Naturally, this defense of comparative statics is based on the presumption that the equilibrium solution is sensible. This section concludes with an additional argument in favor of the methodology we have been using.

A "DYNAMIC" INTERPRETATION OF THE COURNOT EQUILIBRIUM

It is easy to understand why the Cournot equilibrium is a stable solution: No firm would have an incentive to choose a different output. In other words, each firm is choosing an optimal strategy given the strategy chosen by its rival. But, is the Cournot equilibrium a realistic prediction of what will happen in reality?

The equilibrium concept we have used is that of Nash equilibrium, first introduced in chapter 4. There, we presented possible justifications for the concept of Nash equilibrium. Here, we present an argument, first proposed by Cournot himself, which is similar to the idea of solution by elimination of dominated strategies.

Although the Cournot model is a static game, let us consider the following dynamic interpretation. At time one, Firm 1 chooses some output level. Then, at time 2, Firm 2 chooses the optimal output level given Firm 1's output choice. At time 3, it's again Firm 1's turn to choose an optimal output given Firm 2's current output, and so on. Firm 1 chooses output at odd time periods, and Firm 2 at even time periods.

Figure 7.14 gives an idea of what this dynamic process might look like. We start from a point in the horizontal axis (Firm 2's output at time zero). At time 1, we move vertically toward Firm 1's reaction curve (Firm 1 is optimizing). At time 2, we move horizontally to Firm 2's reaction curve (Firm 2 is optimizing). At time 3, we move again vertically toward Firm 1's reaction curve. And so on. As can be seen from the figure, the

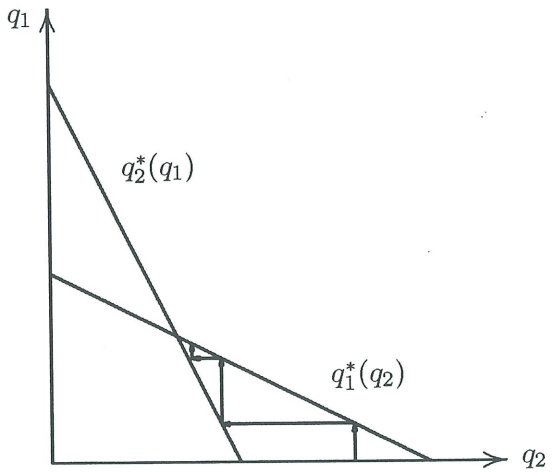

FIGURE 7.14 CONVERGENCE TO COURNOT EQUILIBRIUM.

dynamic process converges to the Cournot equilibrium. In fact, *no matter what the initial situation, we always converge to the Nash equilibrium.*

This is reassuring insofar as it provides an additional motivation for the idea of Cournot equilibrium.[l] Moreover, it reinforces the idea that static models (like Cournot) are useful for comparative statics only. They do not describe the dynamic process that leads from one equilibrium to another one. Static models give an idea of where the "system" will converge after all of the interim adjustments have taken place.[m]

SUMMARY

- Under price competition with homogeneous product and constant, symmetric marginal cost (Bertrand model), firms price at the level of marginal cost.
- If firms set output or capacity levels (Cournot model), then duopoly output is greater than monopoly output and lower than perfect competition output. Likewise, duopoly price is lower than monopoly price and greater than price under perfect competition.
- If capacity and output can be easily adjusted, then the Bertrand model is a better approximation of duopoly competition. If, by contrast, output and capacity are difficult to adjust, then the Cournot model is a good approximation of duopoly competition.

KEY CONCEPTS

- oligopoly
- duopoly
- best response
- reaction function
- residual demand
- comparative statics
- calibration

[l] In fact, the point we are making here is more generally applicable to the justification of Nash equilibria in a certain class of games. The argument we are using is similar to elimination of dominated strategies, a topic we dealt with in chapter 4.

[m] In fact, the dynamic process we consider earlier is not very realistic: At each moment in time, one of the firms is choosing an optimal output, assuming that the rival's output remains constant, which in fact does not occur except in the Nash equilibrium.