TAX REFORM IN LATVIA:
COULD IT BE FAIR?

Alf Vanags
BICEPS

STOCKHOLM SCHOOL OF ECONOMICS · SSE RIGA

baltic
international
centre for
economic
policy
studies

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Executive summary

The recently published guidelines for the medium term development of Latvia's tax system (Nodokļu un nodevu sistēmas attīstības pamatnostādņes 2011-2015" have for the first time introduced social fairness (socialais taisnīgums) as an explicit goal of Latvian tax policy. Social fairness is further explained in the guidelines as "a more progressive tax system" and a "lower tax burden on lower wage workers and a higher tax burden on exclusive properties". The challenge for policy-makers is how to realise this goal in combination with the other goals, in particular the goal of improving the competitiveness of the Latvian economy. The aim of this paper is to operationalise the concept of fairness of a tax system by developing quantitative indicators of tax fairness. We take 'progressivity' of a tax or a tax system to be the fundamental indicator of fairness, where progressivity means that the tax liability of higher income groups is higher than their share of income and that the tax liability of poorer people is less than their share of income. This approach leads naturally to the use of the Kakwani index (developed by Kakwani (1976)) which provides a summary measure of the progressivity of a tax or a set of taxes defined in this way. A positive value of the Kakwani index indicates that a tax is progressive and a negative one that it is regressive and a zero value indicates that the share of tax liabilities of different income groups is exactly proportional to their share of income. This methodology is applied to Latvian experience in three ways: i) the recent changes in taxes between 2006 and 2010, ii) the proposals made in the government guidelines – removing the current reduced rate of VAT, 1.5% real estate tax, 21% income tax rate and 95LVL untaxed personal allowance, iii) as a comparator we consider the introduction of a 10% reduced rate of VAT on food. The main results are as follows:

- direct taxes are overall progressive but indirect taxes are overall regressive;
- the overall tax system is mildly progressive;
- international comparisons suggest that the Latvian tax system is towards the less progressive end of the spectrum;
- the tax measures implemented since 2006 have overall been regressive;
- the measures proposed in the guidelines are overall marginally regressive, especially removing the reduced rate of VAT and reducing the income tax rate to 21%;
- increasing the untaxed income allowance and introducing a higher property tax are both progressive;
- a reduced (10%) rate of VAT on food is quite strongly progressive even if it is used to substitute for the current reduced rate regime.

The revenue impact of the various tax changes suggests that the removal of the reduced rate of VAT and the extension of the property tax would result in more revenue but not by enough to compensate for the loss of revenue from the proposed income tax changes. The net effect would be a total tax revenue loss of 3.9% as compared with planned 2010 tax revenues. Thus, the policy paper measures are both regressive overall and would lose revenue. The comparator proposal of a reduced rate of VAT on food is clearly progressive and even if uncompensated by removing the existing reduced rate of VAT would result in an overall loss of 3.3% of planned 2010 revenues.

It is hoped that these results throw a new light on Latvia's tax system and can inform the debate on tax policy in the election campaign and beyond.

1. Introduction

After many years of a rather stable tax system the economic crisis and the consequent intervention of the international lenders has resulted in a number of quite significant changes in the structure and composition of Latvia's tax system. Moreover, further tax changes remain firmly on the policy agenda. At the insistence of the international lenders[1] the government has produced a policy paper on medium term developments in the tax system. The paper was published on 17th June as Finance Ministry (2010) "Nodokļu un nodevu sistēmas attīstības pamatnostādnes 2011-2015" and proposes four political goals for the development of the tax system:

1. Stable budget revenues
2. A stable and predictable tax system
3. Improved competitiveness of the economy
4. Social fairness (sociālais taisnīgums)

The paper also makes some specific proposals which include:

- Abolishing the reduced rate of VAT
- Introducing a tax on residential properties of up to 1.5% of cadastral value
- By steps reduce the rate of income tax to 21% by 2015
- Also by steps increase the untaxed personal income allowance to 95LVL a month by 2015

The medium term approach of the policy paper is a welcome contrast to the experience of the last year and a half when tax changes were often introduced with much haste, with insufficient thought about implications and when the motivation for tax changes was simply to find a quick fix to fill the budget gap.

The fourth goal of 'social fairness', which is further elaborated in the policy paper as "a more progressive tax system" and a "lower tax burden on lower wage workers and a higher tax burden on exclusive properties", represents something of an innovation in Latvian politics. Here again one suspects the hand of the international lenders who have been quite clear on the need to defend the wellbeing of the poorest members of Latvian society in the fiscal consolidation.

However, the government policy paper offers very little to flesh out how more fairness might be characterised in terms of concrete indicators and a major aim of the current paper is to address this gap. The specific goals include the following:

- To define and discuss concepts by which the fairness of taxes can be measured.
- To calculate indictors of fairness for both individual taxes in Latvia (VAT, income tax etc) and for the tax system as a whole.
- To calculate the impact of recent tax changes on fairness indicators.

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[1] According to the 22.02.2010 Supplemental Memorandum of Understanding between Latvia and the EU, Latvia had to "by end-June 2010, in consultation with international organizations and relevant stakeholders, prepare a policy paper on long-term tax reform, taking into account the needed fiscal consolidation and implications for the competitiveness of the Latvian economy" (p 7).

- To estimate the fairness impact of the changes in VAT and other taxes proposed in the government medium term policy paper.
- To estimate the revenue impact of the proposed changes.

The paper is organised as follows. The next section offers a short description of the Latvian tax system in an international context. This is followed by a section which provides i) a basic primer on the mechanics and efficiency of taxes, especially indirect taxes such as VAT and ii) a discussion of the concepts of equity and fairness of taxes and the challenge of reconciling fairness and equity. It is proposed that fairness can measured by progressivity and that a good summary indicator of progressivity is the Kakwani index (proposed by Kakwani (1976)). A fourth section contains the main empirical contribution of the paper and examines a) the progressivity impact the of the recent changes in Latvian taxes and b) the fairness impact of the tax changes proposed in the government policy paper. As a comparator we also consider the effect on fairness of applying a lower rate of VAT on food. This is a policy which has sometimes been used in other countries, e.g. Sweden or Ireland and the UK (in the latter two food is zero-rated), to mitigate the regressivity of VAT. The estimated revenue impact of the alternatives considered is also reported because ideally the fairness implications of alternative tax changes should be considered under the assumption of revenue neutrality.
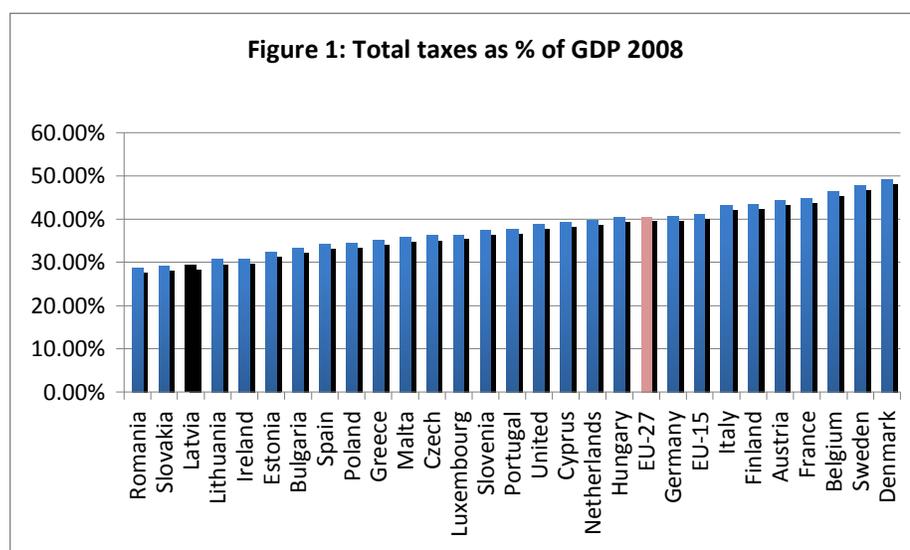
We see this paper as informing the debate on economic policy both for the coming October 2010 election and beyond. Taxes and tax reform should be right there at the top of the political agenda.

2. The international perspective

The following figures illustrate some basic features of the Latvian tax system in an EU context. The following are the main characteristics:

   a) At just over 29% Latvia's total tax burden as a share of GDP was the third lowest in the EU in 2008 (see Figure 1)
   b) For direct taxes as a percentage of GDP Latvia was also in third last place with a share of just over 18% (Figure 2)
   c) Also, in terms of indirect taxes as a whole Latvia was in third last place with a share of just over 11% of GDP (Figure 3)
   d) However, in terms of VAT revenues as a share of total taxes Latvia was much higher up in 10th place (Figure 4).

The last is an interesting indicator – nearly all the countries with a high share of VAT in total taxes are new member states – of the 12 countries with the highest share only two, Portugal and Ireland, are old member states. This suggests that VAT may be particularly important in countries where taxes are difficult to collect. In order to test this idea the share of VAT in total taxes was regressed against GDP per capita adjusted for price levels, where there is a presumption that taxes are generally more difficult to collect in poorer countries, but the VAT is easier to collect than, say, income tax. The results are shown in Figure 5 where a clear and significant negative relationship can be seen between the ranking of countries by GDP per capita and the share of taxes contributed by VAT. In other words the poorer EU countries rely more on VAT for their tax income than do richer countries. This result is in line with what is discussed in Jah (1998) in a worldwide context, that the less developed the economy the higher the fraction of tax revenue generated by indirect taxes. This observation is to a large extent explained by institutional factors. In particular the fact that direct tax instruments such as income taxes are poorly enforceable.
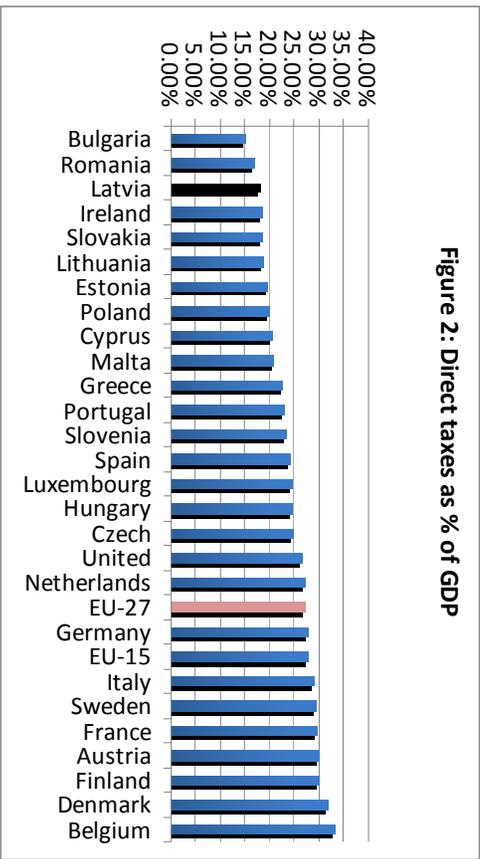

Figure 1: Total taxes as % of GDP 2008

Source: Eurostat

Figure 2: Direct taxes as % of GDP

Source: Eurostat

Bulgaria
Romania
Latvia
Ireland
Slovakia
Lithuania
Estonia
Poland
Cyprus
Malta
Greece
Portugal
Slovenia
Spain
Luxembourg
Hungary
Czech
United
Netherlands
EU-27
Germany
EU-15
Italy
Sweden
France
Austria
Finland
Denmark
Belgium
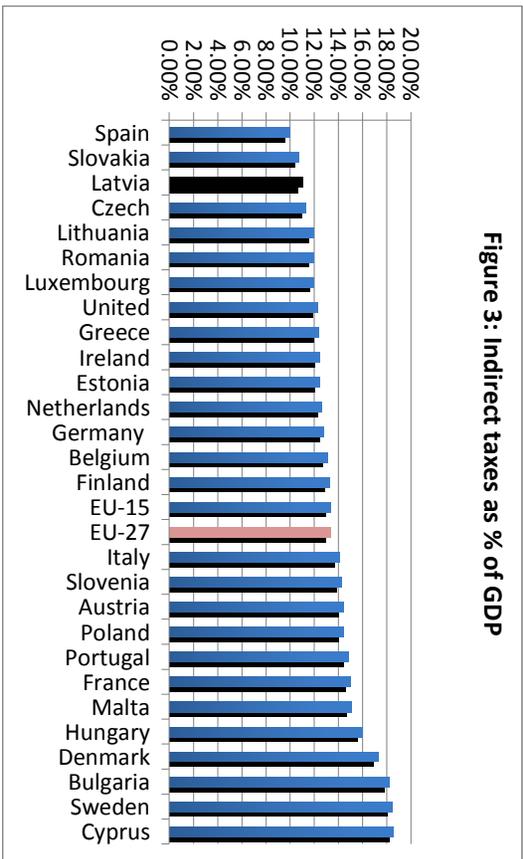
Figure 3: Indirect taxes as % of GDP

Source: Eurostat

Spain
Slovakia
Latvia
Czech
Lithuania
Romania
Luxembourg
United
Greece
Ireland
Estonia
Netherlands
Germany
Belgium
Finland
EU-15
EU-27
Italy
Slovenia
Austria
Poland
Portugal
France
Malta
Hungary
Denmark
Bulgaria
Sweden
Cyprus
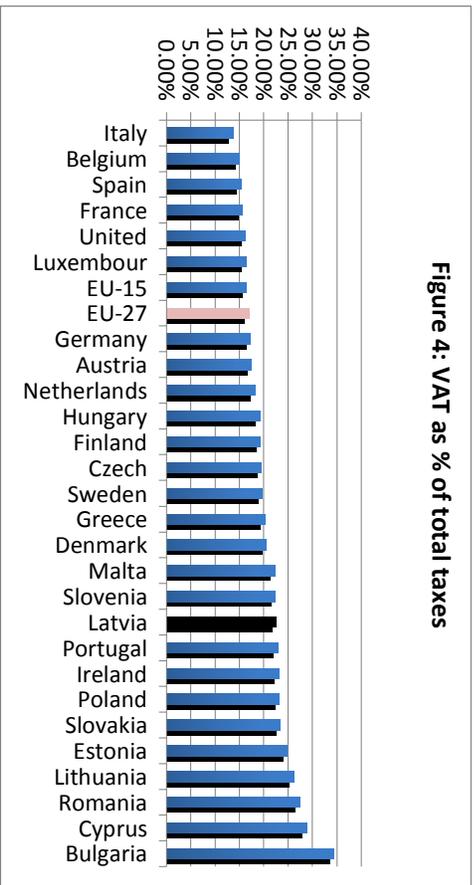
Figure 4: VAT as % of total taxes

Source: Eurostat

Italy
Belgium
Spain
France
United
Luxembour
EU-15
EU-27
Germany
Austria
Netherlands
Hungary
Finland
Czech
Sweden
Greece
Denmark
Malta
Slovenia
Latvia
Portugal
Ireland
Poland
Slovakia
Estonia
Lithuania
Romania
Cyprus
Bulgaria

Figure 5: VAT as % of total taxes to GDP per capita (PPS)

$y = -0.0413\text{Ln}(x) + 0.3087$

$R^2 = 0.5333$
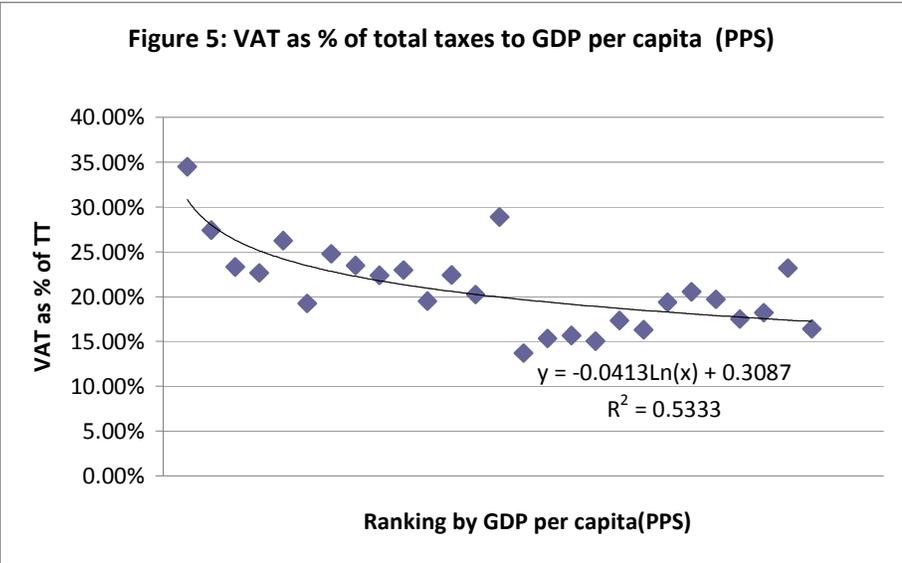
Source: Eurostat and own calculations

3. A short primer on the economics of taxes

Taxes are normally classified into to two broad types:

- *Direct* taxes. These are taxes levied directly on economic agents. The most common types of direct taxes are: personal income tax, social taxes, corporate income tax and property tax

- *Indirect* taxes. These are taxes that are levied on activities at the point of sale of a particular good or service. The most important indirect taxes are: sales taxes of which value added tax is the most important in Europe and excise taxes which are typically levied on goods such as tobacco products, alcoholic products.

Although direct and indirect taxes are collected in different ways, ultimately *all* taxes are paid by people, i.e. by individuals or households, and one of the aims of tax analysis both theoretical and empirical is to assess how this burden is distributed across different groups of people. For example, a corporate income tax levied on companies will ultimately be paid for by people e.g. by workers through lower wages, by customers of the final product or service through higher prices or lower quality or by shareholders through lower dividends. The ultimate 'payer' of a tax may often not be the economic agent on whom the tax is levied. Thus, sales taxes are levied on the seller of a good or service but typically some or all of the tax is passed on to the buyers or consumers of the product. In other words the *incidence* of tax generally deviates from the initial pattern of its imposition.

Taxes are usually imposed in order to raise the revenues needed to finance public goods such as defence or merit goods such as education or health, so the main reason for imposing taxes is the *revenue* motive. Additionally, taxes are sometimes imposed to influence economic behaviour e.g. carbon taxes which are aimed at reducing carbon emissions or congestion taxes aimed at reducing urban congestion. A third reason for imposing taxes may be to explicitly influence income distribution – this is typically one of the motives for applying progressive income tax rates. In general any tax will have an effect both on revenues and on economic behaviour and a good tax system is one that on balance minimises the economic or efficiency costs of achieving the desired goals of tax policy. Of course, there may not be universal agreement on what exactly should be the scope of the state in providing goods and services or of influencing income redistribution and often disagreement on these issues is related to different views on the non-revenue effects of taxes e.g. the effect of income tax on the incentives to work or save.

3.1 The mechanics of an indirect tax[2]

We consider an indirect tax (sales or VAT[3]) levied on sellers of a particular good or service that is provided in a competitive market (where a competitive market is defined as being one where no seller is sufficiently large to influence the market price

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[2] This sub-section may be skipped by the non-technical reader.
[3] In the context of an isolated market with a single stage production process VAT and a sales tax are equivalent. However, if there is a multistage process that involves different agents then a sales tax results in the 'cascading' of taxes which penalises production that involves many independent stages. By contrast VAT is neutral with respect to the number of transactions involved in a process.

of the good). We start by describing the market equilibrium in the absence of a tax. This is illustrated in Figure 6.

Market equilibrium is defined as the price (P*) at which supply and demand coincide (Q*). At a higher price more will be offered than demanded so there would be pressure on prices to fall and at a lower price there would be an excess of demand over the offered supply and we would observe upward pressure on prices. One important property of this equilibrium is that if there are no externalities[4] present then market equilibrium represents an efficient allocation of resources because the marginal willingness to pay by consumers, i.e. the price, just coincides with marginal cost of provision at the equilibrium quantity Q*.

Figure 6: Equilibrium in a competitive market
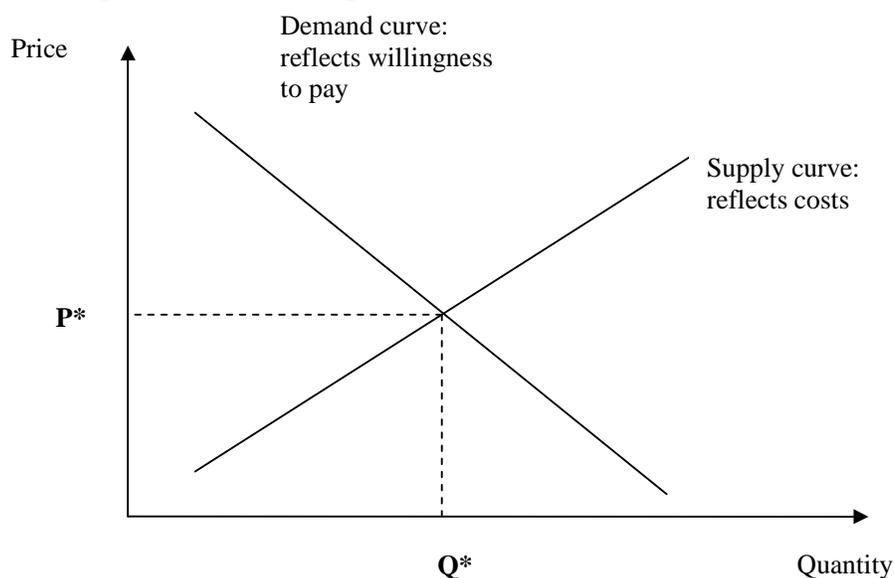
On the other hand if externalities are present then the market equilibrium may represent an inefficient resource allocation e.g. the presence of pollution implies that the social costs of the polluting activity exceed private costs and the optimal scale of the activity is therefore lower than generated by the market. In such a case taxing the activity represents one possible instrument by which the scale of the activity may be reduced to a socially desirable level.

Suppose a tax at rate t per unit sales is imposed[5]. This has several important consequences that are illustrated in Figure 7:

1. The tax drives a wedge between the price paid by consumers, P^C, and the price received by sellers, P^S, with $P^C = P^S + t$. This wedge means that the tax *pass through* of the tax is 100% i.e. the tax is fully passed on. However, in general the tax has the effect that consumers pay a *higher price* but sellers

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[4] Externalities are effects that are not captured in the private costs or benefits of market participant. Classic examples of a production externalities are bees pollinating fruit trees (positive externality from honey production) or downstream pollution of an industrial process using river water (negative externality). Externalities may also be generated by consumption e.g. pollution from private cars.
[5] An *ad avalorem* tax i.e. a tax that is levied as a percentage of the seller's price would have the same effects but is not as convenient to illustrate on the diagram.

receive a *lower price*. The exact distribution between a higher consumer price and a lower price received by suppliers is called the *incidence* of the tax and depends on the relative responsiveness of demand and supply to price changes. Thus, if consumers can easily substitute other products for the taxed one then the demand curve will be rather flat and the increase in P^C will be rather low. On the other hand if the resources used in supply can be easily switched to other uses the supply curve will be flat and the effect on P^S will be relatively small.

2. The equilibrium quantity traded in the market will fall from Q^* to Q^T. The effect on sales also depends on the responsiveness of demand and supply. Thus if there are few or no substitutes for the product demand will be unresponsive and sales will not fall by much. Alternatively, if the employed resources have few alternative uses then supply will be unresponsive and again market sales will not fall by very much.

3. The tax will generate revenues of $t \times Q^T$. Clearly, if sales fall a lot as a consequence of the tax then a given tax rate will generate relatively smaller revenue.

4. The wedge between P^C and P^S means that the marginal willingness of consumers to pay (P^C) now exceeds the marginal cost of supply (P^S) so there is what is called a *deadweight loss* associated with the tax. The deadweight loss represents the cost of misallocated resources induced by the tax and it can be measured in money terms. In Figure 2 this is represented the area a + b. Other things being equal the deadweight loss will be larger the bigger is the reduction in sales induced by the tax.

Figure 7: The impact of an indirect tax
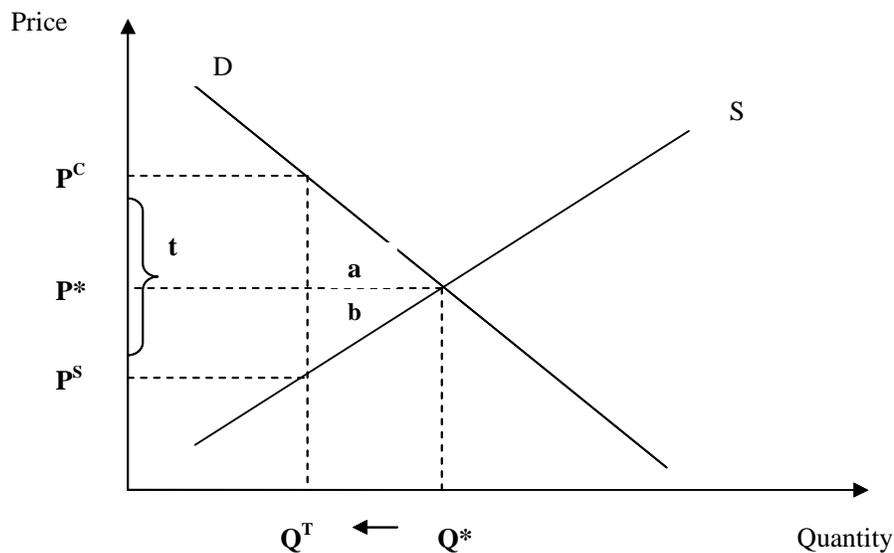
If the market in which the tax is imposed is not competitive in the sense of having a large number of sellers then not all of the tax will be passed on. The opposite of a competitive market is a monopoly. In the case of a monopoly with constant costs and facing a linear demand curve it is easy to show that the monopolist will absorb ½ of the tax and pass on the other ½. For market structures in between monopoly and

competition the degree of pass through will lie somewhere between 50% and 100% depending on the degree of competition.

What is the situation in practice? Hard evidence is somewhat thin on the ground but the studies cited in Blundell (2009) suggest that for "many goods we should expect a full pass on" (p 33) and that pass through is unlikely to be less than 75%.

This broad view is also taken by Copenhagen Economics (2007) who note "there is little doubt that permanently lowering the VAT rate on a particular good (or service) sooner or later will lead to a reduction in the price of the good more or less corresponding to the monetary equivalent of the lower VAT rate. If the VAT rate goes down by 10 percentage points on a good with a before tax price of €100, the price paid by the consumer will sooner or later drop by €10 for the vast majority of products. In economics jargon, there will be a strong tendency towards full pass-through" (p9). Copenhagen Economics also note that the degree of pass through may be different for temporary as compared with permanent changes in the rate and between increases and decreases in rates.

3.2 Efficiency
Since taxes are normally levied on many commodities a classic issue of tax theory is how to characterise the optimal tax structure. The criterion for optimality is normally defined as the minimisation of distortions associated with raising a given level of revenue. Distortions are measured by deadweight losses. So the optimal tax structure is the one that minimises the sum of dead weight losses and gives rise to a rule in which the tax rate on an individual commodity should be set inversely to its price elasticity of demand[6]. The intuition is clear: a commodity with a low price elasticity of demand should carry a relatively high tax rate and one with a high price responsiveness should carry a relatively low tax rate. In this way the deviation or distortion from the no tax equilibrium is minimised.

A tax structure based on these principles has never been anything like fully implemented. As noted by Copenhagen Economics (2007): "even the most ardent believer in efficiency would admit that the practical problems of implementing an efficient VAT system along these lines would be gargantuan. Not only must the tax authority be able to estimate price elasticities for every product on the market (in each member state), it may also have to re-estimate these price elasticities regularly due to changes in preferences and the introduction of new goods on the market that may impact on price elasticities of goods already on the market. In short, the practical problems of implementing an efficient tax system along these lines seem overwhelmingly prohibitive" (p 8).

In practice, it could be argued that high excise taxes on say tobacco or alcohol are at least partially motivated by elasticity arguments.

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[6] The price elasticity of demand measures the % change in quantity sold in response to a % change in price. Thus, if a 10% price rise leads to a 20% fall in sales the price elasticity of demand is said to be (minus) 2. If on the other hand a 10% increase in price led to a 5% fall in sales the elasticity is (minus) 0.5. The second case represents a smaller price elasticity of demand i.e. the responsiveness of sales to price is lower.

3.3 Fairness, equity and the Kakwani index

As discussed in the introductory section of this report, the Latvian government's policy paper explicitly addresses the issue of "fairness". Fairness or equity in relation to taxation has a long history in the economics literature. One of the basic principles of taxation since the publication of Adam Smith's *Wealth of Nations* in 1776, has been the individual's ability to pay, i.e. taxes raised to finance state expenditures should be related to each individual's ability to pay. Taxation according to the ability to pay has since gained more or less unanimous acceptance as an equity norm for tax design[7]. The concept is however too general for concrete policy purposes since application of the ability to pay principle requires, as discussed in Tresch (1981), specifying exactly how much each individual should be asked to contribute.

In addition to the general ability to pay principle, there are two other concepts (or sub-principles) that are typically considered when assessing the fairness of tax system: horizontal and vertical equity, respectively:

- *Horizontal equity* is the property of a tax system that people who are equal should be treated equally in terms of tax burden. Two individuals judged to have equal ability to contribute should be treated equally, i.e. bear the same tax burden.
- *Vertical equity* is the principle that taxpayers with different incomes should pay different amounts of tax – usually that those with a higher income should pay higher taxes, i.e. that the tax liability should depend on the ability to pay.

When discussing VAT and horizontal equity, it is important to emphasize that horizontal equity does not necessarily implies a uniform tax rate. As discussed in, e.g. Atkinson and Stiglitz (1976, 1980), when the elasticity of demand differs between the goods in question, then efficiency considerations (as noted also in the previous sub-section) suggest that the VAT rate should also differ. Only if the price elasticity is the same, then a uniform VAT rate would be optimal. For example, if two individuals are identical in all respects except that one likes chocolate ice cream and the other likes vanilla. A system that taxes chocolate ice creams in the same way as vanilla ice creams might be perceived as horizontally equitable. However, this is only the case if the elasticities of demand are the same for the two types of ice cream. The challenge facing the policy maker is how to reconcile equity and efficiency.

The basic principle of vertical equity is that unequals should pay unequal taxes. Hence, the policy maker has to decide how unequally unequals should be treated. In its general form vertical equity is consistent with a proportional tax burden and even with a regressive tax burden as well as with a progressive one[8]. However, usually, some degree of progressivity is regarded as a desirable feature of a tax system.

To summarize the discussion so far: 'fairness' seems to involve some sort of progressivity, while efficiency (discussed above) suggests that goods with low price elasticities of demand should carry a relatively high tax rate. However, consumption of goods with low price elasticities of demand usually tends to rise only slowly with

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[7] See Musgrave (1959), chapter 5.
[8] If for a given tax the share of tax liabilities of higher income groups is on average higher than their share of income, then a tax is said to be *progressive*. On the other hand, if the share of tax liabilities is on average lower than their share of income, then a tax is said to be regressive and if the share of tax liabilities exactly matches the share of income the tax is proportional.

the income; this means that there is not much (if any) progressivity in such a tax[9]. Hence, the policy maker faces, in many cases, a trade off between efficiency on the one hand, and equity (measured by progressivity) on the other. In the forthcoming discussion we shall consider progressivity at least to some extent to be a desirable property in terms of fairness even though it comes at the expense of efficiency[10].

This approach leaves us with the question: How to measure progressivity? A widely accepted indicator is the Kakwani index (proposed by Kakwani (1976), for its applications see e.g. Aronson *et al* (1994) and Kakwani and Lambert (1998)) which provides a summary indicator that compares the share of the tax liabilities of each income group or recipient with their/its share of income. Thus, if on average, for a given tax, the share of tax liabilities of a higher income group is higher than their share of income then the tax is supposed to be progressive, whereas if it is smaller then it regressive[11]. Since the Latvian government's policy paper explicitly discusses a 'more progressive tax system' as one of the objectives of tax reform the Kakwani index is particularly well suited to analyse the tax changes proposed in the policy paper from the perspective of fairness. Accordingly it will be the key indicator employed in the next section when discussing the fairness of both the current Latvian tax system and of the impact induced by the proposed changes.

To conclude, the search for horizontal and vertical equity starts with the definition of the tax base. The tax base serves as the defining characteristic in order to ensure that two equals pay the same tax and two unequals pay different taxes. In addition vertical equity requires that one determines how unequally unequals should be treated. Although this sounds fairly applicable, it cannot be translated immediately into policy. To formulate a policy, the government's distributional preferences have to be taken into account. Arguably, hitherto, the Latvian government's preferences on the distribution of income or the distribution of the tax burden have not been explicitly stated. Today for the first time 'social fairness' is an explicit goal of tax policy.

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[9] Goods with low price elasticities of demand are usually goods that are essential to everyday life, whereas goods which are not essential or have many substitutes usually have high price elasticities of demand. A good introduction to price elasticities of demand can be found at: http://www.mackinac.org/article.aspx?ID=1247.

[10] Thus many countries have a progressive income tax even though this may result in a less than optimal level of effort.

[11] Formally, the Kakwani index (K) is given by the difference between the concentration index of the tax (C) and the Gini index of gross income (G), i.e. $K = C - G$. If K is positive it indicates progressivity and if negative regressivity and if zero the tax burden is proportional to income.

4. Latvian taxes: analysis and 'experiments'

In this section we use the Kakwani index methodology to a) assess the impact of recent tax changes on the progressivity of the Latvian tax system and b) to conduct an analysis of the effects of the tax changes proposed in the government policy paper, Finance Ministry (2010). We term these analytical exercises 'experiments' since they represent the outcome of a modelling process[12].

In particular we examine the progressivity impact of:

- removing the reduced rate of VAT
- reducing the rate of personal income tax to 21%
- increasing the untaxed income allowance to 95LVL per month
- introducing a 1.5% tax on residential dwellings

In addition we report on:

- the impact of a applying a reduced rate of VAT on food
- the revenue impact of the tax changes examined

4.1 Assessing recent changes in taxes
The main changes in the Latvian tax system since the beginning of 2009 have been the following:

Income tax
- Income tax rate up from 23% to 26%
- Self-employed income tax rate up from 15% to 26%
- Capital gains tax at 15% and dividend tax at 10% introduced for the first time
- From July 1 2009 the personal income tax allowance was reduced from 90LVL to 35LVL per month
- Various tax allowances changed mainly in a downward direction

Value added tax
- Standard rate up from 18% to 21%
- Reduced rate up from 5% to 10%

Other taxes
- Excise taxes have generally been increased
- Property tax has been extended to residential property. However the current burden of this tax is not regarded as heavy and in Finance Ministry (2010) it is proposed to increase the tax rate up to 1.5% so as to generate revenue that is difficult to avoid while at the same time limiting the negative impact on poorer people.

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[12] The analysis does not take any behavioural effects into account i.e. the fact that people are likely to respond to changed taxes by altering their expenditure or work/leisure patterns. Taking behavioural effects into account would require a fully fledged general equilibrium model of the Latvian economy which, alas, is not available. Arguably, the behavioural effects are likely to be of e second order of magnitude as compared with the direct or impact effects.

These tax changes represent an apparent mix of both regressive and progressive changes and here we construct Kakwani indices for each tax and combination of taxes so as to enable quantitative inferences about the impact of the changes on progressivity.

We have used data on the incomes and expenditure of different quintiles in the income distribution[13] to construct a representative household for each quintile in the distribution. For each representative household we impute a gross income and construct tax liabilities for both direct and indirect taxes. This generates the information required to apply the Kakwani approach i.e. we have the share of gross income accruing to each quintile and we can compute the representative tax liability of each quintile for each tax. Thus we can compute the gross income Gini coefficient (which measures the inequality of income) and for each tax or combination of taxes we can calculate the concentration index of tax liabilities, i.e. w shall compare the tax share with the income share, if for low income households the tax share is lower (higher) than the income share, then the tax is progressive (regressive).

The logic of the approach is illustrated in Figures 8 and 9 which show the relationship between income shares and tax liability shares by quintile (where 1 on the horizontal axis indicates the quintile with the lowest share of income and 5 the quintile with the highest share).

Figure 8: Tax share vs income share by quintile VAT (2010 regime)
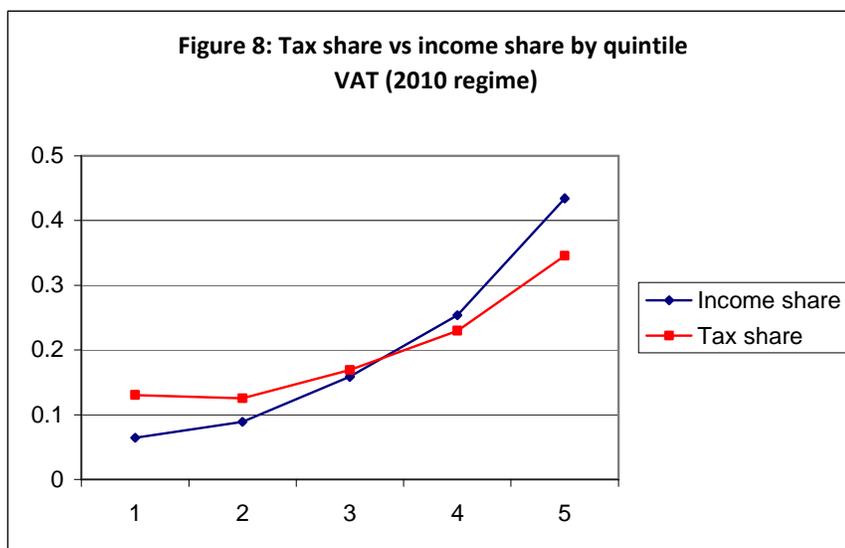
Source: Own calculations

Figure 8 compares tax shares with income shares by quintile for VAT for the 2010 VAT regime. It is easily seen, that the share of VAT paid by the three poorest quintiles exceeds their share of income, whereas the opposite is true for the two richest quintiles. Clearly VAT is a regressive tax. The regressivity of VAT is summed up by its Kakwani index which for the data of Figure 8 has a value of -0.150.

Figure 9 compares the share of income tax paid by quintile with each quintile's share of income. Here we see the opposite – the share of tax paid by the three poorest quintiles is below their share of income. Indeed the two poorest quintiles pay almost no income tax at all. On the other hand, the share of income tax paid by the two

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[13] Supplied by the CSB from Household Budget survey data.

richest quintiles exceeds their share of income. Thus, the richest fifth of the population has 43% of the income but pays nearly 58% of income tax revenues[14]. The Kakwani index that sums up the data of Figure 9 has a value of 0.576.
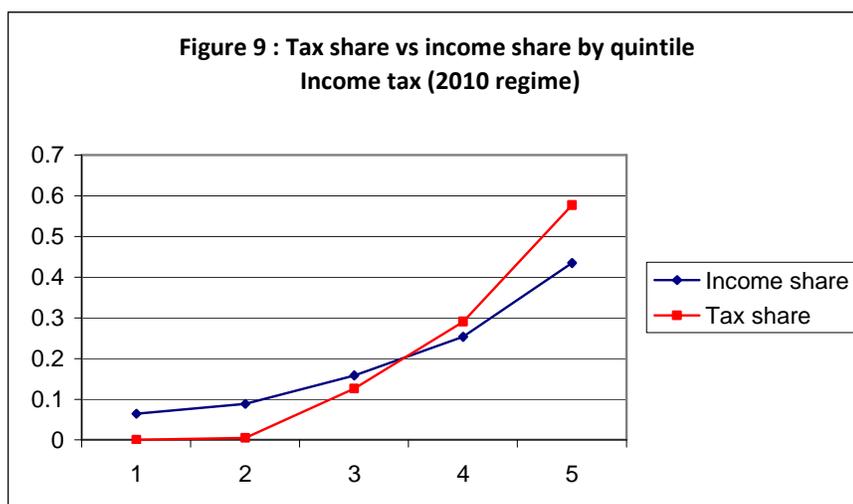
Source: Own calculations

These methods have been applied to estimate the progressivity impact of the tax changes that have been implemented between 2006 and 2010. The main results are reported in Table 1.

Table 1: Kakwani indices for recent tax regimes in Latvia

Tax	2006	2009 (post July)	2010	% change between 2006-2009 pos-July	% change between 2006-2010
VAT	-0.149	-0.150	-0.150	-0.09%	-0.09%
Excise taxes	-0.104	-0.108	-0.108	-0.44%	-0.44%
All indirect taxes	-0.139	-0.140	-0.140	-0.13%	-0.13%
Direct Taxes	0.147	0.158	0.164	1.15%	1.68%
All Taxes	0.049	0.038	0.048	-1.14%	-0.14%

Source: own calculations

Things to note about these results are the following:

- Overall the Latvian tax system is mildly progressive with a positive Kakwani index in all years.

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[14] A caveat is needed here. The tax share is an estimate based on the tax regime and the characteristics of households and it could be that in practice households manage to avoid or evade some of the income tax they should be paying. If this is so, then in practice, income tax may be less progressive even than implied in Latvia's near flat tax regime.

- The direct tax system is moderately progressive. This is a result of the untaxed personal allowance which serves to take people in the lowest income quintiles out of income tax liability.
- Indirect taxes are however regressive with VAT being more regressive than excises. Thus the Latvian indirect tax system appears to be rather regressive.
- It could be argued that a more appropriate the base for calculating the indirect tax Kakwani index should be expenditure rather than gross income. If we do this then for Latvia the VAT Kakwani index for 2010 is 0.003 (i.e. almost proportional) and the overall indirect tax Kakwani index is 0.014 (i.e. very mildly progressive) and that for excise taxes the Kakwani index is 0.046 i.e. also progressive. This is not inconsistent with the results reported for Russia by Decoster (2005) who found both VAT and excise taxes to be progressive. His reported overall Kakwani index for indirect taxes was 0.047. However, these results are almost certainly influenced by the fact that food in Russia carried a 10% rate of VAT as compared with a standard rate of 20%.
- In terms of the progressivity of the overall tax system we see that the post crisis system is slightly less progressive than was the case in 2006

4.2 The international context

It is clearly of interest to locate the Latvian tax system in an international context. However, as noted by Prased and Deng (2009) "The international comparison of tax progressivity is not a well-developed field" (p 5). This is mainly because of a variety of data problems[15]. Wagstaff et al (1999) report Kakwani indices for direct and indirect taxes for a variety of OECD countries from the early 1990s on a basis that we believe is comparable to what has been estimated here. These are compared with the Latvian indices for 2010 in Figure 10 and Figure 11.

Figure 10: International comparison of Kakwani indices direct taxes

Country	Value
UK	0.2843
Germany	0.2488
Portugal	0.218
Spain	0.2125
Switzerland	0.2055
Netherlands	0.2003
Latvia	0.164
Italy	0.1544
Finland	0.127
Denmark	0.0624
Sweden	0.0529
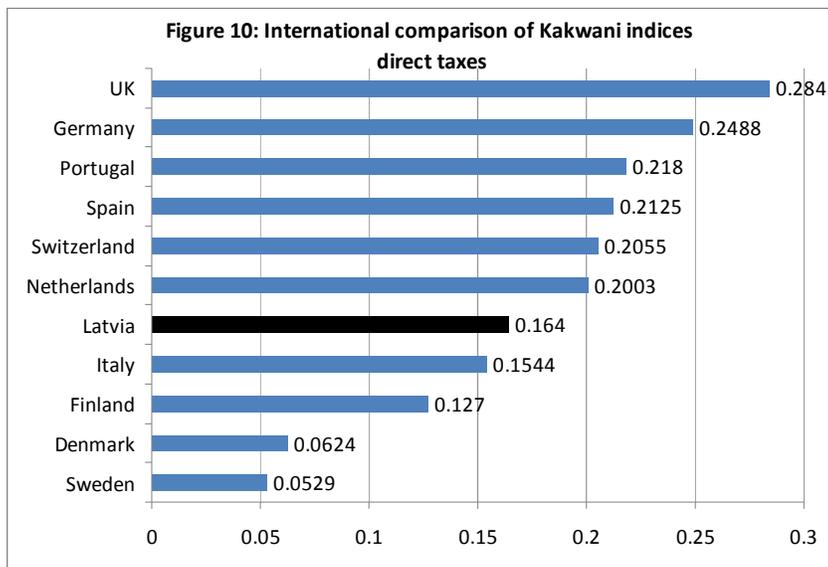
Source: Wagstaff et al (1999) and own calculations

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[15] These include the following: different tax structures e.g. the US does not have a VAT, some studies of income tax include transfers as well as tax liabilities, and the distortions induced by tax evasion and the informal economy.

Figure 11: International comparison of Kakwani indices indirect taxes

Country	Value
Portugal	-0.0347
Switzerland	-0.0722
Sweden	-0.0827
Netherlands	-0.0885
Germany	-0.0922
Finland	-0.0969
Denmark	-0.1126
Italy	-0.1135
Latvia	-0.14
UK	-0.1522
Spain	-0.1533
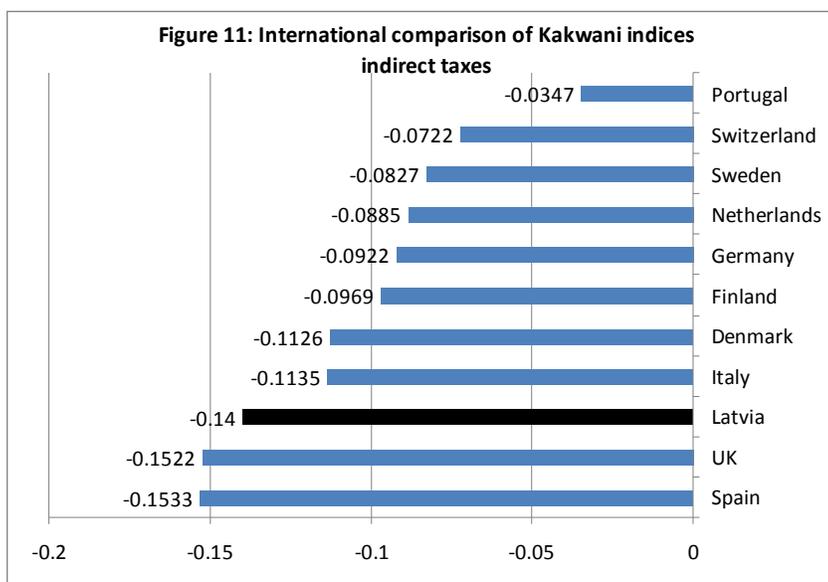
Source: Wagstaff et al (1999) and own calculations

Inspection of Figure 10 shows that internationally Latvia's direct tax system is towards to lower end of the progressivity rankings, while Figure 11 shows that Latvia's indirect tax system is at the higher end of the regressivity rankings. In other words taken together, the Latvian tax system, although overall progressive, as shown in Table 1, is not particularly so when compared internationally. The low position of Sweden and Denmark in the direct tax rankings is interesting. In Sweden this is apparently the result of a flat rate local income tax but Prasad and Deng (2009) argue that, in general, regressive taxation supports an extensive welfare state as in continental Europe but that progressive taxes constrain it, as in the US.

4.3 The Finance Ministry tax proposals

The proposals of the government policy paper are aimed at all four policy goals and not just 'fairness' however here we concentrate on the fairness implications of the four tax proposals both individually and taken together The results of the experiments for individual taxes are summarised in Table 2. The term 'combined measures' refers to the whole package of: no reduced rate for VAT, income tax rate of 21%, personal allowance of 95 LVL and property tax of 1.5%.

The impact of each tax on the relevant Kakwani index is compared with the base year (2010) and the direction of the impact in terms of progressivity/regressivity is summarised in the last column. Thus we see that removing the reduced rate of VAT makes the VAT Kakwani index more regressive. Similarly, reducing the income tax rate to 21% makes the direct taxes Kakwani index more regressive. On the other hand, increasing the personal allowance and applying a 1.5% property tax are progressive. The whole package of measures results in a more progressive direct tax system.

Table 2: Kakwani indices for individual tax changes proposed in the government policy paper

	K index initial (2010)	K index new	Change in K index, %	Conclusion
VAT index				
VAT no reduced rate	-0.150	-0.152	-0.19%	more regressive
Direct taxes index				
Income tax 21%	0.164	0.157	-0.63%	more regressive
Direct taxes index				
Personal allowance up to 95 LVL	0.164	0.186	2.27%	more progressive
Direct taxes index				
Property tax on dwellings 1.5%	0.164	0.171	0.69%	more progressive
Direct taxes index				
Combined measures	0.164	0.184	2.03%	more progressive

Source: Own calculations

Table 3 reports the results of the same calculations for the overall Kakwani index. Here we see that the impact of the whole package is a more regressive overall tax system. Not by much, i.e. the Kakwani goes down from 0.048 to 0.044, but nevertheless the implication is that the package of tax measures does not achieve any improvement in 'social fairness' – at best the measures overall are close to neutral.

Table 3: Impact on the overall Kakwani index of the 'guidelines' proposals

	K index initial (2010)	K index new	Change in K index, %	Conclusion
VAT no reduced rate	0.048	0.042	-0.60%	more regressive
Income tax 21%	0.048	0.035	-1.26%	more regressive
Personal allowance up to 95 LVL	0.048	0.050	0.24%	more progressive
Property tax on dwellings	0.048	0.060	1.17%	more progressive
Combined measures	0.048	0.044	-0.38%	more regressive

Source: own calculations

4.4 A reduced rate of VAT on food
According to the arguments discussed in Copenhagen Economics (2007), an EU commissioned study on the issues relating to reduced rates of VAT, possible reasons for applying reduced rates include income distribution considerations and the desire to support particular sectors. On both grounds the food sector is a potential candidate for

reduced VAT in Latvia. This can be seen from Table 4, where the share of food expenditure by income quintile is shown.

Table 4: Food share of expenditures by income quintile 2007

Quintile	1	2	3	4	5
Latvia	34.60%	33.60%	30.10%	24.10%	17.70%
Sweden	14.80%	14.10%	13.70%	13.90%	12.70%

Source: Eurostat

It is clear that in Latvia the bottom three quintiles spend a much bigger share of their income on food than the top two quintiles. In Sweden, by contrast the distribution is almost flat and all quintiles spend a much smaller share of income on food than in Latvia.

The significance of indirect taxes, including VAT, for the poorest Latvian inhabitants is shown in another way in Table 5, which reports the share of different taxes in the estimated tax liabilities of each income quintile. It is clear that for the two poorest quintile the overwhelmingly top share of the taxes they pay are collected in the form of indirect taxes, whereas income tax, in particular is hardly paid at all by the two poorest quintiles. In other word applying a reduced rate of VAT on food represents a potentially attractive way of reducing the tax burden imposed on Latvia's poorest households.

Table 5: Share of different taxes in estimated tax liabilities of each quintile (2010)

Quintile	1	2	3	4	5
SIC	18.25%	20.32%	20.84%	21.58%	21.96%
Income tax	0.00%	3.01%	33.43%	41.95%	44.65%
Property tax	2.43%	1.27%	0.99%	2.36%	5.12%
Indirect taxes	79.32%	75.40%	44.75%	34.11%	28.28%

Source: own calculations

This proposition can be tested directly by examining the implications on Kakwani indices of introducing a reduced rate of VAT on food. We have conducted two experiments: one is to introduce a reduced rate of VAT on food of 10%, leaving the rest of VAT unchanged and the second is to remove the existing reduced rate and substitute for it the reduced rate on food. The results are reported in Table 6. It is clear that the reduced rate of VAT on food represents a progressive move even if accompanied by the removal of the currently reduced rate. The impact is to increase the overall Kakwani index from 0.048 to 0.063 (or 0.056 if the reduction on food is compensated by removing existing reduced rates of VAT).

Table 6: Progressivity impact of a reduced rate of VAT on food

	K index initial (2010)	K index new	Change in K index, %	Conclusion
Lower VAT (10%) for food (VAT K-index)	-0.150	-0.127	2.29%	more progressive
Lower VAT (10%) for food & no reduced rate (VAT K-index)	-0.150	-0.132	1.84%	more progressive
Lower VAT (10%) for food (Overall K-Index)	0.048	0.063	1.53%	more progressive
Lower VAT (10%) for food & no reduced rate (overall K-index)	0.048	0.056	0.85%	more progressive
Combined measures (overall K-index)	0.048	0.044	-0.38%	more regressive

Source: own calculations

Thus a 10% rate of VAT for food has a positive impact on overall progressivity in contrast to the overall regressive impact of the combination of measures proposed in the policy paper (shown again in the last row of Table 6). An obvious consideration in comparing alternative measures is the revenue impact of each measure Estimates of the revenue implications of the 'experiment' are reported in Table 7.

Table 7: Revenue impact of tax 'experiments'

Measure	Change in revenue of each tax	Change in total revenue
No reduced rate VAT	up by 9.7% (VAT)	up by 2.0%
Lower VAT (10%) for food	down 15.6% (VAT)	down 3.3%
Lower VAT (10%) for food & no reduced rate	down 5.9% (VAT)	down 1.2%
Income tax 21%	down by 19.2% (IT)	down 4.8%
Personal allowance up to 95 LVL	down by 23.1% (IT)	down 5.8%
Property tax on dwellings	up 194.9% (property tax)	up 3.5%
Combined measures	down 6.5% (IT, VAT, property tax)	down 3.9%

Source: own calculations

For example, in comparing an increase in the untaxed personal allowance (which increases the overall Kakwani index to 0.050) with the alternative of replacing the current reduced rate VAT by 10% VAT on food (which increases the overall Kakwani index to 0.056), we see that the first measure results in a loss of total tax revenue by 5.8% of planned 2010 total tax revenues whereas replacing the current lower rate by a 10% rate on food results in a revenue loss of just 1.2%. In other words the food VAT measure induces more progressivity and costs less in terms of foregone revenue. Interestingly, the package of measures proposed in the government policy paper overall increases regressivity and results in a revenue loss of nearly 4%.

4.5 The output impact of lower food VAT

In Latvia locally produced food is a 'sensitive sector' and it is of interest to see what the impact of lower food VAT would have on this sector. The impact depends upon the following factors/assumptions:

- The degree of pass-through of VAT to prices. Here we assume arrange of between 75% to 100% based on the evidence discussed in Blundell (2009) and Copenhagen Economics (2007)
- The responsiveness of demand to price changes i.e. price elasticity of demand. Here we assume a range of -0.3 to -0.5 based partly on Copenhagen Economics (2007) and partly on broader international evidence.
- Changes in sales of food products translate directly into changes in the output of local food producers. This is because VAT is neutral with respect the origin of supply.

These assumptions yield the following output effects.

Table 8: Food output % increase following reduction in VAT on food

VAT rate (from 21%)	Price elasticity = 0.3		Price elasticity = 0.5	
	Pass-through: 75%	Pass-through: 100%	Pass-through: 75%	Pass-through: 100%
18%	0.68	0.9	1.1	1.5
10%	2.5	3.3	4.1	5.5
5%	3.6	4.8	6	8

Source: own calculations

So assuming a pass through of 100% and price elasticity of demand of -0.5, a reduction in VAT on food to 10% would in a 5.5% increase in sales.

5 Concluding remarks

The results of the progressivity calculations reported in section 4 suggest that the proposals of the policy paper do little to promote social fairness and will result in less revenue. This also suggests that perhaps the government should look elsewhere for creating more fairness in the Latvian tax system. One of the experiments conducted suggests that reducing the VAT on food would increase the progressivity of the Latvian tax system. However, the government appears to have gone explicitly for a single VAT rate.

Differentiated VAT is a topic that has been widely discussed in the literature on optimal taxation (i.e. how to minimize distortions and inefficiencies when raising a given revenue)[16]. In terms of actual policy making, the overview in section 3 revealed that it is inoperational to differentiate indirect taxes, such as VAT from the point of

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[16] See e.g. Sørensen (2006) for an overview.

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view of efficiency, since we do not have and cannot realistically obtain the information needed to differentiate e.g. VAT. This has been taken as an argument against differentiated VAT among academic economists as well as many policy makers. Furthermore, as discussed in Sørenson (2006) these arguments could be supplemented by arguments such as: that it is much easier to administer a uniform VAT system; that a uniform VAT reduces the risk of fraud in comparison to a system with differentiated taxes; a uniform VAT reduces the scope for lobbying from different interest groups. However, when discussing differentiated VAT or not, it is important to keep in mind that in practice (unless the VAT rate is universally 0 per cent, i.e. no VAT), the VAT rate is necessarily differentiated since there are always some goods and in particular services that are not subject to VAT.

The issue raised in the Latvian policy debate is however different from optimal taxation – it is how to increase the fairness of the Latvian tax system, where, as discussed above, fairness is defined as increased progressivity and this is context in which the discussion of a reduced VAT on food should be seen. One obvious alternative to a reduced VAT on food would be to support low income households by cash transfers and thereby increase progressivity. However, income related transfers create huge incentives for underreporting household or individual income in order to receive the benefits. Furthermore, the marginal effect on disposable income will be large when passing the threshold where there are no or reduced benefits are received. Hence, to achieve the desired outcome in terms of progressivity requires reliable reporting of income and an overall well functioning tax administration. In the case of a differentiated VAT, the fraction of household income spent on food will serve as the screening device – a screening device where there is no incentive to cheat e.g. on reporting of household income. Given these observations, a reduced VAT on food might still serve as a practical alternative when it comes to increasing the progressivity of the Latvian tax system[17].

In general, tax reform cannot be discussed without addressing the issues of tax collection and tax administration as well as public sentiment towards taxes (and hence government spending). The quantitative Kakwani index analysis assumed that taxes are collected and paid properly. If this is not the case, then, in addition to losing revenue, the tax system is not fair since it results in a situation where equals are not treated equally, i.e. it breaches one of the fundamental concepts of fairness, horizontal equity discussed in section 3.3. Anecdotal evidence suggests that it is possible to bargain with the local VID (revenue service) office with respect to the VAT payments. From a fairness perspective this suggests that filing VAT should be 'electronised' not only to reduce the cost of collecting taxes but also to improve the fairness of the tax system (since electronic submissions rules out bargaining etc.).

Attitudes towards taxes and tax evasion put additional restriction on the tax system and hence on tax reform. According to the most recent SKDS survey (Spring 2010) nearly 50% of the Latvian population believe that "in current circumstances it is justified to partially not pay taxes". Tax design must necessarily be shaped by societal attitudes such as these. In a country with a high propensity for tax evasion the tax base has to be different in comparison to a country with lower propensity evade. In the former a greater fraction of tax revenue must be raised by taxes that are more difficult to evade such as property taxes or excise taxes on e.g. automobiles and petrol – it is

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[17] The redistributive power of indirect taxes such as VAT is however, as discussed in Sah (1983), limited. Hence, indirect taxes should in terms of redistribution be seen as a supplement to direct taxes.

much more difficult to avoid paying these taxes (by e.g. concealing properties or automobiles) than income or value added taxes. Higher taxes on the private use of cars have faced a difficult time in Latvia but if the government is really serious about "higher taxes on exclusive properties" then it should bite the bullet and address the taxation of cars.

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Annex 1

Table A.1: VAT rates in the EU 2010

Member States	Code	Super Reduced Rate	Reduced Rate	Standard Rate	Parking Rate
Belgium	BE	-	6 / 12	21	12
Bulgaria	BG		7	20	
Czech Republic	CZ	-	10	20	-
Denmark	DK	-	-	25	-
Germany	DE	-	7	19	-
Estonia	EE	-	9	20	-
Greece	EL	4,5	9	19	-
Spain	ES	4	7	16	-
France	FR	2,1	5,5	19,6	-
Ireland	IE	4,8	13,5	21	13,5
Italy	IT	4	10	20	
Cyprus	CY	-	5 / 8	15	-
Latvia	LV	-	10	21	-
Lithuania	LT	-	5 / 9	21	-
Luxembourg	LU	3	6 / 12	15	12
Hungary	HU	-	5 / 18	25	-
Malta	MT	-	5	18	-
Netherlands	NL	-	6	19	-
Austria	AT	-	10	20	12
Poland	PL	3	7	22	-
Portugal	PT	-	5 / 12	20	12
Romania	RO		9	19	
Slovenia	SI	-	8,5	20	-
Slovakia	SK	-	10	19	-
Finland	FI	-	8 / 12	22	-
Sweden	SE	-	6 / 12	25	-
United Kingdom	UK	-	5	17,5	-