DECISION PROBLEM ANALYSIS BY USING KT® PROBLEM SOLVING AND DECISION MAKING METHODOLOGY

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Abstract

The paper deals with a relevant macroeconomic decision problem in the Czech Republic using KT® Problem Solving and Decision Making methodology by students in the study subject Managerial Decision Making at the University of Economics, Prague. Based on the application of this methodology, the paper seeks to answer several questions. Firstly, "How applicable is the methodology for the defined macroeconomic decision problem?" Secondly, "What are the strengths and weaknesses of the methodology itself on the one side, and of the users of the methodology on the other side?". And finally, "If any, how to overcome weaknesses of the methodology and how to utilize its opportunities?". The result of each analytical step of the methodology is summarized and critically evaluated. Subjective and objective shortcomings are identified; SWOT analysis of the methodology is developed. The major contribution of the paper is the identification of assumptions for the proper use and benefits of this methodology; the identification of places where people make often mistakes; and the proposal for improvements. The findings can contribute to practical applications of the methodology as well as to academic purposes.

Key words: decision problem, decision making, Kepner-Tregoe, problem solving, public debt

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Introduction

Human life and thus our business are full of decision problems. Inner judgment and intuition are not however always sufficient helpers in decision making, especially about non-structured decision problems. There are several approaches that describe how to proceed for getting the right decision. The core is similar for most of these approaches, but the steps and techniques vary.

1   Background

Business people pay a particular attention to a specific problem solving and decision-making process developed by consulting and training firm Kepner-Tregoe Inc. (KT®). Their approach is already used in many industries and for different types of decision problems. It is based on long-term studies on how entrepreneurs solve problems and make decisions.

This paper focuses on a macroeconomic problem which is not easily solved due to many aspects included – economic, legislative, political, social, and methodological as well as to both short-run and long-run impacts involved. The problem itself is a non-structured one and therefore well applicable for this methodology.

1.1   Methodology

KT® discovered that managers often use unconsciously "four basic patterns of thinking" defined by four questions: "What's going on?", "Why did this happen?", "Which course of action should we take?", and "What lies ahead?" (Kepner & Tregoe, 2006, p. 9). They formulated "the rational process" (2006, p. 9) and divided it according to the particular questions into four steps: "situation appraisal", "problem analysis", "decision analysis", and "potential problem (opportunity) analysis" (2006, p. 13-15). Each of the steps "differs in objectives and also in application procedure respectively" (Nagashima & Nakamura & Shirakawa & Komiya, 2008, p. 247). Very little research (e.g. Nagashima et al., 2008; Nakamura & Yeagashi & Suzuki & Nakamuru & Ido & Komiya, 2005) is however devoted to the KT® processes. The KT® rational-process approach is called the KT® methodology in this paper. Core parts of this methodology are applied on assigned decision problem.

1.2   Decision problem

The macroeconomic decision problem we concentrate on is public indebtedness of the Czech Republic. Its public debt is noticed since the early nineties as a result of historical reasons. Comparing with other Central and Eastern European, the EU and other highly developed countries, the Czech Republic belongs to countries less burdened with debt all that time (Čihák & Mitra, 2009; Stoian & Câmpeanu, 2010). In 2011, general government debt is CZKbn 1,567.8 (CSO, 2012, p. 2), "the overall deficit […] is estimated at 3.8% of GDP (IMF 2012, p. 4), "the public debt to GDP ratio" represents "41.2%" (CSO, 2012, p. 2; IMF 2012, p. 2) while the EU average was below 60% (Stoian & Câmpeanu, 2010, p. 503), Euro area-15 makes 95.1% and OECD 103% (OECD, 2012). The amount of the debt itself in not as severe

"when compared to regional [Austria, Germany, Poland, Slovakia] peers" (OECD, 2011, p. 46), but it is rather the debt hike (Karpová, 2011) – the debt-to-GDP ratio "has doubled over the past 10 years" (OECD, 2011, p. 13). The government seeks "to bring the general government deficits under 3% of GDP by 2013 […] and to balance the budget by 2016" (Klyuev & Snudden, 2011, p. 306).

2   Results

In this section, we describe the key issues of the process (see 2.1) by which the students had to go through when applying the methodology. We mainly focus on their objective and subjective difficulties in solving the individual steps. Afterwards (see 2.2), we recommend some improvements. To finish, we work out the SWOT analysis of the methodology (see 2.3).

2.1   Application of the methodology on assigned decision problem

Students of the study course Managerial Decision Making voluntarily participated in application of the KT® methodology (—, 2012). The problem was assigned in general as "Debt of the Czech Republic is increasing". We found several key issues which ought to be considered and discussed.

Issue 1. Macroeconomic topic of public debt is an unstructured decision problem for the Business Administration students. They have no experience in dealing with macroeconomic matters. The only theoretical discipline which they could use is macroeconomics. Step-by-step KT® methodology and searching for relevant data helped the students to solve this unique and complex problem.

Issue 2. The basis for the successful treatment of any decision problem is its exact wording. The decision problem should therefore be clearly stated first and then specified. By intent, a vague Problem Statement[1] was assigned to students. Only about a third of students understood the need for the exact Problem Definition which required tracing data. Specification of the task was completed by describing four Dimensions of the problem: What, Where, When, and Extent. In solving Problem Analysis, the students were faced with several difficulties. These difficulties were represented in particular by identification of "what is not" a problem, "how many deviations are on each object", and by differentiation between "when was the deviation observed first" and "when since that time" (Kepner & Tregoe, 2006, p. 33).

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[1] Capital letters indicate the key terms of the KT® methodology.

Issue 3. Generally speaking, the problem can be solved by affecting its consequences, or by influencing its causes. KT® puts emphasis on finding and testing causes. Students were allowed to use the methods of causal analysis in the search for the causes of the problem. Around 41% of the students really used such a method which helped to find the true causes. Most worked with root-cause analysis while about 8% constructed the cause-effect-diagram.

Issue 4. Decision Analysis starts with the Decision Statement and continues with formulation of Decision Objective/s. KT® methodology defines what objectives mean but does not specify requirements on their formulation. It happened therefore that the students in the vast majority (approx. 90%) set indistinct both Decision Statement and Objectives; moreover they did not quantify them.

Issue 5. To verify achieving the objectives, the students were tasked to formulate five criteria for evaluation of alternatives. Even here, there were numerous inaccuracies. Most students defined ambiguous criteria. Many students did not follow other general requirements for the criteria, especially independence. KT® methodology does not distinguish decision objectives from evaluation criteria ("Objectives […] are the criteria for the decision" say Kepner & Tregoe, 2006, p. 81), therefore it does not specify requirements on criteria.

Issue 6. Students were assigned to consider a progressive tax as an alternative for the public debt decrease known as the Buffett's Initiative (Buffett, 2011, p. A21). In lastly solved analytical area of Potential Problem/Opportunity Analysis, students should therefore state the Action including the end result and conditions applicable for this alternative. Errors were made by the students also in this task.

Issue 7. Finally, the students recognised (with restrictions on only three proposals per a student) over hundred different proposals of potential problems and similarly for potential opportunities. Speaking about Potential Problem Analysis, the students identified Likely Causes, their Preventive Actions, and Contingent Actions reducing likely effects. Some of the students however set Triggers not for Contingent Actions but for Problems. They often forgot to identify Deadline and Who should be responsible for the particular Action. They also had difficulties in determination of Signal Level which ought to activate Contingent Action. Similar errors appeared in Potential Opportunity Analysis. The Impact (Probability multiplied by Seriousness of the problems or by Benefit of the opportunities) was assessed well.

How applicable is the KT® methodology for the defined macroeconomic decision problem? No significant constraint has been recognised in depth and breadth of the application. We can confirm that the KT® rational process can be used even for government issues, by government agencies, consulting agencies or education institutions.

2.2 Proposal for improvements

Based on the findings of each analytical step of the methodology summarized in key issues (the subsection 2.1), we propose seven potential improvements as follows.

Proposal to Issue 1: We confirm that the KT® methodology:

1.1 Can be used for unstructured problems,

1.2 Can be used for non-profit organisations,

1.3 Can be used even for macroeconomic decision problem of government agencies.

Proposal to Issue 2:

2.1 From the above it is clear that training in KT® methodology is needed to be ensured a complete understanding of consequences and the individual parts of the methodology.

2.2 It is still necessary to more emphasize the need for precise formulation of the Problem Statement, Problem Definition, and specifications according to four Dimensions (e.g. to practise more cases during training).

Proposal to Issue 3:

3.1 Finding causes is not a simple matter especially for unstructured problems and for beginners. Moreover, even when using a computer, KT® processing is not very illustrative; one is easily lost. Therefore, we recommend the use of graphical methods of causal analysis, which can be also combined for sorting out the causes from various points of view.

3.2 Graphical techniques serve not only as a visual aid for solvers (analyst) but also as a presentation tool.

Proposal to Issue 4:

4.1 The methodology should refine the requirements and recommend how Objectives ought to be correctly formulated. We support using the SMART method. Especially, it is always necessary to determine which level of a value is to be achieved and when.

Proposal to Issue 5:

5.1 Criteria must be based on Objective/s. At least one criterion needs to be defined for each objective. Criteria should be measures monitoring if objectives have been already achieved.

5.2 The criteria should meet certain requirements as unambiguity, completeness but sobriety, balance, non-redundancy, and independence.

Proposal to Issue 6:

6.1 Errors highlight the need for initial KT® training.

6.2 It is necessary to consistently ensure a clear statement of Action, result, and conditions.

Proposal to Issue 7:

7.1 Initial training will ensure a proper procedure and help with finding a solution.

7.2 To underline a need to fill out all the cells of the table.

7.3 Probabilities can be refined by calculations (e.g. by using the method of relative frequencies or the method of quantiles).

7.4 Quantifying the Probability and Seriousness/Benefit would be more appropriate than just qualitative (low, medium, large) expression.

7.5 Tabular form for indicating the Impact can be replaced by a matrix of risks/opportunities which is widely used in risk management and project management.

We were looking for pros and cons. We tried to take account of the methodology itself as well as its users (e.g. decision makers, analysts, evaluators, advisors, students). The question "What are the strengths and weaknesses of the methodology?" does not have one-word reply. Both the sections 2.2 and 2.3 have a share in the answer.

2.3   Strengths and weaknesses of the KT® methodology

Strengths and weaknesses accompanied by threats and opportunities of the methodology are identified by SWOT analysis summarized in Tab. 1.

Tab. 1: SWOT analysis of KT® methodology

Strengths	Weaknesses
- Systematic procedure with unified approach	- Training needed
- Rational solution	- Training fee
- Step-by-step analysis helping to know how to proceed and not to forget anything	- Time consuming
- Applicability for different type of decisions	- Level of subjectivism
- Applicability for different industries and services, different organisations	- No creativity
- Applicability by a single person, by a group and even within the whole organisation	- Hard to overlook easily, tablet form only, no graphics (poorly arranged)
- Dealing with potential risks	- Lack of methodological support in finding likely causes
- Dealing with potential opportunities	- Lack of methodological support in defining objectives and criteria
- Looking both at effects and at their causes	- Lack of methodological support in quantifying estimation of probabilities and significance
- Working with future scenarios for risks and opportunities	
- Availability of KT® training	- Not about how human decisions are

Strengths	Weaknesses
- Availability of PC version - Decision-making process covered from problem identification up to a choice of the most appropriate future alternative - The methodology drives to know which analysis to do and which one not to do	actually made - One method among other methods
Opportunities	Threats
- Improvements in better visibility - Improvements in better overall orientation - Combination of other techniques/methods	- Misuse of the methodology - Disuse of the methodology - Refusal or rejection of the methodology

Source: the author, 2012

Students handled a new and challenging task relatively well. It is important to say that without the KT® methodology, students´ solution would not be so complex, not so detailed, and therefore – apart from the initial errors in their first KT® application – not so accurate. Application reached its purpose for the specified task. The students consider the KT® methodology a useful and helpful tool, although very time consuming.

We see from the Tab. 1 that strengths outnumber weaknesses. From the qualitative view, we strongly believe that strengths and opportunities exceed weaknesses and threats respectively. We depicted above (see 2.1) several shortcomings which should draw our attention to the precise implementation. We also identified weak points and threats (see 2.3). How to overcome weaknesses of the methodology and how to utilize its opportunities? To throw down a challenge (see 2.2 and 2.3) and grab the opportunity.

Conclusion

Several approaches exist in how to proceed in solving problems and making decisions. Not to rely sorely on intuition, as many managers do, the KT® rational process can be used with good results. This methodology is becoming known more in practice rather than in academic environment. We have rewarding experience that this methodology can bear fruits in practice even for macroeconomic issues of government agencies. It also can help students in learning-by-doing and in understanding the decision making process. This paper defines advantages and disadvantages of the methodology and formulates further improvements. The findings and proposals can contribute to practical applications as well as to academic purposes.

References

—. "Debt of the Czech Republic - Kepner-Tregoe® Methodology Application." Seminar Papers on Managerial Decision Making. University of Economics, Prague. 11 May 2012.

Buffett, Warren. "Stop Coddling the Super-Rich." *New York Times* 15 Aug. 2011: A21.

CSO. "Czech Republic in International Comparison 2011. Macroeconomic Indicators." 24 Febr. 2012. *Czech Statistical Office.* 10 June 2012 <http://www.czso.cz/csu/2011edicniplan.nsf/engpubl/1607-11-eng_r_2011>.

Čihák, Martin, and Mitra, Srobona. "The Financial Crisis and European Emerging Economies." *Finance a úvěr-Czech Journal of Economics and Finance 59 6* Dec. 2009: 541–553. 10 June 2012 <http://journal.fsv.cuni.cz/storage/1174_1174_541-53---cihak-mitra.pdf>.

IMF. "IMF Country Report No. 12/115. Czech Republic: 2012 Article IV Consultation—Staff Report: Staff Supplements; Public Information Notice on the Executive Board Discussion; and Statement by the Executive Director for Czech Republic." May 2012: 1-57. *International Monetary Fund.* 10 June 2012 <http://www.imf.org/external/pubs/ft/scr/2012/cr12115.pdf>.

Karpová, Eva. "Public Debt in the Central and Eastern European Countries - Development in the Context of the World Economic Crisis." *Acta Oeconomica Pragensia 2011* Dec. 2011: 21-38 (in Czech). 10 June 2012 < http://www.vse.cz/aop/abstrakt.php3?IDcl=349>.

Kepner, Charles, and Tregoe, Benjamin. *The New Rational Manager. An Updated Edition for a New World.* Princeton: Princeton Research Press, 2006.

Klyuev, Vladimir, and Snudden, Stephen. "Effects of Fiscal Consolidation in the Czech Republic." *Finance a úvěr-Czech Journal of Economics and Finance 61 4* Aug. 2011: 306-326. 10 June 2012 <http://journal.fsv.cuni.cz/storage/1216_str_306_326_-_klyuev.pdf>.

Nagashima, Takeo, Nakamura, Keiichi, Shirakawa, Kiyomi, and Komiya, Seiichi. "A Proposal of Risk Identification Based on the Improved Kepner-Tregoe Program and its Evaluation." *International Journal of Systems Applications. Engineering & Development 2 4* Oct. 2008: 245-257.

Nakamura, Keiichi, Yaegashi, Rihito, Suzuki, Satoshi, Nakamaru, Manabu, Ido Takaaki, and Komiya, Seiichi. "A Group Problem Solving System Based on Kepner-Tregoe Program: Experiment-based Confirmation of Effectiveness as Coordinator Support Facilities." *Journal of Integrated Design & Process Science 9 2* Apr. 2005: 47-64.

OECD. *OECD Economic Surveys: Czech Republic 2011.* Paris: OECD Publishing, 2011.

OECD. "OECD. StatExtracts. Economic Outlook No 91 - June 2012 - OECD Annual Projections: General government gross financial liabilities, as a percentage of GDP." June 2012:1. *Organisation for Economic Co-operation and Development.* 10 June 2012 <http://stats.oecd.org/Index.aspx?QueryId=36382>.

Stoian, Andreea, and Câmpeanu, Emilia. "Fiscal Policy Reaction in the Short Term for Assessing Fiscal Sustainability in the Long Run in Central and Eastern European Countries." *Finance a úvěr-Czech Journal of Economics and Finance 60 6* Dec. 2010: 501-518. 10 June 2012 <http://journal.fsv.cuni.cz/storage/1198_str_501_518_-_campeanu.pdf>.

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