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How realistic is the supply/demand equilibrium story? A simple demonstration of false trading and its implications for market equilibrium

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Abstract

Transactions at non-equilibrium prices are "false trades". Under standard assumptions, markets without false trading produce Pareto-efficient outputs. This paper demonstrates graphically the complications created when false trades occur, showing that quantities produced deviate from Pareto-efficient quantities except under unique conditions. In a general equilibrium framework, this spills over to cause Pareto-inefficient results in other markets as well. These observations call into question the use of standard supply-and-demand equilibrium theory as a starting point for policy analysis.

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This paper uses very simple graphing techniques to re-examine one of the most basic issues in neoclassical economics: convergence to market equilibrium. As has long been noted (see especially Arrow and Hahn, 1971), the absence of the so-called "Walrasian Auctioneer" in a market creates a difficult theoretical problem. Specifically, even if one could divine the excess demand functions in every market, and even if there were a set of prices that would create simultaneous general equilibrium in all markets, how could we be confident that any individual market will actually reach its equilibrium—much less that an entire market economy will actually find its way into its general equilibrium? The process known as *tâtonnement* (a French word meaning "groping" or "trial and error") is the mechanism through which neoclassical economists have

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typically attempted to demonstrate that markets move toward their (partial or general) equilibrium values.

An arguably plausible description of the real-world process of market clearing shows, however, that even under the usual assumptions of perfect competition, the neoclassical equilibrium output in any particular market will only be produced under a unique set of conditions—conditions that do not presumptively hold in real markets. (This is the case for all but a very special class of markets, i.e., futures markets.) Moreover, this problem – the failure to reach Pareto-efficient outcomes – exists in both partial equilibrium and general equilibrium frameworks.

The standard story motivating our understanding of market equilibrium is therefore potentially quite misleading. It requires that there be no "false trading", that is, trading at prices other than general equilibrium values. A graphical analysis that carefully depicts the nuances of the groping process is significantly more complicated than the simple supply and demand story. This complication, moreover, is not due to transaction costs or other supposed market imperfections. It is, rather, fundamental to the process of trading itself.

I argue below that the standard textbook *explanation* of market adjustment is generally accurate and, therefore, that the standard *graph* is, at best, optimistic. This is contrary to the standard story. If pressed, most economists would most likely claim that the graph (and, more fundamentally, the underlying algebra) is correct and that the explanation is merely "fudged" to make students' lives easier. This difference is not merely unfortunate; it highlights an underappreciated, central difficulty with standard economic theory.

After demonstrating how false trading changes the results of the standard analysis, I will draw out further implications and discuss some extensions of these conclusions. Most importantly, attempts to extend the analysis to explain dynamic rather than static processes do not obviate the problem. Rather, they make the problem even more challenging to the standard analysis.

1. Theoretical background

The basic result demonstrated later in this paper that standard market-clearing analysis ignores false trades and thus does not capture potential sources of disequilibrium is neither new nor seriously disputed. Economists who work in this area have long since concluded that convergence to equilibrium is, at best, an open theoretical issue. For example, Fisher (1987, p. 26) points out:

> ". . . [W]e have no rigorous basis for believing that equilibria can be achieved or maintained if disturbed. Unless one robs words of their meaning and defines every state of the world as an 'equilibrium'in the sense that agents do what they do instead of doing something else, there is no disguising the fact that this is a major lacuna in economic analysis."

It is always possible, of course, that even a "major lacuna" ultimately might have no impact on the validity or usefulness of a theory, if the theory's central elements do not in some important sense rise or fall on the missing piece of the puzzle. Unfortunately, neoclassical theory does rely crucially on the achievement and maintenance of equilibria. Fisher (1987, p. 27) goes on to note:

> "Tâtonnement stability requires extremely strong special assumptions. This has extremely important implications. Indeed it is not too strong to say that the entire theory of value is at stake . . . Moreover, comparative static analysis, that major tool of theory, will miscompute the effects of a displacement of equilibrium . . .."

Indeed, long before Fisher wrote those words, Edgeworth (1934) noted: "[T]he equations of exchange enable us at best to determine the final position, not the steps by which it is reached."