If, on the other hand, the considered products are produced in a different production segment and/or different nodes of the focused company's supply network, the reliability with which a scheduled inflow date is met (e. g. in a semi-finished stock point) depends on the quality of production management in the delivering production segment. If capacity constraints are anticipated and prevented through suitable planning procedures, the scheduled inflow times are met with a high probability. Data from the past has little significance in this case.

In the following we discuss several available options of coping with uncertainty in supply networks. It will not be possible, though, to present a theoretically as well as practically satisfying analysis for each structure of a supply network that may possibly be found in industrial practice. For many types of supply network configurations suitable methods for the analysis and the optimization still have to be found. We shall first take a look at models for often occurring types of isolated inventory nodes and analyze them under the assumption that the decision parameters of a considered node do not have any influence on the other nodes in a supply network. Accordingly, we shall deal with selected single level inventory policies which have in common that they are based on the assumption of a given demand structure (output of the node) and a given delivery behavior of the supplier (input of the node). Later, the discussion will be extended to selected structures of multi-level systems in which several nodes of the supply network will be considered with their interactions. Finally, we will discuss some practical approaches of covering risk.

B.3 Modeling of Supply Networks

Before presenting the problems arising with the analysis and the optimization of processes in a supply network, let us first address several questions with general relevance for the modeling of supply networks. Following some **basic definitions** we illustrate different ways of modeling the time axis with respect to the **order arrivals** as well as to the **review intervals**. Then we discuss the criteria used to measure the contribution of an inventory node to the **logistical performance** of a supply network. After that we address methods to compute the probability distribution and the parameters of the **demand during the risk period**.

B.3.1 Basic definitions

In the analysis presented in the remainder of this book, several definitions of inventory-related terms are used. As in the majority of the presented models a discrete time axis is considered, we record the different types of inventory at the end of a period. Note that