

Preface

As an empirical science, economics employs theoretical models to describe economic phenomena and processes. These models are then used to generate empirically testable hypotheses. Comparative statics analysis facilitates the derivation of such hypotheses. This book is a self-contained introduction to comparative statics analysis.

The demands that modern economic analysis places upon the student renders an incremental approach to learning essential. This permits students' intuition to develop as mathematical tools are employed in problem solving. In this book, students learn comparative statics analysis by doing comparative statics in progressively more sophisticated models. Repeated application of the basic technique allows students to gain competence in comparative statics analysis with minimal distractions.

Comparative Statics Analysis in Economics presupposes knowledge of intermediate microeconomic theory and the ability on the part of the student to compute the partial derivatives of a function of several variables. While the level of mathematical sophistication has been kept as elementary as possible, understanding of some additional preliminary results is essential. These preliminaries are summarized in Chapter 1.

Chapter 2 is devoted to a discussion of the comparative statics methodology. Simple examples provide the motivation for the remainder of the text. The Implicit Function Theorem is presented, and we discuss the basic comparative statics technique.

In Chapter 3, we examine the comparative statics properties of models with explicit solutions. These are the simplest type of comparative statics problems and serve to illustrate concretely the dependence of the "solution" values of a model on its parameters.

In Chapter 4, we pass to a discussion of general function models. Having clearly illustrated the dependence of solutions on parameters in Chapter 3, the transition to models with arbitrary functional forms satisfying a minimal set of

assumptions is relatively straightforward. The presentation here is intentionally repetitious in order to emphasize the common structure of the models, the applicability of the Implicit Function Theorem, and the importance of the second-order sufficient conditions in optimization-based models. Moreover, it is in this chapter that the ability of the comparative statics methodology to generate qualitative results becomes most evident.

Chapter 5 presents the basic comparative statics theorems for parameterized optimization problems. In order to reinforce the technique, the theorems are proven using the formal methodology of Chapter 4.

Chapter 6 provides an introduction to primal-dual analysis. The ability of this method to yield all implications of the optimization hypothesis is emphasized, while formal proofs of some claims are omitted.

No results have been presented without application. In addition, the exercises at the ends of the chapters involve application of the techniques and results presented in the chapters. These exercises should be considered an *essential* part of the text, as one masters the technique only through its application. Answers to selected problems are presented in the back of the book.