Managing dualities for efficiency and effectiveness of organisations

Roberto Biloslavo
Faculty of Management, University of Primorska, Koper, Slovenia
Carlo Bagnoli
Dipartimento Economia e Direzione Aziendale, Università Ca' Foscari di Venezia, Venezia, Italy, and
Roland Rusjan Figelj
Faculty of Management, University of Primorska, Koper, Slovenia

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Abstract

Purpose – The paper presents the concept of duality, which presupposes the synthesis of two apparently opposing organisation's properties. The purpose of the paper is to empirically verify whether management of dualities correlates with effectiveness and efficiency of organisations.

Design/methodology/approach – The research examines 21 dualities at the normative and strategic level of organisational policy. The research was undertaken in two phases. In the first phase, effectiveness and efficiency indicators were defined by applying the analytic hierarchy process method within an expert group. In the second phase, a questionnaire was sent to 49 CEOs of mid-size and large companies operating in the food, beverage and foodstuff production industry in Slovenia. The questionnaire applied the semantic differential scale.

Findings – The fundamental research hypothesis argues that organisations that are able to transcend the so-called duality paradox thus enhance their effectiveness or/and efficiency. The results partly confirm this fundamental hypothesis within the limitations of the research sample. In terms of future research, the findings offer a valuable starting point for studies involving a larger sample of industries and organisations.

Practical implications – The research findings present enough evidence that although management of dualities does not assure effectiveness and efficiency of organisation, it is a core driver that should enhance a firm's performance relative to its competitors. This means that managers need to develop an ability to constructively face the tensions of opposing dualities, and instead of choosing one at the expense of the other, generating a creative solution of the tensions in the form of a new dynamic model that recognizes dualities as complements and not as forces facing each other.

Originality/value – From a theoretical point of view, it has been observed that management and organisational research have been mainly focused on the definition of organisational dualities or paradoxes and how organisations can sustain competing demands simultaneously. The paper contributes to developing a debate on the potential of managing organisational dualities for greater organisational effectiveness and efficiency.

Keywords Dualities, Paradox, Organizational policy, Organizational effectiveness, Organizational efficiency, Normative management, Strategic management, Performance management, Slovenia

Paper type Research paper

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1. Introduction

At the core of all things, there is always a paradox. A paradox is an idea involving two opposing thoughts or propositions which, however, contradictory, are equally necessary to "convey a more imposing, illuminating, life-related or provocative insight into truth than either fact can muster in its own right" (Slaatte, 1968, p. 4). The paradox is one of the basic characteristics of reality and thought. Therefore, paradoxes should be accepted, made sense of and eventually managed (Handy, 1994).

The importance of managing paradoxes (i.e. dualities[1]) is recognized by different management authors, as for example Achtenhagen and Melin (2003), Evans and Genadry (1999), De Wit and Meyer (2005), Farjoun (2010), Handy (1994), Pascale (1990), Peters and Waterman (1982), Pettigrew and Fenton (2000), Sánchez-Runde and Pettigrew (2003), Smith and Lewis (2011), Sutherland and Smith (2011) and Volberda (1998). They among others suggest that in a world of uncertainty the management of paradoxes is an essential part of successful organisations. In other words, as Peters and Waterman (1982, p. 91) claim: "If there is something that successful companies know, it is how to manage paradoxes".

Within management theory dualism provides conceptual guidance to managers in identifying oppositional poles, as well as helps them in understanding the importance of managing and exploiting such poles simultaneously (Graetz and Smith, 2008). In some research areas management of dualities represents the focal point of research, for example in knowledge exploration and exploitation theme. Knott (2002) points out that the early work on exploration and exploitation was often characterized by a clear strategic choice along the exploration/exploitation continuum (i.e. exploration and exploitation were considered as perfect substitutes for one another). Then Knott (2002) says, the view shifted to consider exploration and exploitation as imperfect substitutes and that the optimal strategy for firms is to pick one of the extremes (i.e. exploration or exploitation). However, based on own research Knott (2002) suggests that the best option is to consider exploration and exploitation as complements. If so, then effectiveness of exploration increases effectiveness of exploitation and vice versa (Collins and Porras, 1994). We based our research on this third perspective and consider it at different levels (i.e. normative and strategic) and within different areas of organisational policy.

The basic purpose of the paper is to empirically verify whether from the perspective of organisational dualities more effective and efficient companies differ from less effective and efficient ones. At the core of this view is the duality concept, which presumes that more effective and efficient companies transcend the polarity of a singular organisational dimension or characteristic whereas other groups of companies are located either at one pole or the other. We believe that empirical examination of dualities at different levels of organisational policy may provide insights into the paradoxical nature of management and help us better characterize the interdependence between dualities, effectiveness and efficiency.

2. Dualities within normative and strategic management

Based on the work of Bleicher (1999) and Collis and Montgomery (2004) we first developed a three-tier organisational policy model (TTOP model; Figure 1). The TTOP model[2] consists of three strategic building blocks: resources, businesses and organisation. As these three elements are developed along three time dimensions – short-term (operational management), medium-term (strategic management) and long-term (normative management) – the model represents both a static (e.g. culture, structure and systems) and a dynamic (e.g. business processes) view of an organisation. The narrowest time

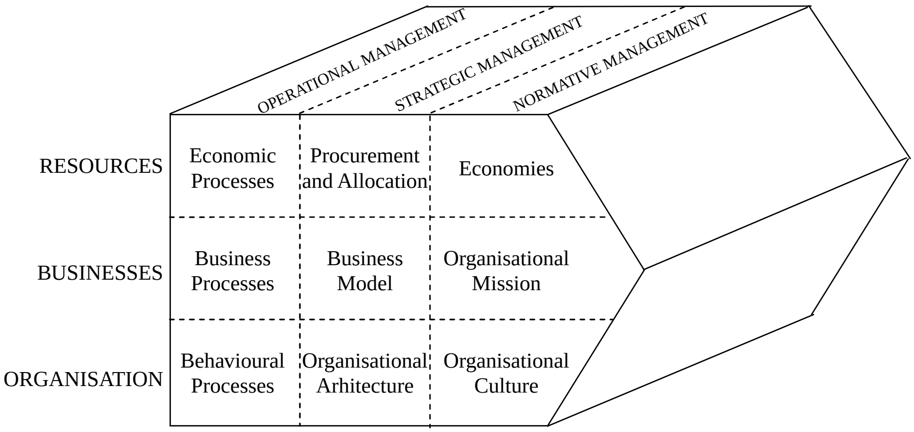

Figure 1.
TTOP model

frame includes short-term operational management, the broader time frame deals with medium-term strategic management and the broadest time frame involves long-term normative management (i.e. represents the long-term normative framework that gives directions to all of an organisation's activities). Each of these management levels entails different characteristics of the basic strategic building blocks.

Based on the findings derived from the literature review and by applying the TTOP model, we identify 21 dualities at the normative and strategic management level of organisational policy as presented in Table I. Dualities are divided according to whether they are primarily associated with the mechanistic or organic organisation. Dualities listed in the left column are mostly related to the mechanistic organisation, while those in the right column relate to the organic organisation.

Due to the limitations in the scope of a paper of this length, it is not possible to discuss in detail all 21 dualities and therefore only brief coverage is provided.

2.1 Dualities within normative management

Profitability vs responsibility. It is without doubt that organisations need to generate profit for their shareholders, but at the same time people inside and outside companies need to be assured that organisations run their businesses in a fair and honest way (i.e. they do not pollute, do not cheat their customers, suppliers or other external stakeholders, they do not exploit their employees). Organisations need to fulfil the shareholders' interests by serving these interests and promoting the values of their stakeholders (De Wit and Meyer, 2005).

Exploitation vs exploration. Existing knowledge and experience enables the organisation to successfully operate today. However, this knowledge and experience does not provide tomorrow's competitive advantage and in the long run they can become the core rigidities of organisation (Leonard-Barton, 1992). Beside investing and taking care of the existing capabilities organisations need to develop new capabilities in a deliberate way or through experimentation (March, 1991; Levinthal and March, 1993; Markič *et al.*, 2011). Bierly and Daly (2002) say organisations need to be capable of bimodal learning or organisational ambidexterity, which is the ability to simultaneously exploit and explore with equal dexterity (Lubatkin *et al.*, 2006).

Table I.
Dualities in normative and strategic management

Organisational policy elements	Content dimensions	Dualities Mechanistic org.	 Organic org.
	Normative management		
Businesses			
Mission	Organisation purpose	Profitability	Responsibility
	Growth orientation	Exploitation	Exploration
	Portfolio orientation	Core business	Diversification
Resources			
Economies	Resource availability	Lean	Slack
	Capital structure	Internal financing	External financing
	Economies orientation	Scale	Scope
Organisation			
Culture	Change orientation	Stability	Change
	Base of relationships	Competition	Collaboration
	Culture differentiation	Uniform	Heterogeneous
	Strategic management		
Businesses			
Business model	Customer domain	Local	Global
	Customer value	Cost	Differentiation
	Value chain	Insourcing	Outsourcing
Resources			
Procurement and allocation	Allocation orientation	Markets	Competencies
	Allocation process	Deliberate	Emergent
	Procurement orientation	Opportunism	Long term partnership
Organisation			
Organisation structure	Vertical structure	Centralisation	Decentralisation
	Horizontal structure	Functions	Processes
	Coordination	Standardisation	Mutual adjustments
Management systems	Information system	Closed	Open
	Performance system	Lag indicators	Lead indicators
	Reward system	Extrinsic motivators	Intrinsic motivators

Core business vs diversification. Diversification can equilibrate seasons or cyclical oscillation, secure critical sources, disperse risk, fill product gaps or help to gain new knowledge. On the other hand, remaining focused on the core business means continually investing in the organisation's unique strengths and protecting its source of sustainable competitive advantage (Zook and Allen, 2001). In that way the organisation retains the long-term consistency and internal fit that are needed to ensure the sustainability of competitive advantage.

Lean vs slack. Slack resources within the organisation can contribute to its inefficiency. On the other hand, the maximum capacity utilisation rate can also lead to ineffectiveness in the long run as the organisation becomes inflexible to radical changes in the business environment. In fact, the availability of slack resources enables the company to experiment with new strategies or to pursue uncertain projects with high potential that typically characterize more organic organisations (George, 2005; Geiger and Makri, 2006; Voss *et al.*, 2008).

Internal vs external financing. External financing allows organisations to potentially generate more profits by taking advantage of volatile market opportunities or increased amount of operations. However, external financing increases financial risk as the cost of external funds may outweigh the return that the company generates through business activities. Organisations need to recognize uncertainty and interaction among the future rates of return on assets and interest rates that need to be paid.

Scale vs scope. Economies of scale allow organisations to achieve lower costs per unit of product due to the increased production volume, while economies of scope is based on the assumption that organisations can obtain a cost advantage over competitors if they diversify their programs. Cost of production and sales of related products is lower than if those products are manufactured and sold individually. A possible solution to the paradox is diversification into different markets and market segments together with standardisation of production process.

Stability vs change. Some researchers emphasize the duality of stability and change as the main paradox in organisational theory (Farjoun, 2010; Lok, 2006; Smith and Lewis, 2011). Modern organisations need to be innovative, flexible and responsive to change, and at the same time they need to be stable and reliable (Farjoun, 2010). This balance is be possible if organisations keep important core values yet also make radical changes as required.

Competition vs collaboration. The goals of modern organisations are typically to gain flexibility, to develop in-depth knowledge and expertise needed to identify latent opportunities, to quickly progress from idea to market, and to achieve operating economies (Cravens *et al.*, 1996). Without collaboration that breaks down the walls that exist among organisational units and between the organisation and the outside world, those goals are very difficult to achieve. At the same time, however, saturated markets and globalisation push companies to be more competitive and aggressive. According to Yami *et al.* (2010) "coopetition" is a time dependent phenomena that can promote the appropriate level of competition and collaboration.

Uniform vs heterogeneous culture. In most of the literature on organisational culture it appears that organisations can have either one strong homogeneous culture or different subcultures. Counter to this Nordström and Ridderstråle (1999) consider that the modern organisation has neither uniform culture nor subcultures, but has both at once. Strong organisational subcultures can bring creative solutions to complex problems (Treven, 2001) on the basis of diversity of views, attitudes and beliefs. On the other hand, this diversity might lead to internal conflicts due to mutual misunderstanding and the desire of one subculture to dominate another.

2.2 Dualities within strategic management

Local vs global. Successful strategies include a balance between global standardisation and local adaptation of the organisation (Yip, 2003; Trompenaars, 2003). Although companies compete globally for markets and inputs, such as raw materials, capital and knowledge, there is strong evidence that location continues to play a crucial role in achieving competitive advantage. The challenge is then to determine what mix of local/global business activities (i.e. R&D, manufacturing, procurement, marketing, distribution) an organisation needs and how far in terms of regional adaptation it needs to go.

Cost vs differentiation. Porter (1980) claims that cost leadership and differentiation are such fundamentally contradictory strategies that any firm attempting to combine them would end up in a "stuck-in-the-middle" position. While different studies conducted since have supported Porter's claims, there are just as many that have not. Ghemawat (2001) for example says that a hybrid strategy works well if an organisation knows how to eliminate all sources of waste by better design or better quality management and is able to squeeze out cost from activities which are not its source of differentiation. The same argument can be found in the concept of blue ocean strategy (Kim and Mauborgne, 2005).

Insourcing vs outsourcing. In the past, organisations tried to control the costs of its activities by vertical integration. However, during the 1980s and 1990s when organisations discovered that high vertical integration locked them into high overhead structure costs and inflexibility, they undertook massive outsourcing programs (Davis, 1992). However, the desire to cut cost by all means can quickly move the organisation to the point where it can lose future possible sources of competitive advantage and become dependent on the supplier.

Markets vs competencies. Under this duality the key question is one of who should adapt to whom; namely, whether the organisation adapts to the environment or the organisation proactively seeks that the environment adapts to it. On the one hand, we have an organisation that operates according to the "outside-in" perspective (i.e. focus on markets), on the other hand, an organisation that operates within the "inside-out" perspective (i.e. focus on competencies).

Deliberate vs emergent. An *ad hoc* adjustment to needs approach (i.e. emergent approach) is gaining ground because of the increased complexity of the environment, resulting in rapid change and the emergence of both opportunities and threats to which the organisation must respond. While the *ad hoc* allocation of resources can lead to inefficiency, the allocation of funds under the fixed budget approach limits an organisation's ability to exploit emerging opportunities and defend itself against unexpected threats. Taken together, however, both ways of allocating resources can in fact be complementary, since an organisation can allocate a certain proportion of available funds for unforeseen needs or it can secure an inexpensive source of funds if needed.

Opportunism vs long-term partnership. Companies are moving away from the traditional competitive model of relationships between suppliers and customers by entering into relationships that are closer to a partnership. Within partnership business is not created on the sole basis of product price, but on the total value of business solutions (Wognum *et al.*, 2002).

Centralisation vs decentralisation. The advantages of centralisation are usually disadvantages of decentralisation, and vice versa. Centralisation leads to specialization, which has a favourable impact on costs and exploitation of a firm's core competencies (Hill *et al.*, 2000). However, high specialization makes people less able to perform complex tasks, which is contrary to the requirements of the modern business environment. A more decentralised structure can overcome the limits of centralisation by increasing the autonomy of individuals and work groups within the organisation.

Functions vs processes. Functionally organised organisations have considerable problems taking a customer's perspective because processes that produce value for the customer cut across several departments. In order to be more customer-oriented, a process-based view has been developed which implies a horizontal view of the business that cuts across the organisational departments. Such an orientation is, however, basically incompatible with the traditional organisational hierarchy where functional skills provide required levels of efficiency.

Standardisation vs mutual adjustments. In the development of knowledge economies that are more service oriented and based more on professional workers, there has been a shift towards coordination by standardisation of skills and mutual adaptation than by standardisation of processes or outputs. However, mutual adjustment works only if people share certain values and norms in doing so and in any case it brings more complexity to the organisation.

Closed vs open. Wide availability of information within an organisation brings both advantages and disadvantages. In an open information system we must be careful with what information is classified as widely available and which is not as it can be quickly used by competitors to the detriment of the organisation. Availability of information can increase the loyalty of members of the organisation and contribute to greater acceptance of responsibility, but again there is potential that information may be used to the detriment of the organisation.

Lag vs lead indicators. The usual yardsticks of an organisation's success (profit and loss statements) represent lag indicators, while lead indicators relate mostly to human and social capital. The main difference between them is that the former represents the results of past decisions that cannot be changed while the latter may enable a company to predict the future result. A performance system based predominantly on leading indicators is, however, not completely reliable because the link between leading indicators and financial outcomes is not always clear.

Extrinsic vs intrinsic motivators. Both groups of motivators are important, but they are not interchangeable. Extrinsic motivators come from outside the individual and are above all oriented to reward the achievement of tangible organisational objectives. On the other hand, intrinsic motivators exist within the individual and are driven by an interest or enjoyment in the task itself. Intrinsic motivators require an environment where to employees are given a level of autonomy, a sense of purpose and a desire for improvement (Dweck, 2006). All these can go against some short-term financial objectives that can be more easily achieved with extrinsic motivators.

3. Organisational efficiency and effectiveness

In general, efficiency can be achieved under the conditions of maximizing the results of an action in relation to the resources used. Efficiency is calculated by:

- estimating the costs or the resources consumed in the action (i.e. defined in the literature as the input);
- estimating the results, or the outputs of the action; and
- comparing the two.

On the other hand, the effectiveness is the indicator given by the ratio of the result obtained to the one intended or expected. Being efficient means doing things "right". Being effective means to do the "right" things. It is possible that one organisation is efficient, that is, it creates its products or services completely rationally and technically speaking in the best possible way, but is ineffective because it is not able to reach the appropriate sales price and make a profit. On the other hand, it is also possible to imagine the case where an organisation is inefficient, yet because of a monopolistic position in the market it achieves high sales price and makes a profit.

Thus, the result of operations as well as the resources needed to achieve this result can be expressed in several ways. This is the reason that a single indicator or set of indicators cannot properly measure organisational efficiency. Organisational efficiency can be divided into technical, operational and allocative efficiency. It is therefore appropriate to measure organisational efficiency with the three so-called partial business performance indicators (Turk, 2006), productivity, operational efficiency and profitability. The concept of productivity requires maximizing physical output per unit of input (e.g. capital) and it relates to technical efficiency. A technically efficient position is achieved when the maximum possible improvement in output is obtained from a fixed set of resource inputs. Productivity indicators cannot, however, directly compare alternatives where one alternative produces the same (or better) output with less of one resource and more of another. In such a case, the choice between alternatives is based on the relative costs of different inputs, which is taken into account by the concept of operational efficiency. Operational efficiency refers to the maximisation of output for a given cost, or the minimisation of cost for a given output. On the other hand allocative efficiency refers to appropriate allocation of available resource so as to achieve the highest profit per unit of invested assets. This is measured by profitability indicators, which link together all three forms of efficiency. An organisation can be profitable only as far as it is productive and operationally efficient. If we measure efficiency with only one set of the above mentioned indicators, we cannot get the true picture of it. The picture is incomplete as we need them all to have a complete understanding of the level of efficiency.

The complexity of the concept of effectiveness comes from the fact that different approaches to assessing effectiveness are products of different epistemological and ontological (e.g. positivist paradigm vs social constructivism) understanding of organisations (Cameron, 1986). Among different models of organisational effectiveness that we consider are the goal model of effectiveness (Scott, 1977), the Cameron's (1986) competing values model, the system resource model of effectiveness (Pfeffer and Salancik, 1978), and the multiple constituency or stakeholder model (Tsui, 1990). The stakeholder model recognizes that an organisation comprises multiple internal and external stakeholders with different goals and interests that need to be taken into account. Even though the stakeholder model is one of the prominent models in modern effectiveness discourse, it is not without several shortcomings. Bess and Dee (2008) among others mention that the stakeholder model does not provide guidance regarding the validity of alternative perspectives expressed by different stakeholders, it does not account for partially achieved goals, and sometimes favours external stakeholders at the expense of internal ones. Following on from this is our definition of organisational effectiveness as given by Werhane and Freeman (1999, p. 9) that "the goal of any company is or should be the flourishing of the company and all its principal stakeholders". This is in line with the systems theory that defines an organisation as an open system comprising multiple stakeholders. Prioritising only one group of stakeholders very likely limits the effectiveness of the system.

Based on the literature review, which supports the basic idea that efficient and effective organisations are able to exceed the problem of organisational dualities, and based on the above defined dualities we propose three hypotheses:

H1. Organisations that are more efficient exhibit a higher level of duality at the normative and strategic level of organisational policy than less efficient ones.

H2. Organisations that are more effective exhibit a higher level of duality at the normative and strategic level of organisational policy than less effective ones.

H3. Organisations that are more efficient and effective exhibit a higher level of duality at the normative and strategic level of organisational policy than less efficient and effective ones.

4. Methodology and sampling

4.1 Definition of effectiveness and efficiency indicators

Based on the stakeholder theory (Mitchell *et al.*, 1997), we selected three stakeholder groups from the internal and the external organisational environment. The owners, the management and the employees were chosen as internal stakeholders, whereas the customers, the suppliers and the state, together with the local community, were defined as external stakeholders (Ulrich and Fluri, 1995). We then defined two indicators for each stakeholder group, which are expected to best reflect the interests of that particular group. For practical reasons we decided to apply quantitative indicators only:

(1) The satisfaction of the owners' interests was measured with the indicators:
- profit or loss of the company; and
- return on equity.

(2) The satisfaction of the management's interests was measured with the indicators:
- growth rate of total revenues; and
- added value per employee.

(3) The satisfaction of the employees' interests was measured with the indicators:
- average monthly income per employee; and
- average annual employment growth rate.

(4) The satisfaction of the customers' interests was measured with the indicators:
- growth rate of net sales revenues; and
- receivable turnover[3].

(5) The satisfaction of the suppliers' interests was measured with the indicators:
- growth rate of the cost of employed goods, material and services; and
- current ratio.

(6) The satisfaction of the interests of the state and the local community was measured with the indicators:
- amount of taxes paid; and
- number of jobs that the company offers.

On the other hand, the efficiency of a company was measured based on indicators of productivity, efficiency and profitability (Melavc, 1998):

(1) Productivity indicators:
  - asset productivity ratio;
  - capital asset productivity ratio;
  - labour productivity ratio; and
  - material, goods and services productivity ratio.
(2) Operational efficiency indicators:
  - operating efficiency ratio; and
  - total efficiency ratio.
(3) Profitability indicators:
  - return on sales; and
  - return on total assets (ROA).

The weight (i.e. importance) of each indicator of effectiveness and efficiency was calculated by applying the analytic hierarchy process method (Saaty, 1980; Jackson, 2001). The data were obtained from an expert group, which included a professor of management, a professor of marketing and a professor of accounting. In each case the respondent has the option of rating the indicators as equally important (numerical value of 1), one moderately more important than the others (value of 3), one strongly more important than the others (value of 5), very strongly more important than the others (value of 7), and extremely more important than the others (value of 9), or any even number gradation value in between. With respect to the organisational effectiveness, the importance of each stakeholder group was first calculated. Based on the answers provided by the expert group[4], we calculated the weight for each stakeholder group as the geometric mean of the experts' answers (Saaty, 1986). The geometric mean scores for each of the stakeholder groups were (in descending order): owners (0.23), employees (0.23), customers (0.18), management (0.12), suppliers (0.12) and the state and local community (0.12). These weights were then given to the corresponding group of indicators and equally divided between indicators within the group. The weights for efficiency indicators were obtained in the same way by calculating the geometric mean value for each group of indicators, with the results of profitability (0.66), operational efficiency (0.25) and productivity (0.09). As in the previous case, these weights were then equally divided between indicators within the group.

4.2 Sampling

Related to the purpose and goals of our research the entire research population consisted of all medium and large manufacturing companies in Slovenia. This population includes a total of 164 large companies and 1,861 medium-sized enterprises (SORS, 2010). Because of limited resources available for the research we decided to apply a convenience sampling method. We choose as a research sample all large and medium-sized firms in the food, beverage and foodstuff production industry in Slovenia, which includes 49 companies. Due to the non-probability sampling method we cannot generalize our conclusions to population, even if the sample appropriately reflects the characteristics of the total population in terms of average revenue and profit.

Executive managers of all 49 companies were contacted and asked to participate before a copy of the questionnaire was sent to them by mail. In total, 44 companies out of 49 agreed to participate in the research, which represents a 90 percent response.

A high response rate is attributed to our familiarity with the industry as well as to the fact that we expressed our willingness to personally present aggregated data and findings at the end of the research. We also emphasized the benefits that will result from the research. About 55 percent of the companies involved were mid-size, whereas 45 percent were classified as large companies.

4.3 The questionnaire

There are different methods for measuring opposites. One is to use a typical Likert-type scale with rating items that refer directly to opposing poles. This method, however, is problematic because ratings on these kinds of items tend to be ambiguous and inter-rater reliability tends to be dubiously low (Kaiser and Craig, 2005). Other methods use separate scales for opposing dimensions (Kaplan and Kaiser, 2003). In these methods evaluators evaluate performance on items from two separate scales representing theoretically opposing dimensions. The disadvantages of this approach are the large number of items required and the need for mathematical merging of data from both scales. This can be avoided if a semantic differential scale is applied. The semantic differential, developed by Osgood (1962) to find semantic "dimensions" for objects of all kinds, is a bipolar rating scale consisting of five to seven points with a middle value that links the two opposing poles. In our study respondents scored each pair with marks from 1 to 7. The mark 1 meant "I completely agree with the affirmation on the left", the mark 4 "The affirmations are equally correct", and the mark 7 "I fully agree with the affirmation on the right". In addition to the above stated marks, the managers could also choose between marks 0 and 8, where the mark 0 meant "Neither affirmation can be attributed to our company" and the mark 8 meant "I can't answer (I can't decide or I'd rather not answer)". Below is an example of a question from the questionnaire[5]:

A main long-term goal of our company is:

Company profitability (we are responsible to the company shareholders)	1	2	3	4	5	6	7	*Social responsibility* (we are responsible to company stakeholders: employees, customers, management, suppliers, the State and the local community)	0	8

Before the questionnaire was administered, it was pre-tested with a group comprised of five representatives from the companies that took part in the research. On the basis of the pre-testing results, we retained the original questionnaire since the testing showed that the understanding, the level of difficulty, and the time necessary to answer the questionnaire conformed to our expectations. The pre-test study provided support for face validity of the measures applied.

4.4 Analysis and findings

On the basis of the defined effectiveness and efficiency indicators, we collected and organised the financial data of each company from the sample drawn from the review of its balance sheet and the income statement for the year 2008[6]. For each indicator of effectiveness and efficiency we got a range of value, which we divided into ten classes from 1 to 10. The width of the classes on the scale is identical, except for the first class, which is not limited downward, and the tenth class, which is not limited upward. The higher the value of the indicator; the more points a company got. By summing up all the points according to the determined indicators and by considering the defined weight of each group of indicators, we obtained an effectiveness and efficiency index value for each company.

Since our model includes 21 characteristics, we obtained 924 answers. Eight of them were marked with a 0, which meant that neither the first nor the second statement applied to the company, and 15 statements were assessed with an 8, which meant "I can't answer (I cannot decide or I'd rather not answer)". At first, we classified all answers into three groups according to the duality concept:

(1) the marks 1-3 were classified as being representative of the left pole (i.e. monopolarity related to the mechanistic organisation);

(2) the mark 4 represented duality[7]; and

(3) the marks 5-7 were classified as being representative of the right pole (i.e. monopolarity related to the organic organisation).

From the set of 44 companies, we selected the five companies with the highest/lowest effectiveness index, the five companies with the highest/lowest efficiency index, and the five companies with the highest/lowest sum of effectiveness and efficiency index; in the last case both indexes had weight of 0.5. Based on this categorisation, we identified a group of the five best and the five worst companies according to our effectiveness and efficiency index. We then divided the answers to questions into two parts based on normative and strategic policy. For every answer we calculated the deviation from value 4, given that value 4 represents duality. Deviation in negative figures (e.g. on the left from value 4) means that organisation is more mechanistic than dual, on the other hand deviation in positive figures (e.g. on the right from value 4) means that organisation is more organic than dual. Based on this we calculated the following indicators:

- the number of negative deviation and average value of negative deviations;
- the number of positive deviations and the average value of the positive deviations; and
- the duality index with values in the range from 0 to 100; the duality index was calculated using the following equation):

$$((3[8] \times \ number\ \ of\ \ questions\ \ in\ \ the\ \ set[9]) \\ -(sum\ \ of\ \ the\ \ absolute\ \ deviations\ \ from\ \ value\ \ 4))/ \\ (3^1 \times \ number\ \ of\ \ questions\ \ in\ \ the\ \ set^2) * 100$$

For the normative policy this can be represented as: (27 $-$ *sum of the absolute deviations from* 4)/27 $*$ 100. For example, if someone were to answer to all questions related to the normative policy with 7 or 1 then the absolute deviation for each question would be 3. The total sum of the absolute deviations would be 27, which is the same value calculated as: *max. deviation* × *number of questions in the set*. Therefore, it means that in this case the duality index would be 0. In the event that answer to all questions was value 4, then the sum of the absolute deviations would be 0 and the value of the duality index would be 100. An index value between 0 and 100 indicates the relative value of duality.

The correlation results for all three cases are presented in Tables II-IV. From the analysis of results in Table II it is possible to deduce that in companies with the highest/lowest efficiency index a statistically significant positive correlation exists between the duality index and effectiveness of these companies at the normative level of organisational policy. From the analysis of results in Table III we can deduce that in companies with the highest/lowest effectiveness index a statistically significant correlation exists between duality index and efficiency and effectiveness of these companies at the strategic level of organisational policy. However, statistically insignificant correlations have been found in companies with the highest/lowest composed efficiency-effectiveness index[10] (Table IV).

5. Conclusion

This study was designed as an initial experiment to study the relationship between management of dualities, efficiency and effectiveness of organisations. Although past research has consistently emphasized the significance of dualities for organisational theory and practice, little empirical research exists to support this. We consider our study an initial step toward filling this gap in the literature. As an initial study, our work has several limitations that should be considered in evaluating its contribution.

		Correlations			
		Effectiveness	Efficiency	Index_dual_ normative	Index_dual_ strategic
Effectiveness	Pearson correlation	1	0.889**	0.646*	0.461
	Sig. (two-tailed)		0.001	0.044	0.179
	n	10	10	10	10
Efficiency	Pearson correlation	0.889**	1	0.336	0.447
	Sig. (two-tailed)	0.001		0.342	0.195
	n	10	10	10	10
Index_dual_ normative	Pearson correlation	0.646*	0.336	1	0.375
	Sig. (two-tailed)	0.044	0.342		0.286
	n	10	10	10	10
Index_dual_ strategic	Pearson correlation	0.461	0.447	0.375	1
	Sig. (two-tailed)	0.179	0.195	0.286	
	n	10	10	10	10

Note: Correlation is significant at: *0.05, **0.01 levels (two-tailed)

Table II. Correlation values for top/bottom five companies based on efficiency index value

Table III. Correlation values for top/bottom five companies based on effectiveness index value

Correlations		Effectiveness	Efficiency	Index_dual_ normative	Index_dual_ strategic
Effectiveness	Pearson correlation	1	0.822**	0.337	0.688*
	Sig. (two-tailed)		0.004	0.341	0.028
	n	10	10	10	10
Efficiency	Pearson correlation	0.822**	1	0.342	0.686*
	Sig. (two-tailed)	0.004		0.333	0.028
	n	10	10	10	10
Index_dual_ normative	Pearson correlation	0.337	0.342	1	0.362
	Sig. (two-tailed)	0.341	0.333		0.304
	n	10	10	10	10
Index_dual_ strategic	Pearson correlation	0.688*	0.686*	0.362	1
	Sig. (two-tailed)	0.028	0.028	0.304	
	n	10	10	10	10

Note: Correlation is significant at: *0.05, **0.01 levels (two-tailed)

Table IV. Correlation values for top/bottom five companies based on efficiency and effectiveness index value

Correlations		Effectiveness	Efficiency	Index_dual_ normative	Index_dual_ strategic
Effectiveness	Pearson correlation	1	0.903*	0.501	0.492
	Sig. (two-tailed)		0.000	0.140	0.148
	n	10	10	10	10
Efficiency	Pearson correlation	0.903*	1	0.277	0.334
	Sig. (two-tailed)	0.000		0.439	0.345
	n	10	10	10	10
Index_dual_ normative	Pearson correlation	0.501	0.277	1	0.561
	Sig. (two-tailed)	0.140	0.439		0.092
	n	10	10	10	10
Index_dual_ strategic	Pearson correlation	0.492	0.334	0.561	1
	Sig. (two-tailed)	0.148	0.345	0.092	
	n	10	10	10	10

Note: Correlation is significant at: *0.01 level (two-tailed)

First, our results are based on only one industry. Although this sample has been considered appropriate with regard to the internal validity of the study, we recognize the tradeoffs involved and the limited generalizability of our findings. Second, as a result of our focus on the food, beverage and foodstuff manufacturing industry in

Slovenia, our sample was relatively small. The small sample is likely to have reduced representational power and although we attempted to balance the error rates by a choice of confidence level, we recognize that other significant effects may have gone undetected. Third, although we made considerable effort to define dualities at normative and strategic levels of organisational policy, we recognize that more work is needed to further define and develop such understanding for future research.

Despite these limitations the results of the research indicate that the best companies involved in food, beverage and foodstuff manufacture in Slovenia do indeed apply the concept of duality. The worst companies, on the other hand, apply the concept significantly less often. The research results confirm the following research hypotheses:

- Organisations that are more efficient exhibit a higher level of duality at the normative level of organisational policy than less efficient ones.
- Organisations that are more effective exhibit a higher level of duality at the strategic level of organisational policy than less effective ones.

However, we could not confirm *H3* regarding the differences in duality when both effective and efficient index were applied.

Although we found that management of dualities is positively associated with effective and efficient organisations, we cannot infer causality because our study was correlational and did not involve the manipulation of variables. As such, the present research design cannot rule out the possibility of reverse/reciprocal causality or influences extraneous to the management of dualities, such as industry context or environmental dynamism. Taken together, our findings appear to provide sufficient evidence to indicate that in the long run flexibility, ambidextrity and creative response to meet multiple, divergent demands are better than sticking to the best single option. Accordingly, we reason that although management of dualities does not assure effectiveness and efficiency of organisation, it is a core driver that should enhance a firm's performance relative to its competitors. This means that managers need to develop an ability to constructively face the tensions of opposing dualities, and instead of choosing one at the expense of the other, generating a creative solution of the tensions in the form of a new dynamic model that recognizes dualities as complements and not as forces facing each other. Such skills are in the literature referred to as integrative and paradoxical thinking.

This article attempts to bridge the gap between theory and practice while at the same time approaches the economic impact the management of paradoxes could have on an organisation's efficiency and effectiveness. Future research should involve more organisations, and a different measurement approach could also be adopted. From the methodological point of view, instead of the semantic differential scale two Likert-type scales for each item could be employed and the results then averaged to arrive at a final score for that duality. Further, to better understand how efficient and effective organisations differ from inefficient and ineffective organisations when handling paradoxes we propose that a mixed research approach is employed with qualitative analysis based on interviews supplementing quantitative analysis. A final point for further development of the concept of duality is the definition of dualities at the operational level of organisational policy, a point which is often neglected in the literature.

Notes

1. Different authors have referred to bipolar concepts in different ways. Some of them have used concepts such as paradoxes (Handy, 1994; Quinn and Cameron, 1988), dilemmas (Hampden-Turner, 1990), dialectics (Mitroff and Linstone, 1993), competing goals and values (Cyert and March, 1992), and dualities (Achtenhagen and Melin, 2003; Evans and Genádry, 1999; Pettigrew and Fenton, 2000; Sánchez-Runde and Pettigrew, 2003). We use the notions of paradoxes and dualities interchangeably as both are used in the literature to denote the twofold character of an object of study without separation.
2. More details about the TTOP model can be found in Biloslavo (2004, 2005).
3. This indicator originates from the presumption that satisfied clients are better payers, a fact which is reflected in shorter repayment terms with regard to a company's receivables.
4. We calculated the consistency ratio (CR) for all evaluations done by the expert group. The values of CRs vary from 0 to 0.25. Based on Saaty's (1980) guideline the CR above 0.1 needs to be carefully scrutinized before it is accepted. However, based on the model proposed by Alonso and Lamata (2006) values of the CR below 0.5 are still acceptable. For this reason we kept the calculated values of weights.
5. The questionnaire is available upon request from the first listed author of this paper.
6. The assumption was that accounting data before the world financial crisis better represents the situation within the industry in relation to the goal of the research.
7. Duality is understood as an organisational ability to manage and present characteristics of both poles.
8. Maximum deviation from value 4; in the scale from 1 to 7 this value is 3.
9. Nine questions for normative and 12 questions for strategic policy.
10. We performed the same analysis for ten companies with the highest/lowest efficiency and effectiveness index but we found no statistically significant correlation.

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About the authors

Dr Roberto Biloslavo is a Professor in the fields of management and strategic management at the University of Primorska, Faculty of Management. His work experience includes development of executive information systems, marketing and small business system management. His research

work is focused on knowledge management, wisdom and leadership, decision-making, and strategic innovation and change. Roberto Biloslavo is the corresponding author and can be contacted at: roberto.biloslavo@fm-kp.si

Dr Carlo Bagnoli is an Associate Professor in Economia Aziendale. His main research areas are knowledge management, strategic management and cognitive mapping approach to business development and change. He has published in different international journals and he won the best paper award for his work on strategic innovation in SMEs.

Roland Rusjan Figelj holds an MBA from the University of Primorska, Faculty of Management Koper. His research is focused on strategic management. He applies theoretical knowledge into practice of an international company that operates in the field of glass containers. In the company he performs the function of Sales Manager.