Edgeworth Cycles in Pharmaceutical Prices from Procurement Auctions in Denmark

Frederik Plum Hauschultz*, Anders Munk-Nielsen† and Harry J. Paarsch‡

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Abstract

We present evidence of pronounced Edgeworth cycles in price data from procurement auctions conducted by the Danish Medicines Agency to acquire generic drugs—in some cases initial price jumps of over 600 percent. By contrast, previous researchers (who focused on a few products in the retail gas industry) found relatively modest jumps. Our research also indicates that cycles occur in a variety of product markets, some 200 in total. Moreover, the incidence, frequency, and duration of the cycles as well as the magnitude of the jumps vary across products as well as with features, such as the number of auction participants.

Key words: Edgeworth price cycles, procurement auctions, generic drugs.
JEL classification: C29, D44, L65.

Extended Abstract

We present evidence of pronounced Edgeworth cycles in price data from procurement auctions conducted by the Danish Medicines Agency (DMA) to acquire generic drugs. The cycles are large—in some cases initial price jumps are over 600 percent—and can last one to two years.

*Department of Economics, University of Copenhagen, Denmark
†Department of Economics, University of Copenhagen, Denmark
‡Department of Economics, University of Southern Florida, USA
Our dataset covers all drugs bought at pharmacies in Denmark between 1995 and 2015. We have data on prices, which are the same across Denmark, and transaction-level data on quantities matched with demographic characteristics on age, income and household composition. Prices are set in an auction-like mechanism where firms report their prices to the DMA every two weeks. Drugs are organized into substitution groups (identical chemical substance and number of Defined Daily Dosages, DDD) and the lowest price in a group is the recommended drug in that period. Thus, the lowest price bidder gains a substantial market share but not all of the market, since some consumers may still wish to buy, say, the brand name drug, paying the extra price out of their own pocket. Note that after prices have been submitted they become public information to all firms.

We track prices across 759 substitution groups and find evidence of cycling behavior in just under half. Figure 1 shows the price over time in the substitution group for the drug with generic name lamotrigine, which is used to treat epilepsy and bipolar disorder (ATC code N03AX09). There are several firms active and the annual revenue is around 4 million DKK.

The large number of markets allows us to relate the presence and magnitudes of cycles to features of the market. For example, we see that cycles are smaller and die
out faster in markets where there are more firms active. We also show that even for the same chemical substance, cycles may be initiated several months apart for the packages with 4 and 20 daily dosages respectively. This indicates that the cycles are not simply driven by costs.

Finally, we present some evidence relating to how firms coordinate on initiating a cycle. Firms appear to use stockout or exit of one bidder as a signal.

In conclusion, we document the existence of pronounced Edgeworth cycles in the market for generic drugs in Denmark. Our findings have two important implications: First, we contribute to our understanding of the phenomenon of Edgeworth cycles. Second, our findings have important implications for optimal regulation of the generic drug market.