

A NEW BUDGET ALLOCATION MODEL BASED ON EFFICIENCY ANALYSIS FOR PUBLIC R&D GRANT PROGRAMMES

ABSTRACT

This study proposes a new budget allocation model based on efficiency analysis for government support programs. The Scientific and Technological Research Council of Turkey subsidizes 350 million Turkish Liras every year via 13 support programs for industrial research and development (R&D). We aim to allocate this budget among support programs analytically. Firstly, impacts of R&D grants are examined. When make an impact analysis several criteria should be taken into consideration like growth rate, number of employed R&D personnels. Therefore, this is a multi criteria decision making problem. Secondly, budget allocation model that uses results of impact analyses is established. As a result, correct budget allocation for government R&D supports could be provided thanks to suggested model.

Keywords: AHP, efficiency analysis, R&D supports, budget allocation

1. Introduction

In Turkey, 350 million Turkish Liras are spent for research and development subsidies every year. We aim to allocate this budget among support programs correctly. In the scope of the study, 4 out of 13 support programmes having the largest budget are selected and an AHP model is developed to test the effect of these programs. Based on the results of the AHP model, a linear programming model that distributes the budget among programmes is developed.

2. Literature Review

There are lots of studies about evaluating effects of public R&D supports (Clarysse et al., 2009; Georghiou and Roessner, 2000). Fang (2015), proposed a new approach for resource allocation based on efficiency analysis using data envelopment analysis. As seen from the literature there is no study budget allocation model based on efficiency analysis via AHP.

3. Hypotheses/Objectives

The aim of this study is to evaluate the effectiveness of industry oriented R&D grant programmes in Turkey and to determine the number of projects to be supported for each program in a year to maximize the efficiency by developing a new linear programming model based on AHP.

4. Research Design/Methodology

As a result of interview with experts who are authority on new product strategies, decision matrix related to criteria and alternatives are formed. Criterias were obtained

making use of the procedures and principles of R&D Grant Programs. As alternatives, 4 out of 13 support programmes having the largest budget are selected.

5. Data/Model Analysis

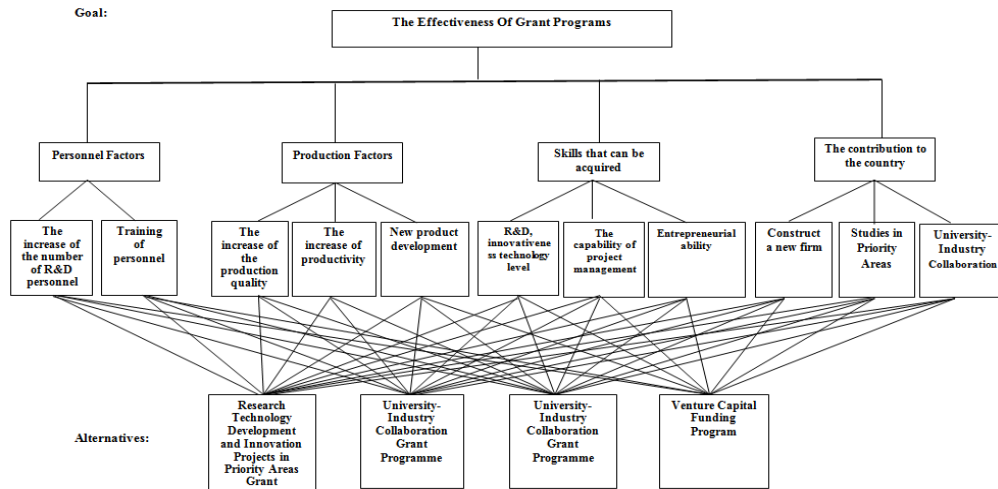


Fig. 1. Hierarchy model

Table 1. Weights of the criteria

Criteria	PF	PrF	SA	CC	Weights	
Personnel Factors (PF)	1	4	3	0,14	0,186	CI=0,088
Production Factors (PrF)	0,25	1	0,33	0,11	0,050	
Skills that can be acquired (SA)	0,33	3	1	0,16	0,107	CR=0,097
The contribution to the country (CC)	7	9	6	1	0,657	

6. Limitations

We couldn't use real sums of money because of the privacy policy.

7. Conclusions

In this study, a hierarchical project effectiveness analysis model is developed. Results obtained by AHP are utilized in the mathematical budget allocation model that is used to allocate total budget to projects. With the help of this method, effects of the projects are identified objectively and budget allocation could made fair on the basis of these effects.

8. Key References

- Clarysse B., Wright M., Mustar P., (2009), "Behavioural additionality of R&D subsidies: A learning perspective", *Research Policy*, 38, 1517–1533.
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