Making Business Sense

The impact on the UK economy of a reduction in fuel duty

Report for Fair Fuel UK

March 2012

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Authorship and acknowledgements

This report has been produced by the Centre for Economics and Business Research Ltd (Cebr), an independent economics and business research consultancy established in 1993 providing forecasts and advice to City institutions, government departments, local authorities and numerous blue chip companies throughout Europe. It is based on the study led by Cebr Head of Microeconomics, Oliver Hogan.

This study has been commissioned by the FairFuelUK and has utilised information provided by campaign members. However, the report does not necessarily reflect the views of FairFuelUK.

London, March 2012

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1 Introduction

1.1 Background and context

Cebr was requested by the FairFuelUK Campaign to investigate whether an economic case could be made to support its view that a cut in fuel duty could generate more tax revenues from across the wider economy as a result of increased economic growth and business and consumer confidence.

The Campaign's central proposition, as outlined in its prospectus[1], is that

> *"fuel taxes, particularly the level of fuel duty, have reached such disproportionate levels that they are adversely affecting swathes of the motoring and business communities with a resultant negative impact on the UK economy as a whole."*

and that

> *"the Government could stimulate the economy by reducing fuel duty. Using a reduction of fuel duty as a means of stimulus would have the added advantage of reducing inflation. This would result in increased tax revenues from a number of sources as such a move would have a positive effect on business development, employment, consumer spending and public morale."*

This is the report on Cebr's independent assessment of the wider economic impact of a reduction in fuel duty and whether the loss of tax revenues from such a reduction could expect to be compensated through the fiscal stimulus that such a reduction would provide to the UK economy.

1.2 Structure of the report

This report is structured as follows:

1. Section 2 outlines the methodology and assumptions underlying our economic impact assessment.

2. Section 3 presents the findings of our assessment, including the wider economic impact under alternative fuel duty reduction scenarios and the net tax revenue position arising from those scenarios.

3. Section 4 draws our key conclusions.

[1] See "Reduce Fuel Duty: The Key to the UK's Economic Recovery", FairFuelUK. Available at http://www.fairfueluk.com/ .

2 Methodology and assumptions

This section describes the modelling framework used in Cebr's assessment of the economic impact of a fuel duty reduction and outlines the assumptions embedded in that modelling framework.

2.1 The economic modelling framework[2]

To arrive at estimates of the economic impact of reductions in fuel duty, we undertook a counterfactual analysis, asking the question 'how would the economy look if fuel duty was reduced?' and comparing this against the counterfactual of no change in the duty, the latter representing the economy 'as is'.

For this purpose, we used the modelling framework provided by the ONS' Supply-and-Use Tables (otherwise known as the input-output framework). These tables form part of the system of national accounts, reconciling the three approaches to the measurement of gross domestic product (GDP), that is, the output approach, the income approach and the expenditure approach. The key benefit of using this framework for the fuel duty assessment is the identification that it allows of the interrelationships between:

- The output of industries and their intermediate consumption, that is, the goods and services supplied by other industries that they need to produce their own output; and
- The output of industries and their consumption of primary inputs, namely labour, capital etc.

Because the latest available version of the Supply-and-Use tables was 2009, we used this version under the simplifying assumption that the proportional impacts would not differ very much if more up-to-date data had been available. While 2010 and 2011 data are available from other sources (such as the Annual Business Survey, for instance), there is none that provides as accurate and comprehensive a picture of the workings of the UK economy as the Supply-and-Use framework.

Having made this decision on the modelling framework, we undertook a number of steps to arrive at our estimates of the economic impact of fuel duty reductions. These are outlined in the following sub-sections.

Step 1: From raw to interlinked Supply-and-Use tables

This involved a simple preparatory measure, translating the raw Supply-and-Use tables into a set of inter-linked spreadsheets. We preserved each of the 'supply' and 'final demand'

[2] Our analytical approach is technically described as a partial equilibrium approach. This is simpler than a full macroeconomic evaluation. The disadvantage is that it only looks at the 'first round' impact on the economy and ignores most 'knock-on' or multiplier effects. However, because these multiplier impacts would be expected to be positive, the impacts presented in this report can be considered underestimates.

tables as they are presented by ONS. For the sake of tractability, we collapsed the intermediate consumption table to show only total intermediate demand by each of the 109 industries into which the tables split the economy, as opposed to the intermediate consumption by each industry of each of the 109 product groupings.

Furthermore, we transposed this consolidated intermediate demand table to show intermediate demand and GVA (and its components) by industry as columns in a spreadsheet, rather than rows as they appear in the raw Supply-and-Use tables.

We then used this adapted version of the Supply-and-Tables to apply each of the three approaches to measuring GDP which were, as expected, found to be internally consistent.

Step 2: Impact on demand for products

To model the impact of fuel duty reductions, the first step was to establish the impact on demand for all products in the economy as a result of such reductions. We did this through a number of steps, as follows:

1. Established the price reductions available to the suppliers of all products as a result of the fuel duty reduction, achieved by calculating the importance of fuel in the supply chain for each product grouping (or, in other words, the share of intermediate inputs required to produce the output in each product grouping that is accounted for by fuel).

2. Made assumptions about the level of pass-through of these price reductions to other producers (who use their products as inputs) and to households, Government, investors and exporters (that is, to the sources of final demand). We assumed a 35 per cent pass-through to other producers and a 65 per cent pass-through to households etc.

3. Established price elasticity of demand assumptions for each product grouping which, combined with the pass-through assumptions, was used to generate percentage changes in the intermediate demand and final demand for all product groupings.

Steps 1 to 3 above gave the impact of the fuel duty reduction on the values of intermediate and final demand through the impact on the supply chains of each product grouping. However, it was also necessary to account for the direct impact on households' disposable income as a result of a fuel duty reduction. This was achieved by:

4. Establishing the change in the value of final consumption of fuel (at existing levels of fuel consumption) at the new lower final price for fuel.

5. Assuming an economy-wide savings rate of 7 per cent, we allocated the remaining increase in disposable income as an increase in the final demand for a range of product groupings that represent discretionary spend, including things like alcoholic beverages, clothing, household durables, cinema, theatre and other recreational activities.

6. Using the increased demand for these discretionary product groupings to establish the increases in intermediate for all products from the producers of the product groupings

for which final demand has increased, achieved using the mix of intermediate inputs used in the production of each of these groupings.

Steps 1 to 6 thus generated new levels of intermediate and final demands for all product groupings as a result of the reduction in fuel duty.

Note that the new intermediate and final demands for fuel were generated using HM Treasury's assumptions about the price elasticity of demand for fuel used in its 2011 Budget Policy Costings publication. This distinguishes between short-term (one year) and long-term (5 years) behavioural responses. This was combined with the implied new price of fuel resulting from the reduction in fuel duty.

Step 3: Impact on the supply of products

The sum of the new intermediate and final demands for products gave new values for the total supply of products in the supply table (noting that demand equals supply of products in the Supply-and-Use framework).

Using the proportional relationships between the values of imports, distributors' trading margins and taxes less subsidies on products and the value of total supply of products at purchasers' prices, we were able to complete the new supply table that resulted from the reduction in fuel duty. This, in turn, facilitated the calculation of domestic output of each product grouping at basic prices (that is, net of taxes less subsidies on products).

Step 4: Impact on the production of industries

This penultimate step involved completing the new consolidated intermediate supply table. This involved using the proportional relationship between the domestic output of industries and the domestic supply of products. It was then a simple matter of deriving the new intermediate demands of industries, gross value added and each of its components (compensation of employees, gross profit and mixed income and taxes less subsidies on production).

Step 5: Re-calculated GDP based on new Supply-and-Use tables

Steps 1 to 4 gave us what we needed to calculate GDP in the new reduced fuel duty world. We found our measure of new GDP to be internally consistent across the three approaches to calculating it. The impacts were then calculated as the differences between the new scenario and the counterfactual as proportions of the values in the counterfactual world of no change in fuel duty.

This produced the results presented in Section 3 of this report.

2.2 Modelling assumptions

Our starting point was the fact that, in 2009, total taxation of petroleum products was £30.6 billion (as posted in the Supply-and-Use tables), of which £25.9 billion was fuel duty (as

posted in ONS' Government revenues from environmental taxes dataset). We assumed the remainder of taxes on petroleum products is accounted for by VAT.

Using an assumption of approximately 51.5 billion litres of fuel consumed in 2009, this gave an average fuel duty per litre consumed of 50 pence.[3] We used this as the basis of our modelling.

We adopted HM Treasury's assumptions on the behavioural impacts of fuel price reductions. This amounted to assuming a price elasticity of demand for fuel of -0.1 in the first year and -0.4 by the fifth year.

In order to assess the stimulus to demand as a result of the fuel duty reduction, we had to make assumptions about the price elasticities of demand for each of the 109 product groupings in the Supply-and-Use tables. There is no central repository of elasticities for different industries, so we had to use our existing knowledge and experience at Cebr to generate these assumptions. To the extent that these assumptions constitute over- or under-estimates of these elasticities, our impacts of fuel duty reductions will be over- or under-estimated. In other words, the impacts we have calculated are those that can be expected under our elasticity assumptions.

Ranges of elasticity assumptions for each of a number of broad industry sectors are shown in Table 1 below by way of illustration.

Table 1: Price elasticity of demand assumptions by broad product grouping

Broad product grouping	Assumed range of demand elasticities
Agriculture, forestry & fishing	-0.50
Mining	-0.40
Food manufacturing	-0.35
Other manufacturing	-0.25 to -1.00
Utilities and sanitation	-0.05 to -0.25
Construction	-0.50
Wholesale, retail	-0.50
Transport, accommodation and food services	-0.50 to -0.90
Financial and professional services	-0.35 to -0.80
Public services	-0.31
Entertainment and recreation	-0.50 to -0.81

[3] Note that this is the average across all types of fuel that are subject to fuel duty. While fuel duty is higher on the most significant fuel products, it is significantly lower for others. Hence the lower assumed rate per litre that is lower than the duty on, for instance, diesel or standard petrol.

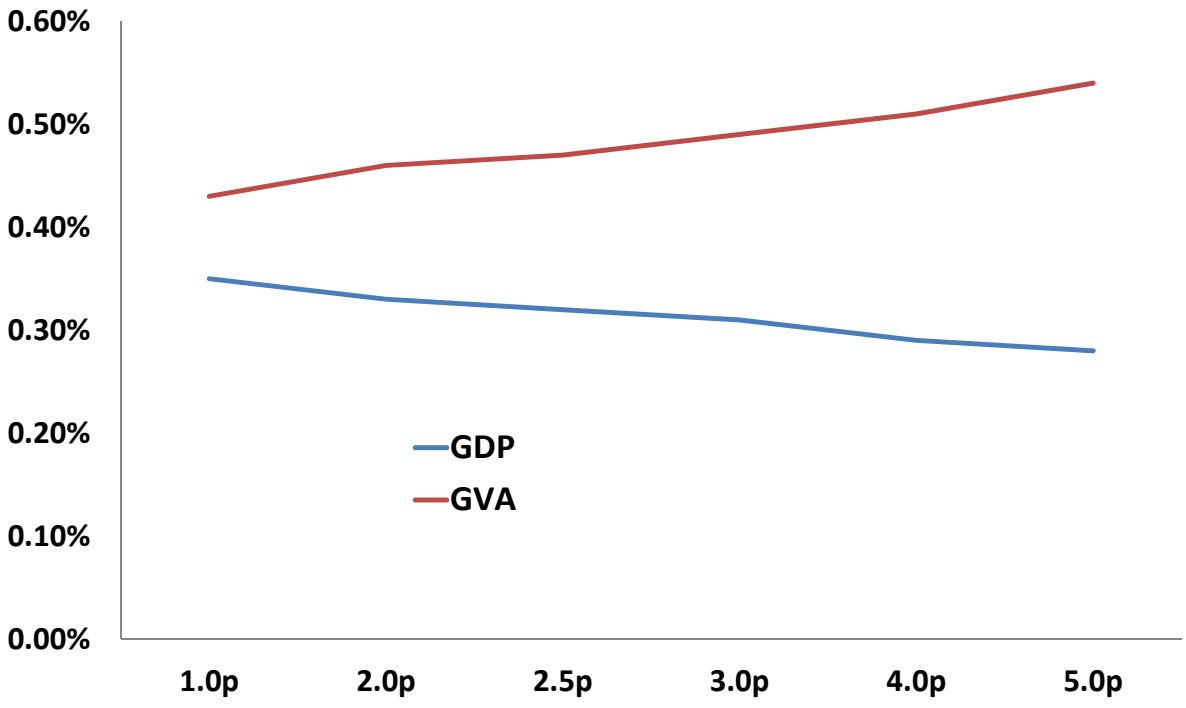
3 Findings of the study

We present the findings of our modelling for six levels of fuel duty reduction, and for each level of reduction, we show the impact that can be expected within one year of the change and within 5 years. We assess the impacts on GDP, GVA, jobs and on the Government's net fiscal position.

3.1 The impacts on Gross Domestic Product (GDP) and Gross Value Added (GVA)

Figure 1 below illustrates the impact of alternative fuel duty reductions on GDP and GVA within the first year of those reductions. As the size of the duty reduction increases, the increase in GDP falls, while the increase in GVA increases. This is due to the increasing direct loss of tax revenues from the fuel duty reduction and the manner in which GDP takes this into account. The increasing positive GVA impact shows a truer impact in terms of the impact of the fuel duty reductions on economic activity. This result is important from the jobs perspective, as explored in the following sub-section.

Figure 1: Impact on UK GDP and total GVA of alternative reductions in fuel duty within one year



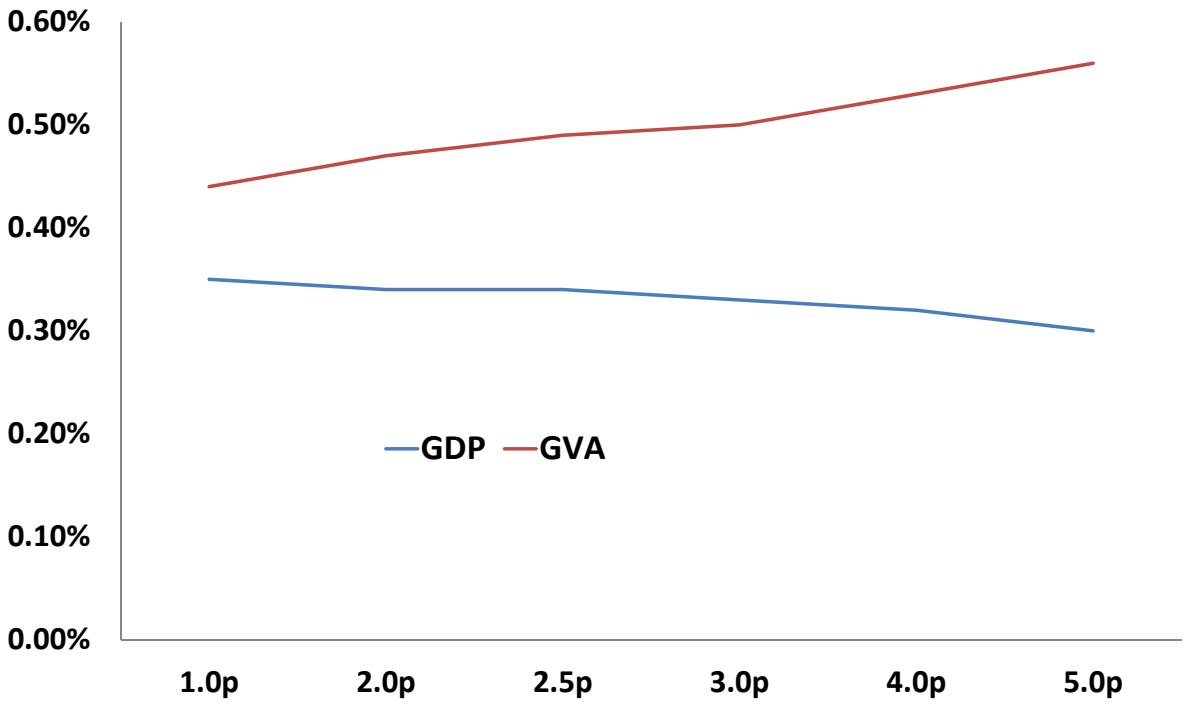
Source: Cebr analysis

The figure shows that for a 1 penny reduction in fuel duty, the expected increase in GDP is 0.35 per cent, while GVA would increase by 0.43 per cent. For a 2.5 pence reduction in fuel duty, the estimated increase in GDP is 0.32 per cent, while the increase in GVA is expected

to 0.47 per cent. With a 5 pence reduction in fuel duty, the increase in GDP would fall to 0.28 per cent, while the increase in GVA rises to 0.56 per cent.

Figure 2 shows the GDP and GVA impacts after 5 years. There is little discernible difference between this and Figure 1. However, the percentage increases are marginally higher for each level of fuel duty reduction.

Figure 2: Impact on UK GDP and total GVA of alternative reductions in fuel duty after 5 years



Source: Cebr analysis

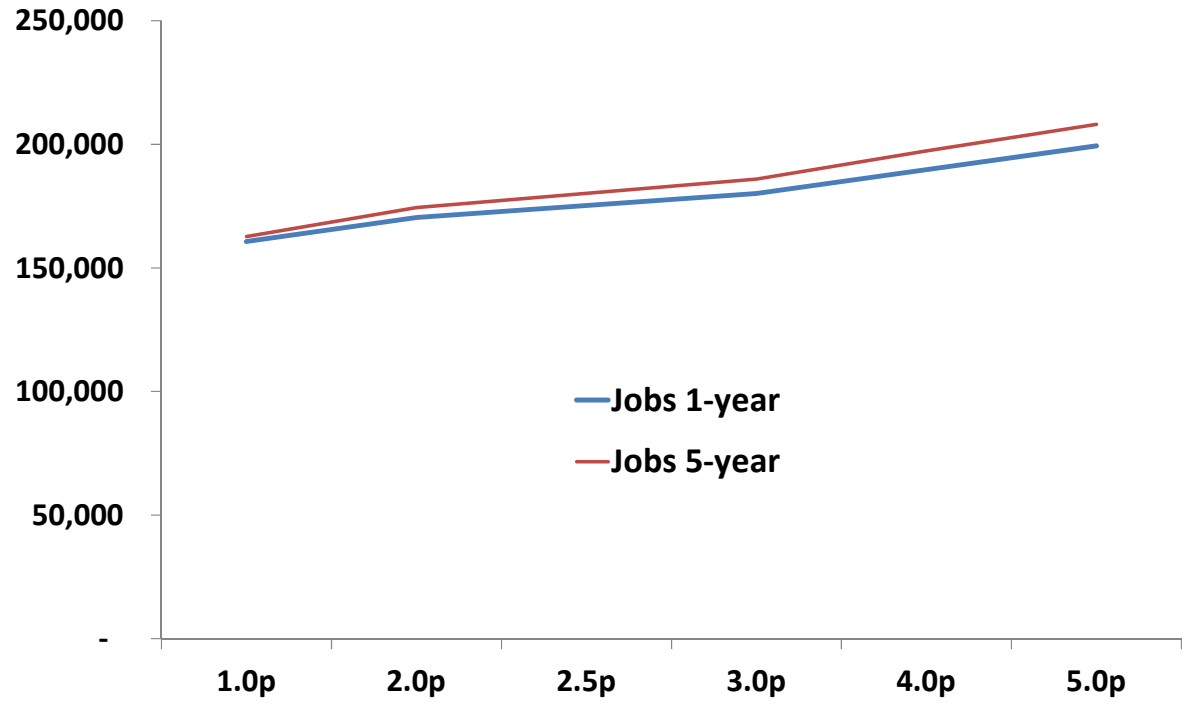
3.2 The impacts on jobs

Figure 3 below illustrates the impact of alternative fuel duty reductions on UK jobs within the one and five years of those reductions. The pattern of job increases, as expected, follows more closely the pattern of impact on GVA, with increases in the numbers of new jobs as the level of reduction in the fuel duty is increased.

In summary, the figure shows that a 2.5 pence reduction in fuel duty could be expected to lead to the creation of 175 thousand jobs within the first year and of 180 thousand jobs within five years.

By way of comparison, a 1 pence reduction would generate 161 thousand new jobs, while a 5 pence reduction could generate almost 200 thousand jobs within the first year. These numbers rise to 163 thousand and 208 thousand respectively after 5 years.

Figure 3: Impact on jobs of alternative reductions in fuel duty in the first and fifth years



Source: Cebr analysis

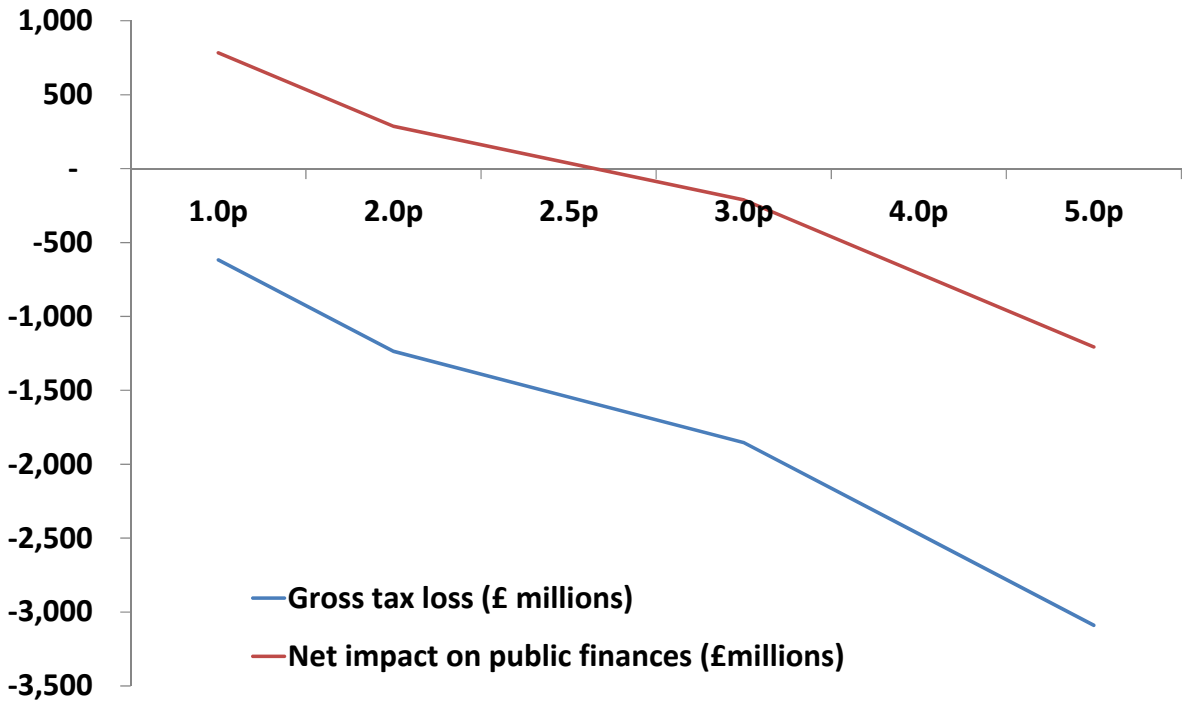
3.3 Impact on Government's net fiscal position

Figure 4 below shows the impact of the same alternative levels of fuel duty reductions on the Government's 'gross' and 'net' fiscal position, where we call 'gross' impact the loss of revenues as a direct result of the fuel duty reduction (taking account of behavioural responses). The net impact also counts increased taxes on production as a result of the stimulus to economic activity as well as the savings in welfare benefits arising from the increases in employment.

This shows that a 2.5 pence reduction in fuel duty achieves a neutral impact on the Government's net fiscal position. When the reduction is greater than 2.5 pence, the direct loss of fuel duty revenues outweighs the additional revenues from additional economic activity and the savings in welfare payments. The opposite is the case when the reduction is less than 2.5 pence, in which case the direct loss of fuel duty revenues is outweighed by the incremental tax revenues from the growth in economic activity and the welfare benefit savings as a result of more people being in work.

The impacts are very similar after 5 years.

Figure 4: Impact on UK Government's net fiscal position after one year



4 Conclusions

Cebr was requested by the FairFuelUK campaign to investigate whether an economic case could be made to support its view that a cut in fuel duty could generate more tax revenues from across the wider economy as a result of increased economic growth and business and consumer confidence.

To do so, Cebr undertook an independent assessment of the wider economic impact of a reduction in fuel duty and, then, whether the loss of tax revenues from such a reduction could expect to be compensated through the greater taxation from other sources and the reduced social welfare commitments that would result from the fiscal stimulus that such fuel duty reductions would provide to the UK economy.

Our findings suggest that a 2.5 pence reduction in fuel duty would result in the creation of 175 thousand jobs within a year and 180 thousand jobs within five years of such a reduction. Such a reduction, we estimate, would not result in any fiscal loss to the Government, while GDP would receive a boost of 0.32 per cent within a year and 0.34 per cent within five years.

We find that a more significant 5 pence reduction could generate an additional 200 thousand at a net annual cost to the Exchequer of around £1.2 billion within a year, which would fall to £1.0 billion per annum within 5 years. The boost to GDP would be smaller in this scenario; 0.28 per cent after a year and 0.30 per cent after 5 years.

These are not insignificant impacts in the current climate of less than 1 per cent annual growth. But this is not to mention the intangible benefits that could flow from the morale boost provided to consumers by helping to alleviate the current squeeze on their disposable incomes.