TFP and environmental factors

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Starting things

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The TFPEN

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- Recent work on ag TFP measurement by OECD (the 'insights' report)
- But, given the published and unpublished work of TFPEN members it is unclear whether conclusions in that are widely agreeable amongst experts in the area (e.g. the use of growth accounting)
- A wide array of outlets and a large disciplinary body of researchers means there are many different approaches that purport to have some connection with TFP measurement
- This body of work remains largely disconnected, except through occasional debates or collaborations: It is separated on conceptual, methodological, data, and pragmatic grounds.
- **Generating a clear description of how these different approaches map to the objectives of 'EATFP' measures, and of agreements, disagreements, and gaps is the concern of this nascent work**
- **The focus is on <u>national-level</u> TFP measures and communication**

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- A starting point in considering approaches to measuring sustainable productivity
- The intention overall is:
  - To map existing methods to principles linked to TFP and
  - To identify if particular methods appear more agreeable and/or more likely to be underpinned by sound principles
  - To consider whether some areas are under-explored as mechanisms to bring environmental factors into TFP measurement
  - To consider language and approaches around ‘sustainable’ or ‘environmentally adjusted’ TFP
  - To establish areas of agreement, disagreement, and lack of knowledge in ‘EA’TFP

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- Let’s start with a simple poll on agreement on approaches to TFP measurement in general (i.e. just vanilla TFP)

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There is widespread agreement on how to measure TFP

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Methods for TFP

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There are four main approaches to calculating/measuring (vanilla) TFP

Direct calculation using aggregate quantity indexes	Growth Accounting	Econometric	DEA
Generate indexes for aggregate outputs and aggregate inputs. Calculate the ratio of aggregate outputs to aggregate inputs.	Generate indexes for aggregate outputs and aggregate inputs. Calculate the residual from the subtraction of changes in aggregate inputs from changes in aggregate outputs.	Estimate input and output distance functions as measures of aggregate quantities Calculate TFP as the ratio of output distance function to input distance function	Compute input and output distance functions as measures of aggregate quantities Calculate TFP as the ratio of output distance function to input distance function

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Please rank these methods in terms of your perspective on their validity and potential as OECD-wide approaches to measuring TFP.

Place any that you think are 'not valid' below the 'not valid' option. Else leave that as the last option.

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Including envm factors in TFP

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The major focus of the TFPEN is incorporation of environmental factors in to TFP measures (for the ag sector). Three main issues are generally present in the review of the 'insights' document

Treatment of environmental factors as inputs/outputs

There has been general acceptance of environmental 'bads' as best being represented as outputs.

1. This appears to have emerged with incomplete consideration of alternative approaches that view them as un-used inputs and/or as the use/deterioration of natural capital.
2. Treatment of inputs may be conceptually just as 'correct' (or more so) and mitigate methodological issues.
3. Treatment as inputs may simplify weighting issues (e.g. allowing use of technical coefficients)

Weighting schemas and weights for environmental factors

Weighting schemas remain contentious. Contention comes from three main areas:

1. Commonly used weighting schemas appear not to be based on measurement theory
2. Arbitrary choice of weights between bads and goods and there are difficulties for multiple bads
3. The common use of prices/shares as weights makes it difficult to find weights for environmental factors

Material balance for pollutants

Material balance appears to be a reasonable constraint. However, it is not clear if it is a 'material' concern.

1. Does material balance really apply to national-level accounts that have substantial measurement issues and are based on aggregated technologies (with different balance coefficients)?
2. Should constraints be applied to models or data? Model constraints are the 'norm' but only easily applied to programming approaches (e.g. DEA). Data constraints seem to make sense but are not typically applied.

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Please rank these issues in terms of their importance.

Use the 'not important' option above any of the options you regard as not important. If all are important leave 'not important' at the bottom.

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Wrapping up

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- This has been a starting point to consider Agreement, Disagreement, and gaps/ideas in TFP measurement and incorporating environmental factors into that.
- The aim is to generate a mapping of methods/data to TFP measures (and back again) and to incorporate the current state of agreement/knowledge into that.
- We hope to develop a short survey with a lot more depth than presented here in the coming months and to seek responses to that from the TFPEN.
- If we can use that to move toward a consensus regarding refinement of current agreements/disagreements and gaps all the better.