

Gender analysis of the changes in indirect taxes introduced by the coalition government, 2010-2011

Jerome De Henau and Cristina Santos¹, UK Women's Budget Group

Introduction

This report ²examines the coalition government's main changes in indirect taxes from a gender perspective. It provides a separate analysis for changes in excise duties on alcohol, tobacco and fuel, and in VAT; and an analysis of the combined effect of these changes, together with changes in insurance premium tax, air passenger duty and gambling duty. We have not included the remaining indirect taxes, namely customs duties, fossil fuel levy, motor vehicle duties, licences for driving and TV, and stamp duties, because we did not have adequate expenditure data on the goods which are subject to these taxes. More detail on the methods we used to compute the amount of indirect taxes paid by different kinds of households can be found in Appendix A.

The March 2011 budget introduced some immediate changes in several excise duties³. The main changes were as follows:

- Alcohol duties were increased by 2% above the RPI, adding 4 pence to the price of a pint of beer, 15 pence to the price of a bottle of wine, and 54 pence to the price of a bottle of spirits⁴.
- Tobacco duties were also increased by 3% above RPI, and the duty was restructured, adding 50 pence to a packet of economy cigarettes and 33 pence to a packet of premium cigarettes. This will collect £80 million in the 2011/12 fiscal year and is estimated to collect similar amounts in the next 4 years.
- The fuel duty escalator, introduced by the Labour Government in 2009, was abolished. (This had ensured that fuel duty rose above the rate of inflation, incrementally). In addition the main fuel duty rate was cut by one penny per litre. This is estimated to cost the government £1,900 million in 2011/12 fiscal year, and will continue to cost similar amounts in the coming years.
- These changes came on top of the rise in VAT from 17.5% to 20%, introduced in the June 2010 budget, which came into effect on 4th of January 2011. This is estimated to raise £12,100 million in 2011/12 fiscal year⁵.

¹ Sue Himmelweit and Diane Elson helped to develop the conceptual framework and the explanation of the results.

² This report has been funded by the Fawcett Society, as part of a programme of collaboration with the UK Women's Budget Group.

³ Details are from HM Treasury, *Budget 2011 (The Red Book)*, Table 2.1, p. 43 and pp.61-63.

⁴ HM Treasury, *Budget 2011 (The Red Book)*, Table 2.1 does not provide an estimate of how much revenue the increase in alcohol duties will raise.

- More details of the changes can be found in Appendix B.

Distributional analysis of impact of indirect taxes

For each of its budgets, the government has provided an analysis of the impact of selected policy changes on the incomes and expenditure of households (in Annexe A to the June 2010 budget Annexe A to the March 2011 budget). The analysis in March 2011 included the combined impact of changes in indirect taxes, direct taxes, and tax credits and benefits, and households were divided into 10 groups (deciles) ranging from the lowest to the highest household net income⁶ (or expenditure). Analysis conducted on a household basis implicitly assumes that income and expenditure are shared in such a way as to make each member of the household equally well off.

Income (or expenditure) is 'equivalised' to take into account the differing needs of households of different sizes and age composition. A household consisting of a couple with two children will need more income to achieve the same standard of living than a household consisting of a single person with no children. But it will not need four times as much income because people who live together share accommodation, and there are economies of scale. Statisticians have agreed a way of 'equivalising income to allow for this'⁷. The first decile of equivalised net income (or expenditure) will contain the poorest tenth of households with the lowest equivalised net income (or expenditure) and the tenth decile will contain the richest tenth of households with the highest equivalised net income (or expenditure).⁸

The impact was assessed both in cash terms (how much money would the average household in each income (or expenditure) decile gain or lose) and also in terms of the proportion of income/expenditure that the average household in each decile gains/losses. The latter is known as the incidence of the tax/benefit change.

The government's analysis showed that as a result of its changes in indirect taxes, households in higher income (or expenditure) deciles will pay more tax than poorer households, because they spend more.⁹ But when the incidence of the tax changes on income is calculated, this shows that the extra tax that households in the poorest decile pay is a greater proportion of their income than for the richest decile.¹⁰ The incidence is in general regressive, with the lower income households paying a higher proportion of their income than the better-off households. The picture is different when the incidence on household expenditure is presented: incidence is lower for households in the first

⁵ HM Treasury, *Budget 2010 (The Red Book)*, Table 2.1, p.40

⁶ Net income is total income minus direct taxes and plus social security benefits.

⁷ The equivalence scale gives a person living on their own a score of 0.67, any additional adult a score of 0.33, each child aged 0-13 a score of 0.20 and each child aged 14-18 a score of 0.33. This implies that a person living on their own can enjoy the same standard of living as a couple of adults with just 67% of the same household income; but to enjoy the same standard of living, a couple with a child aged 13 or under would need 120% of the household income of the couple.

⁸ To avoid repetition, we simply refer to household income (or expenditure) in most of the exposition. It should be understood that income is always net and both income and expenditure are equivalised.

⁹ HM Treasury, *Budget 2011 (The Red Book)*, Annexe A, Chart A 2, p. 76 and Chart A4, p. 78

¹⁰ HM Treasury, *Budget 2011 (The Red Book)*, Annexe A, Chart A.3

two deciles and increases by decile so that it is highest in the richest decile.¹¹ However, we consider that the incidence on incomes is what counts in discussing the extent to which the changes in indirect taxes are equitable. Rich people can afford to spend more and to pay a higher proportion of their expenditure in taxes.

The government did not attempt to provide a gender analysis of the impact of changes in indirect taxes.

Gender analysis of indirect taxes

Currently we lack data and models to make an analysis on what men as a group pay in indirect taxes compared with what women as a group pay. Comprehensive data on expenditure from the household survey is only available at the household level, and we do not have data on who buys what and who consumes what in multi-person households. Analysis at an individual level would require assumptions about the intra-household distribution of consumption and spending power; and would also have to take into account that many goods and services bought by households are in fact consumed jointly by household members (among the many examples are TV, sofas and armchairs, and electricity, water and gas). However, we think that some useful gender analysis can be done by comparing different households categorised by *composition* and by *type*:

- By composition we mean whether the household is a “single male”, “single female” or “couple” household, considering only the adults in the household.
- By household type we mean characteristics such as age of adults, presence of children, and presence and sex of earners. So, for instance “pensioner households” are those that have at least one member over the standard working-age; “working age households” are those with no pensioners, and are further divided by whether there are children present, and by the presence and sex of earners.

We analyse the impact of selected changes in indirect taxes on these groups of households using expenditure data collected by the Office of National Statistics in 2005 and 2006. Of course, since then prices have risen, so we use the Retail Price Index to up-rate these expenditure levels to what they would be at January 2011 prices, implicitly assuming that expenditure patterns have remained unchanged. In order to compare the impact of different indirect tax changes we give the results as if they had all been implemented at the same time in January 2011 (see Appendix A for more details on the method). As is usual in this type of analysis, we ignore any behavioural impact of the tax changes, assuming that people continue to consume the same amount as before the tax changes. Thus we provide what the government calls the “next day” impact¹². We analyse the extra tax payment, both as a cash payment and as a proportion of equivalised household net income, i.e. the incidence of the tax.

¹¹ HM Treasury, *Budget 2011 (The Red Book)*, Annexe A, Chart A. 5

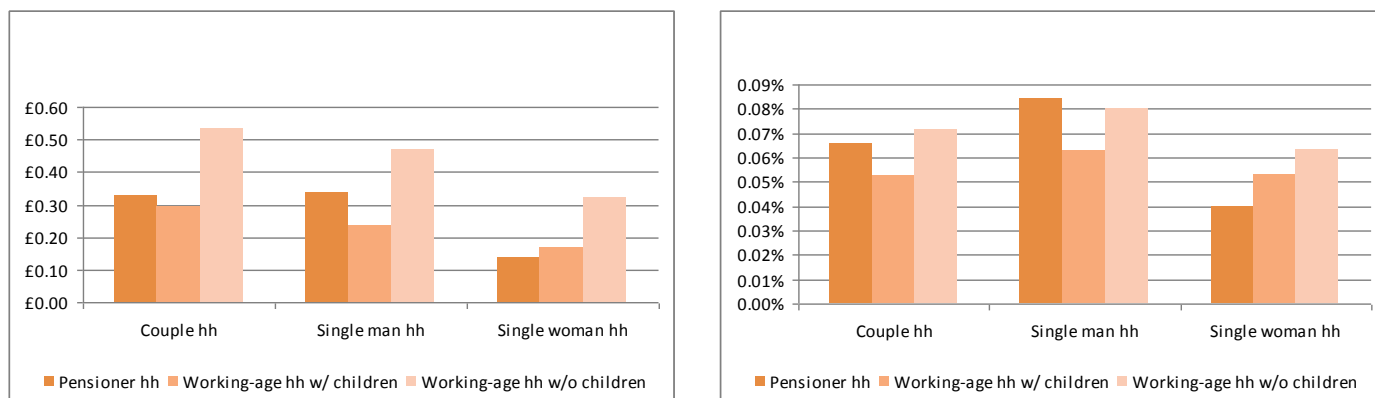
¹² HM Treasury, *Budget 2011 (The Red Book)*, Annexe A, p.74

Impact of Changes in Excise Duties

Alcohol

Figure 1 shows the impact of the change in excise duties on alcohol on couple and male and female single person households, subdivided according to household type (pensioner, working-age with, and without, children). The impact of the change is given both as a weekly change in the amount of tax paid, and as the percentage points change in the incidence of the tax (i.e. the tax paid on alcohol as a proportion of household income).

Figure 1. Impact of Budget 2011 change in alcohol excise duties, by household composition and type: extra tax paid in cash weekly, and percentage points change in incidence on household income



Source: authors' calculations based on Expenditure and Food Survey 2005-2006

Figure 1 shows that single woman households pay less extra cash than single man and couple households across all three household types considered here, with the lowest payment for pensioner single woman households, reflecting the lower consumption of alcohol of these households. Couple households without children pay the largest increase, closely followed by single man households without children. The change in incidence of alcohol duties on household income follows a similar pattern, being lower for the single woman households than single man and couple households, with the exception of single woman households of working age with children, where the change in incidence is slightly higher than for couple households of working age with children. There is a considerable difference between male and female single pensioner households, with the change in incidence being highest for the former and lowest for the latter. However, the changes in incidence are relatively small. For instance, male pensioner households only see 0.085% more of their income going in alcohol excises.

Figure 2. Impact of Budget 2011 change in alcohol excise duties on working age households with and without children, by sex and number of earners: extra tax paid in cash weekly and percentage points change in incidence on household income



Source: authors' calculations based on Expenditure and Food Survey 2005-2006

Figure 2 shows how the increase in alcohol excises has affected working-age households according to the number and sex of earners. Among households without children, two earner households see the highest cash increase in tax payments, followed by single earner households, while households without earners face the smallest increase. This is driven by difference in consumption patterns: households with no earners buy less alcohol, and male sole earner households consume considerably more than female sole earner households. A similar pattern applies among households with children, although they all consume less alcohol and so pay a smaller increase in alcohol excises than corresponding households without children. However, in households with children, the increase in tax payments in male sole earner households is only slightly larger than in female sole earner households.

In terms of change in the incidence of alcohol duties on household income, households without children again see a greater increase than those with children. There is little variation across different household types with children. No earner households without children see the highest increase of any household type, with a rise of more than 0.1 percentage points in the tax incidence. Even though the consumption of these households is lower than that of other households without children, so is their income.

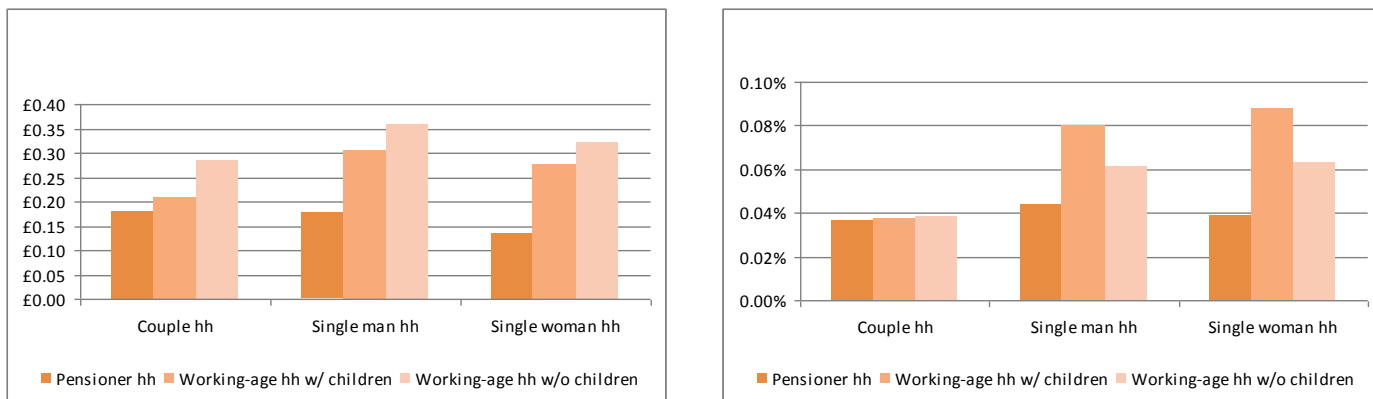
A rise in alcohol duties may have consequences for all members of households, including those who do not consume alcohol themselves, if increasing alcohol duties squeezes the resources available to them rather than discouraging consumption. The government should be aware of the gendered social exclusion consequences this may have.

Tobacco

Figure 3 is similar to Figures 1 but relate to tobacco excises, another good whose consumption the government wants to discourage. As is the case with alcohol, within working age households both with and without children, single male households will pay the highest increase in tobacco excises. But, unlike alcohol, single female households will pay more than couple households, reflecting their relatively high consumption of tobacco. Unlike for alcohol, pensioner households face the lowest increase in payments of tobacco tax, whether couples or singles, and here lone women pensioners face a much lower increase than others. In terms of incidence in relation to income, couples

face the lowest increase within all household types reflecting both their higher incomes and lower tobacco consumption. There is little variation in the incidence on single person households by sex because higher male incomes compensate for their higher tobacco consumption. However lone parents of both sexes, although lower consumers, have sufficiently lower incomes than singles without children that they face a higher incidence of tobacco tax relative to their incomes.

Figure 3. Impact of Budget 2011 change in tobacco duties, by household composition and type: extra tax paid in cash weekly, and percentage points change in incidence on household income



Source: authors' calculations based on Expenditure and Food Survey 2005-2006

Figure 4 categorises working-age households by sex and number of earners, and sharp differences appear. Among households both with and without children, those facing the lowest increase in payment of tobacco duties are now those with two earners, and the highest increases are faced by households with no earner. Male earner and female earner households face similar increases. In all cases those households with children face a smaller increase than those without children, but the difference between households with and without children is much lower than it was with alcohol (see Figure 2), especially for female earner and no earner households.

Figure 4. Impact of Budget 2011 change in tobacco excise duties on working age households with and without children, by sex and number of earners: extra tax paid in cash weekly, and percentage points change in incidence on household income



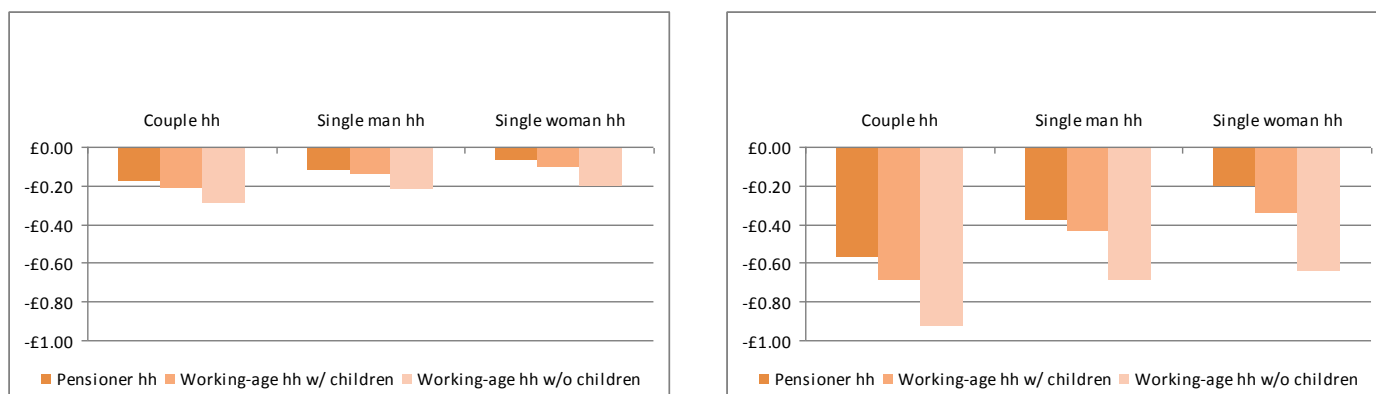
Source: authors' calculations based on Expenditure and Food Survey 2005-2006

This has implications for the incidence of the tax increase relative to household income, where no-earner households face the largest increase in incidence. In this case, the greater incidence is on households with children, and for them the increase is much more than that due to the rise in alcohol duties, which is of concern because these tend to be the poorest households. Unless very effective in curtailing parents' smoking, increases in tobacco duties may squeeze the resources available to satisfy the needs of children in such households.

Fuel

The cut in the rate of fuel duty and the abolition of the fuel duty escalator sits uncomfortably in the March 2011 budget. It will cost the government thousands of millions of pounds in the coming years, only partly offset by increased tax on North Sea oil production, and runs counter to all environmental concerns and the government's stated desire to move to a less carbon intensive economy. In Figure 5, we examine both the "next day" impact of the 1p cut in fuel duty; and the combined impact of the 1p cut and the abolition of the fuel duty escalator, compared to a situation of no cut in duty and the operation of the fuel duty escalator. Figure 5 shows the weekly cash changes in the amount of fuel duty paid: the left hand chart shows the "next day" reduction in payments that are the result of the 1p reduction in the fuel duty and no application of the escalator; the right hand chart shows the reductions in comparison with a situation in which the fuel duty escalator had been kept in operation i.e. the combined gains from the 1p reduction and the abolition of the fuel duty escalator.

Figure 5: Impact of Budget 2011 change in fuel duty, by household composition and type, on weekly cash payments: gains from 1 p cut in duty and combined gains from cut in duty and abolition of fuel duty escalator



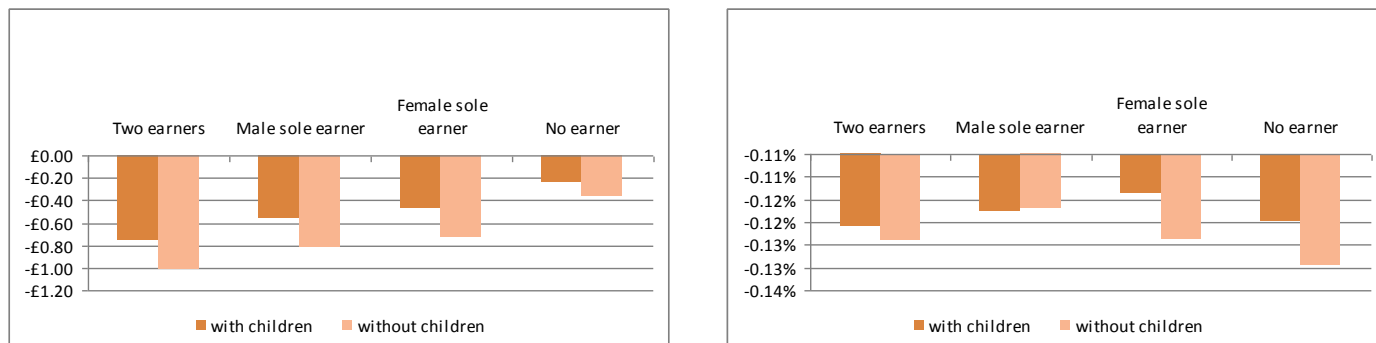
Source: authors' calculations based on Expenditure and Food Survey 2005-2006

For all household types, couple households gain the most in both scenarios, followed by single male households. For all household compositions, working age households without children received the largest tax cut and pensioner households the smallest. The effect of children is most noticeable for single female households, where those without children gain almost as much as single male households, but lone mothers gain less than lone fathers. These differential gains reflect gendered differences in fuel consumption.

Our methodology does not include any behavioural responses to changes in taxes, so whether we examine the "next day" impact of the reduction in duty or compare this with what would have happened under the operation of the

fuel duty escalator, the groups that benefit more or less do not change. The main difference is in the level of the reductions in tax paid, because the abolition of the fuel duty escalator means more revenues foregone for the government and a greater tax break for motorists. From here on, we will only present the results on gains to households compared to the situation in which the fuel duty escalator had continued in operation, thus showing the combined gains to households from both the reduction in duty and the abolition of the fuel duty escalator.

Figure 6. Impact of Budget 2011 change in fuel duty and abolition of fuel duty escalator, for working age households, by sex and number of earners, with and without children: change in cash amount paid by households and percentage points change in incidence on household income

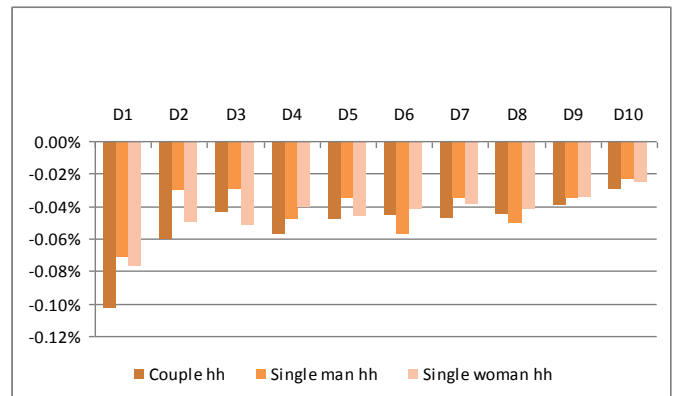


Source: authors' calculations based on Expenditure and Food Survey 2005-2006

Having a male earner in the household increases fuel consumption overall, perhaps because of male commuting, particularly when there are children, which translates into a larger cash benefit for two earner and male earner households. Thus most of the government's tax break went to households with male earners, the household types with the highest income because they benefit from a male wage. Households with only female earners, and those with no earners, benefitted much less because they spend much less on fuel. However, in terms of the incidence of the tax break on income, the households getting the biggest tax break relative to their income were no earner households without children, because they had the lowest income. In general those with children benefitted less in terms of incidence than corresponding household types without children.

Figure 7 shows the distributional impact by (equivalised) income decile and household composition of the decision to abolish the fuel duty escalator and reduce the fuel duty by 1p. This analysis by decile helps to disentangle effects on incidence due to differential consumption from those due to differential household income. We show both the changes in the amount of fuel excises paid and the change in incidence.

Figure 7. Impact of Budget 2011 change in fuel duty and abolition of fuel duty escalator, income decile and household composition: change in cash amount paid by households and percentage points change in incidence on household income



Source: authors' calculations based on Expenditure and Food Survey 2005-2006

Very clearly, households in the upper deciles benefit more from the decrease in fuel duty and the abolition of the escalator, in terms of the tax they no longer need to pay. This is because they consume more fuel, and so most of the revenue forgone by the government has gone to them. However, once this is set against their higher income, these households gain least in terms of a reduction in incidence of the tax on their income. Figure 7 also shows that among households with a similar standard of living (measured by the equivalised income), single female households tend to benefit more from the tax cut, in terms of incidence on their income, than single male adult households for lower income deciles, but single adult men gain more in the higher deciles.

VAT rise

The June 2010 Budget announced a rise in the standard rate of VAT, which applies to most goods and services, from 17.5% to 20%, to be implemented in January 2011. Some goods and services are taxed at a lower rate of 5%, and for a few there is zero rate of tax. In both these cases the VAT rate remained unchanged. A few goods and services are exempt from the VAT system altogether. Table 1 shows the different VAT rates and the goods and services they cover.

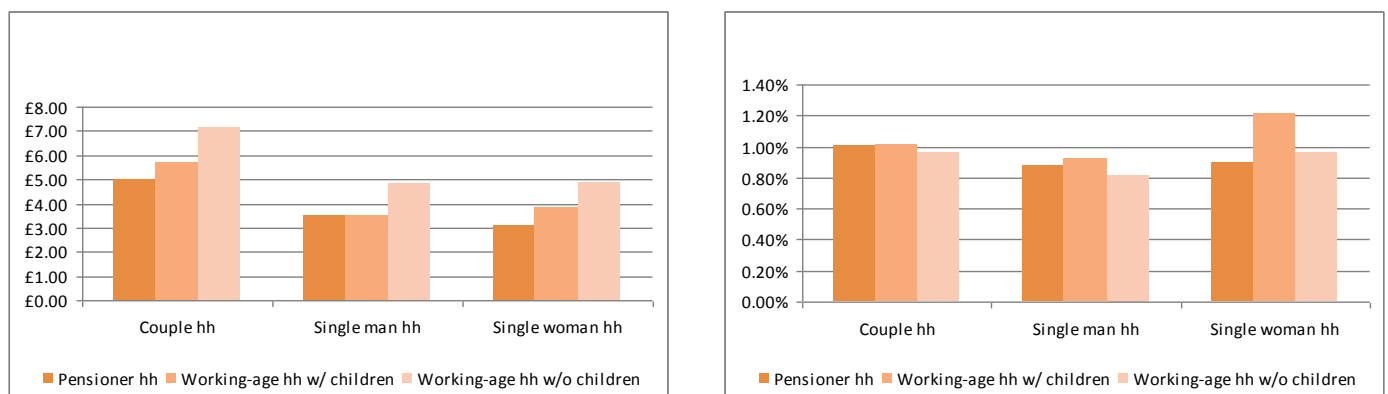
Table 1 VAT rates and liable goods from January 2011

VAT rate	Applied to
20%	Most goods supplied within the UK (standard rate)
5%	Domestic gas and electricity, installation of energy saving materials, installation of heating equipment, connection of gas supply, women's sanitary products, children's car seats
0%	Most food, children's clothing and footwear, public transport, books, records and newspapers, water and sewerage services ,helmets for motorcycles and pedal cycles, public or not-for -profit cultural and sports fees
Exemptions	Financial and banking services, education, caring and health services (exc. spectacles, lenses, sunglasses, most mobility and hearing equipment and non-NHS medical products and services), postal charges, betting, funerals

In our analysis, we treat exempt goods as if they were zero rated. Because VAT is paid on most items, but not on most food, children's goods, health and education, we would expect higher income households, especially those who do not have children, to see the total VAT they pay in cash increase by more than those with lower incomes. However, because poorer spend more of their income we would expect the change in terms of incidence on VAT on household income to hit poor households more, though this effect should be somewhat mitigated for those who have children.

Figures 8, 9 and 10 present the changes in VAT, both in terms of extra cash paid and in terms of incidence on household income: by household composition and household type, and by household composition and equivalised income decile.

Figure 8. Impact of June Budget 2010 rise in VAT, by household composition and type: increase in cash amount paid by households and percentage points change incidence on household income



Source: authors' calculations based on Expenditure and Food Survey 2005-2006

Couple households face a higher increase in their VAT bill while single man and single woman households have very similar changes in tax paid. Working age households without children pay more than those with children, and than pensioners, not only because they do not benefit from VAT concessions for children's goods, but also because they tend to have higher incomes. In terms of incidence, households with children, despite the largest share of VAT zero rated goods consumed, face the largest increase in VAT incidence, followed by pensioner households. In both cases, this must be because of low incomes. In fact, the group that faces the largest increase is one of the most vulnerable groups in the UK, lone mothers. That some of the goods consumed by this group are zero rated goods is clearly not enough to counteract the regressive nature of this tax.

Figure 9. Impact of June Budget 2010 rise in VAT, by sex and number of earners, with and without children: increase in cash amount paid by households and percentage points change incidence on household income



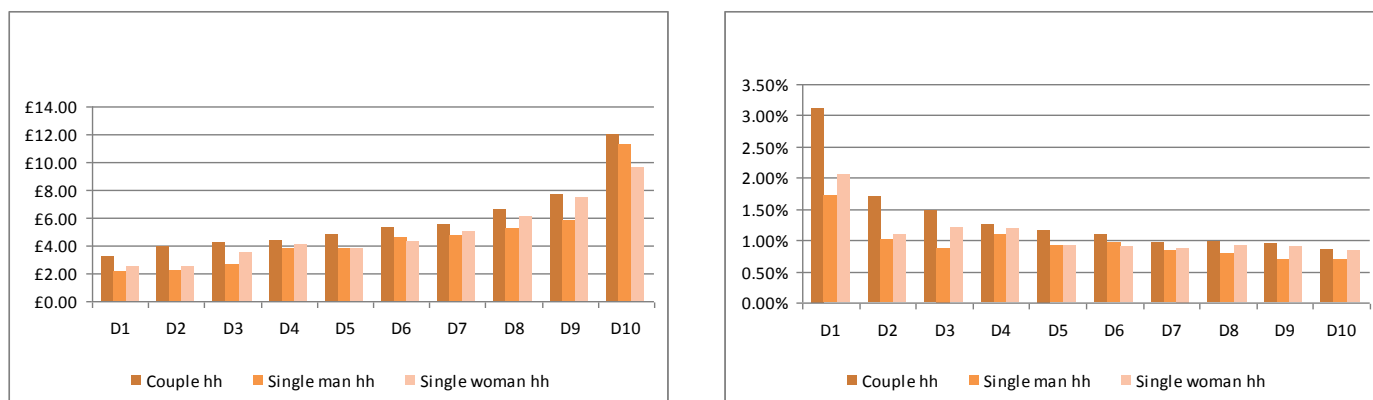
Source: authors calculations based on Expenditure and Food Survey 2005-2006

The increase in amount of tax paid is greatest for two earner households, followed by sole earner households, with little difference according to whether the earner is a man or a woman; and the households who pay least are those with no earners. Households without children, irrespective of their earning type, see their VAT bill increase by more than households with children. However, in terms of increased incidence on household income, this pattern is reversed completely: households with children see the larger increase and no earner households are hit hardest. Here we can see a difference between female and male sole earner households, with the female sole earner households facing the greater increase in incidence.

Figure 10 shows the impact by decile and household composition. It is important to note that 60% of individuals in the poorest households are women and their relative proportion decreases as household (equivalised) income increases. Of all households in the first decile of the income distribution, 49% have a single adult female (out of which 27% are lone mothers and 10% are single pensioners), and only 23% have a single adult man (out of which only 2% are lone fathers and other 2% are single pensioners¹³).

¹³ Authors' calculations based on Expenditure and Food Survey 2005-2006.

Figure 10. Impact of June Budget 2010 rise in VAT, by income decile and household composition: change in cash amount paid by households and percentage points change in incidence on household income



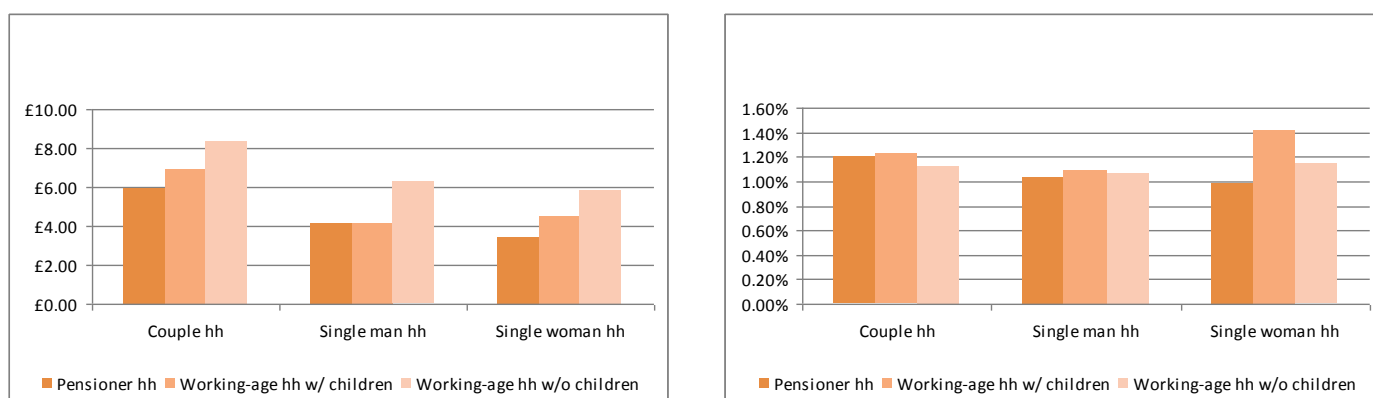
Source: authors' calculations based on Expenditure and Food Survey 2005-2006

Figure 10 shows that while poorer households face a lower increase in cash payments than richer households, they face a larger increase in the incidence of the VAT increase on their incomes than do richer households. In almost every decile, single female households pay more, and face a larger increase in VAT incidence than single male households, even though a larger fraction of single women live with children and thus benefit from zero rating of children's clothing and footwear.

Combined impact of changes in indirect taxes, June budget 2010 and March budget 2011

In order to analyse the combined impact of all the changes in indirect taxes, we treat them as if they had all been implemented in January 2011. Simulating the effects of different tax changes as if they had all been implemented on the same date allows their relative size to be compared. Figures 11, 12 and 13 shows these result by household composition and type, and by household composition and income decile. Figures 11 and 12 mirror the results obtained when we analysed the changes in VAT alone (Figures 8 and 9 respectively). This is because the effect of the change in VAT is much larger than of any other indirect tax change considered.

Figure 11. Combined impact of June Budget 2010 and March Budget 2011 changes in indirect taxes, by household composition and type: change in cash amount paid by households and percentage points change in incidence on household income



Source: authors' calculations based on Expenditure and Food Survey 2005-2006

Figure 11 shows that the increase in total tax paid is just over £3.50 for the group which faces the lowest rise in cash terms (pensioner single woman households) of which more than £3 is due to the VAT rise alone; and just over £8, for the group which faces the biggest rise in cash terms (couples without children) of which more than £7 is due to the VAT rise alone. The increase in incidence is highest for women lone parents and lowest for women pensioner households. Single male households of all types face an increase in incidence slightly above women pensioner households; and couple households of all types face a higher increase in incidence than single male households.

Figure 12. Combined impact of June Budget 2010 and March Budget 2011 changes in indirect taxes, working age households, with and without children, by sex and number of earners: change in cash amount paid by households and percentage points change in incidence on household income

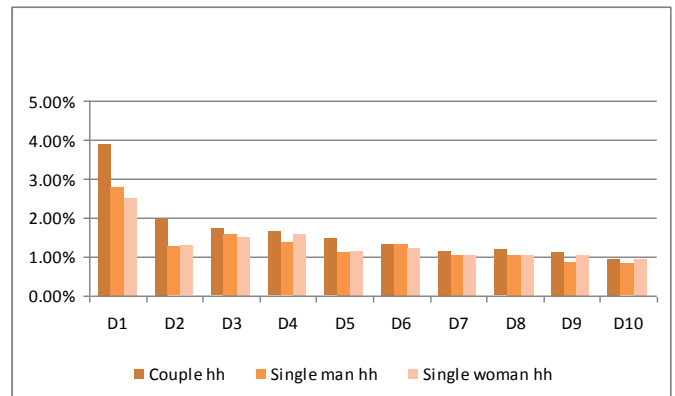
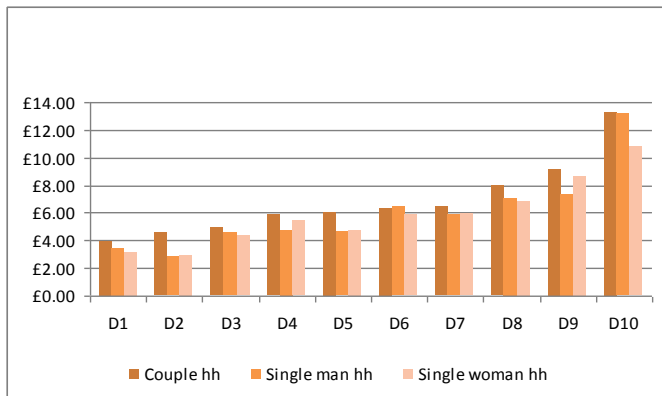


Source: authors' calculations based on Expenditure and Food Survey 2005-2006

Figure 12 shows households by the sex and number of earners, and the presence of children. The increase in total indirect tax paid varies between just over £3 for no earner households with children, of which just under £3 is due to the VAT rise alone; and just over £8, for two earner couples without children, of which more £7 is due to the VAT rise alone. However, change in incidence has the opposite pattern: the increase in incidence on household income is highest for no earner households with children; and lowest for two earner households without children. It is somewhat higher for single women earners than for single men earners.

The impact by household decile and household composition is shown in Figure 13. In cash terms, the richer households pay more than the poorer households, but the increase in incidence is highest for the poorest groups.

Figure 13: Combined impact of June Budget 2010 and March Budget 2011 changes in indirect taxes, by household decile and household composition: change in cash amount paid by households and percentage points change in incidence on household income



Source: authors' calculations based on Expenditure and Food Survey 2005-2006

Single women households in the lower deciles do not face larger cash increases in their total indirect tax bill or a higher increase in incidence on their income, than single men. Here we do see a difference between the impact of the combined changes in indirect tax and the changes in VAT alone. This difference is mostly due to the greater fuel and alcohol consumption of men. Men in the lower deciles could reduce their tax payments by reducing their consumption of fuel and alcohol. Women in the lower deciles might find it harder to reduce their indirect tax payments because VAT is levied at the standard rate on so many goods and services that are essentials.

Conclusion

This report has looked at how the coalition government's indirect tax measures impact on households with different gendered characteristics. Our analysis, by showing the variation in the impact of indirect taxes in terms of both cash (which reveals the sources of extra revenue) and incidence (which reveals the proportionate impact on household income) illustrates the kind of gendered quantitative analysis that policy-makers can do, even given the limitations of existing data sets and models. The variation is driven by the different expenditure patterns of different types of household. These do not just arise from age and children. Households comprising of single adult men and single adult women with the same characteristics with respect to age and children have different expenditure patterns.

The increases in excises on alcohol and tobacco may discourage the consumption of these goods but, at the same time, squeezes the incomes of households which do not reduce their consumption. Although this study could not take account of behavioural responses to such tax rises, it would be useful to analyse how different types of households respond to increases in the price of alcohol and tobacco, especially because some of the most financially vulnerable households face the largest increases in the incidence of these taxes. These are male pensioner, and no earner households without children, when it comes to alcohol; and lone parents, and no earner households with children, for tobacco. Where there is more than one person in the household it is important to find out the impact of such tax increases on the resources available to others in the household.

We show that decreasing fuel duty directly benefits single men and households with male earners more than other households. It benefits pensioner households the least. Such a giveaway of potential revenues from fuel duty should be questioned, given that they could have been used to moderate the much more significant and highly regressive

increase in the standard VAT rate, which among lower income households penalises single women more than single men. Effectively the government's overall indirect tax changes require poor women single households to subsidise the fuel consumption of richer men single households; poor pensioner households to subsidise the fuel consumption of working age households. This casts doubts on claims of budget fairness.

Our analysis shows that rise in VAT has a bigger impact than any of the other tax changes. Its incidence is particularly high on women lone parents, and among single adult households without children, it is higher on women than men. It also has higher incidence on households without a male earner, particularly those with children. Among the lower deciles its incidence is higher on female single households than on male single households.

It seems that considerations of gender equality (or indeed any other form of equality) were not given much weight in the formulation of the indirect tax changes in the June 2010 and March 2011 budgets. We call upon the government to raise revenues in future in fairer ways that do not have the unequal impacts of the rise in VAT; and not to make populist tax cuts that give more money to better-off men but do nothing to help the very poorest in society, the majority of whom are women.

Appendix A: Data and Methodology

The main data set we use is the Office of National Statistics *Expenditure and Food Survey* (EFS), which records detailed expenditure on goods and services and aims to be representative of UK households. It covers about 7,000 households in the United Kingdom each year.¹⁴ We have used the data available at the end of 2007, which was collected at the end of 2005 and in the first months of 2006.

To calculate the impact of the changes in indirect taxes made in the June 2010 and March 2011 Budgets, we have uprated all expenditure by the monthly all-items Retail Price Index to January 2011, the latest index available at the time of the analysis. In order to compare the effect of tax changes occurring at different dates in 2010/11, we have used January 2011 prices throughout, estimating all changes as though they happened overnight in that month with rates as announced.

VAT is charged at a standard, reduced or zero rate; and some goods and services are exempt altogether. We treat exempt goods as if they were zero rated, even though VAT is not levied nor refunded on them. This means we apply a zero rate to exempt goods and ignore the VAT which may have been passed on in the production process.

Excise duties offered us a few challenges because from expenditure data, we know only total amounts spent on each good not prices or quantities purchased. Most excise duties are specific or unit taxes, that is, they are levied *per unit* purchased. Some goods namely filter cigarettes; also have an *ad valorem* tax, which is a percentage of the market price¹⁵. Because not all retail prices were available, we used excise duty rates on typical items to estimate an average retail price, and hence the number of units purchased by each household. The estimation of excise duty tax per category of goods per household proceeded as follows.

(i) estimating an average retail price

The HMRC annual report¹⁶ publishes the national amounts of each excisable good released for consumption in the UK. By adding up the expenditure of all households in the EFS, and reweighting them by their sampling probability, we estimate what would be the national household expenditure on each good. The ratio of national expenditure divided by national quantity gives an estimate of the average retail price charged per unit.

(ii) comparing the average price obtained in (i) with the retail price when available and computing a correction factor

¹⁴ EFS was introduced in 2001/2 and I brought together and replaced the Family Expenditure Survey and the National Food Survey.

¹⁵ The Chancellor typically announces excise rates either as pence on duty or as both the percentage on duty and corresponding pence on the pre-tax price.

¹⁶ HMCE (2005). 'Annual Report 2004-2005 tables and statistics', London: HM Revenue and Customs. Link: <<http://www.hmrc.gov.uk/about/reports.htm>>.

There are two reasons to expect the prices estimated by (i) to be biased. One is that not all quantities released for consumption are purchased by households. Households only account for 48% of all final demand in the UK¹⁷. On top of this, the reweighted expenditure of households surveyed in the EFS will be smaller than the national expenditure because some types of households, which consume a disproportionately large amount of some of these excisable goods, such as tobacco and alcohol, are excluded. These include people living in student accommodation and prisons, for instance. Given that we can observe the retail price of one good in each category, we can compute the proportional difference between the price estimated by procedure (i) and the observed retail price for that good and apply the same correction factor to all goods within that category whose retail price is not available. Under the assumption that the effect of the two sources of bias is similar for goods within the same category, this should yield a reasonable estimate of retail prices.

(iii) computing the excise duty tax

Using the formula to compute the pre-tax price – $p = (1+v) * (p + d + ap)$, where p is retail price, v is VAT rate, p is pre-tax price, d is specific duty and a is ad valorem rate, we estimate the amount of excise duty tax per household. All duty rates are shown in Table 2 below. However, the EFS expenditure items available do not always provide enough information to indicate which duty rate to apply. For alcohol, we have assumed spirits have an average alcohol by volume (ABV) of 40 percent, a beer has an ABV of 4 percent, alcopops based on spirits have an ABV of 15 percent and those based on beer an ABV of less than 5 percent. When the good in the EFS could fall under two different duty rates, we have computed a weighted average of the relevant duty tax, using the relative amounts released for consumption nationally as weights. If data on the national amounts for particular goods were not available either, we used a simple unweighted average.

Appendix B

The main indirect tax changes announced in each Budget are shown in Table 2 below. We analyse all changes in these taxes that were implemented by April 2011 (including those changes previously announced but confirmed in these Budgets).

The most significant announcements in the two budgets were that the Chancellor would (with month of effect):

June 2010 emergency budget:

- Increase standard rate of VAT from 17.5% to 20% (January 2011)
- Increase Insurance Premium Tax (IPT) standard rate from 5 to 6% , and higher rate from 17.5% to 20% (January 2011)
- Retain Labour fuel duty escalator (increase in October 2010 and January 2011)
- Align rise in cider duty to rise in other alcohol duties (June 2010)
- Keep increase in air passenger duty announced by Labour (November 2010)

¹⁷ Mahajan, S. (2006). 'United Kingdom Input-Output Analyses', London: Office for National Statistics.

March 2011 budget:

- Keep VAT and IPT rates at January 2011 levels
- Increase alcohol duties by more than RPI (March 2011)
- Increase tobacco duties by more than RPI and change the way cigarettes duties are calculated (greater emphasis on per unit rate and reduced ad valorem rate) (March 2011)
- Freeze air passenger duty rates until the system is reformed in April 2012
- Cancel Labour's fuel escalator and reduce all main road fuel duty rates by 1p (and proportionally for reduced rates) (March 2011)
-

Table 2: indirect tax changes confirmed and announced between June 2010 and March 2011

		Budget March 2010	Coalition June 2010 - Feb 2011	Budget March 2011
VAT and Insurance Premium Tax (IPT)				
Standard VAT	% of retail price	17.5%	20%	20%
Reduced VAT	% of retail price	5%	5%	5%
Standard IPT	% of retail price	17.5%	20%	20%
Reduced IPT	% of retail price	5%	6%	6%
Alcohol duty				
Spirits	£ per ltr of alcohol	23.8	23.8	25.52
Spirit-based RTD	£ per ltr of alcohol	23.8	23.8	25.52
Wine and made-wine >22%abv	£ per ltr of alcohol	23.8	23.8	25.52
Beer (<22% abv)	£ per hltr per % of alcohol in beer	17.32	17.32	18.57
Still cider and perry 1.2 -7.5% abv	£ per hltr of product	36.01	33.46	35.87
Still cider and perry 7.5 -8.5% abv	£ per hltr of product	54.04	50.22	53.84
Sparkling cider and perry 1.2 - 5.5% abv	£ per hltr of product	36.01	33.46	35.87
Sparkling cider and perry 5.5 - 8.5% abv	£ per hltr of product	217.83	217.83	233.55
Wine and made-wine 1.2 - 4% abv (coolers)	£ per hltr of product	69.32	69.32	74.32
Wine and made-wine 4 - 5.5% abv (coolers)	£ per hltr of product	95.33	95.33	102.21
Still wine and made-wine 5.5 - 15% abv	£ per hltr of product	225	225	241.23
Wine and made-wine 15 - 22% abv	£ per hltr of product	299.97	299.97	321.61
Sparkling wine and made-wine 5 - 8.5% abv	£ per hltr of product	217.83	217.83	233.55
Sparkling wine and made-wine 8.5 - 15% abv	£ per hltr of product	288.2	288.2	308.99
Tobacco duty				
Cigarettes	% of retail price	24%	24%	16.5%
	£ per 1000	119.03	119.03	154.95

	cigarettes			
Cigars	£ per kg	180.28	180.28	193.29
Hand-rolling tobacco	£ per kg	129.59	129.59	151.90
Other smoking and chewing tobacco	£ per kg	79.26	79.26	84.98
Hydrocarbon fuels duty				
Unleaded petrol	£ per ltr	0.5719	0.5895	0.5795
Diesel	£ per ltr	0.5719	0.5895	0.5795
Leaded petrol (light oil)	£ per ltr	0.6691	0.6867	0.6767
Aviation gasoline	£ per ltr	0.3835	0.3835	0.3770
Biodiesel	£ per ltr	0.5719	0.5895	0.5795
Bioethanol	£ per ltr	0.5719	0.5895	0.5795
Road fuel natural gas (NG)	£ per kg	0.236	0.2615	0.2470
Other road fuel gas (LPG)	£ per kg	0.3053	0.3304	0.3161
Rebated fuel oil	£ per ltr	0.1055	0.1088	0.1070
Rebated gas oil	£ per ltr	0.1099	0.1133	0.1114
Air passengers duty				
Standard rate Band A (<2000 miles)	£ per passenger	22	24	24
Standard rate Band B (2001-4000 miles)	£ per passenger	90	120	120
Standard rate Band C (4001 - 6000 miles)	£ per passenger	100	150	150
Standard rate Band D (>6000 miles)	£ per passenger	110	170	170
Reduced rate each band	£ per passenger	50%	50%	50%
Gambling duty				
Lottery	% of ticket value	12%	12%	12%
General betting	% of net receipts	15%	15%	15%
General betting - sports spread bets	% of net receipts	10%	10%	10%
General betting - financial spread bets	% of net receipts	3%	3%	3%
Bingo	% of net receipts	20%	20%	20%
Remote gaming	% of net receipts	15%	15%	15%
Pool betting	% of net receipts	15%	15%	15%

Source: HM Revenue and Customs and HM Treasury, *Overview of Tax Legislation and Rates*, Annex B, March 2011