

13 August 2019  
Our ref: FOI180719#2

Dear

Re: Freedom of Information Request.

We received your request for information under the Freedom of Information Act on 18 July 2019.

You requested the following:

In 2016 I enquired about the formulae The Treasury used for forecasting recession and loss of jobs if the UK voted Brexit.

I've copied and pasted the second page, which clearly indicated the formulae were for modelling elasticity, not designed or tested for forecasting.<sup>1</sup>

Please let me know what formulae you've used for your latest 'no deal' outcome & its past reliability.

The OBR has not produced an economic forecast for a 'no deal' outcome. We published a stress test in our 2019 *Fiscal risks report (FRR)* which illustrates the fiscal effect of a no deal scenario by the IMF – specifically, scenario A of Scenario Box 1.1 in Chapter 1 of its April 2019 [World Economic Outlook](#). We described the key assumptions that the IMF made, and the additional assumptions that we needed to make in order to run our fiscal [ready reckoners](#), in Chapter 10 of the [FRR](#).

I hope this is helpful. If you have any other queries about this letter, please send them to our enquiries inbox at [obr.enquiries@obr.uk](mailto:obr.enquiries@obr.uk).

Yours sincerely

Freedom of Information Unit  
**Office for Budget Responsibility**

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<sup>1</sup> See Annex for the email correspondence.

## **Annex: Correspondence from HM Treasury official to Sandra Killman**

Thank you for your correspondence dated 11 May about the Treasury modelling. As it is not practical for Ministers to respond to all the letters they receive, I have been asked to reply on their behalf.

Please note that we were only partially able to see your email due to formatting issues, but we have assumed you are referring to equations (A.8) to (A.10) on page 180 of HM Treasury analysis: the long-term economic impact of EU membership and the alternatives, HM Government (2016).

Equation (A.8) shows how a “production function” can be used to provide an estimate of the level of technology in an economy. A production function relates inputs, namely technology, labour and capital to the output of an economy. With labour, capital and output all measured, it’s possible to re-arrange the production function to create an estimate of the level of technology. As such, this equation describes how we converted ONS data (by industrial sector) on output, labour input and capital stock into a measure of technology by sector by using a production function of a form that’s consistent with NiGEM.<sup>1</sup> The equation is itself not used for forecasting or econometric estimation and instead just explains how we derived a measure of labour-augmenting technology from out-turn data.

Equation (A.9) suggests how technology might change over time. In this equation, technology grows over time at a different rate for each sector but with an allowance for fluctuations in this growth rate. It is not used itself for any econometric estimation, but is a step along the way to creating equation (A.10).

Equation (A.10) adds FDI to equation (A.9) so that the statistical exercise can estimate the impacts of FDI on technology. This equation forms the basis of our econometric analysis of 1 NiGEM is developed and maintained by the National Institute of Economic and Social Research. NiGEM is used, to different degrees, by over forty organisations including the IMF, OECD, Bank of England and ECB.

The link between the level of FDI stock and the level of UK's technology (often referred to in the Treasury’s publication as “productivity”). The equation is not an equation designed for forecasting and has not been tested for its forecasting properties. The equation are designed to recover the elasticity of technology to the stock of FDI (in levels). The estimation results and the robustness of these results are discussed in paragraphs A.121 to A.125 of the publication; the preferred estimate exhibits the required statistical properties.

Yours sincerely,

[HM Treasury official name redacted]

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Any review request must be made within 2 months of the date of this letter.

It would assist our review if you set out which aspects of the reply concern you and why you are dissatisfied.

If you are not content with the outcome your complaint, you may apply directly to the Information Commissioner for a decision. Generally, the ICO cannot make a decision unless you have exhausted the complaints procedure provided by the OBR. The Information Commissioner can be contacted at: The Information Commissioner's Office, Wycliffe House, Water Lane, Wilmslow, Cheshire SK9 5AF.