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# SERIE RESEARCH MEMORANDA

## **A comparative institutional perspective on urban land use and revitalisation policy**

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**A COMPARATIVE INSTITUTIONAL PERSPECTIVE  
ON  
URBAN LAND USE AND REVITALISATION POLICY**

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**Abstract**

In the context of the devolution of public policy, recently much administrative competence in land use policy is given to **decentralised** forms of decision-making in which local (or regional) authorities and the private sector play a more prominent role. The paper describes the pathway to a more institutional multi-actor mode of urban land use in the framework of deregulated land markets and maps out various relevant aspects of competitive land use. In particular, an attempt is made to identify the crucial ‘drivers’ of this complex decision process in an urban context, against the background of revitalisation objectives for cities.

The analysis is illustrated by means of a comparative study on urban development projects in The Netherlands. A particular type of qualitative classification analysis, originating from artificial intelligence, coined rough set analysis, is developed to assess and extract the most important key factors that are responsible for successes and failures of recent development plans in Dutch cities. The approach allows us to pinpoint the most critical policy variables.

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## 1. New Urban Challenges

Cities have always been a fireplace of economic activity and a source of innovation (see Balchin et al. 2000, Bertuglia et al. 1998, and O'Sullivan 2000). The urban economics literature has convincingly demonstrated that agglomeration economies offer clear locational advantages to urban modes of living and working. The so-called 'new economic geography' has even positioned urban economics in the centre of international trade and networks (see e.g. Fujita et al. 1999). The emergence of new economic opportunities for the city – or, in general, for large metropolitan areas – has prompted a world-wide debate on the 'new mission' of urban governments. A re-positioning of urban policy seems to be at stake, in which in particular the interface between the public and the private sector is of critical importance. The competitive advantage of cities – in terms of their potential to create socio-economic progress – is largely contingent upon their ability to attract efficiently operating firms which through their sense of entrepreneurial spirit are capable of producing an added value out of their urban location. Several years ago already Benjamin Chinitz (1961) has stated: "*An urban area **full** of competitive industries is likely to create new business and more growth*". The question is, however, whether current urban policies generate appropriate **seedbed** conditions for a favourable re-positioning of the city (see also Bertuglia et al. 1997 and Sivitanidou 1997).

Several background factors may be mentioned which necessitate a re-orientation of urban policy. First, cities are increasingly becoming nodes in a broader – often international – network economy (Castells 1996). They transcend the borders of the regional and national territory and are more and more a player in an international competitive force field. Next, the functional transformation of the traditional industrial structure of urban areas towards a service and ICT orientation means a radical change in urban policy-making; urban economic processes become more volatile and business firms tend to become increasingly footloose. A major challenge for the urban administration is not only to attract new firms, but also to keep existing business life within the urban territory, a phenomenon also clearly witnessed in modern 'edge city' development (see Garreau 1988 and Medda 2000). As a consequence, modern cities – as functional-economic and administrative entities – are more and more subject to interurban competition in which the city administration is an important – but not the exclusive – stakeholder.

In many countries this has led to a call for more local competence and **decentralisation** of administrative power. This devolution process has made cities more aware of the need to develop tailor-made urban strategies and to create proper incubator conditions for incumbent and new businesses. Essentially the urban investment climate is a decisive factor for effective policy-making in a modern city. (Adair et al. 1999) Consequently, the balance between private and public investments is a critical success condition for modern urban administration.

Against this background, the present paper aims to identify and investigate critical success factors for urban restructuring on the basis of public-private partnerships (PPP) in urban revitalisation and transformation processes. A PPP means that the decision on a certain urban development plan is not exclusively a public responsibility, but also a result of private and public negotiation and agreement processes. This means in general the involvement of a multiplicity of stakeholders, with different policy objectives and targets. Urban restructuring tends to become a multi-actor task.

Clearly, this change in views on the competence of the public sector has prompted an intensive debate on traditional arguments in favour of government intervention (such as paternalism, presence of externalities, equity motives, ecological and conservation motives, and scale advantages in natural monopolies). The traditional intervention measures of the government were: price instruments (taxation, subsidies), regulation (prohibitions, incentives), and own production under government responsibility. A clear judgement of the performance of the public sector was, however, usually hampered by an interference with the political process (see Downs 1957 and Frey 1983), in particular the lack of incentives in efficiency improvement, the influence of the election process, and the robust and influential position of the civil servants. It goes without saying that the city administration is faced with rather complex institutional problems in a PPP context. Seen from this perspective, this paper seeks to identify the critical success factors for urban development plans (in particular, revitalisation projects). After a sketch of the recent re-orientation of urban policies we will present a comparative study on urban revitalisation projects in the Netherlands. In view of the small sample size and the qualitative (**often** nominal) information on the performance of such projects, a new meta-analytical tool, viz. rough set analysis, is applied. Several empirical results are presented and the paper is concluded with some policy lessons.

## 2. New Urban Pathways

In the light of the dynamic developments of cities sketched in Section 1, the market of urban facilities deserves a closer look. Urban facilities are produced nowadays in different institutional configurations and with different socio-economic objectives. But in most cities, the efficient supply of public commodities is increasingly brought under a market-based regime, so as to stimulate flexibility and innovativeness in the city. This orientation towards the market sector leads to the need to get also private stakeholders involved in the development of the urban economy. These stakeholders may be project developers, banks, exploitation companies or institutional financiers. Consequently, financial viability and profitability become 'Leitmotives' for urban development plans (cf. Harding et al. 1994). The general expectation is that a market orientation for urban development plans will create more flexibility, efficiency, efficacy, innovativeness, and socio-economic spillovers. Clearly, market imperfection should not be overlooked (such as high entry costs, high information costs, negative external costs, or **monopolisation**). It is, of course, a major challenge for urban administrations to strike a balance between different (often conflicting) motives in a complex urban force field (cf. Healey et al. 1992).

The urban activity pattern has to reach an equilibrium between economic, socio-cultural and ecological functions. This is not only necessary for the indigenous urban policy, but also for the external marketing policy of the city (Kotler et al. 1993). A marketing strategy is a common vehicle in an open competitive environment and should address the business sector on the basis of entrepreneurial attitude of the urban administration and with a view to global developments. **Asworth** and Voogd (1988) define 'city marketing' as follows: "*Specific planning actions designed to initiate or stimulate processes that improve the relative market position of cities in regard to particular activities, such as attracting commercial investment, or improving the effectiveness of service activities whether in the public or private sectors.*" In this context Porter (1995) claims: "*Governments can assume a more **effective** role by supporting the private sector in new economic initiatives. It must **shift** its focus from direct involvement and intervention to creating a favourable environment for business.*" This means that the city administration is becoming an agency which manages the urban edifice as a commercial market product. The concept of the 'entrepreneurial city' advocated by **Hardin** et al. (1994) refers to a place "where key

*interest groups in the public, private and voluntary sectors develop a commitment to realising a broadly consensual vision and mobilise both local and non-local resources to pursue it*". Thus an entrepreneurial city is sensitive to the wishes of the business sector, has a strong sense on innovativeness and flexibility, is **project-oriented**, strategic in nature, seeks co-operation with the private sector (including project developers), aims to create an added value for the city, and keeps an open eye on socio-economic performances of the city. Clearly, given the multifunctional and heterogeneous nature of the urban economy, a single and unambiguous performance indicator is difficult to identify. For example, for urban residents the quality of the environment, the access to public and socio-cultural facilities or a favourable socio-economic position may be a key factor, while for business life such factors as availability of land, accessibility, the local tax system, or a flexible and high quality **labour** market may be a crucial condition (see also **D'Arcy** and Keogh 1996 and Jones 1996).

In this context, Kotler et al. (1993) have made a distinction of urban policy interest according to four main target markets, viz. visitors, residents & workers, business & industry, and export markets (see for a further subdivision Table 1).

| <b>Visitors</b>  | <b>Residents &amp; Workers</b>   | <b>Business &amp; Industry</b>  | <b>Export Markets</b>   |
|--|--|---|---|
| <ul style="list-style-type: none"> <li>• Business visitors</li> <li>• Non-business visitors</li> </ul> | <ul style="list-style-type: none"> <li>• Professionals</li> <li>• Skilled workers</li> <li>• Wealthy individuals</li> <li>• Investors</li> <li>• Entrepreneurs</li> <li>• Unskilled workers</li> </ul> | <ul style="list-style-type: none"> <li>• Heavy industry</li> <li>• 'Clean' industry</li> <li>• Entrepreneurs</li> </ul> | <ul style="list-style-type: none"> <li>• Other localities within the domestic markets</li> <li>• International markets</li> </ul> |

Table 1. A classification of four urban main target markets  
Source: Kotler et al. (1993)

Clearly, the focus of urban policy may either be on acquisition (aiming to attract new firms and functions) or on restructuring or revitalisation (aiming to reinforce the economic position of incumbent activities). In the first case an external orientation is needed, whereas in the second case the policy attention is mainly

directed towards firms already located in the city. In both cases however, the aim is to maximise the incubator potential of inner city areas through the mechanism of agglomeration economies (comprising scale, **localisation**, urbanisation and linkage advantages) in an increasingly globalizing world.

### 3. Urban Policy in a Public-Private Domain

The emerging new role of urban governments prompts a discussion on the competence of the public sector. The question whether – and if so, to which extent – urban governments should intervene in the market has extensively been dealt with in the transaction costs approach. In classical economic theory these transaction costs are assumed away, e.g., because information is free and accessible without costs to all economic actors. In the absence of transaction costs, even externalities will be included in the market or government decisions, because in this case (costless) negotiations will continue, until there is a Pareto-optimal allocation of goods (see Rienstra 1998). But in practice, every transaction leads to costs (e.g. negotiating, preparing of contracts, control, information acquisition, etc.) In such a case, there may be a case for public intervention, e.g., to reduce monopolisation of information. However, a government intervention also leads to new transaction costs. It is thus clear that it is difficult to define an unambiguous balance between the tasks and **competences** of the public versus the private sector.

In the literature various arguments can be found which would justify public intervention (see for an overview of arguments Fokkema and Nijkamp 1994). Usually three major classes of argument can be identified, viz. the “infant’ activity argument, the market imperfection argument (in particular, in case of imperfect competition, imperfect information or malfunctioning markets), and the equity (or ethics or justice) argument. It should be noted that transaction costs may play a preponderant role at the interface of the private and public sector.

In the context of the urban land market, there is often not a clear unambiguously operating market, as urban land use is the result of a multiplicity of complex structures and institutions. It is sometimes argued that – instead of substantive rationality – urban development strategies are much more driven by procedural forms of rationality (in particular, learning capacities of organisations and of the system at large). In this institutional perspective much emphasis is placed on organisational models which also take into account transaction costs from



opportunism in human behaviour (see Williamson 1985). As a consequence, the urban regulatory system comprises economic, technological and social dimensions, which have to be reconciled in a collective decision-making process in which mutual agreements and contracts play a critical role. In urban rehabilitation strategies, for instance, the behaviour of contractors, based on bounded rationality and opportunistic behaviour, plays an essential role (see Moschandreas 1997). In case of externalities (or social costs) the property right principle advocated by Coase (1937) is then an important ingredient for urban policy-making. Burgenmeier (1999) has recently argued that the Coasian definition of transaction costs (information, negotiation and uncertainty) can be extended from those emerging on the market to costs outside the market.

Clearly, as outlined above, the role of the public sector is increasingly moving towards a **diffuse** force field in which public and private interests have to be reconciled. In the past years this has necessitated public decision-makers to seek for a new ‘modus operandi’ with the private sector. And as a consequence, public-private partnerships (**PPPs**) have become a rather popular institutional configuration in urban development policy, as they may create win-win situations as a result of mutual benefits or socio-economic symbiosis. A PPP is an **institutionalised** form of co-operation of public and private actors who on the basis of their own indigenous objectives work together for a joint target, in which both parties accept investment risks on the basis of a predefined distribution of revenues and costs. In practice, a PPP is not a fixed structural model for collaboration between public and private partners, but just a tailor-made organisation for the realisation of a given project. Flexibility, speed, cost efficiency and, in general, reduction of transaction costs are the main benefits of a PPP.

It is – in the light of the above observations - no surprise that there is not a single PPP model. Examples which demonstrate the variety are: the building-claim model, the joint-venture model and the concession model. The various types of PPP modals can illustratively, but certainly not exhaustively be typified as follows (see Table 2).

| <b>Model</b> | <b>Role public sector</b> | <b>Role private sector</b> | <b>Risk / financing</b> |
|--------------|---------------------------|----------------------------|-------------------------|
|--------------|---------------------------|----------------------------|-------------------------|

|                |                           |                          |                |
|----------------|---------------------------|--------------------------|----------------|
| Traditional    | Land exploitation         | Real estate exploitation | Proportionally |
| Building claim | Land exploitation         | Real estate exploitation | Proportionally |
| Joint venture  | Exploitation company      | Exploitation company     | Joint          |
| Concession     | Formulation of conditions | Land exploitation        | Proportionally |

Table 2. Models for PPP

Source: Van der Burch (2000)

There is not an unambiguous choice for any of these models, as their effectiveness and feasibility is contingent on various factors, such as the willingness to co-operate. In this context, Mintzberg (1997) has formulated two hypotheses on the effectiveness of organisational structures, viz. the congruence structure (a situation when situational -or contingency- factors and design parameters have a close matching) and the configuration hypothesis (a case of internal consistency among all design parameters). The situational factors are mainly determined by features such as stability, complexity, diversity, information and communication, and degree of cooperativeness.

The number of fields in urban planning where PPP models are applied is rapidly increasing. Especially in the area of infrastructure provision (e.g., parking facilities), residential construction, urban development and revitalisation projects and integral urban (or inner-city) development, PPP solutions have become rather popular. Recently, also PPP arrangements in the field of public service provision are gaining popularity. Clearly, the implementation of a PPP model is often not taking place without problems. Some major barriers to a successful realisation of PPP configuration are: the long planning horizon, the complexity of various projects, the hold-up problem caused by a change in the position of partners, cultural differences between private and public partners, the role of public subsidies, and the competition rules for public projects as formulated by institutional actors such as the European Commission (see also Van der Burch 2000).

In the light of the complexity and the heterogeneous nature of PPP projects, a thorough investigation into the critical success (or failure) factors of such projects is warranted, as it may generate important and transferable lessons for urban

development planning. Against the background of the varying and diverse nature of PPP projects, a methodology based on comparative case study research seems to be most appropriate (see also Yin 1994). This will be further described in the next section.

#### **4. A Comparative Meta-Analysis of Urban Development Projects.**

The aim of this study is to develop a new methodology for a systematic analysis of critical success conditions for urban revitalisation strategies, based on an investigation and comparative evaluation of various empirical cases in The Netherlands. This methodology is based on modern principles of research synthesis, as developed in particular in meta-analysis (see for a general overview inter alia Van der Bergh et al. 1998, Nijkamp and Pepping 1998, and Florax et al 2001). **Meta-analysis** aims to derive common elements from a series of previously undertaken case studies, with a view to the identification of transferable lessons in the form of conditional statements.

In the framework of our investigation, 9 Dutch studies on urban redevelopment have been undertaken and subsequently analysed. The general procedure to carry out the time consuming field work of these case studies was rather straightforward: selection of potentially interesting cases, exploration of willingness to co-operate among major stakeholders in the urban project concerned, assessment of available information relevant for a systematic case study approach, execution of structured interviews with main parties involved, collection of relevant data from study reports including 'grey' literature and experts, and composition of a systematic data base on features and success factors concerning the urban revitalisation project at hand. Each of the finally selected and investigated projects had to **fulfil** at least the following criteria: it has a PPP feature, it concerns urban restructuring projects with a clear economic function, the project has been (more or less) completed, and the project is suitable for an ex post evaluation. Clearly, whether or not a project is successful was not a selection criterion.

The following case study projects have been selected (see for details Van der Burch 2000):

1. Amersfoort: Eemskwartier (**AME**)
2. Amstelveen : Stadshart (**AMS**)
3. 's-Hertogenbosch: Paleiskwartier (**DEB**)
4. Eindhoven: De Witte Dame (**EIN**)
5. Heerlen: Centrumplan (**HEE**)
6. Maastricht: Sphinx **C ramique** (**MAA**)
7. Nijmegen: Brabantse Poort (**NIJ**)
8. Rotterdam: Beurspassage (**ROT**)
9. **Waalre/Aalst**: Centrumplan (**WAA**)

For each case study detailed systematic information was put together in a data matrix in which both within-case data and cross-data patterns are mapped out. It should be noted that such information in our data base is qualitative in nature. In fact, most available information has a categorical measurement scale (nominal, binary). This had ultimately led to the construction of the following codified data matrix (see Table 3).

Based on extensive interviews with stakeholders, administrative representatives and local experts, also an assessment of the relative success scores of each urban project (and its constituent factors) has been made. These results are systematically mapped out in Table 4, according to executive, organisational, operational, contractual, building and marketing criteria. Table 4 is represented at 2 levels of aggregation, ranging from a comprehensive aggregation to a disaggregate representation over 3 items which each contain two of the above-mentioned criteria. Clearly, the information in this table reflects some sort of an ‘average’ opinion from various experts on the various performance indicators.

|                                     | <b>AME</b> | <b>AMS</b> | <b>DEB</b> | <b>EIN</b> | <b>HEE</b> | <b>MM</b> | <b>NIJ</b> | <b>ROT</b> | <b>WAA</b> |
|-------------------------------------|------------|------------|------------|------------|------------|-----------|------------|------------|------------|
| <b>A. Institutional arrangement</b> |            |            |            |            |            |           |            |            |            |
| <b>1. Type</b> of initiative        | 1          | 1          | 2          | 2          | 1          | 1         | 1          | 2          | 1          |

|  |   |   |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|---|---|
| 2. Type of actors' co-operation                          | 2 | 2 | 2 | 3 | 1 | 3 | 2 | 2 | 1 |
| 3. Spatial scope   | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 1 |
| <b>B. Financing and risk</b>                             |   |   |   |   |   |   |   |   |   |
| 4. Financiers and risk bearers                           | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| 5. Awareness of different risk profiles of project parts | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| <b>C. Contractual arrangements</b>                       |   |   |   |   |   |   |   |   |   |
| 6. Transparency of profit (ability) requirements         | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 |
| 7. Nature of contract                                    | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 |
| <b>D. Revenues and costs</b>                             |   |   |   |   |   |   |   |   |   |
| 8. Financial transparency                                | 1 | 1 | 1 | 1 | 3 | 3 | 1 | 2 | 3 |
| 9. Soil pollution costs                                  | 1 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 10. Expected rise in land price                          | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 |
| <b>E. Project organisation</b>                           |   |   |   |   |   |   |   |   |   |
| 11. Selection procedure of partners                      | 2 | 3 | 3 | 1 | 3 | 2 | 1 | 3 | 1 |
| 12. <b>Stepwise</b> approach to project components       | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 1 |

Table 3. Codified data matrix for 9 urban revitalisation projects

Legend:

**A1:** 1: (mainly) public with limited number of players; 2: mainly private or **public-private** with large number of players

**A2:** 1: traditional; 2: joint venture; 3: concession

**A3:** 1: local; 2: regional; 3: (inter) national

**B4:** 1: mainly public; 2: mainly private; 3: joint public-private activity

**B5:** 1: yes; 2: no

**C6:** 1: yes; 2: no

**c7:** 1: global; 2: detailed

**D8:** 1: good; 2: fair; 3: poor

**D9:** 1: high; 2: modest; 3: poor

**D10:** 1: yes; 2: no

**E11:** 1: open selection; 2: target group approach; 3: combination

**E12:** 1: yes; 2: no

| Success score                                     | AM<br>E | AMS | DEB | EIN | H E E | MAA | NIJ | ROT | WAA |
|---|---------|-----|-----|-----|-------|-----|-----|-----|-----|
| S. Aggregate score                                | 1       | 2   | 3   | 2   | 1     | 2   | 4   | 3   | 1   |
| <b>P<sub>1</sub></b> . Executive & Organisational | 1       | 4   | 4   | 2   | 2     | 3   | 4   | 3   | 2   |

|  |   |   |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|---|---|
| P <sub>2</sub> . Operational & Marketing | 2 | 1 | 3 | 3 | 2 | 4 | 4 | 3 | 1 |
| P <sub>3</sub> . Contractual & Building  | 2 | 3 | 3 | 3 | 1 | 1 | 3 | 4 | 1 |

Table 4. Assessment of success scores for each project

Legend:

1. Unsatisfactory
2. Acceptable
3. Successful
4. Very successful

The success scores in Table 4 are essentially endogenous variables to be explained from the background variables in Table 3. According to Eisenhardt (1989) applied case study research seeks to identify linkages among qualitative and/or quantitative variables or indicators in a framework model with a view to theory construction or hypothesis testing. For comparative case study research a cross-case analysis may be helpful. In many cases a carefully selected sample of 5 to 10 cases may be already be fairly representative. The problem is now that a conventional statistical analysis (e.g., discrete choice modelling) cannot be applied because of the low level of measurement (categorical) of the explanatory variables and the small sample of observations. Therefore, we have to resort to other analytical techniques (in particular non-parametric methods) to extract useful information on the drivers of success from Table 3 and 4. An extremely powerful method, which will be discussed in the next section, is rough set analysis.

## 5. An Artificial Intelligence Approach: Rough Set Analysis

In modern social science research we observe an increasing need for quantitative research synthesis. This means that findings from previously undertaken studies (either quantitative stimulus response studies or qualitatively described case studies) are summarised in a quantitative form so as to draw common research or policy lessons or to derive analytical statements that are transferable to other case studies.

In this context meta-analysis is gaining importance as a tool for quantitative research synthesis. Meta-analysis has already a long history in the natural and life sciences, where (semi-) controlled research experiments are rather usual, so that under fairly common *ceteris paribus* clauses a systematic effort can be made to draw quantitative common results from previous research experiments. Meta-analysis aims to offer a statistical underpinning for the comparison and synthesis of studies

addressing largely the same research phenomenon. Various techniques have been developed in this framework, such as meta-regression analysis or analysis of effect sizes (see for a review *inter alia* Van der Bergh et al. 1997, Glass et al. 1994, Hedges and Olkin 1985, and Matarazzo and Nijkamp 1997).

In applied case study research – even when it is based on a systematically designed research format – we are often faced with results of a nominal character (e.g., yes or no) or of categorical nature (e.g., a qualitative rank order). In such cases the application of standard meta-regression techniques is usually more problematic, in particular if not only the response variables but also the stimulus variables have a low measurement scale (or are only nominal in nature). Furthermore, the sample size of comparative case study research is usually small, mainly for time or financial reasons. In depth case study research based on a sample size of more than 10 is rather rare and in many cases even not necessary (see Eisenhardt 1989). Clearly, conventional statistical methods then fall short, so that we have to resort to qualitative non-parametric statistical methods.

A recently developed and potentially promising method for comparative research in case of nominal or qualitative information and small sample size is rough set analysis (see e.g. Pawlak 1991, Slowinski 1995, Van der Bergh et al. 1997).

Rough set analysis belongs to the family of artificial intelligence based on logical induction and deduction rules, and aims to perform a classification analysis on ‘soft’ data distinguished according to various distinct groupings. If a distinction is made between response and stimulus variables (or ‘decision variables’), then rough set analysis is able to identify causal linkages between classified stimuli and responses. It is then able to derive conditional causal links of an ‘if.. ., then.. .’ nature. These linkage statements mean essentially that an unambiguous result can be found between the occurrence of certain stimuli in given data classes and the occurrence of the response variable in a given class. This means that deterministic statements can be derived based on a qualitatively codified data matrix. Thus, rough set analysis is a multidimensional classification tool that may offer a causal explanation for the emergence of phenomena which are described in nominal categories (or codes). Clearly, the codification of qualitative data from a case study is critical, but the rough set software allows for a sensitivity analysis on the codification (see also Nijkamp 2000). In any case, the construction of an information table is essential in any rough

set analysis, as the only way to discriminate among objects is to classify their **characterising** attributes.

In our case study we will use rough set analysis mainly as a tool for Knowledge Discovery in Databases (KDD) (see Glymour et al. 1997), not only for a retrospective analysis of qualitative data on existing case studies, but also as a possible classification of new cases. In particular, we will use a relatively simple and interpretable 'pattern-focused' model rather than a comprehensive explanatory model for institutional decisions. Consequently, we will apply a data mining algorithm which is able to produce a set of conditional statements on dependencies among variables in a rules form.

The methodology of rough set analysis has extensively been described in the literature and will not be replicated here. Details can be found in Polkowski and Skowron (1998). The software has also various test statistics, so that the results can easily be judged in their robustness and reliability.

The algorithm used here belongs to the framework of the '**RoughFamily**' software system, which is able to perform a rough set based analysis of categorical or nominal data, in particular by assessing the approximation of decision classes, checking dependencies between attributes, identifying reduced subsets of attributes etc. (see Slowinski and Stefanowski 1998). In this way we are able to extract characteristic patterns from the data, to induce decision rules from a set of learning examples, to evaluate the discovered rules by means of proper validation techniques and to construct a knowledge representation in the form of decision rules.

The computer software program used here for the rough set analysis is RDAS (version 1.0). This program had an easy user interface; commands are executed by walking **stepwise** through the menus and submenus. In our case we are especially interested in the rules generator through which decisions algorithms can be derived. These contain inter alia conditional statements (i.e., if..., then...), so that we can identify under which conditions attributes of a phenomenon considered lead to a certain performance of that phenomenon. In the next section we will offer results of the rough set analysis applied to our urban revitalisation case studies.

## **6. Presentation and Interpretation of Results**



In this section we will present the results of the above rough set analysis at two levels, viz. at the level of one aggregate performance score (S) for each of the 9 urban revitalisation projects under consideration and at the level of three partial constituents (P1, P2, P3) of the overall performance score (as presented in the success score matrix in Table 4) (see for a detailed description Van der Burch 2000). Clearly, the interpretation is valid in as far the case studies considered offer a fair representation of urban development projects. In all cases analysed here, it turns out that the accuracy and the quality of the rough set approximation is equal to 1, which means that the reliability of the classification for the dependent variable and the overall quality of the nominal classification is at its maximum. The 9 classes are indeed totally distinguishable.

### 6.1 Aggregate results

Application of the rough set methodology to Table 3 in order to ‘explain’ the aggregate performance score included in Table 4 leads to the following ‘decision rules’ (see Table 5). These rules can be interpreted in a ‘compelling’ way. Given our data base, they are unambiguously valid. The following logical rules can be distilled from our case study research.

| logical decision rules |                   |       |                          |
|------------------------|-------------------|-------|--------------------------|
| nr                     | if                | then  | urban projects concerned |
| 1                      | C6 = 2            | S = 1 | AME HEE WAA              |
| 2                      | A2 = 3            | S = 2 | EIN MAA                  |
| 3                      | D9 = 3            | S = 2 | AMS                      |
| 4                      | A1 = 2 & E11 = 3  | S = 3 | DEB ROT                  |
| 5                      | E11 = 1 & D10 = 1 | S = 4 | NIJ                      |

Table 5. Rough set decision rules for aggregate performance score of urban revitalisation projects

#### *Rule 1*

If the profitability requirements of stakeholders involved are not expressed clearly and timely, then the performance of the urban revitalisation project at hand is unsatisfactory. This hypothesis is supported by 3 out of the 9 cases (**AME**, **HEE**, **WAA**). For the interpretation of the remaining cases we have to consult Table 3 and 4, from which we can derive that the 6 remaining cities have been more transparent in their profitability demands. The scores of these cities are fairly good; 3 cities (**AMS**, **EIN**, **MAA**) have an acceptable performance, two (**DEB**, **ROT**) a successful performance and one (**NIJ**) even an excellent performance.

*Rule 2*

If the institutional PPP arrangement is based on a concession, then the overall performance of the urban development project is in general acceptable. It has to be added that from the joint venture arrangements in some cities a successful to even very successful score can be observed (**DEB**, **NIJ**, **ROT**); however, one (**AME**) is unsatisfactory, to that a joint venture arrangement cannot be regarded as an institutional model which will always lead to a good performance.

*Rule 3*

If there are no soil pollution costs, then the success of the project has an acceptable performance from the public side. Closer inspection leads to the conclusion that this statement is not shared by many projects, but for the remaining projects no unambiguous result can be found. This means that the role of soil pollution in urban revitalisation projects is somewhat fuzzy.

*Rule 4*

If the development initiative is a private responsibility or a joint private-public responsibility with many private players, and if also the selection process of partners has taken place via a combination of direct contacts and open selection, then the project is certainly successful. For other combinations of features, the results are ambiguous.

*Rule 5*

If the selection procedure for partners in a PPP constellation is open and if there is reasonable expectation for land price rises in the project stage, then the development project will be very successful. The combination of these two factors seems to be a strong one, as the complementary statements ( $E_{11} \neq 1 \ \& \ D_{10} = 1$  and  $E_{11} = 1 \ \& \ D_{10} \neq 1$ ) lead to unfavourable performance results (mainly a success score of 1 or 2).

In conclusion, the rules generation procedure has led to a collection of interesting findings which – given the assumed validity and representativeness of the data set – reflect important lessons for urban development planning at the interface of public and private initiatives. The rough set analysis does not allow for the derivation of other rules which have a hundred percent validity. But, of course, there may be cases which in a majority of the situations leads to some interesting conclusions, but these are – given the small sample – statistically difficult to judge. We will now turn to an analysis of the constituent factors of the success scores at a more disaggregate level.

## 6.2. Partial results

As mentioned above, the overall success score  $S$  is essentially a latent indicator which can be decomposed into partial performance scores  $P_1$ ,  $P_2$  and  $P_3$ . We will now apply the rough set analysis to each of these partial scores.

### *Executive and organisational performance (P1)*

Application of the rough set algorithm leads to the following decision rules of an ‘if, then’ nature (see Table 6).

| logical decision rules |                   |         |                          |
|------------------------|-------------------|---------|--------------------------|
| nr                     | if                | then    | urban projects concerned |
| 1                      | D9 = 1            | $P_1=1$ | AME                      |
| 2                      | A2 = 1            | $P_1=2$ | HEE WAA                  |
| 3                      | A2 = 3 & E 12 = 2 | $P_1=2$ | EIN                      |
| 4                      | D8= 2             | $P_1=3$ | ROT                      |
| 5                      | A2 = 3 & E11 =2   | $P_1=3$ | MAA                      |
| 6                      | E11 = 1 & D10=1   | $P_1=4$ | AMS DEB NIJ              |

Table 6. Rough set decision rules for partial performance score (execution and organisation)

Based on the results of this table and an interpretative analysis (via an inspection of complementary information in Tables 3 and 4), we may formulate – in a

way analogous to Subsection 6.1, but without further comments – the following lessons in the form of decision rules.

*Rule 1*

In case of severe soil pollution, urban revitalisation projects appear to have a poor performance in terms of execution and organisation.

*Rule 2*

A case of a traditional PPP arrangement leads to a successful implementation and organisation of a project.

*Rule 3*

In case of a concession and absence of temporally phased subprojects, an urban revitalisation project may lead to a fair performance in terms of execution and organisation.

*Rule 4*

A case of reasonable financial transparency leads to a successful project outcome.

*Rule 5*

An urban project **characterised** by a concession agreement and a direct selection of partners has a successful execution and organisation.

*Rule 6*

In case of expected land price rises and an open selection procedure the execution and organisation of the urban project concerned is very successful.

*Operating and marketing performance ( $P_2$ )*

The decision rules for these success factors are contained in Table 7. The logical rules are given below.

| logical decision rules |                          |           |                          |
|------------------------|--------------------------|-----------|--------------------------|
| nr                     | if                       | then      | urban projects concerned |
| 1                      | D9 = 3                   | $P_2 = 1$ | AMS                      |
| 2                      | A3 = 1                   | $P_2 = 1$ | WAA                      |
| 3                      | C6 = 2 & A3 = 2          | $P_2 = 2$ | AME    HEE               |
| 4                      | A1 = 2                   | $P_2 = 3$ | DEB    EIN    ROT        |
| 5                      | B4 = 2 & A1 = 2 & C6 = 1 | $P_2 = 4$ | MAA    NIJ               |

Table 7. Rough set decision rules for partial performance score (operation and marketing)

*Rule 1*

Low soil pollution costs do not necessarily lead to a good operational and marketing performance of a project.

*Rule 2*

In case of a local project orientation, the performance in terms of operation and marketing tends to be poor.

*Rule 3*

A case of unclear prior transparency of profitability requirements and of a regional project scope may lead to fair operational and marketing project outcomes.

*Rule 4*

In case of a private-oriented project (or a private-public model with many actors), we may expect a successful operation and marketing performance of the project.

*Rule 5*

An urban revitalisation project with mainly private financiers, with mainly private actors (or a joint arrangement with many players), and with a high degree of financial transparency will lead to a very high success score for operational and marketing indicators.

*Contractual and building performance (P<sub>3</sub>)*

The decision rules for the above class of performance scores are given in Table 8.

| logical decision rules |                 |                    |                          |
|------------------------|-----------------|--------------------|--------------------------|
| nr                     | if              | then               | urban projects concerned |
| 1                      | B5 = 2          | P <sub>3</sub> = 1 | HEE MAA WAA              |
| 2                      | D9 = 1          | P <sub>3</sub> = 2 | AME                      |
| 3                      | D8 = 1 & C6 = 1 | P <sub>3</sub> = 3 | AMS DEB EIN NIJ          |
| 4                      | D8 = 2          | P <sub>3</sub> = 4 | ROT                      |

Table 8. Rough set decision rules for partial performance score (contractual and building)

*Rule 1*

If there is no clear awareness of the cost composition and risk distribution of different project parts, then the success score in terms of contractual and building performance is very poor.

### *Rule 2*

In case of soil pollution costs the contractual and building performance is marginally successful.

### *Rule 3*

A case of transparent financial picture and a clear insight into profitability requirements leads to a successful project performance from the perspective of contractual and construction aspects.

### *Rule 4*

If the financial transparency is **alright**, then the contractual and building performance is very high.

A more through and comprehensive judgement of the results from Subsections 6.1 and 6.2 leads to the conclusion that the aggregate and partial results are largely consistent. Financial transparency and cost transparency form two critical success factors, while also land price revenues, selection procedure of partners and institutional constellation of a PPP arrangement may be seen as drivers of success.

## **7. Retrospect and Prospect**

Urban policy in modern societies has increasingly a competitive character: it seeks to achieve the highest socio-economic progress. In a situation of devolution of administrative power cities are bound to be more entrepreneurial, more **market-oriented**, and more international with an open eye to global networks. City marketing is a proper instrument for a modern 'entrepreneurial city', provided urban revitalisation policy is able to develop and create **seedbed** conditions for favouring and attracting business life. In this context, urban rehabilitation and urban revitalisation (e.g., harbour front development, city centre transformation) are spearheads of effective urban development policy. This requires also a critical reflection and re-positioning of the urban economy and the role of the government. Institutional reform (e.g., in the form of privatisation or PPP arrangements) may then become a necessity, as it may lead to urban win-win situations with a great added value. The task of the urban administration may then focus more on strategic development, on long-term interests and expectations, and on a balance with respect to environmental sustainability.

Furthermore, also various specific issues may have to be addressed. Based on a thorough comparison of 9 Dutch case studies we have come to the following conclusions.

First, a PPP arrangement has a high chance to become successful, if it is designed on the basis of joint venture model. This is also in agreement with the transition of urban governments towards an entrepreneurial role.

Next, a clear, timely and transparent mapping of all costs, revenues and profitability aspects of a PPP project is a sine qua non. Uncertainty in this respect is bound to lead to a project failure.

The spatial scope of a project may also play an important role, in particular in regard to the success of various project components. A larger geographical orientation of a development project tends to increase its performance (e.g., by means of a broader marketing strategy).

Soil pollution may be a problem, but less for the overall performance of a project. Such costs are to be assessed in advance and the cleaning-up strategies have to be agreed upon in advance. But for specific project parts the costs of polluted soil may be problematic (especially during the organisational and executive stage).

And finally, a clear insight into the planning of project parts, the risk profiles involved, and the way various partners are involved in different project elements is critical for a good performance of an urban development project. In general, a PPP arrangement requires a tailor-made constellation between the public and private sector.

This study has tried to identify the critical drivers of successful urban PPP projects with a view to urban revitalisation. The findings were based on an extensive analysis of results of case studies in The Netherlands. It is clear that the lessons drawn here may generate new hypotheses to be statistically tested in a broader review of experiences.

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