. For whatever reason, both systems are able to achieve a profitable level of production by expanding their amount of land. The competition for land will tend to equal the price for any land at a given equilibrium level. The general explanation is the need for more land and the scarcity of land. Land

is land. And land is a scarce resource, which has a monopoly price; and there cannot be two different monopoly prices. This is why organic and chemical land have the same price.

Ad. 2: The second approach has reference to the uniqueness of organic agriculture due to management, the technology and/or the product. The idea of uniqueness introduced by Cochrane is the only means by which to escape the treadmills. Uniqueness makes the concept of monopoly relevant. The labelling of organic food with the so-called red "ø-label" in 1990 provided organic farmers with a monopoly on the supply side. From then on, the public authorities controlled the production, and all organic farmers had to be certified in order to obtain access to the "white" markets for organic food. With a monopoly, the farmers ought to be able to take a mark-up price and be better off than their conventional neighbours. It is an empirical fact that the typical organic products had – and have – a price above the conventional product. But it is important to state that the supply monopoly established by organic products may be interpreted as a technical monopoly as opposed to a real monopoly. As noted, there is a competitive situation in the market for food in which it is possible to make substitutes. This means that the uniqueness is an apparent uniqueness. The question about whether this apparent uniqueness is transferred to a real uniqueness becomes the subject of interest. This question is not part of Cochrane's theory, which leaves us with the element of speculation. An initial conclusion relates to the opportunity to escape the treadmills by becoming organic farmers, which is then reduced to a question of the function of the market and consumer preferences. This would be Cochrane's conclusion.

Conclusion

Cochrane is in many respects locked into his neoclassical economic universe. However, his general long-term descriptive explanation provides major insights concerning the scarcity of land as the reason for the growth in the size of the agricultural units. The ongoing technological innovation process renders it possible for farmers to increase their productivity as measured without taking into account the externalities from their production. Such accounting is a matter of politics.

When Cochrane evolves his specific descriptive explanation and integrates his ten forces, he encounters problems and ends up with a kind of "anything matters" explanation. However, technological innovations matter more than the rest.

Turning our attention to Cochrane's treadmills, the insight becomes clearer. The land market treadmill is an important contribution to understanding why land prices and rent tend to increase while agricultural structural change tends to continue a process with fewer and larger farms with an increased trend of absentee ownership. Cochrane's theory is generally a theory of a transformation of ownership and the re-allocation of wealth from people without land to land-owning persons or institutions. The economic subsidies to agriculture fuel this structural and transformational process. One of the factors contributing to this policy has been the influence by farmers and their organisations. Cochrane draws a new perspective in a final viewpoint regarding the lack of free competition in the market and the general neglect of the input industries in agriculture and their economic interest. Turning attention to organic agriculture, the contributions from Cochrane become scarce. Our attempt to focus attention on technological innovations and provide them with explanatory power ultimately ends as a rather speculative conclusion. When we further focus on the co-existence of two different technological systems, Cochrane's apparatus assists us with the concept of preferences as the reason for the existence of organic agriculture. The

last element in Cochrane's theory is his portrayal of organic agriculture as a quasi-monopoly. Such explanation ultimately rests upon the function of the market and consumer preferences. Cochrane provides much insight, but his general apparatus is weak in relation to structuring these insights to form a wholesome theory capable of contributing to an integrated explanation providing an overall understanding organic agriculture and the process of structural change and transformation of agriculture.

The Cochrane Perspective and the Hvelplund Approach

In his doctoral thesis (Hvelplund 2005), Hvelplund assembles a comprehensive toolbox for action research. His explicit object generally includes references to the co-existence of different technologies and the evolution of these technologies as a historical process. This situation is similar to ours, where organic agriculture co-exists with other forms of agriculture. The aim is to establish an adequate model enabling scientific society to explain history and predict the future landscape. The point of departure for his argumentation is the established, textbook, neoclassical economic theory, "the abstract institutional economy".

His concrete context: environmental planning. Within this context, he has conducted an analysis of the economic, theoretical principles of regulation during three decades: from 1974 to 2001. He identifies the underlying principles as a theoretical combination of traditional neoclassic economics and a portion of Austrian neoclassical theory. According to Hvelplund, the difference between the Austrian way of thinking and pure neoclassicism is based upon the assumption that the Austrian theory argues for the existence of strong powers within the market capable of destroying the existence of oligopolies and monopolies. Consequently, any regulation of the market in relation to market failures is more or less unnecessary. In the pure neoclassical position, regulation is necessary in order to secure free competition. At issue for Hvelplund is the establishment of the epistemological framework based on the abstract neoclassical economic universe. The abstract neoclassical model operates with four boxes:

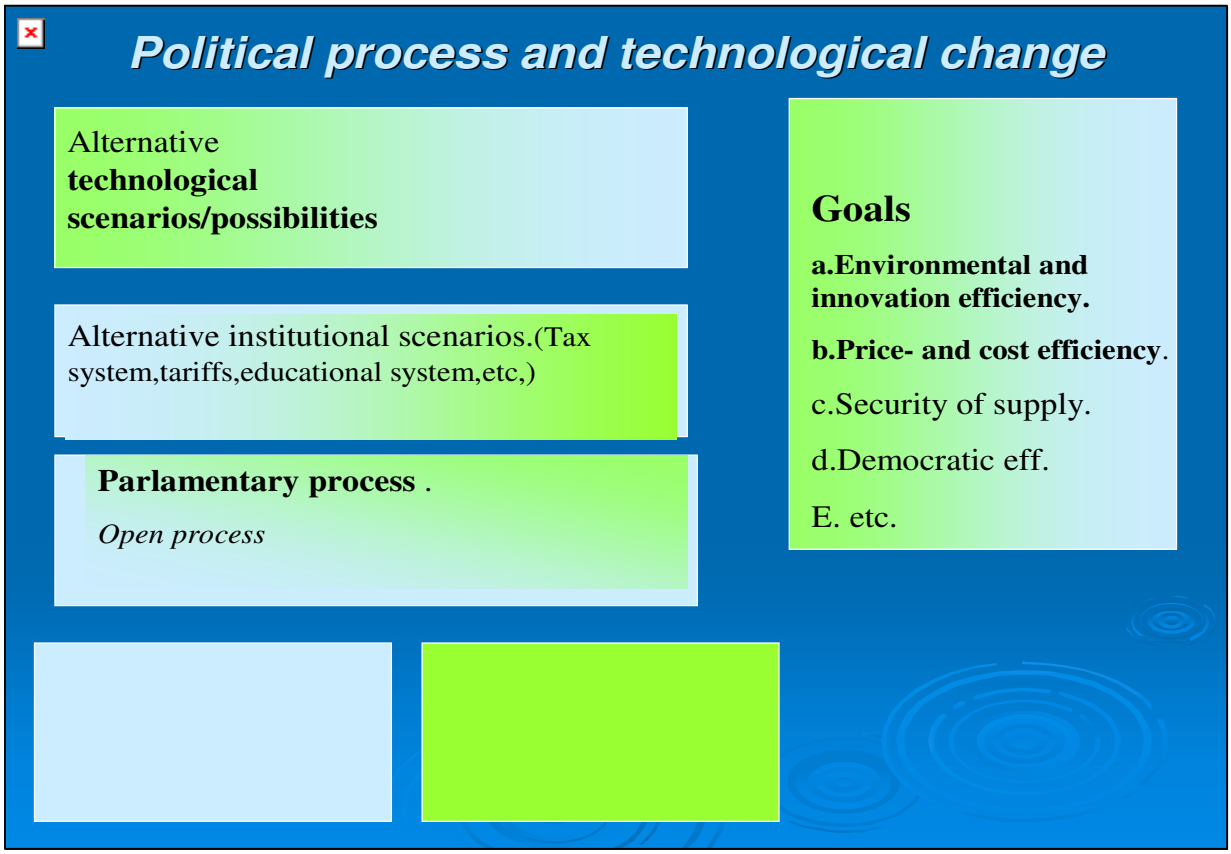
1. Market
2. Goals – objectives for politics
3. Basic institutional assumptions – the institutional set-up
4. Public regulation

Hvelplund argues for the need for the application of neoclassical economics in the real world. Within boxes two and three, there are different sub-boxes and, which is the point, Hvelplund claims that two of them are black boxes in the abstract neoclassical model: concrete context and the wish for direction. The notion of epistemology has been opened by incorporating the historical, concrete institutional and technological contexts into the analysis. It is this integration which potentially enables the political processes to operate in a far more complex and detailed discussion. The explicit focus on the wish for direction for societal change is established as an integrated aspect of the model and signifies a shift from a mechanic to a dynamic understanding of structural change in an economy. The differences between the abstract neoclassical economy and the concrete institutional economic models are:

1. Whether we have a free market situation or whether the market is embedded in institutions and we do not have a free market.
2. Whether we have economic optimisation or not, where the latter situation refers to the result of historical institutions.
3. Firms are rational and optimising units or firms are rational and optimising, but they have different rationales, different stages of development and different patterns of reaction.
4. Context does not matter or context matters.
5. It is necessary or unnecessary to analyse the cost structure and organisational dynamics of the firm.
6. Whether policy rules via market tools or with both market tools and systematic changes to the institutions in which the market is embedded.

The first part of each point reflects the neo-classical economic praxis, while the latter represents the institutional economic praxis. We may argue that, until now, the similarities between Cochrane and Hvelplund are complementary. It is the next step in his modelling which makes Hvelplund special. We start with reference to the analytical main structure. Our claim is that the figure could have been named explicitly: "The model of societal power". We shall argue for this:

Figure 6: The Hvelplund model of societal power



Source: Hvelplund (March 2006). Poster from Ph.D. course. Aalborg University, Department of Development and Planning.

This model assumes that technology is defined as a combination between:

1. Technique
2. Organisation
3. Knowledge
4. Product
5. Profit

An increase in the level of technological change depends upon the change in and between the five dimensions. Radical technological change is defined, and it is required that more than one of the dimensions must change. A radical technological innovation is defined as being when four to five dimensions must be changed. The central issue for change is the establishment of alternatives to the existing order in society. In Hvelplund's universe, the integration of natural science must enter "the game". Engineers have the skills to establish technical alternatives, while the social sciences possess the equipment to form institutional alternatives. *When alternatives are produced, the game of power will start*. This is defined as a democratic process in which different actors attempt to defend and fight for their particular interests. The result of the fight will produce winners and losers.

The case – the problem – represents the starting point. In our situation, the case is both agriculture and organic agriculture. In any case, Hvelplund claims the need to be concrete at an adequate level. The specification of the concrete comes from goals plus a search for the precise distinction of real life that renders action possible. The final part is important and underlines his position as an action researcher. Goals and action-specific, adequate descriptions at both the macro and micro levels are required. We require the description of the interaction between four pillars:

1. Organisation
2. Goals/Objectives
3. Action
4. Epistemological context

The final pillar implicitly introduces the existence of various adequate epistemological contexts. His empirical research has underpinned the need to operate with this "tool" as a kind of "analytical eye-opener". However, the insistence on searching for an adequate epistemology and the explicit search for a universal theory of social science requires a guide. This guide is defined by the specific and context-dependent choice of a macro and micro model. We start with the macro model. Hvelplund operates with a first and second order. The first order is the general and objective infrastructure in the relevant part of society in light of the problem in question. We could also refer to the first order as the given institutional set-up at a given time. The second order is defined with respect to the actors and their process of concrete actions and the choices behind the actions. At first glance, this may be interpreted as the micro model; in Hvelplund's thoughts, however, these actions are the central aspect of his second-order macro model.

Here, we must emphasise an important issue; in order to choose the most adequate analytical macro and micro models, the question of the time dimension plays a crucial role. Any research process must pay attention to this aspect. His argument is illustrated in the following manner: with a very short time dimension, the analysis tends to be static and proposals for action are based upon the existing technology. A man plans a trip with his bicycle from his home to his

workplace. The analysis conducted by the cyclist is concentrated on questions such as: will it rain? Is the road smooth? What is the wind like? If the dimension of time is longer, a discussion of the choice of the means of transportation may be put into question (the choice between different and possible means of technology). With a longer perspective, the question of changing one's transportation needs by changing job or location may increase. Hvelplund's point is that it is exactly here that there is often a discrepancy between the time horizons from which the different actors operate in the game. *Different concepts of time exist in the process of structural change*. These differences must be described, and these descriptions form a central part of his action research. Descriptions are an active part or player in the social power process.

We are now ready to illustrate Hvelplund's model with reference to our research area. It is not a comprehensive description or illustration; merely a number of examples in order to acquire an idea of the possible potential of Hvelplund's apparatus. He makes explicit reference to agriculture and the first-order societal infrastructure. With reference to the theory that all costs are included in the price, direct comparison is made between organic and conventional agriculture. The latter receives what he refers to as "a massive structural subsidy". He claims:

> The point, that the state and the municipalities collect similar taxes from the profits of organic farming as from the polluting hog-factories, the chemical based agriculture is a massive and seldom recognised structural subsidy to the polluting and resource consuming business structure, which also produce pollution, disease and losers. Elements which lead to increased public cost and strengthen the resource spending business structure at the expense of the less resource spending businesses. (Hvelplund, 2005: 100, our translation)

It is evident that Hvelplund has a point from a macro-economic point of view, which can be explained within the paradigm of neoclassical welfare economics and economic externalities. Knowing the point from theory and practice, the next discussion relates to why the consequences are missing in both a historical and contemporary context. Hvelplund claims that the question must be forwarded to the institutions constituting and deciding the direction of societal, institutional change of the first order. Within these institutions, the ongoing praxis is often experienced as a natural law. This leads Hvelplund to state that *without changes of first order, no fundamental change will ever be implemented*. Change to the institutional rules of the game is fundamental in order to bring about radical change. Remark the similarity between our initial definition of transformation and Hvelplund's idea of radical change.

We will now conduct an experiment. We simply assume similarity between agriculture as a whole and electricity and thereafter transfer Hvelplund's electricity analysis to agriculture. We obtain two different models. The focus of the first model is on consumption, while the focus of the second model refers to regulation. In both models, we have a first and second order, consumption and regulation, respectively. When the focus is on consumption, the results are:

1. We have an ongoing democratic process, defined as the interplay between parliament, the different interests behind conventional and organic food production, the unions, the grass roots, the media-system etc.

2. We have an ongoing implementation of politics. The interplay at point one creates a first-order social structural politics within the nation-state, the WTO, EU, the NGOs etc. Secondly, agricultural and food-related sector policy is created. This is the second order.
3. The results are also dual. The first order creates societal agricultural production efficiency, which leads to the first-order, structural food consumption. The production efficiency of the agricultural sector leads to the second-order, non-structural agricultural consumption. This second-order consumption is a function of the efficiency of the various systems of production. The second-order consumption is based upon both the efficiency of the technology and the efficiency of the various technological systems.
4. The total agricultural consumption is the sum of the first- and second-order consumption.

This is central to understanding the difference between first- and second-order consumption. In order to illustrate, Hvelplund provides an example: the change in energy consumption in the transportation sector depends on how far a car is able to drive per litre gasoline and the total number of kilometres the car drives. Total energy consumption does not decrease if the car is able drive 20% more per kilometre when the total number of kilometres correspondingly increases by 20%. In Hvelplund's terminology, the latter refers to the first order, while technological improvements refer to the second-order consumption. *One of the points made by Hvelplund is that the political efforts have been concentrated on the second-order consumption.* Following his logic, the same should be the case in agriculture.

When the focus is on regulation, the results are: the first-order public regulation system is divided into seven elements. The interplay between these elements constitutes the rules of the game, which construct the societal institutions and the level and content of the production of material goods. The seven elements are:

- The competition on the market about the need for products
- Alternative supply systems of goods
- The need for goods
- The national socio-economic structure
- The national policy reaction
- Rules and legislation, market structure, market power etc.
- WTO, EU, NAFTA, multinational companies, NGOs, national governments etc.

What about the second order? Hvelplund draws a distinction concerning the definition of the second order with reference to the following categories and the interaction between these categories and their sub-categories:

1. The agricultural food service supply system. The direct system from earth to table including: Raw materials (nature), primary production (the different systems of agricultural primary production), transmission (transport of primary production), manufacturing of food, transport, distribution (wholesale and retail sales) and the direct agricultural food consumption system.
2. The indirect agricultural food supply system. Determination of the indirect system is managed by the interplay of four different elements. The first els ent is the technological and

institutional scenarios. This refers to the existence and potential of different systems of agricultural production. For simplicity, this can be seen in relation to the existence and potential of the conventional and organic agricultural systems. The second element is the parliamentary process. The third element is the lobbyist with a direct economic interest. The fourth element is the lobbyist without direct economic interest.

How does the first order influence the second order? The influence is dual.

Firstly, the international and national construction of the social and economic rules of the game determine which kind of agricultural services are "needed", and consequently which kind of agriculture shall be produced.

Secondly, the explicit focus is directed towards the rules of the game which decide how the agricultural services "which are needed" shall be produced. The first order, structural agricultural consumption, characterised by the national level, the EU level and the global level, has established rules of the games operating with heavy agricultural subsidies. According to Hvelplund, some of the largest subsidies are the missing taxes on pollution. In such a perspective, pollution covers e.g. the contribution to the spoliation of biodiversity, the fishing ocean, the ocean as recreational facility, sea, lakes and rivers, the poisoning of drinking water with pesticides, the poisoning of food through medicine and polluted animal food with non-tested GMOs and pesticides, the poisoning of people through e.g. meats with too many and dangerous bacteria, the intensive use of fodder, nutrients, vegetables, meat etc. with long transportation (the argument here is related to the missing taxes on transportation plus the fact that transportation is a potential source of pollution). These are merely examples, but the interesting point is: nearly all of the examples do have a direct connection to the conventional and GMO technological agricultural system. In principle, organic agriculture is not a source of pollution due to the principles behind the certification. Another example could be the international agenda concerning organic food and its positive effects. We have two contra-dictionary positions. Within the first the arguments are directed towards the need for the conventional and industrial efficiency of food production with reference to e.g. a growing world population or the business economy of agriculture (Pinstrup-Andersen 2000: ; Christensen 2001: ; Prakash C. S. 2004). The second position argues the contrary position, and their research questions the efficiency of modern technological agriculture and argues for a return to old traditions c.f. organic agriculture (Tillman 1998: ; Monbiot 2000: ; Youyong Zhu 2000: ; Leu 2004). However, organic agriculture is still a small niche. The above examples indicate how the first order directs the evolution of the second order.

Generally, his conclusion is rather simple: in order to obtain a long-term perspective, there must be an offensive participation in the formulation of the first-order level of regulation. This interplay between the first and second-order politics is not well developed by the research community, the politicians or the bodies in the central administration. *The epistemological context is organisationally homeless.*

Thus far, Hvelplund's apparatus seems to work. The next step is the establishment of adequate epistemological micro contexts. Generally, Hvelplund's concept is focused on the value-added process. The focus can be different. If we are to use a profit focus, we would have to compare the development of value added to the product "agriculture" over time. Now we get into trouble. Compared with electricity, agriculture is not homogeneous. Agriculture produces different products;

different products over time, and different technologies co-exist within a competitive system. Is it possible to establish an analysis that describes:

1. The value-added process of conventional agrarian products from ground to table?
2. The value-added process of organic agrarian products from ground to table?
3. Positions 1 and 2 have to be documented during historic time?

Because of the organisation of the business, this may de difficult. However, the solution within the Hvelplund apparatus is to demonstrate the ability to take action at the micro level. He would focus on one litre of milk or one kilogram of pork and make the case study. This would be supplemented by e.g. different calculations about business investments in order to identify boundaries for organic farmers compared to conventional farmers. Hvelplund's idea would be a continuous process of trial and error in order to establish an adequate microeconomic model capable of contributing to an understanding where his reference is the chosen and adequate macro variables of the first and second order.

Conclusion: The benefits from Hvelplund

Because of our deductive point of departure, we are not able to conclude in an ordinary manner. Hvelplund's modelling work is characterised by being concrete; however, we find that Hvelplund's approach seems promising. A main element in this assessment is the idea of the importance of the establishment of a clear alternative. If we take Denmark as an example, plans have been introduced from time to time about how organic agriculture provides an alternative to conventional agriculture (e.g.(Illum 1987), (Specialarbejderforbundet 1995), (Bichel-Committee 1999)). However, the result is still that organic agriculture is a niche. This illustrates that Hvelplund may have a point. Organic agriculture is an alternative, but it is epistemologically homeless.

The second point is that the integration of the political dimension in Hvelplund operates with interplay between a first and second order. By making this distinction, Hvelplund contributes to modelling the concept of policy, politics and polity in his models. This is rather sophisticated as compared with Cochrane. The political infrastructure matters. However, the polity matters fundamentally, because this first-order system must change in the rules of the game in case a fundamental change shall come. However, political efforts have concentrated on the second order and how agriculture shall produce; sector politics such as environmental restrictions on nutrient discharges, rules for animal protection, rules for animal transport, rules for medicine use etc. Some rules of this first-order game must change in order to create a transformation. Transformation becomes a question of a process of human choice.

The third point in Hvelplund's work is that his focus casts attention on the paradox about structural subsidies to conventional agriculture. These subsidies are a cost for the public, and the subsidies constitute a kind of structural advantage to conventional agriculture as compared with organic agriculture. This is a further argument for focus on the first order to understand agricultural structural change.

The fourth point relates to the fact that, at a practical level, there are different time horizons between the involved actors. This must not only affect the practical dimension; the concrete choice of the adequate theoretical frameworks at both the micro and macro levels must

also be affected. Precisely how becomes a modelling puzzle based upon the concrete case and a process of trial and error.

We find that Hvelplund makes a number of further contributions to Cochrane's work. When our Cochrane conclusion ended up with "anything matters and technology matters mostly", the conclusion relating to Hvelplund must be that some things matter more than other things. Matters depend on the problem, the goals and the possibilities for action. When this is decided, one specific description and one specific analysis become more adequate than others.

Section two – Classical Economics

The Physiocrats and Reflections considering Organic Agriculture

The question of the rise and establishment of organic agriculture and an organic market for food may be answered at a high level of abstraction. In order to structure the answer, we separate in two elements: the first element concerns the introduction of a new good, and the second element concerns the expansion of the established production of the new good. In this context, the new good is defined as organic agricultural products. The physiocrats have no reflections according to differentiation between products. The only reference, which may be quite speculative, is the indirect link between the existing surplus of products, which first becomes realised when exports or higher prices are introduced to the model. If the possibility to increase the net product is implemented, we could argue that the whole or part increase in the net product come from a new kind of agricultural product: organic products. The price of organic products is generally higher than conventional products. So it was when organic products were introduced, and so it is today. This focus on higher prices means that a physiocratic explanation as a first contribution would address this element in an explanation. The export explanation has potential both when explaining the introduction as well as the establishment of organic agriculture. Another explanation reflects wishes for the direction of demand. Consequently, the micro foundation in the economics of physiocracy is introduced. Another explanation makes any change in the system of reproduction a question of politics, where politics is defined as a "wish for direction" or their own term, "desire". The potential contribution to an explanation by the physiocrats may be summed up. The following mechanisms may influence the process of structural change in agriculture:

- higher prices for products
- higher prices for organic products
- general export opportunities
- export opportunities for organic products
- consumer choice
- wish for political direction

Dealing with the concept of transformation, the physiocrats contribute with the idea of a change in relative prices between manufacturing goods and agricultural goods. If the relative prices shift and the agricultural goods become relatively cheaper, we are in a situation where the state as a

cumulative process tends to be ruined. This is a cumulative transformation because of a breakdown of the relative price system. The cumulative process is based upon erroneous policy. The explanations illustrate highly complex explanations. As must be noticed, the explanations work at different levels of abstraction. First, we have the focus on the productive sector as a general sector of production. Second, there is a specific focus on organic goods. Third, the consumers determine the composition and direction of societal consumption. Finally, the wish for political direction related to the need to secure reproduction in society in general is represented.

The physiocrats' discussion makes it possible to conclude that an economic model capable of including the dynamic structural process of change and transformation must include the following elements as a point of reference:

Table 1: The physiocratic model of reference

Dimensions	**Analytical levels of abstraction**	**Keywords**
Economy	Macro, Meso and Micro	Accumulation
		Allocation
Politics	Macro and Meso	No restrictions on the productive sector
Nature	Meta	Taken for granted and "the gifts of nature"

The model requires brief explanation; the physiocrats obviously operate with a dialectic between economy and politics, where the latter is important for securing the maximisation of the production of economic wealth. The introduction of three sectors in the economy and their interaction is also an introduction of the meso and macro analytical levels. The element of consumer decisions introduces the micro analytical level. The important role of politics is to secure both allocation, the monetary circulation of wealth and accumulation. According to the latter, this requires an absence of restrictions on the productive sector. The means concerning allocation refer to the various classes or sectors in the economy and are analogous to the idea of consumption. Landowner consumption must be allocated 100%, and it is the role of the state to secure this action. Furthermore, the state must implement a tax system based upon taxing the rent and solely the rent. The state must also ensure that landowners spend all of the net product in an appropriate manner. Consequently, the analytical meso and macro levels are also represented in the physiocratic idea of politics. Natural resources, understood as the use of "the gifts from nature" in the agricultural sector, play an implicit part in the theory, and the meta level of abstraction may relate to something beyond the control of man. Accumulation refers to the only productive sector, agriculture, and the potential of the sector to expand.

Adam Smith and organic agriculture

The first part of "The Smithian Explanation" of agricultural change and transformation refers to a number of agriculture-specific elements as well as some general economic elements. The specific elements are:

1. The change in agrarian product composition

2. The increase in real prices for rude products
3. Landowners become better off in society because of increases in rent and real rude prices and decreases in real manufacturing prices
4. The ongoing use of technology renders it possible to produce and sell at lower prices to maintain the profit
5. The ongoing process of cultivation depopulates the countryside

These are the primary indicators in Smith's discussion of agriculture. In order to construct his general explanation, the general indicators must be integrated. The increased division of labour is the first grand element worth noting. Within agriculture, there are a number of natural limitations on the sub-processes. This is why the industrialisation of agriculture has a time lag compared with manufacturing. Agriculture is different from industry, because it may vary in production due to the natural conditions of the season and the limited demand for food. The second grand element is the actual, institutional level of competition in business. If the situation is far from free competition, the profits are far above the natural level of profit. This leads to inefficient capital accumulation. Generally, the interest of the labourers and the landlords are convergent with the society in question, while the position of the capitalist is opposite. This means that a high rent and a high wage is good for the rate of the accumulation of capital and consequently for the increase of social wealth. The situation with profits is the opposite; the process of change becomes a constant "fight" in order to get the actual institutional profits down to the natural level of profits. At this level, the society will have what we call archetypical market prices on the products. Profits under the natural level always reflect a short-term phenomenon. Profits above the natural level are in the interest of the capitalist and may last for a longer time horizon. Because of this constant "fight" for the level of profits, equilibrium is a rare position. The change in the level of profits is normally a top-down process. In order to avoid such a process, there is an inherent need for social institutions. When these institutions succeed, the society is in a situation with free competition. According to Smith's perspective, the institutional element of free versus non-free competition obviously plays a major role in attempts at understanding any process of social structural change. As we have argued (Rasmussen 2007) and with Denmark as case, the level of competition appears to be decreasing rather than increasing in the third agricultural transformation.

The second aspect of "The Smithian Explanation" of agricultural change and transformation refers to politics. Political decisions are crucial for the capital accumulation process and consequently for the increase of the wealth of a nation. Smith's ideal world is a world of free competition. This world holds the optimal potential in order to create wealth. Any tendency towards a monopoly of any factor of production – land, capital and labour – must be met by political decisions. Consequently, the existence of an institutional framework must be an inherent element in Smith's ideal world.

The question of the establishment and maintenance of public institutions must be touched here. On the one hand, Smith deals with the kind of public expenses required in order to facilitate commerce; this is the idea of the necessary infrastructure of a country. On the other hand, Smith deals with how to finance these expenses. In this perspective, Smith operates with two main groups of institutions.

* The infrastructural institutions

* The institutions for financing public expenses

The important issues for our perspective are:

- The entire political process of making laws, including both policy, politics and polity.
- The content of policy, where the Smithian concept of internationalisation, public sector financing and the role of public subsidies to business shall be emphasised.

In Smith's ideal world, the *rules of the game in the law process* must exclude the capitalist class. Smith expresses himself very precisely:

> Any attempt to make new laws must be examined very carefully. Especially if the proposals come from the group of people who earns their money during from accumulation of capital in order to make profit. The proposal of any new law or regulation of commerce which comes form this order, ought always to be listened to with great precaution, and ought never to be adopted till having been long and carefully examined, not only with the most scrupulous, but with the most suspicious attention. It comes from an order of men, whose interest is never exactly the same with that of the public (Smith 1776 (1981): 267).

This is a warning about the influence of industry on the political level of society[26]. With reference to the works of Ingemann and the Danish agricultural change, it is well documented that Danish farmers have interfered in the political process. In an attempt at following Smith's recommendations, the Danes have actually done the complete opposite by fusing business and politics together.

Two observations in Smith call for specific comments regarding public sector financing. First, taxation as an instrument can create a certain channel for structural change. Second, tax on rent on land is the optimal instrument for maximising the creation of wealth in a society. Taxation is commonly used as a structural instrument and has been a specific instrument in any agricultural policy. Taxes on pesticides is an instrument favouring organic agriculture. Taxes on transportation represent another tax favouring the less input-dependent industries such as, in principle, organic agriculture as compared with chemical or conventional agriculture. The principle of using taxation as an instrument for managing the behaviour of an industry is often referred to as regulation. Taxes on rent are better than taxes on wages or profits because of the capital accumulation process. Consequently, taxation can be used to provide direction for industry, and taxes can be structured to maximise e.g. the organic market for food.

The hard core in his theory of agricultural structural change is the claim of a general tendency for rent to increase until a certain point of time where there is balance. This is the general situation where the accumulation of capital in agriculture is industrialised. Part of this process is an increase in the real prices of agricultural products. Technological improvements counteract this process. Within Smith, the introduction of new technology influences the rules of the game. First, the farmer is able to sell cheaper and keep his profit. Second, the pressure on the small-scale

[26] Smith thus here develops a theory of lobbyism.

farmers increases. When it becomes profitable to improve more and more land, their unproductive production will decrease and the tendency towards depopulating the countryside increases. When demand and supply for all agricultural products are equal, we have free competition and the optimal situation for the accumulation of capital in order to produce wealth. In order to understand Smith, we must think in a space-dimension and with a very long time perspective. Moreover, we must think in different sequences for different agricultural products. Consequently, in a Smithian optic, parts of agriculture are in a general situation with a balance between demand and supply and have a status as "industrialised", while other parts of agriculture have not yet reached this general position.

The constant tendency towards monopolisation represents a main challenge. Treaties, bounties and restrictions on exports are other important elements, where the role of correct political decisions becomes crucial. Within agriculture, the tendency to favour large estates must be avoided, because they are less productive than smaller farms where intensity is higher.

The establishment of organic agriculture becomes a combined explanation of introducing of new technology and profitability. Part of a Smithian explanation could also be with reference to the social institutions and their efforts in relation to e.g. laws, restrictions and taxes.

Malthus and agrarian structural change and transformation

The Malthusian model states that man and nature are part of the conflict about how to survive. Malthus regards the limits of nature to feed man as a fundamental natural law. This is why he concentrates on how human beings can counteract the law. This is the institutional economic element in Malthus. First, the ability of farmers and capitalists to cooperate and press wages creates problems for labourers and their power to provide for a family. Second, the farms must be divided into smaller units in order to exploit nature as intensively as possibly. Third, all of the workers must work within the agricultural sector and the sector must receive subsidies. The factories are not necessary, because they only produce luxury goods. Moreover, it is unhealthy for the workers to be there. Fourth, human beings must be under pressure to invent new and improved technologies capable of contributing to increased food production.

His growth theory provides an integrated perspective on how structural change in a nation evolves, and his perspective is not optimistic with reference to the survival of the global population. However, within the limitations of nature, it is possible to interfere and change the direction of this structural process. This has to do with the rules of the game and bears direct reference to our definition of a transformation. It is a question of the correct combination of politics. In a modern, contemporary context, the Malthusian question and theory are similar to the question posed by all ecological economists and their dismissal of the idea of unlimited growth. Contemporary scientists within ecological economics refer to the limits on the available resources in general – and not the specific question of food. Dr. Aage (Aage 2006) argues in terms of a kind of neo-Malthusian doomsday. Jespersen (Jespersen 1998) represents a more moderate point of view, arguing that the fundamental problem area remains the same. If we expand the Malthusian model to cover all of the scarce natural resources and the limits of nature to absorb pollution, the theory becomes contemporary. Furthermore, Jespersen points out that the ever-increasing use of energy in farming together with the decreasing farming area resulting from erosion strengthens the relevance of Malthusian theory. The relevance of the Malthusian model is stated with further strength, e.g.

"Yet periodically in specific places, Malthus' model has been confirmed, and history may yet confirm it globally" (Costanza 1997: 26).

Ricardo - Contributor to the Conceptual Framework?

Ricardo's model operates with four "domestic" sectors and the export market sector. The sectors are:

1. Agriculture is the dominant sector and the sector that constitutes the model as the fundamental sector. The agricultural sector must be divided into two sub-sectors, which in some cases run athwart one another: the first sub-sector is the landowners sector constituted by the class of landlords. They rent out land and earn their money from the rents paid by the farmers. The landowners receive rent according to the principle of differentiated rent. The second sub-sector is the farmers sector, as constituted by farmers and their labourers. The farmers sector earns their money from corn production. The income from the sale is distributed in the form of wages to the labourers, profits to themselves, and rent to the landowners.
2. Manufacturing is the industrial sector, including services and crafts. This sector is constituted by the capitalists.
3. The financial sector is the pecuniary sector. This sector comprises of banks and "the monied class" (Ricardo 1821 (1971): 112).
4. The government sector is the political system. This sector is made up of politicians and administrators and is financed by taxes. The military is included in this sector.
5. The export market sector is the final sector. This sector is essential to obtaining growth in the economy.

Ricardo's general theory explicitly focuses on the long-term evolution of structures in the economy. The allocation (or, as Ricardo prefers, the distribution) of resources, defined as rent, wages and profit, is the crucial factor in the capital accumulation process. Allocation is the mechanism which constitutes accumulation. Translated into a contemporary perspective, Ricardo was the first economist to emphasise and carry out an economic analysis of the limits of resources. Agriculture represents itself as a contradictory system with reference to ownership of land. The sector consists of farmers and landowners. The farmers are treated as normal capitalists, while the landlords are primarily regarded as an unproductive class. Ricardo's focus is on the macroeconomic integration of the farms. How the unit of production referred to as agriculture participates in the process of the allocation of wages, rent and profit, on the one side, and, on the other side, the accumulation of these resources. The technological improvements, different means of cultivation and management matter for structural change. However, it is the interaction with the other sectors – manufacturing, finance, government and exports – of the economy and the principles behind this interaction that are the causes of structural change in the agricultural sector. In Ricardo, the rules of the game are analogous with these principles. The first conclusion must be that the capital accumulation process is interfered with by different economic laws relating to the interplay between rent, profit and wages, on the one side, and on the other side by unpredictable events such as the introduction of new technologies.

A cornerstone in Ricardo's theoretical work is his emphasis on the difference between industrial and agricultural goods. While the industrial good is constituted by wages and profits, the agricultural good also contains rent. The allocation process – and consequently also the accumulation process – thus represents an interaction based upon a production of fundamentally different material products. Furthermore, there is a quantitative limit to the production of agricultural goods, as land is a scarce and finite resource. Third, industrial goods tend to become cheaper in price in the long run, whereas agricultural goods have a tendency to become more expensive.

Ricardo assumes free competition assumption. Consequently, the monopoly in an economy is not a result of the economic laws of accumulation and must be transferred to the influence of other mechanisms. In the theoretical context of Ricardo, the reference can only be politics and/or unique, monopolised technology. A main policy topic in *Principles* is the question of taxes and the opposite, bounties. How does the system of taxes and bounties affect the capital accumulation process? A number of fundamental principles can be outlined. As a liberal, Ricardo argues for less state, less regulation and no boundaries on business. Instead, he advocates for more market.

In sum; structural change is a process within and between sectors. The search for the maximisation of the rent and profit is claimed to be the most important principle with universal character. The principles of policy are just as important due to their potential power to change the rules of the game, defined as the economic principles of Ricardo. This makes the principles of politics universal with reference to the existence of politics. The role of nature is in the hands of the owners and users. The principles of the owners, i.e. the landlords, regarding the use of nature are determined by rent and consequently the search for maximising rents. This too must be treated as a universal, non-context-dependent variable. Consequently, Ricardo has left us a model with a high degree of complexity built upon a high degree of universal principles. This makes his model relevant in any contemporary context of capitalism and its allocation and accumulation processes. While profit-seeking is based upon a law of economics, rent-seeking is based upon the law of social life or politics. The reference to social life has both a micro- and macro-element. The micro-element is due to the contract between landlords and farmers and the possibility of the land owners to obtain zero rent. The macro-element is e.g. with reference to the corn law.

Consequently, this brings the capitalistic system into a situation where everything can happen and where any outcome of the accumulation process may result. The sources are the processes of the allocation of rent, wages and profit. On the one hand, high rents and wages can halt the capital accumulation process. On the other hand, high profits can lead to a destruction of the system itself. The free market represents the best security for obtaining the optimal result, defined as the total production of society. Politics can act in favour or disfavour of this process. The interaction between politics, the law of economics and new technology leads any society to change over time. This is our idea of *"The Ricardian Universal Law of Capital Accumulation"*.

This interpretation of Ricardo brings further attention to the variables in the model: which variables are independent and which are dependent? As we have demonstrated, no variables are independent, and this theoretical claim turns his model into a question of how to determine the real engine of capital accumulation. Our interpretation of Ricardo's principles must be that it is the actual, historic interaction that creates the actual result: the accumulation of capital defined as the

level of wages, the level of rents and the level of profits. One further consequence must be to shift the focus of the model away from economics and laws of economics to political economy.

The central universal laws of economics are:

- The process of profits must be equal in all sectors of the economy and within all companies in the economy. The process of capital substitution is part of this mechanism;
- The existence of differentiated rent on land; and
- The existence of a dynamic subsistence wage.

The array of modifying mechanisms is so numerous that any interpretation of any context may suffer significantly without such a dual focus. The most important modifying mechanisms are:

- Technological development, development in the division of work and skills
- Subsidies for exports
- Bounties on imports
- Subsidies in general
- Taxation
- Disturbance of the free competition and the market in general
- Political influence in the parliament
- Exogenous shocks

It might be obvious that these mechanisms function on different levels of abstraction with reference to the process of allocation and accumulation in the economy, thus demonstrating that Ricardo operates on both the macro-, meso- and micro-levels.

With this conclusion, the accumulation model ultimately focuses on the evolution of the distribution between rent, profit and wages over time: the allocation process within and between the economic sectors and within and between the group of actors or classes. This struggle over allocation between all of the participants in the constitution of society will, in the Ricardian world, be represented by all of the classes that constitute society: landlords, farmers, labourers in agriculture and manufacturing, capitalists and the supporting financial sector and the government. Wages are more than mere wages; we must also discuss who finances the wages (landlords, capitalist or the labourers). As regards profit, distinction must be made between the profits to the capitalists and farmers versus the interests of the wealthy administrated by the financial sector. This is why we will conclude and claim that Ricardo was a founder of a complicated model of an institutional, modern capitalistic system based upon universal principles.

Transformation may occur in Ricardo's model; not as a result of economic laws, but only with reference to politics. The question is whether and how politics destroy the workings of the market. Excessive interaction in the market may change the rules of the game due to the ongoing struggle over distribution. This struggle can change the rules of the game fundamentally. The introduction of high agricultural subsidies represents such a change in the pure, economic rules of the game. This is a radical change as compared with the situation in free competition. Consequently, our claim is that the hardcore in Ricardo's theory is challenged by the introduction of public subsidies to agriculture. This represents a tax on capital and wages. Another attack on the central core refers to the increased concentration and tendencies towards the establishment of monopolies

in the real world as compared with the monopoly-absent Ricardian world. In both cases, Ricardo's theory opens up for the inclusion of the existence of agricultural transformation.

Von Thünen and the theory of agriculture

What was von Thünen's universe? Imagine an area surrounded by a desert. There is no communication except within the area itself. The city is located in the centre of the area. Around the city, the area is cultivated in order to provide the habitants of the city with raw materials. We essentially have a two-sector economy. The first sector is the rural sector consisting of agriculture, forestry and mining. The second sector is the urban sector consisting of manufacturing and services. The city residents supply the inhabitants of the surrounding rural area with manufacturing goods and services. Von Thünen's initial theoretical assumption may be summed up as below:

1. The citizens are both workers and capitalists. Consequently, the time a citizen spends in the accumulation process results in both a wage and a profit.
2. In von Thünen's world, all workers flow freely. This process is part of the establishment of his equilibrium, natural wage and profit rate.
3. Land is not able to flow freely.
4. Capital flows freely, except in parts of the capital placed in land.

The arrangement of the agricultural production is determined by a combination of:

- distance to market based upon transportation costs
- land fertility
- the differences in nature of the raw materials

In his theoretical argumentation, the differences in land fertility and the differences in nature of raw materials are initially abstracted away. The area is "… all of equal fertility … Various kinds of agricultural products are grown in concentric circles around the city, the exact location at which each product is raised being determined by the cost of transporting it to the city" (Leigh 1946: 482). On the basis of these limited variables, von Thünen develops the following:

- A theory of land rent, interest and entrepreneurial profit
- A theory of distribution of capital and labour – the theory of natural wages and interest

All theories are based upon considerations regarding marginality. Von Thünen stresses the principle of marginality, both as regards labour and capital:

Von Thünen's contribution makes the question of rent more comprehensive than dealing alone with his contemporary colleagues. With von Thünen's contribution, rent is a result of the interaction among many variables, and the differentiation of fertility was only one among several sources for obtaining differential rents. Obviously, belonging to practical farming activities has inspired von Thünen, and the claim of being a business economist is enlightened. Next, the idea of capital bound to land and its inability to move as desired may be of importance to structural

change in the agricultural sector. Third, profit as the remaining capital of the revenue after paying for other "services" may also offer an important insight into the accumulation process.

Von Thünen's contribution adds further complexity to the fundamental pillars of how to understand agricultural structural development. He adds a spatial perspective which contributes to an understanding of the rural area as a differentiated unit with respect to the distance to the market, multiple soil qualities and differentiated food production. This position is the foundation of his theory of land rent. One further aspect of the theory of rent is based upon the fact that land, understood as capital, is unable to move. One of the consequences is that improvements in land may eat capital up without any ability to obtain revenue for the capital invested in that process. On the other hand, his micro-foundation of the economy is based upon marginality with respect to capital and labour. Consequently, von Thünen's apparatus is quite sophisticated; when we line up all of his variables, it becomes clear that it is possible to make von Thünen's system dynamic.

When the system moves, von Thünen's model creates structures and change in structures. The main aspect is the tendency for agriculture to specialise its production. This is an inherent element in the process of structural change. It is this very tendency that creates room for the introduction of new products, e.g. organic food. The development of new products thus refers to needs or demand from the market, on the one side, and the possibility to make a profit, on the other side. This is because increased specialisation forces agricultural units to produce less variation, which in turn creates increased demand from the market for a return to further variation. As regards the introduction and establishment of organic agriculture, on the one hand we have a pure theory of the market relating to demand and profitability. Behind this story, the underlying reason is found within the increased specialisation as a result of the structural change process.

According to von Thünen, structural change is a continuous process based upon economic principles or laws. They present the rules of the game. How does the concept of transformation operate within von Thünen's apparatus? The interference and sources of radical change can be claimed to come from without, e.g. new production techniques and means of transportation, a sudden openness to other isolated states, or by cultivating new lands. This means that the question of transformation is a question to be answered with reference to something outside of economics.

Politics does not represent an issue for von Thünen. However, at one level of abstraction, we could claim that these external economic elements are somewhat related to politics. While the first two elements rest on an increase in human knowledge, the latter two are based upon human decisions. This makes the question of transformation and the radical change of the rules of the game a question with reference to two sources independent of one another. First, we have the element of technological innovation. Second, we have human decisions, or the somewhat synonymous concept of politics. On the other hand, external influence may only influence the continuous process of structural change. Here we receive indication that the difference between structural change and transformation depends upon how we actually define "the rules of the game". The introduction of new techniques changes the production methods or even the content of production. Does this bring about a transformation with a radical change of the rules of the game? New markets may be claimed to affect only the size of production and not the fundamental rules for production of this size. Finally, new land brought into use rests upon the existing principles of what is already going on. The element of transformation within von Thünen's universe appears somewhat distant; however, the structural change concept is definitely part of his theory.

In addition to these findings, von Thünen offers more specific contributions to understanding structural change. The concept of four sources of rent, the specific concept of transport or transaction costs, the inherent element of specialisation, the question of capital-eating estates, expectations about profits and the origin of new products are all elements contributing to understanding structural change and the transformation of agriculture.

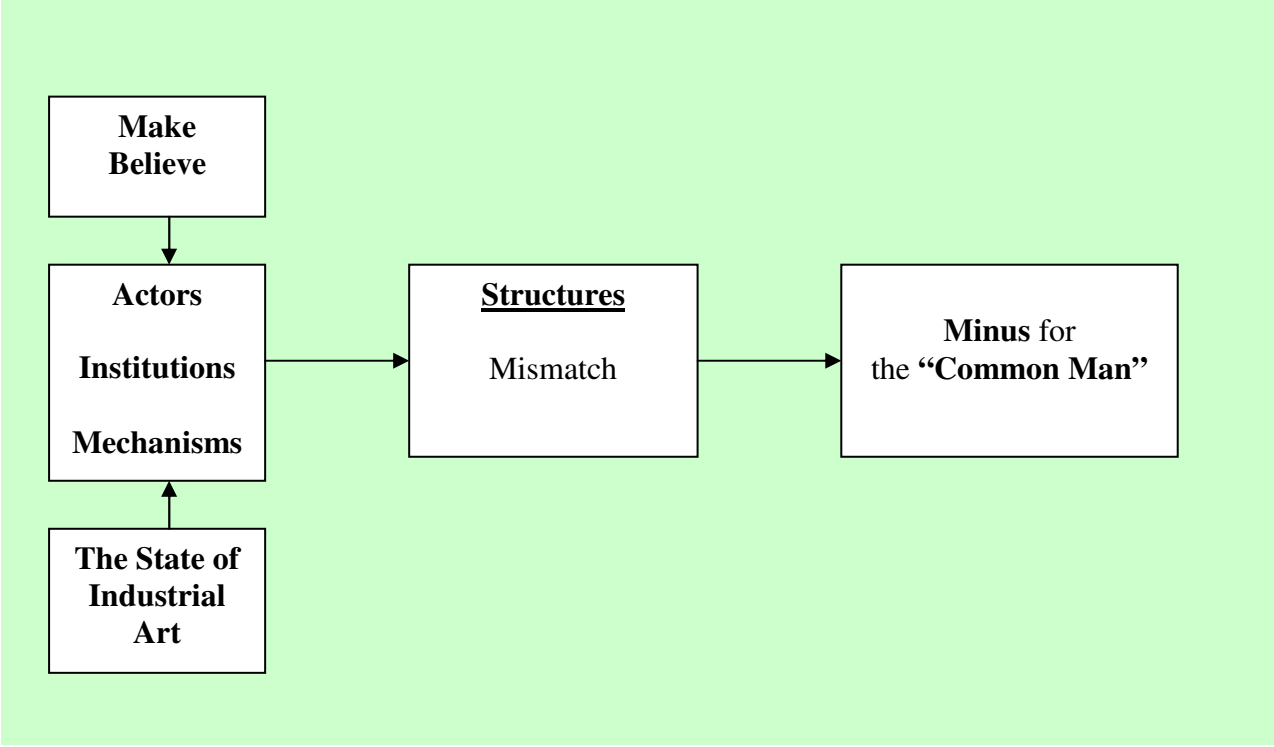
Section three

Institutional and Evolutionary Economics - The Veblenian Economics

The Model

Veblen's theoretical work constitutes a *general macroeconomic theory of structural change* of capitalism (Veblen 1899: ; Veblen 1901: ; Veblen 1904: ; Veblen 1909: ; Veblen 1914 (1964): ; Veblen 1919: ; Veblen 1921: ; Veblen 1923a: ; Veblen 1923b).

Figure 7: The model 1



The interaction between actors and institutions based upon some fundamental mechanisms leads to a number of specific structures. These structures reflect a complex system of mismatch. The most fundamental mismatch is that the net product of society is lower than its social potential. Veblen defines social potential in terms of the concept[27]: "The State of the Industrial Art". The State of the

[27] In our outlining of Veblenian economics, we primarily use the term "concept" as our general point of reference instead of e.g. the term "idea". The term "concept" may refer to something more firm than "idea". However, it is rather

Industrial Art is institutional; consequently, it is a dynamic concept. The general reason for the mismatch is another mismatch; Veblen claims that there is a mismatch between the dominating habits and the need for new habits. We are talking directly about a conflict between the existing "rules of the game" and the need for new such rules. The dominating habits constitute an institution and consequently a dynamic concept. We name this institution "Make Believe".

In order to understand the two discrepancies and their relation to the dynamic process of agricultural structural change, we have identified the following level of abstraction in Veblen:

- The concept of the "Modern System"
- Structural change as a result of seven different mismatches
- Structural change in seven different kinds of institutions
- The three universal working mechanisms

Veblen develops the concept "Modern System" in order to understand the real functions in the capitalist system. There are two modern systems in Veblen's universe. The first modern system replaces "The era of handicraft" and is introduced as a function of the industrial revolution. The historic time and space is identified as the latter quarter of the 18th century in Britain. The evolution of capitalism is a cumulative process. It becomes increasingly complex, and the first modern system is gradually replaced with Modern System II, fully implemented around the last quarter of the 19th century[28]. From then on, absentee ownership and the separation of ownership and management in distinct categories together with a widening of the financial sector *fundamentally changed the rules of the game in capitalism.*

1. First phase – the era of handicrafts and trade – HT
2. Second phase – the first era of modern capitalism – M1
3. Third phase – the second era of capitalism – M2

The links between industry, management, credit and ownership in M1 and M2 can be illustrated graphically.

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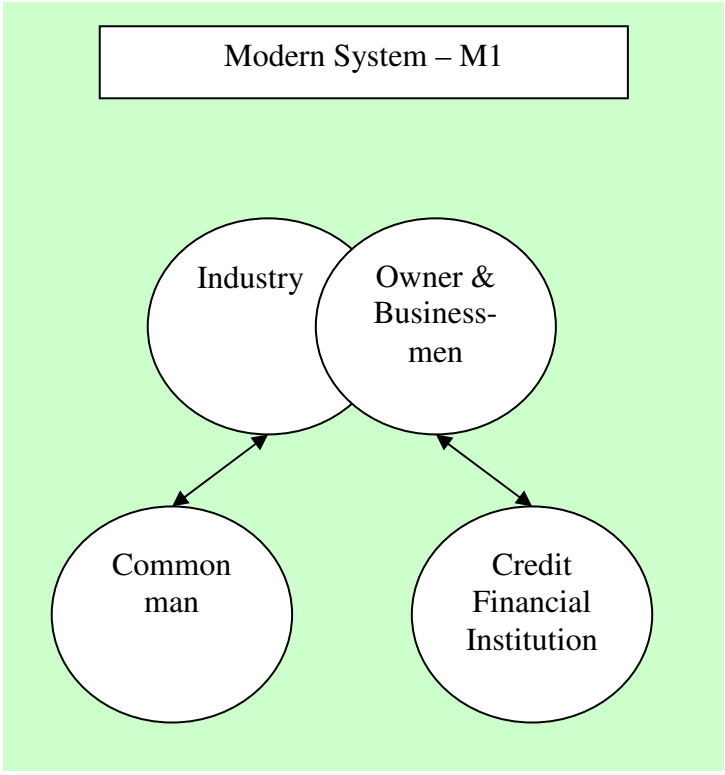
difficult to distinguish between the two terms, as a concept can be argued to be an idea and an idea can be argued to be a concept.

[28] The introduction of and shift from Modern System I to Modern System II varies from country to country in the western capitalistic world. The important point is not the exact historic time but the introduction and implementation of the systems all over and with a minor time-lag from country to country.

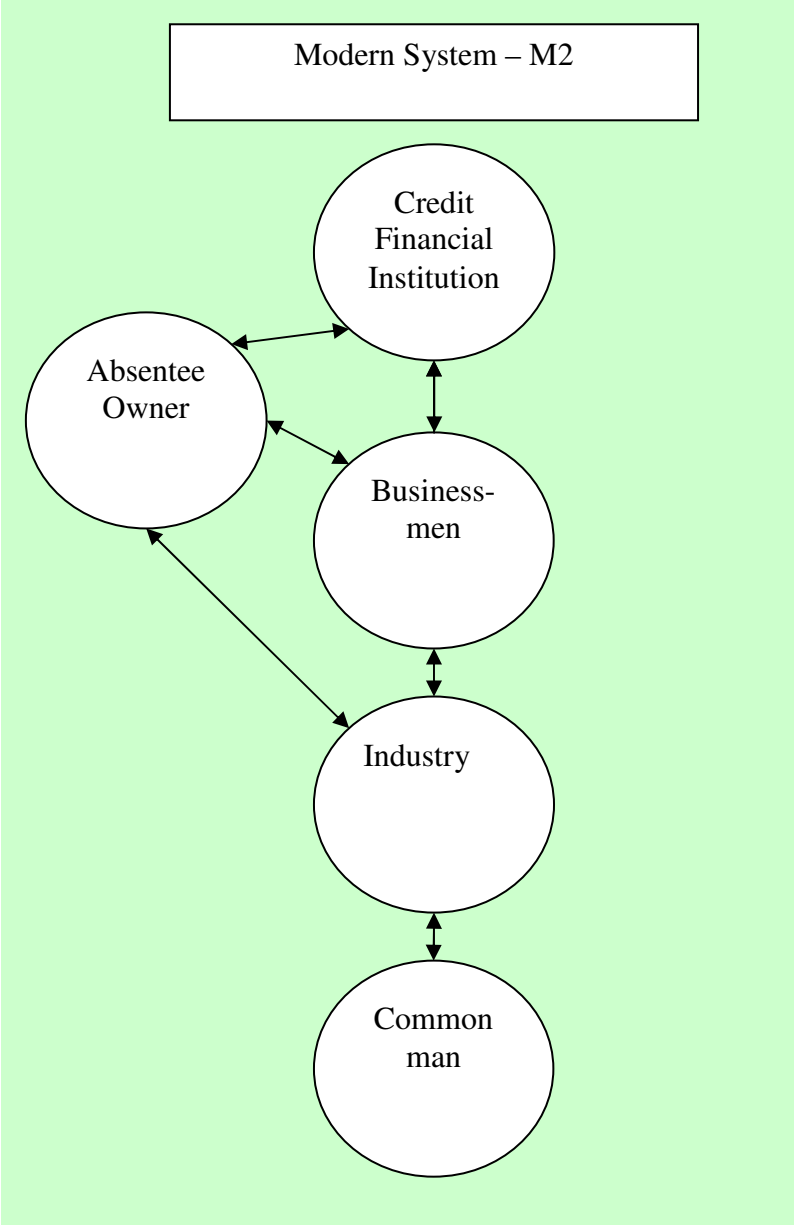
Figure 8: The model II



Veblen's point is that the function of the modern system has changed, but the institution of make-believe remains unchanged. This means that the society rests on an old-fashioned institutional foundation. The complex modern system[29] can be illustrated graphically:

[29] We could have refrained from illustrating the link between "credit" and absentee ownership, because Veblen focuses on industry. He is not concentrated on the ownership or absentee ownership and financing.

Figure 9: The model 3



In order to understand the content and fundamental difference between HT, M1 and M2, we must introduce the actors and shifts in their respective roles and their interests in the process of structural change.

The point of departure in his analysis is his separation of industry and business. In industry, the production of goods and services is the ultimate goal. The only goal in business is money, i.e. the financial end. Consequently, the Veblenian dichotomy consists of two kinds of work: industrial work and pecuniary work. Industrial work is served by labour, while pecuniary work is served by businessmen. This dichotomy was a result of the technological evolution that was the source of further specialisation. The result was the creation of two parallel systems living side by side: the business community and the industrial community.[30] In addition to these groups, the landowners play a special role. Landowners may consist of a combination of labour and

[30] There is a striking parallel to Chayanov's theory of the co-existence of different agricultural systems.

businessmen. On the other hand, the landowners can be pure businessmen or pure industrial workers. The businessmen are divided in different groups, where the industrial managers or businessmen are compared with real estate people acting as middle men between the increased number of financiers and absentee owners. This represents the dynamics involved in the shift from phase M1 and M2. Absentee ownership becomes the dominating form for economic organisation, and the role of the financial businessmen is to accelerate the credits. The absentee ownership illustrates the distance between ownership and the daily management, which is led by the business managers. The absentee ownership is conservative and wishes to maintain the status quo. The role of the manager is steered by the responsibility to make as much money as possible for the owners. Part of this money is directed towards the financial sector due to the increased credits from this sector to industry.

The dynamics of the modern system draw a specific small group of businessmen into the role as "captains of industry". These captains are at the centre of the process of accumulation. Their decisions determine the direction of the structural change of society. When the credit economy expands, Veblen deals with the term "Captain of Solvency". From now on, the power of society is in the hands of the actors who control the credits[31].

The workers are divided in two groups: those with technological knowledge, on the one side, while on the other side are the rest of the workers who are productive in running and developing the industry. Those with technological knowledge are further divided in two archetypes: "The Old Technicians", who do not seek to change the steering system, and "The Young Technicians", who see a potential for changing the steering system due to the enormous lack of employment of the technology and the enormous waste produced by the system. Already at this point, we notice that Veblen searches for sources of transformation.

The general public administration, newspapers etc. are perceived as a means of getting the system to work and keeping change off of the agenda.

The workers are regarded as the uninformed who pay the price due to higher prices, taxes etc. The special position of the landlord as a potential worker – or the common man – must be repeated.

Structural change is characterised as an adaptive, evolutionary and conservative process. Veblen assumes that the life of mankind – like other species – is a process of selective adoption. Societal change is a matter of the change of institutions as "a process of natural selection of fittest habits of thought" (Veblen 1899: 101). The development process is based on the past habits in these institutions and *all of the actions of mankind are teleological*.

The fact that the habits of the past are part of "the rules of the game" in the present produces an inherent and potential unbalance or mismatch between the needs of the present and what the present is actually supported by. The concept of mismatch is a key term. Veblen expresses this in the following manner: "In the nature of the case, this process of selective adaptation can never catch up with the progressively changing situation in which the community finds itself at any given time" (Veblen 1899: 102). The evolution proceeds, stage after stage, with the institutional element as a conservative factor. Change occurs because of external pressure.

[31] When using the term "captain", the reference is their role as the dominating actor in the game.

Veblen's general theory – an overview

As formerly indicated and in order to understand Veblen, we argue that he operates with:

1. Three universal capitalist mechanisms
2. Five institutions and two sub-institutions
3. Two general and six specific mismatches in structures as a result of capitalist evolution

The mechanisms are:

1. Interstitial adjustment
2. The market and the price system
3. All politics are business – politics I

The institutions are:

1. The institution "Make-Believe" and its sub-institutions "Vested Rights of Ownership" and "Money and Profits"
2. The institution "State of Industrial Art"
3. The institution "Competitive System"
4. The institution "Credit, Business Capital, Capitalisation, Tangible and Intangible Assets"
5. The institution "Politics II"

The mismatches are:

1. Mismatch between potential and actual social net products
2. Mismatch between dominating habits and the social need for new habits

1.1 Mismatch between owners and non-owners
1.2 Mismatch between large owners and small owners
1.3 Mismatch between businessmen and the corporation and its absentee owners
1.4 Mismatch between businessmen and industrial intellectuals
1.5 Mismatch between community, businessmen and corporations
1.6 Mismatch between the vested interest of the common man and the vested interest of absentee owners, businessmen and industry.

The cavalry, the mechanisms, the institutions and the mismatches constitute the grand theory. Veblen's theory is comprehensive in more than one sense. We are able to combine any mismatch with more than one institution. This indicates that Veblen thinks across any boundaries.

The mechanism "market and the price system" and Institution 3 "Competitive system"

The market and the price system are main pillars in Veblenian theory. The market is the mechanism for buying and selling goods and services; the mechanism is universal and inherent and constitutes the institution "the competitive system". Competition is an institution. The system is generally a competitive system. Businessmen strive to gain control. From this it follows that the process of change refers to the competition between businessmen and the aim of gaining control to keep profits as high as possible. The element of the creation of coalitions and acquiring monopoly are the main elements constituting the competitive system as a dynamic institution.

The main characteristic of the machine process is the need for standardisation. In order to develop the process economically, there is an inherent need for the production of standards of size, weight, grade, kinds, styles, gauge etc. The standardisation process includes both goods and services. All of industry is part of this ongoing mechanical process. This means that the coordination process becomes crucial at all levels of the development process. The different kinds of industries become entangled with one another. Everyone becomes dependent on one another and their own sub-industries. Consequently, the emergence of group solidarity increases between administration and the management of the industries.

We must note the result of Veblen's analysis at this point. He states that any disturbance to the system must be avoided because of its potential danger to damage the industrial system and its development. However, this is one of the contradictory elements in society. There is an inherent mismatch between all of the actors in the system. Besides, there is a dynamic and ongoing fight in order to win every of the coming battles. This is a consequence of the mechanism "The Interstitial Adjustment of the Industrial System." The means for securing the system is via business transactions; here the businessmen enter the process. It is their disposal of the pecuniary transactions and obligations which decide the direction of the structural change of the community.

The inherent tendency for disturbance means that the modern industrial community has an inherent potential to become involved in a crisis. The performance of the market becomes crucial, because the outcome of the market process determines whether or not the business realises a profit. Modern industry is characterised as being very productive. Generally, the system has an inherent risk of overproduction defined as "Overproduction means production in excess of what the market will carry off at a sufficiently profitable price" (Veblen 1921: 8). Consequently, any production or output must be regulated in order to avoid overproduction. Veblen focuses relates "… to what the traffic will bear – that is to say, what will yield the largest net return in terms of price to the business men who manage the country's industrial system." ((Veblen 1921: 8) "A reasonable profit always means, in effect, the largest obtainable profit" (Veblen 1921: 11). The price of products becomes the heart of the economic organisation of the system, and the businessmen are responsible for obtaining a profitable price. It thus follows that the accumulation of capital can never proceed at full capacity for very long. "The requirements of profitable business will not tolerate it" (Veblen 1921: 8). The mechanisms of "the market and the price system" and "interstitial adjustment" secure the system. Veblen points out that it is not the potential possibilities of the production units or the potential possibilities of the work force which count.

Veblen introduces the potential existence of a mark-up price theory as a latent element in the system[32]. With reference to businessmen who always want to get as much money as possible out of their activities, the profit mechanism is confirmed as a locomotive. There are two methods by which management can operate in order to maintain profit levels. "(a) to maintain profitable prices by limiting the output, and (b) to maintain profits by lowering the production cost of an increased output" (Veblen 1921: 27). Here, the machine process includes two important factors[33]. First, there is "a rapid rate of increasing efficiency", and second,

> the close interdependence of the several lines of industrial activity in a comprehensive system, which is growing more comprehensive and closeknit as improvement and specialization of industrial processes go on. The last-named factor counts for more in proportion as the interdependences grows closer and more comprehensive (Veblen, 1904: 135).

One of the consequences of the latter factor is a demand for ever larger coalitions to maintain a profitable business and capitalisation. This process will not stop until a coalition becomes "one close business coalition virtually the whole field of industry…" (Veblen 1904: 135). "The Interests, properly speaking, are made up of those blocks of absentee ownership which are sufficiently massive to come into the counsels of the One Big Union of the Interests (Veblen 1923a: 399). This is a kind of monopoly[34].

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[32] We do not agree with Mouhammed, A. H. (2000). "Veblen´s Economic Theory: A Radical Analysis." Review of Radical Political Economics **32**(2): 197-221.) when he writes that the Veblenian system is constituted with the theory of mark-up pricing as one of the four fundamental pillars in Veblen's economics. Muhammed postulates that Veblen argues that the prices are inflexible and downward. Our interpretation of Veblen is less rigid. This is why we operate with the idea of the mechanism being latent and potential. The businessmen are interested in money and reasonable profitability. Because of the inherent tendency in the modern system to adjust, Veblen's understanding of the economy includes the existence of crises and booms. In this process, the product prices fluctuate, including downward prices. Part of keeping the general profit acceptable could be related to e.g. technological improvements and the increased effectiveness of production. The dynamic of the system is described well in Veblen 1904 and the chapter entitled "Welfare", in which the theory of conjunctures in the modern system is developed. However, Veblen's universe is much more dynamic and relative than as described by Muhammed (2000). This is why Veblen's works must be understood at different levels of abstraction. The point is that the understanding first occurs when the different levels of abstraction are put together at the same time while employing a dialectic methodological approach.

[33] The impact of the technological machine on human culture is a theme in itself. Veblen debates the consequences rather closely, and one of his main findings may be reflected in the following quote: "The machine throws out anthropomorphic habits of thought. It compels the adaptation of the workman to his work, rather than the adaptation of the work to the workman … and the resultant discipline is a discipline in the handling of impersonal facts for mechanical effect" (Veblen, 1904: 170-171). This is why the spiritual aspects of life, including religion, do not become manifest in the population. "The machine discipline … touches wider and wider circles of the population, and touches them in an increasingly intimate and coercive manner" (Veblen, 1904: 197).

[34] During the period from the mid-1950s until now, the development of the Danish meat and dairy manufacturing industry has evolved in exactly this manner. From being a local industry, the contemporary situation is the evolution of multinational concerns. Danish Crown is the largest meat concern in the EU, and ARLA is one of the largest in the EU (Ingemann, J. H. (2006). Andelsorganisering i det landbrugsindustrielle kompleks - en historisk oversigt. Working Paper. Department of Economics, Politics and Public Administration, Aalborg University. Aalborg**:** 44. Ingemann points out that this new situation makes the traditional organisation model inadequate and calls for new organisational forms. Moreover, Ingemann questions the concentration strategy and reflects on the need for a strategy of differentiation instead of a strategy of standardisation. In a Veblenian context, the development of the agricultural manufacturing sector is a natural consequence of the M2 system. The primary agricultural units of production have become absentee owners of the industry, and there is an inherent risk of conflict between the business manager interest

Institution 1 "Make-Believe"

Shortly, we may interpret the Make-Believe institution as an institution dealing with the mismatch between the predominant understanding of what is good, necessary and correct, and Veblen's theoretical construction of what is good, necessary and correct. Make-Believe refers directly to the rules of the game and the need to change the rules of the game. Consequently, the Make-Believe institutions refer directly to the concept of "Transformation". A rather central element in the make-believe system relates to focusing on tangible assets instead of the influence of the intangible assets. The intangible assets, the immaterial business stock, are prime movers for the content and direction of both agricultural structural change and structural change, generally. Habits are a dynamic concept and constitute the Make-Believe institution.

> So when any given usage or any line of conduct is seen and approved from the modern point of view, it comes to the same as saying that these things are seen and accepted in the light of those principles which modern men habitually consider to be final and sufficient. They are principles of right, equity, property, duty, perhaps knowledge, belief, and taste (Veblen 1919: 3).

This statement implicitly holds that habits change "from one age to another and from one people to another, in response to the varying conditions of life" (1919: 3). It is this very change in the principles which constitutes habits in a broad sense as a main institutional and evolutionary element for understanding the structural change of a society.

Institution 2 "The State of Industrial Art"

The state of industrial art can be characterised as the "potential for the production of goods and services" in society. The state of industrial art is the institution that science and technology are able to produce more goods and services than are actually implemented in society. It is a matter of *the rate of exploitation of the technology and knowledge*.

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and the interest of the owners. In the concrete case with e.g. Arla and Danish Crown, however, some of the owners are more absent than others and, as indicated by Ingemann, there is a tendency that the influential owners are the large owners. A further modification to Veblen's optic is the traditional tendency of a close-knit relationship between the daily management, the board of directors and the multiple working groups inside the meso-organisational level of Danish agriculture. However, these tendencies may be a remnant of the past and, in Veblen's context, the system will develop further in complexity, and the general influence of the large corporations will represent an inherent pressure to strengthen the position of "the captains of industry". And despite the present volume of Danish Crown and Arla, it is not plausible to count these two concerns as represents "the captains". Consequently, the two concerns become part of new coalitions or sub-concerns to larger concerns. Such a development may be a step towards a clear role as absentee owners on the one hand. The concept of "contract-farming" may be claimed to be as old as the corporative movement itself. A general further development of contract-farming is developed with reference to the obligation on the input-side to use specific technology. The concept of contract farming in this broader sense is a well known phenomenon in the structural development of the USA in e.g. poultry production. On the other hand, such a structural change may be a signal for a new evolution as pointed out by Ingemann. The crucial question will be a question of both contracts and financing. The latter discussion involves the value of land, the rate of the debt compared to the value of the property, and the earning capacity of the production unit. The former discussion about contracts may block any attempts to break loose from the existing network; consequently, the absentee owners find themselves in a trap. But this trap will be different than as described by Ingemann. Ingemann's trap refers to the development of the supply and demand in the market, while the contract-finance trap may be characterised as an internal institutional trap.

The new elements in the modern system are primarily with respect to ownership, financing and organisation. The owner managed the plant in M1, whereas the absentee owner becomes the norm in M2. The owner is substituted with staff, and the owner "has taken the shape of an absentee ownership of anonymous corporate capital, and in the ordinary management of this corporate capital the greater proportion of the owners have no voice" (Veblen 1919: 37). One of the new elements in the shift of the modern system from M1 to M2 is that the corporate capital becomes impersonal. The business functions constituted by the businessmen as the practical coordinators are effectuated in a network system. Veblen refers to this network system as a system of "Make-Believers" (Veblen 1919: 39). Their job is to make the productive industry yield a margin of net product over cost, which is "an overhead charge payable to anonymous outsiders who own the corporation securities" (Veblen 1919: 40). The size of the overhead is "a matter of the state of the industrial arts, the technological knowledge, which the community has the use of" (Veblen 1919: 45). The industrial art defines the potential, maximum limits of the production. The actual production is decided as the interaction between the efficiency of the work, on the one side, and the decisions made by the businessmen about what is profitable in the given market, on the other side. Within this arrangement, a net product will be made which exceeds the production costs. Veblen's point is the definition of the capacity limit as an evolving mechanism which he describes as "the community's joint stock of technological knowledge" (Veblen 1919: 46) and the substantial core of civilisation. The use of the community's technological knowledge, the state of the industrial art, becomes only a matter of fact with reference to "their own sole profit" (Veblen 1919: 48). "The outcome is, in effect, that these owners have equitably become the sole legitimate beneficiaries of the possible margin of product above cost" (Veblen 1919: 49). While the principles of unrestricted ownership have created a situation of differential mismatch between what is possible and what is actually implemented, the same principles are "believed to have been highly expedient as well as eminently" (Veblen 1919: 50).

Veblen's insights lead to the following conclusions:

1. The dynamic modern system (M2) tends to favour an ever smaller group of property owners, both with regard to economic wealth and with regard to power and within the crucial influence about the direction of the process of societal structural development. We have a growing mismatch between large and small owners – mismatch 1.2.
2. This process of structural change is inefficient from the perspective of economics and wealth, because the capacity of the industry is not used fully – mismatch 1.
3. The credit or financial capital controls the direction of structural change. We have not characterised this as a mismatch; however, there is a clear link to mismatch 1.
4. The actual structural development is generally referred to as a good, fruitful and societally efficient process. This "bluff" transforms what is "bad and inefficient" to "good and efficient" – mismatch 2.

"Sabotage" in itself expresses the general mismatch between potential and actual social net production. It reflects a dual concept. On the one hand, we have a system which never exploits its capacity fully – plants or workmen – to produce goods for the community. This is the concept of "capitalistic sabotage" (Veblen 1904: 5). On the other hand, Veblen introduces the concept of "syndicalist sabotage" describing "the tactics of passive resistance." The role of the government is

clearly illustrated in the Veblenian optic. Government and law are universal mechanisms for producing security for the businessmen with respect to the accumulation of capital.

"Waste" is one of Veblen's general concepts with reference to the businessmen and their activities. Veblen points out that the pecuniary motive for all activity must be differentiated into gains, on the one hand, and gaining control over large business forces on the other hand. In connection with this position, coalitions are brought into the businessmen's game. The process of the creation of coalitions between competing actors may increase the possibility to increase the ownership[35]. On the other hand, the process of creating a coalition between competitors is perceived as a delay of the production possibility. "These negotiations are in the nature of derangements of industry." Veblen's point is to demonstrate the inability of the modern system to be effective in a productive sense. Because of the steering system with the businessmen at the centre, the production of goods and services becomes a lesser possibility. The negotiation theme addresses these consequences, and Veblen argues that the businessmen work both in favour and disfavour of the coalition. First, the negotiations are the method by which the businessmen attempt to put themselves in a better position compared with the potential coalition partner. Second, the negotiations are an element in a process to harm the potential partner in order to be better off in the negotiations.

The institution of "Vested Rights of Ownership" is an institution of vital importance. Generally, this right must be secured. At the top of the rights, "the rights of ownership is paramount" (Veblen 1919: 19). Veblen's point is that the development of society, industry and science has changed, while the law and customs have remained the same. Industry has evolved and becomes business. Science has evolved and is able to create more than business wants. Everyone enjoys the same rights, and society works to secure these rights, but the structural development of society evolves and some become better off than others[36]. However, the position of ownership has become common sense, axiomatic. "This modern European, common sense theory says that ownership is a 'Natural Right'" (Veblen 1904: 40). The concepts "free income" and "getting something for nothing" are different expressions of the same institution. The vested rights enable owners of e.g. shares to get something for doing nothing. This is what Veblen is referring to as free income.

The agricultural relevance of property rights both relates to e.g. land and the technological system. During the course of history, the latter element has been locked into a general system of patents on machinery and plants. Recent attempts by the American biotechnological concern Monsanto at gaining patents on all of the hog genes in e.g. Europe demonstrate an influence from the principles of ownership and the structural change of agriculture.

[35] Generally, the way to understand Veblen must be with reference to gains. The size of ownership must be interpreted within this framework. Consequently, an increase of ownership as part of a business decision must be related to expectations of increased gains compared with a situation without increasing the size of the ownership.

[36] It can be argued that the moral aspect of Veblen becomes clear at this point. On the other side, Veblen's ambition with his work is to reach an understanding of the evolution of society. The different interests of the different groups in society are part of this perspective. Veblen's analysis merely states that some are better off because of structural change in society. This may not be a moral statement but rather a kind of "matter of fact" based upon his general theoretical assumptions and analysis.

Institution 4 "Credit, Business Capital, Capitalisation, Tangible and Intangible Assets"

Veblen's point of departure is the question of the speed and magnitude of the turnover versus business gains. These two factors determine business gains. The "credit" institution is a potential aid in this process. If the businessman is able to reduce the turnover to less than the ordinary time for the line in the industry, the profit will exceed the normal profit. The turnover process – from investment to capitalisation to profit – can be reduced by the "adoption of more efficient, time-saving industrial processes" and/or through "competitive pushing the sales" (Veblen 1904: 53). The magnitude of the turnover can be increased with assistance from credits. When the recourse to credit becomes general practice, the consequence is "that the competitive earning capacity of business enterprises comes currently to rest on the basis, not of the initial capital alone, but of capital plus such borrowed funds as this capital will support" (Veblen 1904: 54).

The first consequence of the competitive phase is that the capital required to obtain a reasonable profit increases from the initial level. The second consequence is that businessmen who cannot or do not use credit are unable to obtain a reasonable profit, because the others are able to sell cheaply compared with themselves. In order to meet the low prices, their profits must decrease and profits become unreasonable.

The general outcome of the process of capital accumulation reflects a process where the discrepancy between the business capital and the industrial equipment increases. At a certain point, the discrepancy between the two types of capital – business capital as defined as the aggregate nominal capital (capital plus loans) and industrial capital as defined as the actual rate of earning-capacity – reaches a level where the security for credit is threatened. At this certain point, the process of liquidation begins. And it is within this process a transport of property[37] from the former and initial owners of industry to the institutions of credit begins. These are the general principles of Veblen's credit theory. We have an economic system where the actors inside the institutions of credit decide the direction of structural change based upon their judgements about what is in the interest of the absentee owners.

In the Veblenian universe, the change from a "money economy" to a credit and corporation economy constitutes an incentive for economists to shift their focus and, within this change, reassess the general rules of the game. The focus must be on "the earnings-capacity of the corporation as a going concern" (Veblen 1904: 63). In this connection, the concept of "tangible" and "intangible" assets is introduced. The source of the intangible assets is immaterial. The best know is "goodwill". Among other intangible assets, Veblen focuses on the possession of trade secrets, trademarks, patent rights, a franchise and any monopoly. This means that an immaterial possession becomes a legitimate and valuable asset; each of them has a market value. Veblen's perspective is to claim that the existence of these intangible assets represents "an agency of conservation rather than of creation" (Veblen 1919: 59). If the intangible assets did not exist, the total productivity is claimed to be higher[38].

[37] Generally, the process of change in ownership typically involves three parts – the present owner, the promoter or management – and the credit house which financed the operation (Veblen, 1904: 68).

[38] The contemporary debate about e.g. intellectual property rights or patents illustrates two contradictory positions in both the theoretical and practical debates. The first position could be that of Veblen, and the contrary position would point out that it is necessary to protect the plant with patents in order to be able to find investment in R&D. If the patent rights would not exist, the investment would not be brought into action. A first assessment of the logic in both of the

Veblen explicitly states that in the case of farming, the use of goodwill and corporate, large-scale organisation as a means to obtaining a financial contribution in the business process has been scant. However, the inclusion of the manufacturing agricultural sector in an inquiry may change this position. A study e.g. of the agricultural co-operative manufacturing sector illustrates a change from many and locally based units of production to few and larger units with a trend towards monopoly and transnational organisation. Furthermore, the general tendencies in the process of the industrialisation of agriculture over the last fifty years have altered the organisation drastically, both with address to the use of credits and the process of capitalisation.

We will now elaborate on the concept of the process of capitalisation – the accumulation of business and industrial capital and partly the allocation of capital, understood as ownership of capital – which Veblen develops. The point of departure is a theory of the existence of two kinds of stocks – common stock and preferred stock. *Common stock* covers the immaterial, intangible assets[39], while tangible assets are covered by *preferred stocks* (or other debentures)[4041]. In building up capital, the corporate managers make use of both stocks. On the one hand, the preferred stocks can be expanded if someone is willing to purchase new shares. The owners transfer control of their property to someone "far away" and outside their (daily) control. We know that the managers must acquire an expansion of capital and the common stock represents the corporation's goodwill. Consequently, the entire capital of the corporation is now bound up in intangible assets. These intangible assets are the security for all capital in the corporation.

Politics II as Mechanism 3 and Institution 5

All politics is business politics. This is the point of departure for Veblen and constitutes his conclusion concerning the nature of law and politics. This is why we interpret "Politics" as a universal mechanism in the grand theory. The argumentation follows automatically from his general description of the economic system. Industry is managed for business. The welfare of the community is based on success in business. All habits rest on business and the ideas of gain and loss. While we state that "Politics" is a mechanism in Veblen, on a more concrete level of abstraction, we may claim that "Politics" is also an institution. In the real world, there is change in policy. This makes politics matter for the concrete direction of structural change. The result of the *new order* is the creation of two main classes: those owning wealth invested in large corporations and consequently "control the conditions of life for the rest, and those who do not own wealth in sufficiently large holdings, and whose conditions of life are therefore controlled by these others"

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positions may be interpreted as "claims". The first position introduces a new order or organisation of the industry, while the second position makes refinements within the existing order of industry.

[39] These include the intangible assets such as trademarks, patents, processes, franchises etc.

[40] Veblen states that the preferred stock as debenture represents the most characteristic modern development. "It is, de jure, counted as a constituent of the concerns capital and the principal is not repayable; in this (legal) respect it is not an evidence of debt or a credit instrument. But it has little voice in the direction of the concern's business policy. In practice the management rests chiefly on the holdings of common stock" (Veblen, 1904: 78).

[41] Veblen underlines – in a comprehensive note – that his division between preferred and common stock only exists in theory. Once a stock has passed the "stage of organisation and gone into the hands of the purchasers, each share represents nothing but an undivided interest in the aggregate capitalization of the concern, so that the particular item of wealth represented by a given share or given form of security can no longer be identified" Veblen, T. B. (1904). The Theory of Business Enterprise, Document established 1-218. Security refers to e.g. loans from the financial sector, which represents e.g. part of the value of the common stock. In this respect, securities are assets that can be brought to the market and changed from e.g. one financial actor as a bond.

(Veblen 1919: 129). It has become a question of having enough wealth to make it count! The new order had led to a new organisational system of power.

Veblen and Agriculture

Veblen claims that it is the nature of farmers to always want to have more land than they are able to cultivate. From this statement follows two processes: land has a tendency to be extensively[42] used and farms must rely on hired help. This renders the farmer an absentee landowner. The issue of extensive land use has economic implications. Cost potentially becomes incremental. More land leads to a need for more equipment. More land and more equipment lead to expanded credits. A consequence of the structural change with large and extensive agricultural production relates to the capacity to provide credit. Veblen points out that "the actual proportion of unused and half-used land … greatly exceeds what any inexperienced observer will be able to credit" (Veblen 1923: 5). In conclusion, Veblen makes the role of the farmer as absentee landowner more complicated as compared to the normal industrial absentee owners. In order to place any group in the group of absentee owners, there ought to be opportunity to control the market. The farmer is unable to fulfil such a criterion. Their situation is more likely the opposite. The farmer is caught in the system unable to control it.

Veblen proceeds to the situation in which farmers are in a position as owners of speculative real estate. On the one side, land has a prospective or speculative value. On the other hand, the farmers must use his labour in order to provide for himself and his family. In this game, the value of land represents a potential for the farmers and Veblen compares land values with intangible assets. The farmers are transformed into many actors in one. First, he is an absentee landowner with limited power. Second, he is a businessman who wants to expand his intangible assets in order to expand his business, Third, he is an industry with an agricultural production. Fourth, he is a common man with both the position as a technological intellectual and a worker. Consequently, the farmer as landowner occupies all of the roles in Veblen's grand theory except one: he is not a financier. If we recall the theory, we remember that the captains make the decisions determining the direction of industrial structural change. Because the captains rest upon their ability to obtain credit, the institution of credit has the greatest influence, meaning that the farmers are steered by credit institutions. However, both the farmer and the credit institution have a fundamental interest in land values being as high as possible. This reflects a shared interest in rising land values, where the financial institutions become investors in farming.

The farmer is caught between those who want to buy low and sell high. The farmer must take what he can get "on pain of 'getting left'" (Veblen 1919: 134). This is a theory of the farmers as price-takers[43]. This part of the theory is based upon the country-town retailer versus the

[42] Remark that this conclusive statement by Veblen is directly the opposite of Cochrane's position. Consequently, the definition of extensive versus intensive farming becomes a key concept in a Veblen-Cochrane comparative discussion of the theory of agrarian structural development.

[43] The inclusion of e.g. the corporate manufacturing sector challenges this position. On the other hand, the modern trend for large-scale retail companies is directly in line with Veblen's argument. A further analysis of the result of the struggle between producers in manufacturing and the distributors may provide further insight concerning these two counteracting tendencies. In the Veblenian universe, different positions can be argued, but the monopolistic coalition idea may be claimed to be the final outcome of the struggle. Because of the position of the financial sector as the

town. The country-town retailer would like to act like other businessmen – buy low and sell high – but his situation is that he can manage to sell high, but the only place where he can buy low is from the farmers. This is the only place he is able to decide how much the traffic will bear. Veblen introduces a "new" institution by name. When arguing with reference to the country-town retail middlemen, he introduces the concept of "the massive vested interests who move in the background of the market" (Veblen 1919: 135). These actors do not "lend themselves to that purpose" (Veblen 1919: 135). Exactly these background actors who buy low and sell high regulate the life of the farmers, because the farmers have come to depend on the market[44].

As noted the farms are generally over-capitalised. The definition of over-capitalisation is that the current market price is greater than "the capitalised value of the income to be derived from their current use of the farm" (Veblen 1919: 139). When holding the land in speculation of rising land values, the situation becomes familiar to the concept of intangible assets of the vested interest and "persuades the prairie farmer that he is of a class apart from the common man who has nothing to lose" (Veblen 1919: 139). Veblen argues further that even if the farmer is in a position in which the land is going to be sold, he is influenced by the speculative business in farmland, where one only engages in business that is "convenient for own ends. And so the farmer-speculator of the prairie continues to stand fast by the principles of equity which entitle these vested interests to play fast and loose with him and all his work" (Veblen 1919: 140). Moreover, Veblen points out that the speculative element has a limit.

> As land-owners they aim and confidently hope to get something for nothing in the unearned increase of land-values. But all the while they overlook the fact the future increase of land-values, on which they pin their hopes, is already discounted in the present price of the land (Veblen 1919: 139).

The comparison between the farmer and the new order ends with the reasoning that there is an inverse relationship between farmers and businessmen. The farmer has a "negative intangible asset" due to the problem of gaining a modest return for the use of land, and the earning-capacity does not "outrun the capitalised value of the underlying physical property" (ibid: 141)[45]. His situation is the opposite of that of businessmen.

The independent farmer is assumed to be "a slow-dying tradition" (Veblen 1919: 134). The life of the farmers will only last as long as "the run of the market for what they need and for what they have to sell does not take such a turn that the title will pass by process of liquidation into other hands, as may always happen" (Veblen 1919: 136). Veblen states that the process of

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determinant, this sector must obviously be at the centre of any further analysis in which the theme is the structural change of industry and society.

[44] The establishment of an alternative producer-consumer network in organic agriculture may be claimed to be because of this mechanism. However, this economic management hypothesis with reference to the development of the market may contribute to the more sociological perspective in the explanation of these alternative organic food network in Denmark implemented by Kjeldsen, C. (2004). Modernitet, tid, rum og økologisk fødevarenetværk. Department of Economics, Politics and Public Administration. Aalborg, Aalborg University. Ingemann (2006) explicitly touches on the discussion of the future positions of differentiation and the new organisation of the market for food, including organic food.

[45] It must be noted that Veblen's insight complements that of e.g. Cochrane. The only difference is that Veblen's insight was laid forty years before Cochrane (1958). From an academic point of view, it is interesting that Cochrane does not cite Veblen.

structural change will end in a transfer of ownership from the farmers to the institution which has given him credit in order to finance the increased cost of farming, the institution of finance.

Because of his point of departure in the two roles of the farmer as both producer and consumer, Veblen is able to establish this theoretical result. In both a historical and a contemporary context, the result contributes to recommending a further focus on the input elements to the farmer. The input system decides how the life of the farmer turns out – not the output side. The inherent assumption here is with reference to the assumed ability of the farmer to be technically able to produce whatever the market demands. A further element in an input focus is with address to the aforementioned contract farming. Such system has as an inherent risk that the farmers will be locked into a monopolistic input arrangement with specific address to the ruling technological system.

Much has already been indicated with reference to the myth of the independent farmer and the similarity between the farmer and the common man. On the one side, the farmer has always been working hard with a limited pecuniary result. On the other hand, they still perceive themselves as "individually self-sufficient masterless men." Veblen's aim is to argue that this independent role does not correspond to reality. The belief of the farmer and the actual situation do not correspond.

When we make the connection between organic agriculture, agriculture structural change and the Veblen grand economic theory, we get wo positions. The first refers to the assumption that the rules of the game continue and we have "business as usual". This is the idea of explaining organic agriculture as a natural part of agricultural change. The second points refer to the origin and establishment of organic agriculture as a transformation. The *business as usual* explanation argues that because the system is steered by the businessmen and the financial sector, the rise and establishment of organic agriculture must be due to its pecuniary potential. When we confront such profitability explanation with the fact that organic agriculture is still a niche, the Veblenian apparatus would assist us with the explanation that it is not in the interest of the absentee owner and the financial capital to support organic agriculture, because the velocity of capital is simply higher within the industrial, conventional agriculture. The simple example is the conventional chicken factory versus organic chickens. When we turn attention to technological advance Veblen states; it relates to a "continually accelerated rate of advance … more … standardised … it seems this line still farther in the calculable future, rather than the reverse" (Veblen 1919: 72). Within this argument and within the profitability explanation, organic agriculture is only able to mimic conventional agriculture within a niche.

We turn to the idea of organic agriculture as a *transformation*. In a Veblenian context, this explanation would be with reference to the necessity of external pressure if changes are to come. The strength of the pressure is reflected both in the appearance and the establishment of organic goods. Organic agriculture is up against the dominant food production system. The reason why organic agriculture does not take over must be found within the structures in the dominant system and the conservative, institutional power within the system. The general strength of the conventional system lies in its ability keep the rules unchanged by excluding or counteracting laws which support the strength of the organic system, e.g. perspectives concerning anti-pollution, animal welfare and health, and change the rules of the game in the general agricultural steering system.

The discussion of the nature of mankind leads Veblen to engage in a discussion of the inherent resistance to the economic process. Here, we could argue for the existence of a motive for

the establishment and expansion of another kind of agriculture in relation to both producers and consumers. Organic agriculture is due to resistance against the industrial process of conventional agriculture. We get change in the motives or preferences of the actors. Veblen's arguments about the producer part are fully consistent with those of Ingemann (Ingemann 2006) with reference to the Danish pioneers of organic agriculture. It is also supported by the Norwegian anthropologic study of the motives for changing from conventional agriculture to organic farming (Østergaard 1998). Furthermore, the origin of organic agriculture as a social movement is emphasised as one of two reasons for the introduction and establishment of organic agriculture in a recent Danish Ph.D. thesis (Jacobsen 2005).

Summing up, the Veblenian explanation of organic agriculture could be a "business as usual" explanation; second, it could be an explanation with reference to the industrial intellectuals; and third, it could be an explanation of the general resistance against the economic process and a wish for a return to "nature".

Conclusion

According to Veblen, the process of structural change will lead to:

1. The number of farms will continue to grow in size, and the total number of farms will decrease. The increased volume of the actors in distribution, e.g. the retail chains and egg-transport companies[46], have put them in a position where they become an influential factor in the process of structural change. Their interests are in lowering the price they pay for goods. Furthermore, they place pressure on the primary production in order to increase the amounts. If the farmers want to deliver to the existing networks, they must invest in greater units of production.
2. The number of farmers will continue to fall.
3. The regime of competitive business creates a credit treadmill.
4. The transfer of ownership of farms to financial institutions will continue to increase.
5. The mismatch between farm owners and non-farm-owners will continue.
6. The mismatch between large and small landowners will continue to work in favour of the large owners.
7. The farmers will become increasingly like the common man, and the independent farmer will be a rare phenomenon.
8. The money-drain from country to towns will continue.
9. The farmers continue to be price-takers.
10. The mismatch between workmanship and salesmanship in the individual farmer continues in favour of salesmanship.
11. The mismatch between the farmers as managers and the absentee owners of credit institutions continues. The managers have an interest in a mismatch between actual and expected earning capacity.

[46] One case in Denmark in 2006 was the egg-transport refusal by Hedegård (egg packing plant) to an organic farmer. Because he only had 3000 hens, the company cancelled the transport contract. A further case study may cast further light on the more specific details in this story.

The process of structural change is highly modified with the massive entrance of the financial sector and the multiple methods of credit making where the farmer has no power to influence the direction of social structural change, including agriculture structural change. The power evolves into the institution "The Council of the One Big Union of the Interests" and "The Captains of Solidity".

The economic process is an evolution of various institutions and we will focus on the institution of *politics*. There has certainly been an ongoing evolution of both policy and politics; but no fundamental new order or any new fundamental rules of the game have been implemented. Many adjustments have been made, but the other institutions appear to be stable. Similarly, the element of polity has shifted from a more local and national framework to an increasingly transnational and international framework. However, this is included in and how Veblen perceived this institution. The conclusion must be that the institution of *politics* is a stable institution. The general conclusion is that, from a Veblenian point of view, we have experienced structural change without transformation. The discussion of agricultural structural change becomes a discussion of effects or consequences. Any of the trends demonstrated in the above are a logical effect due to the interplay between the mechanism, the actors and the institutions.

Section four

Ecological Economics - Introduction

The "Ecological Economics" paradigm is relatively. While the roots of the paradigm are hardly new, it was not until the end of the 1980s that a group of economists and ecologists formalised the paradigm.

> Ecological economics is not a single new paradigm based in shared assumptions and theory. It represents a commitment among economists, ecologists, and others, both as academics and as practitioners, to learn from each other, to explore new patterns of thinking together, and to facilitate the derivation and implementation of new economic and environmental policies (Costanza 1997: 49).

The political dimension of the paradigm may be claimed to be the putty between all of the scientists who have contributed to the development and implementation of the theoretical and empiric elements within the paradigm

Georgescu-Roegen and Bio-Economics

The economic process

Georgescu-Roegen (GR) focuses on the economic process. His ambition is to describe this process without neglecting any essential factor.The concepts of flow and fund are used to discuss the function of production. GR has illustrated his manner of thinking concerning the interplay between the environment and the economic process.

Figure 10: Illustration of Georgescu-Roegen's System

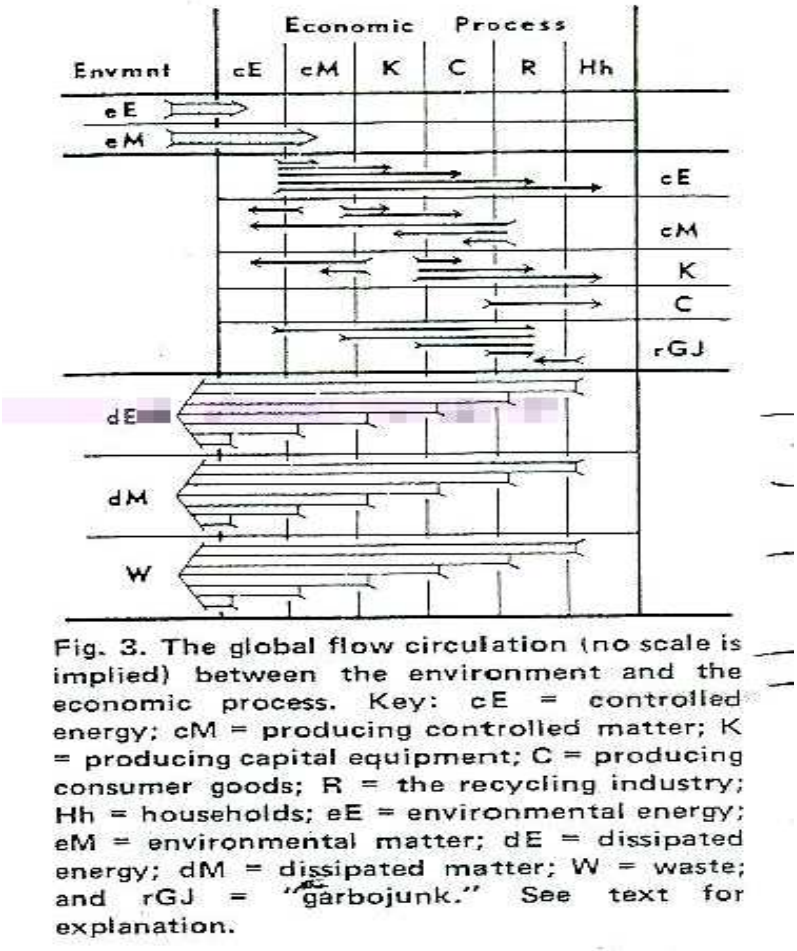


Fig. 3. The global flow circulation (no scale is implied) between the environment and the economic process. Key: cE = controlled energy; cM = producing controlled matter; K = producing capital equipment; C = producing consumer goods; R = the recycling industry; Hh = households; eE = environmental energy; eM = environmental matter; dE = dissipated energy; dM = dissipated matter; W = waste; and rGJ = "garbojunk." See text for explanation.

Source: Georgescu-Roegen (1977: 269)

The economic process consists of six aggregate sub-processes:

a) cE – producing controlled energy e.g. electricity
b) cM – producing controlled matter e.g. steel
c) K – producing capital equipment
d) C – producing consumer goods
e) R – the recycling industry
f) Hh – the households

The model has two kinds of input to the process:

a) eE – environmental energy
b) eM – environmental matter

The model has three output flows:

a) dE – dissipated energy
b) dM – dissipated matter
c) W – waste e.g. nuclear garbage

The final results of the economic process are:

a) cE – producing controlled energy e.g. electricity
b) cM – producing controlled matter e.g. steel
c) K – producing capital equipment
d) C – producing consumer goods
e) rGJ – gorbojunk, which is neither dissipated mater nor waste, but available matter

The model provides different insights:

1. Dissipated matter is not recyclable.
2. The economic system survives only because of a continuous inflow of matter and energy.
3. Because energy and matter cannot be reduced to a common denominator, the concept of efficiency becomes unclear. "We cannot decide on purely physical grounds which of two processes performing the same task is more efficient, if one uses more energy, the other more matter. This decision remains *economic*. One should all the less think of reducing economic value to a physical coordinate" (Georgescu-Roegen 1977: 269).

GR's concept is that the economic process is unidirectional (non-circular) with a *continuous transformation of low entropy into high entropy* – the concept of irrevocable waste or dissipated matter. This is the basic rule of the game for any economic process. GR has a general critique of the market mechanism and what he refers to as "The Myth of the Price Mechanism" (Georgescu-Roegen, 1979: 17). GR rejects the market mechanism as a solution, because it only counts the demand and supply of current generations. "Prices can never be ecologically right, simply because future generations are not present to bid on the scarce resources side by side with the current generations" (Georgescu-Roegen, 1976: 125).

Any production consists of a basic recipe. This is a partial process. Any partial process is an elementary process. All elementary processes share in common that the funds involved in them "must remain idle during a great part of the production time" (Georgescu-Roegen 1971: 236). This is a normal situation. GR makes a simple illustration with reference to the production of a cabinet maker who does not use the saw and the plane simultaneously. We may now introduce the role of demand to the argumentation. When the flow of the demand for products is low, the processes are organised in *series*. "Under such conditions, specialisation was uneconomical" (Georgescu-Roegen 1971: 237). When the demand for products increases, the processes can be arranged in *parallel* (e.g. start the production of more than one table at the same time and repeat the process when the table is finished). The point here is that this "offers little or no economic gain". By

multiplying the number of processes by *n*, the identified idleness must also be multiplied by *n*. The production must therefore be arranged in *lines*. This is the factory system, where the idleness of funds is minimised. Any service from the funds goes from one elementary process to the next without rest. The basis for the system to work is the existence of a process-fund within the factory system. Without a process-fund, the factory system is incomplete. The process-fund is a kind of mechanism which starts to work when the factory opens and production merely continues as it did the previous day. The foundation of the process-fund is based upon the arrangement of the elementary processes. This indicates GR's organisational focus and his focus on the capacity of the system to minimise idleness of flows and funds. With respect to the arrangement of the elementary processes, gains are realised. "In some cases, therefore, technological progress may work against the factory system if the demand does not increase in step with it" (Georgescu-Roegen 1971: 249). This reflects the importance of demand in the specialisation process. GR specifically refers to Adam Smith and his statement that the division of labor is limited by the extent of the market.

Agriculture, the economic process and policy

GR states that

> no parallelism exists between the law of the scale of production in agriculture and industry. One may grow wheat in a pot or raise chickens in a tiny backyard, but no hobbyist can build an automobile with only the tools of his workshop. Why then should the optimum scale for agriculture be that of a giant open-air-factory? (Georegecu-Roegen, 1960: 5).

GR discusses the inherent conflict between the two sources of low entropy: the earth's deposits, which are limited, and the radiation of the sun. The former is closely linked to industry, while the latter is closely linked to agriculture. In industry, it is possible to add further man hours in order to increase production. In agriculture, there is a limit for production due to e.g. the limit of land, the season etc. Agriculture differs from industry, because the elementary processes cannot be arranged in lines without interruption. There will be an inherent element of idleness present. Some partial processes can be produced in lines (the process of e.g. ploughing and sowing). Because of nature, however, much is going to be produced in parallel. Consequently, the concept of the efficiency of agriculture differs from the factory system. GR's point is that the nature dictates in agriculture, while man dictates in industry. Any point has reference to the ability to start and stop elementary processes. GR makes two examples of where there are exceptions to these rules. First, he focuses on Bali and points out their ability to work in lines. Second, he uses the example of the shift in the USA from chicken farms to chicken factories. In both cases, a factory system with production in lines has been implemented. The essential element in the industrialisation of agriculture may be claimed to be exactly this point. The foundation of the conventional agricultural system is the question of gaining control over nature. Organic agriculture, in principle, represents the contradictory position due to the rule of working with and in cooperation with nature.

The result of the analysis carried out by GR is that because of the inherent element of idleness in agriculture, the economic activity is characterised as *overcapitalisation*. Agriculture is simply less efficient than industry because of the inherent disturbance by nature.

The understanding of agriculture as something other than industry generally leads GR to point out a missing link between understanding agriculture and making agricultural policy. "The agrarian economy has to this day remained a reality without a theory" (Georgescu-Roegen 1960: 1)[47]. Both standard economics and Marxist theory have their theoretical foundations in specific institutional traits. In standard economics, individuals behave hedonistically. The entrepreneur attempts to maximise profits, and any commodity is exchanged on a market at uniform prices and no exchange otherwise. In Marxist theory, there is e.g. class monopoly for the means of production; there are profit-seeking entrepreneurs; and demographics do not enter into the theoretical universe. GR's statement is that the use of standard economics (in the west) and Marxist theory (in the east) in the policy with reference to the area of non-capitalistic agriculture lead to inadequate solutions. We have a reality in which policy rests upon an inadequate theory. In other words, there is a need to understand agriculture in order to develop adequate policy.

GR states, "...the economic process as a whole is not a mechanical phenomenon" (Georgescu-Roegen 1971: 139). GR leaves us a concept according to which change is the result of:

1. The decisions of man;
2. The conditions given by the flow-fund model and nature as a closed system with scarce resources.

When the decisions and actions of man are claimed to be crucial, the next question must be how man organises himself. This gives rise to an inherent social conflict in the process of the organisation of society. "Who shall go down the mine shaft and who shall eat caviar and drink champagne? This is the big question" (Georgescu-Roegen, 1976: 109-110). The positions in the social conflict influence the process of economic change in a society. GR point out five positions (Georgescu-Roegen, 1971: 310ff):

1. Any society has an elite which circulates and creates a political agenda.
2. These elites are centred in the town community.
3. This creates an inherent conflict between town and country; between industry and agriculture.
4. The elites have an interest in promoting industry and getting "cheap bread" from agriculture.
5. The conflict is a conflict over distribution; it will never be solved.

The focus on the activity of man and the mind of man leads GR to conclude that there is a great difference between physical science and the science of man; "that, contrary to what Pareto and numberless others preached, there is not only one method by which to know the truth" (Georgescu-Roegen 1971: 363). The aim of economics is "to study man in the hope of being able to promote his happiness in life" (Georgescu-Roegen 1971: 94). In his theoretical work, GR has constructed a programme of bioeconomics. This programme reflects his wish for social direction. It should be noted that "bioeconomics is both a methodology for doing economics and a set of

[47] As we are going to see, GR's thoughts have much in common with some of the thoughts of Chayanov, but these thoughts were not unfolded to the same extent. However, GR was not familiar with Chayanov's works at that time. Later in his career, GR became familiar with Chayanov and became highly influenced by his theoretical work.

overarching recommendations for the proper conduct of human affairs" (Beard and Lozada, 1999: 121).

Summary

GR's theoretical apparatus is based on a focus on the input side of the economic process. We live in a finite system with an ongoing transformation of the environmental resources from low to high entropy. Because natural resources are scarce, industry meets a boundary in the future. A basic rule of the game in the economic process is the production of dissipated matter, dissipated energy and waste. Demand is the absolute engine of the entire system. Behind demand, there is a human decision. This means that a selection process between potential decisions creates structures. The thoughts of man rest on a dialectical concept with an element of randomness. This differentiates the theory of man from the conventional rational man. Because politics are based upon this assumption, politics in general become wrong. This explicitly includes agriculture. A basic rule of the game in the economic process is that demand influences whether the production shall be produced in series, parallels or lines. The production in lines minimises the idleness of the funds. Production in lines is more difficult in agriculture than in industry. Natural resources are an inherent factor creating problems for agricultural line production with respect to e.g. the season and the limitation of land. It is simply not possible to avoid the rules of the game dictated by nature. Consequently, agriculture places limitations on structural change as compared with industry. Moreover, the inherent element of idleness leads agriculture to become overcapitalised.

It is not generally possibly to state that the efficiency of the economic process is highest when the factory system produces in lines. The economic process involves four different perspectives: the valuation of nature is impossible; all funds and flows; all of the three arrangements of production; and the process-fund inside the factory must be involved in order to evaluate the most economical arrangement. The system is complex.

The inherent social conflict is a basic biological rule of the game without solutions. As explicitly noted one place in GR's principal work, it is the elite and the captains of industry and banking who search for and choose direction. It is not a question of technology; rather, it is a matter of which institutional conditions the society operates with and the concrete agenda of the elite of the town community. This renders the structural change of agriculture an economic process steered by conservative institutions in which the social elites of the day determine the direction of society. Their interest in agriculture is to be able to obtain agricultural products as cheaply as possible. The elites establish the political agenda, and it is fundamentally a fight for distribution.

The phenomenon of organic agriculture must be interpreted within a framework in which organic agriculture is able to mimic conventional agriculture and also produce in lines.

GR's bioeconomics programme illustrates his wish for direction and emphasises his normative point of departure.

Co-evolutionary ecological economics and agricultural structural change

The co-evolutionary cosmology of Norgaard's economic model

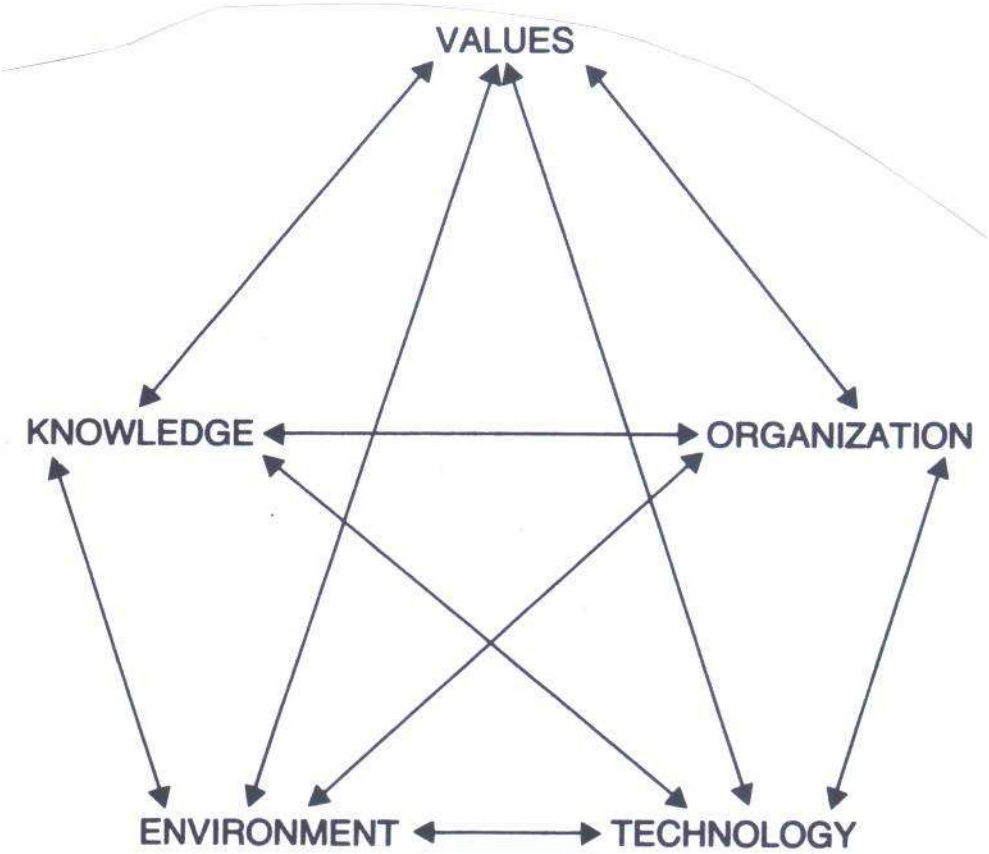
The model deals both with the analysis of why evolution has come about and what mankind can do in order to impact the direction of society. The general perspective generates the ambition for the model to contribute to a grand theory of economic long-term global development, and it is a political economic comment for how to create an alternative for all species on earth based upon the notion of sustainability[48]. His principles are (Norgaard, 1994: 65):

1. Holism: parts must be understood within their wholes and wholes are different from the sum of their parts.
2. Mechanism: systems can be both mechanical and deterministic but they are not predictable. Systems are chaotic or discontinuous. Systems can also be evolutionary.
3. Contextualism: phenomena are contingent upon a large number of factors particular to time and place. Similar phenomena can occur to different times because of different factors.
4. Subjectivism: understanding systems cannot be separated from the observer, the observer's activities, values and how we have known and hence acted upon systems in the past.
5. Pluralism: alternate patterns of thinking must be involved in order to understand complex systems. Different patterns are inherently incongruent.

The fundamental principles behind the concept of a co-evolutionary process are illustrated in Figure 11.

[48] Norgaard uses a chapter to discuss the idea of sustainability. His general conclusion is that "it is impossible to define sustainable development in an operational manner in the detail and with the level of control presumed in the logic of modernity" Norgaard, R. B. (1994). Development Betrayed. The end of progress and a coevolutionary revisioning of the future. London and New York, Routledge.:22).

Figure 11: The Norgaard Co-Evolutionary model



Source: (Norgaard 1994: 27)

The important issue within the co-evolutionary perspective is the general multiple connections between variables. None of the variables can be isolated and claimed to be independent. Any variable is dependent. In the model, Norgaard includes the positive and negative feedback processes in the respective processes. Consequently, the theory is a theory of complex systems. This complexity is demonstrated rather clearly in Norgaard's argument for the increased and inherent need for coordination between specialists. Coordination demands time, and time means costs. The formula $n(n-1)/2$ demonstrates the number of processes. We have n as the number of actors with a skill required for a process. This means that with five actors involved, there are 10 processes. With e.g. eight actors involved, the number of co-ordination processes is 28, and so on. When we transfer the principle to the theoretical model it demonstrates the degree of complexity and the general challenge to understanding a process of structural change in a system. In the model, prediction is impossible, because any change to one variable may change the other variable. Co-evolutionary processes are not like the dynamic of a mechanical machine, where knowledge of the different parts of the machine and knowledge of the specific relations between the parts makes one know how the system works. In the co-evolutionary system, both parts and relations change in unforeseeable ways. Change becomes a process of "experimentation, partly conscious, and selection by whether things work or not" (Norgaard 1994: 37). Norgaard's concept is that selection is a process of trial and error, and the motive for selection is determined by the result of this process. What starts the process of experimentation is not important, because the entire history of mankind is

and always has been a process of experimentation and a process of trial and error. We may refer to this as the hard core in the Lakatos sense of the theory of co-evolution. The motive for selection is an implicit part of the theory, and we claim that this constitutes an inherent, implicit, "co-evolutionary rationality".

Co-evolutionary theory is characterised by the interplay between an environmental system and a social system characterised by a kind of ping-pong, each part continuously reacting to the steps of others. "Over time, neither is more important than the other … Yet over the longer run we approach the equally disturbingly situation of nothing determining anything, that all will change in unpredictable ways" (Norgaard 1994: 46). The theory is based upon the idea that "social innovations … arise randomly." Norgaard expands his viewpoint against any determinism and in support for his own co-evolutionary theory.

> Those who must think deterministically even to begin to understand the coevelutionary process might first simply think of several deterministic processes with mutual feedbacks, both positive and negative, between the components, and then expand this simple model to include statistical or random properties, the introduction of new components, a hierarchical nature, and regional contextuality. (Norgaard 1994: 81)

Generally, Norgaard's idea is to establish a theoretical model based upon a co-evolutionary cosmology. There are six elements in the construction, all related to his principles.

The first refers to the fact that people are within the system or cosmos. People affect the evolution of the cosmos, which we attempt to understand; the observer and the observed are interrelated. The second element refers to the link between how to know and how to act. "How we understand agricultural systems, affects our agricultural decisions and thereby affects both the agro*ecosystem* and agri*culture* which we were originally trying to understand in order to decide" (Norgaard, 1994: 94). The third element deals with the principle of conceptual pluralism. Conceptual pluralism is based upon the idea that we must fight with "multiple ways of understanding and disparate insights. It is naïve to presume that making synthesis is possible" (Norgaard, 1994: 93). The fourth element is the claim that people arrive at a collective understanding, and the process of acquiring knowledge is fundamentally a social process. The last two elements are inseparable.

> In a coevolving cosmos, parts can only be understood in the context of the particular systems in which they are embedded, and history unfolds event by event according to the chance convergence of particular conditions at particular times. Systems just are. History just is. The parts of a coevolving cosmos can only be understood in the context of whole systems because parts co-evolve in the context of wholes. (Norgaard, 1994: 100)

We sum up and define the concept of co-evolutionary change using an example from Norgaard:

> In short, pests, pesticides, politics, policy, the pesticides industry, and integrated pest management evolved in response to changes in each other and in the relationships between them, or more simply, they co-evolved. (Norgaard 1994: 27)

This is the essence of the co-evolutionary theoretical model.

Agricultural structural change as a co-evolutionary process

As has been taking place since it began "between five and ten thousand years ago" (Norgaard 1994: 40), agricultural change takes place through *experimentation*. Experiments have formed the cultural knowledge of agricultural management within generations and from one generation to the next. The process is characterised by the increased specialisation of individuals and increased institutional complexity in receiving feedback from the specialised individuals within the social system and between the social system and the ecosystem. The general explanation of the shift from small-scale to large-scale agriculture is made within this framework. The following *agricultural institutions* are pointed out:

1. A highly complex system of farms has been developed
2. Agrochemical and seed industries
3. A highly developed marketing system
4. Government institutions (responsible for generating and disseminating knowledge, developing new inputs, regulating markets, absorbing risk, subsidising capital, limiting the distributional effects of adjustments, controlling environmental and health impacts)

> The fitness of these agricultural institutions is constantly tested by the responses of the ecosystem to the style of farming occurring under their umbrella. (Norgaard 1994: 42)

How does Norgaard describe the work of the process more precisely? Norgaard starts with the mechanical innovations which precede and select chemical technologies. This selection reinforces the fitness of agricultural mechanical technology. Such a technological system makes large-scale production more economical, and the monocultural farms appear. When the farmer depends on one or two products, the *risk of failure increases*. This pushes the farmer to use agrochemicals, and the *industry becomes an important powerful economic and political actor*. The response from the agro-ecosystem leads to two types of new institutions. The first type of institution should regulate and control for environmental damage. The second type of institution is meant to initiate research in order to reduce the dependence of farmers on chemicals. At the same time, biodiversity decreases and new diseases and pests arrive. The seed industry becomes responsible for maintaining, developing and supplying new varieties.

The result of the process of structural change is that during the process, the economic organisation of agriculture went from the independent farmer selling on a free market towards "a complex of corporate/state agricultural capitalism" (Norgaard 1994: 43). The element of eliminating the risk of farming seems to be inherent in this process. Norgaard describes this as a process in which farms expanded and the ownership of farmland became concentrated. This enabled the farmers to plan additional crops. Farmers also received crop insurance, investment subsidies and market-regulations from government. Some farmers changed their organisation and became

companies in order to reduce personal risk and obtain capital. Large non-agricultural corporations entered the sector. Because a co-evolutionary process contains "positive feedback", the reduction of risk rendered the mono-cultural production more attractive and the process of structural change was enforced to continue existing practices[49]. Furthermore, the larger farms made it difficult for the farmers to manage the different areas with respect to the unique biodiversity of each area. As a result, the ecosystem was damaged.

The agricultural ecosystem has features that reflect co-evolution with the social system. This perspective is in conflict with e.g. neoclassical and Marxist economics.

> Both neoclassic and Marxist economic theory explain growth in terms of accumulation of physical capital and improvements in human ingenuity which enhance our ability to use rationally the earth's resources and to increase the rates of material production. Progress – equated with the advance of Western science, the process of modernisation, and material economic growth – drives development in both neoclassical and Marxist theories. (Norgaard 1994: 45)

The question of new technology versus values is the point of departure for Norgaard to involve the questions of the moral direction of progress and the question: "Is progress whatever science and technology makes possible and societies can adapt to?" (Norgaard, 1971: 57). This point touches upon the arena of politics and policy, and the normative element of the co-evolutionary paradigm is understated as a necessary and inherent element of the theory.

There is one major point that we must highlight in order to acquire the correct perspective and understanding of structural change from a co-evolutionary perspective. According to Norgaard, a gap always exists between the rate of technical progress and the rate of social progress. "New technologies arise faster than we can develop the organizational capability to control their social and environmental side effects" (56). The claim about a time-lag is illustrated with reference to devising new types of pollutants faster than the institutions for controlling the pollution. Norgaard points out that the real problem here is not the uneven rates but the fact that new technologies determine both the kind of social organisation that evolves and the "kinds that must be designed to control and offset the effects from the technologies. Societies, rather than picking up and molding technologies according to their values, are being shaped by technology" (Norgaard, 1994: 56).[50] Notice that this position is diametrically opposed to that of Georgescu-Roegen, who states that mankind develops machines; not the other way around.

[49] The observation here links to the "public subsidy treadmill" described in the chapter about Cochrane.
[50] As we remember, any and every kind of determinism has been rejected by Norgaard. However, it is rather difficult not to argue that Norgaard seems to contradict his own co-evolutionary paradigm on this point. If we should argue in favour of Norgaard's position and claim that he is not in opposition to his own paradigm, then the determinism must be argued to be placed at a high level of abstraction. In the concrete, contextual situation in which selection is made, different technologies can possibly become winners. At this very moment, e.g. organic agriculture as well as chemical GMO agriculture are both possible. The result of the selection process determines the direction of structural change. The selection process is part of the "spaghetti" process. Consequently, the determinism does not mean with reference to direction. We are talking about an abstract and general determinism in line with the need for human beings to eat in order to live. If we are going to interpret Norgaard in this manner, his comments regarding determinism are within his paradigm, and he does not contradict own paradigm.

> Unfortunately, however, most policies of economic development still rest on the old fallacy bred by the mechanistic philosophy, the fallacy that it is the machines that develop man, not man that develops machines. (Georgescu-Roegen, 1971: 361)

In order to develop his theory, Norgaard illustrates some of his points with the assistance of agriculture and food production. We are going to take two examples in order to demonstrate how the theory works when confronted with empirical observations.

The Pesticide treadmill

The pesticide story from the United States is one of the examples which "during the twentieth century provides an excellent example of the co-evolutionary process" (Norgaard 1994: 23ff). The story is about the interplay between three main variables:

1. Pests
2. Pesticide
3. Polity and politics

Prior to the Second World War, inorganic compounds such as arsenic, sulphur and lead were used to control insects and pests. In the beginning of the 20th century, two laws were passed. This regulation was seen as a matter of 'truth in advertising', of seeing that farmers were obtaining useful chemicals and consumers were receiving healthy food. After the Second World War, the number of products was expanded primarily in order to facilitate the chemical industry and protect farmers from ineffective products. DDT was discovered in 1939. DDT is an organic pesticide. The discovery of further organochlorine insecticides changed agriculture dramatically. Because of this effectiveness, the inorganic pesticides were driven from the market by the early 1950s. The insects which survived these effective pesticides developed resistance due to the fact that the insects have many generations within a single agricultural season. Moreover, problems relating to secondary pests and resurgence emerged. Because of the reduction of the primary pest, an agro-ecological niche develops for other species that can play a role similar to that of the initial pest. The response from agricultural researchers and the chemical industry was the recommendation of more frequent and heavier spraying. "More pests demand more pesticides." The farmers entered what we refer to as a "pesticide treadmill"; pest management costs increased as compared with the former situation.

While some farmers followed the minority of the researchers and minimised spraying, most farmers continued. Because of the reduced effectiveness, the chemical industry introduced new insecticides. As a result, there were fewer insects and birds; this was at the time that Carson wrote "Silent Spring". In 1972, an act was introduced to protect the environment and DDT was later banned, which was followed by other chemicals in the course of the 1970s. The response from the chemical industry was slowed down because of higher restrictions on introducing new products to the market. A new type of pesticide was invented based upon synthetic pyrethroids. These chemicals were both more expensive and the timing of their use had to be more precise. While farmers in the beginning of the 1970s could afford to buy the products, they got into trouble in the late 70s and beginning of the 1980s because of decreasing prices. In the 1980s, a shift in the policy supporting traditional chemical agriculture was founded under the LISA program (Low Input Sustainable Agriculture). The elements in this program were in accordance with the philosophy of

integrated pest management from the beginning of the 1950s. The result of the entire process was that crop losses to insects were approximately the same as prior to the introduction of pesticides. However, it is not possible to stop the use of pesticides. "...we cannot simply stop using them because our agroecosystems and agroeconomy have been transformed by their use such that they must be used" (Norgaard 1994: 26). According to Norgaard, "the story" could not have been foreseen. In such a case, pesticides would never have been introduced. Why the change occurred can be explained with reference to the theory of co-evolution. As quoted earlier; "In short, pests, pesticides, politics, policy, the pesticides industry, and integrated pest management evolved in response to changes in each other and in the relationships between them, or more simply, they coevolved" (Norgaard 1994: 27).

Organic Agriculture and R&D Activities

The lack of knowledge also exists within another perspective. Confronted with this issue, Norgaard states:

> But the increase in knowledge and in the number of scientifically trained people has not improved predictive capacity. As our understanding of chaotic systems and coevolving system grows, however, the plea for more of the same falls on increasingly deaf ears.(Norgaard, 1994: 144)

Norgaard thus turns toward a recommendation for increased plurality within research and development. If we momentarily focus on organic agriculture in Denmark as an example, the lack of knowledge is also an issue here. For example, the programmes for publicly financed Danish organic agricultural research are dominated by the premises of Western science à la the Norgaard claim: atomism, mechanism, universalism, objectivism and monism (DARCOF 2002: ; FØJO 2007). (see e.g. Particular projects within the natural sciences dominate. A few social science projects related to marketing and why people purchase organic food offer the exception. The technical focus may be claimed to be a disadvantage when the aim, as declared in the official documents of the research organisation, is to expand the mode of production based upon the IFOAM principles (DARCOF 2000). From our point of view, the need for comprehensive research may be beneficial, with a further focus on contributions from the humanities and social sciences. The lack of insights and the distortion of the R&D activities may be one reason why organic agriculture remains a niche on the global level.

The Idea of the Market versus Organic Agriculture

The idea of the invisible hand is a topic with considerable influence on the concrete structural processes. The market is known and widely accepted as the coordinating mechanism. This is part of the general political discourse. Already more than 70 years ago, Frank H. Knight noticed that increasing specialisation called for co-ordination, which led to increasing costs. Knight did not use the concept "transaction costs"; however, the content is the same. These co-ordination mechanisms are visible in the form of people working within social organisations. The case for Norgaard is his insistence on a change of focus from market to a real and visible co-ordinator. He challenges the idea of the invisible hand as a genuine factor. He points out that much work has been used to

demonstrate and document the transition from a market economy characterised by small farms and farming communities to a society where co-ordination has become increasingly more important. This is why he attacks the reappearance of the metaphor of "the invisible hand" in the end of the 20th century. This focus shifts the focus away from structure and power.

For whatever reason and from a very brief snapshot, the change in the Danish political regime in 2001 started to use the metaphor in relation to organic agriculture. Until then, organic agriculture grew steadily. The political shift introduced the idea that organic agriculture ought to operate on the premises of the market (Finance 2002-2005). The point of the government was that organic agriculture is to operate under market conditions, just as all other farmers do. However, any talk about a market in the classical Adam Smith sense may be claimed to be absurd in relation to European and American agriculture. Instead of an explicit political discussion of values and a wish for direction, the "free market" metaphor is used. With a reference to the concept of politics, the reason why may be in order to obtain the political goals. From a co-evolutionary Norgaard point of view, the re-appearance of "the invisible hand" terminology in the western political economic discourse, instead of strengthening the focus on structure and power, may represent a supplementary research point. The last comment is connected to the general claim of co-evolutionary theory for further empirical insights as to how markets guide producers, speculators and the designers of new institutions. When co-evolutionary economics lack this information, the case must be similar for the rest of economics.

Conclusion

The concept of a co-evolutionary approach in which the five key variables of organisation, technology, values, environment and knowledge change because of the change in each other and the relations to one another constitute a challenge to conventional economic theory. The idea of selection as a continuous process of trial and error represents a new and dynamic concept of rationality; a co-evolutionary rationality. From a co-evolutionary perspective, the structural change of agriculture has involved the continuous transformation of the environment, which has resulted in an ecological crisis. From a co-evolutionary perspective, the question of long-term change in agriculture must be with reference to the quality of life perspective. Increased material wealth has been the general motive behind the 200-year process of exploiting the natural resources using the available technological means. Like the rest of society, agriculture is shaped by technology. The increased specialisation and concentration of farms co-evolves with the increased involvement of input-industries, the marketing-industry, financial industry and governmental institutions. The evolution towards a more complex system has a single explanation best expressed on the basis of the pesticide treadmill. Because of a decision of selection regarding the use of chemicals, the evolution of farming evolves towards the increasing use of technology. The increase of knowledge reorganises earlier mistakes, and new knowledge is applied in order to repair the agricultural system of production and make it more economical. New technology makes it possible and profitable to increase the large-scale production, the advantages being the growth of monoculture supported by the policy of governmental institutions, including economic subsidies. Changes related to farming organisations introduce new organisational forms. Non-farming investors become owners. The environment loses biodiversity. The explanation of agricultural structural change relates fundamentally to microeconomic gains; however, the gains would not have been possible without

technological change, increased knowledge, interaction from public institutions and specific supporting values among the involved actors.

Social Traps and agricultural structural change and transformation

Introduction

Costanza introduced the idea of an integration of the concept of social traps into ecological economics (Costanza 1987: ; Costanza 1997: ; Costanza 2002). However, closer scrutiny reveals that the invention of the term social traps was based on the article "The Tragedy of the Commons" (Hardin 1968). Based upon the reflections in this article and an article about the ecology of micro-motives (Schelling 1971), the idea became explicit (Platt 1973). The first systematic attempt to combine psychology and economics into a theory of social traps was the work of Cross & Guyer (Cross 1980). We will exclusively focus on examples dealt with by the theoreticians. Second, the element of politics is touched upon, and we demonstrate the concept of the way out of traps: escapes.
What is a social trap? The theoretical background refers to learning theory and theory of human behaviour. Substantially, the theory of social traps is a critical questioning of the concept that humans act rationally. The analogy between economics and decision theory, on the one side, and learning theory on the other side is in sharp contrast. The former theoretical concept assumes that mankind has a map from which he knows or can easily guess where choices of action will lead. This is not the situation within learning theory and consequently with the theory of social traps. *Learning theory assumes that direction is chosen from second to second, that the decision is based upon incomplete knowledge, and that we first know the destination upon arrival.* The rationality of the theory may be unfolded in this manner: we thought we acted rationally but we got trapped in a situation we did not want to be in. "Occasionally, however, these road signs lead to unfortunate destinations. These are our social traps." (Cross 1980: 12-13). The taxonomy consists of two parts:

1. Identification of social traps
2. How to escape from social traps

Part one consist of five main social traps and one combined social trap. All of the traps contain counter-traps. Part two consists of seven primary strategic possibilities: the concept of "escapes or ways out". The latter is part of the solution and belongs to our element of politics.

Social Trap 1 - The time-delay traps

Based on experiences and studies of different types of learning situations, it has been documented that a time-lag between behaviour and the associated reinforcer reduces the ability of the reinforcer to affect behaviour. Cross et al. point out a number of examples from economic theory. In decision-making theory – e.g. investment theory – the matter of time and time-delay is part of the theory. On

the other hand, Cross et al. discuss the paradox – from the perspective of learning theory – that economists continue to work with rational economic models. Their position is that the discussion ought to be focused on the deliberative decision-making process in order to improve economics[51]. Environmental economics, including cost-benefit analyses and the discussion of discount rates, represents another area of general importance. The idea of time-delay traps does not generally exist as an issue within the theoretical universe. Any trap is the result of a deliberative choice; any trap is so to speak a voluntary choice based upon present preferences.

Social Trap 2 - Ignorance traps

The ignorance trap is illustrated with a reference to King Midas: anything he touches turns to gold; even his food. The opportunity to obtain a highly attractive reinforcer or reward means that even ordinary, known consequences of an action are ignored. Ignorance traps represent "a failure to accept or utilize generally available knowledge, when making a choice between alternative decisions" (Cross 1980: 22). Generally, the discussion of the existence of ignorance traps has been a subject for much debate. Cross et al. illustrate this by taking the question of balanced budgets up to debate. In economic theory, the attitude differs depending on the paradigm in question[52]. The crucial element here is that ritual behaviour evolves and the theory that develops from this basis "may develop into a theology given widespread applications in all sorts of other, unrelated circumstances" (Cross 1980: 72).

Social Trap 3 - Sliding-reinforcer traps

A sliding-reinforcer trap resembles a time-delay trap. The basis of the definition of the trap is the creation of habits. The establishment of habits requires several reinforcers. Learning is a time-spending process. When habits are established, they can continue without both positive and negative reinforcement. The establishment of the trap is based upon a success. The success turns around and leads to negative consequences. These consequences could have been avoided if the behaviour had been stopped earlier. The behaviour turns into a habit that does not change immediately despite the consequences changing from reward to punishment.

Social Trap 4 - Externality traps

The externality traps are about situations in which the behaviour of individuals has effects on the outside area of the interest of the individual. Cross et al. refer to welfare economics and environmental economics as the core in this trap[53]. Externality traps are hardly something new in

[51] We must remember that the book was written in 1980. Since then, economics has evolved with modelling on e.g. the assumptions of bounded rationality. Furthermore, work with game theory and artificial economics has also challenged the concept of the rational economic man.
[52] The question of whether an ignorance trap exists or not and the connection to various theoretical paradigms call for attention. The theory of science demands firm definitions. If the definitions of central ideas become ambiguous, the question becomes whether it is the heuristic framework instead of a theory we are dealing with. However, the question may still be open.
[53] See e.g. Trong, M. D., Jensen, Jette Thorbjørn (1991). Prisfastsættelse af miljøet, Aalborg University Press, Jespersen, J. (1998). Miljøøkonomi. Copenhagen, DJØF Publishing. for further insights into this area.

the social sciences, but they are known as externalities in relation to consumption and production. Consumption externalities are grounded in differences in preferences and can be directly observed as a confrontation in public space (clothes, choice of house colour, loud music at night in common houses etc.). Production externality is most commonly known from pollution. Behaviour at the micro-level creates a social macro-trap. Cross et al. argue for treating the pollution trap as a consumption trap and focusing on differences in preferences. The priority of one group may be to clean nature, while another group may give priority to the product. The first group has an interest in getting a new structure of incentives, while the latter group is interested in the status quo.

Social Trap 5: Collective traps

The co-existence of more than one externality trap creates a collective trap. The behaviour of the collective body damages the interests of the collective. In collective traps, the individual is not the cause of the trap. Everybody is the cause, and everybody becomes responsible for the creation of the trap. The existence of many actors means that the responsibility of the individual decreases. When the individual responsibility decreases, the risk of becoming trapped increases.

Social Trap 6: Hybrid trap

The classification "Hybrid Trap" reflects a mixture of the five different traps. Cross et al. point out that all types are typically represented in this category of traps. Their concrete example is the problems surrounding the international armament, confrontation and conflict. If we take the increased complexity of the modern societies on a local, nation and international level into consideration, the claim could be that social traps as a phenomenon have more precisely become a question of hybrid traps rather than some of the "pure traps" (numbers one to five).

Social traps versus policy, politics and polity

This section deals with potential escapes from the traps. Cross et al. refer to these considerations as strategic means. Our attempt at linking the strategic perspective fits a perspective of policy, politics and polity. The general concept of Cross et al. is to develop a systematic framework and discuss:

1. How is it possible to counter traps – what are the ways out?
2. How is it possible to escape from traps?
3. How is it possible to make the time in a trap endurable?

Generally, the apparatus is developed on the basis of two levels of action:

A. Actions implemented by individuals or groups of individuals
B. Actions implemented at the macro or society level

Our analysis indicate that it is possible to identify seven types of archetypical actions. When we focus on the first two types of traps – Time-delay traps and Ignorance traps – all seven are included. When we analyse the last four traps, less archetypical actions are included. The seven actions are:

1. Converting the trap to a trade-off. This refers to the situation in which the consequences of the traps become clear. The future is incorporated into the decision-making process; this is what we will designate *the Idea of Information.*
2. Supplementing and modifying the existing reinforcers. This indicates an initiative where e.g. punishment for behaviour ex-ante is reduced or increased in order to motivate action in a direction where a future trap is avoided or transformed into a non-trap. This is what we will designate *the Idea of Regulation.*
3. Eliminating the bait. This refers to an intentional interruption of behaviour when the behaviour has been initiated. This is what we will designate *the Idea of Manipulation.*
4. Adding punishment to the bait. This is a situation in which a new system of punishment is implemented while the normal system continues to exist. This is what we will designate *the Idea of Extra-Punishment*.
5. Trap insurance. This indicates the launching of a reward system in order to reduce the negative consequences of the trap when the trap has caught someone. This is what we will designate *the Idea of Insurance.*
6. Reinforcing competing behaviours. When you are caught in the trap, there are always alternatives to the usual behaviour. The structure of incentives to these alternative behaviours must be rewarded. This is what we will designate *the Idea of Competition*.
7. Superordinate authority. This means delegating the power of decision making "to someone who is not the subject to the entrapping reinforcer" (Cross, 1980: 61). This is what we will designate *the Idea of Authority.*

The development of seven strategic archetypes is possibly a step towards an operational model to prepare policy, implement politics and change the polity. The method would be to incorporate all seven strategies in order to identify the empirical indicators. Part of this exercise is a discussion of the missing empirical data and why this data is missing. Within this method, we would both be able to acquire a better understanding of the past and we would obtain an instrument for proposing changes to policy, politics and polity. We might possibly be able to acquire an instrument combining the past and the future. In a sense, the link to e.g. Ostrom (Ostrom 1999) and her discussion of general political management tools within complex adaptive systems seems likely.

Social Traps and Organic Agriculture

We will end up with an illustration with reference to organic agriculture and social traps. The point of departure is the postulate that we are presently in a hybrid social trap, which refers to e.g. the environmental problems stemming from agricultural production and the decrease in the biodiversity in the environment. This is a hybrid trap, as all of the different traps are involved:

- Time-delay trap, because we simply did not know the consequences from the beginning;
- Ignorance trap, because current knowledge indicates that organic agriculture represents an alternative;

- Sliding-reinforcer trap, because the process of structural change is viewed as a success in terms of its ability to produce a far greater number of products with a higher productivity;
- Externality trap, because the individual farmer affects the external area of interest of the individual; and lastly
- Collective trap, because many farmers participate in the process.

Organic agriculture is one way out of the trap. We now confront the solution with the means: the archetypical actions. First, there is no lack of information. If we involve the conclusion from the Hvelplund, however, the information does not present organic agriculture as a real alternative. Second, regulation represents a possibility; the issue becomes a question of the implementation of new agricultural policy. Third, manipulation represents a possibility; the issue becomes a question of the implementation of a new agricultural policy. Fourth, extra punishment represents a possibility; the issue becomes a question of the implementation of a new agricultural policy. Fifth, insurance represents a possibility; the issue becomes a question of the implementation of a new agricultural policy. Six, competition represents an alternative; the issue becomes a question of the implementation of a new agricultural policy. Using Denmark as an example, e.g. the increased subsidies to organic farmers in the 1990s represents a move in such a direction, while the decreased subsidies to organic farmers in the 2000s represent an action manifesting the trapped situation. Seven, authority represents a possibility; the issue becomes a question of the implementation of a new agricultural policy. The conclusion from this illustration leads to the position that the reason why organic agriculture remains a niche is a combined question of a weak alternative and contemporary opposing politics.

Section five – A Search for Empiric Indicators for evolution of the Global Organic Food Market: Towards the Conceptual model

Introduction

Before the COP-project is able to solve the problem related to how politics may assist to increase the demand for organic food and *how public policy may contribute to a transformation of agriculture and food production towards organic agriculture and organic food* it is necessary to find empiric indicators. This is the first stage towards the construction of *the adequate theoretical model from the perspective of economics for the COP-project.*

The research report has presented an analysis of different theoreticians in order to understand the phenomenon “Organic Agriculture”. In this section we make a compilation with the aim to identify how the COP-project can be assisted in their study with specific reference to empiric indicators.

Compilation, Conclusion and the first Search for Empiric Indicators

The first statement is that nearly all of the economic theoreticians contribute to the theoretical Veblen-Cochrane skeleton for understanding the result of the process of long-term agricultural

structural change and we find a significant coherence. From a more tentative position, we have outlined six arguments (institutional profits, pressure on small-scale farmers, increases in rent, industrialisation differs among products, economic redistribution in favour of profits and rent, land is superior security) for a tentative expansion of the skeleton to a Veblen-Cochrane-Smith skeleton. The only theoreticians who do not fit well into the Veblen-Cochrane theoretical skeleton are the main-stream approach as a whole. Their focus is on material structural change, while the majority of the other theoreticians also focus on changes in immaterial structures. Changes in immaterial structures are precisely part of our approach to agricultural transformation.

Dealing with general theories, it is uncontroversial from an economic theoretical perspective to consider the appearance and establishment of organic agriculture as a result of the dynamic change of social structures. However, when we delve deeper into the respective frameworks of our different theoreticians and devote attention towards understanding the economic process for explaining why organic agriculture appeared and became established, our theoreticians contribute with different explanations.

The first explanation is a *demand explanation*, which we find in all of our economic theoreticians. However, we can identify a specific approach in Georgescu-Roegen, where he draws a link to Smith and his idea of the determinism of the market on the division of labour. This consideration is coupled to Georgescu-Roegen`s general idea of the machine process and the problems of producing in lines in agriculture. Because of the greater limitation in organic agriculture compared to conventional agriculture for line-production, this may be a reason for organic agriculture as a niche. We must remember that, in the universe of Georgescu-Roegen, the demand and supply dimensions are steered by demand as a general rule based upon the idea that deliberative decisions of mankind select organic agriculture. Again, the definition of deliberative decisions is distinct from classical economics, as it refers to the social elites in towns who are in power concerning the steering of the direction of structural change, including the establishment of organic agriculture.

The second explanation is Cochrane's *quasi-monopoly explanation* and could also be part of the demand explanation. Using Denmark as example, we could also call this "The Labelling Explanation", where the ø-trademark signals a monopoly. By this explanation, we can only guess why the demand is established. A plausible guess could be with reference to e.g. environmental crisis, animal welfare or the resistance against toxic food. If we assume that part of the explanation results from political initiatives, the quasi-monopoly explanation becomes a mixed demand-regulation explanation.

The third explanation we refer to as a *profitability explanation*. We can find support for the profitability explanation in the writings of all of our theoreticians. The explanation suffers from the fact that organic agriculture remains a niche. If organic agriculture is profitable, why is it still a niche? The answer to this question could be that it is due to the limited preferences of consumers. Such an answer receives the support of Thünen, who would focus on the specialisation process, which creates demand for new products. If the new product is introduced, the expectations of profitability are realised. The physiocrats would focus on higher prices as the reason for organic agriculture. We confront the profitability explanation to a problem for the organic farmers compared with the conventional farmers. Besides being a price taker, they require a higher price than conventional farmers. All other things being equal, their risk as price takers becomes higher than the conventional farmer. This would be an argument for the financial sector to favour credits to

conventional farmers. Such financial-risk arguments work against the profitability explanation, and support for this argument can be identified in e.g. Veblen, Norgaard and Ingemann. If we repeat the niche-question, the physiocrats would repeat the consumer preference argument and we are back to a kind of equilibrium explanation. If this argument is to be challenged, we can get assistance from Veblen and Hvelplund, who would argue that the scope of organic agriculture is due to the general strength of the organic system as compared with the general strength of the conventional system.

The fourth explanation focuses on *regulation.* Again, all of the theoreticians are represented. The regulation explanation is both able to explain why organic agriculture occurs and why it is established with the actual scope. When focus is on a *political regulation explanation*, all theoreticians find it influential, with the exception of Kærgård. He tones it down as an influential factor. When the focus is on a broader *social regulation explanation*, the element of allocation enters and we have the allocation fight from classical political economics. In Veblen, any decision about social direction, and consequently organic agriculture, is decided by the economic interest among absentee ownership, credit capital and businessmen, where the power of the credit capital is determinant.

The fifth explanation is an *institutional economic explanation.* There is a close link to the regulation explanation, because the explanation has both the political regulation and social regulation as inherent elements. However, we find the institutional economic explanation to be broader. The institutional economic explanation is an explicit aspect of e.g. Ingemann, where the focus is on the general system of agricultural coordination on the supply side between the micro, meso and macro levels of the economy. The interaction here seeks to dictate the change of agricultural structures in a complicated process based upon social conflict and the creation of notions of values among social actors. From Veblen, we have the conflict between organic agriculture and the interest of the credit capital in accelerating the velocity of capital, where organic agriculture in general represents a slower velocity as compared with conventional agriculture. Chayanov's contribution and his theory of the family farm as an institution is also an established part of an institutional explanation.

The sixth explanation refers to the introduction and establishment of a *new value system*. We could argue that a value system is an institution and incorporate this explanation within the institutional explanation. However, in order to have specific attention on Chayanov, we prefer to make an analytical distinction. We have two somewhat different contributions. The first is based upon an assumption that organic agriculture involves more drudgery than conventional agriculture. This idea comes from Chayanov. In such a case, we deal with non-economic reasons among farmers for being organic farmers. We are talking about a *farmer value explanation.* This is a micro decision on the supply-side of the economy assuming that Chayanovian rationality involves non-economic parameters. We find some support for this explanation in the Norwegian anthropological study (Østergaard, 1998). The second is identified within Veblen and reflects a resistance against the experienced and actual change of society and a wish for a return to the simple life or a return to "nature". While the idea of a new value system is clear and the reference to organic agriculture as a return to "nature" is also clear, we may question whether organic agriculture represents a return to a simple life.

The seventh explanation is the *technology explanation* and refers to the introduction of new technology. This is an element in e.g. Cochrane and Smith, where organic agriculture is a "natural" result of new technology making organic agriculture profitable. The explanation also

operates with the existence of an institutional set-up with e.g. research and education and legislation. The technology explanation finds theoretical support in the main-stream approach. In Thünen, organic agriculture is accounted for by the ability for further specialisation with the introduction of new techniques. The technology explanation is challenged by the fact that organic agriculture remains a niche. Why is the new technology only used in a limited part of agriculture? One plausible reason could be a limitation in e.g. education and research on how to exploit the new technology. If knowledge of the organic agricultural technology system is limited to a small group of farmers, a small group of advisors and a small portion of the research and educational system, then we may have a plausible explanation for organic agriculture remaining a niche. According to such an interpretation, however, the technology explanation tends to become part of the institutional economic explanation.

The eighth explanation is a combined Norgaard/Veblen explanation, where the logic is that organic agriculture in reality never should have evolved due to the logic of the rules of the game. While Veblen would call it a *"pressure from the outside" explanation,* Norgaard would call it a *"despite-of explanation"* – instead of a "because-of explanation". The Veblenian interpretation gets support from Brandt Jacobsen (2005). Her focus and the reason for organic agriculture refers to organic agriculture as a social movement. From Veblen and the Hvelplund, the scope of the present establishment is due to the general strength of the organic system as compared with the general strength of the conventional system.

The ninth and final explanation is based upon an assumption that organic agriculture is the "*way out of a hybrid trap explanation"*. This contribution comes from Social Traps. The process of the establishment of organic agriculture is the result of organic agriculture as a clear alternative and the implementation of a new agricultural policy. The reason why organic agriculture remains a niche is a combined question of a weak alternative and contemporary political zigzag course. Again, the establishment and scope of organic agriculture reflects the strength of it as a clear alternative, which has the support of Veblen and Hvelplund.

Off-hand, the nine explanations indicate that understanding the evolution of organic agriculture is ambiguous from a solely economic theoretical perspective. The array of explanations and the fact that many theoreticians are found within different explanations is an argument for understanding organic agriculture as complex and multi-unit economic theoretical phenomenon. Moreover, the explanations are intertwined. When we proceed further with the different explanations, we find that the profitability explanation, the regulation explanation and the "way out of a hybrid trap" explanation suffer from organic agriculture remaining a niche. These three kinds of explanations call for further insight in order to explain the niche position. Such further explanations would shift the focus to another explanation; e.g., if organic agriculture is to be explained in relation to profitability, the answer for the niche position could refer to the limitation in demand, and we would have a demand explanation instead of a profitability explanation. The same argument can be used in relation to the regulation and the trap explanation. If regulation is responsible for the niche position, there must be a reason for precisely the kind of regulation chosen. This is where the regulation explanation moves into an institutional explanation. The case of the trap-explanation also moves into an institutional explanation, because exactly the limited size of organic agriculture states that the trap remains an issue and we must search for an explanation for why organic agriculture remains a weak alternative to conventional agriculture. This could lead us to different kinds of alternative explanations, e.g. the demand explanation or the institutional

explanation. Having eliminated these three explanations with reference to the niche position of organic agriculture, we now have the demand explanation, where the quasi-monopoly explanation is part, together with the new value explanation and the institutional economic explanation. In the latter, we have argued that the new technology explanation and pressure from the outside explanation is part. The demand explanation stands strong and becomes even stronger when the quasi-labelling-monopoly-explanation is incorporated. The demand-explanation also has the strength that it incorporates the new value explanation easily with reference to changing preferences. However, the lack of an answer as to why preferences change indicates that, from a critical realism point of view, we must seek behind the demand explanation in order to acquire a deeper explanation. Such a search may or may not lead to one explanation or the other. The final explanation is the institutional explanation. We can argue that the demand explanation – and consequently the new value explanation – by definition and initially cannot be rejected as being part of the institutional economic explanation. This makes the institutional economic explanation a potentially broader explanation than a demand explanation. In order to avoid any missing links in order to understand organic agriculture, the institutional economic explanation offers the most cautious kind of explanation. Such a fact supports the idea that a further search for understanding organic agriculture may represent the most appropriate explanatory framework. This is why we find *that organic agriculture must be understood on the basis of an institutional economic explanation in which the demand explanation is explicitly claimed to matter.* This does not mean that we can neglect that "the black box" for explaining consists of nine elements. Opening the black box demonstrates that the complexity is made known. However, *we have found an adequate theoretical point of departure for the empirical inductive research – empiric indicators I.*

Compilation, Conclusion and the Second Search for Empiric Indicators

When we dwell into the theoretical foundation for the above nine explanations the reference to empiric indicators becomes more complex. In the table below, we have compiled the rules of the game among the theoreticians. We tentatively distinguish between three categories of rules: agricultural rules, economic rules and general rules. We make a further tentative sub-categorisation of the rules with reference to the accumulation of production, the allocation of production, land and nature.

We start with Table 2, where we list the identified rules of the game found in our theoreticians as outlined in the thesis.

Table 2 - Tentative list of the central rules of the game as stated by our theoreticians – empiric indicators II

Rules	Characteristic	Main Theoretician
Agricultural rules	**Accumulation**	
	A non-mainstream idea of productivity	Georgescu-Roegen, Norgaard, Chayanov, Social Traps, Hvelplund
	Mainstream idea of productivity	Main-stream approach, Smith, Ricardo
	Farming is extensive	Veblen, Georgescu-Roegen
	Farming goes from extensive to intensive	Cochrane, Thünen
	Co-existence of farm systems	Chayanov, Norgaard
	Farm systems have different calculations	Chayanov

	Limits on farm size	Chayanov
	Farmers do not flow freely	Chayanov
	Dependent farmer	Veblen, Cochrane, Norgaard
	Independent farmer	Cochrane, Norgaard
	Farmers have great cupidity	Veblen, Malthus
	The only productive sector	Physiocrats
	Specialisation	Thünen
	Organic agricultural principles for accumulation, allocation and nature	Ingemann
	Allocation	
	Farmers are price takers	Veblen, Cochrane
	Limited demand	Smith
	Increase in agricultural prices	Ricardo
	Increase in agricultural prices until equilibrium	Smith
	Differential rent	Ricardo
	Land	
	Scarcity of land and monopoly price	Veblen, Cochrane
	Land does not flow freely	Thünen
	Land eats up capital	Thünen
	Ownership of land matters	Physiocrats
	Land is superior security	Smith
	Nature	
	Nature matters	Physiocrats, Malthus, Ricardo, Geogescu-Roegen, Cochrane, Norgaard
	The idea of the limitations of nature	Georgescu-Roegen, Ricardo, Cochrane, Norgaard
	Agriculture working against nature	Norgaard,
	Variety in agricultural production due to nature	Smith
	Scarcity of biodiversity	Cochrane
Economic rules	**Accumulation**	
	New technology and the two treadmills	Cochrane
	The credit treadmill	Veblen
	Division of labour	Smith
	Financial capital as an influential actor	Veblen, Cochrane, Chayanov, Norgaard, Ingemann
	Economic subsidies to farmers	Cochrane
	Allocation	
	All politics is business	Veblen
General rules	**Accumulation**	
	The institution of property rights	Veblen, Physiocrats
	Value system	Norgaard, Cochrane, Veblen
	The potential of external pressure	Veblen, Thünen
	Nature vs. population	Malthus, Norgaard, Georgescu-Roegen
	Agriculture the only productive sector	Physiocrats
	Transaction cost and marginality	Von Thünen
	Reinforcers	Social Traps

	The actor cavalry change	Veblen, Cochrane
	The interplay between actors constitutes the rules of the game	Veblen, Georgescu-Roegen, Physiocrats, Smith, Malthus, Ricardo, Social Traps, Ingemann, Hvelplund
	Institutions dealing with social conflict	Veblen, Georgescu-Roegen, Chayanov, Physiocrats, Smith, Ricardo, Malthus, Social Traps, Ingemann, Hvelplund
	Allocation	
	Reinforcers	Social Traps
	Allocation fight, political system and maximisation of profit	Smith and Ricardo
	Political system and maximisation	Chayanov
	Demand/Deliberative decision of man	Georgescu-Roegen, Cochrane

We tentative assume that *the rules of the game represent the empiric indicators for any study about structural change and the appereance of new social phenomenon. Consequently, this includes organic agriculture and the COP-study of the evolution of the market for organic food.*

We have found that all theoreticians find that politics (in the broad sense), accumulation and allocation cannot be meaningfully separated. Politics influences social structural change. Research has demonstrated that politics represents a potential for contributing to a transformation (e.g. Chayanov, Social Traps, the physiocrats, Smith, Ricardo, Thünen, Georgescu-Roegen, Norgaard) and counteracting a transformation (e.g. Malthus, the physiocrats, Smith, Ricardo). This indicates a theoretical link between politics, structural change and transformation. Generally, all of the classical theoreticians have an explicit focus on policy, politics and polity as the instrument which shall secure an optimal accumulation of capital. Georgescu-Roegen suggests a bioeconomic policy programme and Norgaard supports him. As a whole, all of our theoreticians find the agricultural politics inadequate and there are several suggestions for new politics. An interesting approach to the link between policy, politics and polity and agricultural structural change and transformation comes from learning theory. Changes in policy, politics and polity can be activated both before an actor or the society enters a trap or at the time when an actor or the society is in the trap. Accordingly, the policy, politics and polity of the past have become crucial for understanding any present and future process of change and transformation. The assumption is that the economy is a process of continual traps. There are seven instruments for escaping social traps: information, regulation, manipulation, extra-punishment, insurance, competition and authority.

There is a broad agreement that the actions of actors are teleological. The agreement about the core means that structural change and transformation is a result of the teleological actions of the actors. The teleological aspect behind the actions can e.g. refer to a question about obtaining insights about the preferences of the actors and the expectations of the actors in relation to the outcome of their specific actions.

We can conclude that the economic theory analysed generally finds that the decisive meaning for structural change in society, and consequently agricultural structural change, relates to the distribution of capital. Despite the fact that agriculture depends upon a number of specific conditions rendering it complex to reach such a conclusion, agricultural structural change is caused by anything but agriculture itself. Agriculture is subordinated to a range of general material and immaterial structures in society with reference to organisation and power. The understanding of the

process of structural change indicates that the deepest understanding can be found within the perspective of:

1. Social economic power
2. Social economic organisation
3. Actor interest

The perspective of social economic power, social economic organisation and actor interest unites the classical economists, institutional and evolutionary economics, ecological economics and the majority of agricultural economics. From such conclusion the establishment of empiric indicators for the COP-project has a further reference, where the outlined rules of the game shall be subordinated. Because of the increased complexity a choice of how to make it simple becomes the next task.

Compilation, Conclusion and the third Search for Empiric Indicators

The next conclusion is that the research at hand demonstrates the need for a broad focus. Hvelplund finds that an explanation for the niche position of organic agriculture must be understood within the framework that organic agriculture *within an epistemological context is organisationally homeless.* Ingemann finds that the agricultural economic substance builds upon the negotiated economics of agriculture, a differentiated understand of (large) scale, the incentives of agricultural actors and the legislative framework for agricultural actions and, finally, the fight between different notions. These are the central elements for understanding agricultural structural change, where the result is the creation of three asymmetries. Implicitly, it must be assumed that these asymmetries also cover organic agriculture. The Danish main-stream approach focuses on a number of other aspects in order to explain agricultural structural change. Again, we must assume that it applies to organic agriculture. The combination of the Hvelplund, Ingemann and the main-stream approach is found when Veblen and his mismatches are involved. The mismatches are an analogy for the asymmetries in the Ingemann approach; however, the difference is that Veblen has a broader focus. He concentrates on the general conditions for the structural change of the economy and implicitly assumes that these conditions also apply to agriculture. We have a methodological relationship between Veblen and the main-stream approach. The focus is broad rather than narrow with respect to agriculture. When comparing Veblen and the Ingemann approach, Veblen captures a greater number of mismatches, both with a narrow address to agriculture as well as with broad reference to the general institutional economic set-up. The research demonstrates that instead of operating with a narrow focus, which was our point of departure, research must be elaborated with a broad focus. Our initial choice not to focus solely on organic agriculture has found support from an economic theoretical perspective; however, the choice to focus on agriculture versus organic agriculture does not find support in the research. The delimitation tends to exclude important elements of explanation and remove focus from the most deep-lying reasons for agricultural structural change. Stated alternatively, the discussion about definitions of organic agriculture, which we initially delimitated us from, is far from being a central discussion towards understanding organic agriculture as an expansion of the framework to embrace the entire economy. Referring to empiric indicators the consequence is that the COP-choice of indicators need to be broad too. Does the research provide us with a more precise recommendation for empiric focus?

The research demonstrates that the economic theoretical framework of explanation becomes indistinct because organic agriculture becomes established as a niche. This leads to problems for empirical research, because the theoretical rationale that the research must be based upon is incomplete. Research in organic agricultural risks becoming theoretically homeless. If an institutional economic theoretical approach to an explanation is not elaborated, the research aimed at understanding organic agriculture risks at best having faith in an invisible hand – if we are to relate to Adam Smith and our postulate about his inconsistency. We find that the research in organic agriculture simply requires a theoretical framework with an as yet non-evolved conceptual apparatus. We find that research in organic agriculture must search far beyond organic agriculture in order to find such a concept. The research demonstrates that not even a general agricultural economic theoretical framework is sufficient, because the basic relationship remains unidentified. *We have a theoretical demand for the evolution of a framework for the processes of change in society.* W*e are dealing with a need for a general theory about social change based on the evolution of mismatches.*

Because of the tentative distinction between structural change and transformation, the research demonstrates that focus must be directed towards changes in material and immaterial structures. When we focus on the change of material structures, the indication is that accepting a radical change to a central rule leads to transformation; theoretically, the idea of transformation becomes mechanistic and leaves us with a concept with which it is not possible to distinguish between structural change and transformation. By maintaining transformation as a theoretical concept, attention is directed towards change in immaterial structures, because here change in structures can lead to transformations at both the general systems and subsystems level.

The concept of transformation renders it possible to challenge the concept of structural change and shift attention away from e.g. short-term changes and instability in the economic system and its subsystems. With reference to the Hvelplund approach, the concept of transformation moves focus from the second to first order. By applying a transformation perspective, economic theory will be able to operate more radically, where it is obvious that the interrelation between economics and the concept of politics will become more intertwined. Transformation can be produced in case it is decided.

Exactly because of the COP-project focus on transformative capacity the empiric indicators must:

1. Focus on change in immaterial structures
2. Focus on first order indicators in the Hvelplund sense

Having established such conclusion the apparatus of the nine explanations and the rules of the game get support in the process to create and use empiric indicators. *The COP-project must focus on social broad, immaterial and first order empiric indicators.*

The pluralism of economic theoretical explanations of organic agriculture is a weakness if one only expects a single explanation. Synchronously, the ambiguity tentatively implies that economic theory alone is unable to understand but only contribute to an understanding of organic agriculture. This tentatively implies that *other disciplines must be brought into the game*. Further research may benefit from cross-disciplinary collaboration in which the nine explanations indicate that political science, sociology, theories of behaviour and anthropology in particular are

potentially relevant. Despite the pluralism of economic theoretical explanations, the conclusion is that further work towards understanding organic agriculture may gain from being grounded in an institutional economic explanation, where the theoretical universe formulated by Veblen, Georgescu-Roegen and Chayanov, interpreted and presented shortly in this research report and in detail in the dissertation (Rasmussen 2007), constitutes a potentially interesting foundation. Fixating the concept of transformation in the study of organic agriculture, the theoretical approach automatically provides an explicit focus on organic agriculture as an agricultural transformation with an unexploited potential. *The empirical focus is steered by the theoretical findings, where the most important task is possibly an answer to why organic agriculture remains a niche?* The first steps toward an answer have been initially elaborated in the research report by pointing out the existence of institutional barriers; however, a more structured search for answers is missing. The radical element is the theoretical message that the transformation of agriculture towards a total transformation to organic agriculture *alone* is a question of decision. We have demonstrated that understanding organic agriculture in the light of the concept of transformation leads us to a broader social organisational framework than would be the case if we had neglected the transformation concept. *Simultaneously, and as added value, a consequence of the general broader theoretical framework is that the economic theoretical framework can be applied to understand social phenomena other than organic agriculture.*

As argued,changes to the rules of the game do not come about automatically. The research hints that the source of radical change is above all a result of changes to immaterial structures. The most obvious source of radical change to the rules of the game is the institution of politics. The link to transformation converts economic theory in a more relative direction. By this, the ordinary sense of economics and its more or less mechanical ideas of automatic economic laws are challenged. The institution of politics becomes important and within an isolated perspective of transformation, economic theory is reversed to be an auxiliary tool for understanding social processes of change in the economy rather than the tool that understands the social processes of change in the economy. When the perspective is transformation, as a minimum, the explicit involvement of theories about the political processes of decisions must be implemented. The issue is to qualify the teleological motives in the concrete context, where the behaviour of decisions and in the final analysis power of decisions form a crucial frame of reference.

Our theoreticians demand focus at the micro, meso and macro levels, respectively, as relevant to understanding the process of change. By combining the three levels of analysis with agricultural organisation, the understanding of organic agriculture is combined to form a general understanding of the social processes of change. Such understanding could not be arrived at on the basis of a simple theoretical model.

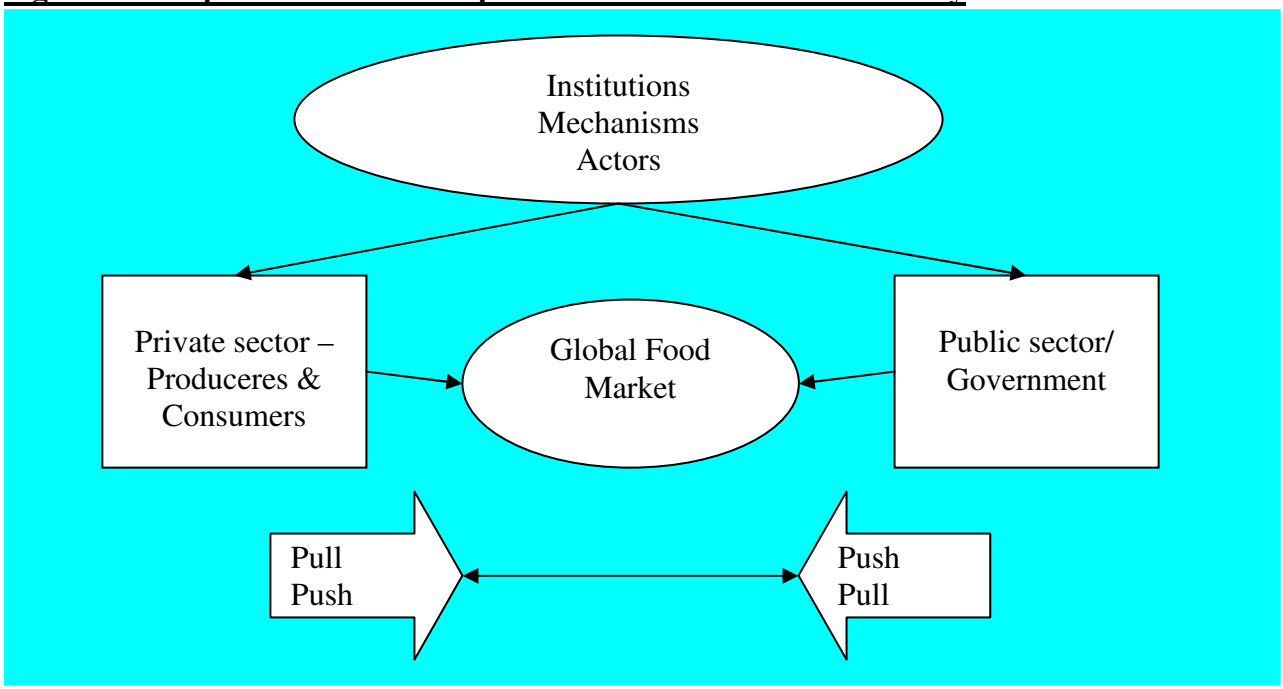
Section six

Conclusion - Model for Conceptual Framework

What is the adequate theoretical model from the perspective of economics for the COP-project? As indicated, the Veblenian focus on intangible versus tangible capital is essential in order to capture and understand the economic process. With a focus on transformative capacity in the COP-project,

we suggest to turn the attention towards change in intangible capital. Exactly here it is possibly to create a link to the concept of transformation. Such choice makes it possibly to unify a pluralistic approach for the COP-study. The idea of a pluralistic approach refers to the assessment that organic agriculture must be understood within a broad theoretical as well as empiric framework. Recent research on intangible capital by Tomer (Tomer 2007) provides part of such framework. Combined with the framework as outlined shortly in the research report with reference the dissertation (Rasmussen 2007) the following model represents a general model of reference

Figure 12: Proposal for The Conceptual Framework in the COP-study



Supply and demand in an economy are the superficial terms for the economic process, where accumulation and allocation of capital constitute the real foundation. Politics enters the economic process and contributes with the idea of democracy. With reference to the Veblenian Economics, we have two universal mechanisms : 1. The market and the price system, and 2. Interstitial adjustment. This is the general model for any capitalistic society and reflects as such how to integrate a political focus in any social science analysis. Without such framework of reference, the analytical result risk to become biased or even result in wrong conclusions. A study of the evolution of the organic food market with an explicit choice of focus on the political influence point of departure has to be the economic process. The organic food market is formed by this process and the contextual political dimension is part of the process. The idea of push and pull strategies offers a potential framework to arrange the discussion (Hamm 2002: ; Rufin 2002: ; Lampkin 2003). From Georgescu-Roegen, we have the idea that the thoughts of man rest on a dialectical concept with an element of randomness. GR's dialectical concept can be simply illustrated by this quote with reference to consumer choice: "…where we take for granted that between 'preference' and 'non-preference' there *must* be 'indifference'" (Georgescu-Roegen 1971: 47). Exactly because of his concept of dialectic, the idea of "Random" is at the centre of his theory, and GR stresses that it is in the nature of change that we cannot predict future events. The actual world is an order, which

cannot be represented by a strict, causal analytical formula. As GR states, "...the economic process as a whole is not a mechanical phenomenon" (Georgescu-Roegen 1971: 139). This differentiates the theory of man from the conventional rational man. Because politics are based upon this assumption, politics in general become wrong.

Having established the theoretical framework for the model the next issue is how to arrange the indicators? The establishment of a second and a first macro order with reference to Hvelplund may assist us in this process. The argument is the idea of the focus on policies as an element with a transformation capacity. The idea of policy, politics and polity is further strengthened with the adoption of the institutional framework elaborated by Halpin and Daugbjerg (Daugbjerg 2007) which exactly focuses on the idea of differential institutional capacity. Methodologically, it is a process involving both a deductive and an inductive dimension. It is precisely within this process a selection of indicators is to be found. Such research process consists of a trial and error process, because we simply don't know exactly where to focus. The research in the area of organic agriculture is rather lightweight. This brings me to conclude: The double concept of push and pull in the above model may tentative be translated into empiric indicators, where the research argues for a multiple framework that satisfies:

- *Focus on the nine explanations for understanding organic agriculture with point of departure in the institutional explanation and with an explicit integration of the demand explanations*
- *Focus on rules of the game with explicit address to change in first order, immaterial structures and rules dealing with social power, social organisation and actors interest*
- *Integration of the two Veblenian mechanisms in the dynamic analysis*
- *A broad empiric focus with reference organic agriculture*
- *A methodological broad focus with reference to a cross-disciplinary study*
- *Focus must be an answer to the question why organic agriculture still is a niche?*

Initially two descriptive indicators may be point of departure:

- *the evolution in organic land*
- *the evolution in the retail market for organic food*

Exactly because of the comprehensive list, we must identify a method that unite the need for a simplification and maintains the complexity of the subject. In order to understand the evolution point of departure is a comparative study of:

- *the evolution in the societal institutional set-up*

Exactly this indicator must be arranged into a mixture of sub-indicators and a comparative test including an evaluation of the test must be implemented. This is the task for next phase of the project.

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