

LABOR INCOME TAXATION IN BULGARIA (1990 – 2008)

The paper analyses the structure of marginal tax rates. It examines the “brackets” of personal income tax, the dynamics and scope of non-taxable threshold (the so called zero tax bracket) and the last tax bracket which is (usually) associated with the highest (maximum) tax rate. The evolution of marginal tax rates at five selected levels of labor earnings defined as a proportion to the average wage in the country is traced against this background. The study also analyzes the behavior of average tax rates at the five selected levels of earnings for the period 1990 – 2008. Certain conclusions are made about the impact of respective changes (in marginal and average tax rates) on labor supply in the economy. Finally the paper examines the fluctuations in local progressivity of the income tax through time.

JEL: H23

The personal income tax is a main fiscal instrument and a powerful tool for socioeconomic regulation in the developed countries. Therefore “the queen of taxes”¹ (traditionally) is subject to special interest both in theoretical and in strictly practical terms.

This paper is dedicated to the evolution of labor income² taxation in Bulgaria for the period 1990 – 2008. Under labor income (for the purposes of the study) we understand “employment income” under Bulgarian tax legislation.

Personal income tax is introduced in Bulgaria in the beginning of the 20th century with the Personal Income Tax Act, adopted on June 30th 1920.³ After the regime change in 1944 personal income taxation in People’s Republic of Bulgaria is regulated through a new Personal Income Tax Act, promulgated in State Gazette No 131 of 1950. Under the conditions of a planned economy and “public ownership of means of production” however “taxes are not what they are”! The Bulgarian tax system (including personal income tax) acquires real meaning and contents after the changes in 1989 which unleashed the process of transition to market economy and democracy in the country. This is to explain the beginning of the period of examination – 1990. The end of the period is also not randomly selected. In 2008 Bulgaria made a revolutionary change in personal income taxation – the classic progressive income tax is replaced by a proportional one (also known as flat tax).

¹ The definition is given in 1926 by the financial minister of Prussia Johannes Popits (1884-1945).

² The main component of personal income in modern economy.

³ Repealed in 1925.

Within the period under examination there are no serious changes in the tax base. Therefore our attention is focused (exclusively) on the “architecture” of tax rates and the progressivity of labor income tax in the Bulgarian economy.

Marginal tax rates

The marginal tax rate measures the proportion (quota) of tax in the last unit of the respective tax base:

$$MTR = \frac{\Delta T}{\Delta B} * 100, \quad \text{where:}$$

MTR is the marginal tax rate (%);

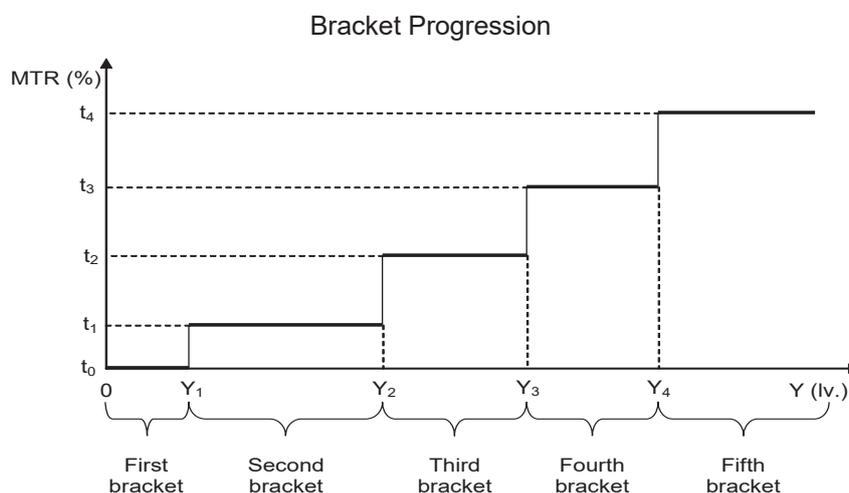
ΔT – change in tax (tax liability);

ΔB – change in tax base.

In the period under examination between 01.01.1999 and 31.12.2007 the so called *bracket (or complex) progression* is used for labor income taxation. The tax base is divided in a number of tax brackets and a different marginal tax rate is applied to each tax bracket. This is how the “architecture” of *statutory structure of marginal tax rates* is formed.

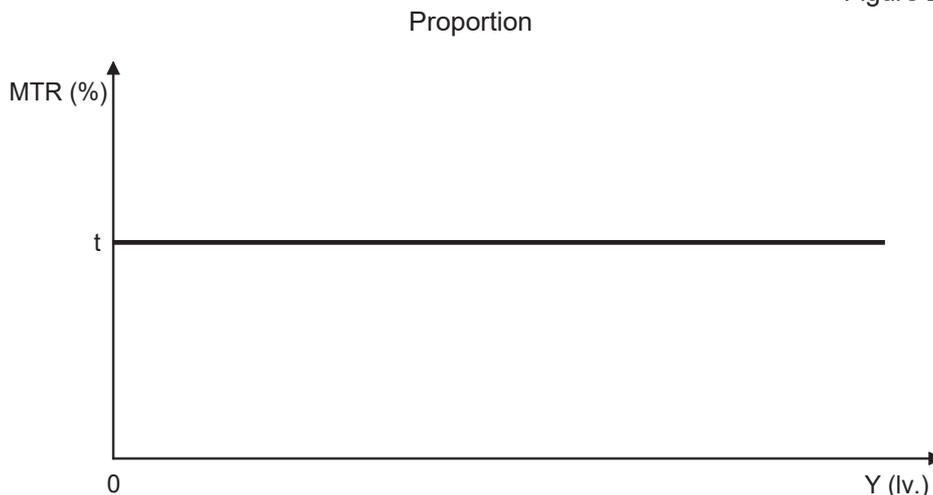
Figure 1 demonstrates a hypothetical structure of marginal tax rates – 5 tax brackets (from 0 to Y_1 leva, from /over/ Y_1 to Y_2 leva, from /over/ Y_2 to Y_3 leva etc.) and the respective 5 marginal tax rates (t_0, t_1 etc. to t_4).

Figure 1



Since 01.01.2008 (until now) personal income in Bulgaria (incl. labor earnings) is taxed at a single (flat) marginal tax rate (see Figure 2).

Figure 2



In 1990 (and the first trimester of 1991) a structure of 4 tax brackets and 4 (different) marginal tax rates which are stipulated in art. 4, par. 1 of the Personal Income Tax Act⁴ is used for labor income taxation (see Table 1).

Table 1

Tax brackets and marginal tax rates (effective from 01.01.1990)

Monthly income	Tax
Up to 140.00 leva	Exempt
From 140.01 to 200.00 leva	0.03 leva for each 0.10 leva on increment above 140 leva
From 200.01 to 400 leva	18 leva + 13.5% on increment above 200 leva
Over 400 leva	45 leva + 14% on increment above 400 leva

Afterwards the number of tax brackets starts to *increase* rapidly (see Table 2). From 01.04.1991 to the end of February 1992 it is 8 (i.e. double), and for the period 01.03.1992 – February 1993 a table with 10 tax brackets is effective – an *absolute maximum* for the examined period. Further follows a (pronounced) *decrease* of the number of tax brackets in the structure of marginal tax rates. After 01.01.1994 they are 9 and after 01.02.1997 – 8.

Table 2

Number of brackets of labor income tax in Bulgaria (1990 – 2008)

1990	1992	1994	1996	1998	2000	2002	2004	2006	2008
4	8 7	10 9	9	5	5	5	5	4	1

⁴ Prom. SG 132 of 1950.

The Personal Income Taxation Act is adopted in December 1997⁵ and replaces the Personal Income Tax Act of 1950. This new law introduces (effective from 01.01.1998) a structure of 5 tax brackets (see Table 2 and Table 3).

Table 3

Tax brackets and marginal tax rates (effective from 01.01.1998)

Monthly income	Tax
Up to 60 000 leva	Exempt
From 60 001 to 80 000 leva	20% on increment above 60 000 leva
From 80 001 to 320 000 leva	4000 leva + 26% on increment above 80 000 leva
From 320 001 to 1 280 000 leva	66 400 leva + 32% on increment above 320 000 leva
Over 1 280 000 leva	373 600 leva + 40% on increment above 1 280 000 leva

The five-bracket structure remains until 31.12.2005 (i.e. for whole 8 years). Since 01.01.2006 the tax brackets decrease to 4. A new Personal Income Tax Act is adopted (in force from 01.01.2007) which continues the traditions of its predecessor and keeps the 4 tax brackets for another year (to 31.12.2007) – see Table 4 (the last multilevel tax structure in the examined period).

Table 4

Tax brackets and marginal tax rates (effective from 01.01.1998)

Monthly income	Tax
Up to 200 leva	Exempt
From 200 to 250 leva	20% on increment above 200 leva
From 250 to 600 leva	10 leva + 22% on increment above 250 leva
Over 600 leva	87 leva + 24% on increment above 600 leva

On 01.01.2007 in Bulgaria was introduced the so called *flat income tax* (a single marginal tax rate of 10%). In other words the multilevel structure of marginal tax rates (from 4 tax brackets in 1990-1991, through 10 tax brackets in 1993-1994, to (again) 4 in 2006-2007) is replaced by a *one-bracket* one.

A key feature of the statutory structure of marginal tax rates is the first tax bracket which is (usually) related with a marginal tax rate of 0% - the so called *non-taxable threshold*. Both in theoretical and in practical terms the non-taxable threshold is determined by the level of income in an economy that is necessary for the living survival of individuals.

In the economic theory it is assumed that “for an income level lower than the existence sum, the marginal utility (of income – R.B.) tends to infinity”.⁶ Therefore “the recipient of pure existence income has capacity (to pay taxes – R.B.) equal to zero;

⁵ Prom. SG of December 10th 1997.

⁶ Fagan, 1938, p. 459.

and any encroachment on his income will cost him his life”.⁷ In other words the non-taxable threshold is a kind of “ground zero” for the individual’s tax capacity. This is the most popular view on the non-taxable threshold and its general logic is usually not questioned. Moreover – it is part of the conceptual foundations of contemporary tax policy.

Due to high inflation rates in the Bulgarian economy (especially in the 20th century 90es) the *nominal* non-taxable threshold varies widely. Starting from 140 leva monthly in 1990-1991 it reaches a record of 75000 leva monthly in 1999 to fall to 80 leva in 2000 (after the denomination of the Bulgarian Lev).⁸ In the new millennium the nominal non-taxable threshold increases slowly (100 leva monthly after 01.01.2001, 110 leva monthly after 01.01.2002, 120 leva monthly after 01.01.2004, 130 leva monthly after 01.01.2005, 180 leva monthly after 01.01.2006, 200 leva monthly after 01.01.2007) and is *eliminated* since 01.01.2008.

The dynamics of the non-taxable threshold (of course) does not give a clear idea of the significance of this important component in the structure of marginal tax rates for the examined period. Therefore Table 6 presents the non-taxable threshold as a proportion to the average wage in Bulgarian economy for the period 1990-2008.⁹

Table 5

Average worker’s wage in Bulgaria, 1990 – 2008 (leva)*

1990	1992	1994	1996	1998	2000	2002	2004	2006	2008
378	2047	4960	13 269	183 250	225	258	292	360	545

*From 2000 in denominated leva (BGN) – since 01.07.1999 1000 BGL = 1 BGN.

During the first several years of the period the non-taxable threshold is around 36-37% (i.e. slightly over 1/3) of the average wage for the country. For 1996 this proportion decreases with about 10 percentage points to 26.38% (i.e. slightly over 1/4 of the average wage). After the 1996-1997 crisis the proportion of non-taxable threshold to the average wage begins to grow gradually and after a short hesitation (2004-2005) reaches 50% (i.e. 1/2) in 2006. Since 01.01.2008 the non-taxable threshold in Bulgarian economy is 0 leva and (respectively) – 0% of the average wage.

For the period 1990-2008 the proportion of non-taxable threshold to average wage obviously shows a (quite) severe instability – from slightly over 1/3 (in the beginning) through almost 1/4, to 1/2 and 0 (at the end of the period).

Table 6

Non-taxable threshold as proportion to the average worker’s wage in Bulgaria, 1990-2008 (%)

1990	1992	1994	1996	1998	2000	2002	2004	2006	2008
37.04	36.64	37.30	26.38	32.74	35.56	42.64	41.10	50.00	0.00

⁷ Fagan, 1938, p. 460.

⁸ Since 01.07.1999 1000 BGL = 1 BGN.

⁹ The dynamics of the annual wage is presented in Table 5.

Another (suitable) “benchmark” for examination of the dynamics of the non-taxable threshold is the statutory minimum wage for the country. During most of the period the minimum wage changes (increases) several times within one year. For example during the 12 months of 1990 (for different periods of time) it was respectively: 140, 165, 191 and 210 leva (see Table 7). For the purposes of the analysis for all such years we calculate an average weighted monthly minimum wage for the country. Take (say) 1992. In the first half of this year the minimum wage is 60 leva and in the second – 850. Therefore the average weighted wage is 735 leva (=620*0.5+850*0.5) – see column II of Table 7. This is the way all the average weighted minimum wages are calculated (the numbers in brackets in Table 7). Since 2002 the minimum wage does not change during the year and there is no need of weighting.

Table 7

Monthly minimum wage in Bulgaria, 1990-2008* (leva)**

1990	1992	1994	1996	1998	2000	2002	2004	2006	2008
140	620	1 565	2 760	48 700	67	100	120	160	220
165	850	1 814	3 040	50 940	75				
191		2 134	4 000	53 500	79				
210			5 500						
(162.75)	(735)	(1771.75)	(3825)	(51 233.33)	(75.33)				

*The numbers in brackets are weighted averages.

**From 2000 in denominated leva (BGN) – since 01.07.1999 г. 1000 BGL = 1 BGN.

Against this background Table 8 presents the non-taxable threshold as a proportion to the monthly minimum wage for the period 1990-2008.

Table 8

Non-taxable threshold as proportion to the minimum wage in Bulgaria, 1990-2008 (%)

1990	1992	1994	1996	1998	2000	2002	2004	2006	2008
86.02	102.04	104.42	91.50	117.11	106.20	110.00	100.00	112.50	0.00

In the very beginning of 1990 the non-taxable threshold is (absolutely) equal to the minimum wage for the country – 140 leva (see Table 1 and Table 7). Afterwards however the minimum wage was raised three times during the same year and generally (as an annual average) some part of it becomes object to individual income taxation. For the period 1992-2006 the non-taxable threshold is higher or at least equal to the minimum wage for the country. The only exception is the crisis 1996 when it “covers” just 91.50% of the minimum wage (see Table 8). Since 01.01.2008 the non-taxable threshold in Bulgaria is 0 lv and (of course) every single Lev from the wage is taxed by individual income tax.

Besides “bottom” (the non-taxable threshold) the statutory structure of marginal tax rates has a “top” in the face of the *last (highest)* tax bracket. While

the non-taxable threshold (de facto) has only an upper limit (formally, the lower is 0) the last tax bracket has only a lower limit (formally, the top is $+\infty$) – see Figure 1 (the last 5th tax bracket includes income of /over/ leva to $+\infty$). It is this lower limit (naturally) that is highlighted when examining the bracket structure of marginal tax rates – where (on the scale of income) starts the last tax bracket that (usually) is associated with the highest (maximum) marginal tax rate?

As one could expect for the period 1990-2008 the *nominal* start (beginning) of the last tax bracket varies in a very wide range. In 1990 the highest (4th) tax bracket includes monthly income of over 400 leva In next year (1991) its lower limit increases 50 times and becomes 20 000 leva.¹⁰ Generally (but not exclusively) under the pressure of inflation the start of this tax bracket (nominally) continues to grow and comes to its “peak” in 1999 – 1 300 000 leva monthly income. After the denomination of the Lev on 01.07.1999 the lower limit of the highest tax bracket is set at 1400 leva (in 2000). The new century brings a decisive (gradual) decrease of the nominal start of the last tax bracket – 1000 leva (2002) and 600 leva (for the period 2003 – 2007). Since 01.01.2008 (as we mentioned before) the tax structure becomes a one-bracket one.

The highest marginal tax rate “weighs” on the income which is in the range of the last tax bracket. Within the period under examination the only exception of this rule is in the tax structure of 1990 – labor income over 400 leva (which are in the last, 4th tax bracket) are taxed with a marginal tax rate of 14% (see Table 1). However this is not the highest marginal tax rate in the statutory tax structure. With the highest marginal tax rate are taxed earnings in the 2nd tax bracket (from 140.01 to 200.00 leva) – “0.03 leva for each 0.10 leva on increment above 140 leva” (see Table 1). This (practically) is a tax rate of 30% on a tax unit of 0.10 leva.¹¹

In the early 90s of last century (immediately after the changes of 10.11.1989) the majority of labor income in the Bulgarian economy is covered by this 2nd tax bracket (between 140 and 200 leva) and are taxed at the highest marginal tax rate (30%). The wages between 200 and 400 leva Are (relatively) few and over 400 leva – (mainly) an exception. Thus the tax structure of 1990 resembles the flat income tax, currently applied in most of the countries in Central and Eastern Europe (except Bulgaria and Georgia for example) – a combination of non-taxable threshold and a single positive marginal tax rate for the income above the respective non-taxable threshold (i.e. a two-bracket structure). In our case (during 1991 and the first trimester of 1992) there is a non-taxable threshold of 140 leva And a positive marginal tax rate of 30% for the income above this value. The last two tax brackets

¹⁰ Precisely speaking, this is the upper limit of the penultimate tax bracket - with the last (and highest) marginal tax rate in 1991 are taxed income over 20 000 leva For simplicity we disregard this (minor) detail and place an equal sign between the "upper limit on the penultimate tax bracket" and "lower margin of the last tax bracket".

¹¹ Par. 2 of Art. 4 of the Personal Income Tax Act (prom. SG 132 of 1950; last changes SG 10 of 1990) declares: “Taxable income shall be rounded to the nearest 0.10 leva”.

(3rd with a marginal tax rate of 13.5% and 4th – with 14%) have little significance for labor income taxation (see Table 1).

After 01.01.1991 the maximum marginal tax rate is 40% and concerns labor income which is in the last (highest) tax bracket. During 1993 comes a (new) increase with (whole) 12 percentage points resulting in a maximum marginal tax rate of 52% (the highest for the period 1990 – 2008). Afterwards the maximum marginal tax rate goes down as follows:

- 50% (1994 – 1997);
- 40% (1997 – 2000);
- 38% (2001);
- 29% (2002 – 2004);
- 24% (2005 – 2007).

Since 01.01.2008 the maximum (and only) marginal tax rate is 10%. Within 15 years (1993-2008) the highest marginal rate of the personal income tax in Bulgarian economy *decreases more than five times!*

To trace the real changes of the lower limit of the highest tax bracket we calculate the proportion “*lower limit of last tax bracket / average wage in the country*”. Results are presented in Table 9.

Table 9

Proportion of the lower limit of last tax bracket to the average wage in Bulgaria (1990-2008)

1990	1992	1994	1996	1998	2000	2002	2004	2006	2008
1.06	9.77	60.48	18.09	6.98	6.22	3.88	2.05	1.67	0.00

In 1990 the last tax bracket starts almost at the level of the average wage in the country (see Table 9) – the lower limit of the highest tax bracket is 400 leva (see Table 1) and the average wage is 378 leva (see Table 5). Generally this is a very low level of a lower limit of the last tax bracket – all income higher than the average wage is in range of the last tax bracket. In this case however, the proximity between average wage and start of last tax bracket is of little significance because (as we mentioned before) the marginal tax rate on income in the last tax bracket (14%) is more than twice lower than the maximum marginal tax rate in the tax structure (30%).

After 1990 the proportion lower limit of last tax bracket / average wage in the country increases, i.e. the beginning of the highest tax bracket (related to the maximum marginal tax rate) *moves away* from the level of average wage in the country. In 1994 the distance is about 60 monthly wages – while the average wage is 4960 leva (see Table 5) the last tax bracket starts above 300 000 leva

During the next 10-12 years the trend is reversed – there is a constant (clear) cohesion between the beginning of the highest tax bracket and the average wage. For 2006 the proportion is (only) 1.67 (see Table 9), i.e. the beginning of the

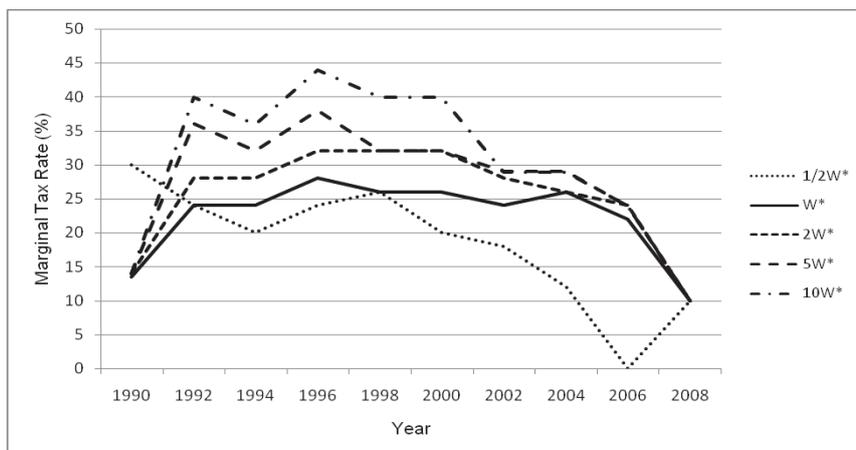
last tax bracket is a little more than half average wage “distanced” from the level of average wage in the country. All of this (shown above) is accompanied by a drastic decrease of maximum marginal tax rates (in 1994 50 stotinki tax are “bitten off” every Lev, while in 2006 – only 24 stotinki). Since 01.01.2008 the lower limit of the highest (and only) tax bracket is 0 leva, therefore the proportion lower limit of last tax bracket / average wage in the country equals zero.

To summarize, Figure 3 traces the evolution of marginal tax rates over 5 levels of income in Bulgarian economy for the period 1990 – 2008. These 5 levels of income are defined as proportion to the average wage in the country as follows:

- half of the average monthly wage ($1/2W^*$) – relatively poor;
- average wage (W^*) – lower-middle class;
- twice the average monthly wage ($2W^*$) – upper-middle class;
- five times the average monthly wage ($5W^*$) – people with high income;
- ten times the average monthly wage ($10W^*$) – wealthy.

Figure 3

Marginal Tax Rates in Bulgaria (1990 – 2008)



At the beginning of the period under examination 4 of all 5 curves presenting the dynamics of marginal tax rates are concentrated in (almost) the same point (the 13.5-14% range). The fifth curve which shows the movement of the marginal tax rate for the level of income amounting 1/2 of the average wage starts at 30% (see Figure 3). What follows is a decrease of the marginal tax rate for the lowest level of income ($1/2W^*$) and an increase of the marginal tax rates of the rest 4 levels of income (W^* , $2W^*$, $5W^*$ и $10W^*$) which is combined with a kind of “divergence” of the marginal tax rates for them. Thus in 1992 we see 4 different levels of marginal

tax rates – 24% for the poor and the lower-middle class, 28% for the upper-middle class, 36% for people with high income and 40% for the wealthy.

Further, the marginal tax rates of the poor, the people with high income and the wealthy decrease and those of the middle class remain unchanged. The result is 5 levels of marginal tax rates in 1994 located in the range 20-36%. In 1996 all marginal tax rates grow (“bundled”). Then the marginal tax rates of the wealthy, the people with high income and the lower-middle class are reduced and this of the poor increases. Thus in 1998 we record (only) 3 levels of marginal tax rates – the poor and the lower-middle class have the same marginal tax rate (26%), the people with high income and the upper-middle class – too (32%).

After 2000 there can be seen a clear trend of decrease and “convergence” (cohesion)¹² of marginal tax rates (see Figure 3). In 2000 the marginal tax rate of the poor is 20% and in 2006 – 0%. Similarly in 2000 the wealthy have a marginal tax rate of 40% and in 2006 – of 24%. The other 3 groups are no exception. Furthermore in 2000 the difference between the marginal tax rate of the wealthy and the one of the lower-middle class is 14 pp. In 2002 this difference is only 5 pp, for 2004 – 3 pp and for 2006 – (only) 2 pp.

Finally (somehow naturally) comes the total *equalization* of marginal tax rates since 01.01.2008 – 10% for all taxpayers (see Figure 3).

To summarize, the above described dynamics could be systematized as follows: from the almost flat rate 13.5-14% (not counting the poor) in 1990-1991 through a “fan” of differentiated marginal tax rates (1991-2007) to a (definite) flat marginal tax rate amounting 10% (since 2008). This is the history of marginal rates of labor income tax in Bulgaria for the period 1990 – 2008.

Average tax rates

The average tax rate measures the proportion (quota) of tax in the corresponding tax base:

$$ATR = \frac{T}{B} * 100, \text{ where:}$$

ATR is the average tax rate (%);

T – tax (tax liability);

B – tax base.

Depending on the behavior of the average tax rate taxes are:

- progressive
- proportional
- regressive (degressive)

When with growth of the tax base (say, income) the average tax rate *increases*, taxation is *progressive* (the quota of tax in the tax base widens) - ATR_1

¹² An exception (until 2006) is the marginal tax rate of the poor which moves away from the others because it decreases faster.

on Figure 4. Until 01.01.2008 the personal income tax in Bulgaria is progressive (see the analysis that follows).

If with increase of the tax base the average tax rate *remains unchanged* (i.e. $ATR=MTR=const.$) the tax is proportional (the tax liability is a constant part of the tax base) – ATR_2 on Figure 4. Proportional taxation is widespread in current Bulgarian tax practice – personal income tax, corporate tax, property tax, inheritance tax, etc.

Finally if with the increase of the tax base the average tax rate *decreases* taxation is *regressive* (the quota of tax in the tax base shrinks) – ATR_3 on Figure 4. Typical example of regressive taxation are social and health security payments (in the world and in Bulgaria). Tax base has a statutory “ceiling” (so called maximum insurable earnings) which currently in Bulgaria is 2000 leva per month. In other words – up to this number the marginal tax rate is positive and above – 0%. As a result above 2000 leva the average tax rate is reduced which indicates the repressiveness of taxation.

Figure 4

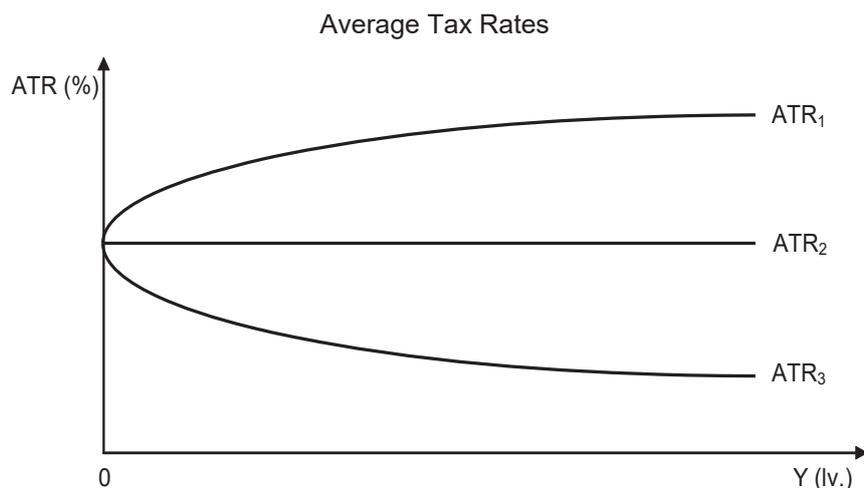
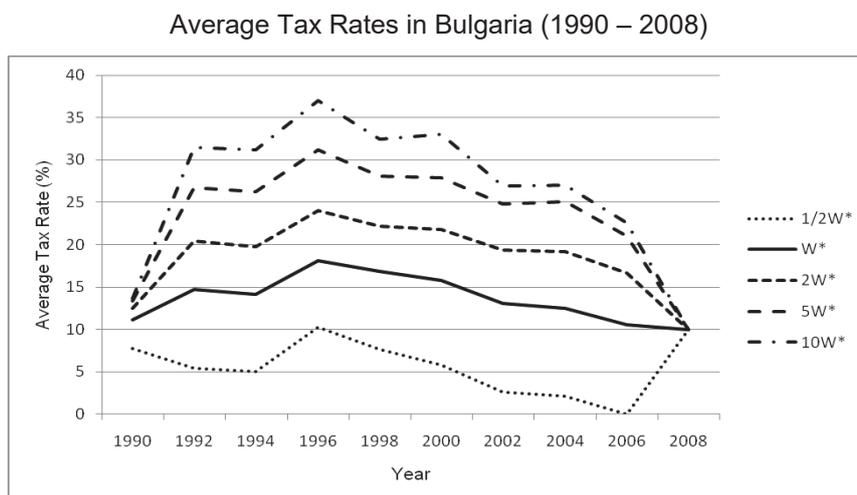


Figure 5 presents the dynamics of average tax rates for the five selected (see above) levels of labor income in Bulgarian economy ($1/2W^*$, W^* , $2W^*$, $5W^*$ и $10W^*$) for the period under examination (1990-2008).

From 1990 to 2007 with increase of the taxable labor income (from $1/2W^*$ to W^* , from W^* to $2W^*$ etc.) the average tax rate grows, i.e. taxation is *progressive* – the higher the wage, the greater part of it is “sacrificed” in form of taxes (tax liability). In 2008 the average tax rate is a constant value – the quota of tax in the tax base is the same for all 5 levels of income (10%). Thus the personal income tax is *proportional* ($ATR = MTR = 10\%$) – see Figure 5 and Figure 3.

Figure 5



In 1990 the average tax rates for the five levels of income are in extremely narrow frame – the differential between the tax rate of the poor (7.78%) and this of the wealthy (13.71%) is a little over 6 pp. Even closer are the tax rates of the middle class, the people with high income and the wealthy. For example the difference between the average tax rate of the upper-middle class (12.54%) and the wealthy (13.71%) is just over 1 pp. Practically this is a *(almost) proportional* taxation.

This is followed by a slight decrease in the tax burden of the poor (about 2 pp) and a *significant increase* of all other tax rates (1992). Most dramatic is the jump for the wealthy – the tax burden grows with almost 18 pp. Now the difference between the average tax rate and the poor and the one for the wealthy is over 26 pp and the one between the upper-middle class and the wealthy – over 11 pp (see Figure 5).

The period 1992-1994 could be characterized as a “plateau” – the rates of tax burden for all examined levels of income remain the same. This is a kind of “hush before the storm”.

In 1996 all average tax rates *increase (again)*. Now the rise is with (average) 5 pp. Thus the rate of tax burden on income in Bulgarian economy reaches its *absolute maximum* for the period under examination (1990-2008). The tax burden of the poor is over 10% of income. The middle class faces an average tax rate between 18 and 24%. The rate of tax burden of people with high income is over 30% and the wealthy are forced to sacrifice almost 37% of their income as tax (see Figure 5).

After 1996 all average tax rates start to go down slowly (but surely). The rate of tax burden of the poor decreases continuously and for a period of 10 years reaches the absolute bottom – 0% (in 2006 monthly income amounting 1/2 average wage falls within the non-taxable threshold and ATR=MTR=0%). Similar is the behavior of average tax rates of the middle class – for the period 1996-2006 the

reduction is almost 8 pp (for the lower layer from 18.13 to 10.61% and for the upper – from 24.05 to 16.64%). For people with high income the downward trend shortly changes direction (for the period 2002-2004 the tax burden slightly grows) but after that goes down again (see Figure 5). So for 10 years (1996-2006) the tax burden on wealthy Bulgarians “becomes lighter” respectively with 10.14 and 14.45 pp (for recipients of high income the average tax rate decreases from 31.21 to 21.06% and for the wealthy – from 36.98 to 22.53%).

In 2008 all functions presenting the dynamics of average tax rates “meet” at one single level on the scale of Figure 5 – 10%. This is a result of the introduction of the so called flat (proportional) tax in Bulgaria since 01.01.2008 (ATR=MTR=10% for all incomes in the economy). The tax burden of the poor increases (for 0 to 10%) and of all other groups is reduced from the respective levels from 2006 (10.61%, 16.64%, 21.06% and 22.53%) to 10%.

The 10% tax rate is an *absolute minimum* within the period under examination for all except the poor. If we take 1990 for a basis the difference is not so significant (2-3 pp) but compared to 1996 (when all rates have their highest levels) the collapse of the tax burden is impressive – for the wealthy and those with high income the average tax rate decreases 3-4 times and for the middle class – about 2 times (see Figure 5). For the poor (receiving 1/2 average wage) the balance is different. Compared to 1990 the growth is slightly over 2 pp but if we take 2004 (for example) for a basis in 2008 the average tax rate is almost 5 times higher. In the end of the period the tax burden of the poor increases (drastically) from 0% (in 2006) to 10% (since 2008).

Taxation of labor income influences the choice “labor – leisure time” and the economic activity in national economy. Contemporary microeconomics teaches that at a given (constant) level of marginal tax rate (MTR) the increase of the average tax rate (ATR) encourages (increases) labor supply in the economy.¹³ This is the so called *effect of income* – the residual income is reduced, workers become poorer and reduce the consumption of all normal goods (goods and services) including leisure time (considered a normal good). Naturally when with constant marginal tax rate the average tax rate decreases, the labor supply in the economy decreases (taxpayers become richer and consume more normal goods – including leisure time, i.e. they work less).

On the contrary, with every (constant) level of average tax rate (ATR) the growth of marginal tax rate (MTR) discourages (decreases) labor supply¹⁴ – the so called substitution effect. The price of leisure time is reduced and workers increase their consumption of (cheaper) leisure time (they substitute labor with rest) – labor supply in economy decreases. Respectively when with a constant average rate the marginal tax rate is reduced labor supply grows (leisure time goes expensive and workers reduce their consumption of leisure time, i.e. they work more – they substitute leisure time with labor).

¹³ Corneo, 2005, p. 159 – 186.

¹⁴ Ibid.

Within the period under examination (1990-2008) *average and marginal tax rates move (generally) in the same direction* (see Figure 5 and Figure 3). Therefore general conclusions on the impact of respective changes labor supply (and economic activity) in Bulgarian economy (generally) could not be made. There are some (not very significant) *exceptions* grouped as follows:

- *The poor*: For the period 1996-1998 the average tax norm *decreases* (from 10,28 to 7,66%) and the marginal tax rate *increases* with 2 pp (from 24 to 26%). Therefore (other thing being equal) changes in labor income taxation through this crisis period for Bulgarian economy *discourage labor activity of people with low income*.

- *Lower-middle class*: For the period 1992-1994 the marginal tax rate is *constant* (24%) and the average tax rate (*slightly*) *decreases* with 1 pp. Finally for the period 2002-2004 the average tax rate *decreases* and the marginal one – grows with 2 pp. All these changes (normally) generate an increase of leisure time consumption and a *reduction in labor supply* in the economy.

- *Upper-middle class*: For the period 1992-1994 the marginal tax rate is *constant* (28%) and the average tax rate (*slightly*) *decreases*. The same thing reoccurs in 1996 – 2000 - 1994 the marginal tax rate is *constant* (32%) and the average tax rate *decreases*. This (again) leads to a *decrease in labor supply*.

- *People with high income*: For 1998-2000 the marginal tax rate is *constant* (32%) and the average tax rate (*slightly*) *decreases*. Therefore *labor supply is reduced*. On the contrary (for 2002 – 2004) with a *constant* marginal tax rate amounting 29% the average one (*slightly*) *increases* encouraging the *growth in labor supply* in the economy.

- *The wealthy*: For 1998-2000 the marginal tax rate is *constant* (40%) and the average tax rate *increases*. The same happens also in 2002-2004 – with a *constant* marginal tax rate (29%) the average one (*slightly*) *grows*. All other things equal these changes lead to an *increase of labor supply* of the wealthy.

To summarize, the deviations from the general trend of joint movement of average and marginal tax rates *discourage* labor activity of people with low income and the middle class and (with one exception) *encourage* labor supply by people with high income and the wealthy (see Figure 5 and Figure 3).

Progressivity

Progressivity (rate of progression) is a key feature of labor income taxation. In specialized literature two main methods for measuring tax progressivity are discussed:

- Local measures (metrics, indexes) of progressivity – they are focused (only) on the respective tax structure;

- Global measures (metrics, indexes) – they measure the particular distribution of income in the economy.

In midst of last century Richard Musgrave and Tun Thin define *four (classic) measures of local (“point”) progressivity* of personal income tax:¹⁵

¹⁵ Musgrave, Thin, 1948, p. 498-514.

- average rate progression;
- marginal rate progression;
- liability progression;
- residual progression.

Since (by definition) tax structure is progressive, when together with increase of tax base (income) the average tax rate also grows, progressivity of taxation could be measured with the rate of change of average tax rate (the so called *average rate progression*):

$$\alpha = \frac{\frac{T_1}{Y_1} - \frac{T_0}{Y_0}}{Y_1 - Y_0}, \text{ where:}$$

α is the average rate progression;

T_1 – tax liability for income Y_1 ;

T_0 – tax liability for income Y_0 ($Y_1 > Y_0$).

Essentially α measures the slope of the curve (function) of the average tax rate (see Figure 4).¹⁶ Therefore:

- if $\alpha > 0$ taxation is *progressive*;
- if $\alpha = 0$ taxation is *proportional*;
- if $\alpha < 0$ taxation is *regressive*.

The coefficient of *marginal rate progression* measures the rate of change in marginal tax rate:

$$\mu = \frac{\frac{T_2 - T_1}{Y_2 - Y_1} - \frac{T_1 - T_0}{Y_1 - Y_0}}{Y_2 - Y_1}, \text{ where:}$$

μ is the marginal rate progression;

T_2 – tax liability for income Y_2 ;

T_1 – tax liability for income Y_1 ;

T_0 – tax liability for income Y_0 (Y_2 is little higher than Y_1 , a Y_1 – little higher than Y_0).

Assuming that the marginal tax rate function is a “smooth” curve (see Figure 1) measures its slope.¹⁷ Hence:

¹⁶ When there are (infinitely) slight changes in taxable income (Y) and the tax liability (T) is presented by a continuous function of Y , the average tax rate coefficient of progressivity looks like this:

$$\alpha = \frac{d}{dY} \left\{ \frac{f(Y)}{Y} \right\}$$

¹⁷ Then if there are (infinitely) slight changes in taxable income (Y) and the tax liability is presented as a continuous function of Y , the marginal tax rate coefficient of progressivity looks like this:

$$\mu = \frac{d^2}{dY^2} \{f(Y)\}$$

- if $\mu > 0$ taxation is *progressive*;
- if $\mu = 0$ taxation is *proportional*;
- if $\mu < 0$ taxation is *regressive*.

Tax liability progression measures the elasticity (the degree of sensitivity) of the tax liability to the tax base (income). Therefore the tax liability progression coefficient is a correlation between percentage change of tax liability and the corresponding percentage change in income:

$$\tau = \frac{T_1 - T_0}{T_0} * \frac{Y_0}{Y_1 - Y_0}, \text{ where:}$$

τ is the tax liability progression;

T_1 – tax liability for income Y_1 ;

T_0 – tax liability for income Y_0 ($Y_1 > Y_0$).¹⁸

Against this background:

- if $\tau > 0$ taxation is *progressive*;
- if $\tau = 0$ taxation is *proportional*;
- if $\tau < 0$ taxation is *regressive*.

Finally, *residual progression* is a measure of elasticity of residual income to income. In other words the coefficient of residual progression is a correlation between the percentage change in residual income and the corresponding percentage change in income:

$$\rho = \frac{(Y_1 - T_1) - (Y_0 - T_0)}{(Y_0 - T_0)} * \frac{Y_0}{Y_1 - Y_0}, \text{ where:}$$

ρ is the residual progression;

T_1 – tax liability for income Y_1 ;

T_0 – tax liability for income Y_0 ($Y_1 > Y_0$).¹⁹

Obviously, in this case:

- if $\rho > 0$ taxation is *progressive*;
- if $\rho = 0$ taxation is *proportional*;
- if $\rho < 0$ taxation is *regressive*.

¹⁸ If there are (infinitely) slight changes in taxable income (Y) the tax liability progressivity coefficient looks like this:

$$\tau = \frac{df(Y)}{dY} * \frac{Y}{f(Y)}$$

¹⁹ If there are (infinitely) slight changes in taxable income (Y) the after-tax income progressivity coefficient looks like this:

$$\rho = \frac{d\{Y - f(Y)\}}{dY} * \frac{Y}{Y - f(Y)}$$

Indices of *global progression* of personal income tax are constructed based on the respective (actual) distribution of income in the economy and measure “the extent to which a particular tax structure leads to a *shift in income distribution towards equality*”.²⁰ In the 70es of last century Reynolds and Smolensky suggest (probably) the simplest global tax progression index – the difference between the Gini coefficient²¹ before and after taxation.²²

$$RS = G(Y_T) - G(Y), \text{ where:}$$

RS is the Reynolds-Smolensky index of global progression of personal income tax;
 $G(Y_T)$ – Gini coefficient measuring the extent of inequality of distribution of residual income;

$G(Y)$ – Gini coefficient measuring the extent of inequality of distribution of before-tax income.

If $RS < 0$ taxation is *progressive*, if $RS = 0$ it is *proportional* and if $RS > 0$ – *regressive*.

To examine labor income tax progressivity in Bulgarian economy we use the *residual income coefficient* which could be defined as:²³

$$\rho = \frac{1 - MTR}{1 - ATR}, \text{ where:}$$

ρ is residual progression;

MTR – marginal tax rate;

ATR – average tax rate.

As the coefficient of residual progression measures the elasticity (degree of sensitivity) of residual income to changes in before-tax income, $\rho(Y^*) = 0.85$ for instance means that 1% growth of the before-tax income of a taxpayer with taxable income of Y^* leva increases his net (residual) income with 0.85%. At a level of Y^* leva tax is progressive only if $\rho(Y^*) < 1$.²⁴ Accordingly the lower the coefficient of residual progression, the higher is the degree of tax progressivity and vice versa - the higher the coefficient of residual progression, the lower is the degree of tax progressivity.

Figure 6 presents the dynamics of residual income elasticity coefficient for the five (above) selected levels of (before-tax) labor income in Bulgaria ($1/2W^*$, W^* , $2W^*$, $5W^*$ and $10W^*$) for the period 1990 – 2008.

²⁰ Musgrave, Thin, 1948, p. 498-514.

²¹ An index for measuring the inequality in income distribution suggested by the Italian statistician, demographer and sociologist Corrado Gini (1884 – 1965) in 1912.

²² Reynolds, Smolensky, 1977, p. 419 – 438.

²³
$$\rho = \frac{d\{Y - f(Y)\}}{dY} \cdot \frac{Y}{Y - f(Y)} = \{1 - f'(Y)\} \cdot \frac{Y}{Y - f(Y)} = \frac{1 - f'(Y)}{1 - \frac{f(Y)}{Y}} = \frac{1 - MTR}{1 - ATR}$$
 (See Musgrave,

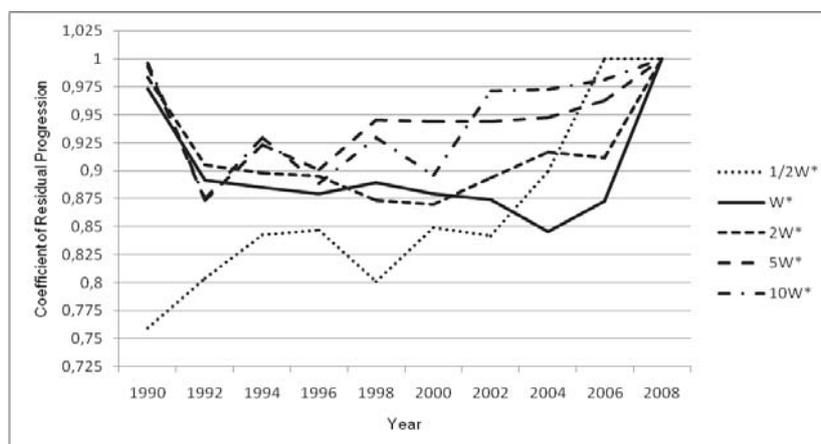
Thin, 1948, p. 498-514).

²⁴ If $\rho(Y^*) = 1$ the tax is proportional and if $\rho(Y^*) > 1$ – regressive.

Until 01.01.2008 all residual income elasticity coefficients are *lower than 1*, i.e. labor income taxation in Bulgaria is *progressive* (in 2006 the residual income elasticity coefficient of the poor equals 1 because their before-tax income is in the range of the non-taxable threshold and $ATR = MTR = 0\%$ ²⁵ - see Figure 3 and Figure 5).

Figure 6

Residual Progression in Bulgaria (1990 – 2008)



At the beginning of the period under examination (1990-2008) there is a kind of *polarisation* in the residual progression coefficients. At one end are the poor with *the highest* degree of tax progressivity – $\rho (1/2W^*) = 0.7591$,²⁶ and on the other – all the rest with *extremely low* tax progressivity (tending to 1, i.e. *almost a proportion* as mentioned in the analysis of average tax rates above) – see Figure 6.

Then there is a *decrease* of tax progressivity for the poor and a significant *increase* of the progressivity for all other levels of income (in 1992 the residual progression coefficient for the middle class is reduced to about 0.90 and for people with high income and the wealthy – to 0.87).

Durring 1992-1996 tax progressivity for the poor continues to *decrease*, the one for the middle class remains *unchanged* and for people with high income and the wealthy *declines* (for 1994) and then *rises* again (1996). Afterwards the tax progressivity for the poor *increases* (1998), for the middle class *remains unchanged* and for people with high income and the wealthy *is reduced* (see Figure 6).

$$^{25} \rho = \frac{1 - 0\%}{1 - 0\%} = 1.$$

²⁶ This is the highest degree of progressivity for all levels of labor income for the period under examination.

For the period 1998-2002 the trend for the poor reverses (progressivity *decreases*), for the middle class and people with high income remains *unchanged* and for the wealthy fluctuates widely – an growth (in 2000) and a substantial decline (2002).

After 2002 progressivity for all levels of labor income starts to *decrease* rapidly. A temporary exception of this general trend is the residual income elasticity coefficient of the lower-middle class – for 2004 tax progressivity grows but afterwards goes firmly down (see Figure 6).

In 2008 (as one could expect) all curves presenting the dynamics of residual progression coefficient concentrate at *the same level* - $\rho = 1$. Single elasticity of residual income is a sign of *proportional* taxation.

Throughout the whole period under examination people with high income and the wealthy benefit from the *lowest tax progressivity* (with the exception of 1992 when the tax for the representatives of the middle class is characterised by lowest progresivity). On the contrary the poor (1990-2002) and the representatives of the middle class (2002-2006) face *the highest progressivity* of labor income tax in Bulgarian economy for the period 1990-2008 (see Figure 6).

*

Labor income tax is a main fiscal and redistribution tool in Bulgarian economy after the changes of 1989. Throughout the period under examination the number of tax brackets and the level of marginal tax rates first increases (1990-1996) and then decreases (1996-2008). From four (in 1990) tax brackets grow to whole ten for 1994. Then they fall (again) to four (2006-2007 in the framework of progressive tax structure) and to one (with the introduction of proportional taxation on 01.01.2008). The non-taxable threshold varies around the minimal wage for the country (1990-2006) and declines to 0 leva in 2008. The beginning of the last tax bracket (which is “burdened” with the highest marginal tax rate after 1990) varies in widely. In 1992 the ratio “lower limit of last tax bracket / average wage” is nearly 10, for 1994 – over 60 and in 2006 – under 2. Since 01.01.2008 the lower level of the highest (and only) tax bracket is 0 leva. The maximum (statutory) marginal tax rate first grows to 30% (on the income of the second tax bracket) in 1990 to 52 (on the income in the highest tax bracket) in 1993 and then decreases to 24% (in 2005-2007) and 10% (only one) in 2008.

Against this background the evolution of the marginal tax rate for five selected labor income levels in Bulgarian economy (defined as ratio to the average wage in the country) starts with a nearly flat rate in the rage of 13.5-14% (not counting the poor) in 1990-1991, goes through a “fan” of differentiated marginal tax rates (1991-2007) to finis with the (definite) flat rate of 10% (since 2008).

From 1990 to 2007 with the increase of taxable income the average tax rate grows, i.e. taxation is *progressive*. In 2008 the average tax rate is constant – the tax quota in the tax base is the same for all five income levels (10%). Thus the personal income tax is *proportional*. In its dynamics the average tax rate “starts” from 7-8% for the poor and 13-14% for the wealthy (at the beginning of the period) in 1996 reaches (over) 10% for the poor and (almost) 40% for the wealthy to decrease to 10% for all income levels in the economy in 2008.

Through the period under examination (1990-2008) the average and the marginal tax rates move in the same direction. Therefore general conclusions on the impact of the corresponding changes on labor supply and economic activity in Bulgarian economy could not be made. Occasional deviations from the general trend of joint movement of average and marginal tax rates discourage labor activity of people with low income and the middle class and encourage labor supply of people with high income and the wealthy.

In 1990 labor income tax progressivity for the poor is high and for all other groups – (relatively) low. For 1992-2002 tax progressivity for the poor and the wealthy fluctuates significantly (up and down) and for the representatives of the middle class remains at (approximately) the same level. After 2002 tax progressivity for all income levels starts to decrease and in 2008 “vanishes” – labor income tax in Bulgarian economy becomes proportional.

Eventually in 2008 the poor in the country are in a worse situation than in the beginning of the period (the fiscal burden on lowest income is highest) and all the rest are in a better one (their tax burden is lower). Redistribution capacity of personal income tax is completely neutralized through the introduction of proportional taxation.

References:

State Social Security Budget Act [Закон за бюджета на Държавното обществено осигуряване] (Prom. SG, N 100 of 20.12.2011).

Personal Income Tax Act [Закон за данък върху общия доход] (Prom. SG, N 132 of 1950).

Personal Income Tax Act [Закон за данъците върху доходите на физическите лица] (Prom. SG N 95 of 24.10.2006).

Personal Income Taxation Act [Закон за облагане доходите на физическите лица] (Prom. SG, N 118 of 10.12.1997).

Main macroeconomic indicators 2008. NSI, 2009.

Statistical Yearbook 1993. NSI, 1994.

Statistical Yearbook 1996. NSI, 1997.

Statistical Yearbook 1999. NSI, 2000.

Statistical Yearbook 2002. NSI, 2003.

Statistical Yearbook 2005. NSI, 2006.

Statistical Yearbook 2010. NSI, 2011.

Fagan, E. D. Recent and Contemporary Theories of Progressive Taxation. - Journal of Political Economy, 1938, Vol. 46.

Corneo, G. The Rise and Likely Fall of the German Income Tax, 1958 – 2005. - CESifo Economic Studies, 2005, Vol. 51, 1.

Musgrave, R. A. and T. Thin. Income Tax Progression, 1929-48. - Journal of Political Economy, 1948, Vol. 56, 6, p. 498-514.

Reynolds, M. and E. Smolensky. Post-Fisc Distributions in 1950, 1961 and 1970. Public Finance Quarterly 5, 1977, p. 419 – 438.

15.III.2012