Chapter 13
System Dynamics Modelling for Policy Design:
A Case Study in Turkey

Arzu Eren Şenaras

https://orcid.org/0000-0002-3862-4551
Uludag University, Turkey

Hayrettin Kemal Sezen
Altınbaş University, Turkey

ABSTRACT

The system dynamics model was developed in the Vensim software. The model was developed based on the Yamaguchi study. The construct and behavioral validity of the model were addressed. Construct validity means that the correlations that construct the model, that is, the "rationale" of the model, are consistent with the correlations in the real system. There were five sub-models in the model. These were manufacturers and consumers sub-model, banks sub-model, central bank sub-model, balance of payments sub-model, exchange rate market sub-model. Five sub models included in the model developed with the VENSIM software are included in the appendices.

INTRODUCTION

System dynamics deals with how things change over time. Almost all are interested in how the past formed the present moment and how today's actions determine the future (Forrester, 1995: 16).

The concept of dynamics indicates change over time. If something is dynamic, it changes constantly. Therefore, a dynamic system is a system in which there are interactions that promote change over time. System dynamics approach is a method used to understand how the system changes over time. The elements and variables that constitute a system that changes in time are expressed as the system behavior. The aim is to understand the basic behavior system of the variables, to discover the factors that cause this mode of behavior and to improve the system behavior. Thus, it could be argued that system dynamics is a method to explain how the systems change with time. In dynamic systems, variables influence each other simultaneously (Barlas, 2005a; Ayanoğlu & Gökçe, 2007).

Dynamic complexity arises from connections and disconnections that link social and business systems. When a change occurs in one part of the system, it causes change in another part later (sooner or later). These effects could not always be observed clearly, usually they are beyond expectations (Morecroft, 2015: 21).

A BRIEF LITERATURE REVIEW

In this section, the studies conducted with system dynamic approach in the fields of economics and finance are briefly discussed.

Kameyama et al. (1997) utilized system dynamics approach to construct a national model in their study. As a result, the entire economy could be scrutinized. Although the system dynamics is one of the most useful tools available to investigate socioeconomic phenomena, it was rarely used by the policy makers. The aim of the constructed SD model was to close this gap.

Kameyama et al. (1999) investigated how the decisions made by the government and local governments affected the economy using the national accounting model they designed in their study.

Kameyama et al. (2001) reported that economic growth is closely associated with the growth of small businesses and all competitive large corporation of today once was a smaş-ll business and small businesses play a significant role in the reduction of unemployment. Thus, small businesses are important for macroeconomics. To examine the effectiveness of the support and incentives provided for small businesses, Kameyama et al. developed the SD model. Thus, they explored the long-term effects of policies, demonstrating the possibility of producing different solutions.

17 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/system-dynamics-modelling-for-policy-design/236319

Related Content

Influence of CSR Activities on Stakeholders in Foreign Markets
Andrija Bari, Mislav Ante Omazi, Ana Aleksiand Mirjana Pejic-Bach (2022). *Research Anthology on Developing Socially Responsible Businesses (pp. 1705-1720).*
www.irma-international.org/chapter/influence-of-csr-activities-on-stakeholders-in-foreign-markets/302345

B Corp Certification Effects: Design and Validation of a Questionnaire Applying Delphi Method
Elsa Diez-Busto, Ana Fernandez-Laviadaand Lidia Sanchez-Ruiz (2022). *Future Advancements for CSR and the Sustainable Development Goals in a Post-COVID-19 World (pp. 198-215).*
www.irma-international.org/chapter/b-corp-certification-effects/287851

Ethics and CSR Practices for Enduring Corporate Governance Culture
Olusegun Vincent, Fredrick Ikpesuand Olamitunji Dakare (2022). *Research Anthology on Developing Socially Responsible Businesses (pp. 33-56).*
www.irma-international.org/chapter/ethics-and-csr-practices-for-enduring-corporate-governance-culture/302260

Type of Relationships and Their Management Towards Quality and Performance in the Textile and Apparel Industry: A Literature Review
José M. Lavín (2020). *Management and Inter/Intra Organizational Relationships in the Textile and Apparel Industry (pp. 1-25).*
www.irma-international.org/chapter/type-of-relationships-and-their-management-towards-quality-and-performance-in-the-textile-and-apparel-industry/245129

Digital and Traditional Tools for Communicating Corporate Social Responsibility: A Literature Review
Gianpaolo Tomaselli, Monia Melia, Lalit Garg, Vipul Gupta, Peter A. Xuereband Sandra C. Buttigieg (2019). *Corporate Social Responsibility: Concepts, Methodologies, Tools, and Applications (pp. 679-696).*
www.irma-international.org/chapter/digital-and-traditional-tools-for-communicating-corporate-social-responsibility/206983