Chapter 1
Multinational Enterprise Adaptation Dynamics, Mathematical Modelling, and Empirical Analysis

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ABSTRACT

Using an applied mathematics approach, this chapter embeds algorithmic measures into cultural theory in research on international business. The specialized area is concerned with adaptation of multinational enterprise (MNE) cross-borders in which how dynamic functions can strengthen the argument by producing robust models. The chapter contributes to the extant literature by offering a set of mechanisms that can be used by MNEs in adapting to a new or complex environment where culture can be diverse and policy choice is challenging. The mechanism by driving an adaptive approach, in particular, addresses a research issue that is persistent in cultural transition studies. The issue is distinguished from the standard economic model in that individual or rational actors have a fixed set of independent preferences (i.e., decision choice based on price, benefit, or rules of the game), uninfluenced by the behavior of others or the social settings within which they operate. The current study addresses the issue by demonstrating that a range of socio-cultural factors can influence behavior.

INTRODUCTION

Using an applied mathematics approach, this chapter embeds algorithmic measures into cultural theory in a specialized area in research on International Business. The area is concerned with adaptation of multinational enterprise (MNE) cross-borders regarding how dynamic functions in mathematical theory can strengthen the argument by producing robust models. The chapter contributes to the extant literature by offering a set of mechanisms that can be used by MNEs in adapting to a new or complex environment where culture can be diverse and policy choice is challenging. The mechanism by driving an adaptive

approach, in particular, addresses a research issue that is persistent in cultural transition studies. The issue is distinguished from the standard economic model in that individual or rational actors have a fixed set of independent preferences (i.e., decision choice based on price, benefit, or rules of the game), uninfluenced by the behavior of others or the social settings within which they operate. The current study addresses the issue by demonstrating that a range of socio-cultural factors can influence behavior.

The chapter also contributes to theory advancement in business mathematics and business analytics first by employing general economic productivity function and second by using the dynamic functions with which to compare the results. The techniques by perturbations of measures associated with cultural adaptation, social learning, and organizational fitness enable examination of correlation between the observed variables (exogenous) and organizational replication (endogenous) where robust models have been generated from the dynamic interactive. The empirical analysis draws out results from MNE data and the findings suggest that reproductive success in changing environments resides with MNE adaptation dynamics - adaptations to conformist norms and valuable good practices create evolutionary fitness of MNEs in the given environment.

Globalization with its processes has posed inherited, local, community culture to those multifaceted ones such as culture mutability, malleability and multiplicity (Hong, Morris, Chiu, & Benet-Martínez, 2000; Leung & Morris, 2015). Gen-culture (e.g., native English or native Chinese) coevolutionary processes have led to the emergence of coevolutionary behavioral dispositions, social rules, institutions, learned expectations and beliefs, and common values of communities (Hannan & Freeman, 1989; Cordes et al., 2008; Boyd et al., 2011). Given the coevolution, traditional research becomes less effective in theorizing on how plural, dynamic cultural proficiencies surface situational-based behavior. Unitary and static predispositions are less able to explain the impact of the dynamic cultural environment on the complex of behaviours of humans and societies (Hong et al., 2000; Leung & Morris, 2015). The evolving social context-based behaviour advances the evolutionary societies where the innate aspects on our social norms, tribal psychology, and institutionary theory keep updating, which insist challenge for research, as well as for complex societies.

The organizations of which complex societies are composed in many ways resemble ancestral tribes (Richerson & Boyd, 1999). Resembling the internationalization of business cycles has also brought many non-inherited, non-locally situated (homogenous) cultures, where a diverse range of groups and communities (heterogeneous) norms and cultural traits is evolving. Human culture constitutes socially transmitted information such as attitudes, beliefs, values, practices, and representations capable of affecting behaviours that are not constant between groups (Peysakhovich & Rand, 2016). Culture differences and variant behaviour patterns influence MNEs that are an interesting type of organizations since, in competitive economies, they are free to succeed or fail (Denison & Mishra, 1996; Deal & Kennedy, 2000). Their success and failure crucially depend upon their adaptive cultures and that involve the situation-specific responses.

The argument of the importance of adaptation to a social environment that is continually changing has been consistent researched by several recent studies (e.g., Boyd & Richardson, 1985; Bosworth, Singer, & Snower, 2016; Henrich, 2004; Hoff & Stiglitz, 2016). On Darwin's (1859) thought, adaptation to variation is the key to survival. We see adaptation is a staple of economics and business management successes, inducing replication or reproductive success (of MNEs, global leaders, migrants). Therefore, how MNEs replicate is also explained by how each of the entity acts to create fitness.

Following from the coevolutionary process, we presume that adaptation drives the evolutionary cycles such that primitive social institutions become established in the local populations and, in turn, exert an

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