Systems and Systemic Risk in Finance and Economics *

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> **Neo**: There are only two possible explanations: either no one told me, or no one knows.
>
> **The Architect**: Precisely. As you are undoubtedly gathering, the anomaly's systemic, creating fluctuations in even the most simplistic equations... an anomaly that if left unchecked might threaten the system itself.
>
> Source: *The Matrix Reloaded*

1 Introduction

While the subject of systemic risk is enjoying a well-deserved surge of interest, many of the systemic risk researchers and practitioners would privately admit of yearning for a more fundamental definition and analysis of systemic risk[1] to complement the operational and somehow ad-hoc definitions currently in use. For concreteness, let us mention the widely used and useful joint IMF, BIS and FSB (2009) definition proposed that defines a systemic event as

> the disruption to the flow of financial services that is (i) caused by an impairment of all or parts of the financial system; and (ii) has the potential to have serious negative consequences for the real economy.

While in broad agreement with this definition, our aim is to micro found the concept and to approach the question from the more fundamental concept of an "economic system." Indeed, we do not believe it satisfactory to analyse systemic risk before first having reflected on what a system is in the first place. If the term "system" has no meaning over and above "aggregate," "systematic" or even "non-chaotic aggregate," then it is not clear what systemic risk means over and above aggregate or systematic risk.

Within the rapidly expanding literature on systemic risk – mostly post 2007/8 – several authors stand out, for example the useful survey paper by Bisias

[1] It may be worthwhile pointing out that one of the most insightful and prescient books attempting to understand the foundations of the notion of systemic risk is Kambhu et al. (2007), written on the back of a conference in 2006 prior to the crisis starting in 2007.