

## Research Article

# Economic Sector Contribution and Tax Revenue: Does Per Capita Income Have a Role?

Suparna Wijaya\*, Heru Subiyantoro, and Sutrisno Sutrisno

Universitas Borobudur, East Jakarta, Indonesia

**ORCID**Suparna Wijaya: <https://orcid.org/0000-0002-8172-4371>**Abstract.**

Taxes are the main source of state income. The research aims to examine the influence of the contribution of the service and the industrial sector on tax revenues. The difference in research is that it uses per capita income as a moderating variable. This research uses data from countries, such as Denmark, Finland, Iceland, Norway, and Sweden, which have several similarities in terms of prosperity, education, and a strong and stable economy. The data used comes from the World Bank and spans 2002-2019. The research results show that the contribution of the service sector, industry, and per capita income positively influences tax revenues. Supported by high tax rates, increasing donations to the service, and industrial sectors means that tax revenues are growing. Interestingly, using per capita income as a moderating variable negatively affects the service and industrial sectors' tax revenues. With the moderating influence of per capita income, tax avoidance can grow in the service and industrial sectors. One of the tax avoidance measures is using a transfer pricing scheme. This was triggered by high tax rates and the Human Development Index (HDI). The higher the tax rate, the more loopholes the taxpayer will look for to avoid taxes, to lower the tax burden. A high HDI will enable a high level of tax knowledge. Apart from increasing tax compliance, a high level of tax knowledge will also allow tax avoidance.

**Keywords:** economic sector contribution, tax revenue, per capita income

## 1. INTRODUCTION

Taxes have many important meanings, including being the main source of state income [1, 2] Increased tax revenues are supported by good economic performance. High tax revenues are important to financing various government programs and activities and maintaining the country's fiscal stability. Low tax revenues in a country can be caused by a tax gap, namely the difference between the tax that should be paid and the amount paid. Tax gaps arise because business processes fail to be captured by existing regulations, resulting in suboptimal income from the tax sector [3, 4]. Therefore, awareness of tax obligations and understanding the importance of taxes for state development are key factors in maintaining the stability of tax revenues.

Corresponding Author: Suparna  
Wijaya; email:  
[suparnawijaya@upnvj.ac.id](mailto:suparnawijaya@upnvj.ac.id)**Published:** 3 July 2024Publishing services provided by  
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Knowing what factors can influence tax revenue is necessary to determine appropriate efforts to increase revenue. Factors that influence tax revenues can be statistical determinants such as per capita income, literacy level, and state expenditure; institutional determinants such as the quality of tax administration and the level of corruption; as well as tax policy determinants such as tax rates and number of types of taxes. According to Castañeda-Rodríguez (2018), determinants of tax revenue can also be differentiated based on the underlying theoretical literature, including structural determinants, tax morality, political motivations, and tax administration's constraints [5–8].

The contribution of the service sector to Gross Domestic Income (GDP) positively influences a country's tax revenues [6, 9–11]. The greater the contribution of the service sector to GDP, the greater the tax potential the government can obtain from this sector. The service sector includes finance, transportation, hospitality, professional services, and the public sector. Taxes obtained from the service sector can come from various types of taxes, such as corporate income tax, income tax from service workers, and transaction taxes, such as value-added tax or VAT. Along with economic growth, the service sector in many countries is increasingly developing and is becoming a mainstay in driving economic growth. The government can use this development to increase tax revenues from the services sector. However, various studies find that the service sector does not affect tax revenues.

The contribution of the industrial sector to a country's Gross Domestic Income (GDP), based on previous research, has a positive effect on tax revenues. The greater the industrial sector's contribution to GDP, the greater the tax potential the government can obtain. Taxes that can be obtained from the industrial sector can come from several types of taxes, including corporate income tax, employee income tax, and transaction taxes such as value-added tax or VAT. However, other findings suggest different results, where the industrial sector does not affect tax revenues.

Another variable is per capita income. Per capita income is one of the factors that has a positive influence on a country's tax revenues [9, 12–15]. The higher the per capita income, the higher the tax revenue. This is because the higher the per capita income, the more sources of income that can be taxed by the government, both from the business and individual sectors. Per capita income can also influence people's consumption patterns, which has an impact on tax revenues. When per capita income increases, people tend to have higher purchasing power, so consumption of goods and services also increases. This could increase tax revenues from value-added or sales

tax (VAT). On the other hand, when per capita income decreases, people tend to limit consumption, so tax revenues from VAT will also decrease.

Godin & Hindriks (2015) modified this by replacing tax revenues with value-added tax revenues, using data from 203 countries in the period 1980 – 2010, with the result that per capita income had no effect on value-added tax revenues [7, 16]. In his research, Castañeda-Rodríguez (2018) found that in 138 countries from 1976 – 2015, per capita income had no effect on tax revenue. However, per capita income has a positive impact on income tax revenues. However, per capita income positively affects value-added tax (goods and services tax) revenues. This research differs by using per capita income as a moderating variable.

The research object is the Scandinavian countries, which consist of three main countries: Sweden, Norway and Denmark. However, in a cultural and historical context, Finland and Iceland are considered included in the Scandinavian countries. These five countries have several similarities in terms of welfare and education. Based on the 2019 (United Nations 2019) *Human Development Report, the Human Development Index* (HDI) of the five Scandinavian countries is in the top 12 highest HDI in the world. From an economic perspective, Scandinavian countries have strong and stable economies. Scandinavian countries are known for their strong social welfare systems. They offer their citizens extensive social security, free or affordable education, and unemployment insurance that protects them from the risk of losing their jobs.

Scandinavian countries' high level of prosperity cannot be separated from their high tax revenues. Regarding tax revenue, Scandinavian countries are known to have a comprehensive and high tax system compared to other countries [17, 18]. Thus, the research aims to examine the influence of the contribution of the service and industrial sectors on tax revenues, using per capita income as a moderating variable.

## 2. METHODOLOGY/ MATERIALS

The research method used by the author is associative quantitative. Quantitative research involves numbers, starting from data collection, analysis and presentation of results. Meanwhile, associative research aims to determine the relationship between variables, which is used in this research to determine the relationship between the independent and dependent variables [19–21].

This research uses secondary data collection techniques that the World Bank has previously published. Secondary data analysis is a data processing technique that utilizes data from a third party. Research data includes tax revenues, industrial sector

contributions, and service sector contributions in Denmark, Finland, Iceland, Norway, and Sweden from 2002 to 2019.

By paying attention to the characteristics of Scandinavian countries, several hypotheses in this research include the following:

The contribution of the service sector partially has a positive effect on tax revenues

The service sector generally has an equivalent proportion to industry in the GDP composition. Services, according to the World Bank's definition, are any action or activity that can be offered by one party to another party without physical form and does not result in ownership. By increasing the contribution of the service sector, there will be additional income, consumption and wealth from business actors in the service sector. The tax base comes from income, consumption and wealth. So that increasing income, consumption and wealth can increase tax revenues

The industrial sector's contribution partially has a positive effect on tax revenues.

According to the World Bank, the industrial sector contributes to GDP through mining, manufacturing, construction, electricity, water, and gas.

Per capita income has a positive effect on tax revenue.

Consumption theory states that consumption tends to increase when the income received increases. Rising consumption levels will increase sources of tax revenue from value-added tax and income tax on companies producing goods/services consumed. This is in line with the research results Castro & Camarillo (2014), who prove that countries with high GDP per capita are likelier to have higher income [11, 22–25].

Per Capita Income moderates the influence of the service sector on tax revenues.

Per Capita Income moderates the influence of the industrial sector on tax revenues.

In this type of panel data, classical assumption testing is not necessary. The tabular (panel) data type has minimal bias and can provide more information and degrees of freedom. The advantage of research using panel data is that it has low collinearity and greater variability and information. This type of data helps better detect and measure impact. This cannot be done using cross-sectional or time series methods.

### 3. RESULTS AND DISCUSSIONS

Based on the analysis results using the multiple linear regression method using panel data, the author divides the internal testing results into three parts, namely descriptive analysis, panel model selection results, and regression results based on the selected model. The average tax revenue in Denmark is 33.01%, in Finland it is 20.75%, in Iceland

it is 23.91%, in Norway it is 25.75%, and in Sweden it is 27.40% (Table 2). The lowest tax revenue rate during this period was 18.60%, especially in Finland in 2010, and the highest tax revenue rate occurred in Iceland in 2016, namely 37.61% (Table 1). On average, Denmark has the highest level of tax revenue, followed by Sweden, Norway, Iceland and Finland.

Meanwhile, in terms of the average contribution of the service industry, the country with the largest service industry contribution is Denmark at 63.78%, followed by Sweden, Iceland, Finland and Norway. On an annual basis, the proportion of service sector contributions is the lowest, namely 48.15%, especially in Norway in 2006. Meanwhile, the country with the highest proportion of service sector contributions is Iceland in 2019 at 65.89%.

TABLE 1: Descriptive analysis.

Variable	Mean	Standard Deviation	Minimum Value	Maximum Value
Y	26.16	4.65	18.60	37.61
IND	25.26	5.45	19.51	40.29
SERV	60.28	4.67	48.15	65.89
PCI	56.70	16.12	26.87	102.91
CORR	2.19	0.16	1.70	2.47

Source: processed data

TABLE 2: Average per country from 2002 to 2019.

Country	Y	SERV	IND	PCI	EFF	CORR
Denmark	33.01	63.78	21.14	55.07	2.33	2.33
Finland	20.75	58.23	26.36	44.66	2.28	2.28
Iceland	23.91	62.61	20.98	54.04	2.03	2.03
Norway	25.75	53.18	34.37	79.00	2.11	2.11
Sweden	27.40	63.62	23.49	50.74	2.20	2.20

Source: processed data

Regarding the industrial sector’s contribution, the highest average was recorded in Norway at 34.37%, followed by Finland at 26.36%, Sweden at 23.49%, Denmark at 21.14%, and Iceland at 20.98%. The industrial sector contribution in this period was the lowest, namely 18.60%, especially in Finland in 2010, and the highest industrial sector contribution was in Norway in 2008 at 40.29%.

On an annual basis, Finland had the lowest per capita income in 2002, at 26.87 USD. On average, Finland has the lowest per capita income, namely 44,660 USD, followed by

Sweden, Iceland, Denmark and Norway. Norway has the highest per capita income, at USD 79 thousand. To select the best panel model between Partial Least Squares (PLS), Fixed Effect (FE) and Random Effect (RE), the author first compares PLS with FE and obtains that the Prob <  $\alpha$  point is 0.00 so FE is selected. Then, the author compared PLS with RE and found that Prob <  $\alpha$  was 0.00, so RE was chosen. Finally, the Hausman test is carried out to select the FE or RE panel model (Table 3).

TABLE 3: Panel model test results.

Test Method	Prob. Mark	Conclusion
Chow test	0.00	The PLS model is better than the FE
Lagrange Multiplier (LM) test	0.00	The PLS model is better than the RE
Hausman test	0.07	RE model is better than the FE

Source: processed data

Based on the Hausman test results, the Prob >  $\alpha$  value is 0.07, so random effect (RE) was chosen as the panel model used in this test. Then, using the random effect model, the experimental results were obtained as shown in table 4 below:

TABLE 4: Panel data regression results using the *Random Effect model*.

Variable	Coefficient	z	P> z
Service Sector Contribution (SERV)	4,3000	2.80	0.005
Industrial Sector Contribution (IND)	2.9417	2.37	0.018
Per Capita Income (PCI)	0.0051	2.17	0.030
SERV.PCI	-0.0001	-2.16	0.030
IND. PCI	-0.0000	-2.01	0.045
Corruption Control	10.2849	3.92	0,000
Constant	-334.5310	2.71	0.007
Prob > chi2			0.0000
Overall R-squared			0.3505

Source: processed data

Based on Table 4, it can be understood that the two independent variables influence the dependent variable simultaneously. This is indicated by the Prob > chi2 value, which is smaller than  $\alpha$ , namely 0.00. Furthermore, based on the overall R-squared value, it can be seen that the variation in the dependent variable is influenced by the two independent variables tested by 81.63%, while other variables influence the rest.

Table 4 shows that the service sector's contribution has a value of P>|z| = 0.005, indicating a significant influence on tax revenues (two-tailed). Like the service sector,

the industrial sector's contribution also significantly influences tax revenues, with  $P > |z| = 0.008$ . At the same time, moderate per capita income weakens the relationship between service sector contributions and tax revenues, as indicated by  $P > |z|$  censored variables  $< 0.050$  with the opposite constant. Like the contribution of the service sector, moderate per capita income also weakens the relationship between the industrial sector's contribution and tax revenues.

Meanwhile, the partial contribution of the industrial sector also has a significant positive impact on tax revenues (one-tailed) with  $P > |z| = 0.009$ . This is consistent with several previous studies conducted, [22, 26–29]. In this research, it is emphasized that the cause of the significant positive influence of the industrial sector's contribution to tax revenues is that it is easier to regulate taxation in the industrial sector because it is directly related to production and distribution. These are still the characteristics of the 5 Scandinavian countries as countries with a high Human Development Index (HDI), so they are more compliant with regulations and able to produce highly competitive products, which in the end can increase tax revenues.

Tax rates and Human Development Index (HDI) figures allow tax avoidance to occur. High tax rates will increase the tax burden. An increasing tax burden will reduce business profits. So that taxpayers can think about avoiding taxes and controlling the tax burden. One effort that is often carried out is a transfer pricing scheme. Transfer pricing can lower the overall tax burden within a group.

Based on the 2019 Human Development Report, the Human Development Index (HDI) of the five Scandinavian countries is in the top 12 highest HDI in the world [30–33]. A high HDI will increase tax compliance. However, the negative effect of HDI is that the higher the HDI, the higher the tax knowledge. The negative impact of increasing tax knowledge is that taxpayers will know the loopholes for tax avoidance. When tax avoidance occurs, tax revenues will decrease.

Meanwhile, all variables combined (simultaneous) significantly influence tax increases. Increasing the contribution of these two areas can increase tax revenues in five Scandinavian countries: Denmark, Finland, Iceland, Norway and Sweden. Apart from its relation to the literature review above, based on the case study, the service sector in Sweden significantly contributes to the country's economy. The tourism industry is important in attracting tourists because of its natural beauty, rich cultural heritage, and cities such as Stockholm and Gothenburg. Sweden is also known as a center for technological innovation and information technology services, with leading companies such as Ericsson and Spotify creating jobs, driving economic growth, and increasing

tax revenues. In addition, the design and fashion industries, such as IKEA and H&M, also make a significant contribution to the Swedish economy.

In Denmark, industry significantly contributes to the country's economy and is closely linked to tax revenues. Denmark has a strong creative sector focuses on design, architecture, and fashion. Companies like LEGO and fashion brands like GANNI originate from Denmark, which has a significant economic impact. Apart from that, Denmark also has a high technology and advanced science sector. This industry's contribution creates jobs and affects state tax revenues. The growth and success of these industries help increase tax revenues through corporate and personal income taxes, supporting Denmark's social programs and public funding.

The same applies to Norway's industry and services. These two fields significantly contribute to the country's economy and are closely related to tax revenues. Norway is known as Europe's largest producer of oil and natural gas, so the energy sector, including oil, gas and renewable energy, significantly contributes to the country's economy. In addition, Norway also has a thriving maritime industry and a thriving financial services sector in the capital city of Oslo. The contribution of the industrial and service industries directly impacts state tax revenues, especially through corporate tax and personal income tax. High tax revenues from these sectors support Norway's public spending and welfare system, including infrastructure, public services and social programs.

## 4. CONCLUSION

Based on research, it can be concluded that together (simultaneously), contributions to the service sector and to the industrial sector in five Scandinavian countries significantly influence tax revenues. Separately (partially), contributions to the service sector have a significant positive influence on tax revenues. The higher the contribution of the service sector, the higher the tax revenue. As with the service sector, contributions to the industrial sector also significantly impact tax revenues. When the contribution of the industrial sector increases, tax revenues also increase. Likewise, per capita income has a positive influence on tax revenues.

However, when per capita income becomes a moderating variable, the contribution of the service and industrial sectors has a negative effect. The high tax rates in Scandinavian countries have a negative influence. Meanwhile, the high Human Development Index figure is another factor that allows for a negative impact. The high HDI makes taxpayers aware of tax loopholes. Thus, high tax rates and high HDI negatively influence tax revenues.



## References

- [1] Tricahyono D, Wijaya S. Pengaruh Kontribusi Sektor Agrikultur Dan Sektor Industri Dalam PDB Terhadap Penerimaan Pajak Di ASEAN Dengan Variabel Populasi Penduduk Urban Sebagai Moderasi. *Akuntansiku*. 2023;2(3):120–32.
- [2] Alfarisi F, Rolimas G, Maharani A, Kadarusman MD, Wijaya S. Analisis Strategi Manajemen Perpajakan Pada Universitas Terbuka. *Akuntansiku*. 2024;3(1):55–63.
- [3] Gemmell N, Hasseldine J. *The tax gap: A methodological review*. Emerald Group Publishing Limited; 2012.
- [4] Björklund Larsen L. Mind the (tax) gap: An ethnography of a number. *J Cult Econ*. 2017;10(5):419–33.
- [5] Casta neda Rodríguez VM. Tax determinants revisited. An unbalanced data panel analysis. *J Appl Econ*. 2018;21(1):1–24.
- [6] Piancastelli M, Thirlwall AP. The determinants of tax revenue and tax effort in developed and developing countries: theory and new evidence 1996-2015. *Nova Econ*. 2021;30(3):871–92.
- [7] Robinson Z, De Beer J. Revisiting corporate income tax determinants in Southern Africa. *Dev South Afr*. 2021;38(4):564–79.
- [8] Lyulyov O, Lyeonov S, Tiutiunyk I, Podgórska J. “The impact of tax gap on macroeconomic stability: Assessment using panel VEC approach.” *Journal of International Studies*. vol. 14, no. 1, p. 2021. <https://doi.org/10.14254/2071-8330.2021/14-1/10>.
- [9] Sarmiento J. The determinants of value added tax revenues in the European Union. *The European Journal of Management Studies*. 2016;21(2):79–99.
- [10] Amoh JK, Adom PK. The determinants of tax revenue growth of an emerging economy—the case of Ghana. *International Journal of Economics and Accounting*. 2017;8(3–4):337–53.
- [11] Minh Ha N, Tan Minh P, Binh QM. The determinants of tax revenue: A study of Southeast Asia. *Cogent Econ Finance*. 2022;10(1):2026660.
- [12] Arif I, Rawat AS. Corruption, governance, and tax revenue: Evidence from EAGLE countries. *J Transnational Manage*. 2018;23(2–3):119–33.
- [13] A. Dramane, “Tax revenues effects of corruption and governance in Waemu countries.” *Journal of Economic Development*. vol. 47, no. 4, p. 2022.
- [14] Capasso S, Cicatiello L, De Simone E, Santoro L. Corruption and tax revenues: Evidence from Italian regions. *Ann Public Coop Econ*. 2022;93(4):1129–52.

- [15] Tahlova S, Banociova A. "Assessment of corporate income tax revenues in the light of their current determinants." *Montenegrin Journal of Economics*. vol. 15, no. 1, pp. 87–97, 2019. <https://doi.org/10.14254/1800-5845/2019.15-1.7>.
- [16] Godin M, Hindriks J. An international comparison of school systems based on social mobility. *Econ Stat*. 2018;499(1):61–78.
- [17] Pereira DA, Dos Santos M, Costa IP, et al. Multicriteria and statistical approach to support the outranking analysis of the OECD countries. *IEEE Access*. 2022;10:69714–26.
- [18] Lentner C, Hegedűs S, Nagy V. Correlations of taxation and macroeconomic indicators in the OECD member countries from 2014 to the first year of the crisis caused by COVID-19. *J Risk Financ Manag*. 2022;15(10):464.
- [19] McKim CA. The value of mixed methods research: A mixed methods study. *J Mixed Methods Res*. 2017;11(2):202–22.
- [20] Timans R, Wouters P, Heilbron J. Mixed methods research: What it is and what it could be. *Theory Soc*. 2019;48(2):193–216.
- [21] Creswell JW. *A concise introduction to mixed methods research*. SAGE publications; 2021.
- [22] Castro GÁ, Camarillo DB. Determinants of tax revenue in OECD countries over the period 2001–2011. *Contad Adm*. 2014;59(3):35–59.
- [23] Andrejovska A, Pulikova V. Tax revenues in the context of economic determinants. *Montenegrin Journal of Economics*. 2018;14(1):133–41.
- [24] Celikay F. Dimensions of tax burden: A review on OECD countries. *J Econ Finance Adm Sci*. 2020;25(49):27–44.
- [25] Gobachew N, Debela KL, Shibiru W. Determinants of tax revenue in Ethiopia. *Economics*. 2018;6(6):58.
- [26] Topal MH, Sahin M. Governance quality and taxation: A panel co-integration evidence for OECD countries. *Studies on Balkan and near eastern social sciences*. Frankfurt: Peter Lang; 2017. pp. 265–79.
- [27] Rashid MH, Buhayan MS, Masud MA, Sawyer A. Impact of governance quality and religiosity on tax evasion: Evidence from OECD countries. *Advances in Taxation*. Emerald Publishing Limited; 2021. pp. 89–110.
- [28] Andreoni V. Environmental taxes: drivers behind the revenue collected. *J Clean Prod*. 2019;221:17–26.
- [29] Aizenman J, Jinjara Y, Kim J, Park D. Tax revenue trends in Latin America and Asia: A comparative analysis. *Emerg Mark Financ Trade*. 2019;55(2):427–49.

- [30] Montiel I, Cuervo-Cazurra A, Park J, Antolín-López R, Husted BW. Implementing the United Nations' sustainable development goals in international business. *J Int Bus Stud*. 2021;52(5):999–1030.
- [31] Bach M, Morgan MS. Measuring difference? The United Nations' shift from progress to poverty. *Hist Polit Econ*. 2020;52(3):539–60.
- [32] Stewart F. The human development approach: An overview. *Oxf Dev Stud*. 2019;47(2):135–53.
- [33] Ghislandi S, Sanderson WC, Scherbov S. A simple measure of human development: The human life indicator. *Popul Dev Rev*. 2019 Mar;45(1):219–33.