Comments on "Higher Minimum Quality Standards and Redistributive Effects on Consumer Welfare" by Marco J. W. Kotschedo and Max J. Pachali

I am happy to provide comments on an interesting paper about the effect of minimum quality standards in a context in which "quality", as it is defined, is directly observable by the consumer. The paper was presented at the 2017 QME conference, and my comments concern that version of the manuscript. The paper uses household-level demand data in Germany (from Nielsen Homescan), and focuses on the redistributive effects of banning battery cage eggs. The authors use a Logit discrete choice demand model and a Nash-Betrand model with differentiated products on the supply side. The structure of the model allows for counterfactual analyses looking at 1) changes in ownership structure, 2) potential subsidies that would remove some of the distributional effects of the ban, and 3) a stricter ban allowing only the sale of organic eggs.

The ban in question banned sales of battery eggs in retail stores, through which approximately 80% of eggs are sold in Germany, according to the paper. There are four vertically differentiated egg types: battery i.e. cage, barn, free-range, and organic. In 1999 the EU decided that all member states had to ban the production of battery eggs by 2012, allowing them to produce instead "Kleingruppenhaltung" eggs, which fall somewhere between battery and barn eggs in terms of the welfare of the hens. Germany, however, proceeded with an earlier ban so that all battery eggs were delisted by the end of 2010. Some retailers expedited their own delisting of battery eggs, such as Lidl, who banned them in 2009.

Given the fact that quality is observable, there is no resolution of information uncertainty as a result of the ban. In contexts with information asymmetries (Leland 1979), quality standards can lead to welfare gains through this mechanism. With a minimum quality standard, banning the lowest quality product type (battery eggs) is a simple product ban. As such, we would expect a decline in consumer surplus for those consumers who, through their revealed preferences, prefer to buy battery cage eggs (at the pre-ban equilibrium prices). If there are any welfare gains, they must therefore come from other difficult to quantify dimensions such as animal welfare, health benefits, or indirect effects after the new equilibrium is reached, accounting for price responses and entry and
exit. After equilibrium, net welfare implications are a priori unclear given that we would expect a new pricing equilibrium and possibly effects on costs for upstream firms.

Despite the fact that resolution of information uncertainty is not a relevant mechanism in this context, this paper is very topical and there are many examples of minimum quality standards with observable quality and product bans being implemented or proposed in recent years. Product bans such as this one have been discussed in the United States extensively in product categories ranging from soda (such as Michael Bloomberg’s ban on large soft drinks, which was struck down by a Manhattan judge) to firearms (in relation to semiautomatic weapons and devices like bump stocks after the Los Vegas shooting), to genetically modified foods (GMOs). These examples all relate to human health. In terms of animal welfare, recent regulations in the United States have been used to improve the conditions of livestock as the battery ban has done in Germany, including a 2015 regulation in California that banned the use of gestation cages for pork and poultry which has been argued as the cause of a price increase of $0.49 per done (Kaiser, 2016), and a similar 2016 regulation in Massachusetts. Most recently in the United States, the Trump administration has relaxed the standards for organic eggs. Any such increase or decrease in quality standards will have direct impacts on consumers who purchase those products, and potentially indirect effects on all consumers from readjustment of prices.

The price increase in California after the pork and poultry standards were implemented point to other mechanisms through which consumer welfare will be affected, through the supply side. In the concrete industry, Ryan (2012) finds a decline in welfare due to the fact that a minimum quality standard discourages entry. In this paper, the authors do not yet account for upstream effects. What happens post-ban to the farmers? Do they change methods? Do they exit? Do they sell their battery eggs in other channels, or export them? Using prices for representative egg products found from the European Commission on Agriculture and Rural Development, I generated the graph shown in Figure 1 showing the relative prices for eggs in Germany and in the EU. There is a huge discrepancy in the price paths in Germany versus the EU as a whole for the representative products plotted, beginning in late 2009. Spikes in price for both occur at the start of 2012, coinciding with

the EU ban. Part of these spikes can be explained by composition effects, since battery eggs are the cheapest and cannot be included after the ban. But the data do highlight the need to assess the supply side reactions by upstream firms.

The authors do a nice job in accounting for price responses by retailers. In addition to the demand side welfare impact on consumers who can no longer buy battery eggs and the potential effects through the supply of battery eggs, equilibrium prices for all egg varieties adjust in the market, leading to less obvious effects on surplus for those consumers not purchasing battery eggs. Such effects the authors incorporate through their discrete choice model. If the authors can incorporate data on upstream prices, this offers more variation they can use to help quantify the distribution of welfare effects. The authors do indicate that there is some information on wholesale costs available, which could be really useful to get a sense of the extent to which marginal costs change after the ban.

In terms of the actual implementation of the model, I have a few concerns which I will only briefly mention. First, given that the main effect of interest is the distributional impact of the ban on consumer welfare, accurate representation of the demand model is essential. The current Logit formulation does not offer sufficient flexibility in substitution patterns to accomplish this. Second, in estimation it would be desirable to not constrain the signs of the coefficients (excepting price) and let the data show the extent to which some product varieties are preferred. This also then permits some consumers to prefer lower quality eggs. Third, I would allow the flexible distribution of heterogeneity (on which I commend the authors) to be a function of the observable demographic variables; Regressing individual estimates on demographics in a second stage when the individual estimates were affected by the distributional assumptions on the parameters has unusual implica-

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3 A product is currently defined as a combination of the quality level (of which there are four), size (6-egg or 10-egg cartons), and retailer (there are ten retail chains). The assumption is that consumers make their choices over this full set of 80 products, with full information. The Logit framework allows no correlation in the stochastic utility term - even though we would expect strong correlation for eggs of the same size package (6 or 10 eggs), the same quality type, and those at the same store. This leads to IIA substitution patterns within-household across all 80 products. A choice across the eight quality X size combinations, conditional on store visit, would probably be more appropriate, and it would remove the issue of correlated errors within the store. The authors actually say that "the decision to visit a certain store is assumed to be exogenous from the egg category and driven mainly by other factors, such as proximity and high value items in the shopping basket." If this is the assumption they would like to make (and it is very reasonable), then the model should be conditional on store visit. A nested Logit or a Probit model could remedy the lack of correlations for similar egg varieties and similar sizes. The ban gives the authors some great variation in the data which can identify the actual substitution patterns after the ban, it can be used much more effectively.
One final concern I have is that it is unclear to what extent short-term price variation is driving the estimates of the price coefficient, which could be addressed with more temporal aggregation, a difference-in-difference analysis, or regression disunity approach.\(^4\) The long-term elasticity is what is relevant for the counterfactuals.

With demand estimates in hand, the authors use a Nash-Betrand supply side model with differentiated products to run the counterfactual analyses (with 5 companies and 10 multi-product retailers).\(^5\) The counterfactuals they run include varying the ownership structure and providing incentives to farmers for the production of barn eggs. In the case of the former, the authors find that more market power in the retail sector leads to smaller welfare losses for typical battery egg purchasers because there are steeper price reactions following the implementation of the minimum quality standard if retailers have more market power. This is a useful finding in trying to extrapolate the authors results into markets with different market structures.

The latter counterfactual is particularly interesting since it is an actionable intervention that could reduce any undesirable shifts in the distribution of consumer welfare. The main limitation of the current version is that subsidies for barn egg production will lead to farmers being incentivized to produce barn eggs (since the subsidy is absent for free-range and organic). Thus, as with the previous concern about potential supply side effects, we cannot ignore upstream effects in the counterfactual. It could be that a simple monopoly model on the retailer side with an model of upstream behavior by farmers could provide more insights with regards to incentives that reduce retailers’ marginal costs (i.e. the wholesale prices). With the incorporation of supply side impacts of the ban, the results of this second counterfactual will be of particular importance to policymakers.

In sum, this paper estimates the redistributive effects of a quality standard on consumer welfare. It is an interesting context, and I think that it will have some generalizable results for other contexts in which there are product bans or quality standards with observable quality. The current welfare estimates depend on some debateable model assumptions, but this can be remedied with a more

\(^4\)Alternatively, a separate regression could be run for each household and the welfare effect calculated, and then these estimates could be used in a second stage regression, such as the authors do now, because there are no associated distributional assumptions that affect the estimates in the first stage.

\(^5\)The authors have variation from a ban, which shifts prices for barn, free-range, and organic eggs, but they also leverage short-term price variation (due to supply shocks) in order to estimate the price coefficient. We expect short term price elasticity to be much larger than long-term price elasticity, which is the relevant elasticity when determining the impact of a battery egg ban that leads to permanent price shifts.

\(^6\)They use the 2008 data for estimation and restrict the demand side to only 10-egg packages, which is a concern given the assumption about demand substitution patterns.
flexible framework. A lot more descriptives of the data would be useful, and since the authors have
the ability to leverage variation from an actual ban, I would like to see calculations of the welfare
effects without a model that is so highly parameterized. With the great variation from the ban, the
authors have the opportunity to get a robust calculation of the ban’s effect on consumer surplus,
including the heterogeneity in this effect, which will have important implications in many human
and animal health contexts.

References

Kaiser HM (2016) The implications of interstate commerce restrictions on retail egg and pork prices
and demand, working paper.


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Figure 1: Non-confidential Prices for the Most Representative Products

Data from the European Commission for Agriculture and Rural Development.