# IMPACT OF INCOME CHANGES ON PRIVATE CONSUMPTION EXPENDITURE AND ITS STRUCTURE

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**Abstract.** Income changes have significant impact on overall consumption and saving process and, in result, on structure of consumption expenditure. The paper is devoted to evaluation of impact of income changes on consumption in Latvia. Household disposable income had increased by 129 % in 2008 in comparison to 2005. During this period, household expenditure per member had increased by 81 %. It is also noteworthy to analyse the effect of income changes by consumption expenditure and by income quintile. The results of research can be useful source of information for managers, consultants, non-governmental organizations, government institutions etc. to have a more sophisticated view of current social and economic environment.

**Keywords:** private disposable income, consumption expenditure, income quintiles, income elasticities, economic modelling.

## 1. Introduction

Income changes have significant impact on overall consumption and saving process and, in result, on structure of consumption expenditure. Households make decisions whether to spend or to save received income, or to spend savings created during the past years, or to borrow money to spend more than incomes and savings allow. Since 2005 incomes and consequestly expenditures have dramatically increased and, at the same time, structural changes have taken place in Latvia. However, the same general trend has been observable in Lituania and Estonia.

Household disposable income had increased by 129 % in 2008 in comparison to 2005 in Latvia. During this period, household expenditure per member had increased by 81 %. Income changes influence differently various groups of expenditure. Some expenditure are less elastic towards income changes (for instance, expenditure on food (+49 %)), at the same time, some groups of expenditure have increased as sharply as income (for instance, transport (+129 %), expenditure on recreation and culture (+126 %)).

The analysis of the effect of income changes by consumption expenditure and by quintile is topical and demanded in current economic situation, as income increase for the lowest income quintile and for the highest income quintile have different impact on expenditure structure.

Reveal and evaluation of effect of income changes on private expenditure is the goal of the research, which results are presented in this paper.

Data analysis is performed for a time period from 2002 till 2008. Data comparison is performed for 2008 or the latest data on 2005. The applied methods by this research are inductive and deductive methods, analysis and synthesis methods, generalization, statistical and modelling methods.

Many authors have examined specific aspects of impact of income changes on selected sphere or process in the economy. However, the number of studies devoted to income elasticities is unsuffient and demands further studies in detail.

Theoretical aspects of household expenditure and private consumption function have been an object of research in lots of studies and researches. Many theoretical studies in econometrics have been directly or indirectly devoted to these issues or cover these economic processes (as Bardsen *et al.* 2005; Intriligator *et al.* 1996; Mills 2003; Klein *et al.* 2005). The researches solely devoted to consumption behaviour and estimation of income changes are relatively in small number (for instance, Garratt *et al.* 2009; Lo *et al.* 2007; Marquez 2006). Many researches have been devoted to specific aspects or certain groups or purposes of expenditure (as Braunch 1993). In Latvia, private consumption has been rather frequenlty analysed to evaluate the current state (government and non-government organizations publish various reports on current economic and social environment and lattest trends, for instance, Ministry of Economy of Latvia publishes twice a year Report on the Economic Development of Latvia (2009) that also covers also an analysis of overall consumption trends, and Central Statistical Bureau of Latvia

(2007) etc.) or forecast (as Auzina 2008). The above-mentioned determines the ground for further and detailed study in this field.

## 2. Analysis of dynamics and structural changes in Latvia

Personal disposable income includes various sources and types of income obtained during a certain period of time. In Latvia, the main income type that forms more than ¾ of all income are wages and salaries. In 2007, wages and salaries were accounted for 77.4 % of household income (Fig. 1).
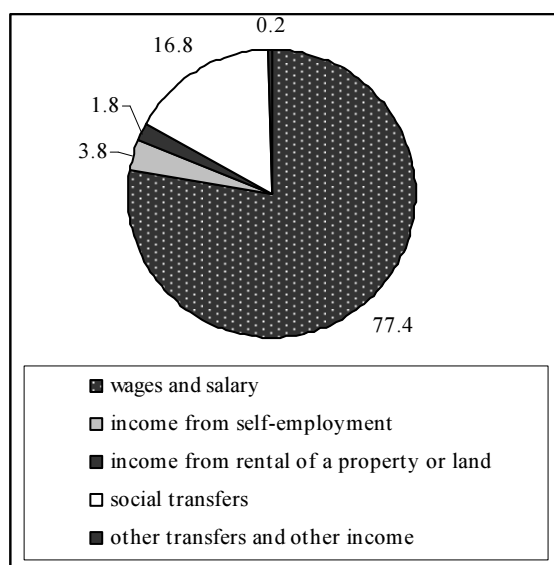


**Fig. 1.** Structure of personal income in 2007 (%) (CSB)

The second major income type is social transfers that form 16.8 % of household income. Social transfers include pensions (old-age pensions and other), social security benefits, social etc. benefits paid by state or municipality. Income from self-elpoyment forms 3.8 %, income from rental of a property or land forms 1.8 %, and other income – 0.2 %. It is observable that wages and salaries, or income from labour, take the dominat place and, in a result, changes in wages and salaries have the largest impact on volume of household income. It should be stated that both effects increasing and decreasing have siginificant influnece on household income.

Main factors that determine volume of wages and salaries are gross average wages and salaries (before taxing), taxes on wages and salaries, minimum state-determined wage. The dynamics of gross and net average wages and salaries and average size of main social trasfers, old-age pensions, are presented in Figure 2.

Size of net average wages and salaries per employed person per month has increased by 98.9 % in 2008 in comparison to 2005. Average size of old-age persions has increased by 74.1 %. In Latvia, according to social ensurance system, in average, old-age pensioners per month receive aprox. 40 % of average size of wages and salaries per employed person per month.

It must be stated that mimum wage level that is determined by state and it is regulated by legislation have been increased several times during the period analysed. Minimum wage determined by state has doubled in this period.
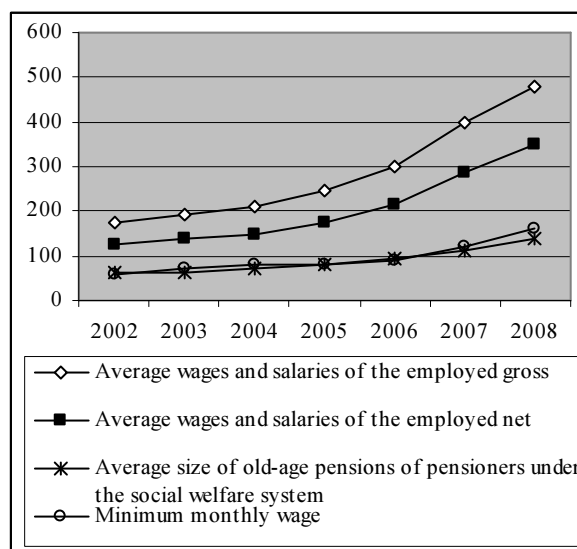


**Fig. 2.** Dynamics of income per month (LVL) (CSB)

Average household spent 232.06 LVL per member of household in 2008. Regional differences are also observable - average urban household spent by 8.9 % more (average household in Riga spent by 22.8 % more) than the average, and average rural household spend only 80.9 % of the average (Fig. 3), it means that it spends less by 19.1 % than the average in the same time period.]

It must be stressed that gradual income convergence in regions takes place in Latvia, as in 2005, average rural household spent only 77.5 %of average household spending per member (76.6 % in 2002). At the same time, average household in Riga spent by 32.8 % more than the average in 2005 (33.8 % in 2002).

Structure of average household consumption expenditure in 2008 is presented in Fig. 4. Main consumption purposes is expenditure on food and non-alcoholic beverages (25.6 %), transport (14.6 %), housing, water, electricity, gas and other fuels (11.9 %). These three consumption purposes form more than a half of all expenditure (52.1 %).
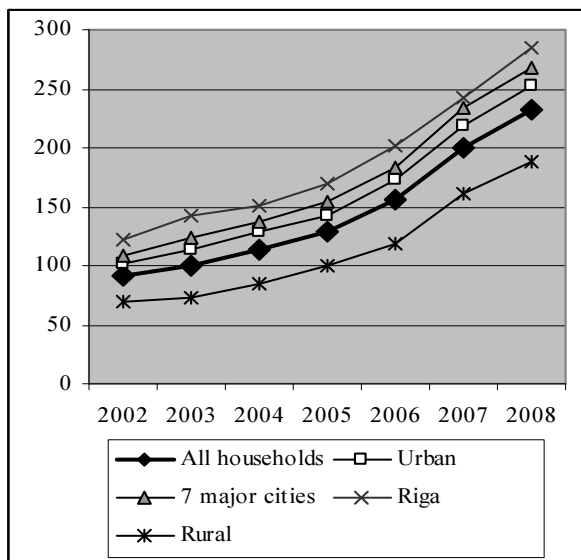
**Fig. 3**. Dynamics of consumption expenditure average per household member per month (LVL) (CSB)

Other nine groups are the following (descending): recreation and culture (8.3 %), clothing and footwear (7.8 %), furnishings etc. household maintenance (6.2 %), miscellaneous goods and services (6.1 %), hotels, cafes, restaurants (5.5 %), health (4.8 %), communication (4.6 %), alcoholic beverages and tobacco (3.1 %), and education (1.4 %). In comparison to 2005, the most significant structural changes are related to expenditure on food and non-alcoholic beverages – the share has decreased by 5.4 percentage points (from 31.0 % to 25.6 %) despite increase by 49.6 %, as total expenditure has increased by 81.2 %. Share of expenditure on recreation and culture has increased by 1.6 percentage points (from 6.7 % to 8.3 %), but share of expenditure on communication has shrank by 1.5 percentage points (from 6.1 % to 4.6 %). Other groups of expenditure have less than one percentage point change in the analysed time period.

Detailed study of composition and structure of consumption expenditure by quintile gives additional information and more realistic results demanded in further analysis and modelling. In 2008, the highest-income or richest quintile has spent 418.67 LVL per member per month, however, at the same time, the lowest-income or poorest quintile has spent 123.61 LVL (Fig. 5). Average expenditure of highest-income quintile per person per month is 3.4 times larger than in the lowest-income. In comparison, in 2005, this ration was 3.6.

Highest-income quintile spends only 18.4 % on food (77.16 LVL), at the same time, the lowest-income – 38.4 % (42.96 LVL) (Table 1). On transport 18.7 % of expenditure of highest-income quiltile are spent (78.11 LVL), but the lowest-income quintile spends only 9.5 % (11.70 LVL). The same trend is observable regarding expenditure on recreation – 10.5 % (43.77 LVL) and 6.0 % (7.47 LVL), and restaurants, cafes and hotels – 7.2 % (30.23 LVL) and 4.2 % (5.19 LVL).

Three main groups of expenditure (food, transport, and housing, water, electricity, gas and other fuels) form 47.0 % of consumption expenditure for the highest-income quintile, but – 58.5 % for the lowest-income quintile in 2008.

The analysis of dynamics and structure of income illustrates the recent trends and structural changes occurred in period under investigation.

To evaluate impact of income change on consumption it is necessary to elaborate a method based on income elasticities.
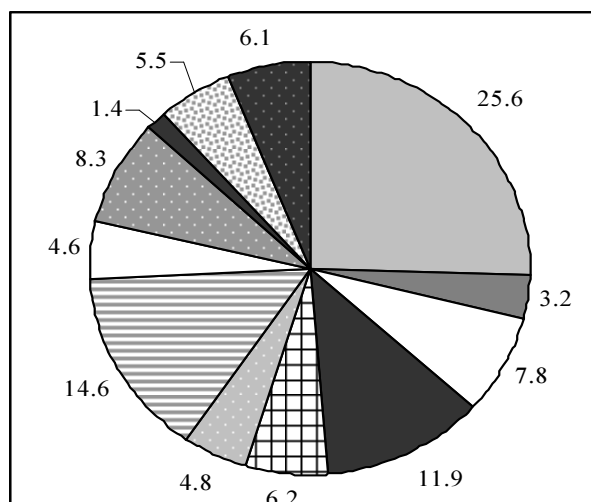


**Fig. 4**. Structure of household consumption expenditure in 2008 (%) (CSB)
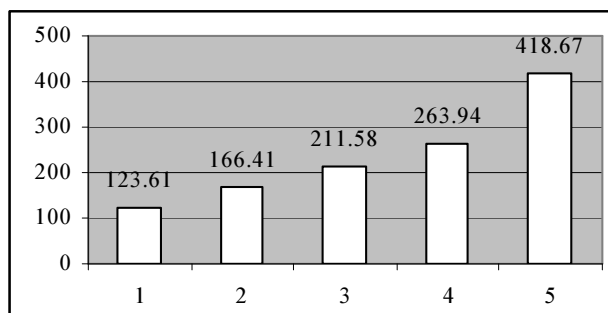


**Fig. 5.** Composition of consumption expenditure by quintile average per household member per month (LVL) (CSB)

581

**Table 1.** Structure of consumption expenditure by quintile average per household member per month in 2008 (%) (CSB)

| Purpose\Quintile | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| TOTAL | 100 | 100 | 100 | 100 | 100 |
| Food and non-alcoholic beverages | 34.8 | 31.4 | 29.1 | 25.1 | 18.4 |
| Alcoholic beverages, tobacco | 4.0 | 3.1 | 3.0 | 3.2 | 2.9 |
| Clothing and footwear | 7.0 | 6.9 | 7.8 | 8.0 | 8.2 |
| Housing, water, electricity, gas and other fuels | 14.2 | 14.8 | 13.1 | 11.1 | 9.9 |
| Furnishings, household equipment and routine household maintenance | 4.8 | 4.7 | 5.9 | 6.4 | 7.3 |
| Health | 4.8 | 6.6 | 5.4 | 4.1 | 4.2 |
| Transport | 9.5 | 11.1 | 11.5 | 15.9 | 18.7 |
| Communications | 4.9 | 4.9 | 4.7 | 4.8 | 4.3 |
| Recreation and culture | 6.0 | 6.1 | 8.0 | 8.0 | 10.5 |
| Education | 1.1 | 1.3 | 1.2 | 1.8 | 1.4 |
| Restaurants, cafes and hotels | 4.2 | 3.8 | 4.9 | 5.3 | 7.2 |
| Miscellaneous goods and services | 4.6 | 5.3 | 5.5 | 6.4 | 7.1 |

## 3. Method

Household budget indicators (as annual time-series) used to estimate the existing relatioships amid changes in income and changes in expenditure by purpose (according to COICOP classification).

The pre-study hypothesis is stated that impact of income changes have different effect on consumer spendings.

To evaluate income change influence, income elasticities have been computed for each of income quintile and each expenditure purpose (Equation (1)).

$$elast_{q,g,t} = \frac{inc\_\%_{q,t}}{\exp\_\%_{q,g,t}},\qquad (1)$$

where, $elast_{q,g,t}$ – elasticity of quintile $q$ of products (expenditure purpose) $g$ in time period $t$; $inc\_\%_{q,t}$ – percentage change of income of quintile $q$ in time period $t$; $exp\_\%_{q,g,t}$ – percentage change of expenditure spent on products (expenditure purpose) $g$ of quintile $q$ in time period $t$.

## 4. Data

Data base of Central Statistical Bureau of Latvia (Sub-data base: Household budget) is used in re-search in order to ensure a unified data resource for all calculations and comparability of data and results.

Data period is 2002–2008. As the study focused on latest changes after 2005, then detailed calucations have been performed for this time period. However, due to technical limitations the paper includes the results of 2008.

## 5. Results

According to the results, the pre-study hypothesis is confirmed as the impact of income changes are different amid expenditure groups. Table 2 illustrates the computed elasticities of average household in 2008. One per cent increase in income increases expenditure on housing, water, electricity, gas and other fuels by 2.20 per cent. However, one per cent increase in income increases expenditure on communication only by 0.24 per cent, id est, the most inelastic group of expenditure.

**Table 2.** Computed elasticities of average household consumption expenditure by purposes

| Purpose | 2008 |
|---|---|
| Food and non-alcoholic beverages | 1.03 |
| Alcoholic beverages, tobacco | 1.44 |
| Clothing and footwear | 0.26 |
| Housing, water, electricity, gas and other fuels | 2.20 |
| Furnishings, household equipment and routine household maintenance | 0.96 |
| Health | 0.85 |
| Transport | 0.59 |
| Communications | 0.24 |
| Recreation and culture | 1.13 |
| Education | 1.93 |
| Restaurants, cafes and hotels | 0.60 |
| Miscellaneous goods and services | 1.62 |

Other inelastic expenditures are the following: expenditure on clothing and footwear (0.24), transport (0.59), restaurants, cafes and hotels (0.60), health (0.85), furnishings, household equipment and routine household maintenance (0.96).

The research is focused on estimation of income changes on various income groups (quintiles) and the results reveal the theoretical preassumption that higher income quintiles react differently as do lower income quintiles on income changes. The results of calculations regarding the highest-income quintile are given in Table 3.

One per cent income change results in 2.63 per cent change in expenditure on housing, water, electricity, gas and other fuels. This purpose of expenditure is the most elastic towards income

changes. Expenditure on education is also relative-ly especially elastic and one per cent income change results in 2.32 per cent change of expenditure on education.

It is observable that according to the results, one per cent increase in income results in 0.05 per cent decrease in expenditure on communication of highest-income quintile households. Relatively inelastic expenditures are expenditure on transport (0.10), clothing and footwear (0.40), restaurants, cafes and hotels (0.50).

**Table 3.** Computed elasticities of highest-income household consumption expenditure by purposes

| Purpose | 2008 |
|---|---|
| Food and non-alcoholic beverages | 1.37 |
| Alcoholic beverages, tobacco | 1.80 |
| Clothing and footwear | 0.40 |
| Housing, water, electricity, gas and other fuels | 2.63 |
| Furnishings, household equipment and routine household maintenance | 1.20 |
| Health | 1.68 |
| Transport | 0.10 |
| Communications | -0.05 |
| Recreation and culture | 1.23 |
| Education | 2.32 |
| Restaurants, cafes and hotels | 0.50 |
| Miscellaneous goods and services | 1.42 |

The results of calculations regarding the lowest-income quintile are given in Table 4. Expenditure on housing, water, electricity, gas and other fuels also is the most elastic group of expenditure (2.20). In 2008, it is observable a unusual trend that increase in income does not stimulate persons to get involved in education and spend more on educations, but otherwise –elasticity is negative. The same ungrounded trend is observable regarding expenditure on health and recreation and culture. However, since 2005 this trend is not observable and for all the above-mentioned groups of expenditure all elasticities were postive. For instance, in 2007, elasticity of expenditure on education was 1.83. These values can be a result of households' sharp reaction to overall economic changes and recession.

The results of calculations regarding other income quintiles (below medium income (2); medium income (3); above-medium income (4)) in

2008 are given in Table 5.The most elastic expenditures are expenditure on housing, water, electricity, gas and other fuels (2.07; 1.54; 2.50).

**Table 4.** Computed elasticities of lowest-income household consumption expenditure by purposes

| Purpose | 2008 |
|---|---|
| Food and non-alcoholic beverages | 1.05 |
| Alcoholic beverages, tobacco | 1.23 |
| Clothing and footwear | 0.27 |
| Housing, water, electricity, gas and other fuels | 2.22 |
| Furnishings, household equipment and routine household maintenance | 0.11 |
| Health | -0.08 |
| Transport | 1.41 |
| Communications | 0.45 |
| Recreation and culture | -0.03 |
| Education | -0.75 |
| Restaurants, cafes and hotels | 1.61 |
| Miscellaneous goods and services | 2.00 |

**Table 5.** Computed elasticities of other quintiles income household consumption expenditure by purposes

| Purpose\Quintile | 2 | 3 | 4 |
|---|---|---|---|
| Food and non-alcoholic beverages | 0.57 | 0.82 | 1.30 |
| Alcoholic beverages, tobacco | 1.25 | 1.20 | 1.53 |
| Clothing and footwear | 0.42 | 0.72 | -0.33 |
| Housing, water, electricity, gas and other fuels | 2.07 | 1.54 | 2.50 |
| Furnishings, household equipment and routine household maintenance | 0.64 | 0.59 | 1.56 |
| Health | 0.03 | 1.25 | 0.77 |
| Transport | 1.73 | 0.95 | 0.49 |
| Communications | 0.62 | 0.28 | 0.24 |
| Recreation and culture | 0.39 | 1.75 | 1.25 |
| Education | 3.95 | 0.89 | 2.71 |
| Restaurants, cafes and hotels | 1.80 | 0.89 | -0.11 |
| Miscellaneous goods and services | 2.73 | 1.41 | 1.59 |

It must be stressed that values of elasticities fluctuates from year to year in case of more detailed analysis by income quintiles. Average household behaviour and spending traditions are more stable and less volatile and hence elasticities computed within the study are fluactuating in a

narrow range. Table 6 illustrates the computed elasticities of average household consumption expenditure by purposes from 2005 to 2008.

In 2008, the most elastic expenditure towards overall changes is expenditure on housing, water, electricity, gas and other fuels (2.20). Nevertheless, in 2007, it was expenditure on health (2.41), in 2006, it was expenditure on transport (1.74), and, in 2005, it was expenditure on clothing and footwear (1.70). It is observable that values of computed elasticities (the most elastic) have increased and the same income change (increase or decrease) of one per cent has a larger impact on consumption.

**Table 6.** Computed elasticities of average household consumption expenditure by purposes 2005-2008

| Purpose | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|
| Food and non-alcoholic beverages | 1.11 | 0.48 | 0.58 | 1.03 |
| Alcoholic beverages, tobacco | 0.45 | 0.92 | 0.66 | 1.44 |
| Clothing and footwear | 1.70 | 0.96 | 1.52 | 0.26 |
| Housing, water, electricity, gas and other fuels | 0.57 | 1.10 | 0.27 | 2.20 |
| Furnishings, household | 1.60 | 1.32 | 1.33 | 0.96 |
| Health | 1.06 | 0.63 | 2.41 | 0.85 |
| Transport | 0.73 | 1.74 | 1.83 | 0.59 |
| Communications | 0.31 | 1.03 | 0.31 | 0.24 |
| Recreation and culture | 1.67 | 1.66 | 1.44 | 1.13 |
| Education | -0.61 | 0.81 | 0.47 | 1.93 |
| Restaurants, cafes and hotels | 1.57 | 1.33 | 0.95 | 0.60 |
| Miscellaneous goods and services | 0.81 | 1.09 | 1.39 | 1.62 |

## 6. Conclusions

Overall changes of available resources, which can be whether consumed or saved, influence consumer behaviour and determine consumption pattern. According to the research results and mainstream economic theory, one per cent income increase or decrease has different impact on expenditures by purpose – thus elastic and inelastic expenditure purposes can be determined. Values of elasticities vary in large amplitude if statistics of average household budged is replaced with data of households by income quintile and a more sophisticated study has been performed. According to the

results, the pre-study hypothesis is confirmed as the impact of income changes are different amid expenditure groups.

Empiric research of the estimation of the impact of income changes on expenditure by purpose by income quintiles in Latvia enables to state that:

– Presented results can be used by companies – production and wholesale and retail trade companies by its management, finance department etc. – to evaluate potential consumer behaviour and spendings;

– Presented results can be used by consulting companies – to estimate and predict further changes in income and consumption for corporate finance planning, project managment etc.

– Presented method and results can be used by government institutions – to evaluate the results of performed politics and plans regarding changes in income (wages and salaries, old-age pensions) and its impact on economy.

– Presented method and results can be used by non-government organisations and other interested institutions and persons – to have a deeper insight in existing and developing processes in the economy and its consequences and relations.

The research is carried out on data when both income and expenditure (total and by purpose) have been growing in comparison with the previous time period. Economic development rates were positive and relatively high in 2002-2007 in comparison with the average growth rates in the European Union. In 2008, Latvian economy had the sharpest economic decrease in the EU (-4.6 %) (according to Eurostat data (2009)). Taking into account the latest economy development (recession) it should be taken account that consumption pattern and elasticities can be changed and cannot be differently applied to conditions when income decreases in comparisons with previous time period. However, the results give significant insight in existing relations. The study is performed on Latvia's data, but the method and a part of results can be applied to other Baltic states as comparable economic development pace and trends have been observable.

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