

Spikes in Generic Drug Prices: A Necessary Evil?

Introduction and background. The pressure to control health spending is growing as the population ages, and the pharmaceutical market plays a key role, accounting for just under 1% of GDP in Denmark. Across the OECD, spending increased by 50% from 1998 to 2008. Danish spending has grown slower, with one potential explanation being the unique Danish system for pricing generic prescription drugs. However, the Danish system is plagued by short-lived but large increases in drug prices; media reports tell of price increases of over 500%.¹ Understanding the causes and implications of these price spikes is the goal of this project. In particular, I will investigate whether the spikes are an inherent feature of the system or something that can and should be avoided.

Background. In Denmark, prices on generic prescription drugs are set at auctions held every 14 days where a firm's bid is the price at which it will supply its drug for that period. By law, the pharmacists must recommend consumers the cheapest available substitutable drug – this constitutes the value of winning the auction. As standard auction theory predicts, the competition has brought lower prices but the system is plagued by the above-mentioned spikes in prices. These spikes are presumably supply-driven since the demand for prescription drugs is most likely fairly inelastic in the short run. On the other hand, there is anecdotal evidence that capacity constraints play a role for parallel importers. The reason for this is a punishment mechanism in the scheme; if a firm is unable to meet demand at the price it has bid, it is punished by being excluded from the market and forced to undergo a costly re-application process. Therefore, a firm faced by capacity constraints might bid high to avoid winning the auction and risk the punishment.

Should we worry? When substitutes are available and competition is perfect, price spikes need not worry us. However, price spikes are frustrating to consumers since budgetary planning is complicated and moreover, there is strong evidence that consumers strongly dislike changing their brand too often (e.g. Crawford and Shum, 2005; Kaiser et al., 2014). In support of this, the Competition Authority frequently receives complaints from consumers about the price spikes. In this sense, the price spikes constitute an externality on consumers. Nevertheless, if there are no other externalities then benefit of the lower average prices may offset this. On the firm side, however, we may worry about price spikes if they lead to market power. Jofre-Bonet and Pesendorfer (2003) have demonstrated in procurement auctions how firms that are able to predict capacity constraints among competitors in present and future auctions can exploit this to obtain market power in a current auction. Thus, **a central goal of this project is to determine whether competing firms respond to a high-bidding firm.** If they do, it may be taken as evidence of a market failure and if not, it indicates that capacity constraints are unforeseeable. By measuring the frequency and magnitude of the spikes and responses by other firms, I can assess the potential welfare costs. Furthermore, by utilizing that there are many simultaneous auctions (i.e. generic substitution groups) with the same bidders (i.e. drug sellers), I can explore whether competing firms respond in the same auction and/or other, parallel auctions to explore whether constraints are firm-wide or product-specific using fixed effects. Linking the price data to purchases from *Lægemiddelstatistikregistret*, I can control for market dominance using the excellent Danish data.

¹ Avisen.dk on 9/7/2014 (goo.gl/IKXPSM) and Apotekeren.dk on 31/3/2012 (goo.gl/5BWuU6).

Policy-relevance. For Danish policy-makers, the findings will be directly relevant both for evaluating the overall efficiency of the price system and in particular for assessing whether the punishment scheme is optimal; if the spikes occur often and I find evidence of exploitation (i.e. market power) by competing firms, then the punishment is most likely too harsh. For health-policy makers internationally, pressure to control pharmaceutical spending is mounting and pricing of generics is typically done using reference price systems, which may be inferior. Thus, attracting attention to and providing a thorough analysis of the Danish auction mechanism will be valuable in other countries. More broadly, the insights are relevant for procurement auction design. Almost all public auctions (da: *licitationer*) feature a punishment mechanism of some sort. Given the increasing use of auctions, knowledge on the implications of such punishments is becoming more important.

Related literature. The previous literature has emphasized reference price systems, consumer demand (e.g. Skipper, 2013; Skipper and Leth-Petersen, 2014; Simonsen, Skipper and Skipper, 2015) or in the closest case to my proposed project, Kaiser et al. (2014), the price basis for the co-payment system in Denmark. My analysis will build on the insights from these studies but focus on the auction mechanism. The Jofre-Bonet & Pesendorfer (2003) framework has been applied to public construction projects by e.g. Gugler, Weichselbaumer and Zulehner (2015).

Publication and time plan. I am handing in my PhD on September 1 2015, and I have a postdoc position funded by the Department of Economics until December 2016. I will thus have at least until April 1st 2017 to finish the project. Price data is readily available for exploration while I expect to have the full dataset ready for analysis in January 2016, aided by a research assistant. I expect to have a first working paper ready by June 1st, 2016 (see timeline below). Given that I will be the first to explore an auction mechanism for price setting, I expect great interest academically, in particular from health economists. I expect to publish the paper in the *Journal of Health Economics*, or maybe the *Scandinavian Journal of Economics*, given the emphasis on the Danish policy setting.

Future research and broader agenda. Associate prof. Bertel Schjerning will supervise me during the project, even though he will not participate in the project (see letter). This project fits well within my broader agenda; the findings will serve as a stepping-stone for a methodological project on dynamic auctions I have discussed with Harry J. Paarsch (U. of Central Florida). Harry is one of the founding fathers of structural empirical auction models (see e.g. the book by Paarsch and Hong, 2006) and the former principal economist at Amazon.com. Given the prospect of future collaboration, he would be keen to give valuable feedback for the project and help international dissemination. Moreover, I plan to visit Morten Sæthre at the Norwegian School of Economics; Morten has worked on similar topics for Norway, where the regulation is different.

	2015				2016								2017					
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Funding																		
Teaching																		
Research assistant																		
Analysis																		
Writing																		
Checkpoints									WP	Present								Submitting

Selected Literature

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