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# Fiscal Incidence in Belarus: A Commitment to Equity Analysis

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## Abstract

The paper employs the Commitment to Equity (CEQ) framework to present a first attempt at a comprehensive fiscal incidence analysis for Belarus, encompassing both the revenue and expenditures components of the fiscal system, including direct and indirect taxes, as well as direct, indirect and in-kind transfers. The analysis reveals that fiscal policies in Belarus effectively redistribute income from the top to the bottom of the income distribution. Direct transfers, in particular pensions, are the most equalizing and pro-poor of the fiscal interventions – direct transfers and direct taxes lower the national poverty headcount by 17 percentage points and lower the Gini index of inequality from 0.407 to 0.267. Some of the indirect taxes, on the other hand, are regressive, and indirect transfers – poorly targeted, such that the effect of these components of the fiscal system is not equalizing. Finally, the cost-efficiency of different parts of the fiscal system in Belarus varies considerably. Unemployment benefits, pensions and child benefits are found to be cost-efficient, while indirect subsidies are highly cost-inefficient. The analysis points towards possible reforms that would allow to reduce poverty and inequality more efficiently.

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# 1.    Introduction

Belarus is often positioned as a country that has "socially oriented economy", at least as stated by the authorities. This statement is supported by the facts that Belarus has low income inequality (one of the lowest in the region) and low poverty (poverty headcount based on international poverty line of USD 4 PPP is effectively zero). Different studies (e.g. Chubrik, 2007; Chubrik and Shymanovich, 2016) revealed pro-poor nature of Belarusian economic growth, but there is no clear evidence whether low inequality and poverty have resulted from tax and subsidies systems design or from other factors.

This paper seeks to fill this gap by analyzing the impact of fiscal policy on poverty and inequality in Belarus. The methodology of the analysis follows approach developed within Commitment to Equity (CEQ) analysis, which has already been applied for more than thirty low and middle-income countries (see Lustig, 2016). This fiscal incidence analysis reveals beneficiaries of public social expenditures and contributors to the public finances who bear the major tax burden.

The assessment of the impact of fiscal policies is timely for Belarus. Currently, the country is struggling with the prolonged recession and has to optimize its budget expenses. So far, the reforms debate has been centered around the pension reform (Lisenkova and Bornukova, 2017, Shymanovich, 2016), and elimination of utility subsidies (IMF, 2016; Chubrik, Shymanovich, 2016; Zhang and Hankinson, 2015). This paper provides the current debate with the new information on the poverty and inequality impacts of the social programs and their cost efficiency. To the best of our knowledge, this is the first attempt of a comprehensive fiscal incidence analysis for Belarus.

The fiscal incidence approach captures only the effects of the government policies in form of taxes, subsidies and benefits collected from and provided to households. However, part of the social support is provided implicitly through subsidization of state-owned enterprises (SOEs). It is partially reflected in budget expenditure (in 2015, 4.3% of GDP was spent on subsidies to the SOEs), and partially comes through quasi-fiscal operations and not captured by the fiscal data. On the one hand, this support helps to SOEs to preserve excessive employment, on the other – it leads to inefficient resource allocation, thus reducing overall welfare. Thus, in addition to the general problems with imputation of the effects of SOEs subsidization at the household level, there is an open issue of the overall "sign" of its impact on poverty and inequality: perhaps lower subsidies to SOEs would result in faster job creation in the private sector and better job opportunities for the poor. That is why in this study we do not consider the social roles of SOEs, focusing only on the taxes payed by households and subsidies provided to them directly from the budget. Other limitations of the CEQ approach are that it does not evaluate the quality of the government services, does not take into account the behavioral/rational responses to changes in the fiscal policy, and assumes equal distribution of income and consumption within the household.

Our results suggest that fiscal policy in Belarus is very effective in lowering both poverty and inequality. The direct transfers (including pensions) and direct taxes lower national poverty measure by 17 percentage points. They also decrease the Gini index from 0.407 to 0.267. The impressive magnitude of positive fiscal effects puts Belarus among the equalization leaders in the group of developing countries. Most of the effect could be attributed to pensions. When we adopt the pensions-as-deterred-income (PDI) approach, the poverty reduction amounts only to 2.5 percentage points, and the Gini coefficient decreases only by 0.02.

The results also point towards possible reforms. As the government seeks to minimize expenditure, it is important to focus on the most efficient interventions. Indirect subsidies are highly cost-inefficient. 1% of GDP spent on the utility subsidies delivers 3 times less the reduction in poverty and inequality compared to the same 1% spent on pensions. The indirect subsidies to utility and transport tariffs are not targeted, available to everybody and regressive. Replacing indirect subsidies with the well-targeted benefits program will allow reducing poverty and inequality more efficiently. Unemployment benefits (currently at very low level) are the most cost-efficient benefits program, suggesting that the plans to increase benefits will have significant impact in reducing poverty and inequality.

The paper proceeds as follows. We describe the welfare state in Belarus in Section 2, also discussing the role of quasi-fiscal policies for social welfare. Section 3 describes the methodology of CEQ assessment and peculiarities of its application to the Belarusian data. In Section 4 we present and discuss the results of CEQ assessment and fiscal impact on poverty and inequality in Belarus. Section 5 concludes.

## 2.    Belarusian "welfare state": Overall principles

### 2.1.  Poverty, growth incidence, and trends in inequality

In its recent history, Belarus demonstrated impressive reduction of poverty. Poverty headcount based on the official poverty line[1] fell from 46% in 1999 to 4.8% in 2014; it stays well below 10% of population since 2007 (see Figure 1). Poverty measured with international poverty line of USD 4 PPP stays below 1% since 2011, and since 2013 it is close to 0. Economic growth (quite impressive between 2000–2010, when Belarus was among top-25 fastest growing countries in the world) was the key factor behind the poverty reduction – correlation between real GDP and national poverty headcount is -0.91. The outliers are explained by extremely fast growth of housing and utility tariffs (2002) and a hyperinflation episode (2011).

However, Belarusian economic growth was not sustainable. It was driven by fast capital accumulation financed initially from the budget and later via directed lending at preferential interest rates. As a result, returns on investment was falling, as well as total factor productivity (Kruk and Bornukova, 2014; 2015). On the demand side, GDP growth was driven by domestic demand; fast growth of investment and household consumption led to growing external imbalances that were financed via growing government borrowing. Altogether, these factors caused economic recession, which started in Belarus in the end of 2014, and growth prospects look gloomy: recent IMF and World Bank outlooks forecast very modest growth[2], while statistical filters give real GDP long term trend growth rate below zero (Chubrik and Shymanovich, 2016).

Recent GDP decline led to slight increase in poverty. Poverty rate according to the national definition grew from 4.8% in 2014 to 5.7% in 2016. Moreover, the national definition of poverty does not properly take into account the significant increases in utility tariffs, which is happening since 2014. Regional inequality is also increasing, with the population outside the capital, and in particular in the small cities and rural areas, lagging behind the large urban centers in terms of wages and other types of income (Chubrik, 2016b; Mazol, 2016).
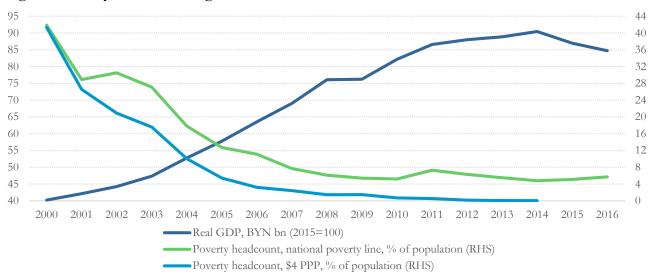
**Figure 1. Poverty and economic growth, 2000–2015**



*Source*: Belstat, World Bank POVCAL (USD 4 PPP headcount).

Such a strong correlation between poverty and economic growth should mean that Belarusian economic growth on average had pro-poor nature. Indeed, in general, the higher the initial income was, the lower rate it grew between 2000 and 2015. Income of the poorest decile grew by 0.65 percentage points a year faster than income of the richest decile (see Figure 2a). However, over time real income growth rate was falling, following the real GDP growth rate, and profiles of the incidence curves changed too. The rich benefited the most between 2005 and 2010, while the poorest – between 2010 and 2015, and lower middle class – between 2000 and 2005 (Figure 2b). After all, Belarus

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[1] Absolute poverty line ("minimum subsistence basket", or "subsistence minimum") is calories-based poverty line; before 3Q2014, it included administratively defined set of food and non-food goods and basic services, since 3Q2014 it is calculated as the value of administratively defined food basket times 1.77.

[2] See IMF WEO database, April 2017 (https://www.imf.org/external/pubs/ft/weo/2017/01/weodata/index.aspx), and World Bank's Belarus Economic Update, May 2017 (http://pubdocs.worldbank.org/en/819391494832531504/Eng-EcUpdate-May14-17.pdf).

succeeded in delivering benefits of economic growth to all household groups, including (and especially) the poor, and the existing system of income redistribution could be one of the important reasons.

**Figure 2. Growth incidence curves in Belarus, 2000–2015**



**(a) Real disposable resources growth rates, 15-year annual average, %**

**(b) Real disposable resources growth rates, 5-year annual averages, %**

*Source*: own estimates based on HBS data (disposable resources) and Belstat data (inflation).

Historically, redistribution plays important role in Belarus. The share of the general government expenditures in GDP stays at the level of European welfare states (47.2% on average between 2000 and 2010). Even after impressive fiscal consolidation, when the average government expenditures dropped by 6.7% of GDP (see Figure 3), that share remained higher than in the upper middle income countries from Central and Eastern Europe and CIS. And the fiscal consolidation of the last five years resulted only in very moderate increase of Gini index: from 0.266 between 2000 and 2010 to 0.281 between 2011 and 2015.

**Figure 3. Redistribution and inequality in Belarus, 2000–2015**



*Source*: GFS, Belstat.
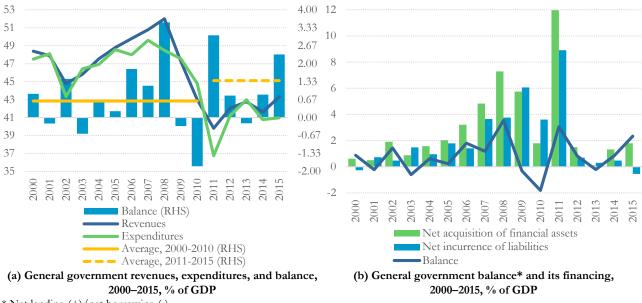
## 2.2. Revenues and expenditures of the general government

*Government revenues*

The need for fiscal consolidation was called by drastic reduction of the general government revenues during the currency crisis of 2011 that had not restored completely. As fiscal policy was quite conservative (the budget had a surplus of 0.6% of GDP on average between 2000 and 2010 and 1.4% of GDP between 2011 and 2015, see Figure 4a), general government expenditures followed the revenues. That "conservative" policy was imposed by the size of operations "below the line": deep interference of the state into the economy required regular recapitalization of the largest state owned banks and other types of support to the state owned companies. For instance, during the

severe currency crisis of 2011 the government spent about 12% of GDP on net acquisition of assets – far above the fiscal surplus of 3% of GDP, which required substantial debt increase and assets sale. After the crisis of 2011, size of these operations became smaller (see Figure 4b). But because of the debt accumulated between 2007 and 2011, the government should keep fiscal surplus in order to pay principle, which limits its capacity to redistribute.

**Figure 4. General government balance, 2000–2015**



**(a) General government revenues, expenditures, and balance, 2000–2015, % of GDP**

**(b) General government balance\* and its financing, 2000–2015, % of GDP**

\* Net lending (+)/net borrowing (-).
*Source*: GFS.

The most stable sources of government revenue are contributions to social insurance and personal income tax (see Table 1), as their tax base is mainly wage income, which share in GDP is quite stable. VAT and excise taxes are also quite stable, relying mainly on household consumption, which is even less volatile than household incomes. In 2015, these four sources together generated 60.1% of all general government revenues, social insurance contribution and VAT – 45.1%.

**Table 1. General government revenue**

| | BYR mln* | % of GDP |
|---|---|---|
| **Total Revenue & Grants** | **37 666.540** | **43.3** |
| Tax Revenue | 31 991.929 | 36.8 |
|     Direct taxes *of which* | 7 319.485 | 8.4 |
|         Personal Income Tax | 3 700.907 | 4.3 |
|         Corporate Income Tax | 2 384.990 | 2.7 |
|         Taxes on Property | 1 233.588 | 1.4 |
|     Contributions to Social Insurance | 9 715.236 | 11.2 |
|     Indirect Taxes *of which* | 14 853.340 | 17.1 |
|         VAT | 7 267.080 | 8.4 |
|         Turnover & other general taxes on goods and services | 567.897 | 0.7 |
|         Excise Taxes | 1 944.165 | 2.2 |
|         Customs Duties | 864.359 | 1.0 |
|         Taxes on Exports | 2 992.432 | 3.4 |
|         Other indirect taxes | 1 217.408 | 1.4 |
|     Other taxes | 103.867 | 0.1 |
| Nontax Revenue | 5 599.073 | 6.4 |
| Grants | 75.539 | 0.1 |

\* Taking into account denomination in 10 000 times of 2016.
*Source*: GFS.

Corporate income tax, taxes on exports, and non-tax revenue together brought 29.1% of the general government revenues, but they are far more volatile due to different reasons. Corporate income tax and large portion of non-tax revenue depend on the financial status of the SOEs. Thus, on the one hand, the government subsidizes them, on the other – withdraws profit and collects corporate income tax. *Ceteris paribus*, the lower the subsidies, the lower the SOEs' profit and the related government revenues. Fiscal challenges force the government to reduce subsidies, and, hence, the tax/revenue base. Size of the revenue from taxes on exports depend on the current design of the agreements between Belarus and Russia concerning crude oil and oil products trade. Now Belarus gets all export

duties on the oil products produced by Belarusian refineries from Russian oil (which was not the case between 2007 and 2014), but Russia may cut oil supply to Belarus, reducing its exports and related budget revenues.

*Government expenditures*

A quick look at the structure of general government expenditures supports the statement about "social orientation" of the fiscal policy: social spending amounts 64.9% of the general government expenditures (see Table 2). The biggest share (10.4% of GDP) is spent on old age pensions (from the Social Protection Fund and directly from the budget). Another 2.6% of GDP is spent on social allowances on temporary disability, childbirth allowance, family allowances, maternity pay, disability/old age carer's allowance, and funeral assistance (financed by the SPF). Public expenditures on health care and education in Belarus are at the level of advanced economies (as a percentage of GDP). Indirect social spending also quite substantial: the IMF (2016) estimated government expenditures on housing and utilities subsidies to households of 1% of GDP.

**Table 2. General government expenditure and balance**

|  | BYR mln* | % of GDP |
|---|---|---|
| **Total Expenditure & Grants** | **35 629.917** | **41.0** |
| Social Spending | 23 131.264 | 26.6 |
| Social Protection | 12 991.387 | 14.9 |
| Social Assistance *of which* | 2 172.121 | 2.5 |
| Noncontributory Pensions (Expenditure on social protection, line "expenditure on old age") | 684.931 | 0.8 |
| Expenditure on family & children | 168.322 | 0.2 |
| Expenditure on housing | 646.521 | 0.7 |
| Other | 672.346 | 0.8 |
| Social Insurance (Social Protection Fund)** *of which* | 10 819.266 | 12.4 |
| Old-Age Pensions** | 8 359.478 | 9.6 |
| Education[1] *of which* | 4 649.904 | 5.3 |
| Pre-primary and primary | 977.513 | 1.1 |
| Secondary | 1 918.113 | 2.2 |
| Post-secondary non-tertiary | 476.392 | 0.5 |
| Tertiary | 793.725 | 0.9 |
| Health[2] | 3 872.301 | 4.5 |
| Expenditure on housing & community amenities *of which* | 1 617.671 | 1.9 |
| Expenditure on community development | 1 044.949 | 1.2 |
| Spending on Defense, Public Order and Safety | 2 622.543 | 3.0 |
| Expenditure on public debt transactions | 1 504.896 | 1.7 |
| Grants | 71.551 | 0.1 |
| Other Government Expenditure | 8 299.667 | 9.5 |
| **Fiscal Balance** | | |
| Primary net lending (+) / borrowing (–) | 3 541.516 | 4.1 |
| Net lending (+) / borrowing (–) | 2 036.620 | 2.3 |

* Taking into account denomination of 2016.

[1,2] Ministry of Finance of Belarus provides different figures for education and health care – BYR 4 186.4 mln and BYR 3 497.7 mln (denominated) respectively. These figures do not include investment financed within government investment programs. National classification by functions of government puts all financing of government investment programs under the line "Expenditure on general public services", while GFS distributes these expenditures between the respective functional lines. Further imputation of health care and education subsidies is based on the Ministry of Finance data.

*Source*: GFS, except ** – Social Protection Fund of Belarus.

Although large portion of the government expenditures was directed to subsidies to the state owned enterprises (SOEs), 4.7% of GDP in 2015, public investment (2.7% of GDP), and debt service (1.7% of GDP), overall design of the redistribution system allows to keep inequality relatively low. Not only social programs of the government, but also subsidies to the SOEs contribute to income redistribution. First, at least part of SOEs have excessive employment (see Favaro et al., 2012; World Bank, 2012). Hence, thanks to the government subsidies, they are paying salary to potentially unemployed people. Second, most of the SOEs bear the costs of cross-subsidization of utility tariffs, and, once again, government subsidies help them to pay higher tariffs for electricity, gas and utilities, while households pay below the level of cost coverage. Finally, SOEs apply so called "wage grid" that sets different markups to some basic wage for different types of employees and puts limits on the difference between maximum and minimum wages at any particular enterprise. Wage setting at private companies is not regulated through this mechanism, i.e. wage regulation at SOEs should reduce inequality.

However, one should not overestimate the role of the SOEs in the overall system of social support. First, between 1995 and 2016, their share in total employment fell from 60 to 40%, which means that the excessive employment fell accordingly (see Chubrik, 2016a). Second, comparing to pre-crisis level, the government cut its direct and

indirect support to the SOEs: subsidies to the SOEs fell from 9% of GDP in 2008–2009 to 4.3% of GDP in 2015; directed lending portfolio – from 25.2% of GDP in 2010 to 21.4% of GDP in 2015, see IMF (2016). These cuts leave less resources for the "social" roles of SOEs.

## 2.3. State social insurance system design

Belarusian pension system preserved main features of the PAYG system formed in the Soviet Union. There is no mandatory funded pillar with defined contribution design, and there is a rudimentary third pillar (mainly in the form of life insurance). It is organized in the form of the state social insurance system (hereafter – SSI), which is operated by the Social Protection Fund (hereafter – SPF) and funded mainly by a payroll tax (which is called "insurance contribution"). The tax rate is 35% of the total wage fund, of which 34% is funded by employers, and additional 1% is paid from employees' wages. In 2015, revenues collected via the employer contributions amounted to 91.8% of the SPF revenues. The second biggest source of the SPF revenues (5%) are subventions from the central budget, i.e. the current design of the SSI system cannot ensure complete funding of its obligations.

Out of the 35%, 29 percentage points are directed to paying pensions, while the remained 6 percentage points go to the social allowances on temporary disability, childbirth allowance, family allowances, maternity pay, disability/old age care (attendance) allowance, and funeral assistance[3].

Within the pension system, the majority of employees are subjects to 29% tax rate, of which 28% is paid by an employer and 1% is paid from employees' wages (although it is accounted as employer contribution, too). Physical persons (e.g. individual entrepreneurs) usually pay 29% of the minimum wage for the accounting period. Employers – agricultural producers pay 25% (24+1). Very small group or employers (e.g. public associations of people with disabilities, pensioners, etc.) are subject to 6% tax rate (5+1). People employed in the High-Tech Park have a celling for this tax base amounting to one average wage in the economy (others have a celling of five average wages). Self-employed and people who get pay according to civil law contracts with foreign organizations do not pay contributions to the SPF (but they can do it at will). Several categories of employees are not subject to the state social insurance – military servants and command and private personnel of the interior, and several state controlling, investigation, and emergency agencies. They do not pay contributions and receive pensions directly from the central budget. In addition, retired government officials with a state service record above 20 years are subject to additional pension which is also paid from the central budget[4].

Taking into account the high share of formal employment, the coverage is quite high: out of 4.5 mln of the employed population, about 3.4 mln employees, 0.3 mln individual entrepreneurs, and 0.3 mln of other categories paid contributions in 2016[5]. However, working age population is shrinking, while the number of pensioners is growing. As a result, dependency ratio increased from 44.1% in 2000 to 48.2% in 2016.

Between 1956 and 2016, pension age in Belarus remained constant: 55 years for women and 60 years for men. Since 2017, pension age will increase by 6 months a year until reach 58 and 63 years, respectively. In addition, to be eligible for old-age pension, in 2015 a person should have not less than 15 years of "insurance record", i.e. period of paying contributions to the SPF. In was increased from 5 years to 10 years (since 2014) and to 15 years (since 2015). Then, since 2016, this record is increasing by 6 months a year until reach 20 years.

The design of the pension system ensures substantial income redistribution. First, old age pension is equal to 55% of the "wage base", but not less than the minimum old age pension[6]. Second, one year of work record above 25 years for men and 20 years for women adds 1 percentage point to the 55%, but no more than 20% of wage base

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[3] In addition, the SPF finances targeted social assistance and employment promotion, professional pensions, sanatorium-resort rehabilitation, etc.

[4] The pension system of Belarus is regulated by laws ("On Basic Provision for State Social Insurance", "On Pension Provision", "On Civil Service in the Republic of Belarus", "On Pension Provision for Military Servants, Command and Private Personnel of the Interior, Investigation Committee of the Republic of Belarus…", etc.), Presidential edicts ("On the issues of Social Assistance", "On the Social Protection Fund of the Ministry of Labor and Social Protection", etc.), and other legislative acts.

[5] High formal employment and its coverage with social security contributions are partially inherited from the times when state owned enterprises dominated as employers. However, although their share in total employment fell from 60 to 40% between 1995 and 2016, the coverage of the employed population with social security contributions remained stable. Thus, SOEs are not the main "donor" of the Belarusian social protection system anymore, while private companies have similar payment discipline. In addition, despite the subsidies cut, the discipline of payments to the SPF remained very high: as of the beginning of 2010, overdue arrears for taxes, duties, and social contributions amounted to 0.22% of GDP, in 2016 – to 0.18% of GDP. In other words, SOEs' payments to the SPF are their own burden, not those of the state budget, at least not anymore.

[6] Minimum old age pension is equal to 25% of the subsistence minimum plus 20% of the average wage. As of 2017, it is 5.5% below the subsistence minimum.

(or minimum old age pension). And the most serious redistribution comes from the method of the wage base calculation:

$$\text{wage base} = w_1 + w_2, \text{ where}$$

$$w_1 = 0.13 \cdot \overline{w} + (w - 0.13 \cdot \overline{w}) \cdot 0.45, \text{ if } (w / \overline{w}) \leq 1.3,$$

$$w_2 = (w - 1.3 \cdot \overline{w}) \cdot 0.1, \text{ if } 1.3 < (w / \overline{w}) \leq 4,$$

where $w$ is average wage of an individual accounted for pension calculation and $\overline{w}$ is the average wage in the economy in the same period. The redistributive effect is provided in the table below.

| Actual wage, % of average wage in the economy | 50 | 100 | 130 | 400 | 500 |
|---|---|---|---|---|---|
| Wage base, % of average wage in the economy | 29.65 | 52.15 | 65.65 | 92.65 | 92.65 |
| Wage base, % of actual wage | 59.30 | 52.15 | 50.50 | 23.16 | 18.53 |

As a result, Gini index for old-age pensioners[7] in 2015 was 0.126, while for employees[8] – 0.269.

## 3. Methodology of the analysis

### 3.1. Data available and CEQ approach to income concepts construction

Analysis is based on the Household Budget Survey (HBS) data. This survey is conducted each year starting from 1995. It covers all oblasts and Minsk city, and includes observations from around 50 towns and rural councils. The sample of the survey is expected to be 6000 households (0.2% of general population). In 2015 actual sample included 6269 households, including 313 households with zero sampling weight, as they did not provide basic information about their income and expenditures. Remaining households represent 9.1 mln of people or 96.3% of total population. The sample does not cover collective households, i.e. care homes, students' dormitory, specialized institutions, etc. As any other survey, it does not properly represent the richest households and the most marginalized households, which refuse to participate in the survey. The sample is structured to be representative at country level for key population groups and for total population at oblast level. Still it inevitably has some distortions. For instance, the sample overestimates rural population by 10.1% and underestimates urban population by 7.8%.
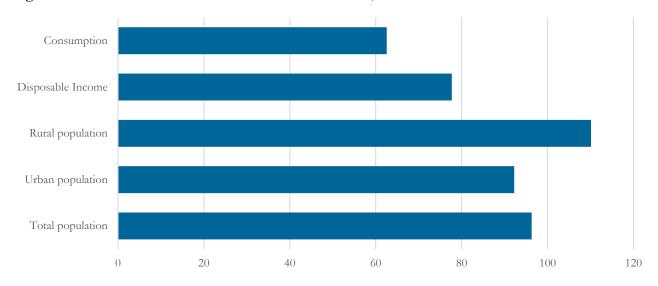
**Figure 5. Ratio of HBS data and data of national accounts, %**



*Source*: Belstat.

HBS data is used by statistical committee while computing national accounts. However, HBS data permanently underestimates household consumption if compared to retail statistics. In 2015 the scale of underestimation was extraordinary high (37.4%, see Figure 5). First, it is related to the increased volume of consumer lending. A purchase of goods on terms of consumer loans is reflected in the survey as loan servicing expenditures by households instead of consumption expenditures, which creates difference between HBS and retail statistics. Therefore, disposable income of households calculated based on total expenditures within HBS is substantially lower (22.3%)

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[7] HBS data: women 55+ and men 60+ who have pension income (total – 2,448,272 individuals).

[8] HBS data: for those who received wages during 12 months, sum of all wage-related incomes (total – 3,186,139 individuals).

than estimated within national accounts. Second, households traditionally underreport expenditures on alcohol consumption, which is a common problem of the surveys. Third, households tend not to report purchase of tobacco and fuel (and alcohol as well) for the purpose of further resale abroad, which is a wide spread coping strategy in western regions of Belarus. Hence, these expenditures accounted in retail statistics, are not actually household consumption, but rather costs within their entrepreneurial activity, so they should not be taken into account while calculating households' consumption or disposable income.

HBS data can be used to estimate household welfare and overall macroeconomic effects without additional adjustments as it represents almost the whole population and covers household expenditures in full with exception of alcohol consumption. Belstat uses this data for poverty and living standard analysis. Poverty analysis is based on comparison of disposable income of household with absolute poverty line. Disposable income is officially calculated as a sum of total household expenditures, net in-kind income and privileges (in-kind benefits). Hence, it is calculated based on reported expenditures rather than reported income, as it is believed to be underestimated (total reported cash income was 3.5% less than total reported expenditures in HBS 2015). Absolute poverty line is set at the level of minimum of substance for a member of a household containing two adults and two children.

Following official approach and assuming underreporting of households' income, we also conduct CEQ analysis based on disposable income data, assessed through expenditure side. We also apply the same national poverty line for analysis of fiscal effects on poverty. However, we are not able to match official estimate of poverty for 2015, as Belstat uses quarterly data for its estimation, while we work with the annual file. In addition to national poverty line we also calculate moderate poverty based on annual average minimum consumer budget set for a member of a household containing two adults and two children. Nowadays, this budget is not widely used for the purposes of social policy. Still it is believed to serve a threshold for determining households with a risk of vulnerability. For instance, it is used as eligibility criteria for privileged loans.

The core element of CEQ analysis is calculation of income concepts. Based on data available we take disposable income as a starting point (see Figure 6). Subtracting reported direct transfers from disposable income and adding estimated direct taxes we calculate market income. There are two approaches of assigning direct taxes and transfers based on pension system of a country. Pensions can be viewed either as a government transfer (PGT) or a deferred income (PDI). In first case, it implies that social security contributions are accounted as direct taxes while pensions are added to direct transfers. In the second case, pensions and related contributions are not taken into account while estimating market income – pensions are considered as a part of both market and disposable income concepts.

The pension system in Belarus is purely pay-as-you-go. The link between contributions and actual pensions payments in Belarus is quite weak (see Section 2.3). From this point of view, is it more natural to consider pensions as transfers similarly to other contributory programs (like unemployment benefits).
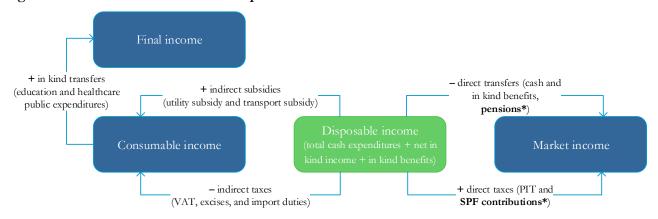
The pension system in Belarus is redistributive, effectively weakening the link between the market income and pension income after retirement. Hence, even if we agree that the effects of the pension system on poverty is debatable, the redistribution effect is the direct consequence of the government fiscal policy and should be take into account when the fiscal effects are analysed.

Finally, two important benchmark cases for the Belarus CEQ study – Russia (Lopez-Calva et al., 2017) and EU (based on EUROMOD) consider pensions as public transfers in the main scenario (in case of Russia) or the only one (EU). Considering pensions the same way in Belarus will allow proper comparison with these countries.

Due to abovementioned reasons, we chose to model pensions as government transfers (PGT) in our primary scenario. We also consider the alternative approach. Pensions are often viewed not as a handout from the state, but rather as something earned in the working age. Hence it might make sense to view pensions as deterred income (PDI). Methodologically it means that now we include pensions into the definition of market income, or, since we go from consumption, we do not subtract pensions when going from the disposable to the market income. Direct taxes now also do not include social contributions tax, and only the personal income tax is added to the disposable income to get market income.

We calculate consumable income as disposable income plus imputed indirect subsidies minus estimated indirect taxes. Further adding imputed in kind transfers we get final income. Detailed principles of estimation and imputation of related transfers and taxes are discussed in the next section.

**Figure 6. Construction of income concepts**

### 3.2. Direct taxes

Taxed paid directly by people are personal income tax (PIT), property taxes, and taxes paid by entrepreneurs. The HBS data does not contain explicit information on these taxes. Household expenditures on *property taxes* are included in the line "taxes and insurances" that feature expenditures on property taxes payment, as well as on medical, life, auto insurances, stamp duties, fines, membership fees, and other. There is no feasible opportunity to separate property taxes from other payments. Moreover, the role of these expenditures in the households' welfare is marginal. On average, "taxes and insurances" constituted only 0.8% of the disposable income of household in 2015. The role of these expenditures increases with increase of income. The richest decile spent 0.9% of their disposable income on "taxes and insurances" in 2015. Related ratio for the poorest decile was 0.6%. Hence, it may signalize about progressivity of property taxes if one assumes that they are distributed the same way as total expenditures on "taxes and insurances". However, situation may have changed in 2016, as some privileges on property tax for old-age people were abolished. Still these taxes pay limited role both in fiscal policy and households' welfare, and ignoring them would not affect conclusions about overall impact of fiscal policy on poverty and inequality in Belarus.

*Personal income tax and taxes on entrepreneurial income*

*Personal income tax* (PIT) is paid from employment and related income at the flat rate of 13%. The HBS data presents information on net income, implying that gross income and PIT payments should be estimated. We assumed that PIT is paid only from employment income. HBS contains also information on income from sales of agricultural products, receipts from personal property and real estate sale, on dividends and rental income. However, they are fully (income from sales of agricultural products) or partly exempted from PIT. In order to simplify estimation, and due to absence of information needed to make reliable assumptions on which part of the income was taxed, we considered that all these lines of income are not taxed within PIT.

Employment related income presented in HBS files on household level contains information on self-employment income. This income was subtracted as entrepreneurs enjoy special tax regime (see below).

PIT legislation provides various deductions from the tax base aimed at reduction of tax burden on vulnerable groups – low income deduction, deduction on children aged below 18 for their parents, on spouse in maternal/paternal leave, on children aged above 18 continuing education. We took into account deductions on children aged below 18, equaled to BYR 210 thsd per month for one child and 410 thsd for 2 and more children, and low income deduction of 730 thsd for persons with income less than 4420 thsd per month. As there is no information on relations between household members, we assigned deductions on children for all employed members of the household with children.

According to our estimates (see Appendix A) total volume of PIT should have amounted to BYR 36.2 trn in 2015, which fits actual data. PIT revenues of consolidated budget in 2015 were equal to BYR 37.0 trn[9]. The ratio of estimated PIT paid by household and gross income from employment of household members is 11.3%, which can be viewed as effective PIT rate in Belarus. The modelled PIT payments are distributed rather progressively both

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[9] In BYR before denomination of 2016 by 10000 times. For revenues in BYR after denomination see Table 1.

in absolute and relative terms (see Figure 7a). Lower deciles pay less personal income taxes than upper deciles if measured as a share of their disposable income before taxation due to deductions provided to households with children and low-paid employees. Another factor is lower share of employment income in disposable resources of lower deciles. Only first decile from the first five relies on employment income at the same extent as population on average (around 50% of disposable income of the first decile is generated by employment income). This strata comprises more households with children and less households with pensioners compared to other low income deciles[10], which explains higher role of employment income in their disposable resources. Consequently, first decile has slightly higher PIT tax burden than other low deciles.

*Taxation of entrepreneurs* is not uniform. It depends on type of entrepreneurial activity, place of residence, and its scale. In general, entrepreneurs may pay taxes on general basis, may apply simplified tax regime for entrepreneurs, or pay lump-sum tax set by local authorities. Therefore, modelling of entrepreneurial taxes was based on macroeconomic data. Total amount of taxes paid by entrepreneurs in 2015 amounted to BYR 4212.8 bn, while total number of entrepreneurs as of the end of 2015 was 240 781[11]. It means that on average entrepreneur paid BYR 1,458,000 of taxes monthly. This volume of payments was assigned to every individual who had entrepreneurial income.

Information on related income is provided in HBS files together with income from side (day-to-day) jobs as a part of employment income. We assumed that entrepreneurial income was only that exceeding 2 minimal wages in annual terms. This threshold guaranteed that number of entrepreneurs in HBS files corresponded to their total amount[12].

*Social Protection Fund contributions*

Social Protection Fund (SPF) finances public expenditures on pensions and social benefits. Contributions to SPF are payroll tax at the rate of 35%. Employers pay main part of the tax (34%), while employees are charged with 1% of their gross wage. According to legislation, lower rates (31%, i.e. 30 and 1%) are levied on those employed in agricultural sector (at enterprises with agricultural production exceeding 50% of total production). As most of rural population in Belarus is employed in agricultural sector, we assumed that all rural population pays payroll tax at the rate of 31%.

Furthermore, there are upper and lower bounds for the payroll tax base. It should not be lower than minimum wage and should not exceed 5 average wages in case of full employment. In our sample there were only 3 observations, where gross wage exceeded 5 average wages. For these persons, SPF contributions were calculated as 35% of upper bound.

In practice, lower bound is not applied for employed as minimum wage regulation holds in Belarus. It is more relevant for entrepreneurs. They are obliged to pay contributions to the SPF at the rate not less than 35% from minimal wage. Entrepreneurs can choose to pay contributions from higher wage base but they are reluctant to do it, as it does not guarantee feasible increase in future pensions. Hence, we assumed that entrepreneurs paid contributions to the SPF at the volume of 35% of minimum wage[13].

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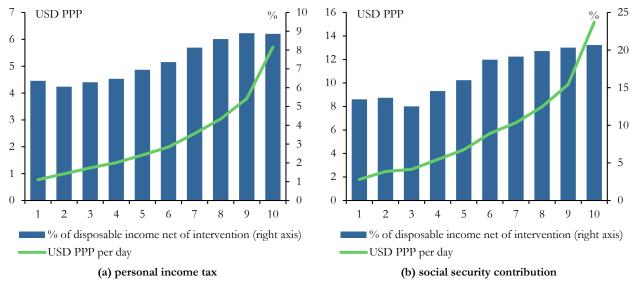
[10] 81% of households in the 1st decile ranked by disposable income before personal income taxation are households with children, while average share is 47.5% (48.5% for the 4th decile). The share of households with at least one member above 60 years old is 37.3% in the first decile and 57% on average in the sample (72.1% in the 4th decile).

[11] Ministry on Taxes and Duties of Belarus, www.nalog.gov.by/uploads/folderFor-Links/Ежемесячно%20на%20сайт%20по%20СМП%20и%20ССП%20на%2001.01.2017.xlsx.

[12] According to this approach, the number of entrepreneurs in HBS file corresponds to the total number of 218,000.

[13] SPF contributions by entrepreneurs are paid once a year in February. It means that in 2015 entrepreneurs paid contributions for 2014. So we estimated payment based on annul average minimum wage of 2014.

**Figure 7. Incidence of direct taxes by deciles**



| (a) personal income tax | (b) social security contribution |

*Note.* Deciles are ranked by disposable income before personal income tax (a) and social security contribution (b).
*Source*: own estimates based on HBS data.

This approach generated relevant estimates of payroll taxes. Total amount of estimated SPF contributions equaled to BYR 94.3 trn, which is close to actual amount of contributions in 2015 (BYR 95.3 trn). Estimated contributions are distributed progressively in absolute and relative terms (see Figure 7b). A fall in the share of SPF contributions in disposable income before SPF taxation in the third decile is related to significant share of pensioners in this strata[14].

### 3.3. Indirect taxes

*VAT*

VAT generates the largest volume of general government revenues. Most of the goods and services either domestically produced or imported are taxed at the rate of 20%. Hence, share of VAT in consumer prices of these goods and services is 16.7%. Lower rate of 10% (corresponding to the share of 9.1% in consumer prices) is applied to agricultural and most of food products, as well as children goods. Exported goods are taxed at the rate of 0%. Furthermore, some services that are exempted from VAT. The list of these services reduced substantially in last decade, as the government strives to keep the tax base stable despite economic recession. As of 2015, healthcare, education, and utilities services were exempted from VAT. Besides VAT was not applied to purchase and rent of real estate by households. Exemption from VAT implies that providers of corresponding services has no VAT refund. So they report VAT on inputs as costs, including them into basic prices. Hence, effect of VAT taxation on consumer prices of these services depends on the share of intermediates in total production. Related estimates were accomplished within input-output tables after matching household expenditure lines with the industries from national accounts. Results of these estimations are presented in the Table 3.

According to these estimates, share of VAT in household consumption is equal to 11.7%, which corresponds to the ratio of general government VAT revenue to national final consumption (11.9%).[15] It stresses good approximation of obtained estimates of VAT burden on households to actual VAT payments. Still, due to discrepancy between consumption data of HBS and national accounts we may underestimate total volume of VAT payments by households. The estimated volume is BYR 37.7 trn, which constitutes only 51.8% of total general government revenues from VAT. For instance, share of household final consumption in total final consumption is 77.1%.

Our estimates show that this burden is evenly distributed among population if measured as a share of disposable income (see Figure 8a). It can be attributed to the facts that structure of household expenditures does not differ

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[14] 77.1% of households in the third decile ranked by disposable income before payment of SPF contributions are households with at least one member aged above 60 years. Average share is 57%.

[15] The ratio of estimated VAT payments of households to their disposable income is 8.8%. According to the administrative data, collected VAT revenue is equal to 8.4% of national disposable income.

much across population (with some exception of the 1st and 10th deciles), and most of goods and services are taxed at the same VAT rate.
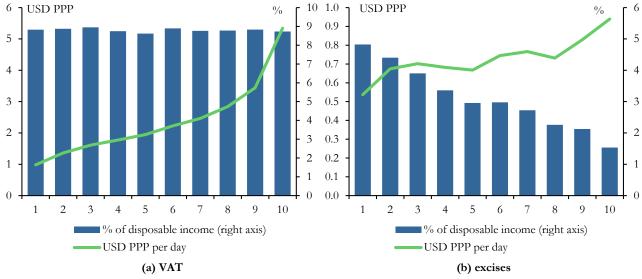
**Table 3. Share of VAT in consumer prices by expenditure line**

| Expenditure line (COICOP) | Industry (ISIC) | VAT rate |
|---|---|---|
| Food* | Food products | 9.1 |
| Alcohol and tobacco* | | 16.7 |
| Clothing | Textiles, and textile products | 16.7 |
| Footwear | Leather and footwear | 16.7 |
| Fabrics | Textiles, and textile products | 16.7 |
| Housing, fuel for heating dwellings** | Electricity, gas and water supply and forestry | 7.6 |
| Housing, utilities*** | Electricity, gas and water supply and other community, social and personal services | 7.3 |
| Housing, other | Real estate activities and renting | 0.0 |
| Household appliances | Computer, electronic and optical equipment, | 16.7 |
| Furniture | Wood and products of wood and cork | 16.7 |
| Health care | Health and social work | 3.9 |
| Public transportation | Transport | 16.7 |
| Maintenance of private vehicles | Coke, refined petroleum products and nuclear fuel | 16.7 |
| Purchase of cars and other vehicles | Motor vehicles, trailers and semi-trailers | 16.7 |
| Communication services | Post and telecommunications | 16.7 |
| Culture, recreation and sports | Hotels and restaurants | 16.7 |
| Secondary and higher education | Education | 3.0 |
| Preschool education | Education | 3.0 |
| Eating out and restorans | Hotels and restaurants | 16.7 |
| Personal care | Chemicals and chemical products | 16.7 |
| Other goods and services | Manufacturing nec | 16.7 |
| Food purchased for animals and for cultivation of land plot | Agriculture | 9.1 |
| Construction and purchase of real estate | Construction | 8.1 |

*Notes.*
\* VAT rate for alcohol and tobacco is 20%, while for majority of food products it is set at 10%.
\*\* Structure of fuel used for heating in houses with autonomic heating is following: 40% wood fuel, 60% gas[16]. Based on these weights we estimated VAT rate for expenditures on fuel for heating as weighted average VAT rate for "electricity, gas and water supply" and "forestry".
\*\*\* VAT rate is estimated as average for "electricity, gas and water supply" and "other community, social and personal services" weighted on sectors' total output.
*Source*: own estimates based on the Tax Code of Belarus and Input-Output Tables for 2014.

**Figure 8. Incidence of indirect taxes by deciles**



**(a) VAT**    **(b) excises**

*Note.* Deciles are ranked by disposable income.
*Source*: own estimates based on HBS data.

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Excises are levied on alcohol, tobacco, and fuel for motor vehicles. Excise rates are set to physical and the government tends to review them regularly due to high inflation rates. So we calculated excise payments of households based on quarterly files of HBS.

HBS files contain information on household expenditures of excise goods. However, households tend to underreport related consumption. The gap between expenditures on *alcohol* reported by households and its actual consumption based on the retail trade turnover is especially high: alcohol expenditures reported in the HBS are only about 25% of retail sales of alcohol. It implies that HBS data needs an adjustment to retail trade statistics in order to receive reliable volume of excises paid by households.

We possess HBS data on the total amount of alcohol expenditures on the one hand, and sales/average prices/excise rates by types on the other. Based on data on alcohol retail sales, its average prices, and respective excise rates, we estimated shares of excise taxes in retail prices by alcohol type. Next, we made an assumption about the structure of alcohol consumption by different types of households. We assumed that the cheapest alcoholic beverages are consumed by the poorer households, and shares of more expensive alcohol are growing with the household income, distinguishing between quintiles of households by their expenditure (see Table 4). Having the retail trade data on sales of different types of alcohol and assuming about the structure of alcohol consumption by quintiles, we estimated total alcohol expenditures by household quintiles. Dividing imputed alcohol expenditures by HBS alcohol expenditures for every quintile, we got quintile-specific "alcohol expenditure underreporting coefficients" (see Table 5). Assuming that every household in a particular quintile that reported about alcohol expenditures has the same "bias", we imputed alcohol expenditures as $EXP_i^{alc} \cdot m_i^q$, where $EXP_i^{alc}$ is initially reported expenditures on alcohol of household $i$ from quintile $q$, and $m_i^q$ is quintile-specific alcohol expenditure underreporting coefficient from the Table 5. Consequently, the amount of alcohol excises paid by household $i$ was calculated as $EX_i^{alc} = EXP_i^{alc} \cdot m_i^q \cdot dEX^q$, where $dEX^q$ is the share of excises in expenditures on alcohol by quintile from the Table 4.

**Table 4. Assumptions and inputs for estimating household payments of alcohol excises**

| | Vodka | Liquers | Wine | Fruit wine | Cognac | Sparkling wine | Low alcohol beverages | Beer |
|---|---|---|---|---|---|---|---|---|
| **Share of excise tax in retail prices of alcoholic beverages, %** | | | | | | | | |
| 1st quarter | 43.1 | 32.6 | 7.6 | 36.9 | 20.5 | 9.6 | 28.0 | 17.5 |
| 2nd quarter | 44.1 | 32.9 | 7.3 | 36.9 | 19.8 | 8.4 | 27.5 | 16.6 |
| 3rd quarter | 44.2 | 29.2 | 7.8 | 39.0 | 18.2 | 8.8 | 27.2 | 16.1 |
| 4th quarter | 43.9 | 30.0 | 7.8 | 39.0 | 17.9 | 8.5 | 27.2 | 15.6 |
| **Structure of alcoholic beverages consumption by quintiles of population, %** | | | | | | | | |
| 1st quintile | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 |
| 2nd quintile | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| 3rd quintile | 30 | 0 | 25 | 0 | 0 | 50 | 0 | 25 |
| 4th quintile | 25 | 40 | 25 | 0 | 0 | 25 | 100 | 30 |
| 5th quintile | 15 | 60 | 50 | 0 | 100 | 25 | 0 | 15 |
| **Total** | **100** | **100** | **100** | **100** | **100** | **100** | **100** | **100** |

*Source*: own estimates based on Belstat (retail prices for alcoholic beverages) and Ministry of Taxes and Duties (excise tax rates for 2015); own assumptions.

Expenditures on *tobacco* and *fuel for motor vehicles* reported in HBS files are also below retail sales data. This discrepancy can be attributed to the widespread cross border trade in cigarettes and gasoline/diesel with EU countries. Hence, contrary to alcohol products, there is no need to adjust consumption expenditures of households on tobacco and fuel for motor vehicles to the retail statistics.

In order to estimate tobacco excise payments, we calculated average weighted share of excises in consumer prices of the tobacco products. The weights for tobacco products (cigarettes with filter, cigarettes without filter, imported cigarettes with filter) were taken proportionally to their share in consumer price index. According to our estimates, the share of excises in expenditures on tobacco equaled to 31.9% in 2015.

Estimates of fuel excises were based on structure of fuel expenditures reported in HBS files and shares of excises in gasoline and diesel prices (13.4 and 7.6%).

**Table 5. Estimated parameters of alcohol consumption underreporting and share of excises in house-hold expenditures by quintile**

|  | 1st quintile | 2nd quintile | 3rd quintile | 4th quintile | 5th quintile |
|---|---|---|---|---|---|
| Scale of underreporting, times | 7.9 | 6.5 | 5.6 | 4.5 | 2.8 |
| Share of excises in expenditures for alcohol, % | 38.0 | 32.4 | 28.7 | 27.7 | 23.3 |

*Source*: own estimates based on Belstat (retail prices for alcoholic beverages) and Ministry of Taxes and Duties (excise tax rates for 2015); own assumptions.

According to our estimates, total volume of excises paid by households in 2015 amounted to BYR 11.4 trn. Total volume of excises collected by general government was BYR 19.4 trn. The difference is constituted by fuel excises paid by legal entities, as well purchase of tobacco and fuel by households for further sale abroad rather than individual consumption. According to our estimates, excises are regressive in relative term (see Figure 8b), as lower deciles of population tend to spend bigger share of their disposable resources on alcohol and tobacco products.

*Import duties*

Impact of import duties on welfare of socially vulnerable groups was partly analyzed in research devoted to the consequences of Russian WTO accession to Belarus social policy in Shymanovich (2013). Results showed that reduction of import tariffs expected due to Russian WTO accession should have had minor impact on population welfare, which is evenly distributed among population. One of the reasons of these results were small scale reduction of tariffs that is scheduled in Russian WTO accession agreement.

In our research, we will apply the same methodology as in Shymanovich (2013) in order to see whether conclusions on neutral influence of import duties on inequality hold within full-fledged abolishment of import tariffs. Volume of import duties paid by households we estimate based on data on household consumption, share of import products in retail sales and import tariffs by formula:

$$D^m = \sum_{i=1}^{n} C_i \cdot S_i^m \cdot \frac{t_i}{1+t_i},$$

where $C_i$ is the consumption of the product $i$ from HBS data, $n$ is equal to 37 product groups (see table), $S_i^m$ is the share of imports in the consumption of the product $i$, and $t_i$ is a level of import tariff for the product $i$.[17]

Table 6 presents data required for these estimations. Import tariffs for expenditure lines were taken for corresponding product groups within HS classification and weighted by import volumes. Share of import products in household consumption was supposed to be equal to the share of related goods in retail sales.

**Table 6. Assumptions and inputs for estimating import duties**

| Expenditure line (COICOP) | Corresponding HS code | Weighted average import tariffs | Import share in retail** | Import price elasticity*** |
|---|---|---|---|---|
| Expenditures for bread | 1905 | 13.2 | 6.1 | -0.8 |
| Expenditures for pastry | 1905 | 12.5 | 6.1 | -0.8 |
| Expenditures for flour | 11 | 11.2 | 4.0 | -1.2 |
| Expenditures for cereals and beans | 10 | 5.5 | 43.3 | -0.9 |
| Expenditures for macaroni food | 1902 | 14.0 | 35.4 | -0.7 |
| Expenditures for milk | 4 | 15.8 | 5.7 | -1.4 |
| Expenditures for sour cream and cream | 4 | 15.8 | 5.7 | -1.1 |
| Expenditures for butter | 405 | 18.2 | 1.3 | -0.8 |
| Expenditures for cheese | 406 | 18.5 | 12.6 | -0.6 |
| Expenditures for other dairy products | 4 | 15.8 | 5.7 | -1.1 |
| Expenditures for beef and veal | 201 | 23.8 | 0.1 | -1.0 |
| Expenditures for pork | 203 | 32.5 | 0.3 | -2.9 |
| Expenditures for sausages and smoked meat | 16 | 14.8 | 0.6 | -1.1 |
| Expenditures for poultry | 207 | 52.5 | 0.8 | -2.9 |
| Expenditures for fat | 209 | 15.0 | 0.5 | -1.8 |

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[17] This formula allows estimating first order welfare effect of import duties abolishment on welfare of population, if one assumes that reduction of duties results in proportional reduction of prices. For estimating second order effect one should tak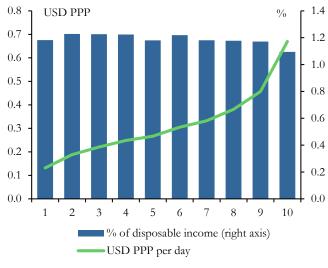e into account import price elasticities $\varepsilon_i$, estimated in Shymanovich (2013) based on data from Kee, Nicita, Olarreaga (2009). Related formula is: $\Delta W = \sum_{i=1}^{n} C_i \cdot \frac{t_i}{1+t_i} \cdot S_i^m \cdot (1 + \frac{t_i}{1+t_i} \cdot \varepsilon_i)$.

| Expenditure line (COICOP) | Corresponding HS code | Weighted average import tariffs | Import share in retail** | Import price elasticity*** |
|---|---|---|---|---|
| Expenditures for other meats | 2 | 34.2 | 0.7 | -1.4 |
| Expenditures for fish and seafood | 3 | 8.0 | 42.1 | -1.3 |
| Expenditures for vegetable oil, margarine and other grease | 15 | 14.3 | 74.2 | -1.0 |
| Expenditures for eggs | 407 | 0.2 | 0.2 | -1.0 |
| Expenditures for potatoes | 701 | 13.8 | 6.8 | -1.2 |
| Expenditures for vegetables and melons | 7 | 13.8 | 32.1 | -0.8 |
| Expenditures for fruits and berries | 8 | 3.4 | 89.8 | -1.0 |
| Expenditures for sugar and confectionery | 17 | 6.1 | 22.0 | -1.0 |
| Expenditures for tea, coffee, cocoa | 9 | 12.9 | 76.6 | -1.0 |
| Expenditures for non-alcoholic drinks | 2201, 2202* | 10.9 | 17.2 | -0.9 |
| Expenditures for other food | food average | 15.9 | 26.3 | -1.2 |
| Expenditures for alcohol and tobacco | 22, 24* | 7.7 | 11.7 | -1.5 |
| Expenditures for clothing | 61, 62* | 10.1 | 41.5 | -1.9 |
| Expenditures for footwear | 64 | 2.3 | 52.4 | -1.0 |
| Expenditures for fabrics | 59, 60* | 5.8 | 30.9 | -1.0 |
| Expenditures for household appliances | 85 | 5.3 | 74.7 | -1.2 |
| Expenditures for furniture | 94 | 12.4 | 10.4 | -0.9 |
| Expenditures for health care | 30 | 7.7 | 64.6 | -0.9 |
| Expenditures for maintenance of private vehicles | 2710, 8708* | 1.2 | 18.5 | -1.4 |
| Expenditures for purchase of cars and other vehicles | 25% for 19.2% of import | 4.8 | 98.9 | -1.2 |
| Expenditures for personal care | 34 | 10.6 | 77.7 | -0.8 |
| Expenditures for for food purchased for animals and for cultivation of land plot | 23 | 4.2 | 47.9 | -1.0 |

*Notes.*

\* Average import tariffs were weighted by import volume (from world in 2015). Data of tariff rates is taken from TRAINS database (as of 2014, partner – world).

\*\* Data on share of import goods in retail sales is obtained from Belstat yearbook on retail trade[18] and monthly bulletins on retail trade.

\*\*\* Elasticities are from Shymanovich G. (2013). Absent elasticities were assumed as following: for "bread", "other dairy products", and "poultry" equaled to "pastry", "sour cream and cream", and "pork" respectively; for "eggs" equaled to -1; for "other food" as average of elasticities for food products; for "alcohol and tobacco" as average elasticity of alcohol and tobacco weighted by import; for "maintenance of private vehicles" as average elasticity for HS2710 and HS8708 weighted by import volume.

*Sources:* TRAINS database, Shymanovich G. (2013), Belstat.

**Figure 9. Incidence of import duties by deciles**



*Note.* Deciles are ranked by disposable income.
*Source:* own estimates based on HBS data.

According to the estimates total volume of import duties paid by household amounted to BYR 5.0 trn in 2015. Ministry of Finance reported BYR 8.6 trn revenue from import duties. These numbers look reasonable as import

[18] http://www.belstat.gov.by/ofitsialnaya-statistika/realny-sector-ekonomiki/vnytrennia-torgovlya/roznichnaya-torgovlya/pub-likatsii_6/index_702/.

of investment goods is largely exempted from import duties, while intermediate goods are mainly imported within customs union with Russia and other CIS countries. According to our estimates import duties are progressive in absolute terms, but neutral in relative terms (see Figure 9). Payment of import duties constitutes similar shares of disposable income of lower and upper deciles. The only exclusion is the 10th decile, in which people tend to save more and spend more on real estate and services.

## 3.4. Direct transfers

Data on majority of direct transfers received by households is available in HBS files. They feature revenues from following benefits and privileges:

- Benefits
  - o    pregnancy registration and child birth benefit
  - o    maternity benefit
  - o    children allowances for children aged below 3,
  - o    children allowances for children aged above 3,
  - o    attendance allowance
  - o    funeral benefit
  - o    pension for death of a breadwinner
  - o    pension for disabled children
  - o    unemployment benefit
  - o    severance pay
  - o    student grants
  - o    social assistance and other
- Privileges
  - o    Food privilege
  - o    Passenger transportation privilege
  - o    Hosing and utilities privileges
  - o    Fuel privileges
  - o    Electricity privileges
  - o    Communication service privileges
  - o    Health resort privileges
  - o    Privileges for pharmaceuticals
  - o    Privileges for social rehabilitation appliances
  - o    Preschool education privileges
  - o    Other privileges
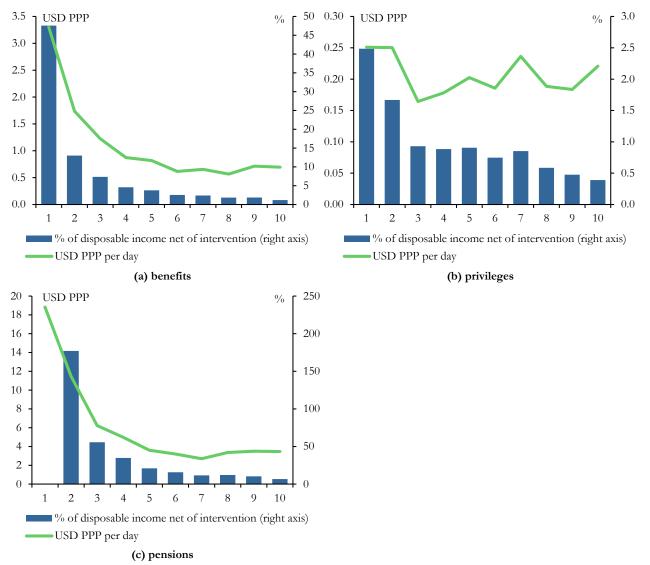
Total amount of benefits received by households corresponds to public expenditures of BYR 17.6 trn. It matches official figure of BYR 17.5 trn that SPF spent on financing social benefits in 2015. Volume of privileges, according to HBS data, equaled to public expenditures of BYR 3.2 trn. Distribution of cash and in-kind direct transfers differs significantly. Benefits are progressive in absolute and relative terms (see Figure 10a). First decile ranked by disposable income net of transfer receives on average almost 2 times more benefits in absolute term than the second decile. Benefits increase disposable income of the first decile by 47.6%, while average effect over the sample is 8.6%. Privileges are less targeted. Absolute volume of privileges received by lower and upper deciles is almost the same (see Figure 10b). Still, disposable income for lower deciles is more vulnerable to revision of privileges than income of upper deciles.

Belarus has a PAYG pension system, which implies that pensions have nature of transfer rather than deferred income. Pensions reported by households are equal to total public expenditures of 96.2 trn. Related expenditures of SPF were equal to 83.4 trn. Besides, non-contributory pensions (provided to retired civil servants and persons retired from national security, defense and law enforcement agencies) were financed from the central government budget at the level of BYR 6.8 trn. Still HBS data overshoots actual public expenditures on pensions by 7.3%. It is related to the structure of the survey sample, which overestimates actual number of population above working age by 9.5%.

**Figure 10. Incidence of cash and in-kind benefits by deciles**



(a) benefits

(b) privileges



(c) pensions

*Note.* The ratio of pensions to the disposable income net of pensions for the first decile is not calculated as related net income for this decile is close to 0.
*Source*: own estimates based on HBS data.

### 3.5. Indirect Subsidies

Subsidies on the utilities and urban public transportation are two major types of indirect subsidies in Belarus. Utilities subsidies amount to 2% of GDP, with around 1% covered by the cross-subsidization by the enterprises, and the other 1% coming directly from the budget (IMF, 2016). As of 2015, subsidies on utilities were available to everyone automatically in form of subsidized tariffs in the utility bill (since September 2016 direct subsidies to the utilities are also available). Some households and apartments, however, are not eligible for a subsidy. These are the households where the household head owns more than one apartment or house, or if no one is registered in the apartment (usually in case when the apartment is rented out). According to IMF estimates, households with access to subsidy covered 48.5% of the actual costs.

Expenditures on the utilities are reported in the HBS, but the households do not report if they get the subsidy or not. To identify the households without access to the subsidized tariff we establish a cut-off in utilities cost per square meter. If the household is paying above the cut-off of BYR 15 000 per m² (two times higher than average), or above BYR 1 000 000 in total per month (three time higher than average), we assume the household does not obtain the subsidy. The rest of the households are assigned a 51.2% subsidy on top of their actual utilities expenditure.

To check if we have allocated the utilities subsidy correctly, we gross up the allocated utilities, and find that they sum up to 1.96% of GDP, which coincides with the IMF estimate of 2% of GDP.

**Figure 11. Indirect subsidies by disposable income deciles**



**(a) Incidence of indirect utility subsidy, by disposable income decile, USD PPP and %**

**(b) Incidence of indirect transport subsidy, by disposable income decile, USD PPP and %**

*Source*: own estimates

As we see from Figure 11a, utility subsidies are regressive in absolute value: the top decile obtains twice the amount the bottom decile obtains through the subsidy. This result is not unexpected: the subsidies are equally available to the rich and the poor. But since higher income usually implies more spacious housing, higher income households face higher utility costs and receive higher subsidy. However, in relative value the utility subsidy is progressive: lower deciles obtain higher proportion of their income in form of the subsidy.

Many kinds of public transportation are indirectly subsidized in Belarus by budget support to the state-owned transport companies. However, we focus on the urban public transportation as the major source of transport subsidies, and also the only one on which the data on cost coverage is available. As with the utility subsidies, the transport subsidies are built-in in the tariffs, but unlike the utility subsidies, transport subsidies are available to every user without exemptions.

Transport expenditures are reported in HBS as a total for all kinds of expenditure, including but not limited to the urban public transport. To impute the urban public transport expenditure, we follow the next steps:

1. We assume that all household transport expenditure below BYR 100 000 (a sum close to the average cost of round trip ticket between the regional centers) are expenditure on urban public transportation. A monthly pass cost above BYR 200 000 in 2015 in Minsk, hence this cut-off is not too high.
2. We build a truncated regression model for the transport expenditure below the threshold of BYR 100 000. The explanatory variables are number of the working-age and retirement-age adults in the household, region, residence type (large cities or small cities) and car ownership. Income level turned out to be insignificant, and we excluded it.
3. Using the estimated model, we imputed the urban public transport expenditure for the rest of the households. If the imputed level was higher than the actual reported expenditure on transportation, we replaced it with the reported value.
4. We applied the subsidy of 62%[19] to the imputed urban transportation costs.

According to our imputation, transport subsidies amount to almost 1% of GDP. Unfortunately, we do not have the aggregate data on the value of transport subsidies, so we cannot check the validity of our imputation of transport subsidies by grossing up. Hence, all the results concerning those subsidies should be interpreted with caution.

Transport subsidies are regressive in both absolute and relative value: the top decile obtains twice the amount the bottom decile obtains through the subsidy (see Figure 11b). The result is mainly driven by the fact that only the urban population (with higher incomes) has access to the transport subsidy. Moreover, employed working-age individuals are more likely to use public transportation and enjoy the subsidy, and they also happen to be the ones with higher incomes.

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[19] See https://news.tut.by/society/505674.html.

### 3.6. In-kind transfers (healthcare and education)

Healthcare in Belarus is dominated by the government, which remains the main provider of health services. The public health system is a Soviet-style centralized *Semashko* system, with the extensive network of state-owned polyclinics and hospitals providing comprehensive healthcare. Healthcare in the public system is free to every citizen of Belarus, independent of income, employment or any other socio-economic characteristics. No contributions are necessary to gain access to healthcare.

According to the official data (Ministry of Finance, 2016), total health expenditure in the government budget amounted to BYR 34 977 bn in 2015 (4.0% of GDP). Around 40% of the total public health expenditure is spent on the primary and secondary care through polyclinics, and the rest covers the tertiary care through hospitals (World Bank, 2013).

While healthcare expenditure is universal, and it would be tempting to distribute health expenditure (and benefits) equally, we prefer to assign the health expenditure to the actual beneficiaries. In this case we would attribute expenditure to actual recievers. This approach would allow us to capture differences in needs, for example, by gender and age. Moreover, despite the universal system, de-facto access to health services is very different for rural and urban residents.

HBS stopped reporting doctor's visits and hospital stay since 2008. We use the 2008 dataset to model number of doctor's visits and probability of hospital stay, and then use the model to predict those variables in the 2015 data. We use the Poisson estimation to model the number of visits to the doctor, and probit to model the probability of a hospital stay. In both cases the explanatory variables are age, age squared, gender, being a child dummy, smoker status, self-reported health evaluation, region, residence type, body mass index, and level of education.

**Figure 12. Health and education expenditure by disposable income deciles**



**(a) Incidence of health expenditure,**
**by disposable income decile, USD PPP (bars) and % (lines)**

**(b) Incidence of education expenditure,**
**by disposable income decile, USD PPP (bars) and % (lines)**

*Source*: own estimates.

After using the estimated models to predict the number of doctor's visits and probability of hospital stay in 2015, we allocate primary and tertiary care expenditure on healthcare proportionately to them. In absolute values health expenditures are allocated rather flatly across different disposable income deciles, although there is a slight upward slope. Ceteris paribus one might expect a negative relationship between health expenditure and income (with poorer people usually having lower health). However, in Belarus the lower income deciles are largely represented by rural non-retiree households, which have lower access to healthcare. Hence, the expenditure schedule across deciles looks flatter than expected. In relative terms, however, health expenditures are clearly progressive, reflecting the free universal access to healthcare (see Figure 12a).

Public education expenditure amounted to 4.8% of GDP in 2015. 1.1% of GDP was spent on pre-school and primary school education; 2.24% of GDP on general secondary (school) education; 0.56% on continued secondary education (vocational and specialized non-college education) and 0.90% of GDP on higher (college) education (Ministry of Finance, 2016).

Public school education is free, although the households pay for the textbooks and food out of pocket; private schools and colleges exist, but they are few and negligible in their coverage. At the tertiary level (vocational, specialized and college education) fees are widespread, and access to free education is conditional on performance. Usually the fees are below the total education cost.

As the primary and secondary school enrollment rates are 100% or higher in Belarus (World Bank, 2013), we allocate the preschool and primary and general secondary education expenditures to all children of ages 3-10 and 11-16 correspondingly. At 16 children graduate from the obligatory school, and are free to either continue in high school to enter college, go to the labor market or enroll in the vocational or specialized educational institutions. Since 2015 HBS data lacks information on the socio-economic status, and we do not observe whether a young person is a student or not. To impute the probability of being a student, we use 2014 data which still had the socio-economic status variable. We build a probit probability model for people aged 16-40, with age, gender, region, residence type, household size and education level being the explanatory variables. After imputing the probability of being a student, we assign expenditure on continued secondary and college education according to age. We do not scale down health and education expenditure. The main reasoning behind scaling down is that normally all the taxes and transfers in the CEQ analysis are not forced to be equal to their counterparts in the national accounts (see Higgins, Lustig, 2016). However, in our exercise the allocation of most of the taxes and transfers are quite close to their counterparts in the national accounts.

Major education expenditure categories, primary and secondary education, are highly progressive both in relative and absolute terms, as seen in Figure 12b. Households with children, the main recipients of educational expenditure, are on usually poorer (in per capita terms) than households without children; poorer households also tend to have more children. The expenditure on college (higher school) education, in contrast, is regressive in absolute terms, as individuals from higher-income households are more likely to enroll in colleges.

## 4.    Results and Discussion

### 4.1.  Main results
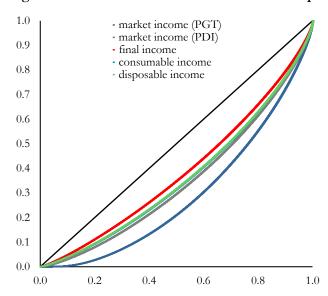
Results of the CEQ analysis show that fiscal interventions contribute much to reduction of inequality in Belarus if pension system is modelled as a part of fiscal policy. Most of the effect on inequality comes from direct transfers and privileges in case pensions are treated as government transfer (PGT) (see Figure 13). The decrease in inequality indicators calculated for market and disposable income, when pensions are viewed as government transfer, is massive, from 0.407 to 0.267 in Gini index. Particularly large improvement is observed for the ratio of the average income of the richest 10% to the poorest 10% - from 14.82 to 3.25 (see Table 7). A significant number of people without market income relying on direct transfers, pensions in particular, explains this result[20]. According to modelling approach when pensions are viewed as deferred income (PDI), reduction of inequality related to fiscal interventions determining difference between market and disposable income is only marginal. Furthermore, moving from disposable to consumable income does not influence overall level of inequality, implying that the burden of indirect taxes and gains from indirect transfers is distributed among population proportionally to the income. In-kind transfers are obviously more progressive, as inequality indicators reduce substantially from consumable to final income.

Fiscal interventions also determine the level of absolute poverty. According to the international poverty lines of 2.5 and 5 USD PPP per day risk of poverty is eliminated in Belarus at the level of disposable income. Moreover, the risk of absolute poverty at these lines is also negligible according to market income concept when pensions are treated as deferred income (PDI). Only having excluded pensions from market income (PGT approach) poverty lines of 2.5 and 5 USD PPP per day can reveal some vulnerable population, as some households rely heavily on pensions. The risk of poverty is much higher if one considers the line of 10 USD PPP per day (which is often used for determining middle class in international studies) or national poverty line. In fact, the subsistence minimum in Belarus – national absolute poverty line – exceeds 10 USD PPP line, implying relatively high overall level of income in the country if measured in USD PPP terms. Hence, we will use national absolute poverty line as a main benchmark for analyzing influence of fiscal policy on poverty in Belarus. For more detailed analysis of vulnerable groups of population one can also apply minimum consumer budget as a national moderate poverty line.

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[20] 3.5% of population lives in households without market income (modelled by PGT approach).

**Figure 13. Lorenz curves for basic income concepts**



*Source*: own estimates based on CEQ methodology.

According to national poverty line, 20.2% of population would be poor if there were only market income without any fiscal interventions including pension system[21]. In case pensions are treated as deferred income the level of poverty is much lower (5.9%), stressing significant role of pension system in poverty reduction. On the one hand, it stems from the size of pensions that exceed national poverty line. On the other hand, it stresses that pensions is a sole or dominant income for many households in Belarus. Fiscal redistribution related to other direct transfers and taxes offsets the risk of poverty down to 3.4%[22]. Moreover, the poverty gap according to the disposable income concept is also rather low, stressing absence of extreme poverty within disposable income concept. On the contrary, the system of indirect taxes and subsidies increases the risk of poverty up to 5.2%, not affecting much its depth (poverty gap remains low).

**Table 7. Main poverty and inequality indicators by income concepts**

| | | Market Income | | Disposable Income | Consumable Income | Final Income |
|---|---|---|---|---|---|---|
| | | PGT | PDI | | | |
| Gini | | 0.407 | 0.292 | 0.267 | 0.270 | 0.227 |
| Theil Index | | 0.259 | 0.151 | 0.129 | 0.131 | 0.094 |
| 90/10 | | 14.82 | 3.70 | 3.25 | 3.32 | 2.61 |
| USD 2.5 PPP | Headcount Index | 8.3 | 0.2 | 0.0 | 0.0 | 0.0 |
| | Poverty Gap | 5.9 | 0.1 | 0.0 | 0.0 | 0.0 |
| USD 5 PPP | Headcount Index | 11.6 | 0.7 | 0.0 | 0.1 | 0.0 |
| | Poverty Gap | 8.0 | 0.2 | 0.0 | 0.0 | 0.0 |
| USD 10 PPP | Headcount Index | 19.0 | 5.0 | 2.5 | 3.9 | 0.7 |
| | Poverty Gap | 11.6 | 1.3 | 0.4 | 0.7 | 0.1 |
| National poverty line (USD 10.62 PPP) | Headcount Index | 20.2 | 5.9 | 3.4 | 5.2 | 0.8 |
| | Poverty Gap | 12.1 | 1.6 | 0.5 | 0.9 | 0.1 |
| National moderate poverty line (USD 16.69 PPP) | Headcount Index | 32.7 | 21.6 | 19.8 | 24.8 | 7.5 |
| | Poverty Gap | 17.2 | 5.7 | 4.2 | 5.6 | 1.3 |

*Note*. Minimum consumer budget represents national moderate poverty line.
*Source*: own estimates based on CEQ methodology.

The scale of redistribution caused by fiscal interventions is higher than change in inequality indicators may suggest. Decomposition of change in Gini indicator reveals that vertical equity generated by fiscal policy is accompanied by significant horizontal effects (see Table 8). In particular, reduction of Gini related to influence of direct taxes and transfers, including pensions, would be 0.20 pp if there were no re-ranking effect between market (PGT) and disposable income. However, change in relative welfare of population within these income concepts is natural as

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[21] Application of national absolute poverty line to other income concepts than disposable income is for illustration purposes only, as it is constructed based on actual retail, i.e. post-fisc prices.

[22] Poverty estimates based on disposable income and national poverty line should correspond to the official share of low-income people in Belarus. In practice there is significant difference, as official estimates are done based on quarterly data.

it is attributed to the pension system, which stands for major part of direct taxes and transfers. Modelling pension system as a deferred income results in minor horizontal equity effect of direct taxes and transfers.

Less desirable is horizontal equity (reranking) caused by indirect taxation and subsidies, as well as in-kind transfers. Reranking effect of consumable income is higher than of disposable income, while vertical equity remains unchanged, irrespectively to the market income concept applied. Hence, indirect taxes and transfers do not reduce inequality, but lead to the households switching places in their distribution by income. On-contrary, in-kind transfers are associated with significant vertical equity effect. In case market income is modeled according to assumption of pensions as deferred income, in-kind transfers generate most of the vertical equity effect of the fiscal policy. However, they also cause some horizontal equity effects if households are initially ranked by market income that includes pensions (PDI). On the contrary, comparison of household distribution by final income and market income modeled according to PGT approach reveals that in-kind transfers reduce scale of reranking. This contradiction is rooted in the nature of modeled in-kind transfers. Namely, education transfers are inevitably lower for households with elderly. Therefore, they make pensioners less wealthy relative to youth. When we compare final income distribution to market income distribution prior to pension system effects (PGT), we see that in-kind transfers limit reranking effect associated with pension system provisions. Vice versa, initial ranking of households by market income including pensions (PDI) results in deteriorated relative welfare of pensioners and increasing horizontal equity effects after accounting for in-kind transfers.

**Table 8. Decompositions of inequality changes into vertical and horizontal equity components**

| | Change to market income (PGT) | | | Change to market income (PDI) | | |
|---|---|---|---|---|---|---|
| | Disposable income | Consumable income | Final income | Disposable income | Consumable income | Final income |
| Gini change with respect to market income | 0.139 | 0.137 | 0.180 | 0.025 | 0.022 | 0.065 |
|    Vertical equity (Reynolds-Smolensky Index) | 0.200 | 0.202 | 0.236 | 0.031 | 0.030 | 0.087 |
|    Reranking (Atkinson-Plotnick Index of horizontal equity) | 0.060 | 0.065 | 0.056 | 0.006 | 0.008 | 0.022 |

*Note.* Vertical equity implies reduction of gap in welfare between rich and poor due to fiscal intervention. Horizontal equity implies that fiscal intervention does not influence ranking position of an individual, see Kakwani (1984).
*Source*: own estimates based on CEQ methodology.

Incidence analysis of income change caused by fiscal interventions shows that benefits are concentrated within the lowest deciles. First two deciles, ranked by market income that does not include pensions (PGT approach), enjoy substantial average increase of income, which is partly related to the low base of market income (see Figure 14). Positive effect depletes by the 4–5 deciles, while 7–10 deciles suffer income reduction (see Table 9). If market income is modeled within PDI approach the positive effect of fiscal interventions holds only for the first deciles (with exception of in-kind transfers) and its scale is much lower. Consequently, the scale of losses by upper deciles is also lower. Moreover, losses are distributed evenly among relatively wealthy deciles, implying similar tax burden for upper deciles. Incidence of net effects changes substantially after accounting for in-kind transfers. At the level of final income, effect from fiscal interventions steadily diminishes from lower deciles to the upper deciles (both compared to the market income modeled by PDI and PGT approach), implying progressivity of in-kind transfers. Moreover, effect at the level of final income becomes negative only for the wealthiest deciles.

**Table 9. Incidence of net effects from fiscal interventions in relation to market income by deciles**

| | Market income by PGT approach | | | Market income by PDI approach | | |
|---|---|---|---|---|---|---|
| | Disposable Income | Consumable Income | Final Income | Disposable Income | Consumable Income | Final Income |
| 1 | 890.6 | 805.1 | 1214.1 | 18.2 | 8.0 | 56.5 |
| 2 | 111.4 | 95.2 | 169.7 | 4.9 | -3.1 | 33.8 |
| 3 | 37.5 | 27.7 | 68.1 | 1.3 | -6.0 | 23.6 |
| 4 | 13.8 | 5.9 | 36.2 | -1.6 | -8.4 | 18.0 |
| 5 | 1.2 | -4.9 | 18.6 | -2.4 | -8.2 | 14.0 |
| 6 | -7.1 | -13.1 | 6.8 | -3.6 | -9.8 | 10.7 |
| 7 | -12.7 | -18.2 | -0.8 | -4.8 | -10.8 | 8.4 |
| 8 | -14.9 | -20.1 | -6.1 | -5.5 | -11.4 | 4.1 |
| 9 | -17.6 | -23.7 | -11.4 | -6.7 | -13.7 | -0.1 |
| 10 | -19.5 | -23.9 | -17.3 | -6.9 | -12.1 | -4.0 |
| Total | -3.2 | -9.5 | 9.3 | -3.5 | -9.8 | 9.0 |

*Source*: own estimates based on CEQ methodology.

Differences in incidence of effects generated by moving from market income to disposable, consumable and final income are related not only to the progressivity of fiscal interventions, but also scale of redistribution, caused by them and modelling of separate income concepts. Huge size of pension system compared to other social expenses determines higher scale of effects if post-fiscal income is compared to the base of market income by PGT approach rather than by PDI approach. More positive effect at the level of final income compared to consumable income is rooted in the modelling, as total modeled final income is 9.3% higher than total market income by PGT approach (9.0% by PDI approach, see Table 9), while consumable income is 9.5% lower (9.8% lower by PDI approach).

**Figure 14. Distribution of individuals by market and disposable income**



*Source*: own estimates based on CEQ methodology.

Overall progressivity of fiscal interventions and average positive effect observed for lower deciles, however, does not necessary imply that everybody from low income groups of population automatically benefits from fiscal interventions (see dots below 45 degree line, Differences in incidence of effects generated by moving from market income to disposable, consumable and final income are related not only to the progressivity of fiscal interventions, but also scale of redistribution, caused by them and modelling of separate income concepts. Huge size of pension system compared to other social expenses determines higher scale of effects if post-fiscal income is compared to the base of market income by PGT approach rather than by PDI approach. More positive effect at the level of final income compared to consumable income is rooted in the modelling, as total modeled final income is 9.3% higher than total market income by PGT approach (9.0% by PDI approach, see Table 9), while consumable income is 9.5% lower (9.8% lower by PDI approach).
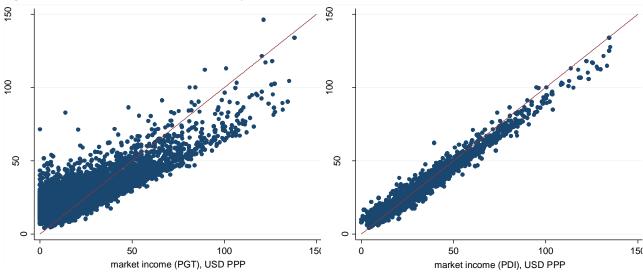
Figure 14). On the one hand, distribution plots of net recipients and donors overlap at rather small extent if they are ranked by market income modeled according to the PGT approach (see Figure 15a). Around 45% of all net beneficiaries within the system of direct taxes and transfers (that includes pension system) have market income below 10 USD PPP (which is a proxy of national poverty line). Moreover, 97.5% of population with market income below 10 USD PPP benefit from this system. The donors, in their turn, are largely people with market income above 20 USDD PPP, which may be interpreted as a good targeting of the system. On the other hand, ranking people according to disposable (post-fiscal) income changes situation dramatically. Distribution plots of net recipients and donors within the system of direct taxes and transfers largely coincides (see Figure 15b). As a result, 60% of population with disposable income below 10 USD PPP per day faces reduction of the income due to system of direct taxes and transfers that includes pension system. Hence, direct transfers and taxes, and pension system in particular, substantially reduce poverty and inequality but generate significant reranking effect as well.

If pension system is excluded from analysis number of net beneficiaries is much lower. Their distribution by income bins coincides at significant extent with distribution of net donors even if people are ranked by market income (see Figure 15c). The share of people benefiting from the system of direct transfers and taxes among population with pre-fisc market income (PDI approach) below 10 USD PPP is 82.3%. However, they constitute only 14.6% of all net beneficiaries from the system of direct taxes and transfers. Besides, 15.8% of population with market income (PDI approach) below 10 USD PPP suffer fall in the welfare due to direct taxes. The tax system limits size of their losses providing deductions for low income households (see PIT tax). Tax burden, if measured

by net losses from the system of direct taxes and benefits (excluding pension system) is the same for all income bins starting from 10 USD PPP per day. Hence, the system of direct taxes and transfers (excluding the pension system) play important role in mitigating poverty (especially extreme poverty, as net benefits from direct transfers constitute 64% of disposable income of households with market income below 5 USD PPP), but at the same time significant part of fiscal support is targeted to relatively wealthy households.

Distribution of net benefits and losses by income bins related to difference between consumable income and disposable income has similar profile. It implies that indirect taxes and subsidies does not have significant redistributive effect. Influence of fiscal interventions determining difference between market and final income is more pronounced (see Appendix C). It increases the number of net beneficiaries within relatively low income population and shifts distribution of net donors towards high income bins. It is achieved due to accounting for in-kind transfers that make total final income of population significantly higher than market one. However, there are still net fiscal donors among population with disposable income below 10 USD PPP. Tax burden at the level of final income is more progressive than at the level of disposable income, but the difference between high and low income bins is not big (especially if the bins are distinguished based on disposable income).

**Figure 15. Distribution of gains and losses at the level of disposable income with respect to market income by income bins set in USD PPP**

*Gains and losses compared to the level of market income (PGT approach) distributed by bins,*
*a) ranked by market income*        *b) ranked by disposable income*



*c) Gains and losses compared to the level of market income by*
*PDI approach distributed by bins, ranked by market income*



*Source*: own estimates based on CEQ methodology.

Reshuffling of population by income ranking caused by fiscal intervention leads to impoverishment of some households. According to the concept of disposable income, 1.9% of population became poor or fell into deeper poverty

due to the system of direct taxes and transfers (irrespective to the approach of pension system modelling, see Table 10). It means that more than half of the poverty (56.3%) is caused by fiscal redistribution. At the level of consumable income the scale of fiscal impoverishment is even higher: 3.3% of population turned poor due to direct and indirect taxes and subsidies, including pension system, which constituted 67% of total poverty headcount (if fiscal interventions do not include pension system the scale of impoverishment is even bigger).

Nevertheless, fiscal gains to the poor are much higher than fiscal impoverishment. Around 20% of population, poor at the level of market income by PGT approach (i.e. 97.3% of pre-fiscal poverty headcount) enjoy increase in the welfare after receiving direct transfers and pensions, and paying direct taxes. Broader concepts of fiscal interventions create benefits for similar amount of pre-fiscal poor population. The scale of these benefits are around 60% national absolute poverty line, which is also higher than impoverishment effect. If pension system is not treated as a fiscal intervention the scale of poverty reduction generated by direct transfers, as well as indirect subsidies, is much lower (around 4% of population). Nevertheless, around three quarters of pre-fisc poor population benefits from fiscal interventions, and the size of net benefit is around 25% of poverty line.

The fact that fiscal gains to the poor surpass fiscal impoverishment in absolute terms is also illustrated by poverty gap dynamics, which is actually difference between fiscal gains to the poor per capita and fiscal impoverishment per capita. Estimates show, that poverty gap reduces from 12.1% at the level of market income by PGT approach to the less than 1% at the level of disposable and consumable income. If pension system is excluded from analysis the scale of poverty gap reduction is much lower, as initially depth of poverty is rather low.

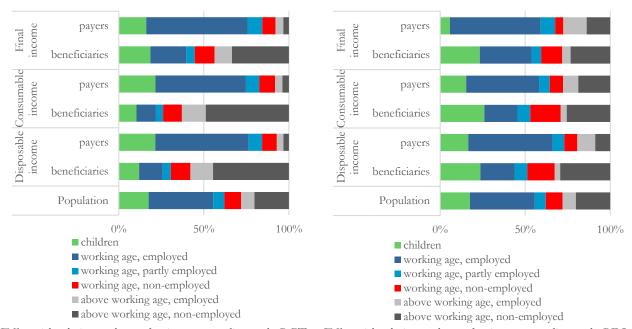**Table 10. Fiscal gains to the poor and fiscal impoverishment in relation to market income**

| | Pensions as government transfer | | | | Pensions as deferred income | | | |
|---|---|---|---|---|---|---|---|---|
| | National extreme poverty line | | National moderate poverty line | | National extreme poverty line | | National moderate poverty line | |
| | Disposable Income | Consumable Income | Disposable Income | Consumable Income | Disposable Income | Consumable Income | Disposable Income | Consumable Income |
| Fiscal impoverishment | | | | | | | | |
| headcount, % of population | 1.89 | 3.25 | 10.52 | 15.39 | 1.89 | 3.56 | 11.00 | 16.96 |
| headcount, % of post-fiscal poor | 56.30 | 62.96 | 53.03 | 62.01 | 56.12 | 68.98 | 55.47 | 68.33 |
| fiscal impoverishment per capita, % of market income | 0.24 | 0.45 | 1.46 | 2.32 | 0.12 | 0.36 | 0.63 | 1.64 |
| fiscal impoverishment per capita among fiscally impoverished, % of poverty line | 12.49 | 13.73 | 13.85 | 15.06 | 6.59 | 10.00 | 5.76 | 9.66 |
| Fiscal gains to the poor | | | | | | | | |
| headcount, % of population | 19.67 | 19.29 | 28.38 | 26.89 | 4.44 | 4.13 | 12.22 | 10.86 |
| headcount, % of pre-fiscal poor | 97.30 | 95.42 | 86.88 | 82.30 | 75.26 | 70.04 | 56.60 | 50.33 |
| fiscal gains to the poor per capita, % of market income | 11.77 | 11.65 | 14.51 | 13.92 | 1.14 | 1.04 | 2.14 | 1.69 |
| fiscal gains to the poor per capita among fiscal gainers, % of poverty line | 59.87 | 60.39 | 51.14 | 51.77 | 25.71 | 25.07 | 17.49 | 15.53 |
| Poverty gap reduction, pp (fiscal gains minus fiscal impoverishment per capita) | 11.54 | 11.20 | 13.06 | 11.60 | 1.02 | 0.68 | 1.50 | 0.05 |

*Note.* Fiscal impoverishment is a considered a situation when i) somebody who is non-poor according to the pre-fiscal income (market income) appears to be poor according to the post-fiscal income (disposable or consumable), ii) somebody poor according to the pre-fiscal income suffers further income reduction due to fiscal interventions. Fiscal gains to the poor take place when somebody poor according to the pre-fiscal income enjoys income increase due to fiscal interventions.
*Source*: own estimates based on CEQ methodology and Higgins, Lustig (2016).

According to the socio-economic status, population at pension age enjoy most of the gains from fiscal interventions if pension system is treated as a fiscal intervention, while employed population at working age bear most of the costs (see Figure 16). If pension system is excluded from analysis, beneficiaries of the system of direct taxes and transfers are children, non-employed population in working and above working age, while employed population (both working and above working age) are net payers within the system. Indirect taxes and subsidies contribute to further increase of welfare of unemployed population in working age and children, while positive effect for non-employed people in working age reduces. Besides, in-kind transfers result in increasing redistribution within employed population in working age.

**Figure 16. Structure of net beneficiaries and payers of fiscal system by socio-economic status**



*Effect with relation to the market income according to the PGT approach*

*Effect with relation to the market income according to the PDI approach*

*Note.* HBS does not contain information on social economic status of respondents. Employed where considered those receiving income employment for more than 6 months. Those receiving employment related income for less than 6 months and those reported income from self-employment where considered as partly employed. Those who did not report any employment related income were considered ono-employed. This group comprises unemployed and economically inactive, including housewives, students, disabled persons.
*Source*: own estimates based on CEQ methodology.

Despite generally benefiting from fiscal policy, children still have higher risk of fiscal impoverishment than population on average (see Table 11). Especially high risk is observed for large families with three and more children. Existing tax burden appears to be too high for households with several dependents and it is not fully mitigated by system of child allowances. Other social vulnerable groups also face high risk of fiscal impoverishment. In particular, fiscal policy may affect welfare of partly or self-employed people. Being low paid and baring tax obligations related to labor market participation determine high risk of poverty for them. The same is true for those living in rural area, where employment opportunities are limited to low paid jobs in agriculture.

**Table 11. Fiscal impoverishment in relation to market income by social vulnerable groups, headcount, % of group**

|  | Pensions as government transfer | | Pensions as deferred income | |
|---|---|---|---|---|
|  | disposable income | consumable income | disposable income | consumable income |
| children | 3.96 | 6.41 | 3.40 | 5.85 |
| working age partly employed | 3.98 | 6.56 | 4.28 | 7.37 |
| working age non-employed | 2.71 | 3.74 | 2.88 | 4.58 |
| rural area household member | 3.52 | 5.89 | 2.70 | 6.53 |
| lone parent household member | 3.54 | 5.37 | 2.81 | 4.59 |
| large family (3+ children) member | 10.68 | 12.89 | 6.43 | 10.65 |
| average | 1.89 | 3.25 | 1.89 | 3.56 |

*Source*: own estimates based on CEQ methodology.

## 4.2. Distributional impact and marginal contributions of fiscal interventions

Concentration curves of fiscal interventions help understand whether the particular intervention is equalizing or not. If the curve of the intervention is above the 45-degree line (i.e. concentration coefficient is negative), it is progressive and equalizing. However, the intervention can be equalizing even if it is regressive and below the 45-degree line. To be equalizing concentration curve of a transfer only needs to be above the selected income concept (concentration coefficient of a transfer exceeds Gini coefficient for the income). Taxes are equalizing in case their concentration curves are below Lorenz curve of related income concept (concentration coefficient of a tax is lower than Gini coefficient). To preserve space, the concentration curves are presented in Appendix B, while concentration coefficients, as well as Kakwani index, representing difference between Gini coefficient of income and concentration coefficient of an intervention, are presented in Table 12.

**Table 12. Progressivity of taxes and transfers in relation to income concepts**

| | Market income (PGT) | | Market income (PDI) | | Disposable income | |
|---|---|---|---|---|---|---|
| | concentration coefficient | Kakwani index | concentration coefficient | Kakwani index | concentration coefficient | Kakwani index |
| All direct transfers incl contributory pensions | **-0.285** | **0.691** | **-0.265** | **0.557** | 0.098 | 0.169 |
|   benefits | **-0.121** | **0.527** | **-0.304** | **0.596** | -0.091 | 0.358 |
|   privileges | **-0.194** | **0.601** | **-0.051** | **0.343** | 0.065 | 0.202 |
|   pensions | **-0.350** | **0.757** | -- | -- | 0.169 | 0.098 |
| All direct taxes | **0.425** | **0.018** | **0.337** | **0.045** | 0.292 | 0.024 |
|   Personal income tax | **0.434** | **0.027** | **0.337** | **0.045** | 0.296 | 0.029 |
|   Social Contributions | **0.422** | **0.015** | -- | -- | 0.290 | 0.022 |
| All indirect subsidies | 0.127 | 0.280 | 0.188 | 0.104 | **0.186** | **0.081** |
|   Utilities subsidy | 0.059 | 0.348 | 0.133 | 0.159 | **0.135** | **0.133** |
|   Public transport subsidy | 0.268 | 0.139 | 0.300 | -0.008 | **0.293** | **-0.026** |
| All indirect taxes | 0.186 | -0.221 | 0.220 | -0.072 | **0.224** | **-0.044** |
|   VAT | 0.225 | -0.182 | 0.260 | -0.032 | **0.265** | **-0.002** |
|   Tobacco excise | 0.145 | -0.262 | 0.073 | -0.219 | **0.058** | **-0.209** |
|   Alcohol excise | 0.010 | -0.397 | 0.049 | -0.244 | **0.048** | **-0.219** |
|   Fuel excise | 0.349 | -0.058 | 0.326 | 0.033 | **0.327** | **0.060** |
|   Import tariffs | 0.186 | -0.221 | 0.240 | -0.052 | **0.249** | **-0.018** |
| All gross in-kind transfers | 0.006 | 0.401 | -0.070 | 0.362 | **-0.075** | **0.342** |
|   Gross health transfers | -0.052 | 0.459 | 0.025 | 0.267 | **0.038** | **0.230** |
|     Primary and secondary health expenditure | -0.055 | 0.462 | 0.034 | 0.258 | **0.049** | **0.219** |
|     Tertiary (hospital) health expenditure | -0.050 | 0.456 | 0.019 | 0.273 | **0.030** | **0.237** |
|   Gross education transfers | 0.055 | 0.352 | -0.150 | 0.442 | **-0.170** | **0.437** |
|     Preschool and primary school education | 0.018 | 0.389 | -0.238 | 0.530 | **-0.249** | **0.516** |
|     Secondary education | -0.032 | 0.439 | -0.248 | 0.540 | **-0.268** | **0.535** |
|     Continued secondary education | 0.139 | 0.268 | -0.035 | 0.327 | **-0.064** | **0.332** |
|     Higher (college) education | 0.253 | 0.154 | 0.113 | 0.179 | **0.089** | **0.178** |
| All taxes | 0.355 | -0.052 | 0.267 | -0.025 | 0.272 | 0.004 |
| All net transfers and subsidies excl contributory pensions | -0.143 | 0.550 | -0.079 | 0.371 | 0.049 | 0.218 |
| Gini | 0.407 | | 0.292 | | 0.267 | |

*Note.* Concentration coefficient of a tax exceeding Gini coefficient of related income implies positive Kakwani index and progressivity of tax. Concentration coefficient of a transfer exceeding Gini coefficient of related income implies negative Kakwani index and regressivity of a transfer. Bold characters reflect income concept influenced by the intervention.
*Source*: own estimates based on CEQ methodology.

Direct taxes levied on market income are minimally equalizing. The concentration curves of both the personal income tax and social contributions tax are slightly below the income schedules (Kakwaini index is positive, but close to zero). It is not surprising, given the flat schedule of taxes with some exemptions for the low-income individuals.

Indirect taxes, paid from disposable income. in turn, are unequalizing. This is particularly true for the alcohol and tobacco excises, which put most of the burden on the poor households. However, since the purpose of these taxes is not to be equalizers, and, ideally, not even to deliver revenues to the budget, but to penalize for unhealthy behavior, we cannot judge these excises on their redistribution properties. Import tariffs and VAT taxes have virtually no redistributive effect with respect to disposable income. Higher share of consumption within lower deciles results in higher burden of VAT and import duties for them, but lower VAT rates for food products[23] mitigate this effect. Fuel excise, however, is equalizing as the fuel excise applies mainly to the car owners, the burden falls mainly to the upper deciles.

The concentration curves for direct transfers show that most of transfer interventions are equalizing and progressive when ranked by market income (see Appendix B, Figure 20). Pensions play major role in redistribution from the market to disposable income. Benefits and privileges interventions are also equalizing. The scale of their progressivity depends on the analyzed income concept. While privileges are more progressive if households are ranked by market income before pension system intervention, benefits play more important redistributive role when pensions are considered as market income (see Table 12). Moreover, benefits are progressive with respect to disposable income. It implies that benefits, contrary to privileges, target groups of population that are not covered by pension system. Furthermore, benefits do not fully employ their equalizing potential. On contrary, pensions are not progressive and only slightly equalizing with respect to disposable income. It stresses their significant role in redistribution and their massive contribution to the disposable income of population.

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[23] Difference in expenditure structure of the 1st and 10th deciles is mainly related to food purchase and savings (see Shymanovich, 2013).

Indirect subsidies received at the level of disposable income are regressive, but equalizing. However, it is achieved only in account of the utilities subsidy, while the transport subsidy is unequalizing with respect to the disposable income. The transport subsidy has equalizing effect only in absence of pension system (see Appendix B, Figure 21).

Health expenditures are distributed quite equally, and we can see at the Figure 22 (Appendix B), that health transfers are equalizing with respect to disposable income and all the curves lie very close to the 45-degree line. Consequently, concentration coefficients are close to zero. Education transfers are also equalizing. Furthermore, all types of education transfers except for the college education are progressive. Primary and basic secondary school has the most pronounced equalizing effect.

The concentration curves and related indices allow to see the direction of redistribution impact of the fiscal interventions, but they do not allow to estimate the size of this impact, or to see the impact on poverty. Marginal contributions in Table 13 show the change to inequality and local poverty measures after the application of intervention.

**Table 13. Marginal contributions to inequality and poverty**

|                          | Gini | National Poverty | Moderate Poverty |
|--------------------------|------|------------------|------------------|
| Benefits                 | 2.0  | 5.1              | 3.9              |
| Privileges               | 0.2  | 0.7              | 0.3              |
| Pensions                 | 11.1 | 23.5             | 19.2             |
| Personal income tax      | 0.4  | 4.1              | 0.9              |
| Social Contributions     | 1.1  | 8.9              | 2.1              |
| VAT                      | 0.0  | 5.2              | 1.2              |
| Excises on tobacco       | -0.1 | 0.4              | 0.0              |
| Excises on alcohol       | -0.4 | 2.1              | 0.3              |
| Excises on fuel          | 0.0  | 0.1              | 0.0              |
| Import duties            | 0.0  | 0.9              | 0.1              |
| Utilities subsidy        | 0.6  | 3.6              | 1.2              |
| Transport subsidy        | -0.1 | 1.2              | 0.3              |
| Primary healthcare       | 0.9  | 3.9              | 1.5              |
| Tertiary healthcare      | 1.4  | 5.7              | 2.5              |
| Primary education        | 1.4  | 3.2              | 2.8              |
| Secondary education      | 3.6  | 5.8              | 6.6              |
| Cont. secondary education| 0.6  | 1.6              | 1.2              |
| Higher education         | 0.7  | 2.2              | 1.3              |

*Note.* Changes to inequality and poverty for the direct benefits and taxes are measured in comparison to the disposable income prior to the related intervention (i.e. market income (PGT) plus direct taxes and transfers net of analysed intervention). For indirect subsidies and in-kind transfers changes to inequality and poverty are measured in comparison to the disposable income. Negative values for Gini mean increase of inequality due to fiscal intervention. Positive values for poverty mean increase of poverty headcount in case of abolishment of direct transfers, need to cover in full costs of utilities and public transportation, as well as pay for education and healthcare services, and increase of poverty headcount caused by presence of taxes.
*Source*: own estimates.

Pensions are the most effective fiscal intervention, lowering Gini by 11 points, and extreme poverty by over 23 percentage points. Benefits also have positive effects, but they are much smaller. The most effective of all benefits is the childcare benefit (for children aged 0-3), contributing 1.3 points to Gini decrease and 3 points to poverty decrease. Excises on tobacco and alcohol increase inequality, although modestly. Same is true about the transport subsidy. Utilities subsidy decreases inequality and poverty. Primary and secondary education and tertiary healthcare have sizable equalizing effects and gains for the poor.

### 4.3. Efficiency

The marginal contributions of fiscal programs described in the previous section are especially useful when evaluating social programs, fiscal interventions designed primarily to combat poverty and inequality. In case of Belarus, marginal contributions to poverty and inequality are the major indicators for the effectiveness of benefits, privileges, pensions and indirect subsidies. But the marginal contributions miss another dimension of the fiscal interventions – their cost. While pensions have the biggest impact on poverty and inequality, they are also the costliest program of all.

Table 14 lists several efficiency measures which reflect both the impact on poverty/inequality, and the cost of the intervention. The size column lists the size of the intervention as a percentage of GDP according to our allocation in micro data, not according to aggregate data. Efficiency measures are derived as the ratio of marginal contributions to the relative size of intervention . Hence, efficiency measures represent the effect (on reduction of Gini or poverty) of

1% of GDP spent on the particular intervention. The composite measure reflects the effect of 1% of GDP spent on the composite impact measure, consisting of poverty and inequality effects both weighted by 0.5.

**Table 14. Efficiency measures for social fiscal interventions**

| | Size (relative to GDP) | Inequality Efficiency | Poverty Efficiency | Composite Efficiency | Share spent on top 5 deciles | Share spent on top 2 deciles |
|---|---|---|---|---|---|---|
| Benefits: | 1.957% | 1.04 | 2.02 | 1.53 | 42% | 12% |
|    pregnancy registration | 0.110% | 0.82 | 1.28 | 1.05 | 48% | 15% |
|    pregnancy and childbirth | 0.069% | 0.72 | 1.21 | 0.97 | 45% | 17% |
|    child 0-3 | 1.039% | 1.21 | 2.28 | 1.74 | 34% | 11% |
|    child 3+ | 0.171% | 1.28 | 2.00 | 1.64 | 31% | 7% |
|    Attendance | 0.104% | 1.06 | 1.19 | 1.12 | 40% | 8% |
|    Funeral | 0.095% | -0.53 | 0.10 | -0.21 | 88% | 24% |
|    child support after breadwinners death | 0.126% | 1.03 | 2.26 | 1.65 | 42% | 9% |
|    children-disabled | 0.048% | 0.83 | 1.30 | 1.07 | 45% | 8% |
|    assistance and other | 0.048% | 0.63 | 1.67 | 1.15 | 52% | 5% |
|    unemployment benefit | 0.004% | 0.00 | 5.50 | 2.75 | 16% | 8% |
|    severance pay | 0.076% | -0.53 | 0.00 | -0.26 | 88% | 18% |
|    student grants | 0.069% | 0.43 | 0.24 | 0.33 | 60% | 23% |
| Privileges | 0.360% | 0.53 | 0.96 | 0.74 | 56% | 15% |
| Pensions | 10.708% | 1.02 | 1.79 | 1.41 | 62% | 11% |
| Utilities subsidy | 1.956% | 0.31 | 0.61 | 0.46 | 59% | 26% |
| Transport subsidy | 0.945% | -0.02 | 0.36 | 0.17 | 70% | 37% |

*Note.* Deciles are identified based on market income.
*Source*: own estimates.

Pensions are not as efficient as total benefits (1.41 versus 1.53 composite efficiency), but nevertheless remain among the efficiency champions even after accounting for the cost. Among benefits, unemployment benefits are the most efficient program. Severance pay, funeral benefit and student stipends are among the most inefficient benefits – a direct result of the absence of means-testing. Unemployment benefits are notoriously low in Belarus (around 10 USD per month). Currently the government is considering to increase benefits at least to the subsistence minimum. Our results suggest that these plans will have significant (and efficient) impact in reducing poverty and inequality.

Most of the child-related benefits are also efficient. Interestingly, the childcare benefit which is paid for mothers of children below 3 years (child 0-3) is more efficient than the pregnancy and childbirth benefit (it is paid from the end of the pregnancy and after the childbirth, for the total of 126 days). The possible explanation is that the childcare benefit is paid in full only if one of the parents stay at home to take care of the child. Parents with higher wages are less likely to take all the three years of the maternity leave.

On the other hand, privileges and indirect subsidies are highly inefficient. The result is not unexpected for the indirect subsidies: they are not targeted, available to everybody and usually regressive. Privileges, on the other hand, are targeted: households and individuals have to meet certain criteria to get access to privileges. The low efficiency of privileges suggests the low quality of targeting or the misuse of the privileges programs.

As an additional measure of fiscal efficiency, we also compute the proportion of the program expenditure going to the upper income deciles (by market income): to the top 5 deciles (everyone above the median); and top 2 deciles. More than half of the pensions go to the individuals above the market income median, reflecting the fact that the pensions program is not means-tested. According to this measure privileges and indirect subsidies are again highly inefficient. If all benefits, privileges and indirect subsidies were not available to the top 2 deciles of market income, savings would amount to 1.4% of GDP.

The CEQ effectiveness measures provide a similar picture[24]. The highest effectiveness is assigned to the pensions and direct benefits, while indirect subsidies are not effective.

## 4.4. Targeting and vulnerable groups

To understand how the expenditures and taxes are focusing (or not) on vulnerable groups, we compare the size of the transfer/tax allocated to vulnerable groups to the average transfer/tax size for the rest of the population. The results are in Table 15. The first part (a) of the Table looks at vulnerable groups by type of individual, namely by age and employment status. HBS does not have the employment or socio-economic status variables. We assign

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[24] However, the CEQ package function *ceqef* is bugged and the CEQ effectiveness measures are hence incomplete and are not provided in this paper.

the status of the employed to individuals who report some wage income and worked during more than 6 months over the year. Those who worked 6 months or less, and had wage or self-employment income, are marked as partially employed. The rest are classified as non-employed, which includes the traditional definition of unemployed, inactive (out of labor force), retired and those on childcare leave. Adults (18 and older) are divided in three age groups: youth (18-24), working age (25-55 for women and 25-60 for men) and elderly (above retirement age; over 60 for men and 55 for women).

**Table 15. Sizes of transfers/taxes by vulnerable groups, relative to the rest of the population**

**(a) By individual type (age/employment)**

| | Youth | | | Working age | Elderly | | |
|---|---|---|---|---|---|---|---|
| | **Employed** | **Partly employed** | **Non-employed** | **non-employed** | **Employed** | **Partly employed** | **Non-employed** |
| Benefits (without pensions) | 69 | 127 | 139 | 225 | 40 | 61 | 52 |
| Pensions | 31 | 36 | 36 | 90 | 253 | 261 | 488 |
| Direct taxes | 143 | 126 | 109 | 69 | 131 | 74 | 26 |
| Indirect subsidies | 114 | 116 | 108 | 91 | 158 | 133 | 105 |
| Indirect taxes | 108 | 107 | 96 | 90 | 131 | 115 | 89 |
| Health | 82 | 98 | 93 | 116 | 106 | 109 | 141 |
| Education | 93 | 139 | 213 | 81 | 23 | 29 | 20 |

**(b) By household type**

| | **Rural HH** | **HH of elderly** | **HH with children** | **HH with lone parent** | **Large HH** |
|---|---|---|---|---|---|
| Benefits (without pensions) | 74 | 55 | 306 | 189 | 328 |
| Pensions | 102 | 414 | 15 | 13 | 9 |
| Direct taxes | 63 | 34 | 99 | 78 | 47 |
| Indirect subsidies | 48 | 154 | 60 | 104 | 40 |
| Indirect taxes | 78 | 101 | 79 | 88 | 57 |
| Health | 104 | 150 | 74 | 91 | 77 |
| Education | 75 | 7 | 298 | 297 | 261 |

*Note*. The number of 69% in panel a) line "Benefits", column "Youth employed" means that the young employed receive on average only 69% of benefits the rest of the population (not young and employed) receive. Description of household types and socio-economic economic status see in Table 11, Figure 16.
*Source*: own estimates.

Despite the modest size of unemployment benefits, working age non-employed enjoy higher support through benefits programs than population on average. Childcare benefits, which normally go to the households with non-employed mothers can explain this trend. In turn, elderly people and employed youth do not enjoy benefit support. For the elderly, this lack of social support is compensated by pensions. Employed (and partially employed) carry most of the burden of direct and indirect taxes, but they also enjoy more indirect subsidies. Unsurprisingly, young people receive more in-kind transfers from education, while the elderly receive higher than average support from healthcare.

In the panel (b) of Table 15 vulnerable groups are classified by household type. The major vulnerable types are rural households, households of elderly people (were the only adults are above the retirement age), households with children, especially households with a lone parent (household with at least one child and only one adult) and multi-child households (with three or more children).

Households with children are the major target group of benefits, with the childcare benefits being the most substantial program. Pensions are naturally skewed towards the elderly households. Most of the vulnerable groups pay fewer taxes than average. Health and education are again following their corresponding demographic patterns, with health expenditure more substantial for the elderly, and education – for households with children.

While the vulnerable groups in general get more than average out of fiscal transfers and pay fewer direct taxes, there is space for improvement. Currently the benefits are focused on families with children, and pensions – on the elderly, while other vulnerable groups, like people in the rural areas and youth, remain untargeted by social programs. Indirect subsidies are particularly badly targeted, often offering less than average support to the vulnerable groups.

## 4.5. Cross-country differences

Figure 17 shows results of CEQ analysis for several countries including Belarus. Countries are ranked by the Gini reduction effect with pensions modeled as government transfers. All the effects are going from market to disposable income. On average fiscal interventions decrease Gini by 0.036, and poverty by 6.05 percentage points. Belarus

is doing better than average on both accounts. However, it is lagging behind the EU28 group of countries in redistribution.

**Figure 17. Cross-country comparisons of redistribution and poverty reduction effect of direct transfers and taxes**



*Source*: Lustig (2016), own estimation based on CEQ methodology

The fiscal impact in Belarus is similar to that of Russia in Gini reduction. As in Russia, in Belarus the PGT scenario delivers more equalization than the PDI scenario (Lopez-Calva et al., 2017). Poverty reduction in Belarus is lower. However, it does not mean that the fiscal interventions reduce poverty less in Belarus than in Russia, it is merely the reflection of the fact that the 4 USD PPP poverty in Belarus is zero in disposable income, so the reduction in poverty is at its maximum possible level.

The Belarusian taxation has very different redistributional impact when compared to the EU. In most of the EU countries, the PIT tax is equalizing due to its progressive nature. The flat PIT structure in Belarus, however, delivers very little redistribution, while the redistribution task is completely delegated to the expenditure side of the fiscal policy. Given the high level of possible tax evasion in Belarus, this design of the fiscal policy is optimal. The VAT tax, in contrast, is not regressive in Belarus, unlike in many EU countries. This is achieved through multiple VAT exemptions.

## 5. Conclusions

This paper presents the assessment of the fiscal incidence in Belarus using the Commitment to Equity (CEQ) methodology as developed in Lustig & Higgins (2016). Using the household budget survey and aggregate data we have allocated fiscal interventions across households. The allocation allows us to measure the effect of fiscal policies on redistribution and poverty.

Fiscal policies in Belarus effectively redistribute income from the top to the bottom of income distribution - 97.5% of population with market income below 10 USD PPP benefit from these policies. The direct transfers (including pensions) and direct taxes lower national poverty measure by 17 percentage points. They also decrease the Gini index from 0.407 to 0.267. The impressive magnitude of positive fiscal effects puts Belarus among the equalization leaders in the group of developing countries. However, most of the effect is attributed to the pension system. If we treat pension as a deferred market income rather than government transfer, direct taxes and transfers result in Gini reduction by minor 0.025 pp. Indirect taxes and subsidies do not contribute to inequality reduction at all. Besides, fiscal interventions may be a cause of poverty, as 1.9% of population becomes poor due to direct taxes and transfers. The fiscal impoverishment headcount goes up to 3.3% when we account for indirect taxes and subsidies as well. Vulnerable groups like large and lone parent households, people living in rural areas and those not being fully employed have especially high risk of turning poor due to fiscal interventions. These groups are in general benefitting from social policy, but high impoverishment rates suggest that related social security measures need improvement and better targeting.

Direct transfers, in particular pensions, are the most equalizing and pro-poor of the fiscal interventions. Pensions, for example, are often assigned to households with zero market income, effectively pulling them out of poverty.

Taxes in Belarus are not equalizing. Direct taxes are neutral in their influence over inequality. Indirect taxes are regressive. Indirect transfers and taxes increase poverty by 1.8 percentage points, mostly due to the regressive nature of the indirect taxes and poor targeting of subsidies.

Our results also point towards possible reforms. Unemployment benefits (currently at very low level) are the most cost-efficient benefits program, suggesting that the plans to increase benefits will have significant impact in reducing poverty and inequality. Pensions and child-care benefits are also cost-efficient.

Indirect subsidies are highly cost-inefficient. 1% of GDP spent on the utility subsidies delivers 3 times less the reduction in poverty and inequality compared to the same 1% spent on pensions. The indirect subsidies to utility and transport tariffs are not targeted, available to everybody and regressive. They are also offering less-than-average support for the vulnerable groups. Replacing indirect subsidies with the well-targeted benefits program will allow reducing poverty and inequality more efficiently. Restricting access to benefits (like student grants and childcare benefits) and subsidies for the households from the top of income distribution also might be a possibility worth exploring: even the most conservative estimate suggests possible savings of 1% of GDP from better targeting of transfers and subsidies.

## References

Chubrik, A. (2007). *GDP Growth and Income Dynamics: Who Reaps the Benefits of Economic Growth in Belarus?* In Haiduk, K., Pelipas, I., Chubrik, A. (Eds.) *Growth for All? Economy of Belarus: The Challenges Ahead*, IPM research Center.

Chubrik, A. (2016a). Uslovija obuslovlennogo finansirovanija: MVF vs. EFSR [Conditions of Conditional financing: the IMF vs. the EFSD], IPM Research Center, *Commentary* DP/16/05.

Chubrik, A. (2016b). Effects of Economic Downturn on Regional Development in Belarus, World Bank background paper, *mimeo*.

Chubrik, A., Shymanovich, G. (2016). Impact assessment of the social economic policy changes on the status of the socially vulnerable groups in Belarus, UNDP report, *mimeo*.

Chubrik, A., Shymanovich, G. (2016). Increasing utility tariffs: social aspects, IPM Research Center, *Commentary* 16/01 (in Russian)

Favaro, E., Smits, K., Bakanova, M. (2012). Structural challenges for SOEs in Belarus: A case study of the machine building sector, *World Bank Policy Research working paper* WPS 6010, Washington D.C.

Higgins, S. (2017). Producing Indicators and Results, and Completing Sections D and E of CEQ Master Workbook using the CEQ Stata Package. Chapter 7 Lustig, N. (Ed.) *Commitment to Equity Handbook. A Guide to Estimating the Impact of Fiscal Policy on Inequality and Poverty*, Tulane University and the World Bank, Fall 2016.

Higgins, S., Lustig, N. (2016). Allocating Taxes and Transfers and Constructing Income Concepts. Chapter 5 in Lustig, N. (Ed.) *Commitment to Equity Handbook. A Guide to Estimating the Impact of Fiscal Policy on Inequality and Poverty*, Tulane University and the World Bank, Fall 2016.

IMF (2016). Staff Report For The 2016 Article IV Consultation, IMF *Country Report* 16/298.

Kakwani, N. (1984). On the measurement of tax progressivity and redistributive effect of taxes with applications to horizontal and vertical equity, *Advances in Econometrics*, 3, 149-168.

Kee, H., Nicita, A., Olarreaga, M. (2009). Estimating Trade Restrictiveness Indices, *Economic Journal*, 119, 172-199.

Lisenkova, K., Bornukova, K. (2017). Effects of Population Ageing on the Pension System in Belarus, *Baltic Journal of Economics*, forthcoming.

Lustig, N. (2016) "Fiscal Redistribution in Low and Middle Income Countries." Chapter 8 in N. Lustig (editor) *Commitment to Equity Handbook. A Guide to Estimating the Impact of Fiscal Policy on Inequality and Poverty*, Tulane University and the World Bank, Fall 2016.

Lopez-Calva, L. F., Lustig, N., Matytsin, M., Popova, D. (2017). Who Benefits from Fiscal Redistribution in Russia?, in *The Distributional Impact of Fiscal Policy: Experience from Developing Countries*, edited by Gabriela Inchauste and Nora Lustig (Washington: World Bank, forthcoming).

Lustig, N., Higgins, S. (2016). The CEQ Assessment: Measuring the Impact of Fiscal Policy on Inequality and Poverty. Chapter 8 in Lustig, N. (Ed.) *Commitment to Equity Handbook. A Guide to Estimating the Impact of Fiscal Policy on Inequality and Poverty*, Tulane University and the World Bank, Fall 2016.

Mazol, A. (2016). Spatial Wage Inequality in Belarus. *BEROC Working Paper Series*, WP no. 35

Ministry of Finance of the Republic of Belarus (2016). *On the status of government finance in January-December 2015*, accessed through http://minfin.gov.by/upload/bp/doklad/2015/yd2015.pdf as of 20th of December 2016

Shymanovich G. (2013). Social Effects of Accession of Belarus to the WTO, IPM Research Center, P*olicy Discussion Paper* PDP/13/08.

Shymanovich, G. (2016). Impact of socio-economic policy changes on the position of elderly people in Belarus, *IPM Research Center*, Commentary 16/04 (in Russian).

World Bank (2012). *Belarus country economic memorandum: economic transformation for growth*. Washington, DC: World Bank.

World Bank (2013). *Belarus – Public expenditure review : enhancing public services in times of austerity. Public Expenditure Review (PER)*. Washington DC; World Bank Group.

Zhang, F., and Hankinson, D. (2015). Belarus Heat Tariff Reform and Social Impact Mitigation, *World Bank Publications*, The World Bank, number 22574.

**Appendix**

**A.    Estimation of personal income tax**

Based on legislation regulating PIT taxation we calculated gross income from employment by formula:

$$GW = \left( NW - rPIT \cdot (DCH + DLI) \right) / (1 - rPIT - rSSF)$$

Where *NW* – net income from employment, *rPIT* – PIT rate of 13%, *rSPF* – rate of contribution to the Social Protection Fund done by employee equaled to 1%, *DCH* – deduction on children aged below 18,

$$DCH = \begin{cases} 0, \text{ if there is no children aged below 18 in the household} \\ 210, \text{ if there is 1 child aged below 18 in the household} \\ 410, \text{ if there are 2 and more children aged below 18 in the household} \end{cases}$$

*DLI* – deduction for persons with low income, *DLI* = 730 if

$$NW < (4420 \cdot \left(1 - rPIT - rSSF\right) + rPIT \cdot (730 + DCH))$$
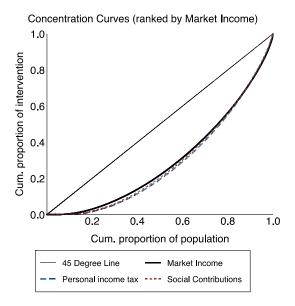
i.e. reported personal income is below upper threshold for net income for a person who received deduction on low income.

Then size of PIT paid monthly by individual is equal to:

$$PIT = (GW - DCH - DLI) \cdot rPIT \qquad\qquad ()$$

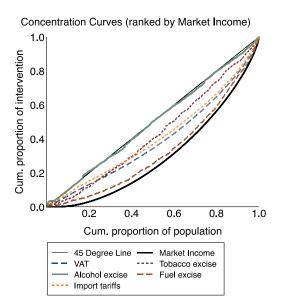## B. Concentration curves

### Figure 18. Concentration curves for direct taxes



(a) **Concentration curves of direct taxes with respect to market income**

(b) **Concentration curves of direct taxes with respect to disposable income**
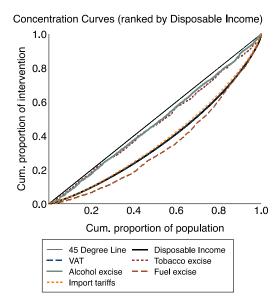
*Source*: own estimates with use of CEQ Stata package.

### Figure 19. Concentration curves for indirect taxes
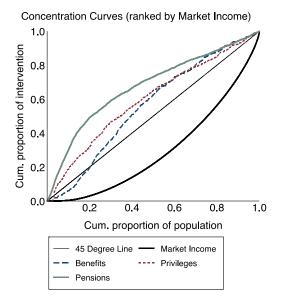


(a) **Concentration curves of indirect taxes with respect to market income**

(b) **Concentration curves of indirect taxes with respect to disposable income**

*Source*: own estimates with use of CEQ Stata package.

**Figure 20. Concentration curves for direct transfers**



(a) Concentration curves of direct transfers with respect to market income
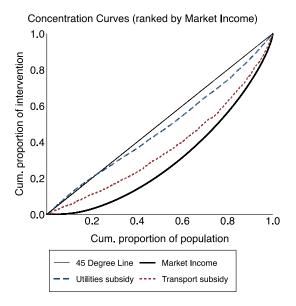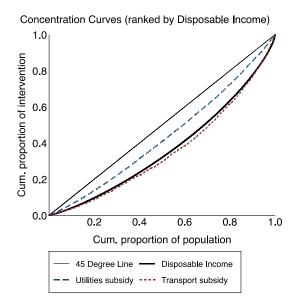
(b) Concentration curves of direct transfers with respect to disposable income

*Source*: own estimates with use of CEQ Stata package.

**Figure 21. Concentration curves for indirect subsidies**



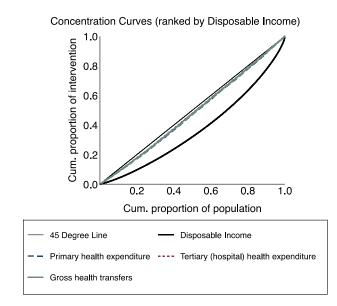(a) Concentration curves of indirect subsidies with respect to market income

(b) Concentration curves of indirect subsidies with respect to disposable income
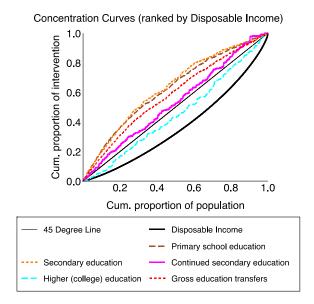
*Source*: own estimates with use of CEQ Stata package.

**Figure 22. Concentration curves for in-kind expenditure**



(a) Concentration curves of health expenditure
with respect to disposable income



(b) Concentration curves of education expenditure
with respect to disposable income

*Source*: own estimates with use of CEQ Stata package (Higgins, 2017).

## C. Distribution of gains and losses at the level of final income

**Figure 23. Distribution of gains and losses at the level of final income with respect to market income by income bins set in USD PPP**

*Gains and losses compared to the level of market income by PGT approach distributed by bins,*



*ranked by market income*

*ranked by disposable income*

- recipients, thsd
- donors, thsd
- average reciept, % of disposable income
- average donation, % of disposable income

*Gains and losses compared to the level of market income by PDI approach distributed by bins, ranked by market income*



- recipients, thsd
- donors, thsd
- average reciept, % of disposable income
- average donation, % of disposable income