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## New banking trends, MCDA and financial decisions: insights and a framework for retail banking

### Abstract

Since most decision making involves multiple criteria, extensive research has been developed in this area over the past few decades. However, as it is widely known in the decision-making field, there are significant differences in the way that the decision-making process has been addressed. This has led to two different approaches: Multiple Criteria Decision Making (MCDM) and Multiple Criteria Decision Analysis (or Aid) (MCDA). Having the most recent world economic and financial trends as a background, this paper aims to highlight the relationship between MCDA and financial decisions in a banking context. The paper is based on previous work of well-known authors in the financial decision-making field, but highlights new findings and presents a multicriteria framework for retail banking in order to increase the interest of the MCDA approach for banking issues. In particular, the framework offers a holistic view of banking activities at a bank branch level, where at least eight different phases, when correctly integrated and performed, provide banks with a greater capacity to support decisions and to adapt strategies to a permanent changing environment. The paper discusses insights, advantages and disadvantages of MCDA to provide recommendations for successful applications of this approach in similar contexts.

**Keywords:** MCDA, financial decisions, retail banking, decision support, economic crises.

**JEL Classification:** A12, E44, G20.

### Introduction

Competition among financial and banking institutions has been intensifying in recent decades because of the globalization of financial markets, financial innovations, technology dissemination, economic and social changes. As an immediate consequence, increasing levels of instability and complexity have been spreading worldwide, leaving decision makers with no option except to support their decisions on realistic and sophisticated analytical methodologies and/or techniques. Optimization, simulations, forecasting, stochastic tools, fuzzy logics, decision support systems, Multiple Criteria Decision Making (MCDM) and Multiple Criteria Decision Analysis (or Aid) (MCDA) are just a few examples of approaches that have been commonly considered valuable for supporting financial and banking decisions (Zopounidis and Doumpos, 2003; Spronk et al., 2005). As far as MCDM/A is concerned, while progress has already been made over the past years on its relationship with financial decisions (see, for example, Zopounidis, 1999; Hallerbach and Spronk, 2003; Zopounidis and Doumpos, 2003; Steuer and Na, 2003; Spronk et al., 2005), more research seems to be required in order to improve the current knowledge on the theoretical framework that supports this relationship, and to expand the existing empirical evidence regarding the use of these tools to support the financial decision-making process.

Although MCDA provides an arsenal of tools and methods that may be applied to support financial decisions within realistic and flexible economic conditions, it should be highlighted that any comparative discussion on those tools and methods is beyond the scope of this research. Instead, this paper aims to augment the theoretical insights on the relationship between MCDA and financial decisions. In doing so, we also encourage the use of analytical tools that assist decision makers to identify financial (or non-financial) measures, and that take into account the trade-offs among the measures assessed. Since we are considering the multi-dimensional character of the financial and/or banking decision aid process, which covers profitability, risk, liquidity, social responsibility, environmental protection and employee welfare, among others, an integrated and multifaceted approach is strongly encouraged.

The paper is based on previous work of Zopounidis (1999), Hallerbach and Spronk (2003), Steuer and Na (2003), Zopounidis and Doumpos (2003) and Spronk et al. (2005) (see Table 1), but highlights new findings and presents a multicriteria framework for retail banking in order to increase the interest of the MCDA approach for banking issues.

Table 1. Previous work on the relationship between MCDM/MCDA and financial decisions

Author/s and date	Methodology	Main contribution/findings
Zopounidis (1999)	<ul style="list-style-type: none"> <li>◆ Extensive bibliographic review.</li> <li>◆ Examples and applications in finance.</li> </ul>	<ul style="list-style-type: none"> <li>◆ MCDA is presented as a possibility to overcome the restrictive framework of optimization.</li> <li>◆ MCDA main advantages are discussed in detail.</li> </ul>

Table 1 (cont.). Previous work on the relationship between MCDM/MCDA and financial decisions

Author/s and date	Methodology	Main contribution/findings
Hallerbach and Spronk (2003)	<ul style="list-style-type: none"> <li>◆ Detailed discussion of financial decision problems and financial theory.</li> <li>◆ Framework development.</li> </ul>	<ul style="list-style-type: none"> <li>◆ The need to treat financial-economic problems as multiple criteria decision problems is highlighted.</li> <li>◆ The study provides guidance in applying financial theory, decision tools, and common sense, to solving financial problems.</li> </ul>
Steuer and Na (2003)	<ul style="list-style-type: none"> <li>◆ Compilation and classification of 256 bibliographic references.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Categorized bibliographic study on the application of MCDM techniques to problems and issues in finance.</li> </ul>
Zopounidis and Doumpos (2003)	<ul style="list-style-type: none"> <li>◆ State-of-the-art comprehensive review of the research made up on the use of MCDA in financial decisions.</li> </ul>	<ul style="list-style-type: none"> <li>◆ The authors provide an in-depth presentation of the contributions of MCDA in the field of finance, focusing on the methods used and their real-world applications.</li> <li>◆ The paper clearly states that MCDA is well suited to the complex nature of financial decision-making problems.</li> </ul>
Spronk et al. (2005)	<ul style="list-style-type: none"> <li>◆ Discussions to justify the presence of MCDA in financial decision making.</li> <li>◆ Examples and applications in finance.</li> </ul>	<ul style="list-style-type: none"> <li>◆ The study presents contributions of MCDA in finance.</li> <li>◆ MCDA is presented as well-suited to the growing complexities encountered in financial decision making.</li> </ul>

Source: Authors' conception.

The paper begins with a review of the most recent world economic and banking trends, in order to present the current world context. Although we will not discuss the impacts of the present world economic crisis in detail, its scenario is taken into account along the study. Following this, a brief MCDA theoretical background is presented in order to better understand the foundations of MCDA and its relationship with financial and banking decisions. After discussing MCDA's potential in financial and banking contexts, a framework for retail banking is then presented with the scope of pointing out how MCDA tools can be applied in a constructive way, making the learning activity easier, and introducing transparency in the decision aid process. In fact, it is one of our goals to show that the MCDA approach can be seen as a portfolio of instruments and tools that (desirably) assist decision makers in achieving negotiated solutions to their problems, namely when optimum solutions are not possible. The strengths and weaknesses of the use of MCDA techniques in financial and banking contexts are also discussed. Finally, research forecasts and concluding remarks are shared herein.

### 1. Recent world economic and banking trends

In despite of some slight recovering signs that arose during the second quarter of 2009, the world economy still has a major bridge to cross: retake private demand, especially rising families demand, and stabilize it to sustain economic growth. This is not an easy task for countries and governments to address, the representatives of which until now were more concerned with the public debt and banking balance than with issues such as unemployment, poverty and welfare economics. In this context, and in line with Casalinho et al. (2009) and ECB (2009), several points mark today's economic trends:

- ◆ Economic activity is slightly recovering, after 2008's fourth-quarter and 2009's first-quarter minimum. While the USA has already shown

positive growth in 2009's second-quarter, Europe might have to wait a bit longer for a similar result.

- ◆ Better economic environment is produced from better performances in international trade and industrial production. However, we still do not know for sure the effect that rising unemployment and oil market prices have had, and will have, on private demand.
- ◆ The gradual reduction of banks and families debt is proceeding, but it does not add value for the needed adjustment of the imbalances of markets and economies. At the same time, this efficaciously slows the desired economic recovery. Maybe this is our first lesson for the future: sustainability demands smaller economic growing rates.
- ◆ The major currencies in the world (US Dollar and Euro) should probably maintain actual balance of forces, such as no changes to monetary policies. Investors should maintain the trend on changing public debt markets for more risky assets. However, the expected profitability is not a rising one. Is this the second lesson for the future? It seems that financial markets will not be as profitable as they used to be.

Following Table 2, the 2009 unemployment average rates for advanced economies and major advanced economies are 8.1% and 8.0%, respectively, while in industrialized Asian economies the 2009 unemployment average rate is 4.9%. In answering why should we be so concerned about these values (namely regarding the forecasted values for 2011), it should be underscored that as much as unemployment rises, private demand (and especially families' demand) will probably decrease and, above all other factors, this leads to a huge lack of confidence among private consumers. Accordingly, companies are facing one of the biggest paradigms of their history: decreasing confidence in private demand makes their sales at lower levels than ever, fixed

costs are placing pressure on business margins, and in response dismissing employees is the easier answer. However, each dismissed employee is a one-less client for their own products and services, and gives a very negative message to other clients in the market. These are the basic assumptions of a loop

that is weakening the majority of companies in most advanced economies: if leaders choose unemployment, sooner or later, they will sell less and the survival of their companies will be uncertain at best. Table 2 provides a cursory view of the most recent world economic trends.

Table 2. Advanced economies: real GDP, consumer prices and unemployment

	Real GDR				Consumer prices				Unemployment			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
Advanced economies	2.7	0.9	-3.8	0.0	2.2	3.4	-0.2	0.3	5.4	5.8	8.1	9.2
United States	2.0	1.1	-2.8	0.0	2.9	3.8	-0.9	-0.1	4.6	5.8	8.9	10.1
Euro area <sup>1</sup> :	2.7	0.9	-4.2	-0.4	2.1	3.3	0.4	0.6	7.5	7.6	10.1	11.5
Germany	2.5	1.3	-5.6	-1.0	2.3	2.8	0.1	-0.4	8.4	7.3	9.0	10.8
France	2.1	0.7	-3.0	0.4	1.6	3.2	0.5	1.0	8.3	7.8	9.6	10.3
Italy	1.6	-1.0	-4.4	-0.4	2.0	3.5	0.7	0.6	6.1	6.8	8.9	10.5
Spain	3.7	1.2	-3.0	-0.7	2.8	4.1	0.0	0.9	8.3	11.3	17.7	19.3
Netherlands	3.5	2.0	-4.8	-0.7	1.6	2.2	0.3	1.1	3.2	2.8	4.1	5.0
Belgium	2.6	1.1	-3.8	0.3	1.8	4.5	0.5	1.0	7.5	6.8	9.5	10.5
Greece	4.0	2.9	-0.2	-0.6	3.0	4.2	1.6	2.1	8.3	7.6	9.0	10.5
Austria	3.1	1.8	-0.3	0.2	2.2	3.2	0.5	1.3	4.4	3.8	5.4	6.2
Portugal	1.9	0.0	-4.1	-0.5	2.4	2.6	0.3	1.0	8.0	7.8	9.6	11.0
Finland	4.2	0.9	-5.2	-1.2	1.6	3.9	1.0	1.1	6.8	6.4	8.5	9.3
Ireland	6.0	-2.3	-8.0	-3.0	2.9	3.1	-0.6	1.0	4.5	6.1	12.0	13.0
Slovak Republic	10.4	6.4	-2.1	1.9	1.9	3.9	1.7	2.3	11.0	9.6	11.5	11.7
Slovenia	6.8	3.5	-2.7	1.4	3.6	5.7	0.5	1.5	4.9	4.5	6.2	6.1
Luxemburg	5.2	0.7	-4.8	-0.2	2.3	3.4	0.2	1.8	4.4	4.4	6.8	6.0
Cyprus	4.4	3.7	0.3	2.1	2.2	4.4	0.9	2.4	3.9	3.7	4.6	4.3
Malta	3.6	1.6	-1.5	1.1	0.7	4.7	1.8	1.7	6.4	5.8	6.9	7.6
Japan	2.4	-0.6	-6.2	0.5	0.0	1.4	-1.0	-0.6	3.8	4.0	4.6	5.6
United Kingdom <sup>2</sup>	3.0	0.7	-4.1	-0.4	2.3	3.6	1.5	0.8	5.4	5.5	7.4	9.2
Canada	2.7	0.5	-2.5	1.2	2.1	2.4	0.0	0.5	6.0	6.2	8.4	8.8
Korea	5.1	2.2	-4.0	1.5	2.5	4.7	1.7	3.0	3.3	3.2	3.8	3.6
Australia	4.0	2.1	-1.4	0.6	2.3	4.4	1.6	1.3	4.4	4.3	6.8	7.8
Taiwan Province of China	5.7	0.1	-7.5	0.0	1.8	3.5	-2.0	1.0	3.9	4.1	6.3	6.1
Sweden	2.6	-0.2	-4.3	0.2	1.7	3.3	-0.2	0.0	6.1	6.2	8.4	9.6
Switzerland	3.3	1.6	-3.0	-0.3	0.7	2.4	-0.6	-0.3	2.5	2.7	3.9	4.6
Hong Kong SAR	6.4	2.5	-4.5	0.5	2.0	4.3	1.0	1.0	4.0	3.5	6.3	7.5
Czech Republic	6.0	3.2	-3.5	0.1	2.9	6.3	1.0	1.6	5.3	4.2	5.5	5.7
Norway	3.1	2.0	-1.7	0.3	0.7	3.8	1.5	1.9	2.5	2.6	3.7	4.7
Singapore	7.8	1.1	-10.0	-0.1	2.1	6.5	0.0	1.1	2.1	3.1	7.5	8.6
Denmark	1.6	-1.1	-4.0	0.4	1.7	3.4	-0.3	0.0	2.7	1.7	3.2	4.5
Israel	5.4	3.9	-1.7	0.3	0.5	4.7	1.4	0.8	7.3	6.0	7.5	7.7
New Zealand	3.2	0.3	-2.0	0.5	2.4	4.0	1.3	1.1	3.6	4.1	6.5	7.5
Iceland	5.5	0.3	-10.6	-0.2	5.0	12.4	10.6	2.4	1.0	1.7	9.7	9.3
<i>Memorandum</i>												
Major advanced economies	2.2	0.6	-3.8	0.0	2.1	3.2	-0.4	0.0	5.4	5.9	8.0	9.3
Newly industrialized Asian economies	5.7	1.5	-5.6	0.8	2.2	4.5	0.4	2.0	3.4	3.5	4.9	4.9

Notes: <sup>1</sup> When countries are not listed alphabetically, they are ordered on the basis of economic size. <sup>2</sup> Based on Eurostat's harmonized index of consumer prices.

Source: IMF (2009).

Based on the present trends, the answers are not quite clear, however, it is a given that there must be a compromise between profitability (as it used to be) and sustainability, as aforementioned. Per-

haps there is not a crisis scenario on the actual current economics context; perhaps we are just crossing the way to a new era in economic contemporary history.

As it became more visible, companies and employees also became more preoccupied about respective roles in the economy and in the productive process. There has been an obvious trade-off between technological investment and labor maintenance in the company. Technology became one of the causes of unemployment. In retrospect, we recognize the 1970s as a period of economic wealth. In those years, private demand had grown at high rates and the middle class was “wealthy”. Having more available income and more time to spend it, the average consumer had become more and more demanding, and the technical quality of the products has been increasingly considered. The answer for market trends had been almost unanimous, i.e., to strengthen product added value, where most of the time extra-services such as post-sell services, consumers clubs, marketing differentiation actions and other similar added value actions were executed. Selling processes were completely transformed, turning a product sell (and product marketing) into a *service + product sell* (and a *service + product marketing*). This is primarily the way companies sell product today. That is also the way that retail banks currently present their offers.

For banks in general and retail banks in particular, the main goal for the next few years is to reduce their debt, and to embody their losses on real estate and stock markets. For big and small banks all over the world, the success of this task (not a strategy!) is the measure of their survival. Recently, the Chair of the European Central Bank (ECB) made a public statement, encouraging European banks to increase their loans to short and medium enterprises (SMEs), in order to maintain the Euribor index. This is a brand new stand for the leader of a Central Bank such as the ECB, but it exhibits the level of exposure of most of the European banks. Otherwise, as has been emphasized in the media, American banks have tightened their credit criteria on mortgage loans, which sent a restrictive sign to real estate markets and a defenseless image of banking conjuncture. As previously mentioned, there is no big expectation for the stock markets.

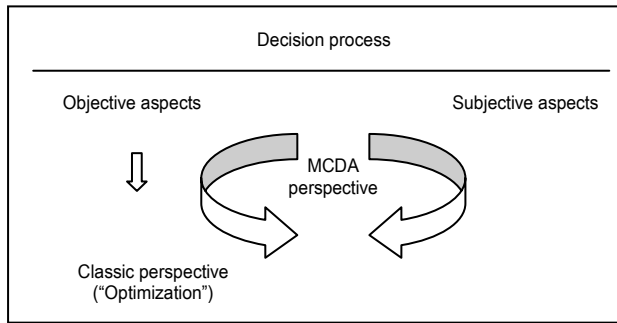
On the other hand, rising rates of unemployment send private savings to very low levels, removing funding directly from the banks. In the need to buy money from central banks and pay more for it, retail banks have in sight a last and definitive goal to make money in a sustained way and that is in increasing consumer satisfaction, i.e., keep consumers satisfied and loyal to the specific bank, avoiding volatility and increasing fidelity in each contact between bank and client. This has been the major trend/option used by retail banks to face the very difficult situation that they have been placed in (for further details, see Carlzon, 1989).

From this logic, nowadays, few would contest that the world economy has fallen into recession, and this recession has been spreading rapidly worldwide. Credit markets have been frozen, and banks are struggling to recover their financial health. Under recession restrictions, customers also become more local (or less global), and this aspect increases local competition indexes (Quelch, 2009). In addition, it seems evident that the most recent world economic and banking trends are characterized by an unstable environment, where each decision is surrounded by multiple variables and several decision makers with different (and often conflicting) interests that make decision processes complex and uncertain. As an immediate consequence, this scenario requires local-oriented actions that should be supported on more formal and/or (at least) more transparent methodologies. It is precisely here that we assert that MCDA methodologies may add value to the financial and banking decision-making processes, especially because they are conceived to support decision makers in dealing with complex problems characterized by multiple variables and evaluation criteria; multiple decision makers with different values, perceptions and convictions; subjectivity; ill-structured problems; and, among several other things, situations where optimum solutions are not possible. In fact, the MCDA approach should be seen as a portfolio of instruments and tools that will (desirably) assist decision makers in achieving negotiated solutions to their problems. A brief theoretical background of the MCDA approach is presented in the next section.

## 2. Brief MCDA theoretical background

As described by Bana e Costa et al. (1997: 30), the MCDA approach stands out as a new position for Operational Research (OR) for the treatment of complex problems. According to the authors, “*in contrast to the more classical OR approaches, the multicriteria decision aid framework facilitates learning about the problem and the alternative courses of action, by enabling people to consider their values and preferences from several points of view*”. Based on the recognition that objectivity has limits, one of the main objectives of the multicriteria methods is the construction or creation of something that helps the decision makers to shape and/or transform their preferences and/or to make decisions according to their own values. Keeney (1992: 154) seems to strengthen this approach, asserting that “*values are subjective, but they undeniably are part of decision situations. Not modeling them does not make them go away*”. This recognition that objectivity has limits is precisely one of the main factors that allow distinguishing the two basic types of multiple criteria approach (i.e., MCDM and MCDA).

Usually, in complex problems, the need to consider subjective aspects becomes evident (Figure 1).



Source: Authors' conception.

**Fig. 1. MCDA conceptual approach**

The scheme presented in Figure 1 shows the existing inseparability between subjective and objective aspects in a given decision-making process. Accordingly, the MCDA approach aims to clarify the decision makers' thoughts by providing them with arguments that will enable them to reflect, to shape and/or to validate their own values through an interactive and constructive supportive decision process. Following this, it may be stated that MCDA attempts to overcome the fact that there is a pre-determined model for every problem. For Bana e Costa et al. (1997: 36), "the theory of MCDA is thus an open theoretical field and not a closed mathematical theory solving a specific class of problems". Roy and Vanderpooten (1997: 27) present five of the main standpoints that permit distinguishing the MCDA approach:

- ◆ The boundary between what is feasible and what is not feasible is vague and often changes, depending on what is defined during the study itself.
- ◆ In many real problems, the decision maker, as a person who is really able to take decisions, is either difficult to identify or does not exist. Rather, s/he is the person (or group of people) to whom, or on behalf of whom, the support is provided.
- ◆ It must be understood that the study itself helps to resolve conflicts and contradictions.
- ◆ The information, such as numerical values or evaluations of performance in many cases, is vague, uncertain or ill-determined.
- ◆ In general, it is impossible to say if a decision is good or bad by referring only to a mathematical model. Indeed, the issues that matter involve organizational, cultural, educational and learning dimensions, and also contribute to the quality and success of the decision.

These five items clearly show that objective factors interact with factors of a subjective nature and, therefore, it seems negligent to deny the importance of subjective factors and put them aside in favor of a

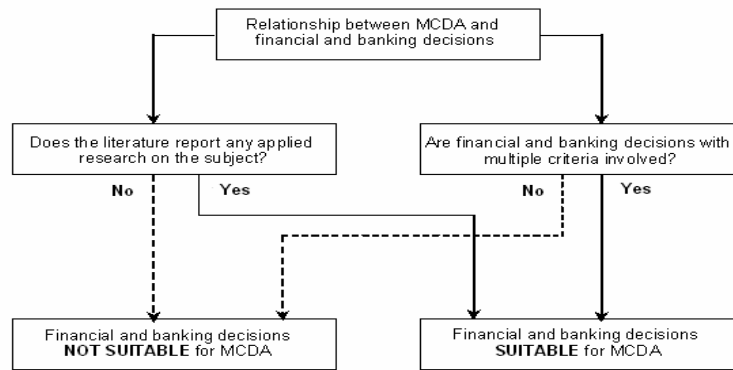
purely objective analysis. It is at this point the main gap emerges regarding the single criterion approaches, which do not recognize the limits of objectivity and, even considering the existence of multiple objectives, reward the search for optimization. In line with Belton and Stewart (2002: 3), "the concept of an optimum does not exist in a multicriteria framework and thus multicriteria analysis cannot be justified within the optimisation paradigm frequently adopted in traditional Operational Research [...]". MCDA is an aid to decision-making, a process which seeks to: integrate objective measurement with value judgments; make explicit and manage subjectivity". Indeed, according to the perspective of these authors, in the MCDA approach, the subjectivity is inherent in all decision-making processes, and the point is to make explicit the judgments and preferences of the individuals involved, and to ensure the transparency of the entire process. Moreover, it is based on a criticism to the single criterion approaches for not recognizing their limits. In accordance with Roy and Vanderpooten (1997: 26), "one of these schools is now commonly referred to as the "European School", its members being a part of a European Working Group [...] which celebrated its 20th anniversary in 1994"<sup>1</sup>.

Following a constructivist approach, this school recognizes, among other things, the limitations of a mathematical optimum, and is guided by a guiding principle that, without any pre-conditions, aims at building a model based on observation of the working hypotheses and/or on a set of key elements, allowing the decision actors to change the process in accordance with their own goals, convictions, beliefs and/or value systems. Quoting Zopounidis (1999: 405), "Multicriteria Analysis [...] is a set of methods which allow the aggregation of several evaluation criteria in order to choose, rank, sort or describe a set of alternatives (i.e., investment projects, financial assets at variable revenue, financial assets at fixed revenue, dynamic firms, etc.)".

### 3. MCDA, financial and banking decisions

Following O'Leary's (1986) guideline, before promulgating MCDA for financial and banking decisions, two questions must be previously considered: "Are financial and banking problems suitable for MCDA?" and "What evidence might there be to support this relationship?". Figure 2 presents a conceptual framework that aims to sketch the relationship between financial and/or banking decisions and the MCDA approach (as a sophisticated OR branch).

<sup>1</sup> There are two primary schools of multicriteria methodologies. On one hand, the American School defends the most possible descriptive and prescriptive models, while, on the other hand, the European School adopts a constructivist approach. These beliefs have a clear and fundamental influence on the structuring and evaluating phases of the decision process, and serve as a behavioral guide throughout the process of the decision support. For further details, see Eden (1995) and Dubois (2003).



Source: Authors' conception.

**Fig. 2. Supporting the relationship between financial decisions and MCDA**

**3.1. Examining the literature.** According to Figure 2, examining the literature is one possible way to find out if there is any research that relates MCDM/A and financial decisions. Steuer and Na (2003) and Zopounidis and Doumpos (2003) offer categorized bibliographic reviews on this aspect. Despite the fact that their research is respectively focused on MCDM and MCDA, and there are significant differences between both approaches (for further details on those differences, see Roy and Vanderpooten, 1997; Zopounidis, 1999), the authors provide an overview of the literature on MCDM/A combined with Finance. In line with Zopounidis and Doumpos (2003), Steuer and Na (2003) and Spronk et al. (2005), financial planning, evaluation of bank acquisitions strategies, bankruptcy prediction, credit risk assessment for firms and consumers, stock evaluation and classification, selection of financing instruments for foreign investments, country risk assessment, bond rating, capital budgeting and interest rate, risk analysis, prediction and classification, are just small examples of reported and well discussed situations where MCDM/A techniques have been successfully applied to support financial and banking decisions (see also, Zopounidis and Doumpos, 2002; Nasrallah and Qawasmeh, 2009).

In a more specific domain, Suwignjo et al. (2000) propose the integrated use of cognitive maps and Analytical Hierarchic Process (AHP) (an MCDA technique developed by Saaty, 1980) to support evaluation criteria selection, and to add transparency in dealing with trade-offs procedures in a bank branch performance evaluation context. Recently, in a study by Ferreira et al. (2010), the integrated use of cognitive maps and Measuring Attractiveness by a Categorical Based Evaluation Technique (MAC-BETH) (another MCDA technique developed by Bana e Costa and Vansnick, 1994; Bana e Costa et al., 2005) has also been proposed for adding value to bank branch performance evaluation from an MCDA perspective. This way, quoting Zopounidis (1999:

408), “MCDA has already contributed in a significant manner to solving several financial problems such as venture capital investment, business failure risk, credit granting, bond rating, country risk, political risk, evaluation of the performance and viability of organizations, choice of investments, financial planning and portfolio management” (for further developments, see also Zopounidis and Doumpos, 2003). Based on the literature, we may state that financial and banking problems are suitable for MCDA.

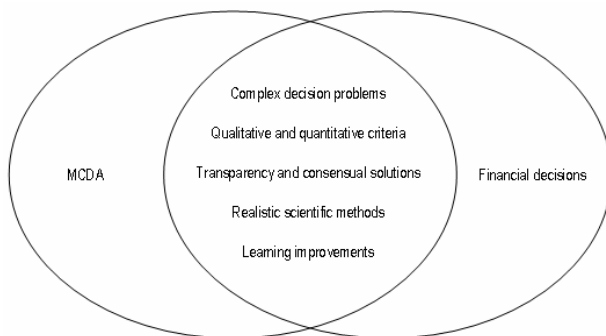
**3.2. Looking for multiple criteria in financial and banking decisions.** Another possible way to find out if there is any relationship between MCDA and financial decisions is to examine the decisions that financial analysts and bankers face. This will allow for the discovery of the involvement of multiple criteria.

In line with Zopounidis (1999: 404), concerning a long-term period, there are decisions related to funds allocation and decisions concerned with capital structure. In the short-term, decisions may be focused on stocks, cash, accounts receivable, current liabilities, among other possibilities. Nevertheless, the author claims that “the financial theory analyzes these decisions (short and long terms), but always from an optimization perspective (for example, theory of capital cost, portfolio theory, options theory, etc.)”. Based on this statement, the author presents three major reasons that may increase the interest in using MCDA for financial and banking decisions support: (1) while seeking optimal solutions for their problems, financial decision makers frequently reach unrealistic and/or unadjusted solutions; (2) decisions are usually taken by human beings and it becomes necessary to consider their values, experiences and knowledge (in fact, this corroborates Keeney’s (1992) assumption that subjectivity exists, and not modeling it does not make subjectivity go away); and (3) in certain types of problems (e.g., choice of investment projects or portfolio selection) optimum solutions may not be possible, since there are multiple criteria involved. It seems also worth

mentioning that financial problems involve several other important aspects, such as: (1) multiple and conflicting criteria; (2) complexity; (3) subjectivity; (4) ill-structured problems; and/or (5) involvement of decision makers in the decision process (for further details, see Roy, 1988; Zopounidis, 1999; Steuer and Na, 2003; Tufan et al., 2007). For example, in an investment context, companies usually appraise multiple goals (e.g., profitability, company's growth, risk and liquidity, among many others).

Following all these remarks, Zopounidis's (1999: 405) research suggests that financial and banking decisions may be suitable for MCDA, because MCDA's "principal objective is to provide the decision maker with tools that enable him to advance in solving a decision problem [...], where several, often conflicting, multiple criteria must be taken into consideration". In fact, when correctly applied, those MCDA methodologies and tools allow decision makers, among other things, to resolve conflicts among criteria and to determine the relative importance of each one of the many criteria involved in the decision-making process. Naturally, under economic recession, the degree of conflict among or between criteria tends to increase, and the need for those decision support tools increases accordingly.

**3.3. Advantages of using MCDA to support financial decisions (under economic crises).** Based on the two points presented above, it may be stated that financial and banking decisions are suitable for MCDA. Therefore, a discussion on the major advantages that MCDA methods provide in Financial Management can add value to the theoretical framework. Despite the fact that most of the advantages to be discussed are true under scenarios of economic wealth, its importance also seems to be highlighted under crises circumstances. Bana e Costa et al. (1997) and Belton and Stewart (2002) (from a broad logic) and Zopounidis (1999), Hallerbach and Spronk (2003), Zopounidis and Doumpos (2003) and Spronk et al. (2005) (from a financial perspective) discuss some of the advantages of using MCDA to support decisions (Figure 3).



Source: Authors' conception.

**Fig. 3. Some of the reasons for using MCDA in a financial context (under economic crises)**

**3.3.1. Supporting the structuring process of complex problems.** A deep discussion on problem complexity can be found in the literature (see, for example, Checkland, 1999; Cossette, 2003). However, any discussion on complex problems is beyond the scope of this research. One of the main points is to highlight how the MCDA approach can add value to the structuring process of complex problems. According to Simpson (1996: 919) "multicriteria models are being increasingly studied and applied because of the ability of human brain to consider only a limited amount of information at any one time. Therefore, as decisions become more complex there is a need for such formal approaches".

Following this line, Belton and Stewart (2002) state that MCDA offers a variety of methods and tools that help decision makers in structuring their problems before proceeding with solutions. Similarly, Bana e Costa et al. (1997) defend that one of the major characteristics (and advantages) of those methods and tools is, precisely, the fact that they are interactive, in the sense that they contribute to the construction of solutions by allowing a direct involvement of the decision makers, and because they follow an evolutionary approach. This evolutionary approach seems to be, in reality, extremely important under economic recessions because it provides decision makers with enough flexibility to change the course of their (financial) decisions if it were required.

**3.3.2. Inseparability of quantitative and qualitative criteria.** Although objectivity is an element of undeniable importance in a decision-making process, any decision is, above all, a human activity based on the concept of value. Therefore, Keeney (1992) and Mingers and Brocklesby (1997) argue that subjectivity is always present, even when it is not explicitly included in the models. As an immediate consequence, any methodology used to support any multiple criteria decision should consider subjectivity and act as an important tool for communication among decision makers. According to Cossette (2003) it should also be used as a guide for the preparation, justification, and/or support of the decision makers' value judgments.

From a financial perspective, and following Zopounidis (1999), quantitative variables may be dependent on qualitative factors (e.g., poor assistance services will affect customer satisfaction and, consequently, the firm's profitability ratios). Therefore, since quantitative and qualitative criteria inseparability is difficult (if not impossible) to be modeled by the classical optimization techniques, MCDA methods have already proved to be a possible alternative, since they allow for the incorporation of qualitative and quantitative criteria in the

financial decision-making process (for further developments, see Zopounidis and Doumpos, 2002 and 2003).

**3.3.3. Transparency and consensual solutions.** Since MCDA methods are focused on the decision makers' preferences and value systems, they will enable good argumentations on the special features of the problems. This will ensure accuracy in the transparency regarding the way that certain procedures may be conducted, not only because the direct intervention of the decision makers will allow them to argue along the process (see Zopounidis, 1999; Zopounidis and Doumpos, 2003; Ferreira et al., 2010), but also because, by the end, decision makers are very aware of the different stages of the decision process, and it is seldom that the solution is not supported by all concerned. Nonetheless, in those rare cases, decision makers are always free to negotiate the results, and to discuss their points of view, until a consensual solution is reached. This way, MCDA methods support decision makers gradually until they reach a commitment that allows them to decide, given their objectives and value systems. This inherent flexibility seems to be an advantage in the field of Financial Management, especially under economic crises scenarios.

**3.3.4. Realistic scientific methods.** Although MCDA tools are not the only sophisticated approach to resolve a financial decision problem, their intrinsic characteristics (e.g., interactivity, learning oriented, consensual solutions, etc.) increase their scientific and practical interest (Zopounidis, 1999; Zopounidis and Doumpos, 2003). In other words, their importance results not only from the fact that they are scientifically valid, but also because they have practical applications.

Considering MCDA methods and tools' major characteristics, and based on the fact that financial and banking decisions are often resolved in dynamic environments with incomplete information and by several stakeholders with conflicting objectives, it seems clear that both parts (i.e., MCDA and Finance Management) could profit from synergies. Actually, according to Hallerbach and Spronk (2003) and Spronk et al. (2005), such a finding is one of the main reasons why researchers have been exploring the potentials of MCDA in addressing financial decision-making problems.

**3.3.5. Learning improvements.** The interactive character of the MCDA methods (see Section 3.3.1 of the present study) permits definition of the problems' structuring process as a mix between art and science, and introducing a paradigm of learning by participation.

In line with Bana e Costa et al. (1997) and Bana e Costa et al. (2004), learning requires a progressive construction of a model that is supported on the decision makers' participation. These learning improvements also require a permanent criticism to the problems and to the decisions taken. Therefore, the increasing introduction of MCDA tools in the field of Finance should be able to increase the technical skills of the decision makers, since they will be learning during the decision process. For Bana e Costa et al. (1997: 32), "*almost everybody agrees that the interactive process is above all a learning process, where feedback must be allowed, in the sense that the conclusions of a certain iteration should not be taken as definitive but open to revision in the course of the constructive process*".

#### **4. Managing branch retail banking: options and decisions in a new scenario**

As previously mentioned in this paper, the current economic environment brings new challenges to banks all over the world, leading to changes in the way that corporations define and apply their business strategies and their customer approach.

Applied to the retail banking sector in particular, and to other industries in general, Pereira (2009) states that several points should be highlighted: (a) in today's global market, SMEs may fit into this new scenario better than large companies. They have smaller cost structures, more active commercial forces, more effective and flexible strategies and positioning. They can differentiate in a sustainable way, keeping customers satisfied for a longer period of time, and maintain loyalty to the brand or company, with a positive image in the market and an optimized positioning in order to conquer new customers in attractive segments of demand; (b) these kinds of strategies, based on continuous adding of value to customers and focused on "always satisfying" selling contacts, are the leading vector of today's services industries, and, among them, retail banking is on the top (Carlzon, 1989; Frei, 2008). This requires a complex adjustment of the banks' organizational structures, preparing them to support commercial forces instead of acting only as a product factory, or procedures centralizers; and (c) retail structures must work as supporters of local commercial forces. The more this assumption moves to practice, the quicker banking positioning will be optimized, customers will recognize and prefer the bank's offers, business margins will rise, and annual reports will become more healthy.

From this standpoint, Flatters and Willmott (2009) present four key trends in consumer behavior that have been emerging from the actual economic recession: (1) consumer demand for simplicity; (2) a



call for ethical business governance; (3) a desire to economize; and (4) a tendency to flit from one offer to another. In this way, current customers are more concerned with family budget control than with product/service complexity, or with social or political questions about the products they are buying. They are no longer loyal to companies or brands; they just select a choice based on the best offer. In fact, this is a “cruel” scenario for banking commercial operations in our days, especially for retail banking.

Following this perspective, it should be highlighted that retail banking commercial strategy is not composed of a group of coherent guidelines driven to optimize bank positioning in its market, but also a sum of different “sub-strategies”, where each branch faces a different competitive environment, and needs to decide what actions to promote in order to optimize local positioning and conquer customers (Moormann and Wilkerling, 2006). It is precisely here that we may find one of the major contributions of the MCDA approach: the possibility to support decisions taking into account that problems should be structured on a case-by-case basis, and each decision problem posed requires a different solution.

Furthermore, the guide to bank branch strategic planning deduces a large set of decisions that must be taken in different moments of planning, and at different levels of the retail banking organization. A planning supported by budgets and strictly founded in an algorithm basis is no longer enough to maintain retail banking positioning (or re-positioning) in turbulent times like the present. In fact, new approaches are required to optimize retail banking profit and positioning in each moment. On this basis, the MCDA approach comes up (again) as an interesting and possibly fundamental tool to attain this goal, namely due to its remarkable heuristic elasticity that provides banks with a bigger capacity to support decisions and to adapt strategies to a permanent changing environment.

### 5. A conceptual framework for retail banking

Based on the remarks presented herein, it seems possible to assume that financial and banking problems are suitable for MCDA, and that there are many advantages in using MCDA methods and tools to support financial and banking decisions. Therefore, and following the most recent world economic and banking trends (see Section 1 of this article), a multiple criteria framework for retail banking is proposed with the scope of indicating how MCDA techniques can be applied in a real-life banking context.

Under economic recession, banks should fine tune and focus their strategies, in order to capture more (and better) customers and increase their profitability. Most of the determined strategies should be directed as operational at a branch level, where the management team has privileged contact with (potentially new) customers. Nonetheless, defining a branch strategy and positioning in the local market is not enough to maintain a sustainable and loyal relationship with present and future customers. The basis of the entire process is the relationship developed between the *front office* employees (i.e., the commercial force) and the customers.

Banking is a patrimonial business, which means that the customers’ welfare and security in the future are involved each time a major decision is taken. Customers recognize that and emphasize it in the relationship, giving a bigger importance to the person that impersonates the bank to them, than to the bank itself. Retail bank managers know this reality and must count on it as an argument to increase customer loyalty (even in today’s economic environment). From this perspective, and despite the fact that banks’ profitability is one of the major objectives of our framework, insights from finance, banking, marketing and strategy also have to be borrowed, in order to follow an integrated approach. However, at this initial stage, any type of performance evaluation or any feedback that might arise from it to other stages of the decision aid process have not been considered. Instead, we are only proposing and discussing the use of the MCDA approach to combine qualitative and quantitative data, and to support branch activity under economic recession. In fact, because individual bank branch activity is composed of a variety of interconnected decisions with multiple and conflicting objectives, it should be conveniently modeled.

Following this, there is a set of main functions that should be successively carried out and technically supported to sustainably add value to customers and generate profit to the banks. In broad terms, those main functions are related to: (1) search for new customers; (2) develop contacts; (3) meet (new) customers; (4) business follow-up; (5) approve deals; (6) formalize contracts; (7) increase customer loyalty; and (8) increase customers’ direct business. Moreover, to correctly support those functions, it seems necessary to overcome some of the main difficulties that might exist in data selection, results aggregation, and use of qualitative variables. By proposing the use of MCDA techniques, our framework aims to support all of those functions of the retail banking value chain, which are represented in Figure 4 in a form of a conceptual loop diagram.



Source: Authors' conception.

**Fig. 4. A conceptual framework for retail banking**

As previously discussed, the type of decisions required to implement and control this framework seems to be suitable for MCDA tools. In fact, the proposed framework seems to be suitable to aid, among others, discrete financial and banking decisions that might take place in each one of the functions presented, while it also offers a holistic view of the banking activity at the bank branch level.

In reality, several financial and banking decisions require the evaluation of a finite set of alternatives  $A = \{a_1, a_2, a_3, \dots, a_n\}$ , which may include customers (e.g., individuals or firms; private or public), daily tasks, investment policies, credit concessions, etc. Following Roy (1985), Bana e Costa (1994), Zopounidis (1999) and Spronk et al. (2005), these problems are usually referred to as “discrete” problems, and the outcome of the evaluation process may have different forms (also known as “*problematics*”): (1) *Problematic  $\alpha$* : selecting one among several alternatives (e.g., selection of a financial product); (2) *Problematic  $\beta$* : sorting the alternatives into well-defined groups (e.g., classification of firms as high credit risk firms or low credit risk firms); (3) *Problematic  $\gamma$* : ranking the alternatives (e.g., ranking financial products according to their stock market performance or ranking customers according to their risk); and (4) *Problematic  $\delta$* : providing a description of the alternatives under evaluation (e.g., when a financial description on the alternatives of  $A$  is given).

Considering the proposed framework (Figure 4), we can proceed with an application of each one of the four problematics presented above, based on each one of the eight functions that contribute to increase the banks' and/or the customers' value. Naturally, several MCDA tools can be applied to support the evaluation criteria selection (e.g., cognitive maps and causal loop diagrams) and/or to deal with the

trade-off procedure among those criteria (e.g., AHP and MACBETH). It should also be highlighted that the selection of each one of these problematics in each one of the eight functions depends only on the objective and/or on the context of the decision under analysis. However, once a problematic is selected, the evaluation process is dependent upon a group of evaluation criteria, where each criterion  $k$  represents a value function  $v$  that describes the partial performance of an alternative  $a_i$  and allows partial comparisons between alternatives:  $v(k_{ai}) > v(k_{an}) \Leftrightarrow a_i \succ a_n$  ( $a_i$  is preferred to  $a_n$ ) or  $v(k_{ai}) = v(k_{an}) \Leftrightarrow a_i \sim a_n$  ( $a_i$  is indifferent to  $a_n$ ), where  $v(k_{ai})$  represents the performance of an alternative  $a_i$  on criterion  $k$ . To achieve the aggregation values, trade-offs among criteria must be specified, and several MCDA techniques can (again) be applied to achieve those criteria weights (e.g., AHP and MACBETH).

Statistics and econometrics have been dominating this scientific field for the past few decades, but MCDA techniques have been progressively showing their ability to overcome some of statistical and econometric methods' major shortfalls (review Section 3.3 of this article, and see Spronk et al. (2005) and Al-Jarrah (2008) for further details). On the basis of this discussion, it seems also important to highlight that MCDA techniques can also be powerful instruments for controlling the branch strategic and financial planning, while it supports the account managers' workflow in adding value to the specific retail banking activity.

In broad terms, our framework offers a holistic view of the banking activity at a bank branch level, where at least eight different phases, when correctly integrated and performed, may increase the customers' satisfaction and the banks' profitability. In each one of these phases, decision support systems can be created in order to better support financial and/or banking decisions. Among several possibilities, discrete MCDA techniques can be applied to overcome some of the existing shortfalls, namely: integrated use of quantitative and qualitative criteria, data selection, and results aggregation.

In our opinion, MCDA methodologies and tools may assist decision makers in gaining better insights on shortfalls they are confronted with. Obviously, much work remains to be done, and the framework should be discussed at length and improved.

### Discussion and future research

There is an increasing variety of financial and banking problems that require decision support. The literature has been very generous in reporting problems related to pensions, investments, mutual funds, mortgages, swap contracts, to name just a few. According to Spronk et al. (2005), financial decisions

may be classified in three major groups: (1) *Capital Budgeting*, where most of the decisions are related to investment opportunities evaluation (i.e., distinguish profitable from non-profitable projects) or to select between competing projects; (2) *Corporate Finance*, where the decision problems are particularly related to capital structure and dividend policies; and (3) *Finance Investment* which involves the selection of a portfolio of financial securities for different purposes. Despite this apparently simplified stratification, there is a variety of different problems in each one of the three categories. However, such decisions have also much in common, such as: multiple and conflicting criteria, complexity and ill-defined problems.

For the past few decades, the financial and banking fields have been dominated by statistical and econometric methods that aim to find optimum solutions to the different decision problems. Nonetheless, despite their undeniable importance in the decision process, it seems generally accepted that optimization techniques are oversimplifications of real-world problems, and they reduce the problems' multidimensional character. In broad terms, if there is a multiplicity of financial decision makers, it will be easy to find multiple objectives, multiple constraints and multiple points of view that will become, at least, conflicting during the decision aid process. Therefore, optimization techniques and their oversimplifications of real-world problems will lead (most probably) decision makers to unrealistic solutions (sometimes not even recognized by themselves). In our opinion, MCDA methods might help decision makers to overcome some of these problems, not only because they offer a more realistic framework, where quantitative and qualitative criteria may be combined, but also because they allow decision makers to reach negotiated solutions (namely when optimum solutions are generally not possible). Quoting Hastie (1982), in Spronk et al. (2005: 9), "[...] *particularly in the field of finance, what is needed are approximate answers to the precise problem rather than precise answers to the approximate problem*".

It seems also clear that the MCDA approach allows decision makers to combine sophistication, realism, and easy computational treatment and implementation. However, it can always be argued that this combination does not ensure effectiveness (Spronk et al., 2005). Many research cases that applied MCDA tools and interactive procedures for resolving financial and banking problems revealed the tools to be time consuming and too dependent not only on the decision makers' availability and willingness, but also on the ability of the facilitator (i.e., scientist, consultant or researcher that conducts the

decision-making process). On the other hand, MCDA methods have been frequently and favorably compared to different statistical and optimization techniques. In consideration of these issues, it seems clear that further research still needs to be done, as well as further theoretical discussion and empirical applications. Only then, we will be able to strengthen this evolving field of research. Naturally, our framework for retail banking is just in an initial phase, and it requires further developments to maximize its capabilities and applications.

## Conclusion

Following previous major contributions to the field (e.g., Zopounidis, 1999; Hallerbach and Spronk, 2003; Steuer and Na, 2003; Zopounidis and Doumpos, 2003; Spronk et al., 2005), this paper's objective is to add to the theoretical framework on the relationship between MCDA and financial and banking decision problems. In fact, one of the major points of interest in this research has been intrinsically related to review the up-to-date relationship between MCDA and financial and banking decisions.

After a preliminary analysis of the most recent economic and banking trends, a short theoretical background on MCDA was presented, in order to highlight some of its potential uses to financial and banking contexts. The suitability of financial and banking decisions has been then analyzed in two different ways (i.e., examining the literature, and looking for multiple criteria in financial and banking problems). Later, special attention has been given to the MCDA methods' capability to overcome some of the shortfalls presented by statistical and optimization techniques, such as their difficulty to deal with the multidimensional character of the financial and banking situations (i.e., multiple decision makers, multiple and conflicting criteria, complexity and subjectivity). To support this statement, several examples and a conceptual framework for retail banking have been presented in order to justify the importance of considering financial and banking decision problems in a multidimensional context (and to use MCDA techniques).

Actually, MCDA tools have been achieving positive results in the field, and it may be stated that they offer a very good alternative to resolve problems when optimum solutions are not possible. Following this, it seems generally accepted that the MCDA modeling framework is sufficiently robust to successfully deal with the diversified nature of the financial and banking industry, namely due to its remarkable heuristic elasticity that provides banks with a larger capacity to support decisions and

to adapt strategies to a permanent changing environment. Obviously, since a practical application of MCDA and its interactive procedures depend on the availability or willingness of the decision maker/s, and on the ability of the facilitator as well, it might become demanding and time consuming. Still, MCDA advantages may compensate for the efforts made by qualified actors. Therefore, the development and promotion of MCDA tools in finance and banking are a key issue in their successful application.

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