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**Price, authority, ideology and rules:
Co-ordination mechanisms and
co-ordination forms**

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ABSTRACT

Theories of co-ordination are partial and confuse mechanisms and forms. This paper suggests a theoretical integration based on New Institutional Economics (NIE) extended by contributions from Organisation theory. A distinction is made between co-ordination mechanisms, fundamental alternative options for obtaining co-ordination, and co-ordination forms, idealised descriptions of institutionalised co-ordination-solving devices in the economy. Co-ordination forms contain combinations of various mechanisms and one mechanism can occur in various forms. Four co-ordination mechanisms are identified; Price, Ideology, Authority and Rules. *Price* refers to exchange between autonomous parties, *Ideology* to shared systems of values and beliefs, *Authority* to differences in rank and commands of a superior, and *Rules* refers to formal regulations and instructions. The choice of mechanisms is explained by contractual scale advantages, teamwork situations, asset specificity, transfer of knowledge, degrees of complexity, environmental stability and human motivation. The theory for price and authority is based on NIE, whereas the theory for rules and ideology is based on Organisation theory. The quadripolar set of four co-ordination mechanisms adds new perspectives to the theoretical analysis of market forms, as well as hierarchical forms and other forms. Finally, different forms are briefly analysed as combinations of these four mechanisms.

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INTRODUCTION

Different co-ordination theories are biased toward certain mechanisms and forms. Neo-classical economics focuses on market co-ordination and neglects co-ordination by alternative institutions (North 1984). Co-ordination within firms, on the other hand, is analysed in detail in various organisation theories in the field of management research. These theories emphasise formal co-ordination rather than informal/cultural co-ordination, pre-planned co-ordination rather than on the spot co-ordination, top-down co-ordination rather than self-co-ordination and material interdependencies rather than abstract interdependencies (Larsson 1990). The theoretical situation is fragmented with various partial approaches but there is, at least in Scandinavian research, evidence of an increasing degree of integration based on the writings of the Carnegie-school (Engwall 1995).

The new institutional economics (NIE), on the other hand, analyses a wide spectrum of co-ordination forms as it covers both market and hierarchies. It has developed from neo-classical economics but it also embraces the Carnegie school-assumption of bounded rationality due to imperfect information. NIE is thus a theory that can be used for further integration of partial approaches, as it embraces a wide spectrum of mechanisms and forms, and integrates theoretical traditions from neoclassical economics and the organisation theories of management research.

But NIE has been criticised. Doz & Prahalad (1991) argue that NIE is too simplistic for analysing the complexity of co-ordination in today's large enterprises. NIE analyses the choice between different co-ordination forms, but needs more nuance for analysing co-ordination within a certain form. One problem is that NIE, as other co-ordination theories, links the analysis of mechanisms to the analysis of specific forms, i.e. the price mechanism is connected to market forms and co-ordination by authority to hierarchies. This is illustrated by Williamson (1996) who, on the

one hand, describes markets/hierarchies as mechanisms of governance, modes of governance and contractual instruments and, on the other hand, as forms of governance, governance structures and organizational forms.

The analytical connection between mechanisms and forms is unfortunate since a certain mechanism can occur in several forms. Co-ordination by price is used in firms whereas co-ordination by authority occurs in markets. There is therefore a need for a clear theoretical separation between mechanisms and forms, which been suggested by Bradach & Eccles (1989). This paper separates the analysis of co-ordination mechanisms from co-ordination forms. Mechanisms are fundamental alternative options for obtaining co-ordination, whereas forms are idealised descriptions of the co-ordination-solving devices that have emerged and institutionalised in the economy. With this approach a certain co-ordination form can use different co-ordination mechanisms, according to transactional characteristics, and a certain mechanism can be used in different forms. Furthermore, this paper integrates NIE with contributions from Organisation theory to create a more comprehensive analysis of co-ordination mechanisms and to enable an analysis of specific forms in more detail.

FOUR CO-ORDINATION MECHANISMS

NIE provides an analysis of the choice between the price-mechanism of markets and the unified governance of hierarchies. Extensions of NIE has identified co-ordination by "trust" or "ideology" as a third option used in forms that has been named clans, networks or brotherhoods (Ouchi 1980, Powell 1991, North 1992, Collin 1993). Braddach & Eccles (1989) build on these contributions and identify price, authority and trust as fundamental co-ordination mechanisms, they also make clear the distinction between mechanisms and forms. Within the field of management

studies and organisation theory, however, several co-ordination mechanisms are discussed in more detail. This discussion was early summarised by Edström & Galbraith (1977) as a choice between co-ordination by centralisation, bureaucratisation and socialisation. Later contributions distinguish between centralisation, formalisation and socialisation (Bartlett & Ghoshal 1992).

Taken together, these different traditions have combinatorial possibilities. The bipolar framework of NIE (price-authority) and its extended tripolar version (price-authority-trust/ideology) can be combined with the tripolar framework of Organisation theory (centralisation, formalisation and socialisation). The result is a quadripolar framework with the four co-ordination mechanisms *price*, *authority* (corresponding to centralisation), *rules* (bureaucratisation, formalisation) and *ideology* (trust, socialisation). *Price* refers to the exchange between autonomous parties, *Ideology* to shared systems of values and beliefs, *Authority* to the commands of a superior to subordinates, and *Rules* refer to co-ordination by formal regulations and instructions. The four mechanisms should be analysed separately, not in connection with specific forms, and as alternatives that can be combined in various ways, depending on the transaction costs in specific situations.

Compared to earlier extensions of NIE, this theoretical framework adds *rules* as a fourth mechanism. Rules have in earlier works been mixed together with authority and identified as a mechanism used in hierarchies. Mitchell (1991, p 105) writes "hierarchy involves a stratification of authority and the following of rules". But rules can be used for co-ordination in other forms as well. Rules in market transactions, for example, are illustrated by highly elaborated formal contracts, signed by two exchange parties. Rules should therefore be analysed as a separate co-ordination mechanism. Below follows theoretical explanations of the choice between the four co-ordination mechanisms.

Price and Authority

Why should one institutional co-ordination mechanism be used before the other? In this paper, explanations of the choice between price and authority is deduced from NIE and the theory of markets vs. hierarchies. The choice between rules (formalisation) and ideology (socialisation) is then explained from the view of Organisation theory, more specifically by using its analysis of formalisation and socialisation/culture as alternative options in organisations.

Neo-classical theory analyses the advantages of price in markets. If the distribution of information is symmetrical and there are alternative partners, the relative-price determined by supply and demand direct exchange parties to an efficient allocation. Here, strong productive incentives are created and the relative-prices allow co-ordination with a minimum of information required. Another, and more dynamic, advantage is that co-ordination through exchanges allows decentralised actors to use their dispersed specific knowledge for development with a multitude of competing experiments and an incremental process (Hayek 1945, Williamson 1985). Price or exchange between autonomous parties, therefore has certain advantages as a co-ordination mechanism due to its strong productive incentives and its use of dispersed knowledge and incremental change. Co-ordination by price also allows demand from different sources to be allocated, enabling indivisible resources to be fully utilised.

On the other hand, asymmetrical information and lack of alternative exchange partner motivate co-ordination through the involvement of an authority. Schumpeter early observed the entrepreneurial role of creating "new combinations" in the market economy. NIE explains this entrepreneurial role from a transaction cost view. The entrepreneur acts as a middleman between many buyers and sellers. Hereby the entrepreneur reaps scale advantages compared to individual

buyers/sellers in collecting information, in design of a product, in negotiating contracts and in performing control-functions (Akerlof 1970, Cheung 1983, McNulty 1984). Then why does the entrepreneur sometimes develop authority over those that contribute to a product? Teamwork-situations or joint production have explained the need for authority. When individual contributions in a group are difficult to separate from each other, and everyone needs to co-ordinate with everyone else, an authority can act as a centre for communication. The authority can also make decisions and give sanctions, thereby reducing transaction costs for information and misdirected incentives in teams (Alchain & Demsetz 1972, Williamson 1975, Alchain & Woodward 1987). Asset-specific investments are another reason for co-ordination by authority, as they reduce the risk for opportunistic behaviour when one party is adapting especially for another party. Asset specificity thus explains vertical integration of different steps in production (Williamson 1985, Alchain & Woodward 1987). A third case of co-ordination by authority is transfer of specific knowledge, i.e. unique knowledge that is difficult to articulate and formalise (Polyani 1958). Co-ordination through price meets transaction costs due to the information paradox (Arrow 1973) and due to difficulties to secure ownership rights, which explain firm expansion by horizontal integration (Teece 1982, Williamson 1985, Liebeskind 1996). Specific knowledge is a heterogeneous asset that explains competitive advantages (Penrose 1959:1980, Barney 1991) and therefore, control of knowledge-diffusion is crucial. Finally, co-ordination by authority has dynamic advantages due to the possibility for managers to monitor different parties to rapidly move into a new direction. When central positions have information advantages a superior party can direct others to perform a radical change, which is a final argument for co-ordination by authority (Williamson 1991).

Co-ordination through the commands of an authority has, of course, also disadvantages compared to the price-mechanism. One disadvantage is weaker and biased incentives due to the fact that rewards to subordinates do not directly correspond to their contributions to final results (Alchain & Demsetz 1972, Williamson 1985). Another disadvantage is the costs of hiring superiors, and the risk that superiors act in accordance to their own interests. These principal-agency problems raise the question of how to control managers and create efficient incentives (Fama 1980, Fama & Jensen 1983, Williamson 1985).

Rules and Ideology

Co-ordination by rules and ideology correspond to the formal and informal restrictions that guide behaviour in society, as described by North (1990). Ouchi (1980) discusses rules (formal regulations and instructions) as a mechanism used in bureaucracies. Rules can also be used in other forms. Rules are explicit *ex ante* constructions illustrated by formal contracts in market exchanges. Within firms, written manuals and planning systems illustrate the use of rules. Rules (formalisation) have played an important role in the writings of organisation theorists and cover different levels and functions in organisations, from work operations to the overall firm-strategy (March & Simon 1958:1994, Jelinek 1979, Mintzberg 1994). Weber (1924:1977) early described bureaucratic organisations, which are co-ordinated by rules and therefore are less dependent on the individual than other organisations. Taylor (1947) introduced the idea that work in organisations can be analysed and specified by experts, hence securing the most efficient conduct among employees.

Co-ordination by rules is an alternative to co-ordination by authority, i.e. analysed as a choice between centralisation and bureaucratisation (Child 1973). Rules are also an alternative to ideology, i.e. illustrated by co-ordination in the mechanic and organic organisation form as described

by Burns & Stalker (1961). Edtröm & Galbraith (1977) identify centralisation, bureaucratisation and socialisation as three alternative mechanisms, which resemble co-ordination by authority, rules and ideology.

Rules reduce costs of communication between individuals. Co-ordination is created without the interpretations made by actors exchanging, collaborating or giving orders. Therefore, rules save time and efforts in recurrent situations. Rules also provide stability as future performance can be specified in advance (Galbraith 1973).

Rules are used in predictable situations or in situations where a high degree of predictability is desired as the costs of deviations are high (for example for security reasons to prevent human mistakes). But the analyst who constructs regulations and instructions must have knowledge enough to do so. This implies that transactions should be "simple", that it should be possible for external analytical experts to understand and codify them. (Mintzberg 1983, 1994). In sum, Mintzberg (1983) identifies standardisation of work processes (comparable to rules) as efficient in simple and stable situations, i.e. situations that are not too complicated for rule-makers to grasp, and that situations are predictable, alternatively in situations where a high predictability is called for.

Disadvantages with co-ordination by rules occur when tasks are complex and the outcome is hard to predict. Other disadvantages are that organisations run by rules tend to be obsessed with control and that individuals involved in transactions are alienated and that hostility and suspicion prevails (Mayo 1949, Mintzberg 1983). With rules a minimum level of performance can be secured but performance at higher levels demand other mechanisms.

Co-ordination by ideology (shared beliefs and values) is, therefore, an alternative to rules. Alternatively, "trust" could be used to describe this mechanism. But the use of the concept trust

has been criticised in NIE and organisation theory. Williamson points at "the elusive notion of trust" (1996, p 250), referring to Gambetta (1988). Creed & Miles writes:

"...there does not yet appear to be a consensus on the role of trust in organization theory. Theories of its role range from viewing trust as the most general of three classes of control mechanisms ... to viewing trust as the essential factor that permits all forms of risk taking in any social system ..."

(Creed & Miles 1996, s 17)

In this paper *ideology* is used to describe co-ordination based on the shared views and values among transactional participants. At a societal level North analyses the importance of informal constraints and describes ideology as having "an essential normative element; that is, they explain both the way the world is and the way it ought to be." (North 1992, s 485).

Ethical codes, trust and confidence have been identified as important to facilitate market exchanges (Arrow, 1973). Macneil (1978) identifies relational contracts with shared norms and expectations as a way of achieving co-ordination in complex long term exchanges that are difficult to measure. Ouchi (1980) identifies performance ambiguity and goal incongruence as the forces behind the use of co-ordination by "traditions" rather than rules and price. Traditions involve the development of common values and beliefs among the participants.

"..The set of traditions/.../may produce a unified, although implicit philosophy or point of view, functionally equivalent to a theory about how that organization should work. A member who grasps such an essential theory can deduce from it an appropriate rule to govern any possible decision."

(Ouchi 1980 p 139)

If the outcomes of transactions are difficult to predict and the participants involved have better knowledge than an external party, co-ordination should be based on the knowledge of the involved participants. High complexity and difficulties to foresee outcomes obstructs co-ordination by price, authority or rules. If rules are to be used in situations which are simple and stable, ideology with mutual adjustment, standardisation of skills and shared values and norms is the mechanism for situations that are complex and dynamic (Edström & Galbraith 1977, Mintzberg 1983, Bartlett & Ghoshal 1992). Ideology is also a mechanism used in situations when individual motivation and creativity is crucial.

A disadvantage with co-ordination by ideology is that individuals have to internalise certain values and views, which might be a costly process. An organisation can promote a common ideology by its recruitment policy, by internal training programs and internal communication.

The co-ordination mechanisms give a common theoretical basis for analysing institutions in the economy, including various market forms and hierarchical forms. Different forms are briefly discussed in the next section.

THE VARIETY OF CO-ORDINATION FORMS

The four co-ordination mechanisms can be used to analyse the choice of co-ordination in single transactions as well as in sets of transactions in more elaborated co-ordination forms. The different mechanisms occur in market forms and hierarchical forms, as well as in other forms.

Market forms make significant use of the price mechanism but vary according to characteristics of the transaction performed. Various market forms can be analysed according to

transaction characteristics and the co-ordination mechanisms used. One way to distinguish forms is to study how forms use different mechanisms in combination. Market forms are characterised by the use of the price mechanism and different market forms can be identified according to how price is combined with other mechanisms. A market where exchange parties develop high levels of shared norms and expectations is a co-ordination form that is using the mechanisms price and ideology. This form could refer to bilateral markets as described by Williamson (1985) and Jansson (1994). High levels of complexity and difficulties to foresee the specific outcome of an exchange explain these forms. A market with detailed formal contracts and few personal relationships or shared values and views is a form comprised of price and rules. These forms are characterised by simple transactions (possible to analyse and codify) and a high degree of predictability in performance and/or high costs of deviations. A third version can be found in markets influenced by a third party, for example markets where a middleman co-ordinates buyers and sellers. Entrepreneurial scale-advantages in activities that have to do with information, design, contract and control explain the combination of authority and price in this form. These examples briefly illustrate co-ordination by the use of various co-ordination mechanisms in different market forms. More complex combinations are of course possible, with the identification of three or four mechanisms. Trilateral markets, for example, where a third party is solving problems due to unclear formal contracts (Williamson 1985, Jansson 1994), could be analysed as a form based on price, rules and authority.

Co-ordination forms between markets and hierarchies are characterised either by the use of ideology or by the use of rules. In complex teamwork situations, for example, co-ordination is achieved by ideology combined with authority. Clans described by Ouchi (1980) illustrate this combination. On the other hand, the bureaucracy described by Weber (1924:1977) exemplifies co-

ordination by rules and authority, and could be explained by teamwork situations and simple activities with a high degree of predictability in performance and/or high costs of deviations.

In hierarchical forms there is a significant use of the authority mechanism. Hierarchical forms, as other forms, vary depending on the characteristics of the transaction performed. Hierarchical forms that combine authority and rules occur in stable and simple situations. These forms are illustrated by the U-form (Williamson 1985). Hierarchical forms that combine authority, rules and price are illustrated by the M-form (Williamson 1985). Important characteristics of the M-form are diversified firms with distinguishable outputs in stable and simple situations. As complexity and unpredictability increases, hierarchies tend to increase the use of co-ordination by ideology (Edström & Galbraith 1977).

CONCLUSION

This paper expands NIE with Organisation theory and distinguishes between co-ordination mechanisms and co-ordination forms. Four different mechanisms are identified, price – authority and rules – ideology. The choice between the mechanisms is discussed and analysed pair-wise, which leads to a brief discussion of various co-ordination forms. Together, the distinction between mechanisms and forms and the use of NIE extended with Organisation theory, is a step towards a more comprehensive theory on co-ordination mechanisms which in turn can make it possible to study specific co-ordination forms in more detail.

NIE explains the choice between the price-mechanism of markets and the co-ordination through authority in hierarchies. Later extensions to the theory include a third mechanism (i.e. trust, ideology) and identify a third class of forms (i.e. clans or networks). In the fragmented field

of Organisation theory and Management, on the other hand, mechanisms of co-ordination within the firm have been summarised as a choice between centralisation, bureaucratisation and socialisation (Edström & Galbraith 1977). This paper integrates these perspectives. The bipolar framework of NIE (price-authority) and its extended tripolar version (price-authority-trust/ideology) is thus combined with the tripolar framework of Organisation theory (centralisation, formalisation and socialisation). The result is a quadripolar framework integrating these traditions.

The theory for price and authority is based on NIE, i.e. contributions from Williamson (1975, 1985), whereas the theory for rules and ideology is based on Organisation theory, i.e. Mintzberg (1983). *Price* refers to the exchange between autonomous parties, *ideology* to shared systems of values and views, *authority* to differences in rank and the commands of a superior and *rules* refer to formal regulations and instructions. Transaction costs determine the use of one mechanism before the other. By using the New Institutional Economic theory and its explanations of the choice between markets and hierarchies, co-ordination by price is compared to co-ordination by authority. Price gives strong result-oriented incentives and enables incremental development based on specific knowledge among dispersed actors. Price also allows demand from different sources to be allocated. Co-ordination by authority is explained by the entrepreneur/middleman who, in contrast to the individual buyer/seller, reaches scale advantages by the design of products, by collecting information, by making contracts and by controlling quality. The entrepreneur develops a superior role to resource-owners when transactions are characterised by teamwork problems, when parties are involved in transaction specific investments, when the authority can shelter and diffuse specific knowledge, and when an authority at a central position can gain advantages by the ability to reach radical change. The analysis of the choice between rules and ideology is based on contributions from

organisation theory, especially the discussion about co-ordination by formalisation or socialisation/culture. Co-ordination by rules is explained by transactions with low complexity and high stability. Rules are used to avoid deviations and secure performance, or to improve performance when individuals lack important knowledge. Ideology, on the other hand, is explained by situations with high complexity and low stability. Ideology is also used when motivation, creativity and individual responsibility are important for the common result.

The identified co-ordination mechanisms are fundamental alternative and combinatorial options in market forms, as well as hierarchical forms and other forms.

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