

Extended Abstract

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Paper/Poster Title	Potential Impact of Brexit on Fruits and Vegetable Purchases in Scotland
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Abstract prepared for presentation at the 97th Annual Conference of the Agricultural Economics Society, The University of Warwick, United Kingdom

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Abstract	<i>200 words max</i>
<p>At the start of 2021, the economics observatory suggested that the British pound was 15% weaker relative to the Euro than it was on the eve of the Brexit referendum. The goal of the present study is to assess the implications of the depreciation of the British pound (relative price rise) on fruit and vegetable purchases based on their country of origin in Scotland. Demand for fourteen types of fruits and vegetables purchased in Scotland was estimated using monthly time series data constructed from a consumer panel collated by Kantar Worldpanel from 2006 to 2020. Using short-run elasticities calculated from the demand model, we simulated the impact of a 10% price increase for fruit and vegetable due to trade tariffs or movements in exchange rates. The results tend to suggest that a major share of the vegetables purchased in leading retail shops in Scotland are either of UK origin or from the rest of the world. A major share of fruits especially tropical fruits and grapes bought are sourced from the rest of the world. The depreciation of the British pound relative to the Euro has negative implications for demand for all kinds of fruits and vegetables. The reduction in purchases is highest for fruits and vegetables of EU origin. This could result in as high as a 25% reduction in purchases for seed vegetables and as low as a 0.36% reduction in purchases for pomes of UK origin. From the policy perspective, this could harm the Scottish government's goal to increase fruit and vegetable consumption by 400 grams per person per day.</p>	
Keywords	Five-a-day, Fruit and vegetable, Brexit, Depreciation, Demand modelling
JEL Code	D12; C55; see: www.aeaweb.org/jel/guide/jel.php?class=Q)
Introduction	<i>100 – 250 words</i>
<p>Fruits and vegetables intake in Scotland is considerably lower than it is in the rest of the UK (Piacentini et al., 1995). Climate, availability, poor quality and cost have been cited for the poor consumption of fruits and vegetables in Scotland (Anderson et al., 1994). High consumption of fruit and vegetable has been identified as important in the prevention of cardiovascular diseases and certain cancers (Aune et al., 2017) due to their high content of bioactive compounds (Steinmetz & Potter, 1996; van't Veer et al., 2000). As a result, current Scottish dietary guidelines recommend the consumption of five portions or 400 grams of fruits and vegetables per day (Anderson, Marshall, et al., 1994), however, average consumption continues to remain low. Current and future trade agreement between the UK (post-Brexit) and trading partners could potentially reduce this further (Barons & Aspinall, 2020; Hubbard et al., 2018; Seferidi et al., 2019;</p>	

Strong & Wells, 2020). The reason is that the UK imports more than half of its domestic consumption of fruits and vegetables. Therefore, unfavourable trade agreements (i.e. increase trade tariffs or movements in exchange rates) could harm food choice and population health especially demand for fruits and vegetables (Schram et al., 2018; Seferidi et al., 2019). On 23 June 2016, the United Kingdom voted to exit the European Union, by majority of 52-48%. The impact on food and agricultural sector is expected to be extensive. The goal of the present study is to simulate the implications of the depreciation of the British pound following Brexit on fruit and vegetable purchases in Scotland.

Methodology

100 – 250 words

The study relied on monthly Kantar Worldpanel data for Scotland covering the period 2013 through to 2020. The dataset also consists of household food purchases as well as demographic information such as income levels. We adopted a three-stage budgeting process; first, purchases were group under fruits and vegetables. In the second stage, fruits were disaggregated into 5 types and vegetables into 8 types. The third stage disaggregated each type of fruit and vegetable into their country of origin. A total of 39 price variables were considered. The analyses involved: 1) analysing the purchase shares of fruits and vegetables based on origin bought in major retail stores in Scotland from 2006 to 2020; 2) estimating the demand elasticities for fruits and vegetables based on their origin; and 3) simulating the implications of a 10% price rise due to trade tariffs or depreciation of the British pound on fruits and vegetables demand in Scotland. A time series version of the Exact Affine Stone Index (EASI) demand model (Lewbel & Pendakur, 2009) was estimated to derive short run demand elasticities for the simulation.

Results

100 – 250 words

Results show that consumers were less responsive to price changes for leafy greens, cruciferous, marrow, and root from the UK and the rest of the world but highly responsive to those from the EU. Second, fruit vegetables of UK origin were found to be own price elastic whilst those from the EU and the rest of the world were price inelastic. Third, edible stem vegetables from the rest of the world were found to be price elastic whilst those from UK and EU origins were price inelastic. Seed vegetables, grapes, and tropical fruits were found to be price elastic irrespective of the origin. For vegetables: a 10% price rise will cause the demand for leafy greens of EU origin to fall by 12% whilst those from the UK and the rest of the world would increase by 3% and 6%, respectively. Demand for cruciferous vegetables is expected to decline irrespective of the origin. Demand for marrows is expected to decline by 13% for those of EU origin but increase by 1 and 4% for the UK and the rest of the world. Demand for root vegetables from the EU is expected to decline by 17% whilst those of the UK and the rest of the world will increase by 11% and 2%, respectively. Edible plant stem is expected to reduce 7% for those of EU origin but increase by 6 and 2% for the UK and rest of the world respectively. For fruits, demand for drupes/pomes is expected to decline by 0.4%, 13% and 3% for the UK, EU, and the rest of the world, respectively; total reduction of 16%. Demand for banana would fall by 2% for the rest of the world which is a major player in the market. Demand for EU citrus is expected to fall by 10% but increase by 5% for the rest of the world; a net reduction of 5%. Grapes, soft fruits and tropical fruits of the EU origin are expected to decline by 9, 7 and 12%, respectively but increase for remaining other origins.

Discussion and Conclusion

100 – 250 words

Our analyses were primarily based on fruits and vegetables from three main origins: UK, EU and the rest of the world. Our results suggest that a major share of the vegetables sold/purchased in leading retail shops in Scotland are either produced in the UK or the rest of the world. Leafy greens, cruciferous, marrow, root vegetables and allium are mainly sourced from the UK. A major share of fruity vegetables bought in major retail shops are from the EU whilst edible seed stem and seed vegetable are from the rest of the world. Major share of fruits especially tropical fruits, and grapes bought in Scotland are sourced from the rest of the world. Soft and tropical fruits are the most responsive to Expenditure changes. They are followed by edible stem vegetables, citrus, marrows, and seed vegetables. Price elasticities for all types of fruits and vegetables were less than one except for allium, grapes, and tropical fruits. The simulation shows that the net demand for all categories of fruits and vegetables will be negative, indicating that an unfavourable Brexit deal could potentially reduce the purchases of fruits and vegetables. The impact of the price rise is higher for fruits and vegetables of the EU origin. Purchases of fruits and vegetables of EU origin could potential reduced by 7 - 25%. This phenomenon could have negative implication for the government's agenda to increase fruits and vegetables to 400 grams per capita.