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Macroeconomic valuation: Food waste in the FEW nexus of the UK

Taoyuan Wei

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Economic effects of food waste reduction: Macro-level

Production

Supply

Food

Generate

Purchase

Income

Flows to

Households

Generate

Sources: Pictures are copied from the internet for illustration.

Economic effects of food waste reduction: Macro-level

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Region i	Agriculture Forestry Fisheries Electricity … Services	Consum Invest	Total demand
Agriculture Forestry Fisheries Electricity Other energy Heavy industry Light industry …… Transport Services	Input and output across production sectors	Final demand for consumption and investments	
Labor Capital Natural res.	Returns/income to productive resources	Income = Expenditure	
Total output			

Key sectors in UK IOT2015

- **Food products**
  - 01 Products of agriculture, hunting and related services
  - 03 Fish and other fishing products; aquaculture products; support services to fishing
  - 09 Mining support services
  - 10.1 Preserved meat and meat products
  - 10.2-3 Processed and preserved fish, crustaceans, molluscs, fruit and vegetables
  - 10.4 Vegetable and animal oils and fats
  - 10.5 Dairy products
  - 10.6 Grain mill products, starches and starch products
  - 10.7 Bakery and farinaceous products
  - 10.8 Other food products
  - 10.9 Prepared animal feeds
  - 11.01-6 and 12 Alcoholic beverages & Tobacco products
  - 11.07 Soft drinks
  - 56 Food and beverage serving services

Key sectors in UK IOT2015

- **Energy products**

  - 05 Coal and lignite
  - 06&07 Extraction Of Crude Petroleum And Natural Gas & Mining Of Metal Ores
  - 19 Coke and refined petroleum products
  - 35.1 Electricity, transmission and distribution
  - 35.2-3 Gas; distribution of gaseous fuels through mains; steam and air conditioning supply

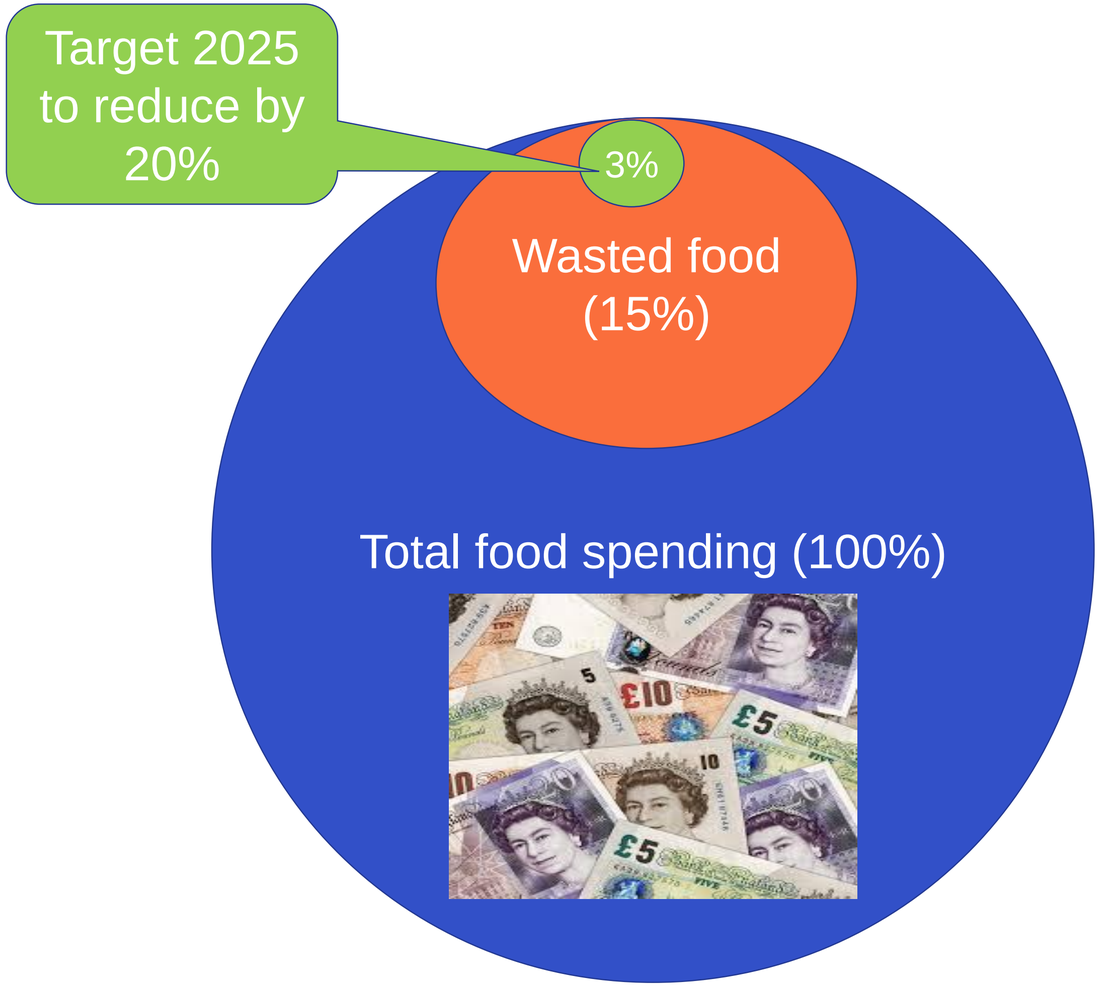
Key sectors in UK IOT2015

- **Water products**
  - 36 Natural water; water treatment and supply services
  - 37 Sewerage services; sewage sludge

- **Waste**
  - 38 Waste collection, treatment and disposal services; materials recovery services
  - 39 Remediation services and other waste management services
  - 38g Waste collection, treatment and disposal services; materials recovery services non-market

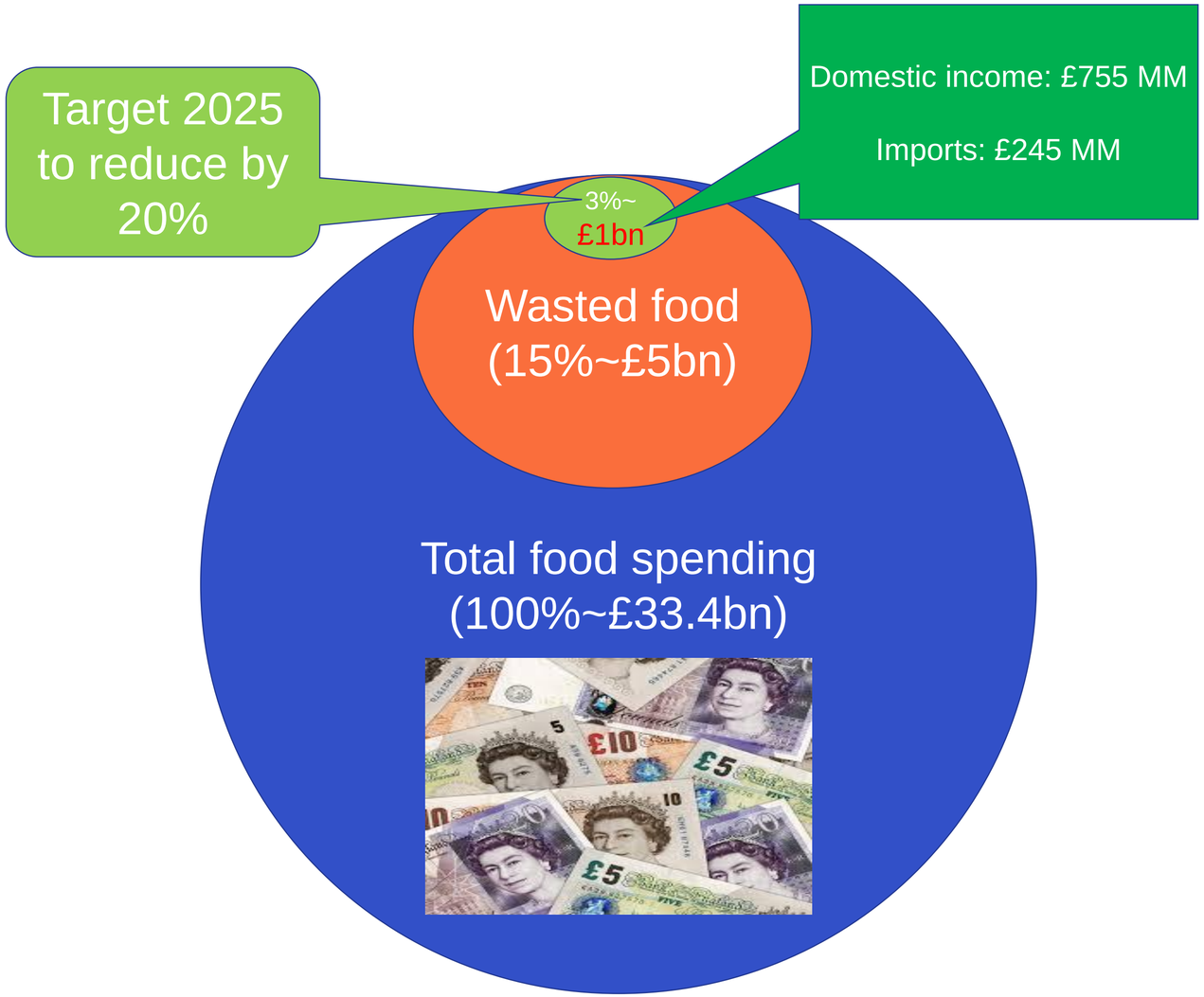
A rough calcuation: The example of UK households

- In 2012, the wasted food (or editable part of food waste) costs £12.5 bn, accounting for 14% of total spending on food and drinks by households of £92 bn according to the Family Food datasets (WRAP, 2013, p. 60).
- The wasted food costs were adjusted upward as £14 bn for 2012 according to WRAP (2018), meaning the share in total spending becomes 15.2%.
- The WRAP has set a target to reduce wasted food by 20% in 2025 compared to the 2015 level (WRAP, 2019). If we assume the households follow the reduction target, then the reduced share in total spending of households would be 15.2%*20%= 3.04%, all of which are assumed for domestic produced food.



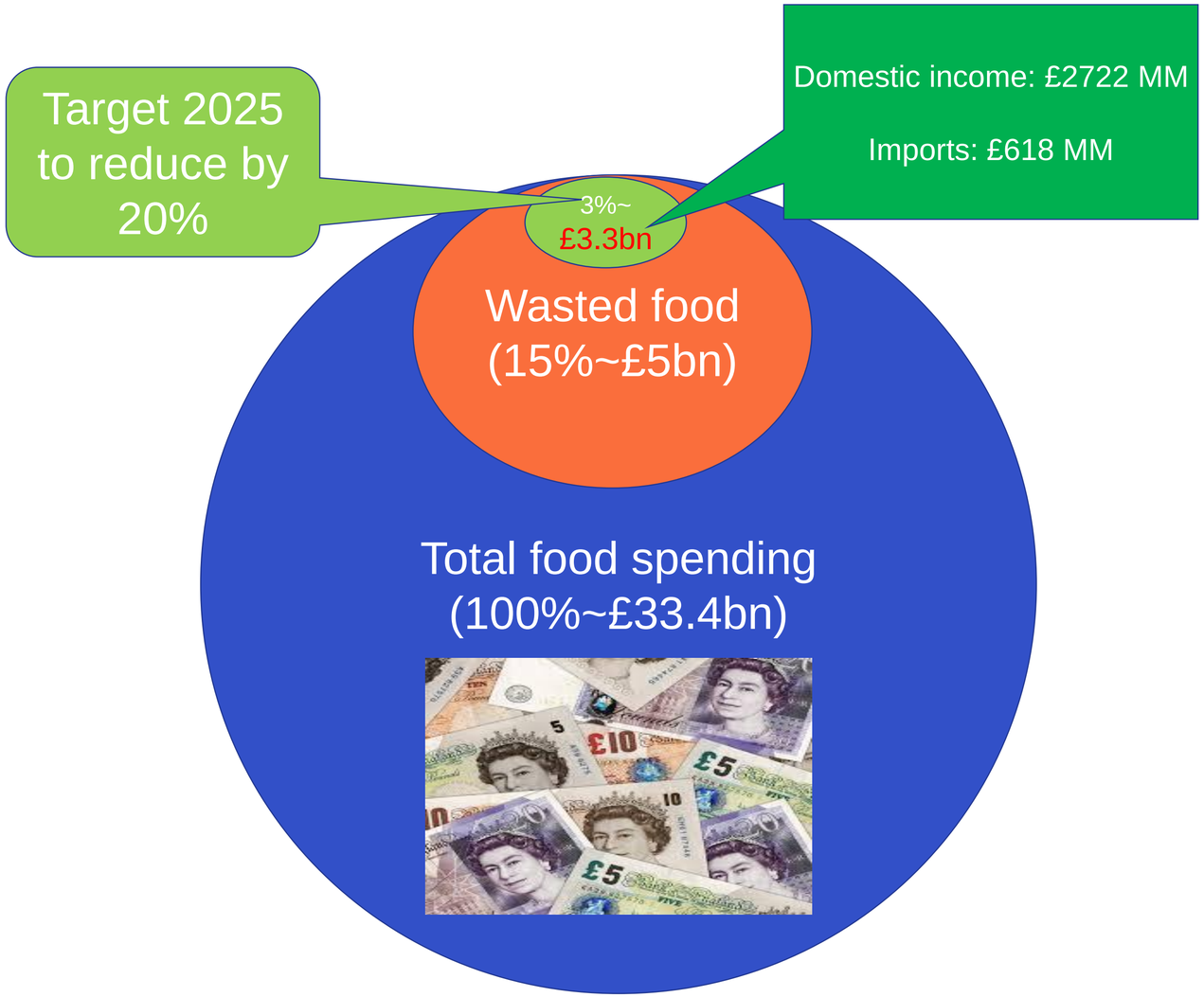
A rough calcuation: The example of UK households

- Total expenditure of households on food amounts to £33.4 bn (IOT2015, ONS2018): products of agriculture (01), fish (03), and produced food (10) and drinks (11) by households.
- The 3.04% reduction of food expenditure is equivalent to £1001 million, which is the maximum savings of income.
- This income savings correspond to domestic income (value added or sectoral GDP) of £756 million and imported goods of £245 million (based on IOT2015)
- If the reduced income from production activities is considered, then the income savings could be as low as £245 million, which can be for other consumptions
- How to spend the saved income? Scenarios!!



A rough calcuation: The example of UK households

- If food services are included, then
- Total expenditure of households on food amounts to £111.3 bn (IOT2015, ONS2018).
- The 3.04% reduction of food expenditure is equivalent to £3340 million, which is the maximum savings of income.
- This income savings correspond to domestic income (value added or sectoral GDP) of £2722 million and imported goods of £618 million (based on IOT2015)
- If the reduced income from production activities is considered, then the income savings could be as low as £618 million, which can be for other consumptions
- How to spend the saved income? Scenarios!!



A rough calcuation: The example of UK households

- If food services are included, then
- The main reduction is from food sectors.
- Values from energy and water sectors are relatively small
- Imports: about 18% as total, but for energy (38%) and water (5%).

	Domestic Income	imports	Total
food	1874.3	423.9	2298.2
energy	60.7	37.7	98.4
water	5.5	0.3	5.8
waste	3.8	0.7	4.5
others	777.9	154.9	932.8
Total	2722.2	617.5	3339.7
	Domestic Income	imports	Total
food	82	18	100
energy	62	38	100
water	95	5	100
waste	85	15	100
others	83	17	100
Total	82	18	100

A rough calcuation: The example of UK households

Further extensions

- Distinguish private and public consumers and investors

- Cost to implement the reduction of wasted foods
- Cost of restructure of labour force and capital to maintain income

- Social and environmental values
  - Carbon emissions
  - Savings of water, energy, and land use for production
  - Savings of food waste disposal and treatment (Phosphorus?)
  - Any others?

- What can the Bristol ULL contribute to the analysis?

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Taoyuan Wei
taoyuan.wei@cicero.uio.no

cicero_klima
cicero.oslo.no
cicerosenterforklimaforskning