Our perception of firms is, to a large extent, shaped by fundamental precepts of systems theory. In other words, a firm is understood to be a complex system in our model. By a system, we mean an ordered entirety of elements. A system becomes complex, when the elements of a system interact in a variety of ways and interrelate with each other in a specific and dynamic relationship. This theoretical description will be explained thoroughly in the ensuing text.

2.1 What is a complex system?

2.1.1 Systems and the environment

First and foremost, a system is an entirety of elements, an integrated whole, a unity which is distinguishable from its environment. The ability to distinguish implies that there must be recognisable borders which allow a firm to set itself apart from its environment. There are a variety of criteria for such separation and many types of borders. For example, there are institutional borders such as membership (having a contract of employment with the firm) or borders of identity (a sense
of belonging and considering oneself to be a part of the firm), etc.
Demarcating the borders of a firm, i.e. defining a firm as a unity (or
entity) in a complex environment, is no trivial matter in light of the
increasingly diverse terms of contract and the enormous number of
different forms of cooperation undertaken by today’s firms with others
(customers, suppliers, partners).

2.1.2 Systems and system elements
A system is a unity comprising elements. Elements are the components of
a system – everything which constitutes an interconnecting system.
However, elements should not exclusively refer to material or object-like
elements such as buildings, furnishings, machines, infrastructures of com-
munication technology or information technology, products, documents,
ar执法facts and employees. At least of equal importance are immaterial ele-
ments too, those having no objective physical embodiment such as
events, patterns of communication, relationships, processes, teams,
departments, divisions, principles of conduct, strategies, etc.

2.1.3 Interconnection and dynamism as expressions of system
complexity
The diversity of the elements and of the interactions between these
elements forms the complexity of a system. We describe a system as
complex when:

• multiple and not easily intelligible relationships and interactions
  between the elements of a system exist;
• due to various reconnections and a certain independence inherent in the
  system elements these relationships and interactions undergo constant and barely predictable change; and
• these relationships and interactions, or the way in which the system
  behaves, provide emergent results, i.e. results that can in no possible way
  be traced back to peculiarities or characteristics of individual elements;
  rather, they arise from ways in which the elements of the system
  combine and especially in the dynamics of their interaction. This means
  the results depend upon certain patterns of recurring interactions that
  emerged historically.

Therefore, complex systems are typically dynamic systems, meaning
that they are constantly developing, are in constant ‘re-construction’.