


Chapter 5


Computer–Brain Interface in Economics: An Innovative Method for Policy Analysis

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ABSTRACT

The utilization of Brain-Computer Interface (BCI) technology in economics offers a unique perspective on policy analysis by accurately capturing the affective and cognitive responses of individuals to economic stimuli in real-time. Biases and delayed feedback mechanisms frequently compromise the behavioral data, surveys, and simulations that traditional economic models use to assess the effects of policies.

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By offering a direct means to evaluate brain activity, brain-computer interfaces (BCIs) address these challenges, thereby providing real-time insights into emotional responses, preferences, and decision-making processes. This research concentrates on the potential of BCI to enhance the development, implementation, and assessment of fiscal policies. Policymakers can enhance their comprehension of the intricacies of human behavior, adjust policies to align with actual responses, and enhance the accuracy of economic forecasts by incorporating brain data.

INTRODUCTION

The application of Brain-Computer Interface (BCI) technology (Pan, X. & Hamilton, A. F., 2018) in economics represents a transformative approach to policy analysis. Quantitative data (Pandey, D. et al., 2024), surveys, and behavioral evaluations are frequently employed by conventional economic models to develop policy. However, these methodologies (Shahul, A. et al., 2024) frequently fail to accurately represent the immediate cognitive processes and affective reactions of individuals, which are essential for economic decision-making (Krajbich, I., 2019). The direct observation of cerebral activity facilitated by BCI technology bridges this divide, demonstrating how individuals perceive, respond to, and interact with economic policy (Pandey, B. K. et al., 2024a). BCI operates by analyzing cerebral impulses and transforming them into valuable outputs, thereby allowing researchers and policymakers to acquire a deeper understanding of the cognitive patterns that influence decision-making (Pandey, D. et al., 2020). The precision and profundity of economic studies are improved by this real-time (Gupta, R. et al., 2023), neural-level data. BCI can be employed to evaluate the responses of individuals to changes in monetary policy (Pandey, D. et al., 2020), taxation, or social programs (Tareke, S. A. et al., 2022), thereby offering a more comprehensive understanding of their potential efficacy and public reception (Gluth, S. et al., 2018).

In addition to improving the accuracy of economic forecasts, BCI-based policy analysis can make policies more responsive and personalized. Governments are able to develop policies that are tailored to the unique behavioral tendencies and requirements of different demographic segments by comprehending cognitive variability within groups (Pandey, D. et al., 2024a). This may lead to more effective and widely accepted policies by incorporating the cognitive and affective motivations of diverse individuals into economic strategies that are more inclusive (Muralidhar, L. B. et al., 2024). Ethics concerns are raised by the application of BCI in economics (Zeki S., 2015). The potential exploitation of neurological data, data ownership (Sharma, S. et al., 2023), and privacy must be addressed (Kumar Pandey, B. et al., 2021). The technology's effective and responsible application in economic analysis

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