Tax Rate Changes: Does It Affect Gross Domestic Product (GDP)?

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Abstract. Taxes as the country's main source of financing are an important component for increasing or decreasing value of Gross Domestic Product (GDP). However, the influence of the individual income tax level is thought to have a negative effect on individual spending power. This research aims to review whether there is a relationship between the applicable tax rates and economic growth, in terms of GDP. Testing was carried out through a difference test followed by a test of the influence between the level of individual income tax and GDP (y-on-y). Because the results of the normality test found abnormal data, the test was carried out using non-parametric difference tests and correlation tests. As a result, it was found that an increase in individual income tax rates could have the effect of reducing GDP (y-on-y). This is due to reduced people's purchasing power and reduced circulation of money for shopping/consumption.

Keywords: GDP, Individual Income Tax Rates

1. Introduction

Taxes are one of the main sources of state financing. According to Oktaviyoni (2024), tax revenues throughout 2023 reached IDR 1,869.23 trillion, an 8.9% increase compared to 2022, amounting to IDR 1,176.77 trillion. Meanwhile throughout 2024, until June 2024, tax revenues amounted to IDR 893.8 trillion, down from the same month in the previous year of IDR 970.2 trillion (Indriani, 2024).

If we look at its relationship with economic growth, according to Purnomo (2023), the tax ratio is a comparison between total tax revenue and the country's Gross Domestic Product (GDP). The high value of the tax ratio shows that the country can reduce dependence on debt (Panjaitan, 2024). However, if you look at it from the opposite direction, because of high taxes, the circulation of money to boost economic growth actually decreases. Thus, tax rates and economic growth can be opposites, depending on the angle from which the policy review or analysis is carried out.

According to Saeno (2022) quoting from worldpopulationreview.com, taxes can also be a financial burden for taxpayers. However, in state finances, taxes are needed to fund public services, including education, health, infrastructure development, and state defense and security.

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Pension funds are also financed from tax revenues. However, on the other hand, taxes collected from individuals and entities will cut net income, and result in reduced circulation of money for consumption. As a result, it leads to the level of economic growth which is proxied by Gross Domestic Product (hereinafter abbreviated as GDP). This research aims to compare economic growth between countries in the world, with different tax rates.

This research also needs to be carried out because of the family office policy which is likely to be implemented during the administration of the new president, Prabowo Subianto. But can tax exemptions to attract investment from "rich families" have an effect on increasing money circulation and GDP economic growth?

According to Kurniati (2024), based on government policy which is currently being reviewed whether it will be implemented, the concept is guided by countries such as Singapore, Hong Kong and the United Arab Emirates (Dubai). In this country, family office concept are used. Still according to Kurniati (2024), taxation in these countries includes, among other things, tax exemptions for profits obtained from capital gains and dividends. The imposition of minimum domestic spending in these countries is also implemented, with tax relief included. However, if such exclusions is implemented, it needs to be assessed whether this will have an effect on economic growth.

According to Wikipedia (2022), Gross Domestic Product (GDP) refers to spending ability (abbreviated KKB in Indonesian language) per capita. The ability to shop alone is assessed on all products and services that can be produced in a country in a particular year, divided by the average population in the same year. Thus, shopping ability here refers to individual shopping ability, which is influenced by the tax rate imposed on individuals.

According to data from the Statistics Indonesia (2024), in the first quarter of 2024, GDP (y-on-y) or from year to year, increased by 5.11%. This increase was caused by the consumption expenditure of non-profit institutions serving households (abbreviated PK-LNPRT in Indonesian language) which experienced growth of 24.29%. However, in the last quarter of 2023, economic growth seen from the Government Consumption Expenditure Component (abbreviated PK-P in Indonesian language) actually decreased by 36.69%. Thus, the increase in GDP in terms of consumption of non-profit institutions explained above could be caused by tax contributions. But income from Income Tax Section 21 which were not too high compared to the previous year.

Research in Indonesia was conducted by Sumiyati & Julia (2023). According to Sumiyati & Julia (2023), which examined the influence of tax incentives on overall economic growth and per capita economic growth. Research by Sumiyati & Julia (2023) found that tax incentives for entities/corporations have not been able to increase economic growth, but tax incentives for individuals and non-corporate taxpayers can influence investment growth. Investment growth as a control variable is also able to increase economic growth. Therefore, they suggest that policy makers implement tax incentives for individual taxpayers and non-corporate taxpayers or Medium and Small Entities's (MSME's), to encourage new businesses and increase per capita economic growth.
This is also proven by research by Akanbi (2020), which examined the effectiveness of taxation in Nigeria with data from 2010-2018. Akanbi (2020) research findings state that the effectiveness of taxation as an instrument that functions to encourage economic growth is still

inconclusive. This research emphasizes the impact of tax collection and incentives on economic growth in Nigeria, with data from the Central Bank of Nigeria and data from the Federal Inland Revenue Service. From this research, it was found that there is a negative, but not significant relationship, between tax revenues and economic growth. Apart from that, there is also a negative and insignificant relationship between foreign direct investment equity and economic growth. From this research, it is recommended for the Nigerian Government to improve tax collection mechanisms, in order to stimulate economic growth. On the other hand, the existence of tax incentives may have to be evaluated for efficiency.

The purpose of the test in this article is to review whether there is a relationship between the tax rates that have been in effect and economic growth in terms of GDP. This is necessary especially when implementing a family office. This research is research that aims to predict whether the application of personal tax relief will affect the level of economic growth as proxied by GDP. Testing through a test of differences in economic growth between countries that apply tax relief and those that do not. Moreover, according to Sumiyati & Julia (2023) as quoted from Roberts & Bobek (2004), large companies generally use political power, especially when the government formulates regulations or makes changes to tax policy. Therefore, this research is very important to do.

2. Literature Review

Individual Income Tax Rates

Researchers suspect that differences in individual income tax levels influence the level of economic growth. In practice, there are countries that impose individual income tax rates of up to 55%, such as Denmark and Austria. The imposition of individual income tax of up to 50% also occurs in Japan and Belgium. The effect is varied economic growth.

Japan, with an individual income tax rate of 50%, experienced negative economic growth in the first quarter of 2024 of -0.2%. Likewise for Austria, GDP economic growth (y-on-y) until March 2024 reached -1.1%. However, Belgium and Denmark actually experienced positive GDP economic growth (y-on-y) of 1.3% and 1.4% respectively. Thus, the effect on GDP (y-on-y) varies.

Gross Domestic Product (GDP)

GDP (y-on-y) is the Gross Domestic Product from year to year. Based on Trading Economics (2024), this is the monthly GDP realization data in 2024:

Table 1. Realization of Gross Domestic Product (GDP)

Period	Realization	GDP in Previous Period
2024-02-05	5.04%	4,94%
2024-05-06	5.11%	5.04%

Note: The sources are from Statistics Indonesia (2024)

From the data above, the range of GDP realization during 2024 is around 5%, increasing every quarter. To the best of the researcher's knowledge, research that focuses on the relationship between GDP economic growth and the level of individual income tax is still limited. Most previous research focuses on the relationship between GDP and tax incentives, or Corporate

Income Tax. Moreover, research using different test methods is still quite rare, most of them use influence analysis with regression.

Based on Akanbi (2020) research about the effectiveness of taxation as an instrument for promoting economic growth in Nigeria. Research using data for the period 2010–2018, from the Central Bank of Nigeria and Federal Inland Revenue Service. With multiple regression, there is a negative insignificant relationship between tax revenue and economic growth. It means that with high tax personal income, economic growth can decrease.

In line with Akanbi (2020), Holcombe & Lacombe (2004) and Liyana et al. (2021) found something similar. The difference in the research done by Liyana et al. (2021), research results show that personal income tax using a progressive tariff scheme actually has a negative, but not significant effect on economic growth. The data used by Liyana et al. (2021) is Indonesia's data from the 2005-2019 period.

In contrast with Simarangkir et al. (2010) who researched Indonesia from the period with data from 1970-2008. As a result, direct taxes such as Income Tax actually have more influence on GDP than indirect taxes, such as those originating from VAT. Therefore, it is hoped that the government will reduce or provide incentives for Income Tax to increase GDP.

Instead that, Salebu (2018) analyze the effect of foreign direct investment (FDI) and Gross Domestic Product (GDP) on Tax Revenue (TR) in Indonesia. Analyze is done with panel data of 9 sectors for the period 2005–2015. Analysis use correlated random effect dengan Hausman test. The results show that GDP has a significant and negative effect on TR, but FDI has a significant and positive influence on TR. For GDP, the increase in GDP is not followed by an increase in tax revenue.

But Usmansyah & Santiago (2022), (Nguyen, 2019), and Rosalina (2016) find different things. From their research, the more State Revenue and GDP increase, the more tax ratio and income tax increase. Nguyen (2019) also find that GDP per capita has a positive effect on individual income tax revenue at 1% significant level.

3. Methodology

3.1. Difference Test and Effect Test

This research uses a difference test method, between the GDP variable (y-on-y) and the individual income tax level. The GDP variable (y-on-y) uses March 2024 data, while the individual income tax rate uses data on the highest individual income tax rate or individual taxpayer in force in a country, as of December 2023. The difference in periods is due to the researcher's assumption that changes of individual income tax rate in previous quarter period will affect GDP (y-on-y) in the following quarter period.

The data source is tradingeconomics.com website which contains variable indicators for all countries per continent, and supplemented with data from the m.investing.com website. and https://taxsummaries.pwc.com/. After the data is collected, the difference test is preceded by a normality test. If the normality test results produce normal test, the difference test is carried out using the independent sample t-test method. However, if the normality test shows that the test

results are not normal, then the test is carried out using a non-parametric test using Mann-Whitney method. The difference test is then continued with a non-parametric regression test, with correlation method.

4. Results And Discussion

Based on data collection on GDP (y-on-y) and individual Income Tax rates for all countries on each continent, it is found that individual Income Tax rates vary. There are countries that charge income tax rates of up to 50%, such as Japan, Belgium, Denmark and Austria. This is in line with research by Ardiansyah & Putra (2023) which found that the level of GDP per capita has a positive influence on the level of tax collection (tax effort). Japan, Belgium, Denmark and Austria have quite high GDP per capita, so tax collection efforts are more intensive.

However, on the other hand, it turns out that from the results of the data documentation, the results were obtained that in March 2024, Japan actually experienced negative GDP economic growth (y-on-y), amounting to -0.2%.
Countries with a predominantly Islamic population base that have adequate natural resources also impose an individual income tax rate of 0%. These countries include Oman, Kuwait, Bahrain, Brunei, Qatar and Saudi Arabia. However, unfortunately, there are some of these countries that will receive minus GDP (y-on-y) in the first quarter of 2024. These countries are Kuwait and Saudi Arabia. Following are the test results descriptive statistics:

Tabel 2. Descriptive Statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
GDP	73	-6.5	25.7	3.377808	4.25512281
Individual Income Tax	73	0	55	29.70959	13.03967412
Valid N (listwise)	73				

Note: The sources are from data processed by SPSS

Based on descriptive tests, the minimum value or GDP (y-on-y) for the first quarter of 2024 is -6.5 for Ireland. Even though the highest individual income tax rate in the country is 40%. After the descriptive test, testing continued with the normality test. Following are the test results:

Tabel 3. Normality Test

			GDP vs Tax Income
Most Extreme Differences	Absolute		.945
	Positive		.945
	Negative		.000
Kolmogorov-Smirnov Z			5.710
Asymp. Sig. (2-tailed)			.000
Monte Carlo Sig. (2-tailed)	Sig.		.000[b]
	95% Confidence Interval	Lower Bound	.000
		Upper Bound	.000

a. Grouping Variable: GDP and Tax Income Nominal

b. Based on 10000 sampled tables with starting seed 2000000.

Note: The sources are from data processed by SPSS

Because the results of the normality test found that the data were not normal, the test was continued with a non-parametric test, using the Mann-Whitney method. Following are the test results:

Tabel 4. Non-Parametrics Different Test Ranks

	GDP and Individual Income Tax Nominal	N	Mean Rank	Sum of Ranks
GDP vs Indvidual Income Tax	0	73	107.68	7861.00
	1	73	39.32	2870.00
	Total	146		

Test Statistics[a]

			GDP vs Tax Income
Mann-Whitney U			169.000
Wilcoxon W			2870.000
Z			-9.771
Asymp. Sig. (2-tailed)			.000
Monte Carlo Sig. (2-tailed)	Sig.		.000[b]
	95% Confidence Interval	Lower Bound	.000
		Upper Bound	.000
Monte Carlo Sig. (1-tailed)	Sig.		.000[b]
	95% Confidence Interval	Lower Bound	.000
		Upper Bound	.000

a. Grouping Variable: GDP and Tax Income Nominal

b. Based on 10000 sampled tables with starting seed 2000000.

Note: The sources are from data processed by SPSS

Based on the results of non-parametric tests, it was found that different individual income tax rates between each country produce different GDP (y-on-y). Furthermore, the results of the different tests were tested again with a non-parametric influence test via correlation. Following are the test results:

Tabel 5. Non-Parametrics Correlation Test

Correlations			
		GDP	Individual Income Tax
GDP	Pearson Correlation	1	-.305**
	Sig. (2-tailed)		0.009
	N	73	73
Individual Income Tax	Pearson Correlation	-.305**	1
	Sig. (2-tailed)	0.009	
	N	73	73
**	Correlation is significant at the 0.01 level (2-tailed).		

Note: The sources are from data processed by SPSS

From the results of the correlation test, the results obtained show that the level of individual income tax is negatively related to GDP (y-on-y). This means that if the individual income tax rate is high, the value of GDP (y-on-y) will decrease, due to the reduction in people's purchasing power and the reduction in the circulation of money for shopping/consumption.

The results of this research are in line with research by Akanbi (2020), Holcombe & Lacombe (2004), and Liyana et al. (2021). Thus, similar cases occurred in Nigeria, areas bordering the state, and Indonesia.

5. Conclusion

Tax as the main source of financing is an important component in the increase/decrease in the value of Gross Domestic Product (GDP) year-on-year (y-o-y). However, the influence of the individual income tax level is thought to have a negative effect on individual spending power. Therefore, the concept of the family office also emerged. This research aims to review whether there is a relationship between the applicable tax rates and economic growth in terms of GDP.

Testing was carried out through a difference test followed by a test of the influence between the level of individual income tax and GDP (y-on-y). Because the results of the normality test found abnormal data, the test was carried out using non-parametric difference tests and correlation tests.

As a result, descriptively, GDP data collection (y-on-y) and individual income tax rates for all countries on each continent vary. There are those who charge 0%, but there are also countries that charge 55%, 50% and 49.5%. GDP per capita also varies, but not always countries that charge high personal income tax rates have positive GDP (y-on-y). Meanwhile, from the difference test and correlation test, it was found that an increase in the individual income tax

rate could have the effect of reducing GDP (y-on-y). This is due to reduced people's purchasing power and reduced circulation of money for shopping/consumption.

The weakness of this research is that it does not involve or exclude other variables such as inflation. Apart from that, this research only focuses on individual income tax rates, and does not use corporate income tax either.

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