

EVALUATION OF RATES AND BRACKETS IN THE PERSONAL INCOME TAX OF UKRAINE¹

Reform of the Personal Income Tax (PIT) in Ukraine is being actively undertaken by the Ministry of Finance. Changes to this tax are expected with respect to the definition of taxpayers, taxable income, allowed expenses, and selected taxpayer preferences. However, there seems to be no clear policy with respect to preferred effective rate of taxation, and how that rate will be distributed over income brackets. Will there be five tax rates? Three? One? What are the revenue and distributional implications of these various options? These questions remain unanswered.

The revenue implication of the reform process is very important, and in some ways pre-ordained. The pressure to reduce the tax burden on the very poor as well as the very rich virtually guarantees that the reform of the PIT will result in significant revenue loss. A portion of this revenue loss can be offset by the elimination of revenue reducing tax privileges. It is also possible that a portion will be offset by the legalization of shadow-market activities. However, the fundamental question must be focused on the selection of appropriate tax rates and brackets, as they will define how much revenue is to be extracted from any defined tax base.

Unfortunately, there is insufficient data to adequately evaluate the impact of changes in rates and brackets in the traditional way. For this reason, it is necessary to construct a simulation methodology that allows the Ministry to accurately and quickly estimate the revenue and distributional implications of these changes to the legislation. This report lays out a proposed methodology for addressing this problem, basing the analysis on readily available information (tax collections, taxable population, etc.). In addition, application of the methodology to several current legislative proposals is undertaken.

Data Issues

Ideally, a precise estimation of the impact on liability of bracket changes requires specific information on the demographic and economic distribution of the taxable base. Such information usually comes in the form of *microdata*, i.e., data about individual taxpayers. Microdata can be used to identify the types of taxpayers that will shift from one bracket to another, from one tax rate to another, given a proposed change in legislation. Unfortunately, because of the current structure of the tax administration apparatus in Ukraine, a representative sample of individual taxpayers is not available.

Ukraine does possess a high-quality Household Expenditure (HES) survey, which includes information describing the income of individual households. However, the use of the HES for tax purposes would result in a number of restrictions placed our analysis. Firstly, the data contains observations on households rather than individuals, without specifying the number of individuals that earn income and their contributions to household income. Using income averages could lead to misleading estimate of the tax liability. Moreover there is no way to reconcile reported income with taxable income because the reported values could contain for example the monetary worth of agricultural products cultivated at homestead land and purchased by a household. Secondly there is a measurement error resulting from the tendency of households to underreport their income. Thirdly, many tax exemptions and privileges are based on criteria that cannot be extracted from the survey. Finally, this dataset is insufficiently disaggregated by region, rendering it unsupportive of the need of the Ministry to carry out analysis at the regional level.

¹ By Natalie Leschenko and John Thissen, Support for Economic and Fiscal Reform Project / Development Alternatives, Inc (DAI) funded by the United States Agency for International Development (USAID).

Hence, we are constrained to turn to the use of aggregate data. On one hand, such kind of data does not provide information on the characteristics of individual taxpayers. On the other hand, aggregated data in Ukraine has the following strengths:

- It reports observed PIT collections, forcing results to be consistent with observed reality;
- It is comparatively easily to obtain;
- The data is disaggregated by regions.²

Aggregate data for the State and Consolidated Budgets is available regularly. Information at the sub-national level is currently available for the year 2000 (most recent full year), along with partial-year observation for 2001. The data is a special calculation by request of Budget Department of Ukrainian Ministry of Finance for purposes of establishing the annual formulate for distributing transfers to local governments. It includes the following: population and aggregate tax collections plus privileges under law currently in force.

Rates, Brackets and Liability

The proposed methodology for calculating tax liability under alternatives sets of rates and brackets requires information on the income and number of taxpayers that are falling within the various tax brackets. This information is used to create a plausible distribution of taxable income that can be used in our analysis. In essence, the objective is to use aggregate data to simulate the distribution of taxpayer liability as if microdata were available.

To understand what such a distribution might look like, we turn to the HES. We first rank households with respect to the size of their total income. In other words, with the income of the i^{th} household equal to Y_i and the income of the j^{th} household equal to Y_j , then $rank_i < rank_j$ only if $Y_i > Y_j$ and vice versa. Using this ranking, we can then sort the observations of households' incomes in a descending order, and calculate the cumulative weights of the households given their representative weights in the population. The plot of income against the individuals' ranks is presented in Diagram 1, with household number and income size measured across horizontal and vertical axis respectively. The shaded area represents total household income.

Keeping in mind that we do not have microdata describing income for individual taxpayers, it is necessary to simulate the characteristics of the individual income distribution for taxpayers using a smooth function. Such a function should have all of the characteristics described above. In additional, it is required that the function be easily manageable for the purposes of computation. Thus, the next problem that we face is choosing the appropriated distribution function.

While discussing the characteristics of the distribution, we should mention the following:

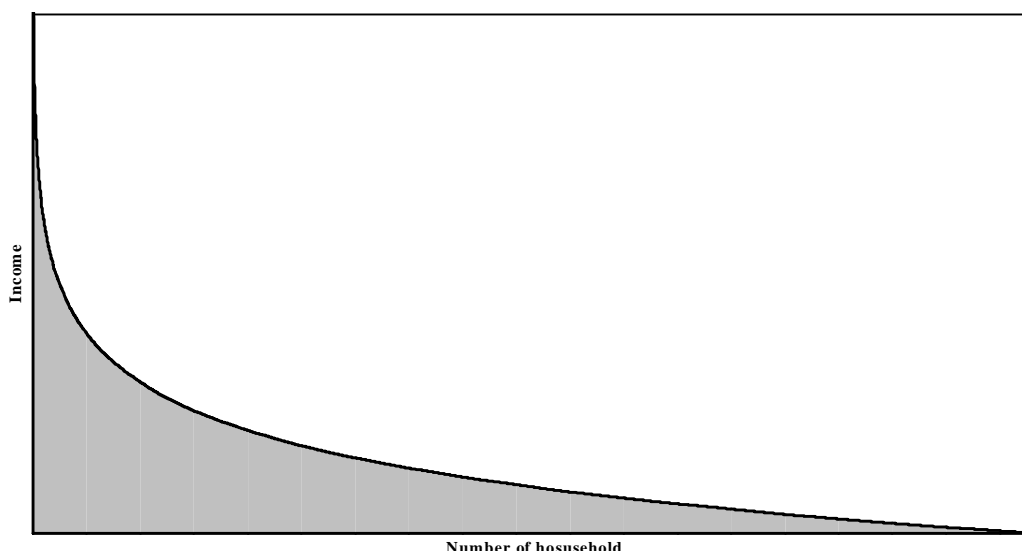
- Since it is an income distribution, it is skewed to the right, indicating that relatively large proportion of the population earn modest incomes;
- The monotonically decreases from left to right because of ranking;
- The area under the curve is equal to the total income of all households and could be written as:

$$Y = \sum_0^M Y_m, \quad (1)$$

² Special tabulation for 686 cities, rayons, and oblasts are regularly conducted by the STA at the request of the Ministry of Finance.

where m is the index for household that earns income Y_m and M is the number of households.³ This shape of this distribution is consistent with the tax base of most income taxes in the world. In general, most countries have fewer wealthy persons than poor. The shape of the distribution is generally smooth. This shape holds in general for individual, household and corporate income.

Diagram 1: Households' income distribution



What is required is to select a smooth function f , which is a function with domain covering the taxable population N . The following function successfully meets all the aforementioned requirements:

$$f(n) = -\left(\frac{Y^T}{N}\right) \ln\left(\frac{n}{N}\right). \quad (2)$$

In this case we define N to be the number of the taxpayers, n to be the rank of the individual, Y^T to be total taxable income.⁴

The function f provides an excellent fit to our requirements, and has been used successfully for similar purposes in other transitional economies where microdata was unavailable.⁵ To demonstrate its closeness of fit in Ukraine, we have plotted calculated values against the distribution presented by the HES, assuming similar levels of income and population. The results are presented in Diagram 2. The curve labelled HES reflects the patterns of income distribution based on the household survey dataset

³ For clarification, we use M to indicate the number of households, and N to indicate the number of individuals. When comparing the HES to the distribution of individuals, we implicitly assume that $M=N$.

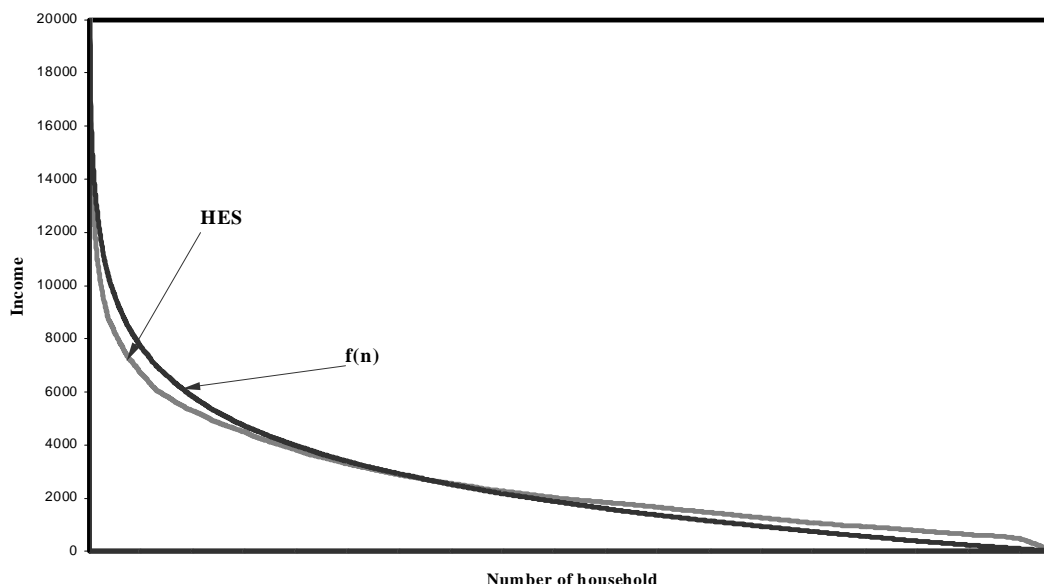
⁴ The alternative way to find the area under the curve is the following: $\int_0^{\infty} \varphi(Y_n) dY_n = Y^T$, therefore the

inverted distribution function is $\varphi(Y_n) = Ne^{\left(\frac{N}{Y^T}\right)Y_n}$

⁵ The proposed distribution has been used as the basis for enterprise profits tax simulation models in both the Russian Federation and Uzbekistan.

and the curve labelled $f(n)$ is the proposed approximated income distribution. The two distributions share the same mean, and as a result, the proposed distribution is an unbiased estimator.⁶

Diagram 2: Comparison of income distributions



It would be too much to ask for the fit to be perfect. In fact, it appears from this graph that the HES curve lays under the approximated income distribution on the high-income side of the distribution. In this case, however, this is the preferred result, as we would expect high-income households to hide more income than low-income households. The actual income distribution probably lies above the HES curve that has been plotted, thereby indicating a tendency to reduce this bias. In essence, this suggests that the fit is even better than it appears. The difference of the right-hand tail has smaller impact on our analysis since it contains low-incomes individuals who will likely escape significant taxation under proposed legislative alternatives.

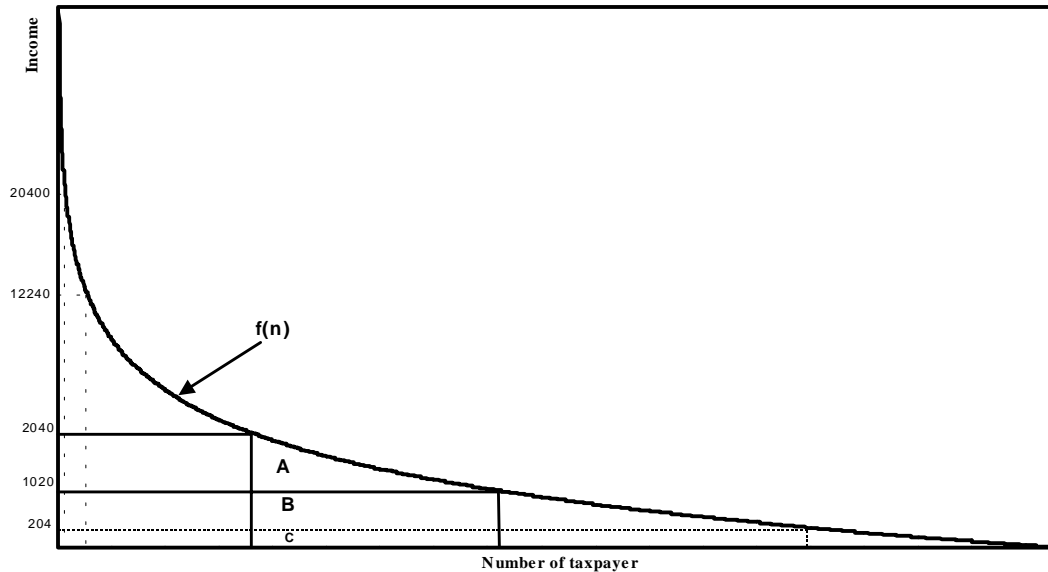
Given the distribution for taxable income, we can determine the tax liability for any individual whose income falls into any bracket. By applying the proposed methodology to current legislation period such an application is illustrated in the following example.

Example. Suppose that we want to calculate tax liability for individuals whose annual income is higher than 1020 UAH but lower than 2040 UAH. According to the current legislation, the tax liability for this part of taxpayers is determined in the following way:

- The part of income that exceeds 1020 UAH is taxed at 15% rate (in terms of diagram 3 it is 15% of area A).
- The part of income that is higher than 204 UAH but lower than 1020 UAH is taxed at 10% rate (10% of rectangle B area in diagram 3), which is a tax rate for the second tax bracket. This part also called fixed tax payment for the third tax bracket.
- The part of income below 204 UAH is non-taxable minimum (in terms of diagram 3, non-taxable minimum for the third bracket is presented by rectangle C).

⁶ The shared mean is true by definition: the estimated distribution was chosen to have the same population and total income. This is a fundamental component in then estimation process.

Diagram 3: Deriving tax liability



To summarize, the tax liability for the third bracket equals to the 15% part of area A plus 10% part of area B in diagram 3. Therefore, we can write the total tax liability TR as it is presented in equation (3)

$$TR = \sum_{i=1}^k tr_i \quad (3)$$

where tr_i is a tax liability for tax bracket i and k is number of tax brackets determined by legislation.

The Change in Tax Liability

Since we begin our computation based only on tax collections⁷ and the number of taxpayers, the first issue of our calculation is to derive total taxable income. Knowledge of rates and brackets, total liability and taxable populations along with our assumed distribution of taxable income is sufficient to fully define the distribution of taxable income⁸. Thus, once we know the total taxable income⁹, we are able to estimate the impact of bracket change.

⁷ By assumption, tax collections are equal to the tax liability.

⁸ Reverting to the issue of available data, proposed income distribution function given in the equation (2), and the properties of income distribution described in the previous section, the equation for calculation the total taxable income is as follows:

$$Y^T = \int_0^N -\frac{Y^T}{N} \ln\left(\frac{n}{N}\right)$$

Where taxable income Y^T and the number of taxpayers N should be given exogenously. Due to the known values that we have, the mathematical problem should be stated as finding the equation for tax liability and then solving it for Y^T .

After some transformation of equation (3), we would find that the personal income tax revenue equation would take the same form as:

We propose to make a comparison of personal income tax collections under alternative provisions in several ways:

- To compare impact on tax liability due to the changes in tax brackets.
- To compare allocation of tax relief provided by low-income tax credits.
- To compare combined effect on tax liability of bracket change and the low-income tax credit by income deciles.¹⁰
- To compare resulting revenue impact on local government budgets.

To compare different sets of rates and brackets, we recalculated the tax liability for proposed rates and brackets under alternative provisions. We then allocate the resulting change in tax liability by income decile and region.

To evaluate the final impact, including a low-income tax credits, we calculated the combined effect as a difference of tax liability and effective tax credit for a decile. The formula that enables us to calculate the effective tax credit is as presented in equation (4):

$$C_j = \sum_{i=1}^{N'} \min\{c_{i,j}, l_{i,j}\}, \quad (4)$$

where N' is the number of recipients¹¹, c_i and l_i are the tax credit and the tax liability for the person i .

Tax credit recipients fall into two classes: full recipients and partial recipients. Full recipients have tax liability in excess of the amount of the tax credit, whereas partial recipients benefit less from the credit because they have insufficient liability to claim the full credit. Put it another way, the effective tax credit could be calculated as the sum of the credit to full recipients and those whose tax is less than full personal tax credit. To know the total tax credit that is received by full recipients, we should multiply amount of the full tax credit for a person by their number that could be derived from the

$$TR = \sum_{i=1}^k Y^T \cdot t_i \cdot \left(e^{-\frac{N}{Y^T} u_{Ui}} - e^{-\frac{N}{Y^T} u_{Li}} \right) \quad (A)$$

Where u_{Li} and u_{Ui} are the bottom and upper tax brackets given say in the Appendix 3, i is the index for the bracket, k is the number of tax brackets, t_i is the tax rate charged in the respective bracket. Since it is not easy to find close-form solution we use computer software program to solve equation (A) for Y^T .

⁹ Taxable income (Y^T) is held constant for all simulations.

¹⁰ We define the deciles as taxpayers' groups of equal size and derive it by dividing the total number of taxpayers by 10.

¹¹ Number of recipients depends on the proposed policy. For example, in the *Concept Paper*, it can be calculated as the number of individuals that fall into the first and second tax brackets by applying the inverse distribution function for calculating the number of individuals that have income Y_n . Specifically, the number of recipients is

found to be $N' = N - Ne^{\left(\frac{N}{Y^T}\right)^{B_{u2,j}}}$, where $B_{u2,j}$ is the upper tax bracket of the second tax bracket under proposal j .

inverted distribution function¹². The tax credit of partial recipients is equal to their tax amount that can be derived from equation 5 by setting appropriated parameters¹³.

Analysis of Proposed Rates and Brackets

The reform of the PIT that is currently underway has spawned a large number of proposals for improving the legislation with respect to its effect on the economy, its fairness, and its revenue raising capacity. These proposals fall into three categories: (i) amendments to the Proposed Tax Code, (ii) amendments to current legislation, and (iii) proposals in support of the Russian Single Tax model.

Tax Rates and Brackets

Current Law		Tax Code 2nd Reading		Concept Paper		Tax Code 3rd Reading	
Maximum Income	Rate	Maximum Income	Rate	Maximum Income	Rate	Maximum Income	Rate
204	0%	7,200	10%	4,800	10%	4,800	10%
1,020	10%	72,000	15%	24,000	15%	24,000	15%
2,040	15%	> 72,000	25%	> 24,000	25%	> 24,000	25%
12,240	20%						
20,400	30%						
> 20,400	40%						

Low-Income Tax Credits

Current Law		Tax Code 2nd Reading		Concept Paper		Tax Code 3rd Reading	
Maximum Income	Credit	Maximum Income	Credit	Maximum Income	Credit	Maximum Income	Credit
204	N/A	7,200	144	4,800	72	4,800	96
1,020	N/A	72,000	144	24,000	72	24,000	96
2,040	N/A	> 72,000	144	> 24,000	N/A	> 24,000	N/A
12,240	N/A						
20,400	N/A						
> 20,400	N/A						

Single Taxes

Single Tax 1		Single Tax 2		Single Tax 3	
Rate	Credit	Rate	Credit	Rate	Credit
12.5%	144	12.5%	72	12.5%	96

With all of these proposals, there is special attention given to the tax treatment of low-income individuals. Current law provides for a *non-taxable minimum* level of income, which acts as a zero-rates tax bracket for low-income persons. All taxpayers benefit from having their first 17 hryvnias per month subject to a zero rate. Recent proposals have introduced the concept of a *low-income tax credit*, which is a reduction in liability (as opposed to taxable income) for selected groups of taxpayers. The benefit of the tax credit is that it can be granted to select groups of taxpayers (such as the truly low-income persons), whereas the current system benefits all taxpayers equally. Many current proposals suggest providing low-income tax credits to all taxpayers other than those in the highest tax bracket.

¹² The number of full low-income tax credit recipients N'' can be calculated using the following formula

$$N'' = N - Ne^{\left(\frac{N}{Y^T}\right)^{\frac{100\%}{t_j}}}$$

¹³ Estimate equation (4) for: $u_{Lj} = 0$ and $u_{Uj} = -\left(\frac{Y^T}{N}\right) \ln\left(\frac{N - N' + N''}{N}\right)$.

There are four major proposals currently being circulated amongst tax policy makers:

- The Proposed Tax Code as it was passed in the 2nd Reading. This proposal provided a standard tax credit to all taxpayers of 144 hryvnias (annual).
- The Proposed Tax Code as it is being prepared for the 3rd Reading. This proposal provides a low-income tax credit of 96 hryvnias (annual) to person in the lowest two tax brackets.
- The *Concept Paper* on personal income taxation, prepared by the Ministry of Finance to guide the reform of current legislation. This proposal provides a low-income tax credit of 72 hryvnias (annual) to all persons in the lower two tax brackets.
- There are several proposals suggesting a significant simplification of the PIT to incorporate the Single Rate tax currently applied in the Russian Federation. For discussion, we have combined the single tax with all tax credits described above.

Comparison of Six Alternatives

	Change in Revenue						Percentage Change					
	2nd Reading		Concept Paper		3rd Reading		2nd Reading		Concept Paper		3rd Reading	
	SR 1	SR 2	SR 1	SR 2	SR 3	SR 1	SR 2	SR 3	SR 1	SR 2	SR 3	
Decile 1	16,323	16,323	16,323	23,100	23,100	23,100	151%	151%	151%	214%	214%	214%
Decile 2	19,147	19,147	19,147	40,509	40,509	40,509	29%	29%	29%	61%	61%	61%
Decile 3	(5,022)	(5,022)	(5,022)	32,756	32,756	32,756	-3%	-3%	-3%	21%	21%	21%
Decile 4	(55,633)	(55,633)	(55,633)	922	922	922	-20%	-20%	-20%	0%	0%	0%
Decile 5	(142,656)	(142,656)	(142,656)	(64,168)	(64,168)	(64,168)	-31%	-31%	-31%	-14%	-14%	-14%
Decile 6	(248,156)	(248,089)	(248,089)	(143,292)	(143,292)	(143,292)	-37%	-37%	-37%	-21%	-21%	-21%
Decile 7	(380,541)	(341,712)	(341,712)	(242,581)	(242,581)	(242,581)	-41%	-37%	-37%	-26%	-26%	-26%
Decile 8	(540,463)	(430,728)	(430,728)	(376,106)	(376,106)	(376,106)	-42%	-33%	-33%	-29%	-29%	-29%
Decile 9	(686,342)	(567,797)	(567,797)	(581,710)	(581,710)	(581,710)	-37%	-31%	-31%	-32%	-32%	-32%
Decile 10	(1,680,603)	(1,506,011)	(1,506,011)	(1,757,348)	(1,757,348)	(1,757,348)	-43%	-38%	-38%	-45%	-45%	-45%
Total	(3,703,944)	(3,262,177)	(3,262,177)	(3,067,917)	(3,067,917)	(3,067,917)	-39%	-34%	-34%	-32%	-32%	-32%

	Change in Revenue						Percentage Change					
	2nd Reading		Concept Paper		3rd Reading		2nd Reading		Concept Paper		3rd Reading	
	SR 1	SR 2	SR 1	SR 2	SR 3	SR 1	SR 2	SR 3	SR 1	SR 2	SR 3	
Decile 1	27,109	27,109	27,109	33,886	33,886	33,886	0%	0%	0%	0%	0%	0%
Decile 2	85,447	68,969	81,674	106,716	71,096	90,308	0%	0%	0%	0%	0%	0%
Decile 3	137,428	71,127	94,836	142,254	71,127	94,836	0%	0%	0%	0%	0%	0%
Decile 4	142,254	71,127	94,836	142,254	71,127	94,836	0%	0%	0%	0%	0%	0%
Decile 5	142,254	71,127	94,836	142,254	71,127	94,836	0%	0%	0%	0%	0%	0%
Decile 6	142,254	71,127	94,836	142,254	71,127	94,836	0%	0%	0%	0%	0%	0%
Decile 7	142,254	71,127	94,836	142,254	71,127	94,836	0%	0%	0%	0%	0%	0%
Decile 8	142,254	71,127	94,836	142,254	71,127	94,836	0%	0%	0%	0%	0%	0%
Decile 9	142,254	71,127	94,836	142,254	71,127	94,836	0%	0%	0%	0%	0%	0%
Decile 10	142,254	63,445	84,594	142,254	71,127	94,836	0%	0%	0%	0%	0%	0%
Total	1,245,761	657,412	857,229	1,278,633	673,998	882,881	0%	0%	0%	0%	0%	0%

	Change in Revenue						Percentage Change					
	2nd Reading		Concept Paper		3rd Reading		2nd Reading		Concept Paper		3rd Reading	
	SR 1	SR 2	SR 1	SR 2	SR 3	SR 1	SR 2	SR 3	SR 1	SR 2	SR 3	
Decile 1	(10,786)	(10,786)	(10,786)	(10,786)	(10,786)	(10,786)	-100%	-100%	-100%	-100%	-100%	-100%
Decile 2	(66,299)	(49,822)	(62,527)	(66,207)	(30,587)	(49,799)	-100%	-75%	-94%	-100%	-46%	-75%
Decile 3	(142,450)	(76,149)	(99,858)	(109,498)	(38,371)	(62,080)	-91%	-49%	-64%	-70%	-25%	-40%
Decile 4	(197,887)	(126,760)	(150,469)	(141,332)	(70,205)	(93,914)	-70%	-45%	-53%	-50%	-25%	-33%
Decile 5	(284,910)	(213,783)	(237,492)	(206,422)	(135,295)	(159,004)	-62%	-47%	-52%	-45%	-30%	-35%
Decile 6	(390,409)	(319,216)	(342,925)	(285,546)	(214,419)	(238,128)	-58%	-48%	-51%	-43%	-32%	-36%
Decile 7	(522,795)	(412,839)	(436,548)	(384,835)	(313,708)	(337,417)	-56%	-44%	-47%	-41%	-34%	-36%
Decile 8	(682,716)	(501,855)	(525,564)	(518,359)	(447,232)	(470,941)	-53%	-39%	-41%	-40%	-35%	-37%
Decile 9	(828,596)	(638,924)	(662,633)	(723,964)	(652,837)	(676,546)	-45%	-35%	-36%	-39%	-36%	-37%
Decile 10	(1,822,857)	(1,569,456)	(1,590,605)	(1,899,602)	(1,828,475)	(1,852,184)	-47%	-40%	-41%	-48%	-47%	-47%
Total	(4,949,705)	(3,919,588)	(4,119,405)	(4,346,550)	(3,741,914)	(3,950,798)	-51%	-41%	-43%	-45%	-39%	-41%

The combined set of proposals described above number six in total. We will focus our discussion on the changes in rates and brackets, even though changes to the definition of taxable income included in these proposals will significantly affect the revenue and distributional implications of the analysis.

All sets of rates, brackets, and credits can be simulated at 2002 levels using the methodology described above, basing the analysis on the revenue projections and estimated effective tax rates

presented in the 2002 Budget Law. Results are presented by income decile.¹⁴ Comparison of the six proposed alternatives is presented in the tables. Changes in revenue are measured as changes when compared with current law. Percentage changes are percentage changes when compared to current law. The percentage change in the impact of the tax credit is shown to be zero, as there is currently no tax credit for comparison. The combined effect is shown in the last table of the series.

Several conclusions can immediately be drawn from the above table:

- All proposals result in significant revenue loss, when compared to current law.
- All proposals substantially reduce the tax liability imposed on low- and high-income persons.
- While all proposals provide significant reductions in tax liability to the middle deciles, the proposals differ significantly in their effects.

Based on the above observations, we can make the following broadly-stated conclusion:

- The proposal that is most likely to stimulate economic growth is the Tax Code of the 2nd Reading. This proposal imposed the smallest overall tax burden, and ties for the smallest tax burden on high-income individuals. The first Single Rate proposal is ranked second in this category.
- The proposal that is most progressive, meaning that it provides the most tax relief to low-income persons at the expense of higher-income persons is the Tax Code of the 2nd Reading, followed by the Tax Code of the 3rd Reading.
- The proposal that raises the most revenue is the second Single Rate proposal, followed by the third Single Rate proposal. The Tax Code of the 2nd Reading, performing best in the other categories, places last in this category.

None of these proposals is a clear winner. There is a significant conflict between the ability to achieve the economic and distributional objectives of the government, while still succeeding in funding the budget. Keeping in mind that these changes need to be evaluated within the context of other changes to the PIT, it is still clear that more work is required to find an equitable solution that raises more revenue.

Regional Considerations

The PIT is a major source of revenue for sub-national governments. As such, whenever changes are proposed, it is important to evaluate the change in revenue that will be available to local budgets. Furthermore, PIT revenues are one of the building blocks with which the system of transfers from the central government to the local governments is based. Any changes to the PIT can potentially upset the balance of revenue transfers already in place.

As indicated above, all current proposals result in substantial revenue loss to the local budgets. These funds will result in budget shortfalls that will need to be resolved either through decreased expenditures or the identification of another source of revenue. One of potential sources of revenue is the system of transfers from the central government. However, even if there is no substantial increase in the total value of transfers from the Centre to the regions, there may still be a need to modify the formula that is used to redistribute these funds.

For illustrative purposes, consider the impact of the Proposed Tax Code (for the 3rd Reading) on local budgets. In the Table *Impact on Sub-National Budgets, by Oblast* we can see the combined effect of

¹⁴ The taxable population is divided into 10 groups of equal size, based on individual income levels.

the rate restructuring and the low-income tax credit on the regional budgets, by oblast.¹⁵ In the table it is possible to see that, while the distributional impact of changes in rates and brackets varies significantly by oblast, when the tax credit is included the distributional issues are almost entirely resolved. This gives rise to the possibility that the PIT can be reformed without major changes to the system of local government transfers. However, it is worth noting that not all proposals have such an even regional distribution. The Tax Code in the 2nd Reading has serious distributional issues that would require resolution.

Impact on Sub-National Budgets, by Oblast

City or Rayon	Prior Collections	Estimated Change in Collections	Percentage Change	Low Income Tax Credit	Net Change	Percentage Change
Crimea	212,881	(57,821)	-27.2%	40,462	(98,283)	-46.2%
Vinnitska oblast	129,500	(30,057)	-23.2%	30,912	(60,968)	-47.1%
Volynska oblast	69,237	(15,365)	-22.2%	17,152	(32,518)	-47.0%
Dnipropetrovska oblast	572,328	(174,549)	-30.5%	83,303	(257,852)	-45.1%
Donetska oblast	785,018	(242,063)	-30.8%	111,963	(354,025)	-45.1%
Zhytomyrska oblast	90,777	(19,567)	-21.6%	23,857	(43,424)	-47.8%
Zakarpatska oblast	89,758	(20,770)	-23.1%	20,857	(41,627)	-46.4%
Zaporizka oblast	345,958	(109,410)	-31.6%	44,427	(153,837)	-44.5%
Ivano-Frankivska oblast	108,690	(25,883)	-23.8%	25,213	(51,095)	-47.0%
Kyivska oblast	201,503	(57,067)	-28.3%	36,414	(93,480)	-46.4%
Kirovohradska oblast	85,219	(19,905)	-23.4%	21,636	(41,541)	-48.7%
Luhanska oblast	261,492	(70,348)	-26.9%	53,175	(123,523)	-47.2%
Lvivska oblast	259,731	(69,118)	-26.6%	51,168	(120,286)	-46.3%
Mykolaivska oblast	157,517	(45,409)	-28.8%	26,018	(71,426)	-45.3%
Odeska oblast	341,240	(102,660)	-30.1%	50,459	(153,119)	-44.9%
Poltavska oblast	209,506	(61,269)	-29.2%	33,345	(94,614)	-45.2%
Rivnenska oblast	78,063	(17,673)	-22.6%	18,276	(35,949)	-46.1%
Sumska oblast	131,140	(35,145)	-26.8%	25,937	(61,082)	-46.6%
Ternopilska oblast	59,474	(10,747)	-18.1%	17,526	(28,273)	-47.5%
Kharkivska oblast	393,178	(115,509)	-29.4%	64,354	(179,863)	-45.7%
Khersonska oblast	83,819	(18,968)	-22.6%	21,015	(39,983)	-47.7%
Khmelnitska oblast	95,366	(21,050)	-22.1%	24,086	(45,136)	-47.3%
Cherkaska oblast	125,841	(32,154)	-25.6%	26,959	(59,113)	-47.0%
Chernivetska oblast	53,575	(10,905)	-20.4%	13,750	(24,654)	-46.0%
Chernihivska oblast	110,941	(28,328)	-25.5%	23,669	(51,997)	-46.9%
Kyiv	1,227,740	(450,283)	-36.7%	68,341	(518,624)	-42.2%
Sevastopol	63,182	(19,389)	-30.7%	9,226	(28,615)	-45.3%
Total	6,342,673	(1,881,411)	-29.7%	983,499	(2,864,910)	-45.2%

Conclusions

The choice of rates and brackets for the newly developed PIT is a small part of a large undertaking. Nevertheless, as the rates and brackets are the primary factors defining the effective tax burden, and therefore impact heavily on the consequences of the reform for economic development, they need to be chosen carefully. Further, as progressivity is a stated goal of the Government of Ukraine, it is important to incorporate some form of tax relief for low-income taxpayers, either in the form of a tax credit, standard deduction, or non-taxable minimum. The choice of the tax relief system should be integrated with the choice of rates and brackets so as to best meet the economic development and distributional objectives of the Government. Most importantly, the PIT is expected to raise sufficient revenue. The Government needs to constrain its choice of a system of rates and brackets to be within the group that meets the revenue needs of the local budgets. And finally, the Government should carefully evaluate the impact on local budgets of its proposed changes, and take the necessary steps to insure that local budgets have adequate sources of funding to ensure that the important services that they provide will continue to flourish.

¹⁵ All figures are calculated at year 2000 levels. Oblast figures represent the total of all city and rayon figures in the region.

FURTHER COMMENTS ON “EVALUATION OF RATES AND BRACKETS IN THE PERSONAL INCOME TAX OF UKRAINE”¹

Even though the article by Leschenko and Thissen was written less than two months ago, already there are substantial additions that can be made to its content. The Ministry of Finance has recently distributed a draft law “On the Taxation of Physical Persons”(TPP), which is intended to replace the current personal income tax (PIT). This draft legislation proposes replacing the current set of five rates and brackets with a set of three annual rates and brackets:

Bracket	Maximum Annual Income	Rate	Tax Credit
1	4,800	10%	28.8
2	120,000	15%	28.8
3	No Max	20%	

In addition to the three brackets, there is included a low income tax credit awarded to all persons in the lowest two tax brackets. The value of the annual credit is the equivalent of 0.6% of the maximum income allowed in the lowest bracket in the month of January (400 UAH), multiplied by twelve.

Using the methods identified by Leschenko and Thissen, we can simulate the revenue and distributional characteristics of the rates and brackets defined by this proposal. To evaluate the proposal, we employ three criteria for evaluation:

1. The proposal should significantly decrease the tax liability of low-income taxpayers. Such tax relief should appear in the lowest three income deciles.
2. The proposal should significantly reduce the tax liability for high-income taxpayers. While socially regressive, such policies will tend to increase saving and spur business development. Such tax relief should appear in the top three income deciles.
3. The proposal should minimize distortions to the system of intergovernmental transfers between the central and local governments.²

There are few “good” policies that satisfy these criteria while continuing to raise significant revenue for budget expenditures. Based on the analysis of Leschenko and Thissen, we can compare the TPP rates to the single rate proposal labelled “SR 2” in that paper. These two proposals raise approximately the same amount of revenue. However, while single rate taxes are generally discarded as being regressive, what we find is that the SR 2 proposal is preferable to the TPP proposal in all of the three evaluation areas.³ The results of the policy comparison by income decile is presented in the figure *Comparison of Single Rate and Proposed TPP*.

¹ By John Thissen, Support for Economic and Fiscal Reform Project / Development Alternatives, Inc (DAI) funded by the United States Agency for International Development (USAID).

² The system of transfers from the central government to local governments is based on relative revenue potential. To the extent that the distribution of revenue-raising potential is shifted by new legislation, the formula would require revision. As such changes to the intergovernmental relations would be challenging, it is a worthwhile objective to avoid such redistribution.

³ Please note that we are only examining rates, brackets, and low-income tax credits. Other legislative changes, such as base adjustments, will also affect the distributional characteristics of these proposals.

Comparison of Single Rate and Proposed TPP

Impact on Liability of Bracket Change by Income Decile

	SR 2	TPP	Change	Percent
Decile 1	33,886	27,109	(6,777)	-20.0%
Decile 2	106,808	85,447	(21,362)	-20.0%
Decile 3	188,891	151,112	(37,778)	-20.0%
Decile 4	282,774	226,220	(56,555)	-20.0%
Decile 5	392,442	313,953	(78,488)	-20.0%
Decile 6	524,316	419,520	(104,796)	-20.0%
Decile 7	689,798	590,668	(99,130)	-14.4%
Decile 8	912,338	857,716	(54,622)	-6.0%
Decile 9	1,255,012	1,268,924	13,912	1.1%
Decile 10	2,161,899	2,357,188	195,290	9.0%
Total	6,548,164	6,297,857	(250,307)	-3.8%

Impact on Liability of Low-Income Tax Relief by Income Decile

	SR 2	TPP	Change	Percent
Decile 1	33,886	20,860	(13,026)	-38.4%
Decile 2	71,096	28,451	(42,645)	-60.0%
Decile 3	71,127	28,451	(42,676)	-60.0%
Decile 4	71,127	28,451	(42,676)	-60.0%
Decile 5	71,127	28,451	(42,676)	-60.0%
Decile 6	71,127	28,451	(42,676)	-60.0%
Decile 7	71,127	28,451	(42,676)	-60.0%
Decile 8	71,127	28,451	(42,676)	-60.0%
Decile 9	71,127	28,451	(42,676)	-60.0%
Decile 10	71,127	28,451	(42,676)	-60.0%
Total	673,998	276,917	(397,081)	-58.9%

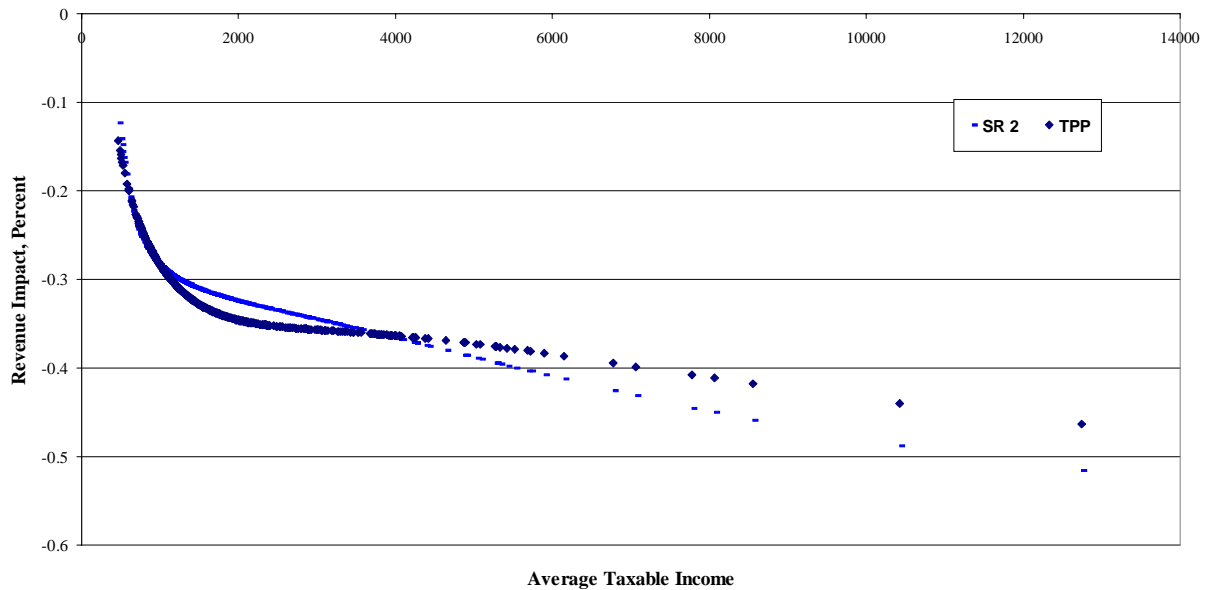
Combined Impact by Income Decile

	SR 2	TPP	Change	Percent
Decile 1	-	6,249	6,249	0.0%
Decile 2	35,712	56,996	21,283	59.6%
Decile 3	117,764	122,662	4,898	4.2%
Decile 4	211,647	197,769	(13,879)	-6.6%
Decile 5	321,315	285,503	(35,812)	-11.1%
Decile 6	453,189	391,069	(62,120)	-13.7%
Decile 7	618,671	562,217	(56,454)	-9.1%
Decile 8	841,211	829,265	(11,946)	-1.4%
Decile 9	1,183,885	1,240,474	56,589	4.8%
Decile 10	2,090,772	2,328,738	237,966	11.4%
Total	5,874,166	6,020,940	146,774	2.5%

The figure is divided into three tables. The first table identifies the revenue impact of the different tax brackets and rates. The second table compares the low-income tax relief. The SR 2 proposal includes substantially more low-income protection (annual credit of 72 UAH), resulting in 60% more tax relief than the TPP for most taxpayers. The combined effect is illustrated in the last table. As can be seen, these two proposals fall within 2.5% of each other with respect to revenue raising potential. However, there are major differences in the distributional characteristics of these two proposals. Examining the

combined impact, we see that the TPP proposal imposes a larger tax burden on the three lowest income deciles. It also imposes a larger tax burden on the two highest income deciles. These two observations conflict with our first two stated objectives above, namely to target tax relief to the lowest and highest income classes.

Impact on Regions, SR 2 versus TPP



Examining the regional distribution of the change in tax liability is also interesting. As can be seen in the figure *Impact on Regions, SR 2 versus TPP*, the revenue impact of both proposals is widely distributed between less than 10% and over 45%. In both cases the resulting reduction in liability is dependent on average taxable income in the region, as would be expected. Poorer regions see a smaller reduction in liability from the reduction of the highest marginal tax rate. While this distribution may seem “fair” in the sense that the poor regions see a smaller reduction in liability, these results are not consistent with our stated objective of treating all regions equally. Should either of these proposals be adopted, it would be necessary to significantly revise the formula for allocating subsidies to regional governments.