Chapter 15
Managing Chaos in Nonlinear Economic Systems:
Globalization and Destination Tourism

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ABSTRACT

The logistic equation (Lorentz, 1963) has been advanced as an explanation of the chaotic growth patterns observed human settlements. It is questioned, however, whether the growth potential in population systems is sufficient for chaos. By modifying the logistic equation to account for the impact of globalization and agglomeration economies on small tourist destinations, Cole (2009a) demonstrates using data from the Caribbean that solutions and trajectories can replicate formal criteria for chaos. Theoretically, the reason for this, in addition to the availability of investment, demand, information, and labor (that alleviate the conventional restrictions on growth), is the demand and supply-side synergies between activities within a dynamic market-segmented sector. This chapter presents continuous and discrete solutions to the model and explains key findings for destination take-off, accelerated growth, and economic maturity, with a rule for modulating and managing chaos-prone economic systems.

INTRODUCTION

Without question, tourist destinations face the full potency of globalization. The industry is claimed to be the world's largest and fastest growing: it has expanded rapidly for half a century, and is on track to double its share of world spending by 2020 (UNTWO, 2006). Increasingly the industry is spearheaded by international chains offering multiple brands in destinations worldwide. Destination tourism typically involves tourists travelling from many parts of the world to favored rather small locations, selected for their climate, heritage, or similar desired characteristics Although a fickle and volatile industry, tourism is a relatively profitable and thus attractive to international business and investors (Cornelissen, 2005; Strauss, 2007). From a business management perspective tourism provides some useful insights. Not only is the industry highly competitive and innovative across the private sector, but so many places, even nations, today look to tourism as the main hope for economic salvation. Thus, hotel, travel, retail, city, public-private partnerships, and tour-

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ism authorities, at all geographic scales cooperate in determining a destination's tourism policy (Knowles, et al, 2001; Wanhill, 2005).

The growth of visitors and tourism-related activities at any given destination typically follows a roughly S-shaped Tourist Area Life Cycle (TALC). This path was originally described by Butler and Brougham (1972) and Butler (1980). The TALC describes the stages of a destination's progression from exploration, involvement, development, consolidation, stagnation, to rejuvenation or decline. This S-shaped life cycle is closely related to the product life cycle proposed by Vernon (1966). A variety of institutional, technological and other explanations have been attached to the model.[1] Over the years there has been considerable discussion of the significance of the life cycle and of the variability in the growth trajectories of different destinations.

A typical trajectory exhibits fluctuations in key variables, such as the annual number of visitors, superimposed on one or more S-shaped curves.[2] In some cases the reasons for these variations are fairly easy to discern, in others more complicated to the point that several authors have called for a "complexity" theory of tourism (Faulkner and Russell, 1997; McKercher, 1999; Baggio, 2008). This raises the question of what type of complexity or chaos theory might be relevant: whether tourism is merely very complicated with many entities and feedbacks subject to a plethora of concatenated fluctuations and shocks, or unstable, even chaotic, due to the embodied structures and behaviors within the tourism system? The answer appears to be that tourism is all of this and possibly more.

The model presented in this chapter makes several predictions about tourism "chaos." These predictions have been explored using available time-series and comparative evidence from island destinations worldwide (Cole, 2007, 2009a, 2012). From this, it appears that, in terms of their logistic growth potential, some tourist destinations are well above the regime of smooth growth and even above levels required for chaos. Whether the fluctuations definitively equate to "chaos" is a moot point since their disruptive impact on an economy is the same and empirically it is difficult to distinguish true chaos from randomness and other extreme disruptions. Based on the formal definition of a destination's trade-offs for risk, growth, and sustainability, this chapter offers a rule for moderating fluctuations. Although tourism may be exceptional in some respects, other rapidly growing industries and places, share the many of its principal characteristics. Thus, our model may have wider applicability. International destination tourism therefore provides an exemplar of how chaos can arise and managed at the local level in a globalized world economy

An Illustration of Tourism "Chaos"

While the historic growth paths of tourist destinations show considerable variability, it is nonetheless useful to provide a particular example to illustrate how the several issues listed above factor into its development. Figure 1 shows the trajectories of international arrivals, new rooms constructed, and average annual occupancy for the Caribbean island of Aruba for years from 1953 to the present.

The tourist arrivals growth trend for Aruba appears to comprise two S-shaped curves: the first from around 1950 to the mid-1980s. This represents the first steps for of international tourism. The initial growth was a highly subsidized policy initiative to offset job losses from the local Exxon oil refinery. Tourism was modeled around the larger American hotel styles, and followed a rather laborious take-off with arrivals steadily rising but with large fluctuations in rates of construction and occupancy. By1980, tourism consultants were questioning whether the island had reached its potential (Spinrad, 1981; Wilkinson, 1987). The second cycle began in the mid-1980s following the near collapse of the island's economy when the refinery "finally" closed its doors. This expansion was again propelled by a system