Chapter 3

The effectiveness of reduced VAT rates as a redistributional tool

This chapter uses the micro-simulation models developed in Chapter 2 to investigate how effective reduced value-added tax (VAT) rates are at supporting poor households. The micro-simulation models are used to estimate the tax expenditures received by different households from different reduced VAT rates by simulating the revenue effects of removing these concessions. The results show that most, if not all, of the reduced VAT rates that are introduced for the distinct purpose of supporting the poor – such as reduced rates on food, water supply and energy products – do have the desired progressive effect. However, despite this progressive effect, these reduced VAT rates are still shown to be a very poor tool for targeting support to poor households: at best, rich households benefit vastly more in aggregate terms than poor households. Furthermore, reduced rates on books, restaurant food and hotel accommodation – often provide so large a benefit to rich households that the reduced VAT rate actually has a regressive effect. These results suggest the need for a careful, case-by-case reassessment of the relative merits of various reduced VAT rates in many countries.

3.1. Introduction

This chapter uses the models developed in Chapter 2 to investigate how effective reduced VAT rates are at supporting poor households. Chapter 2 highlighted that reduced VAT rates have had a small progressive effect on average VAT burdens, reducing the VAT burden on the poor to a greater extent than the rich, whether measured on an income or expenditure basis. However, reduced rates can be expected to be a relatively blunt instrument with which to target the poor. As eligibility for the concessional rate is based solely on the decision to consume the particular item subject to the reduced rate, rich households can be expected to benefit to some extent from reduced rates as well as poor households.

To the extent that reduced rates are targeted at consumption items that make up a greater proportion of the expenditure of poor households than rich households (e.g. inferior goods), reduced rates can be expected to have a progressive effect in that they give a greater relative tax reduction to the poor than to the rich. However, because richer households consume more in aggregate terms than poorer households, rich households can still be expected to gain more in aggregate terms from a reduced VAT rate (though still less in relative terms). Furthermore, if a reduced rate is provided for goods or services that the rich consume proportionately more of than the poor then that reduced VAT rate will actually have a regressive effect. In practice, the size of the tax reduction from a reduced VAT rate will depend on the actual consumption patterns of households – which are of course captured in the HBS data.

Simulation results show that, depending on the particular product subject to the reduced rate, all of the above possibilities can be true: The results show that most, if not all, of the reduced rates that are introduced for the distinct purpose of supporting the poor – such as reduced rates on food, water supply and energy products – do have the desired progressive effect. However, despite this progressive effect, these reduced VAT rates are still shown to be a very poor tool for targeting support to poor households: at best, rich households receive as much aggregate benefit from a reduced VAT rate as do poor households; at worst, rich households benefit vastly more in aggregate terms than poor households. Furthermore, reduced rates introduced to address social, cultural and other non-distributional goals – such as reduced rates on books, restaurant food and hotel accommodation – often provide so large a benefit to rich households that the reduced VAT rate actually has a regressive effect (benefiting the rich more both in aggregate terms and as a proportion of expenditure). These results suggest, at the very least, the need for a careful, case-by-case reassessment of the relative merits of various reduced VAT rates in many countries.

The chapter proceeds as follows: Section 3.2 briefly outlines the simulation methodology. Section 3.3 then presents the simulation results, first for all reduced VAT rates combined, and then individually (grouped according to the policy rationale for their introduction). Section 3.4 provides some concluding comments.

3.2. Methodology

To investigate the distributional impact of reduced VAT rates, we use the microsimulation models described in Chapter 2 to simulate the imposition of the standard VAT rate on all items currently subject to reduced, super-reduced, or zero VAT rates (referred to jointly as "reduced rates"). We then calculate the monetary difference between this simulated VAT revenue and the actual VAT collected from each household for each expenditure item.¹ This amount is referred to as the "tax expenditure" arising from the particular reduced rate. Effectively, the standard VAT rate in each country is being used as the benchmark against which to calculate the size of the tax expenditure.

The underlying assumption made with this simulation is that if the standard rate were imposed there would be no alteration in households' consumption bundles (i.e. no behavioural response). While this would be an unreasonable assumption to make for an increase in the VAT rate on one particular item due to the ability to shift consumption towards relatively cheaper substitutes, where VAT rates are increased across the board it is likely that tax-induced shifts will be smaller (IHS, 2011). Nevertheless, as there would still likely be some behavioural response to the removal of reduced rates, the results presented below are likely to overestimate to a small extent the size of the actual tax expenditure.

While we treat exemptions as zero rates in the modelling, we do not present results for the tax expenditures derived from exemptions in this report. This is due to the added complexity associated with the likely presence of some tax embedded in the production/ supply chain (due to the inability to claim input tax credits for exempt goods). As a result, any modelling would underestimate the amount of tax currently collected from exempt goods, thereby further overstating any estimate of the size of the tax expenditure.

3.3. Simulation results

We first consider the overall effect of all reduced VAT rates before then considering specific reduced rates in three groups defined by policy intent:

- Reduced rates on consumption items typically introduced in order to provide support to poor households. This includes: food; children's clothing and shoes; pharmaceutical products; energy products; and water supply.
- Reduced rates introduced to support cultural activities and social goods. This includes: books; newspapers and magazines; cinema, theatre and concerts; and museums and zoos.
- Reduced rates introduced to support other non-distributional and non-cultural/social goals. This group includes: hotel and other accommodation; food in restaurants; food in cafes and bars; and international air transport.

Simple averages of the tax expenditure results across all countries are presented in the main text, with the detailed country-specific results presented in Annex B.

All reduced rates

Figure 3.1 summarises the tax expenditure results for all reduced VAT rates: solid bars present the all-country simple average of the household average tax expenditure across income deciles (left hand panel) and expenditure deciles (right hand panel). The dotted lines present the same results as a percentage of household expenditure. Individual country results are presented in Tables B.1 and B.2 in Annex B. The results cover 17 of the 20 countries included in this study: Chile, Korea and New Zealand are excluded as they do not provide reduced rates.² Note that many of the goods and services typically subject to reduced rates in the countries considered below are instead exempted in Korea. Chapter 4 discusses the VAT system in Korea in further detail.





Considering first the aggregate tax expenditure results, Figure 3.1 shows a clear pattern with higher income/expenditure deciles benefiting from successively larger tax expenditures. This conclusion is supported when looking at the individual country data in Tables B.1 and B.2. In all 18 countries, every decile gains from reduced VAT rates. Furthermore, in all 17 countries, a tax reduction is provided to the top decile households which is significantly larger than the reduction provided to bottom decile households. This difference tends to be greater across expenditure deciles than income deciles. In almost all countries, the top income (expenditure) decile received a tax expenditure that is more than double (triple) what the bottom income (expenditure) decile received. The difference is most explicit in Estonia, where the top income (expenditure) decile receives a tax expenditure that is around six (27) times the tax expenditure gained by the bottom income (expenditure) decile.

While these differences are large, looking at their size relative to household expenditure nevertheless shows that the poor still gain proportionately more than the rich – confirming the result from Chapter 2 that reduced rates do have a progressive effect. This can be clearly seen from the downward sloping lines in Figure 3.1.

Reduced rates generally aimed at supporting the poor

Figure 3.2 presents the same simple averages of tax expenditure results as above, but this time just for the reduced rates on food. Individual country results are presented in Tables B.3 and B.4 in Annex B. Most countries (15 out of the 20 covered in this report) provide a reduced rate for some or all unprepared food products, though the extent varies. For example, Hungary only provides a reduced rate for certain basic food types (bread, dairy, butter). In comparison, Spain provides a super-reduced rate for some basic foods (rice, bread, some dairy, fruits, vegetables), and a reduced rate for others.



Figure 3.2. All-country average of average tax expenditure per household from reduced rates on food

Figure 3.2 shows a similar pattern to Figure 3.1, though with the (all-country average) aggregate tax expenditure not increasing as substantially as before. Tables B.3 and B.4 confirm this: in every country a larger tax expenditure is provided to higher income and higher expenditure households – though the difference is not as marked as was the case for all reduced rates. As before, the difference tends to be greater across expenditure deciles than across income deciles. The largest differences are in Germany and Slovenia (where both the top income and expenditure deciles receive a tax expenditure around twice the size received by the bottom deciles). Looking at the relative size of the tax expenditures we see that the poor gain considerably more than the rich as a proportion of expenditure.

Overall, given the significant tax expenditure provided across the entire income/ expenditure distributions, reduced rates for food are clearly not well targeted at poor households. However, they still have a progressive effect. Furthermore, comparing these results with the results for all reduced rates, it is clear that reduced rates on food are a key part of most multi-rate VAT systems as they tend to provide the majority of support received by low-income and low-spending households. They are also clearly less poorly targeted than many other reduced rates given the smaller increases in the tax expenditure provided to higher income and higher spending households.

A similar pattern emerges for pharmaceuticals, as shown in Figure 3.3 (and Tables B.5 and B.6 in Annex B). There are also 15 countries that provide reduced rates for pharmaceutical products. Higher income and expenditure deciles tend to gain more than lower deciles. Once again, this is more pronounced across expenditure deciles than income deciles. For example, the tax expenditure received by the top income (expenditure) decile in the United Kingdom is more than three (eight) times that gained by the bottom decile. However, as a proportion of expenditure, the reduced rates on pharmaceuticals still tend to benefit lower rather than higher income/expenditure households. That said, in several countries, including Estonia, Hungary, the Netherlands, Poland and the United Kingdom, middle income/expenditure households tend to benefit the most proportionately. This can be seen in the all-country averages in Figure 3.3, where the proportionate tax expenditure peaks at the third income decile, and roughly between the second and fifth expenditure decile.



Figure 3.3. All-country average of average tax expenditure per household from reduced rates on pharmaceuticals

Figure 3.4 (and Tables B.7 and B.8 in Annex B) present the tax expenditure results for reduced rates on children's clothing and children's shoes. Five countries have reduced rates for both children's clothing and children's shoes: Ireland, Luxembourg, Poland, Turkey, and the United Kingdom.

Figure 3.4 suggests a relatively proportional result for children's clothing and shoes. However, these averages mask considerable variation across the five countries. In Luxembourg, the aggregate tax expenditure is greater for low than high income households, and only moderately greater for high than low expenditure households. However, for Ireland the tax expenditure is vastly larger for high income/ expenditure households than low income/ expenditure households. The differences are so substantial that the reduced rate actually has a regressive effect – that is, the tax expenditure measured as a proportion of household



Figure 3.4. All-country average of average tax expenditure per household from reduced rates on children's clothing and shoes

expenditure increases across both income and expenditure distributions. The other three countries are within those extremes, though with the difference always greater across expenditure deciles than income deciles. Proportionately, the tax expenditures in these three countries are either roughly proportional of fall across the income and expenditure distributions.

Figures 3.5 and 3.6 (and Tables B.9-B.12 in Annex B) present results for energy products. The only two energy products for which more than three countries provide reduced rates are natural gas (Greece, Luxembourg, Italy and the United Kingdom) and electricity (Greece, Luxembourg, Ireland, Italy and the United Kingdom). A similar pattern to food and pharmaceuticals arises here, with higher income/expenditure deciles benefiting from larger tax expenditures than lower income/expenditure deciles. Proportionately, though, the poor still benefit to a greater extent than the rich, with this being more the case for electricity than for natural gas (as the respective gradients of the dotted lines in Figures 3.5 and 3.6 illustrate).

Figure 3.5. All-country average of average tax expenditure per household from reduced rates on natural gas



Figure 3.6. All-country average of average tax expenditure per household from reduced rates on electricity



In contrast, the aggregate tax reduction from the reduced VAT rate on water supply (Figure 3.7 and Tables B.13 and B.14 in Annex B) is relatively evenly distributed across the income/expenditure distributions in most of the nine countries providing reduced rates. Unsurprisingly then, as a proportion of expenditure, the reduced rate on water supply strongly favours low income/expenditure deciles.³



Figure 3.7. All-country average of average tax expenditure per household from reduced rates on water supply

Reduced rates generally aimed at supporting cultural activities and social goods

Other reduced VAT rates are not necessarily introduced specifically to support poor households. For example, a number of reduced rates are aimed at supporting cultural activities and social goods. However, these concessions may still have a significant impact on the income (and expenditure) distribution if they favour some groups over others. In order to develop coherent economic policy, it is important to be able to quantify the distributional effects of such concessions so that the impact on distributional goals can be weighed against the merits of supporting such cultural objectives or encouraging consumption of social goods.

Figures 3.8-3.11 (and Tables B.15-B.22 in Annex B) present results for the four most common HBS categories of expenditure that are supported for broader social and cultural reasons: books; newspapers and periodicals; cinema, theatre and concerts; and museums and zoos. Reduced rates are present for these consumption categories in 17, 16, 10 and 8 countries, respectively, of the 20 countries covered in this study.

There is a very consistent theme with these reduced rates across all countries. While the absolute magnitudes of the tax expenditures are greatest for books, and for newspapers and periodicals, the aggregate tax expenditures increase substantially as income/expenditure increases for each expenditure category in each country. The tax expenditure received by the top income/expenditure decile is at the very least double that received by the bottom decile, and in most cases substantially more. For example, in Estonia, the reduced rate on books provides 19 times the tax expenditure to top income decile households as it provides to bottom income decile households. Across expenditure deciles the difference is even starker as the lowest spending households in Estonia spend

almost nothing on books. Focusing on the top three income/expenditure deciles, these households receive 69% and 82%, respectively, of the total tax expenditure provided in Estonia by the reduced rate on books. Similarly, in Greece, the reduced rate on newspapers and periodicals provides nine (22) times the tax expenditure to top income (expenditure) decile households as it provides to bottom decile households. The top three income/ expenditure deciles receive 56% and 60%, respectively, of the total tax expenditure from the reduced rate on newspapers and periodicals.

These aggregate results are so strong that the tax expenditures also tend to favour high income/expenditure households as a proportion of expenditure. For virtually all countries the reduced rates are regressive for books; cinema, theatre and concerts; and museums and zoos. (The exceptions being Luxembourg for books and the Netherlands for museums and zoos – where the reduced rates have a roughly proportional effect).

Figure 3.8. All-country average of average tax expenditure per household from reduced rates on books



Figure 3.9. All-country average of average tax expenditure per household from reduced rates on newspapers and periodicals



The proportional results for the reduced rate on newspapers are more mixed, as highlighted by the comparatively flat lines in Figure 3.9. In the majority of countries the reduced rate still has a clearly regressive impact. However, it has a progressive effect in the Czech Republic and Ireland, and a roughly proportional effect in Austria. Meanwhile, households in the lower-to-middle part of the income/expenditure distributions tend to benefit most in Estonia, Slovenia and the United Kingdom.



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Expenditure deciles

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Income deciles

Figure 3.10. All-country average of average tax expenditure per household from reduced rates on cinema, theatre, concerts





Reduced rates introduced for non-distributional, non-cultural purposes

Many more expenditure items are subject to reduced VAT rates, with varying policy rationales (e.g. to support industries with predominantly low-skilled workers).⁴ For example, reduced rates are often applied to expenditure in restaurants, bars and cafés (normally just food), on hotel accommodation, and for transport services. Again, it is

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important to be able to quantify the distributional effects of such concessions in order to accurately weigh the benefits and costs of the concessions.

Figures 3.12-3.14 (and Tables B.23-B.28 in Annex B) present the results for reduced rates on expenditure in restaurants (food only, with the exception of Italy, Luxembourg and Spain who also apply a reduced rate to alcohol); in bars and cafés (food only, except Italy, Luxembourg and Spain); and on hotel and other accommodation services. Reduced rates are present for these consumption categories in 11, 10 and 14 countries, respectively, of the 20 countries covered in this study.

Once again, these reduced rates all provide substantially greater tax expenditures for high-income/expenditure households than for low-income/expenditure households. For restaurants and hotels, in particular, the difference is often vast as rich households spend far more money on restaurants and hotels than poor households. At the extreme, 82% and 88%, respectively, of the total tax expenditure from the reduced rate on restaurant food in Poland goes to the top three income and expenditure deciles. Similarly, in Estonia and Turkey over 80% of the total tax expenditure from the reduced rate on hotel and other accommodation goes to the top three income and expenditure deciles.

Unsurprisingly, as a proportion of expenditure, the results also favour high income/ expenditure households. For all countries, the reduced rates on restaurant food and hotel and other accommodation are strongly regressive. The more proportional result illustrated in Figure 3.13 for the reduced rate on cafes and bars hides a slightly mixed picture. While most countries do show either a roughly proportional pattern or one that slightly favours middle income/expenditure deciles, some countries exhibit regressive (e.g. Poland) or progressive (e.g. Turkey, across expenditure deciles) patterns.

In comparison with the cultural and social activities (e.g. books) that also exhibit a regressive pattern, the absolute magnitude of the tax expenditures received by the rich are significantly greater for restaurant food and for hotels and other accommodation services. This is particularly the case for restaurant food, where the average tax expenditure is EUR 136 for the top income decile and EUR 161 for the top expenditure decile. In contrast, the average tax expenditure for the bottom income decile is just EUR 25 and EUR 10 for the bottom expenditure decile.



Figure 3.12. All-country average of average tax expenditure per household from reduced rates on restaurant food



Figure 3.13. All-country average of average tax expenditure per household from reduced rates on cafes, bars, and the like

Figure 3.14. All-country average of average tax expenditure per household from reduced rates on hotels and other accommodation services



The final results presented are for air transport. 10 countries provide a reduced rate for domestic air transport, while all 20 countries covered in this report provide a zero rate for international air transport. Unfortunately, expenditure data distinguishing between domestic and international air travel is only available for two countries, New Zealand and the United Kingdom. Consequently we present results in two parts.

First, in Figure 3.15 (and Tables B.29 and B.30) we present results for air transport generally. This involves modelling all expenditure reported in the HBS data as being subject to the reduced rate legally applied to domestic air transport (with the exception of the United Kingdom where we only model domestic air travel expenditure). While accurately modelling the tax expenditure on the domestic component of air transport expenditure, this will clearly underestimate the tax expenditure on international air transportation. Second, to capture a better picture of the tax expenditure on international air transport, we report separately the tax expenditure results for international air transport for New Zealand and the United Kingdom.

The results in Figure 3.15. show a clear regressive trend, with higher income/expenditure households benefiting substantially more in aggregate terms, and as a proportion of expenditure, than low income/expenditure households. Indeeed, in every country except Luxembourg, the bottom income and expenditure deciles receive virtually no benefit from the reduced rates on air transport.



Figure 3.15. All-country average of average tax expenditure per household from reduced rate on air travel

Figure 3.16 presents the results for international air transport for New Zealand, while figure 3.17 presents the same results for the United Kingdom. (The same results are reproduced in tabular form in Tables B.31 and B.32).⁵ In both countries there is a similarly regressive effect to that shown in Figure 3.15. This is particularly the case across expenditure deciles in the United Kingdom.

For conciseness, the analysis in this section has not covered every single reduced rate available in the 20 countries covered in the report. For example, reduced rates are often also provided for mass transport services by road or rail. These tend to provide a relatively even level of benefit across the income and expenditure distributions, and have a progressive impact when considered as a proportion of expenditure. Similarly a few countries provide reduced rates for expenditure in canteens. In some countries (e.g. Austria) the tax benefit is relatively similar across the income/expenditure distributions suggesting canteen food may be an inferior good in Austria, whereas in Greece, Spain and Slovenia the tax benefit gained is similar to that for restaurants. Countries also provide reduced rates for various other consumption items, including pets and vets, hairdressing, refuse and waste collection, gardens and plants, and sporting and recreational services. These generally involve small amounts of expenditure and/or are only present in a small number of countries.



Figure 3.16. Average tax expenditure per household from zero rate on international air travel: New Zealand

Note: It was not possible to report the tax expenditure as a percentage of expenditure across income deciles.





3.4. Summary and conclusions

This chapter has examined the effectiveness of reduced VAT rates as a redistributional tool. The analysis has been based on average tax expenditure estimates for reduced rates on different goods and services in 17 OECD countries. Tax expenditure estimates were derived by simulating the removal of all reduced VAT rates using the consumption tax micro-simulation models described in Chapter 2.

The simulation results tend to vary depending on the underlying policy rationale for introducing the reduced VAT rate. They show that most, if not all, of the reduced VAT rates that are introduced for the distinct purpose of supporting the poor – such as reduced rates on food, water supply and energy products – do have the desired progressive effect. For example, reduced rates for food provide significantly greater support to the poor than the rich, as a proportion of expenditure, in all 15 countries where they are applied. However, despite this progressive effect, these reduced VAT rates are still shown to be a very poor tool for targeting support to poor households: at best, rich households receive as much aggregate benefit from a reduced VAT rate as do poor households; at worst, rich households benefit vastly more in aggregate terms than poor households.

Furthermore, reduced VAT rates introduced to address social, cultural and other nondistributional goals often provide so large a benefit to rich households that the reduced rate actually has a regressive effect – benefiting the rich more both in aggregate terms and as a proportion of expenditure. For example, reduced rates on hotel accommodation and restaurant food benefit the rich vastly more than the poor, both in aggregate and proportional terms, in all countries in which they are applied. Similar results, but of less absolute magnitude, are also found for reduced rates on books, cinema, theatre and concerts.

Some caution needs to be taken with these results as they do not take account of any behavioural responses to the removal of reduced VAT rates – which may result in some overestimation of the actual tax expenditures. Nevertheless, the results still strongly suggest the need for a careful, case-by-case reassessment of the relative merits of various reduced VAT rates in many countries.

Furthermore, given that redistribution is one of the prime rationales for having reduced VAT rates, the above results also provide support for theoretical arguments for a move towards a single rate VAT system (with its consequent efficiency and compliance cost benefits). These arguments are predicated on the view that targeting can be better achieved through more direct mechanisms such as income-tested cash transfers to lowincome groups. Follow up work to this report will consequently investigate the ability of targeted cash transfers to compensate poor households for the removal of reduced VAT rates.

Notes

- 1. Recall that the VAT rates that have been modelled correspond to the year of the HBS data (most often 2010). Some rates will have changed since this time. For example, in Spain, cinemas, theatres, concerts, and hairdressers were subject to a reduced VAT rate in 2010, but since 2013 have been subject to the standard VAT rate.
- 2. New Zealand does provide a reduced (zero) rate for a very small number of expenditure items, however these are not identifiable in the HBS micro-data with the exception of the zero rate applicable for international air transport. Chile and Korea also provide a zero rate for international air transport. However, international air transport is not identifiable in the HBS data for all other countries (except the United Kingdom), and hence is not modelled for any other country. For consistency, therefore, we do not include this zero rate for New Zealand in the "All reduced rates" tables. However, it is presented separately in Figure 3.16.
- 3. Though not presented here, refuse collection and sewerage collection are also taxed at reduced rates in two countries (Spain and Slovenia), and display only a relatively small increase in the tax reduction at higher income levels.
- 4. Theoretically, applying a reduced VAT rate to services provided by certain low-skill labour intensive industries could increase low-skill employment by boosting demand and wage levels for low-skilled workers and making employment more attractive to them than unemployment. However, empirical evidence in support of such concessions is difficult to find. For example, a recent study by Copenhagen Economics (2007) found reduced VAT rates to have minimal impact on demand for low-skilled workers.

5. This discussion abstracts from a key issue: what country should actually receive the VAT if it were charged on international air travel (e.g. if flying over several countries)? This complexity of this issue appears to be one of the main reasons for the current zero-rating approach.

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