

Chapter 75

Chaos and Complexity in Financial Statements

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ABSTRACT

Conceptual issues and the basis for the use of financial statements from the perspective of complexity and chaos are proposed. After analyzing the implications that these perspectives have for financial statements, basic accounting equation is examined from the view of complex logic through the mechanisms of the circumscription. Besides, the phase spaces arising from the relationship between indicators of financial health, such as total assets, stakeholder's equity, profit and loss, or cash flow at end of year, are analyzed; also, the relationship among ratios of sustainability, liquidity, and profitability is revisited. The management discussion & analysis and notes to financial statements sections of financial statements are subjected to new interpretations, based on the beliefs logic and complex and chaotic metaphorical narratives. Finally, a critical perspective on the use of chaos and complexity in the analysis of financial statements is introduced.

INTRODUCTION

This chapter introduces concepts and insights in the application of complexity and chaos theories in Financial Statements analysis. Basic assumptions, qualitative perspectives and quantitative interpretations that can be analytically made, are provided, when it is appropriate.

The focus of the chapter is on management view, it is not intended to offer a thorough description of logic and the mathematical procedures that could be applied in many aspects of Financial Statements analysis. When some formulations are included, it is only to complement the cor-

responding explanations or to provide a rational for more in depth analysis. Other explanations are strongly based on graphs and figures, what can be helpful to acquire an intuitive understanding of the possibilities of complexity and chaos in Financial Statements.

This intuitive understanding of the application of chaos and complexity in Financial Statements is needed in management and business administration, where it is difficult to make decisions on a daily bases, with just pure mathematical solutions and models. However, this rigorous application of models and formulations is required to understand the power of this set of theories, in their applica-

tions to Financial Statement and to deduce new applications. I tried to keep in between, in the middle between the social world, or the use of complexity in ordinary language, and logic and mathematical applications, or understanding of some formulations that support complexity.

According to the above, the objective of this chapter is to provide some insights into the approach of complexity and chaos to Financial Statements. To this, a conceptualization is made about the use of this approach in Business Administration science and, specifically, in Financial Statements. Next it follows a discussion about the basic accounting equation, interpreted from the viewpoint of a non-classic logic. Still next, phase space and attractors are qualitatively interpreted based on relationships among several global indicators of financial health, such as Total assets, Stakeholder's equity, Profit and loss and Cash flow at end of year, along with several financial ratios. It follows a new conceptualization of the narratives that exist in Management Discussion & Analysis and Notes to Financial statements from the perspective of para-consistent and beliefs logic. Finally, there are some comments from a critical and pluralistic perspective; this is included to deal with some problems in the application of chaos and complexity perspectives.

BACKGROUND: INTRODUCTION TO SCIENCES OF COMPLEXITY AND CHAOS IN BUSINESS ADMINISTRATION

The management sciences have shown interest in developments arising from complexity science, but it might be that, because of the incomprehensibility that complex system concept may have, yet to many sectors, business administration is operating on complicated rather than complex contexts (Richardson, 2008). However, for some time, the implications of complexity science in management studies have been explored (Lewin, 1999), having

it been said that modern organizations must deal with different degrees of complexity and complication (Vasconcelos & Ramirez, 2011). Knowing the initial condition, the complicated contexts support prediction, while in complex contexts prediction depends on the interaction between system elements (Sargut & McGrath, 2011). However, it is impossible to differentiate, artificially, between complicated or complex contexts, since any context always involves some degree of both features (Juárez & Contreras, 2012, p. 19).

Examples of the interaction between complexity and management science are numerous, having it been explored the utility of complex adaptive systems in the analysis of the internal elements of supply chains and their relationship with the environment in terms of co-evolution (Choi, Dooley, & Rungtusanatham, 2001), the development of breeding programs (Teisman, 2008), the processes of government considered as complex systems (Teisman & Klijn, 2008), the strategic management in the public domain, including restrictions on system predictability and meta-planning (Bovaird, 2008), and the use of different strategies among countries, to reduce and absorb complexity (Boisot & Child, 1999).

Also, it has been analyzed the entrepreneurship in social projects (Swanson & Zhang, 2011), the perspective of leadership by intervenient in the mechanisms of learning in microsystem and mesosystemen, through a social network and in the macrosystem, detecting emerging knowledge (Hannah & Lester, 2009), culture generation by social network models or selection models, introducing exogenous effects (Frank & Fahrbach, 1999), or the influence of environmental complexity in the development of transformational leadership (Ussahawanitchakit, 2011).

Other aspects, which have been studied, are the effect of introducing concepts of complexity in the n-person unanimity bargaining game (Chatterjee & Sabourian, 2000), analysis of markets based on market extensive-form games, as opposed to the perfect competition model (Gale & Sabourian,

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