Chapter 1

Base of Corporate Income Tax and the EU Concept

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Additional information is available at the end of the chapter

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Abstract

The chapter discusses the base of the corporate income tax and summarizes the provisions of Polish law on corporate income tax with the draft common consolidated corporate tax base (CCCTB) directive. An analysis of tax revenues and tax costs with particular emphasis on revenue not constituting tax revenue and expenses is not considered tax deductibles. The chapter involved conducting a survey. Surveys were sent to 1000 Polish companies subject to corporate income tax. The companies were selected at random from among all businesses in Poland. Surveys were also sent to 500 companies in the European Union (EU), mainly in Germany, the UK, France, the Netherlands, Italy and the Czech Republic. The survey was answered by a total of 112 Polish companies and 50 foreign companies. Both the Polish and foreign operators who responded to the survey were dominated by limited liability companies and joint stock companies. The basic part of the study was carried out in 2010–2011, but in 2012, the study was repeated, and additional 200 surveys were sent to Polish companies, of which 15 had answered.

Keywords: finance, corporate finance, corporate income tax, tax harmonization in the European Union, CCCTB concept

1. Introduction

The financial and public finance crisis that affected the European Union (EU) countries also highlighted the problem of tax systems in force in 27 EU states. One of the primary purposes of EU law is to eliminate obstacles to the functioning of the internal market, particularly to improve the competitiveness of businesses. Having said that, the concept of a common consolidated corporate tax base (CCCTB) aims to eliminate obstacles to the functioning of the internal market and increases the degree of tax harmonization in the European Union [1].

The chapter discusses the base of the corporate income tax and summarizes the provisions of Polish law on corporate income tax with the draft CCCTB directive. An analysis of tax revenues and tax costs with particular emphasis on revenue not constituting tax revenue and expenses is not considered tax deductibles.

2. Tax revenues

The corporate income tax is based on the universal principle that the value of the tax which the entrepreneur is liable to pay depends on the tax base and tax rates. The tax base is subject to tax harmonization, i.e., the amount will be determined according to uniform rules for all companies covered by the CCCTB in individual EU countries. The tax base will therefore be the difference between taxable income, minus income exempt from taxation and deductible costs. Thus, to determine the tax base, it is important to indicate the notion of tax revenues, income exempt from income tax and deductible costs. Defining these categories in the system of a common consolidated corporate tax base should include a set of common rules for calculating the corporate tax base, without prejudice to the provisions laid down in Council Directives 78/660/EEC and 83/349/EEC and Regulation of the European Parliament and of the Council 1606/2002/EC.

The analysis of the tax base for corporate income tax in the Polish legislation in the context of the CCCTB concept should start with defining the tax base, i.e., taxable income. In the simplest terms, this is defined as a difference between tax revenues and the costs of obtaining them.

In accordance with the provisions of Polish law on corporate income tax, income tax represents the excess of the sum of revenues over costs to obtain them achieved in the fiscal year, subject to the special rules for determining the income (revenue) from participation in profits of legal persons and transactions between related parties and entities residing in tax havens.[1] If the deductible costs exceed the amount of revenue, the difference is a loss. In certain situations, the tax base is the income without taking into account tax-deductible expenses. The income indicated in the act is the basis of income taxation regardless of the type of revenue sources from which it accrues.

The Polish law on corporate income tax does not explicitly specify the definition of "income". The rules for the generation of income are defined in Art. 12 of the Act on Corporate Income Tax. Art. 12, par. 1, only contains a catalogue of examples of taxable income subject to corporate income tax. This is indicated by the legislator with the phrase "income particularly includes". This is an open list, and tax revenues particularly include:

1. Received money, cash, including foreign exchange differences
2. Value of goods or rights received free of charge or partially for a fee, as well as the value of other unpaid or partially paid benefits
3. Value (subject to par. 4 item 8 of the Act) of redeemed or expired:

[1]Vide Law of 15 February 1992 o podatku dochodowym od osób prawnych [on Corporate Income Tax] (OJ 2000 r. No. 54, pos. 654 with later modifications, Art. 7, par. 2; Art. 10, Art. 11.

- Liabilities, including credits and loans and excluding loans amortized from the labour fund
- Funds in bank accounts (banks)

The literature indicates that, based on the open list contained herein, income can be defined as any enlargement of property resulting in increasing assets or decreasing liabilities [1]. Such definition of tax revenue is also reflected in court decisions. In its judgement of 13 July 2010, the Supreme Administrative Court stated that:

> *the legislature did not formulate the requirement that income may only cover the benefits mentioned in Art. 12, which are a direct result of achieving the aim of economic activity of a legal person. Therefore any cash deposit may be considered as income of the legal person, provided it meets other requirements set out in section 2 herein. In particular par. 4 of the quoted article contains a list of benefits that cannot be classified as income. It is important to note that the legal norm contained in Art. 12, par. 4 of the act on corporate income tax provides a closed list, the scope of which is not subject to extension or constriction through the use of analogy and extensive interpretation.*

Essentially, including a property benefit in the revenues of the legal person is determined by the definitive nature of the benefit in the sense that it definitively actually increases the assets of the legal person. In its judgement dated 27 November 2003, the Supreme Administrative Court in Warsaw stated that "income can include only those values that determine the final increase in the assets of the taxpayer".

At the same time, recognizing a benefit as income is not determined by the fact that it was not included in the list of tax revenues not recognized by legislature. This was pointed out by the Supreme Administrative Court in its judgement in 14 May 1998, in which it stated that:

> *the essence of the income tax suggests that it is a public and legal burden on the increase in wealth (income) and, therefore, the revenue - as a source of income – is only the value in entering the property of the taxpayer, may increase their assets. Therefore, the money or monetary values received within the meaning of Art. 12, par. 1 item 1 of the Act in question only include such values that increase the assets of the taxpayer, i.e., those they can dispose of as their own.*

Taxation should cover all income, unless expressly exempted. Tax-neutral revenues and therefore those that do not constitute bases for determining the taxable income of the taxpayer are listed in Art. 12, par. 4 act on corporate income tax, where an exhaustive list is included. As a result of this regulation, this provision provides a closed list, the scope of which is not subject to extension or narrowing through the use of analogies or broad interpretation.

Income free of income tax includes payments or accrued receivables on the account of the supply of goods and services. Recognizing received or accrued contributions as deferred revenue requires the ability to allocate these payments to future accounting periods. The company must prove (pointing to the provisions of the contract or the content of the invoice) that the supply of goods or services is to take place in the following accounting periods after the accounting period in which the taxpayer receives payment (advance payment). The provision in question applies in particular to services provided on a continuous basis.

According to Art. 12, paragraph 4, item 2, income not constituting tax revenues includes amounts of accrued but not received interest on debt, including outstanding loans (credits).

This provision shows that interest is neutral for tax purposes until they paid. The taxpayer receives tax revenue from interest income at the time of actual receipt. In this case, cash accounting will apply, which means that the entity, which is owed interest is required to allocate them to their tax revenues only in the accounting period in which the interest is actually received. Any decision of contractors regarding, e.g., changes in interest rates on loans, postponement of payments, etc., shall remain tax neutral until actual payment of interest.

Income exempt from taxation also includes revenue generated by redeemed shares in a company in the part constituting the cost of their purchase or acquisition. The matter also applies to the value of assets received by shareholders in connection with the liquidation of the legal entity. On the other hand, the amounts received for the redeemed shares in excess of expenditure on the acquisition of those shares are taxable income.

In accordance with the provisions of the act, tax-exempt revenues are revenues due to redistributable as well as non-redistributable capital, provided for the Code of Commercial Companies. Such subsidies are a variety of cash benefits brought by shareholders for the company to enlarge its assets. Therefore, subsidies do not affect the size of the share capital. Tax income also does not include amounts and values that are in excess of the nominal value of shares, resulting in their release and transferred to the capital.

Neutral tax cash contributions include funds brought to the capital company and noncash contributions. The provisions of the Law on Corporate Income Tax represent that property values brought to cover equity (capital) are not tax income of businesses, which means that the capital raised through the issue of new ordinary shares shall not constitute taxable income. The consequence of this is the fact that expenses related to the acquisition of capital may not be treated as tax-deductible costs. After all, they do not refer to tax income. They are directly related to the performance of a tax-neutral operation on the share capital [2].

In accordance with the provisions of the Polish Law on Corporate Income Tax, the provisions of the act shall not apply to:

- Income from agricultural activities, with the exception of income from special branches of agricultural production
- Income from forestry within the meaning of the forest act
- Revenues resulting from activities, which may not be legally effective contracts
- Revenue (income) of shipowners taxed under the principles arising from the Law of 24 August 2006 on Tonnage Tax.

The presented provisions show that income derived from these activities is not subject to income tax, i.e., it is free from this tax.

In the EU concept of a common consolidated corporate tax base, it has been determined that the tax base is calculated by decreasing income by income exempt from tax, deductible expenses and other deductible items. Next to the definition, a normative interpretation of specific rules for its determination was proposed. It has been stated that income shall be calculated according to the following general principles:

- The accrual basis.
- Gains and losses are recognized only when they are effective (principle of realization).
- Taxable transactions and events are measured individually (the principle of individual valuation).
- Income calculation is performed according to uniform rules, unless exceptional circumstances justify a change (consistency).[2]

The introduction of the said rules would favourably distinguish the CCCTB proposals from those used in Polish law on corporate income tax. The Polish solutions reflect the accrual basis in relation to taxable income and costs. The realization principle can be found in relation to interest income and expenses, but it lacks a general reference to taxable profits and losses. The principles of individual valuation and consistency are also slightly emphasized in Polish law.

The draft directive defines the concepts of revenues, profits and losses. The term "revenues" defines income from sales and all other transactions, without the value-added tax and other taxes and duties collected on behalf of government authorities, in cash or noncash form, including proceeds from the disposal of assets and rights, interest, dividends and other distributions and proceeds from liquidation, royalties, subsidies and grants, gifts received, compensation and voluntary payments. Revenues also include in-kind donations made by the taxpayer. Revenues shall not include equity raised by the taxpayer or debt repaid to the taxpayer. According to the authors of the draft directive, "profit" means a surplus of revenues over deductible expenses and other deductible items in a tax year, and "loss" means the excess of deductible expenses and other deductible items over revenues in a tax year.

It is worth emphasizing that, in accordance with the draft directive, taxation applies not only to noncash donations collected by the recipient but also those transferred by the recipient. In the case of the donor it is in fact a fictitious revenue, resulting from the adoption of a fiction that the donated item has not been donated, but was sold according to its market value. In this way, the tax covers the so-called hidden reserves, i.e., income equal to the difference between the market value and the accounted value of a donation [3]. In the Polish law on corporate income tax, there are no solutions requiring the taxation of the donor; hence, the solutions contained in the draft directive may be considered to be less favourable for Polish enterprises. Such an approach to the valuation of monetary donations received by the recipient is based on Article 22 of the draft directive *Valuation*, which states that:

1. For the purposes of calculating the tax base, transactions are evaluated by:(…)

(a) Their market value, if all or part of the benefit from the transaction, is nonmonetary.

(b) Their market value for monetary donations received by the taxpayer.

[2]Vide draft directive Article 9 general principles:
When calculating the tax base, only effective gains and losses are taken into account.
Transactions and taxable events are measured individually.
The calculation of the tax base is carried out in a uniform manner, unless exceptional circumstances justify a change in the method of calculation.
Unless otherwise provided, tax base is determined for each tax year. Unless otherwise provided, tax year is any period of twelve months. Also, WP/066/2008, p. 2 item 5.

The list of exemptions from income tax contained in the draft directive is relatively short. Article 11 *Income exempt from taxation* reads:

The following is exempt from corporate tax:

(a) Grants directly related to the acquisition, manufacture or improvement of fixed assets subject to depreciation in accordance with Arts. 32–42

(b) Income from the sale of assets referred to in Art. 39, par. 2, including the market value of in-kind donations

(c) Distributed revenues received

(d) Proceeds from the disposal of shares

(e) Income from a facility in a third country

	0	**1**	**2**	**3**	**4**	**5**	**No answer**	**Total**
Revenues from forestry and agricultural activities	92.86	0.00	0.00	0.00	0.00	3.57	3.57	100.00
Accrued but not received interest on receivables, bank deposits and so on	66.07	16.07	7.14	3.57	1.79	1.79	3.57	100.00
Foreign exchange gains established at the balance sheet date but unrealized	69.64	8.92	5.36	1.79	5.36	5.36	3.57	100.00
Dividends and other revenues from participation in profits of legal persons	80.36	1.79	3.57	8.92	0.00	1.79	3.57	100.00
Returned taxes, charges and expenses not included in KUP	69.64	17.85	5.36	1.79	1.79	0.00	3.57	100.00
Interest received on excess payment of tax	82.15	8.92	5.36	0.00	0.00	0.00	3.57	100.00
Grants, subsidies and payments received to cover the costs or as reimbursement of expenses	87.50	7.14	1.79	0.00	0.00	0.00	3.57	100.00
Income earned from foreign governments derived from non-returnable aid	92.85	1.79	0.00	0.00	1.79	0.00	3.57	100.00
Revenues generated from the economic activity of the SEZ	94.64	1.79	0.00	0.00	0.00	0.00	3.57	100.00
Income from real estate made available free of charge	94.64	1.79	0.00	0.00	0.00	0.00	3.57	100.00
Revenues established by decision of the head of the tax office	94.64	1.79	0.00	0.00	0.00	0.00	3.57	100.00

Source: Author's own calculation based on surveys.

Table 1. The importance of nontax revenues for polish businesses (0, insignificant; 5, very significant) (in %).

Exemption from tax should also apply to income from dividends, proceeds from the disposal of shares in the company outside the group and the profits of foreign establishments. By granting relief for double taxation, the majority of member states exempts the dividends and proceeds from the disposal of shares, thus avoiding the necessity of calculating the amount to be deducted for tax paid abroad, in particular when while calculating the vested deduction, one must take into account the amount of corporate tax paid by the company paying the dividend. The exemption of income earned abroad meets the same requirement of simplifying the system.

While conducting research on a common consolidated tax base and its importance for the Polish and EU companies, questions were asked regarding the significance of revenues other than tax income. The test results are very interesting also from the point of view of simplifying the Polish tax system. Data showing the answers given by Polish companies is included in **Table 1**.

The analysis of the data contained in **Table 1** shows a high insignificance of amounts of income not constituting tax revenues. This may be due to the fact that many of these exemptions are specific and relate to specific companies, e.g., in the agricultural production and forestry activities in the SEZ. These subjects were relatively few in the total group of companies surveyed.

3. Cost of acquiring income

The provisions of the Corporate Income Tax Act do not contain a strict list of expenses that are treated as tax-deductible costs [4]. According to the Act, deductible costs are costs incurred to generate revenue or maintain or secure sources of income, apart from the costs, which are listed numerically in the laws as not deductible.[3] A literal interpretation of this provision leads to the conclusion that all incurred expenses, excluding those restricted by law,[4] are tax-deductible costs as long as they remain in the causal link with revenues, including those aimed at maintaining or securing the functioning of the source of revenue. The provisions of the Act show that it is possible to recognize as deductible costs these expenditures, which—judging rationally—can help to create or increase the company's revenue, provided that the expenditure has not been excluded from such costs. In the jurisprudence of administrative courts and tax authorities, the notion that costs within the meaning of the Corporate Income Tax Act may include those expenses that are in a causal relationship to the economic activity and the revenue obtained in respect thereof has perpetuated.

While defining deductibles for tax purposes, one should not use the definitions contained in other laws, e.g., the Accounting Law. The definitions presented in the theory of economics and

[3]Expenses that are not deductible for tax purposes are defined by the legislator in Art. 16, par. 1 corporate income tax.

[4]The basic condition for the recognition of the expense as a deductible cost is the absence of this expense in the catalogue of expenditures that are not recognized by the legislature as deductible costs. A list of these expenditures is set out in the law on corporate income tax.

finance and accounting law do not apply to the tax law, and for the purposes of interpretation of the texts of acts of tax law, one should only use the definition of tax expense in Art. 15, par. 1 of the Corporate Income Tax Law.[5]

The wording of the provision on tax-deductible costs gives the company the ability to deduct for tax purposes any cost, provided that there is a direct or indirect connection with the activities and that bearing it has or may have an impact on the amount of income earned. Therefore, tax-deductible costs are all rationally and economically reasonable expenses associated with running a business whose goal is to achieve the protection and preservation of sources of income.

The most important prerequisite that must be met for a certain expense to be recognized as tax deductible is that there should be a causal relationship between the expense and the revenue. This involves such relationship that incurring the cost has an impact on the generation or increase of revenue. In its judgement, the court stated:

> *undoubtedly the costs of revenues must be related to a specific source of revenue, i.e., the amount of income from that source is affected by the costs incurred in order to obtain revenue, i.e., there must be a causal relationship between the expenses incurred and the actual resulting income or the possibility of obtaining that income.*

Tax-deductible costs directly related to revenues should be considered these costs which directly affect the revenue acquired from that source. So these are all costs which are essential for the specified source of revenue to bring specific profits. To recognize the expense as tax deductible, it is not always necessary to demonstrate a direct link between it and the revenue. It should be noted that the deductible costs are all expenses incurred in order to obtain revenue, including in those incurred in order to maintain and secure a source of income, so that this source of revenue brings income in the future as well. Therefore, the costs will also include indirect costs associated with the revenue obtained, if it is shown to have been reasonably incurred in order to obtain revenue (including for ensuring the functioning of the source of revenue), even if the revenue is not achieved due to objective reasons.

Deductibles will therefore include such an expense that meets the following conditions:

- It was incurred by the taxpayer; i.e., in the final analysis, it must be covered with resources of the taxpayer.
- It is definitive (actual); i.e., the value of the expenses incurred has not been reimbursed to the taxpayer in any way.
- It remains in connection with the economic activity of the taxpayer.
- It was incurred in order to obtain revenue or maintain or secure the sources of income.
- It was properly documented.
- It cannot belong in the group of expenses that shall not be deemed tax deductibles in accordance with the provisions of the Act.

[5]The exception is made when the lawmakers reer directly to the provisions of other acts.

It should also be noted that the definition formulated by the legislature is very general. Therefore, every expense incurred by the taxpayer should be subject to individual scrutiny in order to carry out its legal qualification. The exception is when the act clearly shows its affiliation to the category of deductible expenses or disables the ability to include it in such costs. In its judgement, the Supreme Administrative Court stated that:

> *In determining deductible costs, every expense - other than those expressly set out in the Act - requires individual assessments of the direct relationship with income and the rationality of action to achieve this income. Situations, in which this causal relationship is not clear, should therefore be solved according to the principles of rational reasoning, individually for each case.*

Expenses not recognized by the legislature as tax-deductible costs can be divided into three groups:

- Expenses that are not included in the cost of revenues beyond the statutorily defined limits or when no distinct conditions are met
- Expenses which, by their nature, are not deductible for tax purposes but in certain circumstances are recognized as such
- Expenses which re absolutely not deductible

Among the presented groups of costs not considered deductible costs, one can distinguish the following groups:

(a) Expenditure on the purchase and modernization of fixed assets and intangible assets

(b) Losses and penalties, including, e.g.:
   - Loss of prepayments, advances and down payments
   - Interest, contractual penalties and damages
   - Enforcement costs, fines and penalties

(c) Liabilities and reserves, including, e.g.:
   - Overdue receivables
   - Reserves created on the basis of the accounting law

(d) Taxes

(e) Expenditure on the operation of cars not included in fixed assets

(f) Other expenses, including, e.g.:
   - Costs associated with tax-free income
   - Representation expenditure

The definition of deductible included in the draft CCCTB directive (on a common consolidated tax base) differs from that recognized in the corporate income tax. According to the provisions in the draft directive:

> *deductible costs include any costs incurred by the taxpayer for business purposes related to the achievement, maintaining or securing income, including costs of research and development work and the costs of increasing the capital or debt for commercial purposes.*[6]

It follows that the deductible cost of doing business should normally include all costs related to sales and costs associated with achieving, maintaining and securing income. The deductibility also covers the costs of research and development and the costs incurred in raising own or foreign equity for the business purposes. The supplement on deductible costs in the draft directive stipulates that:

> *tax-deductible costs also include donations to charities specified in Art. 16, established in a Member State or in another country covered by the agreement on the exchange of information on request, comparable to the provisions of Directive 2011/16/EU. The maximum amount of deductible costs related to contributions or monetary donations to charities is 0.5% of revenue in the fiscal year.*

In the analysis of deductible cost for income tax and the concept of a CCCTB, the category of cause and effect relationship between the income tax and the cost of its acquisition is extremely important. The draft directive stipulates that deductible costs are the "costs incurred by the taxpayer for commercial purposes related to the achievement, maintenance or protection of revenue". This condition, referred to as the "economic purpose test", is ambiguous [5] and imprecise. As indicated earlier, a provision in the Polish law requires an individual approach to every cost incurred by the company, especially when it concerns the so-called indirect costs associated with maintaining sources of income. However, even a thorough analysis does not eliminate tax risks arising from the fact that the assessment made by the tax authority may be different from the subjective assessment of the taxpayer. It is then often the court that decides on the eligibility of cost as a tax cost. In one of its judgements, the Supreme Administrative Court stated:

> *to include the expense in deductible costs it is not enough to hope that such income would one day be achieved. Each entrepreneur acting professionally must analyse the actions they take, and not just hope that they will prove to be beneficial.*

The risk of an erroneous inclusion of a cost into deductibles is also clear from the wording contained in the draft directive. The fact that the wording is imprecise may result in the assessment of the cost incurred by a company also being ultimately carried out by a court, as setting "economic purposefulness" of the expense incurred can be difficult and ambiguous. However, it should be emphasized that the draft directive contains a provision that "deductible cots are considered as such if they are incurred by the taxpayer for business purposes". This wording is still flexible than that contained in the law on corporate income tax.

The draft directive also allows for pro rata write-downs due to depreciation of fixed assets.

Article 14 of the draft directive lists the costs that are not deductible. These include, e.g.:

(a) Distributed revenues and repayment of equity or debt

(b) 50% of representation cost

(c) The transfer of retained profits to other reserves forming part of the company's equity

[6]Article 12 of the draft directive *Deductible expenses*

(d) Corporate tax

(e) Bribes

(f) Fines and penalties paid to a public authority for breach of any legislation

(g) Costs incurred by the company in order to generate income exempted from taxation pursuant to Art. 11; the amount of such costs is fixed at a flat rate of 5% of that income, unless the taxpayer is able to demonstrate that he has incurred a lower cost

	0	1	2	3	4	5	No answer	Total
Expenses for the purchase of land or the right of perpetual usufruct of land	66.07	10.71	8.93	1.79	0.00	8.93	3.57	100.00
Costs related to the operation of a car to the extent determined by the value of the car exceeding the equivalent of 20,000 Euro	60.72	12.50	8.93	7.14	3.57	3.57	3.57	100.00
Repayment of loans (credits), excluding capitalized interest on these loans (credits)	46.43	21.42	8.93	8.93	1.79	7.14	5.36	100.00
Interest on liabilities accrued but not paid or written off, including loans	62.50	16.06	1.79	3.57	8.93	1.79	5.36	100.00
Interest, fees and currency exchange differences on loans (credits that increase the cost of investment in development)	73.22	7.14	3.57	1.79	3.57	7.14	3.57	100.00
Enforcement costs related to defaults	75.00	14.29	3.57	0.00	3.57	0.00	3.57	100.00
Fines and penalties	76.78	10.71	5.36	1.79	1.79	0.00	3.57	100.00
Debts written off as overdue	58.93	19.64	3.57	0.00	3.57	1.79	12.50	100.00
Interest on late payment of overdue budget payments and others	55.36	32.14	5.36	3.57	0.00	0.00	3.57	100.00
Reserves formed in accordance with the provisions of the accounting act	62.50	7.14	10.71	3.57	5.36	1.79	8.93	100.00
Representation costs	55.36	32.14	5.36	3.57	0.00	0.00	3.57	100.00
Depreciation write-offs calculated for tax purposes more quickly than for accounting purposes	62.50	7.14	10.71	3.57	5.36	1.79	8.93	100.00
Interest on loans granted by shareholders	44.64	25.00	16.07	1.79	3.57	3.57	5.36	100.00
Revaluation of assets in the accounting books	71.42	1.79	12.50	5.36	3.57	1.79	3.57	100.00

Source: Author's own calculation based on surveys.

Table 2. The importance of non-deductible costs for polish businesses in income tax (0, insignificant; 5, very significant) (in %).

While analyzing deductible costs for income tax and the CCCTB concept, it is important to note how businesses perceive the burden of costs that are not deductible for tax purposes. **Table 2** shows the importance of the costs that are not considered deductibles for Polish companies.

The data contained in **Table 2** shows that for Polish company costs that are not considered deductibles in income tax do not have much significance. The least important include fines and penalties, enforcement costs, interest expenses, commissions and foreign exchange differences on loans. In contrast, the cost of interest on loans granted by shareholders has greater importance for tax-payers.

It is important to note the wording states that revenue, expenses and all other deductible items shall be recognized in the tax year in which they were achieved or incurred. It follows that the tax costs are deducted in the tax year in which they are incurred. Incurring a deductible cost occurs when the following conditions are met: firstly, the obligation to make payments; secondly, the ability to determine the amount of liability with reasonable accuracy; and thirdly, in the case of trading goods, transfer of significant risks and rewards of ownership of goods to the taxpayer, while in the case of services, receiving the services by the taxpayer. It should be stressed that the proposed solution is possible to implement in the Polish law on corporate income tax.

4. Common consolidated corporate tax base: fundamental assumptions

A document entitled "A Common Consolidated EU Corporate Tax Base[7]" published on 7 July 2004 includes the assumptions of the concept aimed at reducing the costs and barriers to business activity in the European Union. **On 16 March 2011**[8], the European Commission submitted a proposal for the directive on a common consolidated corporate tax base (CCCTB). According to the proposal, the main goal of the concept is to eliminate at least some major tax problems impeding economic growth on the EU single market. Due to the lack of uniform corporate tax regulations, interdependence of domestic tax systems often results in double taxation. Hence, enterprises have to deal with heavy administrative burdens and high costs associated with conforming to tax regulations. Such a state of affairs discourages companies from making investments in the EU and consequently hinders the achievement of priorities included in *Europe 2020*—a strategy for smart, sustainable and inclusive growth.[9]

[7] *A common consolidated EU corporate tax base*, Commission Non-Paper to Informal Ecofin Council, 10 and 11 September 2004 (http://ec.europe.eu/taxation_customs)

[8] *Proposal for a council directive on a common consolidated corporate tax base* of 16 March 2011*{SEC(2011) 315}{SEC(2011) 316}*

[9] The strategy is aimed at smart, sustainable and inclusive growth. The *Europe 2020* strategy has defined the following three interrelated priorities:
Smart growth: development of the economy based on knowledge and innovation
Sustainable growth: supporting the economy based on a more efficient use of resources, more environmentally friendly and more competitive
Inclusive growth: supporting the economy characterized by a high employment rate, providing social and territorial cohesion
Cf. Communication from the Commission of Europe 2020: A strategy for smart, sustainable and inclusive growth (COM(2010) 2020 Brussels 3.3.2010)

Common consolidated corporate tax base is a major initiative designed to eliminate obstacles to the creation of a single market.[10] It is considered[11] an initiative stimulating growth that should be undertaken in the first place in order to facilitate economic development and create new jobs. CCCTB concept would guarantee the coherence of domestic tax systems but no harmonization of tax rates.

According to the proposal for the directive, tax rates ought to be subject to fair competition. Different rates enable particular countries to maintain a certain level of tax competition on internal market. Furthermore, fair competition based on tax rates provides a greater transparency and allows the member states to take into account the competitiveness of their markets and budgetary requirements while determining tax rates [6].

Supporting research and development is one of the fundamental objectives included in the directive under discussion. As part of common consolidated corporate tax base, all costs associated with R&D are tax-deductible expenses. For enterprises that would decide to adopt the system, such an approach will be an incentive to further investment in research and development. In case of economic losses which are subject to cross-border compensation, consolidation within the framework of CCCTB will contribute significantly to reducing the tax base. Nevertheless, the implementation of CCCTB will expand the average EU tax base mainly due to the option taken as far as the depreciation of assets is concerned.

The introduction of CCCTB would reduce or even eliminate barriers to conducting cross-border activity in the European Union. This is of profound importance for enterprises regardless of their size. In the case of small- and medium-sized companies, costs involved in adjusting the activity to regulations imposed in particular countries are a major barrier. Compared to the turnover of such firms, these costs are an important item. As for large enterprises, the possibility of cross-border settlement of tax losses is the main advantage of the new solution.

A system will be chosen voluntarily. Since not all enterprises conduct their activity abroad, CCCTB will not require companies which do not intend to expand their business outside their homelands to cover costs associated with adopting a new tax system. Only methods for determining tax base will be subject to harmonization. It will not be the case with financial statements. Therefore, the member states will still apply domestic principles of financial accounting, and CCCTB will impose autonomous regulations on calculating corporate tax base. These regulations will not exert any effect on producing annual and consolidated financial reports. As for CCCTB, certain enterprises would have to follow uniform tax rules (applicable in the entire European Union) and would deal with single tax administration (one-stop shop). Having decided to apply common consolidated corporate tax base, the company is no longer subject to domestic corporate tax system as far as all the issues regulated by joint regulations are concerned. Enterprises conducting activity in more than one state will benefit from the possibility of cross-border loss relief and lower the costs involved in conforming to

[10]Communication from the Commission Towards a Single Market Act: For a highly competitive social market economy—50 proposals for improving our work, business and exchanges with one another (COM(2010) 608 Brussels 27.10.2010)

[11]Communication from the Commission Annual Growth Survey: advancing the EU's comprehensive response to the crisis (COM(2011) 11 Brussels 12.01.2010).

corporate tax regulations. The possibility of direct consolidation of profits and losses for the purpose of calculating the EU tax base is a major step towards reducing overtaxation in a cross-border context. At the same time, it is a step towards improving the existing conditions, namely, in the scope of tax neutrality of domestic and cross-border activity. This will lead to a more effective fulfilment of internal market potential.[12]

The main advantage of implementing CCCTB for enterprises is the reduction of costs associated with observing tax regulations. Data published by the European Commission indicates that the introduction of the aforementioned concept may lower such costs by circa 7%. Actual reduction of the costs under discussion may have a major impact on enterprises' potential and willingness to expand their business and enter foreign markets (especially the companies that have operated only on regional markets so far).[13]

The directive under consideration provides a complete set of corporate tax regulations. It specifies which entities may select tax system, method of determining tax base, relief scope and methods. Furthermore, it introduces regulations on combating fraud, proposes a method for the apportionment of consolidated base and specifies how CCCTB system is to be administered by the member states in line with "one-stop shop" principle.

Optional implementation of CCCTB entails that it will be the 28th tax system adopted by the 27 member states. In other words, certain enterprises or individual taxpayers will choose fiscal regime referred to in the directive or follow their domestic tax systems. Therefore, the proposal is a major step towards the harmonization of corporate income tax which, by improving the internal competitiveness of the EU, is to restrict harmful internal competition.

In the context of following the principles of income tax, and particularly the principle of tax system coherence and transparency, it should be emphasized that the directive under discussion provides a complete regulation on CCCTB. Directive on CCCTB and related issues should be implemented only when all the aspects to determining the tax base and its apportionment are known and so are the mechanisms that underlie the functioning of administration in such the new system. Needless to say, the system has to be comprehensive and coherent.

5. Corporate finance and capital structure vs. CCCTB concept

Issues relating to the effect that income tax has on capital structure are very complex. Attention should be paid to fundamental questions regarding tax solutions suggested in CCCTB concept

[12]Calculations made with reference to multinational enterprises operating in the EU indicate that about 50% of multinational financial groups and 17% of multinational nonfinancial groups may receive direct compensation for cross-border losses.

[13]Cf. Council directive on a common consolidated corporate tax base (CCCTB); Brussels, COM (2011) 121/4, 2011/0058 (CNS){SEC(2011) 315}{SEC(2011) 316}. According to the estimates made by the European Commission, a new regulation would enable to save about 700 million Euro annually in the European Union on the costs associated with adjusting to other fiscal systems, circa 1.3 billion Euro as a result of the consolidation of calculation rules, and nearly 1 billion Euro on cross-border activity. Experts are inclined to believe that such a solution would increase the attractiveness of the EU as a location of large-scale investments.

in the context of corporate finance theory. As far as research on capital structure and its impact on goodwill are concerned, major breakthrough was achieved by Franco Modigliani and Merton H. Miller. In 1958 they published an article entitled *The Cost of Capital, Corporation Finance and the Theory of Investment* [7]. Publications has been started discussion that is held up to the present day. The discussion centres on the consequences of the capital structure imposed by the company for its finance and goodwill [8]. According to the theory developed by Modigliani and Miller, in the world without taxes, both the goodwill and weighted average costs of capital (WACC) do not depend on capital structure.

In 1963 Modigliani and Miller published an article which was a correction to the capital structure irrelevance proposition. It was then that they addressed the problem hitherto explored by corporate finance. **Major difficulty lays in defining the role of tax in shaping the financial policy to be pursued by the company** [9]. The authors under discussion presented a different view on the effect that the capital structure had on the goodwill. Having in mind corporate income tax, they were inclined to believe that under such circumstances the level of foreign funding to the enterprise was optimum and therefore the capital structure was optimum. Taking into account the tax differentiation (**tax asymmetry**) was a key to the analysis. The asymmetry is between income generated by shareholders and creditors at the company level [10]. Costs associated with interest on foreign capital reduce income tax base, unlike retained dividends and profits [11]. Hence, the utilization of outside capital involves interest tax shield. If interest is subtracted from corporate tax base, the goodwill of business entity which utilizes debt financing exceeds the goodwill of the company which does not utilize foreign capital (by the compound value of tax shield).

Introducing the tax system allowing to reduce the tax base by expenses such as interest on debt, Modigliani and Miller proved that less expensive foreign capital (due to interest tax shield) increased the goodwill. At the same time, they were the first to stress the importance of tax for financial policy pursued by the company and aimed at increasing its goodwill.

The theory formulated by Modigliani and Miller in 1963 highlighted **the role of tax in corporate finance**. They proved that it was possible to shape the capital structure and goodwill through tax policy. It is worth emphasizing that this aspect to tax has not yet been noticed by employees responsible for tax management in enterprises. Nowadays, tax is often treated as a fiscal burden and not a flow that may be managed in order to exert an influence on the goodwill. **With reference to the concept of CCCTB, the aforementioned theory states reasons for introducing one corporate tax system in the entire European Union so that all entities have equal opportunities for developing their goodwill through tax policy**.

As for factors determining the capital structure in a given company, attention was also paid to the role of the other, namely, non-debt tax shields, resulting from depreciation and investment allowances, that may lessen the effect of interest of tax shield. Non-debt tax shields enabled to modify the research conducted by Miller by adding the concepts framed by DeAngelo and Masulis. They highlighted the role of investment tax shield in determining optimum tax structure. Furthermore, they proved that the goodwill of company with high non-debt tax shield may be the same as the goodwill of entity with high debt and thereby high interest tax shield. The higher the depreciation tax shield, the lower the interest shield.

Such a conclusion was drawn by Masulis. In other words, the variety of tax shields enables one to create capital structure optimum for every company and the economy. Capital structure is optimum at a certain debt level, when the total value of tax shields (interest and depreciation) is a maximum allowance under certain fiscal conditions [12].

Based on the theory developed by Modigliani and Miller as well as the research conducted by DeAngelo and Masulis, it can be stated that **taking into account income tax and depreciation costs enables the companies to increase their goodwill through tax benefits**. Therefore, the optimum capital structure of the company does not stem only from the share of equity and outside capital in the aforementioned structure but is also a consequence of financial system solutions adopted as far as income tax is concerned.

The analysis of the theories referred to in the present paper suggests that debt and interest tax shield are particularly relevant to shaping the optimum structure of capital. So are system solutions for recognizing tax effects of debt financing. Solutions aimed at determining the level and structure of capital have been included in the proposal for the directive on CCCTB. It would be a simplification to put into practice an assumption that interest lessens the debt cost by recognizing it as a deductible expense.

According to Corporate Income Tax Act, tax-deductible expenses do not include loan (credit) repayment, except for capitalized interest on the loan (credit). In other words, interest is recognized as a deductible expense once it has been capitalized. In legal terms, in the case of contract relationship, payment is one form of discharging the liabilities by a debtor due to which the debt is amortized.

General principles formulated in the Act enable one to account for interest expenses by recognizing them as deductible costs. Obviously, there are exceptions to the rule (e.g. interest, calculated to date of handing over a fixed asset for use, is capitalized to its original value and effectively recognized as deductible cost through capital allowance). Therefore, according to the Act under discussion, the term "tax-deductible expenses" does not refer to "accrued but not paid or amortized interest, including interest on loan (credit)".

Other types of expenses associated with incurring a debt by the company are commissions and charges. As to the principle, commission is an expense not directly incurred to accomplish the goal for the sake of which the loan has been taken out but is a source of funding. As for the moment of recognizing commission as a deductible expense, one should pay attention to the regulation included in the Act according to which tax-deductible costs, other than costs directly associated with revenues, are deductible once they have been incurred (on such a date). In line with the Act under discussion, Polish companies can recognize paid and capitalized interest and costs associated with incurring the debt as tax-deductible costs. Therefore, it should be verified if solutions proposed by the legislator are significant to Polish enterprises. **Table 3** shows the survey results.

Polish companies do not attach considerable significance to tax solutions for recognizing costs associated with debt utilization as deductible costs. Over 45% of enterprises participating in the survey do not pay attention to the fact that costs associated with the repayment of loan (credit) are non-deductible. Only more than 7% of entities consider this as a major restriction.

	0	1	2	3	4	5	Absence of answer	Total
Costs associated with repayment of loan (credit) except for capitalized interest on the loan (credit)	46.4	21.4	8.9	8.9	1.8	7.2	5.4	100
Accrued but unpaid or amortized interest on debt, including loan (credit)	62.5	16.1	1.8	3.5	8.9	1.8	5.4	100
Interest, commission and exchange differences between loans (credits) increasing the cost of investment during its realization	73.2	7.1	3.6	1.8	3.6	7.1	3.6	100
Interest on loans granted by shareholders	80.4	1.8	5.3	1.8	1.8	5.3	3.6	100

Source: Based on the questionnaire survey.

Table 3. Significance of tax-deductible expenses associated with debt utilization in the opinion of Polish enterprises (0, insignificant, 5, significant) (in %).

Furthermore, the impossibility of reducing the tax base on accrued (but not paid or capitalized) interest is not a problem for Polish companies. For the few companies place a meaning on interest and commissions paid in the course of actual implementation investments, representing their original value, this is the case for interest on loans granted by shareholders. In other words, Polish entrepreneurs do not notice the role of deductible expenses in reducing the effective cost of raising foreign capital in the form of loans and credits. In addition, the entities responding to the survey do not consider it problematic that interest on debt can be recognized as a tax-deductible cost only if it is paid or capitalized. In this context, it can be stated that suggestions put forward by the European Commission could be adopted by Polish enterprises within the scope under discussion.

Developing the tax system as part of CCCTB concept, attention was paid to the balance between flexibility and standardization of regulations, particularity and generality and attractiveness of solutions proposed in the concept compared to domestic solutions. If the companies are free to choose the taxation system, they will be able to shape the structure and rate of the tax base.

The concept under consideration does not refer precisely to interest expenses as tax-deductible costs. According to a general definition, all the costs covered by the company to incur and service the debt are deductible expenses. The debt repayment (e.g. credit principal) will not be a tax-deductible expense. This solution is identical to the one proposed in Corporate Income Tax Act.

Analysing deductible expenses in line with CCCTB concept, accrual basis is of particular relevance. According to Corporate Income Tax Act in force in Poland, interest is recognized as tax-deductible expense in line with cash basis. Accrual basis is also used in MSR/MSSF. Therefore, it can be concluded that interest expenses would reduce the tax base once the tax has been calculated and not actually paid. Such a solution is favourable for enterprises and makes tax principles similar to accounting solutions.

6. Conclusions

The income tax system, both in Poland and in the European Union, is in need of repair. The need to improve the Polish system is due to the large erosion of the tax law and the poor quality of legislation. Inside the Union, it requires uniformity in order to become competitive with China, Russia and the United States. Currently, EU countries do not constitute a single entity in terms of corporate income tax but 27 different players as they compete with one another within the EU and beyond. The aim should be to harmonize the system of corporate income tax for all companies within the EU to have comparable working conditions in terms of income tax and represent a unified entity outside the Union. According to the idea of the CCCTB concept, unification will include the tax base, namely, the principle of shaping revenues and tax costs.

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Chapter 2

International Aspects of Corporate Income Taxes and Associated Distortions

Liucija Birskyte and Gintare Giriuniene

Additional information is available at the end of the chapter

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Abstract

The purpose of this chapter is to review the latest developments in corporate income tax (CIT) focusing on its international aspects and associated distortions. In this endeavor, the chapter draws on evidence provided by the leading tax experts as well as on the profound and rigorous research produced by academia. This chapter examines and synthesizes research on tax competition, relationship between tax rates and foreign direct investment (FDI), and tax avoidance as a result of differential tax regimes. Trends in the development of CIT are discerned using statistical data provided by OECD and European Commission. Numerous studies done on global, regional, and country-specific datasets support the premise that indeed tax competition for capital exists though the magnitude of effects varies. There is also enough evidence that tax avoidance and evasion through base erosion and profit shifting persist for some time and may be on the rise.

Keywords: corporate income tax, tax competition, tax avoidance, foreign direct investment, multinationals

1. Introduction

Corporate income taxes (CIT) are paid by companies including those operating in several countries. Therefore, there is a strong international aspect in its design, administration, and compliance. In scientific and professional literature, this aspect is covered under the topics of tax competition, tax coordination, and tax harmonization. The scientific interest in international tax competition and related topics is not new. The interest is sustained by a rising capital mobility in the last 40 years and increasing concerns over capital flight and loss of public revenue due to base erosion and profit shifting. The problem stems from the dual objectives of

the governments. On the one hand, governments seek to attract investment into the country, or region, or locality, and therefore offer incentives to potential investors often in the form of preferential tax treatment. In doing so, governments engage in harmful or wasteful tax competition. On the other hand, governments need to collect enough tax revenue in order to provide a sufficient level and quality of public services and fulfill other functions demanded by the public. This calls for a rather complicated balancing between those objectives. Loss of revenue may lead to suboptimal provision of public services or require difficult policy decisions on the higher level of government or at the supranational level, including tax coordination and tax harmonization.

Theoretical studies in public economics provide the conditions for the economic effects of tax competition to be either harmful or useful [1–3]. Those conditions are varied and often hard to reconcile in theoretical models. In empirical research, they lead to inconclusive results. Negative economic effects of tax competition include "base erosion" of taxes on mobile factors of production that ultimately leads to the underprovision of public services and frustrates governments' efforts to redistribute income. The useful effects of tax competition are largely supported by the initiators and followers of public choice theory who find in tax competition efficiency-increasing effects. It limits the tendency of local governments to overexpansion and constrains the growth of a Leviathan state [4, 5]. Empirical literature on tax competition leaves us with a similarly diverse picture [1, 3].

This chapter attempts to synthesize growing scholarship on the economic effects of tax competition and includes the review of the latest trends in CIT, foreign direct investment (FDI), and profit shifting. The topic is of high relevance since tax avoidance and evasion through base erosion and profit shifting continue unabated for some time and may be on the rise due to the ever more sophisticated tax-reducing techniques used by multinationals and increasingly mobile individuals [6–10].

The sections that follow will (1) review the theory of tax competition including "basic tax competition model" and its extensions, (2) present recent trends in corporate income tax rates and revenue in the EU and OECD countries, (3) survey empirical literature on tax competition, including evidence of the relationship between tax rates and FDI, and (4) outline what is known about the magnitude of tax avoidance through base erosion and profit shifting. Finally, the last section concludes.

2. Tax competition theory

There is an extensive literature on the theory of tax competition. The modern literature on tax competition began with Oates's discussion on the potential efficiency problems associated with competition for capital by local governments [2, 11]. Under certain assumptions, small jurisdictions competing for mobile capital reduce tax rates to such level that leads "to less than efficient levels of output of local services" ([1] p. 654). In a small jurisdiction, competition leads to the abandonment of taxes on capital income altogether which produces "race to the bottom" ([1] p. 651). Oates' concludes that this behavior is inefficient that rests on the idea that

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this a zero-sum game. When all governments behave this way, none gain and consequently communities are all worse off than they would have been if local managers had made decisions based on marginal costs [2]. More recent interest in the topic was prompted in part by fears that tax competition among the increasingly economically integrated EU nations will over time significantly reduce the level of capital income taxation to the extent of announcing the death of CIT [12]. Thus, governments must solely rely on financing their expenditures from the taxes on immobile factors of production (labor/land) and on consumption taxes, which have their own constraints and disadvantages.

"Basic tax competition model" has been built by Zodrow and Mieszkowski [13] and Wilson who formalized the notions on tax competition developed by Oates [2]. Alternatively, the model is known as a ZMW model or a simpler version, according to Wilson [2], is known as ZM model [14]. Similar to Tiebout's model [15], the ZM model is built on those assumptions "(1) A large number of homogenous jurisdictions; (2) Perfectly competitive markets; (3) A Nash equilibrium in which each jurisdiction takes as fixed the after-tax return to capital and the tax rates set by other jurisdictions; (4) Fixed population and land in each jurisdiction; (5) Identical tastes and incomes for all residents of all jurisdictions; (6) A fixed national capital stock that is perfectly mobile across local jurisdictions; (7) A single good that is produced by capital and the fixed factor (labor/land) in each jurisdiction; (8) Government services that are "publicly provided private goods," benefit only residents, have no spillover effects to other jurisdictions, and can be modeled as purchases of the single private good;(9) Two local tax instruments—a "property tax" that applies to capital income and a head tax; (10) Local governments that act to maximize the welfare of their (identical) residents" ([1, 15] p. 654).

In the ZM model, interjurisdictional competition results in "race to the bottom," as all taxes on capital income are eliminated. Governments are only able to impose taxes on immobile factors of production only. The insight of this result serves as a model for a "small open economy" [16].

An important assumption of the basic tax competition model is that local public services are essentially another consumption good that enters individual utility functions. However, as Sinn correctly observes, one of the most important roles of government is to redistribute income which has nothing to do with consumption goods [17]. Income redistribution at least partially represents social protection against income uncertainty attributable to different macroeconomic shocks and, more broadly, differences in natural endowments and access to education. Private markets fail to insure against income uncertainty and other risks; therefore, public programs designed to smooth such shocks improve both equity and efficiency of resource allocation. Tax competition results in lower tax rates on mobile factors of production and thus limits the power of governments to engage in redistributive activities. It imposes important social costs. In case of perfect mobility of both capital and highly skilled labor, tax competition implies that only benefit taxes can be levied and the policy of income redistribution is given up. Though Sinn's observation relaxes one of the assumptions of the basic model, it fundamentally reinforces the central message of the basic model.

Since the development of the basic tax competition model, many extensions have been added by changing one or several assumptions of the basic model; for complete list and details, see Zodrow [1]. Some of those modifications support the results of the basic model and find inefficiencies due to tax competition, while others find efficiency enhancing effects of tax competition. The extensions that assume heterogeneous rather than homogeneous jurisdictions and include trade among members of the union or trade with the rest of the world find harmful effects to tax competition. The modification of the model which assumes variable labor supply (instead of fixed) also does not change the results of the basic model.

Another departure from the ZM model is the existence of "interregional externalities." In this case, the actions that one region's government takes to increase the welfare of its own residents lead to reductions in the welfare of residents in other regions. In the tax competition literature, this externality is often described as a "fiscal externality," which occurs through the effects of one region's public policies on the government budgets in another region [18]. For example, when a region lowers its tax rate on mobile capital, it gains capital at the expense of other regions, causing their tax bases to fall and, hence, their tax revenues to decline. Because governments are assumed not to possess unlimited taxing powers, the presence of such externalities reinforces the message of the ZM model (Wilson [2]).

However, other extensions of the basic model, such as the existence of international trade with the presence of agglomeration economies [19] and international public good spillovers do not support the conclusion of the ZM model. Adding the combination of labor mobility and population scale economies to the model yields interesting results. With scale economies, underprovision of local public services tends to decline and disappears entirely in the limiting case of a pure public good [1]. Therefore, this extension contradicts the proposition of the basic tax competition model.

A special niche in this discussion is reserved for public choice literature, which traditionally argues that jurisdictional governments in the union do not act to maximize the welfare of their residents but to achieve their own objectives that are typically positively related to the size of the budget. Under this view, government bureaucrats strive to maximize the budgets of their agencies and increase their own power and prestige. In the public choice literature, tax competition is not a source of inefficiency. On the contrary, tax competition serves a valuable social purpose in constraining government officials who are naturally predisposed to raise revenue to serve their own rather than public interests. To Brennan and Buchanan for instance, "… tax competition among separate units … is an objective to be sought in its own right" ([4] p. 186). In this context, tax competition plays an important role in limiting budget-maximizing behavior of government officials. It restricts the growth of public finance and curbs the expansion of a Leviathan state.

The results of the tax competition literature are mixed to such a degree that it is difficult to draw unambiguous conclusions. It is obvious that the key point of the basic tax competition model (as well as those extensions that reinforce its conclusions) is that tax competition is harmful and leads to inefficient underprovision of public services. On the other hand, some of the extensions to the basic model suggest that tax competition may be desirable as it limits the undue expansion of public budgets.

3. Empirical evidence of tax competition

3.1. Trends in corporate income taxes

As a consequence of the difficulty to develop one and conclusive theory, the empirical literature on tax competition burgeoned in recent years. However, meta-analysis reveals that results are as diverse as those in theoretical analyses [3]. First, the empirical evidence of tax competition and "race to the bottom" depend on the choice of parameters. Second, the findings are not conclusive. For example, there is mixed evidence if rate reductions in the face of increased international capital mobility are actually occurring. At first glance, the reduction of CIT rates is undisputable. CIT statutory rates[1] have decreased substantially in the EU over the past 22 years, with the average rate falling from 35% in 1995 to 22% in 2017, which constitutes a fall of 37.4% from 1995 to 2017 in EU 28 countries [20]. As indicated in **Figure 1**, the decrease of CIT rates in new EU member states (those who joined EU in 2004 and later) is even more substantial. The average statutory rates have decreased from the average rate of 31% in 1995 to 18% in 2017. This constitutes a fall of 43.6% or an average annual rate of minus 3% during the same period. In old EU member states (EU-15), statutory rates fell at an average annual rate of −2% as shown in **Figure 2**.

As indicated in **Figure 3**, in OECD countries combined central and local government, average statutory rates have fallen by 25.6% from an average CIT rate of 32.5% in 2000 to an average

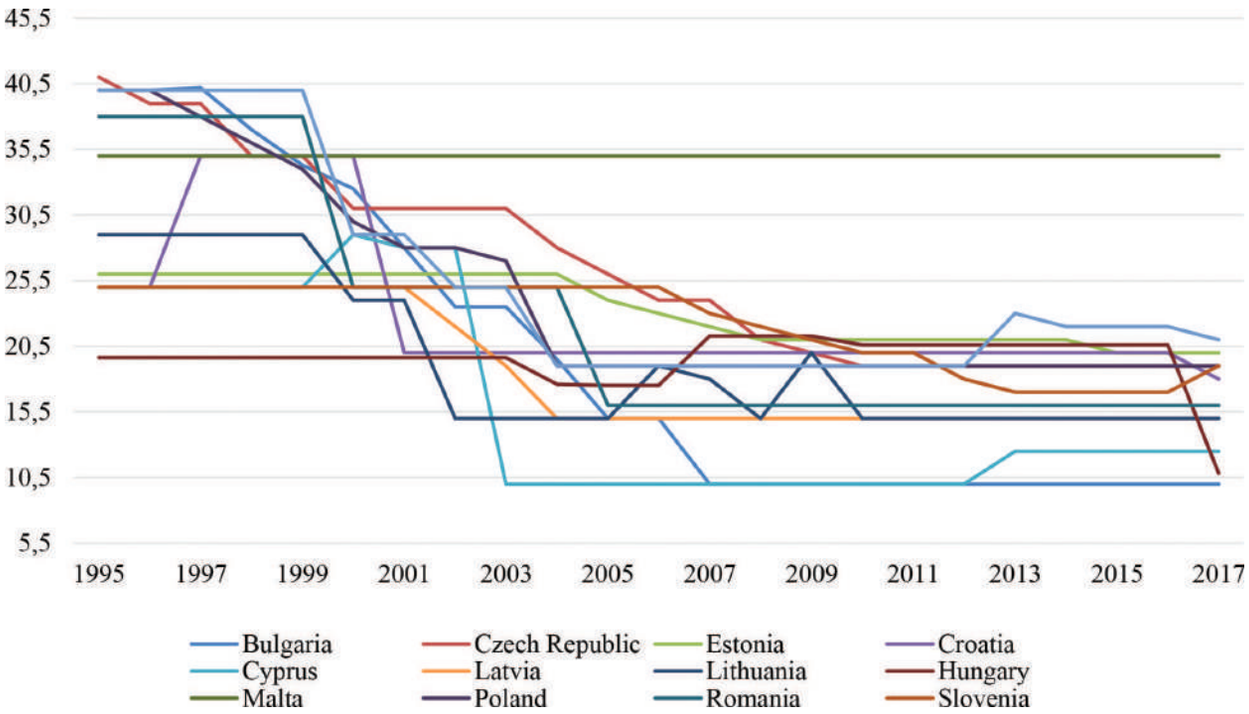

Figure 1. Statutory corporate income tax rates for new EU member states. Source: European Commission. Data on Taxation (2017).

[1]Statutory, or nominal, tax rates are rates stated in a tax law (statute, code) expressed usually in percentage terms to be applied to a tax base, for example, taxable income.

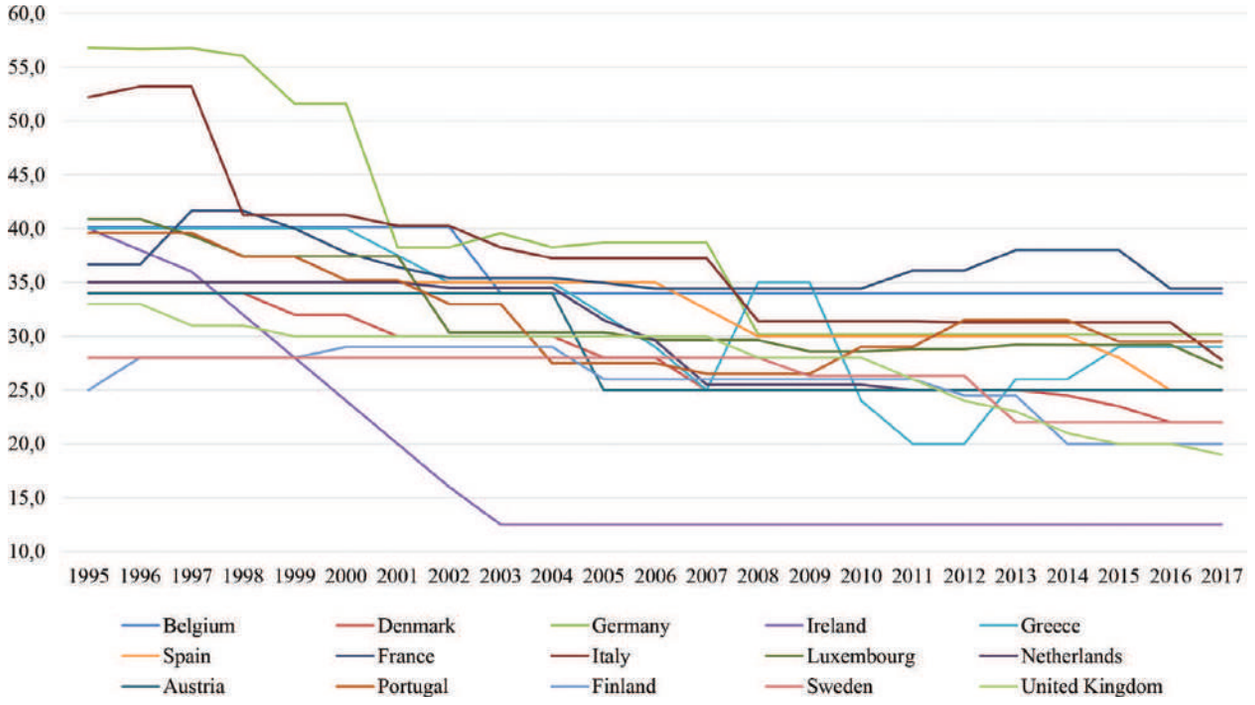

Figure 2. Statutory corporate income tax rates for old EU member states (EU-15). Source: European Commission. Data on Taxation (2017).

CIT rate of 24.2% in 2017 [21]. The statutory rates have fallen in virtually each OECD member state with an exception of Chile where CIT rate has increased by 10% points. The largest fall in the CIT statutory rate has occurred in Germany, albeit from a very high level of 52% in 2000 to 30.2% in 2017, while the change of CIT rate in the United States was incremental (−0.43% points).

However, this evidence becomes less remarkable when base-broadening measures[2] are taken into account leading to much less conspicuous fall in average effective tax rates. As shown in **Figure 4**, average effective tax rates measured as CIT revenue as a % of GDP has stayed overall even. They have decreased by 15% from 2000 to 2014 or at an average annual rate of −1.12%, with the effects of the economic boom and recession standing out.

These trends support previous findings by Grubert that the greatest declines in tax rates were in small, open and relatively poor countries—the countries that are arguably most vulnerable to the effects of tax competition, like new EU member states [22]. These results suggest that the rate reductions predicted by the theory of tax competition are actually occurring. Indeed, governments engage in two-dimensional tax competition. They concurrently compete over effective marginal tax rates for capital and over statutory rates for profits [23]. Evidence from Belgium suggests of regional tax competition taking place between different regions, with a lower effective tax rate (ETR) in the peripheral region of Wallonia than in Flanders [24].

However, it should be noted that reasons other than the tax competition for mobile capital might explain the fall in statutory CIT rates. In particular, this result can be explained by

[2]Like taxation of previously untaxed items such as short-term capital gains.

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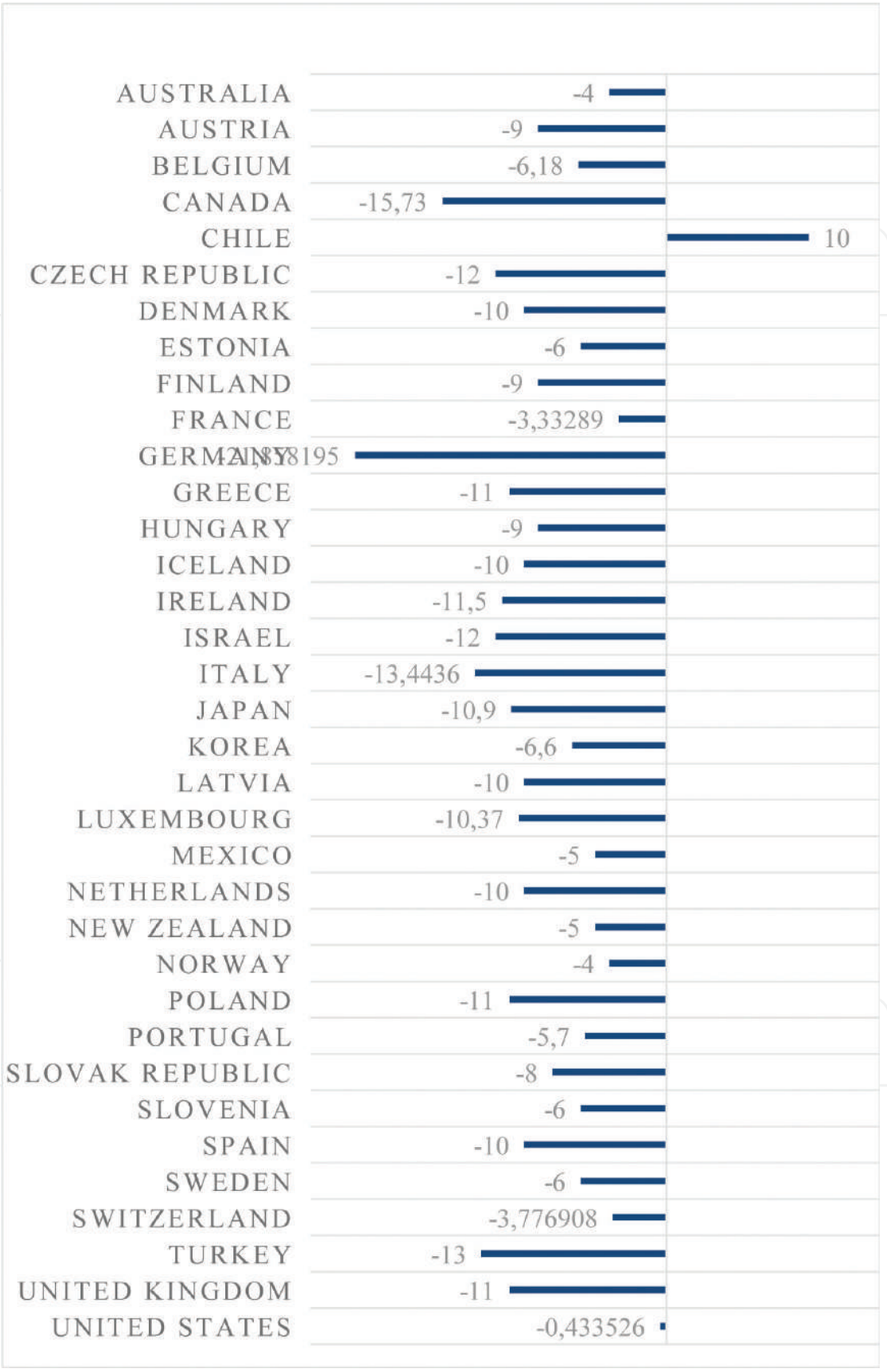

Figure 3. Statutory corporate income tax rates in OECD countries. Difference from 2000 to 2017. Source: OECD (2017).

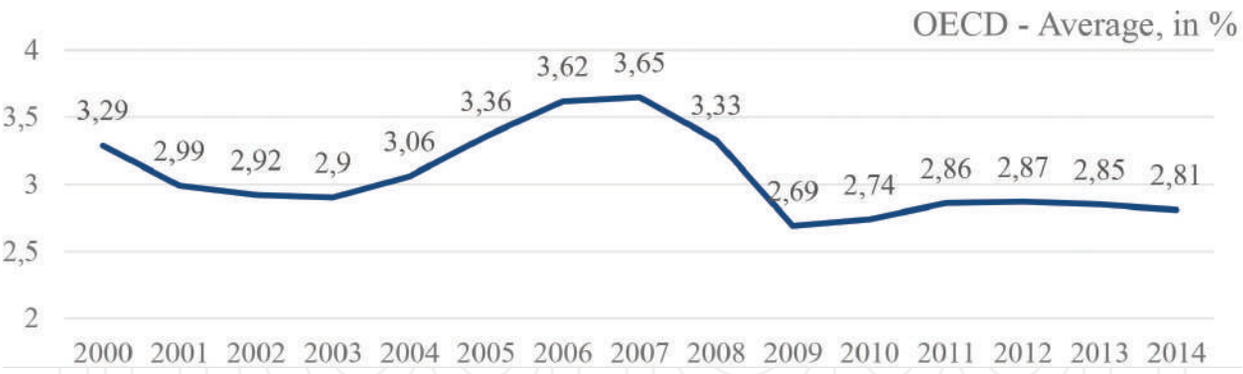

Figure 4. Corporate Income Tax Revenue as percentage of GDP, OECD countries. Source: OECD (2017).

the reforms undertaken by policy makers to adopt base-broadening, rate-reducing measures consistent with persisting reform recommendations to improve the efficiency, equity, and simplicity of the tax system [25]. Besides, reductions in statutory rates can also be explained as an attempt to minimize a country's vulnerability to the use of transfer pricing by multinational enterprises to move deductions to high-tax countries and receipts to low-tax countries [26]. This is consistent with tax avoidance problem caused by capital mobility and tax rate differentials discussed in the following sections.

3.2. Tax rates and foreign direct investment

Since the 1980s, the relation between FDI and corporate taxation policy has been widely studied, and the pioneers in research have focused primarily on the FDI flows sensitivity to capital tax rate [3]. Despite abundant literature, the consensus on the effect of the corporate taxation on FDI in todays' globalized economies has not been reached. Some of the studies find no impact of tax reduction on FDI, but the other studies argue about the negative relationship between taxation policies and FDI gravity.

Hunady and Orviska examine EU countries (except Estonia due to the unavailability of certain data) in the period between 2004 and 2011 and find no statistically significant effect of statutory corporate tax rate on the flow of FDI [27]. Similarly, Kersan-Skabic using data on EU transition economies fails to find evidence that tax rates significantly affect the long-run elasticity of FDI [28]. Studies of Daniels and Egger based on data from the US and other OECD countries basically do not confirm a precise impact of tax rates on the long-run elasticity of foreign investment [29, 30].

There exist even fewer studies which find any positive effect of corporate taxes on FDI. Herger finds that tax elasticity varies depending on the FDI strategy (with vertical FDI being in general more responsive) [31]. Salihu and Faria focus on emerging economies and they show that there is a positive relationship between FDI and the avoidance of corporate tax [32, 33]. Their research is based on Malaysian companies. The findings indicate that investors seek to avoid taxes in both host and parent countries.

The heterogeneity of empirical findings led to a need for concise and comprehensive review of the existing empirical evidence. In the meta-analysis undertaken by Feld and Heckemeyer,

a pooled effect based on the median result taken from each primary study was found. It amounts to semi-elasticity for company taxes on FDI (percentage reaction of FDI to one percentage point change in the tax burden) of 1.68 in absolute terms [3].

4. Distortionary effects of differential tax regimes

4.1. Distortionary effects of corporate income tax

As stressed by Cnossen and many others, even confined to the tax system of one country, the defects of the corporate income tax are numerous as it causes distortions of asset mix, capital allocation, financing and payout decisions, and the choice of organizational form [1, 34]. The main problem with capital taxation is that effective corporate tax and personal tax rates on investment returns vary depending on the choice of financing [35]. Investment can be made either through equity or debt. As a rule, debt finance is favored against equity finance because interest payments are deductible under most tax systems. The tax-favored status of debt discriminates against corporations that face difficulties in attracting debt [35]. Therefore, newly founded corporations have to sustain higher capital costs because of taxation than older, established corporations with either easier access to debt financing or sufficient retained profits to finance new investments.

The corporation's dividend policy produces yet another example of discrimination. Profits can be either distributed to shareholders as dividends or retained. When earnings are retained, the shareholders, instead of receiving dividends, benefit from an increase in the market value of the company. As a result of this bias in favor of retentions, equity funds may be locked in within certain companies rather than allocated between companies in the most efficient manner by financial markets [36]. Broadly, debt finance is favored against equity finance, and individual investors are discriminated relative to corporate investors. Therefore, differential tax rates and other tax structure features inherent to CIT distort investment decisions that should be based solely on economic costs and gains. Those features produce worldwide implications through the operations of multinationals.

4.2. Tax avoidance

As shown in **Figure 5**, OECD member states have widely diverging statutory CIT rates that may have externality effects on other member states. Statutory rates vary from 8.5% in Switzerland to 35% in the United States.

Different tax regimes have a direct bearing on tax avoidance. The main difference between tax evasion and tax avoidance is usually illegality of the former. Avoidance usually implies using and somewhat bending the tax laws in order to pay the least possible amount of taxes. It covers a broad range of behaviors. One example is to pay a tax professional to alert one to the deductibility of income earned from already undertaken activities. Another example is to change the legal form of a given behavior, such as reorganizing a business from one form of corporation to another, recharacterizing ordinary income as capital income or retiming the transaction to alter the tax year it falls under [37].

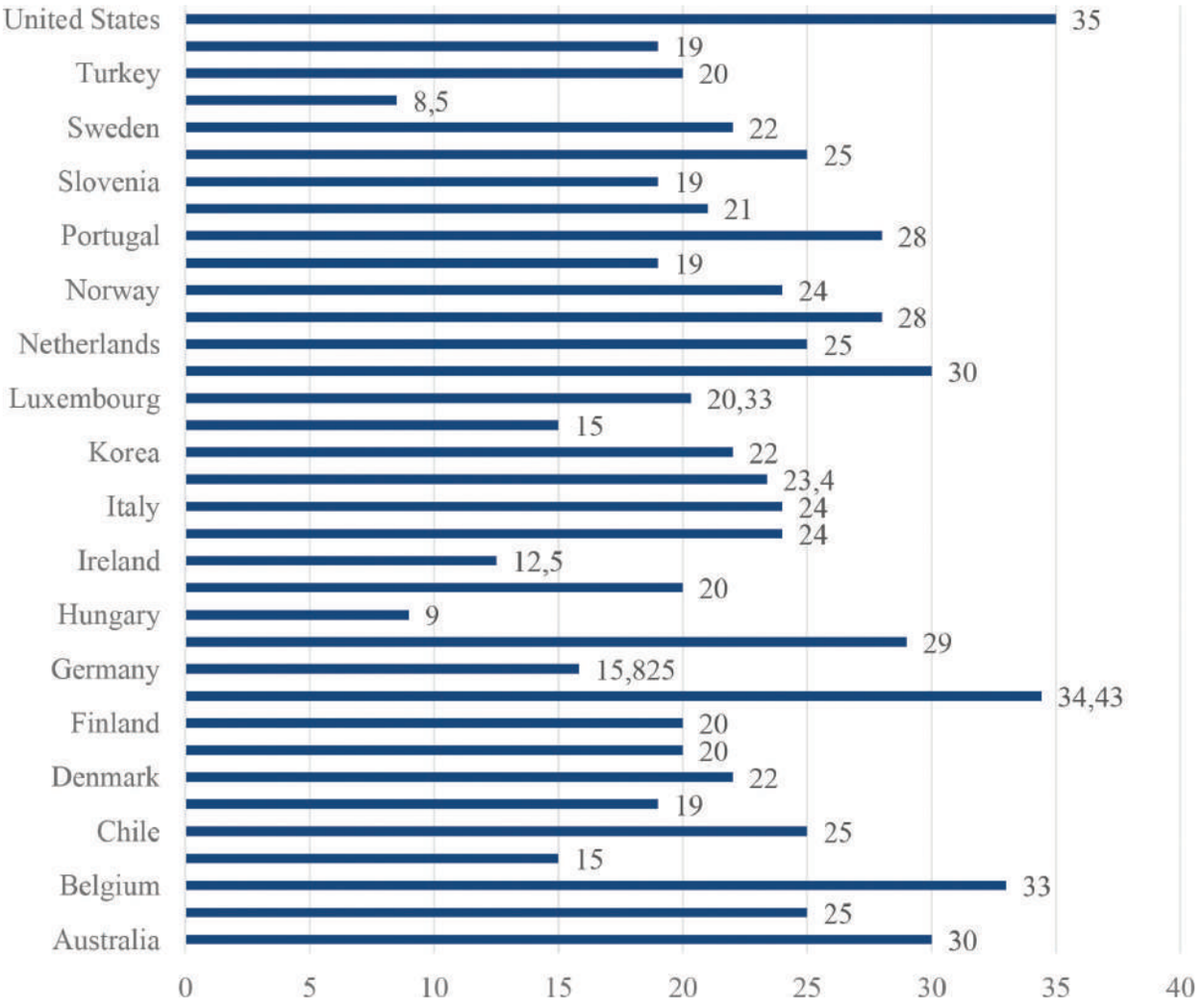

Figure 5. Statutory corporate income tax rates of the OECD countries in 2017 (in %). Source: OECD, 2017.

International investors often have at their disposal numerous alternative methods of structuring and financing their investments, arranging transactions between related parties located in different countries and returning profits to investors. Sophisticated international tax avoidance typically entails reallocating taxable income from countries with high-tax rates to countries with low-tax rates and may also include the changing the timing of income recognition for tax purposes. Since interest, as a rule, is tax deductible while dividends are taxed, it is beneficial for the companies to use debt to finance foreign affiliates in high-tax countries and to use equity to finance affiliates in low-tax countries [8]. Another vehicle to reduce taxation of passive income is the use of hybrid entities or hybrid instruments that are treated differently in different jurisdictions. A new regulation has been introduced in the late 1990s in the USA with an intention to simplify questions of whether a firm was a corporation or a partnership. The application of the rule to foreign circumstances has led to a situation where an entity can be recognized as a corporation by one jurisdiction but not by another. For example, a US parent's subsidiary in a low-tax country can lend to its subsidiary in a high-tax country, with the interest deductible because the high-tax country recognizes the firm as a separate corporation.

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There are also hybrid instruments that can avoid taxation by being treated as debt in one jurisdiction and equity in another [8].

The empirical evidence is broadly consistent with these incentives. The reported profitability of multinational firms is inversely related to local tax rates, a relationship that is at least partly the consequence of tax-motivated debt financing (thin capitalization)[3], the pricing of intrafirm transfers, royalty payments[4] and other such methods. Grubert estimates separate equations for dividend, interest, and royalty payments by foreign subsidiaries to American parent companies and finds that high corporate tax rates in countries in which American subsidiaries are located are correlated with higher interest payments and lower dividend payout rates [22]. Patterns of reported profitability are consistent with other indicators of aggressive tax avoidance behavior. It is widely accepted that firms adjust prices used for within-firm transactions with the goal of reducing their total tax obligations. There is substantial evidence of tax-motivated transfer pricing in US trade prices. Multinational firms typically benefit by reducing prices charged by affiliates in high-tax prices for items and services provided to affiliates in low-tax countries [7, 38]. Prior research has found significant effects of tax rates in affiliate and parent countries on the profit shifting behavior of multinational entities; however, the magnitude of the effects varies. The results measured in semi-elasticities range from close to zero to well above one [39].

The findings of the research based on the profit shifting behavior by US multinationals are supported by European evidence. Weichenrieder using data on German inbound and outbound FDI finds an empirical correlation between the home country tax rate of a parent and the net of tax profitability of its German affiliate that is consistent with profit shifting behavior. The result suggests that a 10% point increase in the parent's home country tax rate leads to roughly half a percentage point increase in the profitability of the German subsidiary [40]. Using a unique dataset containing detailed firm-level information on the parent companies and subsidiaries of European multinationals, Huizinga and Laeven build a model and empirically examine the extent of intra-European profit shifting by European multinationals. On average, they find a semi-elasticity of reported profits with respect to the top statutory tax rate of 1.3, while shifting costs are estimated to be 0.6% of the tax base. They come to the conclusion that international profit shifting leads to a substantial redistribution of national corporate tax revenues [41]. Evidence of income shifting in response to differences in corporate tax rates and the substantial loss of revenues from a unilateral increase in the corporate tax rate is also supported by the research by using data on a large selection of OECD countries [42].

The exception to the findings that support the central message of the basic tax competition model is the paper by Han and Leach who develop a model in which competing governments offer financial incentives to induce individual firms to locate within their jurisdictions [43]. Equilibrium is described under three specifications of the supplementary taxes. There

[3]Thin or hidden capitalization of a subsidiary arises when a foreign investor substitutes foreign debt capital for equity capital, particularly in cases where debt financing exhibits some of the characteristics of equity and the debt is owed to a related lender. (Shome, 1995)

[4]Withholding rates on cross-border interest and royalty payments are (which vary by class of payer and payee and by the financial instrument—in itself a source tax arbitrage) very low. (Cnossen, 2003)

is no misallocation of capital under two of these specifications, and there might or might not be capital misallocation under the third. This result contrasts strongly with the basic tax competition model which finds that competition among governments almost always leads to inefficient allocation of resources.

International tax avoidance is evidently a successful activity. Very little tax is paid on the foreign source income of US firms [8]. This has grave implications for domestic tax policy. "The international mobility of economic activity now dramatically reduces the ability to tax domestic income-producing activity too heavily. Indeed, the importance of this consideration raises the very real question of whether any longer exists such a thing as purely domestic tax policy" ([38] p. 319). It is really another way of saying that greater tax coordination between countries may be an answer to this international problem.

4.3. The revenue loss estimates of base erosion and profit shifting (BEPS)

In the aftermath of the global financial crisis, and the fiscal problems that followed in many countries, the public and policy makers paid greater attention to the tax avoidance of multinational companies. Similarly, researchers devoted greater efforts to estimating the scale and nature of the associated tax losses.

Corporate tax is an important source of government revenue in all regions of the world. As shown in **Figure 6**, though there is an annual fluctuation, on average in the OECD governments raise around 10% of their total tax revenue from CIT, which is approximately 3% of GDP [44]. CIT accounts for a larger share of total tax revenues on average in lower-income countries than in high-income countries [6].

Making estimates of the global losses due to base erosion and profit shifting requires complex and rigorous research. Currently, the most comprehensive studies available are from the International Monetary Fund (IMF) researchers Crivelli et al. and Cobham and Janský whose study has been recently published by the United Nations University World Institute for Development Economics Research (UNU-WIDER) in Helsinki [6, 9, 45].

Using panel data for 173 countries over 33 years, Crivelli et al. examine the magnitude and features of international fiscal externalities. In particular, they focus on the spillovers from tax policy decisions in individual jurisdictions onto others. They develop and use an innovative method allowing a distinction between spillover effects through real investment decisions

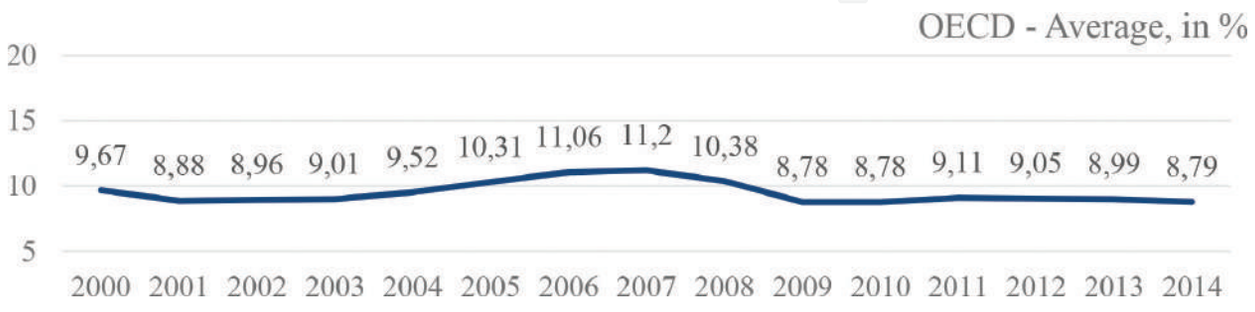

Figure 6. Taxes on corporate income as percentage of total taxation, OECD average. Source: OECD, 2017.

and through avoidance techniques and quantify the revenue losses through the latter. In total, they estimate global revenue losses at around US$650 billion annually, of which around one-third relate to developing countries. The concentration as a share of gross domestic product (GDP) is somewhat higher in developing countries compared to OECD economies [45].

Cobham and Gibson combine this finding with data on the relatively greater reliance on corporate tax revenue in developing countries to show that the estimated losses are around 2–3% of total tax revenue in OECD countries, but 6–13% in developing countries [46].

Applying a methodology developed by researchers at the International Monetary Fund to an improved dataset Cobhan and Jansky estimate revenue losses of around US$500 billion per year globally [6]. Though the largest losses are suffered by rich economies such as the United States, relative losses are more intensive in lower-income countries. While any estimates of this intentionally hidden phenomenon are necessarily uncertain, the size of magnitude suggests that the economic development of countries may in some cases be substantially damaged by the activities of multinational companies.

In country-specific research, Clausing using Bureau of Economic Analysis survey data on US multinational corporations during 1983–2012 finds that profit shifting is likely costing the US government between $77 billion and $111 billion in corporate tax revenue by 2012, and these revenue losses have increased substantially in recent years [7]. Those findings are corroborated by other researchers who estimate that the US tax losses from profit shifting of multinational firms may approach or even exceed $100 billion per year [8].

However, accumulated losses are staggering. Recent estimates show that Fortune 500 corporations are avoiding up to $767 billion in US federal income taxes by holding more than $2.6 trillion of "permanently reinvested" profits offshore. In their latest annual financial reports, 29 of these corporations reveal that they have paid an income tax rate of 10% or less in countries where these profits are officially held, indicating that most of these profits are likely in offshore tax havens [47].

This might be viewed as evidence that lowering corporate tax rates is an effective tool against avoidance. Narrower studies, however, such as the studies by Cobham and Janský (2017) and Clausing [7] provide evidence that profit shifting has grown strongly even as effective tax rates have fallen. Cobham and Janský (2017) document effective tax rates for US-headquartered multinationals of 0–5% in the major misalignment jurisdictions to which most profit is shifted, compared to 15–20% in the USA and other economies on average [6].

5. Conclusions

The survey of the literature in this chapter suggests that tax competition and related problems remain high on the agenda of policy makers as well as researchers. Since governments have the dual mission to attract investment into their jurisdiction and collect enough public revenue to provide public services, the tensions arise. In order to encourage FDI and other forms of investment, the governments offer tax incentives to potential investors. However, that often

means engaging in harmful competition with other jurisdictions. Such behavior is inefficient because it is a zero-sum game. When all governments behave this way, none gain and consequently communities are all worse off than they would have been if public managers had made decisions based on marginal costs. The tax competition may reduce tax revenues and lead to inefficient underprovision of public services.

The recent empiric evidence supports the central message of basic tax competition theory that competition for capital is actually occurring. It is manifested through the overall reduction in statutory and effective corporate income tax rates as well as sensitivity of FDI to tax burden. However, in addition to distortions in capital allocation arising from genuine productive activities, the differential tax regimes create other distortions, like tax arbitrage and tax avoidance by multinational companies. Governments throughout the world incur significant revenue losses through base erosion and profit shifting. Recent estimates show that accumulated losses for some countries are staggering and reach $767 billion in US federal income taxes [47].

The magnitude of revenue losses due to tax avoidance by multinational companies and other distortions arising from differential tax regimes call for the re-examination of CIT policies and tax coordination, and/or harmonization at the international level.

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Chapter 3

Taxes and Their Impact on the Business Sector in Slovakia

Katarina Teplicka

Additional information is available at the end of the chapter

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Abstract

The tax policy of the country must have a direction in terms of supporting the business environment in Slovakia. Within fiscal policy, macroeconomic objectives are mainly focused on securing funds to cover state spending on the possibility of influencing the economic and social policies of the state, on ensuring the interplay of taxes on the stability of the currency, on credit and monetary policy and on unemployment, the problems of tax problems, their conception and structure in the state economy. In addition to the macroeconomic perception of the importance of taxes, the microeconomic point of view, which monitors changes in tax laws and their impact on business entities, influences the tax base by legal instruments of tax policy (depreciation policy), items affecting the tax base of economic subjects (e.g., non-taxable items). In this chapter, we deal with direct and indirect taxes in Slovakia and their impact on the business sector. The purpose of this chapter is to highlight the trend of tax rates development during 2007–2017 and the factors that significantly affect the level of taxes in Slovakia. Factors that reduce taxes have positive development, but tax rates are constantly a barrier to business area because of tax rates growth.

Keywords: taxes, tax process, tax administration, basic institutes, taxes indicator

1. Introduction

Taxes play an important role in the country's economic policy. They represent one of the basic revenues of the state budget or municipal budgets. Every tax has its justification in the tax system and fulfills a certain role. The fact is that tax issues are very extensive and demanding, and therefore, the objective of tax optimization is to create a tax system that is simple and optimal for each business subject [16]. The fundamental problem of EU in area of taxes is tax harmonization and tax competition in the European Union [15]. Basic institutes of the tax

Taxes in Slovakia			
Direct taxes	**Asset taxes**	**Local taxes**	**Indirect taxes**
Income tax	Property tax	Tax of dog	Value added tax
	Vehicle tax	Tax of non-winning game machines	Consumer tax of alcohol
		Local income tax	Consumer tax of tobacco
		Tax of vending machines	Consumer tax of mineral oil
		Tax of nuclear facility	Costumer tax of electricity, coal, gas
		Tax of using historical part of town	
		Tax of using public area	

Source: Refs. [2, 3, 4, 8, 9, 12].

Table 1. Taxes in Slovakia.

Years	DK I (%)	DK II (%)
1995	24.8	39.6
1996	23.0	38.7
1997	21.9	36.6
1998	21.5	36.2
1999	21.2	35.1
2000	19.8	33.8
2001	18.7	32.9
2002	18.4	32.9
2003	19.0	32.7
2004	18.6	31.6
2005	18.8	31.4
2006	17.5	29.2
2007	17.4	29.0
2008	17.1	28.8
2009	16.3	28.8
2010	15.8	28.1
2011	16.3	28.6
2012	15.7	28.2
2013	16.7	30.2
2014	17.5	31.1
2015	18.1	32.1

Source: Eurostat.

Table 2. Taxes quota in Slovakia.

process are important tools that affect the tax process of business subjects and have a significant impact on the quantification of the tax base and the amount of tax liability [1]. The basic prerequisite for improving the business environment is the regulation of laws in terms of support for entrepreneurs so as to find an optimal balance between tax revenues, that is, the tax burden on business subjects and the attractiveness of the country for labor and capital. The tax administration should respond to the current difficult economic conditions, and that is why it changes its anti-tax strategy and focuses on new areas. The business area is still struggling to meet all tax obligations while trying to create added value in business [14]. An important reality of the business environment is to know all laws and to use legal tools to optimize the tax base. The strategic goal of business is to optimize the tax base and business with value added and tax reduction in all areas of taxes. Multimodal transport is an opportunity for a more ecological approach to the environment in EU states and total exemption of vehicle tax [13], and such opportunities create space for creative business (**Table 1**).

2. Macroeconomic indicators of taxes

The tax-deductible burden expresses how high the rate of taxation is or what part of GDP is made up of paid taxes and levies. How many resources are available to the country for redistribution through public finances? The Paying Taxes study 2017 shows the tax burden on companies in Slovakia, which is 10% higher than the global average and EU/EFTA average. Basic macroeconomic indicators associated with fiscal burden measurement include tax quota 1, tax quota 2, tax multiplier, expenditure multiplier, and multiplier of balanced budget. The tax quota is a macroeconomic indicator that does not reflect the impact of tax and levy on economic entities and individuals but pursues the country's priority objective of achieving the highest tax revenues that form the fiscal policy instrument and is the main source of revenue for the state budget (**Table 2**, **Figure 1**).

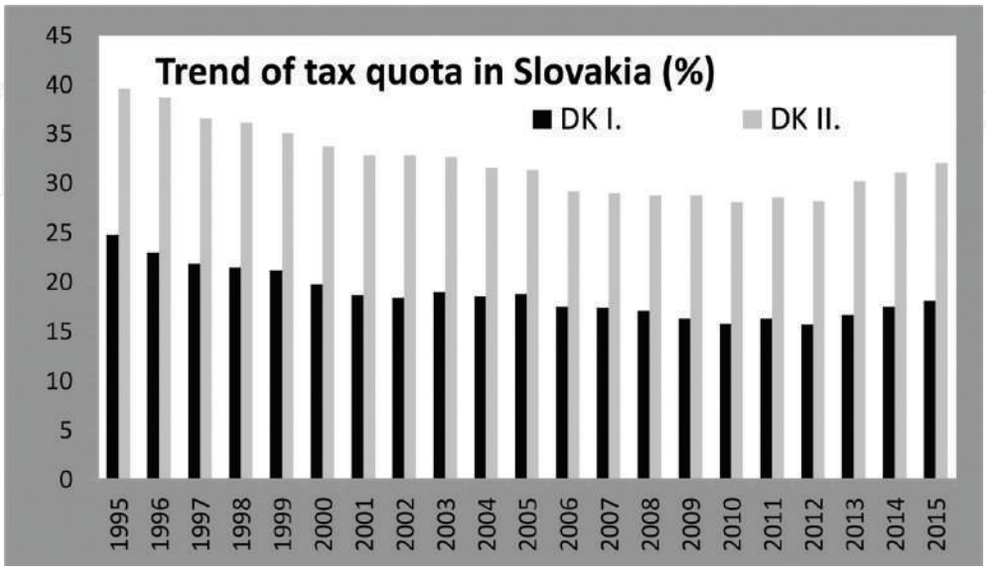

Figure 1. Trend of tax quota in Slovakia. Source: Eurostat.

The World Bank Group and the consulting firm PwC have released a study aimed at simplifying and reducing tax liabilities in business around the world. The study involved 190 countries of the world. The study highlighted the global most common element of tax reforms over the period under review for the introduction of an electronic system for filling in and paying taxes.

3. Tax rates of direct taxes in Slovakia

Tax rates are a fundamental competitive tool and a means of tax harmonization. Setting tax rates is the responsibility of individual EU states, hindering tax harmonization in the EU. Tax rates are an indicator of differences in tax systems across EU countries. We determine the tax rate in terms of income of a natural person and a legal entity. The natural person uses the tax rate based on the tax base reduced by non-taxable parts and the tax loss and the special rate of income tax on the dependent activity of selected constitutional agents, whose income is also taxed at this special rate (the President of SR, Member of the Slovak Republic, and the Vice-Chairman of the Supreme Audit Office of the Slovak Republic) [7]. The tax rate is based on 176.8 times the current living wage (**Table 3**).

The tax liability of a legal person is determined from the tax base reduced by the tax loss according to the applicable tax rate. The legal entity was required to pay the tax license for the first time in 2015 for the taxable period of 2014 as the minimum corporate income tax. The new tax law, which will enter into force on January 1, 2018, will be cancelled, the last taxable period for which taxpayers-legal entities will be required to pay tax licenses will be 2017 if the tax year is a calendar year. If the taxpayer is not a taxable person on the last day of the taxable period and has an annual turnover not exceeding EUR 500,000, a tax license of EUR 480 shall apply. If

Years	Tax rate for tradesman (%)	Tax rate for tradesman (%)	Tax rate for tradesman (%)
2007	19	—	—
2008	19	—	—
2009	19	—	—
2010	19	—	—
2011	19	—	—
2012	19	—	—
2013	19	—	—
2014	19	25	5
2015	19	25	5
2016	19	25	5
2017	19	25	5

Source: Ref. [9].

Table 3. Tax rate in Slovakia.

the taxpayer is a value added taxer at the last taxable date and has an annual turnover not exceeding EUR 500,000, he pays a tax license of EUR 960. If the taxpayer attains an annual turnover of more than EUR 500,000 at the last taxable date, regardless of whether or not he is a taxable person, he has a tax license of EUR 2880 (**Table 4**).

The natural reaction of each business entity to taxing is the search for tax optimization within legal procedures. In order to minimize the indirect tax liability, entrepreneurs may consider the decision on voluntary registration as a value added tax payer. In order to minimize the tax burden on local taxes, entrepreneurs consider regional differentiated tax burdens. In the case of income tax, entrepreneurs consider decisions of long-term nature, including choosing a suitable form of business, choosing the way to apply tax expenses, choosing the way to procure long-term tangible and intangible assets, choosing the depreciation method and using the possibility of aborting the depreciation, non-taxable and deductible items from the tax base, the possibility of applying the tax deducted as a tax advance. Income tax in the Slovak legal system is a common denomination for two types of taxes: the income tax of a natural person and the corporate income tax. Many EU countries complain that some Member States have an unfair advantage from low corporate tax rates. Their aim is to determine the minimum rate of tax within the European Union. In Switzerland, Spain, Italy, England and Austria, income tax has always been relatively high. Taxes have set these countries virtually exclusively on the basis of their national needs. The tax rates in Bulgaria, Cyprus, Romania, Hungary and the Czech Republic had to be set to motivate Western European companies to shift production (**Figure 2**).

Taxation of the economic activity of business entities can be judged at a double level. One is the effort of the state and the self-government to maximize revenue into public budgets that needs to be taken into account in the context of the impact of individual taxes on the behavior of taxpayers and the entire society. The second is the interests of taxpayers and their

Years	TAX rate for company (%)
2007	19
2008	19
2009	19
2010	19
2011	19
2012	19
2013	23
2014	22
2015	22
2016	22
2017	21

Source: Ref. [9].

Table 4. Tax rate for company in Slovakia.

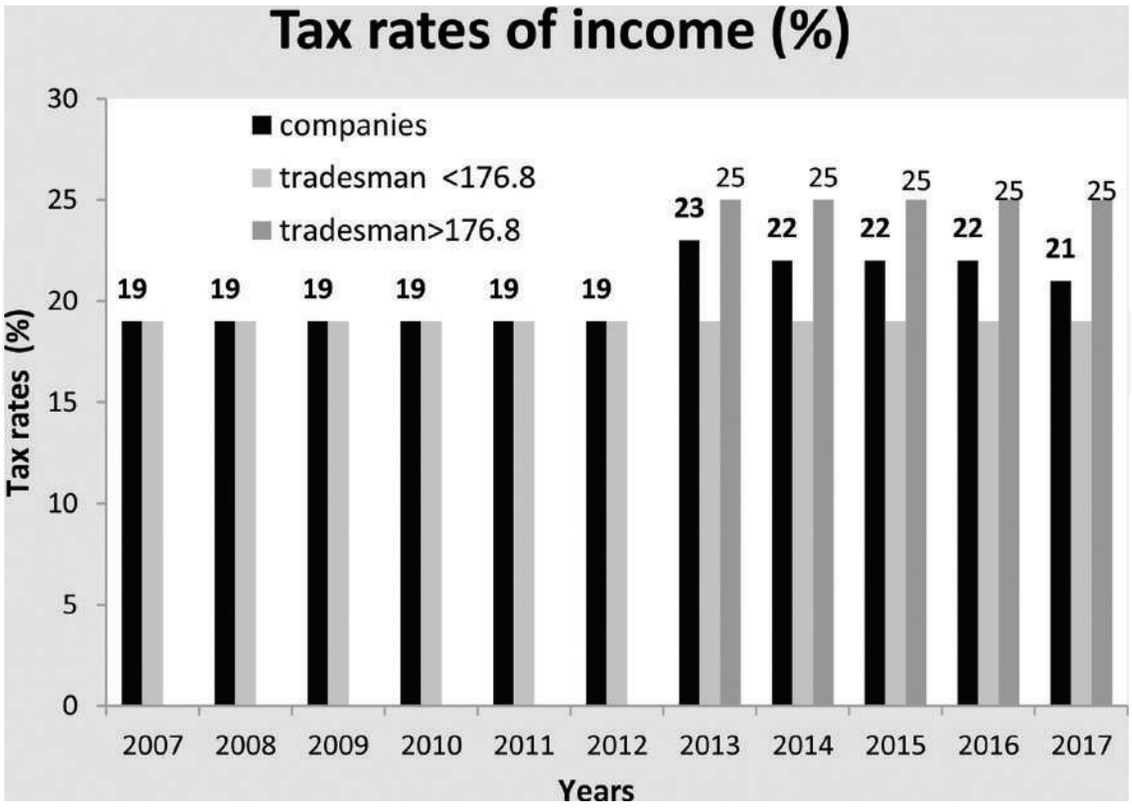

Figure 2. Tax rates of income. Source: Ref. [9].

attitudes toward taxation. Tax harmonization exists where taxpayers face similar or equal tax rates regardless of whether they are working, buying, buying or investing. Harmonized tax rates eliminate budget competition. Tax harmonization can be achieved in two different ways: explicit and implicit tax harmonization. Explicit tax harmonization occurs when countries agree to set minimum or equal tax rates. The EU requires its Member States to apply a minimum standard rate of 15% VAT. The EU has harmonized taxes on fuels, spirits and tobacco, and efforts to harmonize corporate and personal income taxes. In such a direct form of tax harmonization, taxpayers are not able to benefit from better tax policy in other countries, and governments are not under the pressure of competitive discipline. Tax competition is desirable for many reasons. The most important thing is that it underpins economic growth by encouraging policy-makers to make a meaningful tax policy.

4. Limit on tax return

Tax return is the document FO, PO. Its purpose is to grant income that is subject to tax. The result is a quantification of the tax, which can be compared with the tax advances paid. The resulting tax arrears FO, PO will transfer the state through the tax office. Tax return always refers to a certain period, calendar year, marketing year and specific tax, income tax, value added tax (**Table 5**) [9].

Years	Limit
2007	1586.93 €
2008	1634.73 €
2009	2012.85 €
2010	1773.00 €
2011	1779.65 €
2012	1822.37 €
2013	1867.97 €
2014	1901.67 €
2015	1901.67 €
2016	1901.67 €
2017	1901.67 €

Source: Ref. [9].

Table 5. Tax return limit in Slovakia.

For tax purposes, two types of tax returns are available: type A and type B. Type A is intended for taxpayers who have income only from dependent activity under Section 5 of the Income Tax Act. Type B is intended for taxpayers who have income, which are subject to tax according to §5 to §8 of the Income Tax Act. Tax returns are required to be paid by natural persons whose income for the taxable period exceeds 50% of the amount of the taxable amount of tax to the taxpayer if the income derived from the non-taxpayer receives income from abroad, the revenue for which tax cannot be deducted and also if the taxpayer did not ask the employer to perform the annual

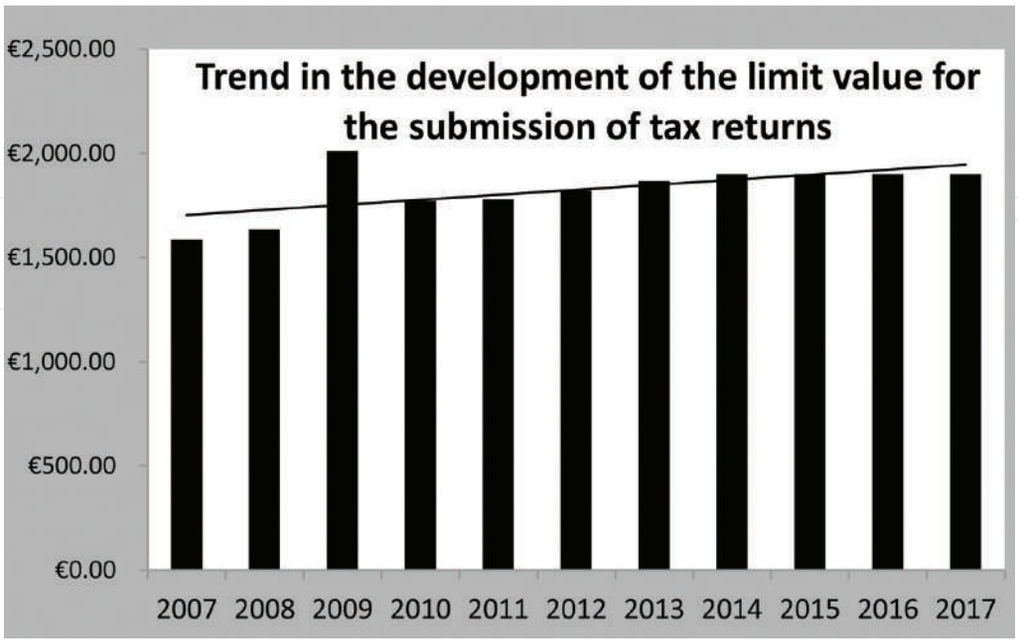

Figure 3. Trend of limit value of tax returns. Source: Ref. [9].

settlement of deductions for tax on dependent activity. The tax return is required to be paid by an employee who has income from dependent activity from several employers or other types of taxable income. Tax returns are required to be filed by natural persons whose earnings for a taxable period do not exceed 50% of the taxable amount of tax on the taxpayer but show a tax loss. The tax return is also filed by a lawyer, a PO person (**Figure 3**).

5. Tax indicators in Slovakia

The term non-taxable portion of the taxable amount is the statutory value for tax purposes of the taxpayer's tax base, which is based on the subsistence level. The amount of the tax base is related to the amount of the non-taxable portion. The Income Tax sets a limit of 100 times the amount of the applicable living wage. If the tax base is lower or equal to 100 times the living wage, the non-taxable portion of the tax base per year is calculated at 19.2 multiple of living wage. If the taxable amount of the taxpayer's tax exceeds the amount of 100 times of living wage, the non-taxable portion of the taxable amount is calculated as the difference of 44.2 times of living wage and ¼ of the tax base. If the result is equal to or less than zero, the non-taxable portion is zero. The non-taxable amount of the taxable amount of the taxable person cannot be claimed by the taxpayer who, from the beginning of the tax period (from 1 January), receives a retirement pension, early retirement pension, social security reimbursement premium, old-age pension, retirement pension or foreign compulsory insurance pension, to whom a retirement pension has been redeemed at the beginning of the current or previous tax period (calendar year), and at the same time, if his or her pension is higher than the non-taxable portion of the taxable person's tax base. Where the amount of the retirement pension is

Years	Month part	Year part
30.6.2017	316.94 €	3803.33 €
2016	316.94 €	3803.33 €
2015	316.94 €	3803.33 €
2014	316.94 €	3803.33 €
2013	311.32 €	3735.94 €
2012	303.72 €	3644.74 €
2011	296.60 €	3559.30 €
2010	355.48 €	4025.70 €
2009	355.48 €	4025.70 €
2008	272.46 €	3269.47 €
2007	264.49 €	3173.87 €

Source: Ref. [9].

Table 6. Non-taxable portion in Slovakia.

lower than the amount of the taxable amount of the taxable amount of the taxable amount, the taxpayer is entitled to claim only the difference between the non-taxable portion of the taxable amount of the taxpayer and the retirement pension (**Table 6**).

Non-taxable portion of the tax base

- Non-taxable portion of the tax base of the taxpayer
- Non-taxable portion of the taxable income of the spouse (spouse)
- Non-taxable portion of the tax base for contributions to supplementary retirement savings (third pillar)

5.1. Non-taxable portion of the tax base on wife, husband

In this type of non-taxable part, the income of his wife, husband is assessed in addition to the taxable person's tax base, which fulfills at least one of the following conditions during the period: she takes care of a child living in common household, she was unemployed, she is a person with a disability, she tooks a care allowance. Include every income, including income tax, maternity and sickness benefits, all kinds of pensions and prizes, between the wife's (our husband's) incomes. This revenue is reduced by compulsory premiums paid and contributions to health and social insurance. We do not include an employee's bonus, tax bonus, retirement pension, state social benefits in our wife's (our husband's) income. State social benefits include childbirth allowance and surcharge for birth grant, contribution to parents who are simultaneously born with three or more children or who have been repeatedly born twins or more children over the course of 2 years at the same time, a funeral grant, parental allowance, child allowance and surcharge for baby allowance, Christmas contribution to pensioners, retirement allowance by political prisoners.

5.2. Non-taxable portion of the tax base for contributions to supplementary retirement savings (third pillar)

It is a part of the taxpayer's contribution to supplementary retirement savings (up to the third pillar). The non-deductible part of the tax base also includes contributions to supplementary pension savings abroad of the same or similar type. The maximum amount of this non-taxable portion is €180 for a taxable period. This amount is fixed by the Income Tax Act. The limit applies to all taxpayers (domestic and foreign employees, tradesmen, etc.) as well.

In order to claim this taxable amount, the taxpayer has to meet the following conditions: the participant under which he paid contributions for supplementary pension savings was concluded after December 31, 2013 or was amended and the change in the plan was canceled, the taxpayer has not entered into a contract with another participant who does not meet the conditions laid down by the law on supplementary retirement savings (**Figure 4**).

The development of a non-taxable portion of the tax base is based on the development of the subsistence level. The minimum age has not changed for the last 4 years, and therefore there has been no change in the taxable portion of the tax base. The non-taxable portion of the tax

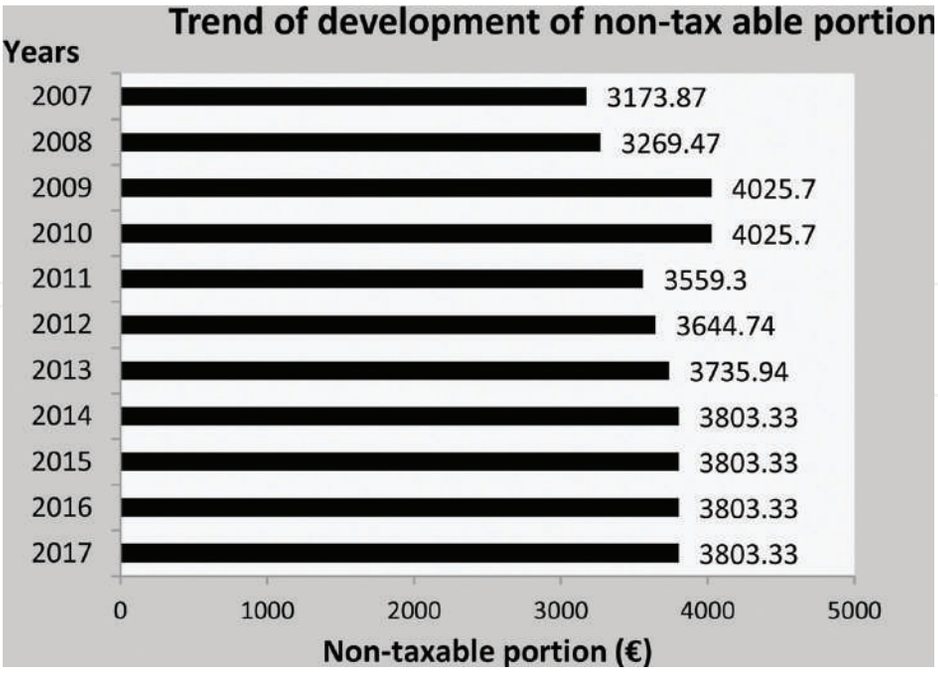

Figure 4. Trend of non-taxable portion in Slovakia. Source: Ref. [9].

base affects the amount of tax liability of business entities and individuals. This is a legal form of tax deduction, which the taxpayer optimizes the tax base.

The taxpayer is entitled to claim a non-taxable portion of the tax base only from the sub-base of the tax on income from dependent activity, business income, other self-employment, rental, use of the work and artistic performance.

5.3. Living wage

The subsistence minimum is defined as the socially recognized minimum income threshold for a natural person under whom a state of material need arises. The subsistence sums are adjusted each year to July 1 of the current calendar year. If the legislation does not change, to 30.6. it is repeat date every year by the Ministry of Labour, Social Affairs and the family of the Slovak Republic [5, 9, 10]. The sum of the subsistence minimum is a relatively important reference (**Figure 5**).

The subsistence sums help in a universal way to find out in what financial situation the persons under review are located. The subsistence amount for one adult physical person, or the coefficient increasing this amount affects a number of other indicators in the tax and social spheres. These include, for example, the amount of the tax bonus, the amount of non-taxable portions of the tax base, the amount of the tax base, after which the individual has to apply a higher rate of income tax (25%), the amount of the allowance and the surcharge for the child allowance, the amount of the unreachable amount for the execution charges [6, 9, 10]. The above minimum subsistence also affects the entitlement to early retirement or the minimum retirement age (**Table 7**).

Figure 5. Trend of living wage in Slovakia. Source: Ref. [10].

Years	Living wage		
	Adult	**Adult Jointly assessed person**	**Child Dependent**
2017	198.09 €	138.19 €	90.42 €
2016	198.09 €	138.19 €	90.42 €
2015	198.09 €	138.19 €	90.42 €
2014	198.09 €	138.19 €	90.42 €
2013	198.09 €	138.19 €	90.42 €
2012	194.58 €	135.74 €	88.82 €
2011	189.83 €	132.42 €	86.65 €
2010	185.38 €	129.31 €	84.61 €
2009	185.19 €	124.81 €	81.66 €

Source: Ref. [10].

Table 7. Living wage in Slovakia.

5.4. Minimum wage

The minimum wage is determined on the basis of key factors that affect it. Basic factors influence determination of minimum wage are economic and social situation in the country, consumer price developments, employment developments, average monthly wage developments in the national economy, and the development of the subsistence minimum. The concept of the minimum wage is the lowest possible wage that must be paid to the employee for a work-related or similar employment relationship to ensure the minimum level of employee's

income for the work done but also for the natural persons performing for the employer under one of the agreements on work performed outside the employment (work agreement, agreement on students' brigade work) [11]. The amount of the minimum wage is set by the Government of the Slovak Republic each year by two amounts: in euros per month (monthly minimum wage) and in euro per hour worked (hourly minimum wage). The amount of the monthly minimum wage applies only to employees who are remunerated in the form of a monthly wage. Employees who are remunerated by another form of wage, such as monthly wages (hourly wages), are based on the hourly minimum wage when assessing their legal entitlements to wage levels. If the employee has a shorter than the prescribed weekly working time or does not work all the working days or hours in the month, the monthly minimum wage is reduced in proportion between the actual times worked and the monthly working time fund. The amount of the minimum wage in euro per month is rounded to the nearest 10 eurocent (**Table 8**) [11].

The minimum wage is not established in Finland, Austria, Denmark, Italy, Malta and Cyprus. Among the most advanced countries where the minimum wage is the highest are Luxembourg, Ireland, the Netherlands, Belgium, Germany and France (**Table 9**).

The purpose of setting a minimum wage is to protect employees and employers. The minimum wage fulfills two basic functions—social protection—the minimum wage must ensure to employee socially acceptable of wage - minimum in height of living wage. And ensures wage

Years	Minimum wage/Monthly wage (€)
2017	435
2016	405
2015	380
2014	352
2013	337.70
2012	327.20
2011	317
2010	307.70
2009	295.50
2008	269
2007	269
2006	252
2005	229
2004	216

Source: Ref. [11].

Table 8. Minimum wage in Slovakia.

Country	Minimum wage
Luxembourg	1999 €
Ireland	1563 €
The Netherlands	1552 €
Belgium	1533 €
Germany	1486 €
France	1482 €
England	1400 €
Spain	825 €
Slovenia	804 €
Malta	735 €
Greece	684 €
Portugal	650 €
Estonia	470 €
Poland	454 €
Slovakia	435 €
Hungary	410 €
Croatia	410 €
The Czech Republic	408 €
Latvia	382 €
Lithuania	381 €
Romania	274 €
Bulgaria	220 €

Source: Eurostat.

Table 9. Minimum wage in Europa.

competition - adequate labor assessment economically critical - the minimum wage motivate people to work, not to take social benefits, to protect employees againts unfair competition on the labor market. The minimum wage in Slovakia has been growing steadily since 2003 (**Figure 6**).

The national minimum wage has 22 states from the 28 EU Member States, with the exception of Denmark, Italy, Cyprus, Austria, Finland and Sweden. When comparing EU countries and outside the Eurozone, the minimum wage is influenced mainly by the level of the exchange rate between the national currency and the Euro. The differences between the minimum wage levels in the EU countries are striking. The maximum difference in the minimum wage recorded in the EU countries is € 1729. Within EU countries, it is not always clear that the minimum wage is valid on a monthly basis; some countries may have it on an hourly or weekly basis.

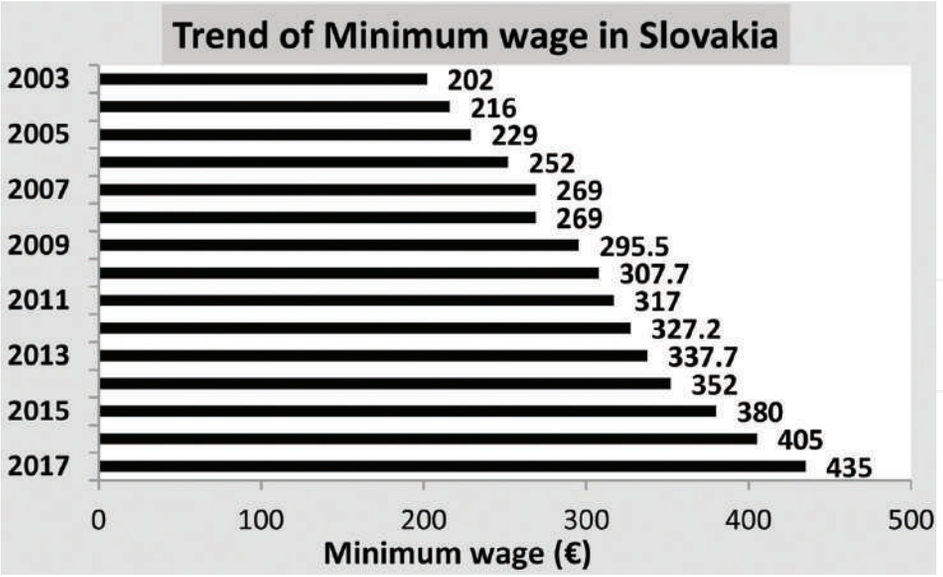

Figure 6. Trend of minimum wage in Slovakia.

5.5. Tax bonus

We understand the tax bonus as a tax concession or tax benefit, which is provided to a taxpayer who is living with a child, in the form of a reduction in income tax or tax advances that the taxpayer would otherwise have to pay. For the purposes of the tax bonus, a child may not have the same permanent residence as a taxpayer. The temporary stay of a child outside the household (e.g., a child studying in another city and staying on board) does not affect the

Years	Tax bonus (€)
2017	21.41
2016	21.41
2015	21.41
2014	21.41
2013	21.41
2012	21.03
2011	20.51
2010	20.02
2009	20.00
2008	19.32
2007	18.42
2006	17.92

Source: Ref. [9].

Table 10. Tax bonus in Slovakia.

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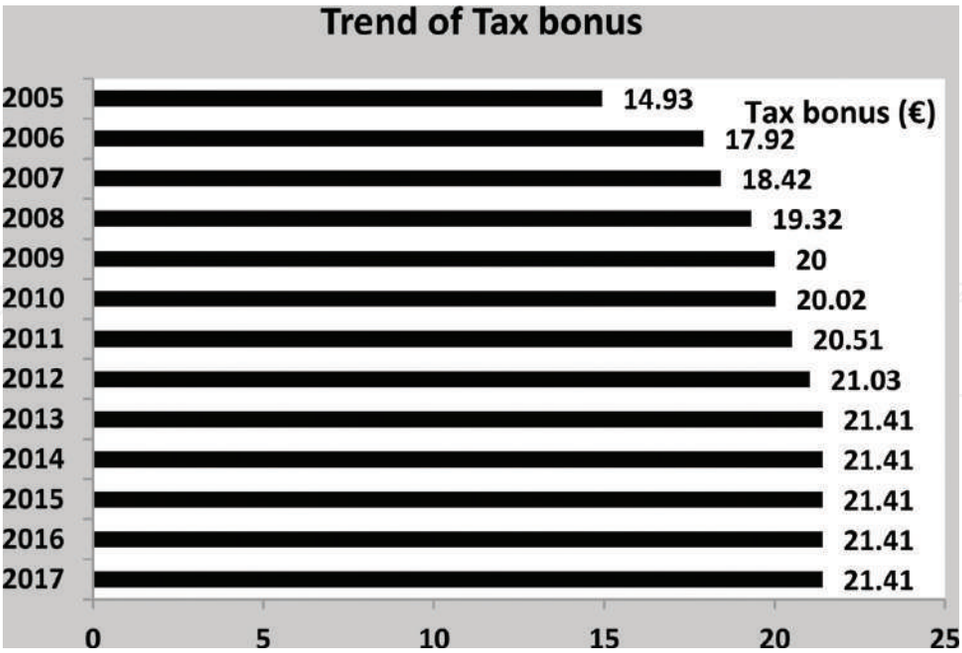

Figure 7. Trend of tax bonus in Slovakia. Source: Ref. [9].

application of the tax bonus. The law does not require the same taxpayer's and child's residence, but that the taxpayer and the child live in one household. In accordance with Section 115 of the Civil Code, households are natural persons who live together and share the costs of their needs together (**Table 10**).

The amount that a taxpayer reduces the tax can be seen as a tax credit or tax benefit to the person who receives it after the specified conditions have been met, the amount of the tax bonus is reduced by the tax (not the tax base). It can be claimed by a taxpayer who has had taxable income in the taxable period: from dependent activity, at least six times the minimum wage or from business, other self-employment and from renting six times the minimum wage and reported the tax base (the tax base from of revenue); only one taxpayer may apply if the conditions for applying the tax bonus are met by more taxpayers and, unless otherwise agreed, the tax bonus for all dependent children is applied or awarded in the following order: mother, father, other eligible person; the taxpayer can apply the tax bonus even if the child has a temporary residence outside the household, for example, if the child is studying at secondary school outside of his/her permanent residence, and he/she is staying at the boarding school (**Figure 7**).

6. Impact of taxes to business sector

The business environment is characterized by constant changes in the law, resulting in legislative uncertainty. Businessmen in Slovakia must constantly observe what changes they are about and how they will affect their business. Their attention is not entirely entrepreneurial because they have to deal with different bureaucratic requirements, but also with accounting and legal problems. Business costs are increasing, which negatively affects their competitiveness and leads to

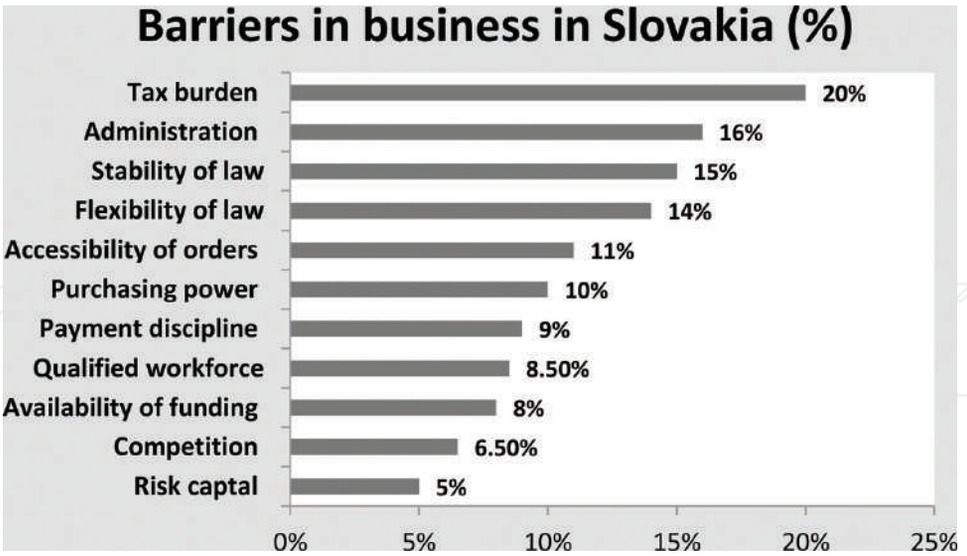

Figure 8. Barriers in business in Slovakia. Source: Research in Slovakia.

the demotivation of business expansion, innovation or improvement of their services. In order to maintain economic growth in Slovakia, it is necessary to improve the business environment, thereby increasing employment, but also booming small- and medium-sized enterprises, especially in the case of economically weaker regions. The need to remove administrative and regulatory barriers in the business sector is a priority for economic growth (**Figure 8**).

7. Summary

The tax policy of the country must have a direction in terms of supporting the business environment in Slovakia. Within fiscal policy, macroeconomic objectives are mainly focused on securing funds to cover state spending, on the possibility of influencing the economic and social policy of the state, on ensuring the interplay of taxes on the stability of the currency, on credit and monetary policy and on unemployment, the problems of tax problems, their conception and structure in the state economy. In addition to the macroeconomic perception of the importance of taxes, the microeconomic point of view, which monitors changes in tax laws and their impact on business entities, influences the tax base by legal instruments of tax policy (depreciation policy), items affecting the tax base of economic subjects (e.g., non-taxable items). **The development of the basic institutes of the tax process points to the support of the business environment in Slovakia.** Trend analyses of the main institutes of the tax process show slight fluctuations over the 10-year period under review, despite slight changes in core institutes. Basic institutes are tools for optimizing the tax base, which affects the business of natural and legal persons in Slovakia. The tax policy of the country has a flexible response to the necessary changes in every area of social life; it should focus on solving problems related to the tax burden on entrepreneurs, in order to avoid, for example, double taxation, which is gradually being addressed through the introduction of double taxation treaties.

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Chapter 4

Taxation and Economic Growth in a Resource-Rich Country: The Case of Nigeria

Ojijo Odhiambo and Oluwatosin Olushola

Additional information is available at the end of the chapter

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Abstract

In this chapter, we examine the relationship between taxation and economic growth in a resource rich country, using Nigeria as a case study. We explore the linkages between availability of higher resource revenue and lower taxation effort of other revenue categories and the effects of these on growth. Ordinary least square (OLS) estimation technique is employed in estimating the specified model. Also, descriptive analysis is carried out regarding tax trends and tax efforts in Nigeria to determine the effectiveness of existing tax structures, as well to as examine relevant national and cross-country data. Empirical results reveal that taxation has a significant impact on Real GDP growth rates. However, the proportion of tax contribution to the growth rate falls short of the optimal level in terms of the volume of economic activities and value of total output. Nigeria also lags other African countries with respect to tax effort and as such has a huge untapped potential for enhanced revenue mobilisation. We recommend therefore, that the Government should institute an appropriate tax system with an emphasis on broadening the tax base and in some cases, reviewing upwards the tax rates in order to increase the tax effort as well as ensure optimal contribution of taxation towards economic growth and development.

Keywords: economic growth, tax administration, tax efforts, resource-rich country, Nigeria

1. Introduction

1.1. Why taxation?

Taxation is an important fiscal policy instrument at the disposal of governments to mobilise revenue and promote economic growth and development.[1] Governments use tax revenue to carry out their traditional functions such as the provision of public goods and services; maintenance of law and order; defence against external aggression; and regulation of trade and business to ensure social and economic maintenance [1]. Effective tax revenue mobilisation reduces an economy's dependence on external flows which have been found to be highly volatile.[2] Taxation also allows governments' greater flexibility in designing and controlling their development agenda; conditions states to improve their domestic economic policy environment, thus creating a conducive environment for the much-needed foreign direct investments; and strengthens the bonds of accountability between governments and the citizens [2]. The 2008/2009 global financial and economic crisis provided useful lessons for countries on the need to direct more attention to domestic resources mobilisation efforts, including through increasing tax revenues, and shift away from over-dependence on external financial flows and export revenues.[3]

Although tax structures vary considerably across countries, the primary objective of any tax structure is to attain maximum revenue and economic growth with minimum distortions. Different countries have different philosophies about taxation and different methods of tax collection. In the same manner, countries have different uses for their revenue which affect growth differently [3]. Agell et al. [4] have argued that the different uses of total government expenditure affect growth differently and a similar applies to way tax revenue is raised. Romer [5] emphasises factors such as 'spill-over effect and learning by doing' by which firms' specific decisions to invest in capital and research and development, or investment in human capital, can yield positive external effects that benefit the rest of the economy. Solow [6], was the first to examine how taxation affects growth. He argued that steady state growth is not affected by tax policy; that is, tax policy, regardless of distortion, has no impact on long term economic growth rates, even if it reduces the level of economic output in the long term. On his part [7], argued that the different uses of total government expenditure affect growth differently and a similar argument applies to the way tax revenue is raised. The economic growth of Singapore for instance can be attributed to low rates of corporate and personal income taxes. Relatedly [8], argue that there exists a structural difference in taxation in developing countries and developed countries. For developing countries, they established that roughly two-thirds

[1]Whereas tax revenues are needed for public investments, including in productive and social and other sectors of the economy, taxation can also hamper growth, for instance, when corporate, income and capital gains taxes are so high that they serve as a disincentive for investments and do not attract the necessary skills; slow down growth in labour supply by disposing labour leisure choice in favour of leisure; discourage investments in research and development expenditures; and cause the flow of resources to other sectors that have lower productivity.

[2]External financial flows include foreign direct investments, portfolio investments, remittances and official development assistance

[3]The Nigerian economy has been negatively impacted by the recent significant fall of oil prices since June 2014 from the peak of $114 per barrel to below $30 per barrel in early 2016.

of tax revenue is derived from indirect taxes while for developed countries two-thirds comes from direct taxes. They suggested however, that tax structure can change over time to maximise the economic growth.

1.2. Taxation–theoretical underpinnings

The differing views of the effects of taxation of growth notwithstanding, important conceptual questions arise however, with respect to the optimal level of taxation for a defined objective function - whether growth or revenue generation; how taxation burden should be allocated among tax payers; the extent of state involvement in taxation; and how tax revenues should be allocated among various public goods and services.

Lindahl [9] attempted to address these questions using a model which allows for determination of the extent of state provision of goods and services and the relative tax shares of two individuals who are free to reveal their preferences for state services against corresponding tax liability. The central thesis of the Lindahl model is the voluntary exchange between the taxes paid by the two individuals and the services rendered by the state. The Lindahl model therefore sought to seek a solution for the following problems: the decision regarding the extent of state activity; allocation of the total expenditure among various goods and services; and allocation of tax burden among tax payers.

From **Figure 1** below, if we assume a linear and homogenous production of goods and services, SS′ is the supply curve of the state services while DDa and DDb are demand curves of two individuals - A and B; the vertical summation of which gives the [total] community's demand curve for state services—DDl. When ON is amount of the state services produced, A contributes NE; B contributes NF while NG represents the cost of supply. Since the state is not a profit maker, it increases its supply up to OM, at which level A contributes MJ while B contributes MR which when combined, equals the cost of supply—MP. P is therefore, the point at which equilibrium (SS = DD) is obtained on the basis of voluntary exchange of goods and services.

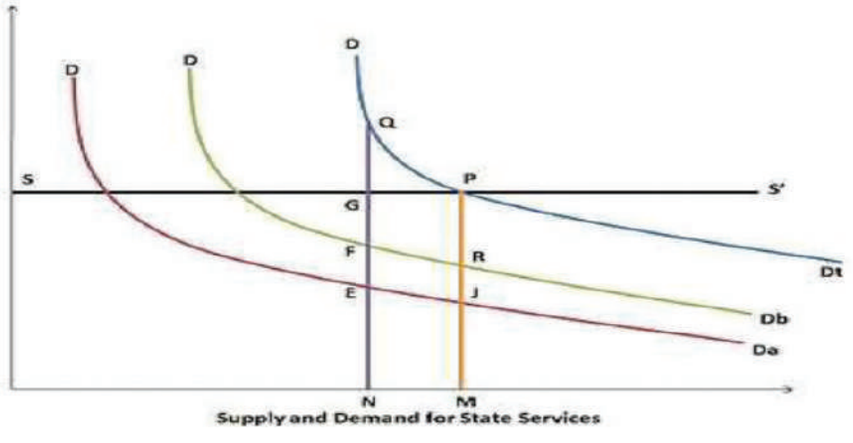

Figure 1. Lindahl model.

Many economists however, tend to favour the Bowen approach [10] since it can be easily adapted to depict what happens when social goods are produced under conditions of increasing costs, as opposed to Lindahl model which assumes linear and homogenous production (**Figure 2**).

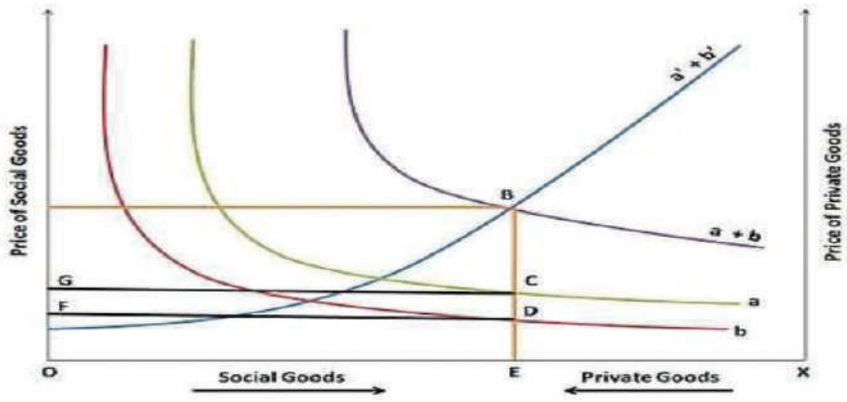

Figure 2. The Bowen model.

The model assumes the existence of one social good and two tax-payers - A and B whose demand curves are represented, respectively, by a and b; with a + b being the total demand. The supply curve 'a + b' implies that the social goods are produced under conditions of increasing cost. But economic theory posits that the cost of producing social goods is the value of private goods foregone; that is 'a + b' is also the demand curve of private goods. The intersection of the cost and demand curves at B therefore, gives a determination of how a given national income should, according to tax-payers' desire, be shared between social and private goods - OE social goods and EX private goods. At the same time, it is possible to determine the tax shares of A and B, which are represented, respectively, by GCEO and FDEO out of the total tax requirement represented by area ABEO.

1.3. What ails the Nigerian tax system?

Irrespective of how a country chooses to share the tax burden among tax payers or allocates tax revenues among various goods and services, the tax revenue to gross domestic product (GDP) ratio is generally accepted as a crude measure of the tax effort of a given country and can be used as a basis for cross country comparisons. Compared to similar economies in Africa, Nigeria has a very low tax revenue to GDP ratio, with the bulk of government revenue being derived from oil and gas sector.[4] Between 1981 and 2015, revenues from the oil and gas sector accounted, on average, for 75% of total government revenues, with the non-oil sector, of which taxation is part, contributing, on average, the remainder 25%, albeit with wide annual fluctuations [11]. Nigeria discovered oil in 1956 at Oloibiri in the Niger Delta after half a century of oil exploration, but commercial exploitation only started in 1968. By 1972, the oil sector share in total revenue was 54.4% against 45.6% share from non-oil sector. But by 1974 oil share of total revenue had increased to 82.1% with only 17.9% revenue accruing non-oil sector. Following the glut in the world oil prices in the later part of the 1970s however, the oil share

[4]The Central Bank of Nigeria decomposes Government revenue into oil revenue and non-oil revenue. Tax revenue, as well as petroleum profit tax, falls under non-oil revenue

in total revenue fell to 61.8% in 1978 while non-oil sector's share rose to 38.2%. More recently, the oil sector share in total revenue has been on an upward trajectory peaking at 88.6% in 2006. As at 2012, oil sector share in total revenue stood at 75.3% while non-oil sector accounted for 24.7% of the total revenue [11]. Overall, tax revenue, as a proportion of GDP, has been on a downward trend in the recent past. From a high of 5.459% in 2009, the tax to GDP ratio stood at 1.557% in 2012 which compares unfavourably with, for instance, the situation in South Africa, with a tax to GDP ratio of 26.81 and 25.52%, respectively, in 2009 and 2012.[5]

Despite the many policy, legislative and administrative reforms effected in the recent past,[6] the Nigerian tax system is still riddled with several challenges which limit its optimal performance. These challenges have been highlighted, variously, by [12–17]; and include, but are not limited to the following: non-availability of tax statistics, inability to prioritise tax efforts, poor tax administration, multiplicity of taxes, regulatory challenges, tax evasion, tax avoidance, structural problems in the economy and a thriving underground economy. The role of taxation in promoting economic growth in Nigeria has therefore, not been optimally felt, owing to defective tax policy framework and administrative mechanisms. Tax administration process and the institutions saddled with the responsibility of tax collection often suffer from limitations in skilled manpower and financial resources; and appropriate tools and technology required to meet the ever-increasing challenges and difficulties associated with tax administration. Over the years, Nigeria has relied heavily on crude oil exports as a major source of government revenue, and consequently, neglecting other critical sectors of the economy that would have broadened the country's tax base. However, the high volatility associated with crude oil prices has made it imperative for the country to explore other sources of revenue to help fund public expenditure.

In this chapter, we examine the relationship between the availability of higher resource revenue—oil revenue in this case, and lower taxation effort of other (non-oil) revenue categories and the effects of these on growth. Specifically, we seek to examine the role of Petroleum Profit Tax in stimulating economic growth in Nigeria; determine the contribution of Companies' Income Tax to economic growth in Nigeria; ascertain the impact of Customs and Excise Duties on economic growth in Nigeria; determine factors responsible persistent low tax efforts in Nigeria; and recommend plausible policy proposals for enhancing optimal and effective tax administration in Nigeria. Whereas previous studies (See for instance [1, 18, 19]) have aggregated the various components of taxation and analysed their impact on economic growth, we disaggregate the various components of taxation in Nigeria with a view to ascertaining their respective influences on economic growth in Nigeria. We also expand the scope of the study to capture the effects of the most recent reforms and policy instruments relating to taxation in the Nigerian economy such as the Company's Income Tax (Amendment) Act. 2007; the Federal Inland Revenue Services (Establishment) Act, 2007 and the Personal Income Tax (Amendment) Act, 2011. More broadly, we examine taxation as an instrument for stimulating economic growth in Nigeria, by tracing trends and performance of various categories of taxes. We also present a cross-country analysis of tax effort in Nigeria and a select group of African countries.

[5]World Bank data. Available at http://data.worldbank.org/indicator/GC.TAX.TOTL.GD.ZS?locations

[6]These reforms measures include the Value Added Tax (Amendment) Act, 2007, intended to widen the tax base and improve collection while the Company's Income Tax (Amendment) Act. 2007; the Federal Inland Revenue Services (Establishment) Act, 2007 and the Personal Income tax (Amendment) Act, 2011, were all aimed at encouraging tax compliance and increasing tax yield.

2. A review of the Nigerian tax system

2.1. Policy, legal, and institutional reforms: a historical overview

Policy, legislative and administrative reforms of the Nigeria tax system predate independence and can be traced back to early twentieth century when the then High Commissioner of the [then] Northern Protectorate issued the Stamp Duties Proclamation in 1903, followed immediately thereafter in 1906 by the Native Revenue Proclamation. This latter Proclamation systematised all the pre-colonial taxes by defining taxable rates; and procedures for assessment and collection, as well as penalties for default thus eliminating arbitrariness that had hitherto characterised the Nigerian tax system. It introduced the four certainties essential in tax practice: what to pay, when to pay, where to pay and who to pay to. The same Proclamation was re-issued as the Native Revenue Ordinance in 1917 to cover the Southern territories and by 1927, was applicable in the whole country. The year 1943 was a watershed period in the history of the Nigerian tax system as it witnessed the creation of the Inland Revenue Department (renamed the Federal Board of Inland Revenue in 1958), the precursor to the present day Federal Inland Revenue Service (FIRS). Following independence in 1960, other legal and institutional reforms were effected in 1961 through the establishment of the Federal Board of Inland Revenue (FBIR) and the Body of Appeal Commissioners as the first point of call for tax dispute resolution. In the same year, the Joint Tax Board (JTB) was created with the primary responsibility of ensuring uniformity of standards and application of Personal Income Tax.

Other major reforms to the tax system were effected in 1982 with the establishment of the Chartered Institute of Taxation of Nigeria [24] and 1993 with a review of the composition of the FBIR and establishment of the present day Federal Inland Revenue Service (FIRS) as the operational arm of the FBIR; as well as a review of the functions of the JTB. Further changes were effected in 2007 with the granting of financial and administrative autonomy to the FIRS following the recommendations of the 'Study and Working Group on Nigerian Tax System' which had been set up in half a decade earlier. These, and other reforms[7] represented the first major attempt at shifting focus away from oil to a more sustainable source of revenue, that is, the non-oil sector. Since then, a raft of changes that cut across organisational restructuring of the Federal and State authorities, the enactment of a National Tax Policy, funding, legislation, taxpayer education, dispute resolution mechanism, taxpayer registration, human capacity building, automation of key processes, refund mechanism and several other areas have been effected.

The foregoing would lead to one logical question: why so many reforms? Given the low tax to GDP ratio, it is plausible to assume that the need to address the problem of low tax returns motivated the Nigerian Government to embark on these reforms. The scope of, and

[7]Other highlights of the tax reforms include, but are not limited to, in chronological order, the Raisman Fiscal Commission of 1957; the promulgation of the Petroleum Profit Tax Ordinance No. 15 of 1959; the promulgation of Income Tax Management Act 1961; the promulgation of the Companies Income Tax Act (CITA) 1979; and the Personal Income Tax Act, 2011.

frequency with which tax reforms have been implemented should however, be viewed within the broader context of the structure of Nigeria's economy and the centrality of taxes to the attainment of national development objectives. In specific terms, four main considerations seem to have informed these frequent tax reforms: the need to diversify the revenue portfolio to safeguard against the oil price volatility in the global market; the need for an accurate and reliable determination of the optimal tax rate, since Nigeria operates on a cash budget system, where expenditure proposals and overall fiscal management are anchored on revenue projections; historical overreliance on petroleum and trade taxes while overlooking direct and broad-based indirect taxes such as value added tax (VAT); and the ever-widening fiscal deficit, an ever-present threat to macroeconomic stability. According to [20], the objectives of tax reforms in Nigeria include the need to bridge the gap between the national development needs and the funding of the needs; achieve improved service delivery to the public; improve on the level of tax derivable from non-oil activities, vis-à-vis revenue from oil activities; constantly review the tax laws to reduce/manage tax evasion and avoidance; and improve the tax administration to make it more responsive, reliable, skilful and taxpayers friendly, as well as achieve other fiscal objectives such as managing inflation and improving balance-of-payment conditions. But the fiscal objectives were only a means to an end. The end objectives of the tax policy reforms were to generate revenue; promote growth and development; ensure effective protection for local industries and encourage greater use of local raw materials; promote value addition and greater geographical dispersion of domestic manufacturing capacities; and create jobs. And although specific policy, legal and institutional measures have varied over time, these objectives have remained relatively unchanged.

2.2. Taxation laws and regulations: who taxes what?

Tax regulations and laws refer to the embodiment of rules and regulations relating to tax revenue and the various kinds of taxes. A tax administration that encourages voluntary compliance, resolutely and legally enforces compliance, treats the tax payer as partner, rewards pro-tax behaviour and operates in an environment of accountability is a preferred tax system [21].

The federal system of government in Nigeria implies that fiscal power is based on a three-tiered tax structure: Federal, State and Local Governments, each of which has, in principle, different and distinct tax jurisdictions. Specifically, the Federal government taxes corporate bodies while State and Local Governments tax individuals. The Taxes and Levies (approved list for Collection) (Decree, 1998) gives the Federal, State and Local Governments the responsibilities for collecting the taxes and levies listed in, respectively, Parts I, II and III of the schedule to the Decree.

Part 1 of the schedule contains taxes to be collected by the Federal Government. These include: Companies Income Taxes; Withholding tax on companies, residents of the Federal Capital Territory, Abuja and non-resident individuals; Petroleum profits tax; Value added tax; Education tax; Capital gains tax on residents of the Federal Capital Territory, Abuja, bodies corporate and non-resident individuals; Stamp duties on bodies corporate and residents of the Federal Capital Territory, Abuja; and personal income tax of members of the Armed Forces of the Federation, members of the Nigeria Police Force, residents of the Federal Capital Territory, and staff of the Ministry of Foreign Affairs and non- resident individuals.

Similarly, Part II of the Schedule presents taxes and levies to be collected by the State Governments and they include: Personal Income Tax in respect of –Pay-As-You-Earn (PAYE) and direct taxation (Self-Assessment); Withholding tax (individuals only); Capital gains tax (individuals only); Stamp duties on instruments executed by individuals; Pools betting and lotteries, Gaming and casino taxes; Road taxes; Business premises registration fee; Development levy (individuals only); Right of Occupancy fees on lands owned by the State Government in urban areas of the State; and Market taxes and levies where State finance is involved.

Part III of the Schedule contains taxes and levies to be collected by the Local Governments and these include: Shops and kiosks rates; Tenement rates; On and Off Liquor Licence fees; Slaughter slab fees; Marriage, birth and death registration fees; Naming of street registration fee, excluding any street in the State Capital; Right of Occupancy fees on lands in rural areas, excluding those collectable by the Federal and State Governments; Market taxes and levies excluding any market where State finance is involved; Motor park levies; Domestic animal licence fees; Bicycle, truck. Canoe, wheelbarrow and cart fees, other than a mechanically propelled truck; Cattle tax payable by cattle farmers only; Merriment and road closure levy; Radio and television licence fees (other than radio and television transmitter); Vehicle radio licence fees (to be imposed by the Local Government of the State in which the car is registered); Wrong parking charges; Public convenience, sewage and refuse disposal fees; Customary burial ground permit fees; Religious places establishment permit fees; and Signboard and Advertisement permit fees.

And to address the hitherto inherent conflict of fiscal responsibilities and powers among the three tiers of government, the 1999 Constitution classifies governmental taxation responsibilities and powers into *exclusive*, *concurrent* and *residual* lists. The National Assembly, is empowered to issue legislation on the taxation of incomes, profits and capital gains, and on matters classified in the concurrent list—particularly those related to the division of public revenue. The State Houses of Assembly may prescribe the collection of any tax, fee or rate, or the administration of a law to provide for such collection by a local government council or any tax, fee or rate not expressly stipulated as being within the authority of the Federal government. The State government is empowered to impose tax on all items in the concurrent list as well as residual matters but to the extent that such laws are consistent with those of the National Assembly.

In sum, the Federal Government is limited to eight specific taxes while the State and Local Governments were restricted to 11 and 20, respectively. However, the Federal government controls most of the buoyant tax handles, accounting for 99% of the tax revenue. The most important tax laws in Nigeria include Company Income Tax Act (CITA), Capital Gains Tax Act and Stamp Duties Act, all enacted in 1990; value added tax (VAT) Act and Education Ac, both enacted in 1993; Personal Income Tax Act (PITA) of 2004; and the Petroleum Profit Tax Act and Information Technology Development Act, both enacted in 2007. In reality however, Nigeria's tax administration environment is fraught with the problem of multiple taxation, which in the extreme compels companies to pay income tax to Federal Government, and other

wide ranging taxes, levies and rates, to State and Local governments. This may be due, in part, to declining and fluctuating earnings from oil and the need by various tiers of Government to raise own revenue.

2.3. A review of national tax policies

Tax policy provides a set of rules, *modus operandi* and guidance for all stakeholders in the tax system. Tax policy formulation in Nigeria is the responsibility of the FIRS, Customs Services, Nigerian National Petroleum Corporation (NNPC), and other agencies of government but under the guidance of the National Assembly. A good tax policy needs to satisfy both *efficiency* and *equity* criteria. Any tax policy is, however, continually subjected to pressure and changes. According to [22], the best approach to reforming taxes is one that considers taxation theory, empirical evidence and political and administrative realities and blending these with a good dose of local knowledge and sound appraisal of the prevailing macroeconomic and international situation to produce a feasible set of proposals sufficiently attractive to be implemented and robust enough to withstand changing times.

Whereas during the pre- Structural Adjustment Programmes (SAP) era tax policies were aimed at boosting government revenue; ensuring effective protection for local industries and equity in the geographic dispersion of manufacturing activities, the introduction of the SAPs in 1986 witnessed a shift in policy focus to using taxes to boost productivity and competitiveness of business enterprises; promoting exports of manufactures; and reducing the tax burden of individuals and companies. The specific measures introduced included a review of custom and excise duties; reduction of company and income taxes; granting of a wide array of tax exemptions and rebates; introduction of capital allowance; expansion of duty drawback and manufacturing-in-bond schemes; elimination of excise duty; introduction of VAT; and monetizing of fringe benefits and increase in tax relief to low-income earners [23].

More recently, a National Tax Policy (NTP) adopted in 2010 sought to provide a set of guidelines, rules and *modus operandi* that would regulate Nigeria's tax system and provide a basis for tax legislation and tax administration. The 2010 NTP seeks to resolve some inherent problems of the existing tax system such as multiple taxation; uncertainty and leakages in the tax system; lack of accountability of tax revenue and expenditure; inadequate clarity on taxation powers of each level of government and encroachment on the powers of one level or state by another; uncertainty in the tax system and increasing cost of tax compliance due to lack of skilled manpower, inadequate funding, improper delegation of tax powers to third parties; the non-refund of excess taxes to taxpayers, due to the lack of an efficient system and funds; obsolete laws which do not reflect Nigeria's current realities; and the lack of a specific policy direction for tax matters in Nigeria, as well the absence of laid down procedures for the operation of the various tax authorities. The 2010 policy in effect has shifted focus from direct taxation to indirect taxation. Its strategy is to reduce companies' income tax rate from 30 to 20%, top rate personal income tax rate from 25 to 17.5% and a gradual increase in the rate of VAT from the current level of 5%. These strategies are aimed at encouraging investments, creating employment, increasing tax compliance and limiting opportunities for tax avoidance.

3. Methodological approach

3.1. Review of the literature

The relationship between taxation and economic growth has been widely studied. Some of these studies suggest that tax policies have positive and significant impact on the rate of growth of output, while others have observed that there is an inverse relationship between the two variables, that is, tax policies have a negative and significant impact on growth. Haq-Padda and Akram [25] examined the impact of tax policies on economic growth using data from Asian economies. They established that there is no empirical evidence that tax policies adopted by developing countries in Asia have a permanent effect on the rate of economic growth, a finding that is inconsistent with the endogenous class of growth models. The results of their study suggest that the relationship between aggregate output and the tax rate is best described by the neo-classical growth models because a higher tax rate permanently reduces the level of output but has no permanent effect on the output growth rate. Consequently, they recommended an optimal tax rate to finance the budgets, with debt instrument used in financing transitory expenditure while permanent expenditures are to be financed through taxes.

In a cross-country analysis, Ramot and Ichihashi [26] used panel data from 65 countries covering the period 1970–2006 to examine the effects of tax structure on economic growth and income inequality and established that company income tax (CIT) rates have a negative impact both on economic growth and income inequality. They also established that personal income tax rate does not significantly affect economic growth and income inequality. The authors therefore, recommended that there is a need to develop a modest design into the tax system since countries which are able to mobilise tax resources through broad-based tax structures, coupled with efficient administration and enforcement of the tax system' are likely to enjoy faster growth rates than countries with narrow tax base and lower efficiency in tax administration. Also, governments should reduce tax evasion, which, they averred, occurs among the highest income group and has potential to distort horizontal and vertical equity in income redistribution. Finally, they recommended that very high earners or the highest income group should be subjected to high and rising marginal tax rates.

Ariyo [14] evaluated the productivity of the Nigerian tax system given the negative impact of persistent unsustainable fiscal deficits on the Nigerian economy for the period 1970–1990 to devise a reasonably accurate estimation of Nigeria's sustainable revenue profile. The results of the study showed a satisfactory level of productivity of the Nigerian tax system. The author therefore, recommended for an improvement of the tax information system to enhance the evaluation of the performance of the Nigerian tax system and facilitate adequate macroeconomic planning and implementation. Kneller et al. [27], taking account of the financing assumption associated with government budget constraints, studied the effect of the structure of taxation and public expenditure to the steady-state growth and established that non-distortionary taxation and productive expenditure enhance economic growth, a finding consistent with the Barro model [28].

Widmalm [29] in a study established that there exists a negative relationship between personal income tax, measured by average income tax, and economic growth, while corporate income tax does not correlate with growth at all. In their estimation, Lee and Gordon [30]

found out that the concrete tax rates that greatly affect economic growth are the top statutory company income tax (CIT) rates. From their estimation, they established that only the CIT rate had a significant negative impact on economic growth in all their regressions by controlling the endogeneity of tax measures while the personal income tax (PIT) rate and its progressivity did not significantly affect economic growth. The results of Lee and Gordon [30] are supported by the findings of Arnold [31] who established that the CIT and PIT rates reduce the economic performance of a country. Analogously, Padovano and Galli [32] argued that average tax rates lead to several biases and concluded that taxation has no impact on growth because of the possibility of high correlation with average fiscal spending.

Poulson and Kaplan [33] explored the impact of tax policy on economic growth within the framework of an endogenous growth model using data from 1964 to 2004. In this model, differences in tax policy can lead to different paths of long-run equilibrium growth. They used regression analysis to estimate the impact of taxes on economic growth. Their analysis revealed that higher marginal tax rates had a negative impact on economic growth. Jibrin et al. [34] used ordinary least squares (OLS) method to examine the impact of Petroleum Profit Tax on Economic Development in Nigeria for the period 2000–2010. Their findings revealed that Petroleum Profit Tax has a positive and significant impact on Gross Domestic Product. The authors therefore, recommended that government should improve on the effectiveness and efficiency of the administration and collection of taxes with a view to increasing government revenue.

Enokela [35] explored the relationship between VAT and economic growth of Nigeria using secondary data and multiple regressions. The results revealed that gross domestic product (GDP) is positive and statistically significant to value added tax; Government capital expenditure (GCE) is positive but insignificant to value added tax; and gross domestic product per capita (GDPPC) is negative and statistically significant to value added tax. The researcher recommended a zero tolerance for corruption to enable the revenue generated from VAT to be channelled to appropriate developmental projects. In a related strand of literature, Emmanuel [36] examined the effects of VAT on economic growth and total tax revenue in Nigeria using data covering the period 1994–2010. He formulated two hypotheses: that VAT does not have significant effects on GDP; and VAT does not have significant effects on total tax revenue. The results of the regression analysis show that VAT has significant effect on GDP; and also on total tax revenue. He therefore, encouraged government to sensitise the people to enable it increase the tax rate in order to increase its annual revenue for economic development. Relatedly, in a study by Wambai and Hanga, [37] titled '*Taxation and Social Development in Nigeria: Tackling Kano's Hidden Economy*', they found that the attitude of the government towards taxation need to change and recommended a tax system that concentrates on establishing simplicity, predictability and neutrality while Olusanya et al. [38] in investigating taxation as a fiscal policy instrument for income redistribution among Lagos state civil servants using Spearman's Rank Correlation coefficient found a positive relationship between tax as a fiscal policy instrument and income redistribution.

Tosin and Abizadeh [39] studied economic growth and tax charges in OECD countries from 1980 to 1999; their study reveals that economic growth measured by GDP per capita has significant effect on tax mix of GDP per capita. The study recorded a decline in shares of payroll, goods and services and positive growth from personal and property taxes. At the regional

level, Chiumia and Simwaka, [40] analysed the effects of taxation in sub-Saharan Africa. They found that taxes levied on personal and corporate income reduces economic growth. From their study, one could be tempted to conclude that the tax structure is largely irrelevant in less developed economies, although we know from theory that embedded in an effective tax system are benefits for both the taxpayers and the government.

3.2. Model specification and estimation technique

The model specified for this study is adopted from Appah [41], Okafor, [42], Ogbonna and Ebimobowei [43] and Nwakanma and Nnamdi, [19]. We used a multiple linear regression model to capture the relationship between taxation and economic growth in Nigeria for the period 1986–2015. Included in the model are; real gross domestic product growth rate (RGDPgr), as the dependent variable; and companies income tax (CIT) revenue, petroleum profit tax (PPT) revenue, as well as customs and excise duties (CED) revenue as the explanatory variables.[8]

i. Petroleum profit tax (PPT) is the tax imposed on companies which are engaged in the extraction and transportation of petroleum products. It is related to rents, royalties, margins and profit-sharing elements associated with oil mining, prospecting and exploration leases [44]. Apart from providing revenue for the government, PPT also serves as an instrument through which the government regulates the number of participants in the petroleum industry and gain control over public assets [45]. In the context of Nigeria, like in other developing countries, the PPT is, in a sense, an instrument for wealth redistribution between the wealthy and industrialised economies who own the technology; and expertise and technical know-how, as well as the capital needed to develop the oil and gas sector [34].

ii. Companies income tax (CIT) is charged on the profit or gain of any company accruing in, derived from, brought into, earned in or received in Nigeria. The tax rate has been 30% and it is applied on the total profit or chargeable profit of the company but was reduced to 20% under the new (2010) tax policy. It should be noted that oil marketing companies, oil services companies are liable to tax under CITA at the rate 20% and Education Tax at the rate of 2% on the assessable profit.

iii. Custom Duties constitute one of the oldest kinds of modern taxation in Nigeria having been introduced in 1860 as import duties. Excise duties are *ad-valorem* taxes on the output of manufactured goods and are administered by the country's Custom Service. They are taxes on the country's imports charged either as a percentage of the value of the imports or as a fixed amount contingent on quality.

The model was thus explicitly specified as:

$$RGDPgr = a_0 + a_1 CIT + a_2 PPT + a_3 CED + U \quad (1)$$

[8]VAT though an important source of government revenue was only introduced in 1994 and as such its inclusion would call for a major adjustment in the temporal scope of the study.

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where: RGDPgr = Real Gross Domestic Product growth rate; CIT = Companies Income Tax; PPT = Petroleum Profit Tax; CED = Customs and Excise Duties; and U = Stochastic error term while a_{0-} a_3, are parameters of the model.

The coefficients of all the explanatory variables are expected to be either positive or negative, depending on the peculiarity of the country's tax structures. The intercept term is expected, *a priori*, to be positive as tax variables are not the only contributors to the country's economic growth rates.

We employed the ordinary least square (OLS) method of estimation based on the desirable properties it possesses and the relative simplicity of its application. We carried out unit root test at 5% level of significance to assess the stationarity of the time series data. Descriptive analysis was also carried out regarding tax trends and tax efforts in Nigeria, to determine the effectiveness of existing tax structures towards enhancing optimal and effective tax administration. Finally, we used descriptive analysis to evaluate relevant national and cross-country tax data, with a view to evaluating their inherent patterns and trends, and determining the implications of these patterns and trends for tax policies and administration in Nigeria.

3.3. Evaluation criteria and data sources

The results were evaluated based on the following criteria: economic *a-priori* criterion, statistical criterion and econometric criterion. We carried out tests to check if the signs and magnitudes of the estimated parameters conform to what economic theory postulates. The coefficient of determination (R^2), was estimated to capture the proportion of the total variation in the dependent variable, Real GDP growth rate, that can be explained by the explanatory variables explicitly captured in the model. We also used the F-test to test whether the explanatory variables included in the model are, jointly, significant or not in determining the level of economic growth while the T-Test was used to test the statistical significance of individual parameters of the regression model. To test autocorrelation, we adopted the Durbin Watson (D-W) statistic because of the absence of lagged dependent variables in the specified regression model while for Heteroscedasticity, we adopted the White's General Heteroscedasticity Test to ensure that the variance of the stochastic error term is constant. Our regression analysis relied heavily on secondary data published by the Central Bank of Nigeria (CBN), the National Bureau of Statistics (NBS), and Federal Inland Revenue Service (FIRS) covering the fiscal period 1986–2015 while data for descriptive analysis of tax trends in Nigeria, as well as cross country tax trends and performance among selected African countries, were sourced from FIRS and the International Monetary Fund (IMF).

4. Regression results and analysis of taxation trends

4.1. Results and discussions

To address the phenomenon of spurious regression usually associated with nonstationary time series data, we carried out the Augmented Dickey Fuller (ADF) unit root test at 5% level

to ascertain the stationarity status of each individual time series data; the results of which are shown in **Table 1** below.

From **Table 1** below, the time series data for RGDPgr is stationary at level, implying that the time series data on Real Gross Domestic Product growth rate is integrated of order zero (0) while the annual time series data on CIT, CED and PPT are all stationary at first difference, implying that they are integrated of order one (1). The finding with respect to Companies Income Tax, Customs and Excise Duties and Petroleum Profit Tax substantiates the theoretical assertion that most economic time series are usually not stationary at level, but they attain stationarity after first differencing.

Based on the results shown in **Table 2** below, the estimated regression equation (Eq. (1)) becomes:

$$\text{RGDPgr} = 2.771101 + 0.0000326\text{CED} - 0.00000926\text{CIT} - 0.000850\text{PPT} \quad (2)$$

From the estimated regression results, the intercept term is positive (2.771101), implying that the growth rate of the Nigerian economy retains a positive value when all the explanatory variables explicitly captured in the regression model are held constant; that is, economic growth rate is dependent on other variables other the explanatory variables captured in the model. The signs of the coefficients of explanatory variables explicitly captured in the regression model conform to the *a-priori* expectations as the impact of tax variables on growth can either be positive or negative, depending on the internal dynamics of the economy as well as the incidence of the various categories of taxes. The coefficient of customs and excise duties is positive while the coefficients of Companies Income Tax (CIT) and Petroleum Profit Tax (PPT) are negative. The estimated regression results show that, a unit change in Customs and Excise Duties will result in an average change in Real Gross Domestic Product growth rate of 0.0000326 units, holding all other explanatory variables in the regression model constant while the coefficient of Companies Income Tax implies that a unit change in Companies Income Tax will result in an average change in Real Gross Domestic Product growth rate of −0.00000926 units, holding all other explanatory variables in the regression model constant. Similarly, the coefficient of Petroleum Profit Tax implies that a unit change in Petroleum Profit Tax will result in an average change in Real Gross Domestic Product growth rate of −0.000850 units, holding all other explanatory variables in the regression model constant.

Variables	ADF statistic	Order of integration
RGDPgr	−4.103592	I(0)
CIT	−3.262681	I(1)
CED	−4.473805	I(1)
PPT	−3.102251	I(1)

Source: Authors' computation.

Table 1. ADF unit root test results.

Variable	Coefficient	Standard error	T-statistic	P-values
C	2.771101	0.888043	3.120460	0.0044
CED	3.26E-05	1.08E-05	3.013292	0.0057
CIT	−9.26E-06	7.45E-06	−1.242312	0.2252
PPT	−0.000850	0.001434	−0.592753	0.5585
Adjusted R^2	0.195645			
D.W statistic	1.707596			
F-statistic	3.351249			0.034229

Source: Authors' computation.

Table 2. Summary of regression results.

The Adjusted R^2 from the estimated regression model shows that only about 20% (0.195645) of the changes in Real Gross Domestic Product growth rate (RGDPgr) can be explained by the explanatory variables explicitly captured in the regression model, implying that the regression model has a poor fit. The low R^2 is an indication that the tax variables explicitly captured in the regression model have not significantly influenced the total change in Real GDP growth rate in Nigeria. This poor tax performance as a driver of economic growth can be attributed to the economy's heavy reliance on commodity export (crude oil) as a major driver of economic growth and the perpetually low tax to GDP ratio as a result of the plethora of challenges facing the Nigerian tax administration system discussed Section 2.

Based on the students' T-test for each of the parameters in the model, the coefficient Customs and Excise Duties is statistically significant at 5% level of significance, while the coefficients of Companies Income Tax and Petroleum Profit Tax are not statistically significant at 5% level of significance. This implies that Customs and Excise Duties do have significant impact on the growth rate of Real Gross Domestic Product (RGDPgr), while Companies Income Tax (CIT) and Petroleum Profit Tax (PPT) have not contributed significantly towards stimulating economic growth in Nigeria during the period under review.

We also employed the F-Statistic (ANOVA) to establish the overall significance of the regression at the 5% significance level. The results show that the equation or model employed is statistically significant with P- value of 0.034229 and F = 3.351249, implying that the relationship between the growth rate of Real Gross Domestic Product and all the explanatory variables explicitly captured in the regression model is statistically significant at 5% level of significance. Thus, even though some of the individual coefficients of some of explanatory variables are not statistically significant, they are, jointly, statistically significant. That is, during the period under review, all the tax variables explicitly captured in the regression equation jointly exerted significant effect on economic growth in Nigeria.

Lastly, we evaluated the results based on econometric criteria. The estimated Durbin Watson statistic (D-W = 1.707596) shows that the regression model is devoid of first order serial correlation. Also, the White's test of heteroscedasticity was carried out to ensure that

the variance of the error term is constant. Since the calculated value of the test statistic is 5.147783, which is lower than the 5% critical value of 7.81 (P-value = 0.525004), the null hypothesis that the model is devoid of first order serial correlation is accepted; the disturbances of the regression model are homoscedastic.

4.2. Analysis of tax trends in Nigeria and selected African countries

The dynamics of taxation and economic growth in Nigeria should be understood not just from the perspective of the tax revenues discussed in the preceding section, but also from an analysis and discussion of other aspects of Nigeria's tax revenue and the broader tax system, some of which may not easily lend themselves to econometric analysis.

Figures 3 and **4** below present recent trends in oil and non-oil tax revenues, as well as the share of oil and non-oil tax revenue as a percentage of total government revenues.

As shown in the **Figure 3**, there has been a steady decline in oil tax revenue in Nigeria from 2011 to 2016. It is noteworthy to mention that oil tax revenue remained higher than the non-oil tax revenue from 2011 to 2014 which marked the beginning of the huge slump in oil prices in the global market. From 2014 however, non-oil tax revenues, though generally declining, albeit at a slower pace, began to outperform oil revenues. It follows therefore, that oil revenue as a percentage of total revenues has been on the decline in the recent past. The converse holds true for non-oil revenues as shown in **Figure 4** below.

From **Figures 3** and **4**, it is apparent that there is a need to pay more attention to other critical sectors of the economy, beyond oil, from which revenue can be generated in order attain fiscal stability and engender macroeconomic stability. An important question thus arises: since taxation is an important fiscal policy instrument for domestic resource mobilisation and economic growth, is Nigeria' tax effort optimal for the desired impact on economic growth? In an attempt to address this policy question, we reviewed comparative tax efforts in Nigeria and selected African countries, focussing on the tax to GDP ratios, over the period 2003–2011.

From **Figure 5** above, it is apparent that, historically, Nigeria lags other African countries in terms of the tax to GDP ratio, that is, tax effort. Over the 2003–2011 period, the average tax revenue as a percentage of GDP for Nigeria was 2.93%, with the corresponding figures for Egypt, Ghana, Kenya, South Africa and Algeria being 14.62, 15.89, 16.10, 25.48 and 35.04%, respectively. Algeria's tax effort, that is, tax to GDP ratio, is 12 times Nigeria's tax effort, while South Africa's tax effort is approximately 10 times that of Nigeria. Nigeria tax efforts is less than

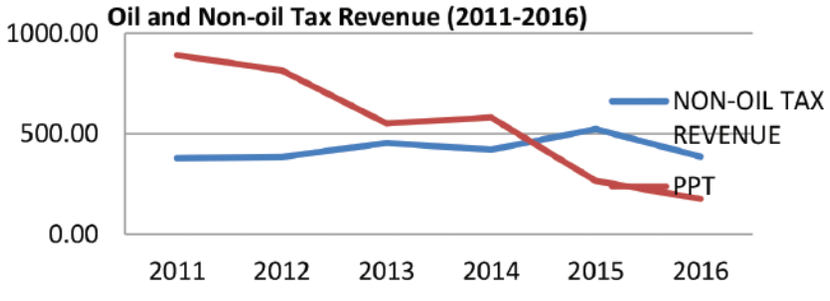

Figure 3. Oil and non-oil revenue—recent trends. Authors' computation from Federal Inland Revenue Service (FIRS) figures.

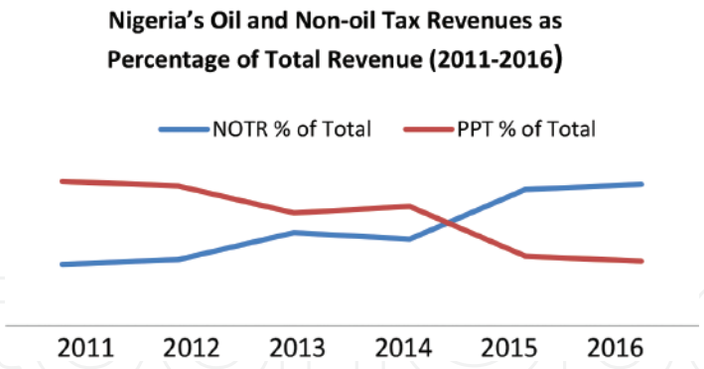

Figure 4. Oil and non-oil revenue as percentage of Total revenue (2011–2016).

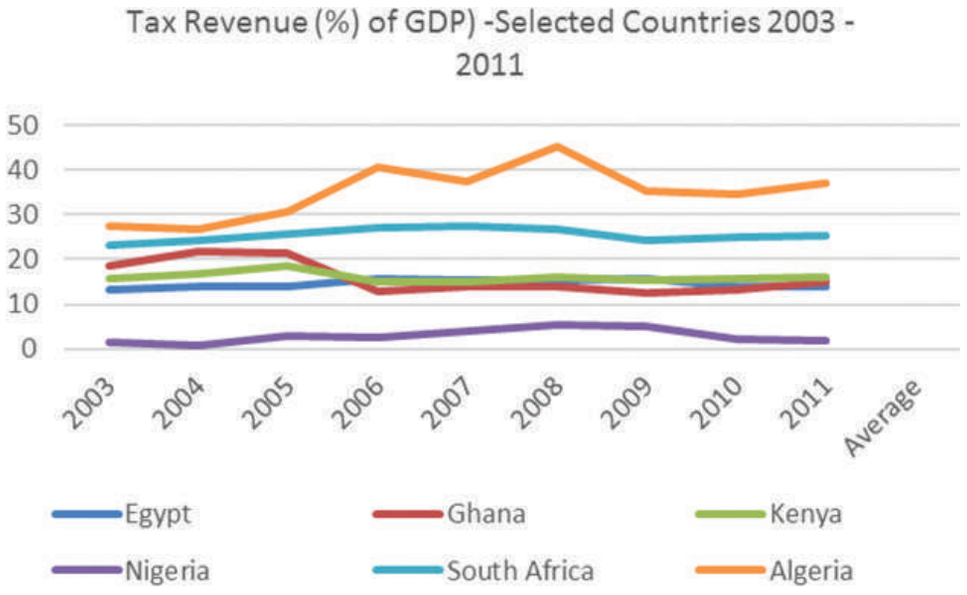

Figure 5. Tax revenue (% of GDP) for selected African countries (2003–2011). Source: IMF.

one fifth that of neighbouring Ghana. The low tax to GDP ratio can be attributed to structural defects associated with overreliance on oil revenue as the main source of government revenue and the consequent neglect of other critical sectors of the economy. This low performance of the non-oil tax revenue has great potential of creating substantial macroeconomic instability and consequently, negatively impacting growth and development owing to the volatility associated with oil prices and the critical role of public expenditures in stimulating economic activities. Nigeria's low performance in terms of tax revenue as a percentage of GDP also points to the existence of unexploited 'fiscal space' or untapped potential for tax revenue mobilisation.

5. Conclusions and policy recommendations

In this Chapter we have examined the relationship between taxation and economic growth in Nigeria over the 1986–2015 period, with special focus on Companies Income Tax, Customs

and Excise Duties, and Petroleum Profit Tax. Empirical results reveal that taxation had a significant impact on Real GDP growth rates in Nigeria during the period under review. However, the proportion of tax contribution to the growth rate of the Nigerian economy falls short of the optimal level in terms of the volume of economic activities and total value of output, as well as the country's potential for revenue generation. This finding is instructive for both policy and decision making as far as the enhancement of Nigeria's taxation structures and domestic resource mobilisation are concerned. Also, cross-country comparisons of Nigeria's tax performance with the tax performance of selected African countries reveals that the county lags other African countries with respect to tax effort, that is, tax revenue as a percentage of GDP. Hence, policy measures that improve tax revenues as well as taxation capacity should be put in place to generate more revenues to positively stimulate economic growth. It hoped that ongoing tax policy and institutional reforms, as well as strategies aimed at diversifying and shifting the economy from over-reliance on the oil and gas sector, will not only elevate the relative position of non-oil tax revenues, but also improve the overall tax effort so that taxation can become an important instrument of fiscal policy, thereby ensuring macroeconomic stability and steady economic growth.

In more specific terms, the Government of Nigeria should institute an appropriate tax system which emphasises the broadening of the tax base and in some cases, reviewing upwards the tax rates to enhance the contribution of taxation towards economic growth and development. In this respect, the tax administrative system in Nigeria should be strengthened to address some of the challenges presently clogging the wheel of progress as far tax administration is concerned. Furthermore, voluntary compliance should be encouraged through continuous taxpayers' education and the institutionalisation of a functional tax administrative system. It is also recommended that the tax execution agencies should forge good relationship with the professional associations involved in tax matters to elicit their support in reducing tax malpractices and other forms of fiscal corruption. In addition, regulatory authorities charged with the responsibility of collecting tax should further be strengthened to enforce compliance by taxpayers. There should be enhanced accountability and transparency from government regarding the management of revenue derived from taxation in terms of provision of public goods and services as this will enhance tax compliance among the tax payers. Lastly, as part of the broader economic diversification programme, tax revenue mobilisation should be used as a policy instrument to shift from the historical overreliance on oil revenues to non-oil revenues which are less volatile and are thus critical for the country's macroeconomic stability.

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Chapter 5

UK Taxes and Tax Revenues: Composition and Trends

Zara Ghodsi and Allan Webster

Additional information is available at the end of the chapter

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Abstract

This study looks at the composition and trends of tax revenues in the UK. It provides a brief overview of the rather complicated system of different taxes in the UK. Three main taxes—personal income tax, national insurance contributions (NICs) and value added tax (VAT)—are shown to account for about three quarters of all tax revenues and that this has been stable over a period of time. In comparison to other countries the UK is similar in its tax composition to both the US and France, where the same three types of tax dominate revenues. It is much less similar to both Malaysia and Argentina. The study examines monthly UK tax revenues for these three taxes, using econometrically estimated trends. It finds that, in constant price terms, revenues have grown slowly and steadily over time, broadly keeping pace with growth in real GDP. Tax revenue forecasting in the UK is mainly undertaken by an independent body which publishes forecasts at the level of receipts for individual taxes. This considerably reduces the risk of political bias in these revenue forecasts.

Keywords: UK, tax composition trends revenues forecasting

1. Introduction

The UK tax system includes a wide range of different taxes. The system is complex and interested readers are referred to Pope and Waters [1] for a more complete survey. The main taxes include:

- Personal income tax. Almost all forms of income are subject to tax but the rate of tax applied is determined by a series of income bands and subject to allowances against tax. Every taxpayer is given a personal allowance (£11,000 in 2016–2017) which is deducted from their pre-tax income before income tax is levied. The allowance is reduced for incomes over £100,000. The rate of tax varies according to bands. In 2016–2017 the basic tax rate of 20%

was applied up to an income of £32,000, a higher rate of 40% for incomes between £31,785 and £150,000 and an additional rate band of 45% for income over £150,000. The UK Government estimates there to be about 30.1 million income tax payers in 2016–2017, including some 609,000 basic rate (only) payers and about 4.4 million in the highest band.

- National Insurance Contributions (NICs). The origins of NICs were as compulsory contribution to a National Insurance fund, which was linked to benefits that could be paid to the contributor. Over the years the link between contributions and payments has gradually disappeared and there is now considerable overlap between NICs and the general budget. Employers and employees are subject to NIC's (at different rates) and the self-employed at a different rate again. The NIC rate for income from employment between £155 and £827 per week was 12% in 2016–2017.
- Corporation tax. This tax is levied on the profits of UK resident corporations and on the UK profits of non-resident corporations. Losses may be offset against future profits for tax purposes. The rate of corporation for the 2017–2018 tax year is scheduled at 19%.
- Value added Tax (VAT). Value added is a tax on the value added at each stage of production. By the stage of final consumption it is, in effect, levied on the value of the good or service. The standard rate of VAT is currently 20%. A small number of goods are taxed at a reduced rate and a range of products are exempt from VAT in the UK.
- Excise taxes. Excise duties are levied on alcoholic drinks, fuels and tobacco products. These duties are typically levied at a specific rate (for example, per litre) but there is also an ad valorem component.
- Capital gains tax. This tax is applied to the gains accruing from the buying and selling of financial and other assets. Like income tax there is a tax free threshold (£11,100 for individuals in 2016–2017). The rate of capital gains tax varies according to the individual's income tax band.
- Council tax. The revenues from council tax go to local rather than national government. Council tax is levied on an assessed value of domestic residences, with the rate of tax depending on within which band the assessed value of the property falls.
- Business rates. These are another tax which generates local rather than national government revenues. They are levied on the assessed rentable value of business and commercial properties.
- Inheritance tax. Inheritance tax applies to transfers of assets in excess of £325,000 after or immediately before death. The standard rate is 40% of the value exceeding £325,000. Some reduced rates and exemptions apply.
- Other taxes. These include stamp duty levied on transactions involving assets such as land, property and financial securities. Taxation of North Sea oil and gas is, essentially, a variant of corporation tax. A bank levy is applied to the liabilities and equity of banks. A number of indirect taxes also exist. These include an excise tax on motor vehicles, air passenger duty, a climate change levy, an insurance premium tax, a landfill tax and duties on gambling

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The complexity of the UK tax system necessitates a degree of simplification to understand its effects and key underlying trends. In particular it makes sense to consider the composition of tax revenues in the UK—to identify which taxes make the most important contributions to government revenues and how they have evolved over time.

2. The composition of UK tax revenues

2.1. UK tax revenues by type of tax

Figure 1A shows the composition of UK tax revenues for the tax year 2008–2009 and **Figure 1B** the composition in 2015–2016.

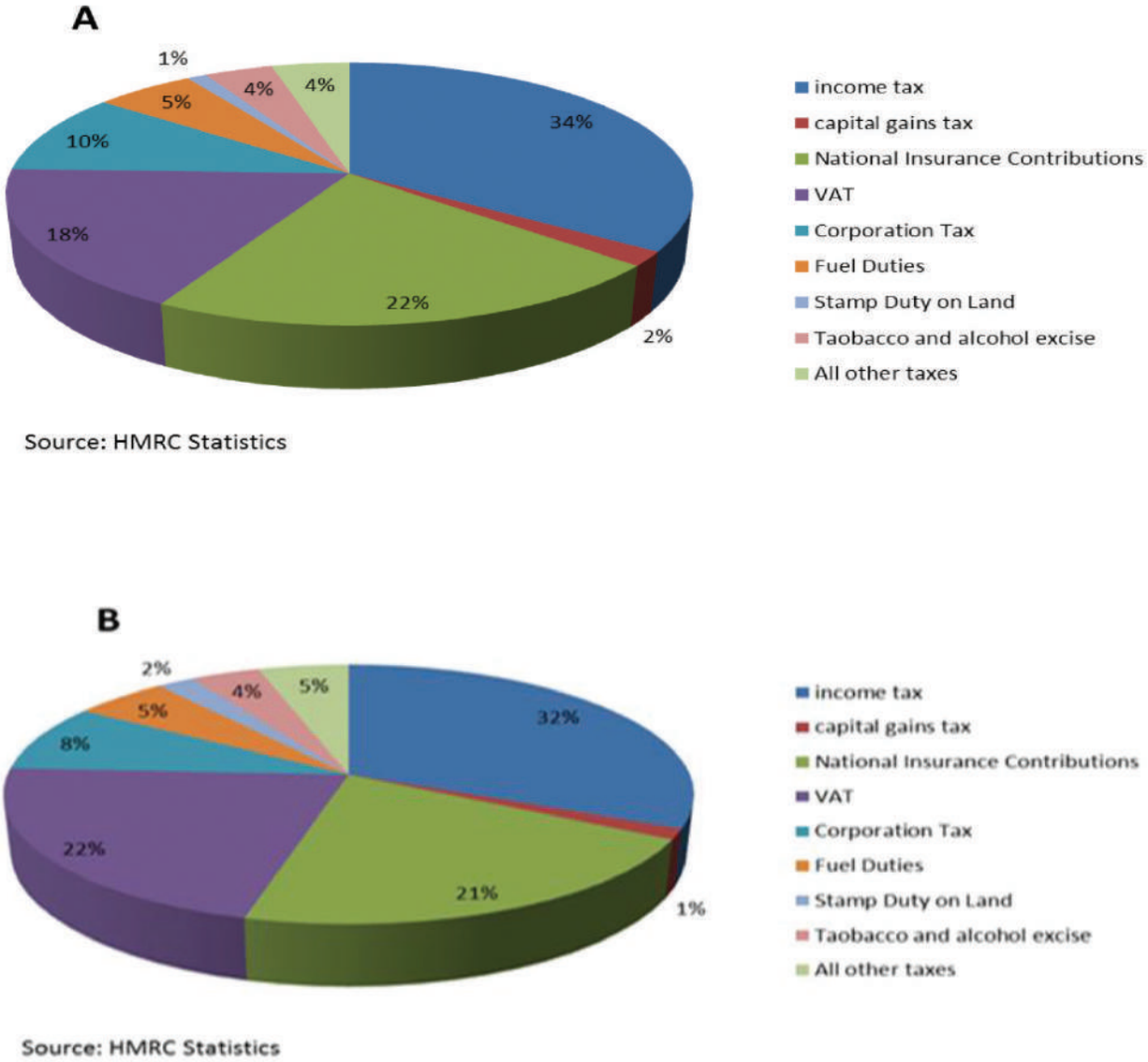

Figure 1. (A) Composition of UK tax receipts for tax year 2008–2009. (B) Composition of UK tax receipts 2015–2016.

In terms of trends the composition of UK tax revenues by type of tax has been stable between 2008 and 2009 and 2015–2016. In 2008–2009 income tax accounted for 34% of total tax revenues and in 2015–2016, in both periods representing the largest revenues for any of the taxes. The next largest contributor to overall tax revenues in 2015–2016 was VAT, comprising 22% of revenues (against 18% in 2008–2009). The contribution of NICs declined slightly in relative importance from 22% of revenues in 2008–2009 to 21% in 2015–2016. Very roughly about three quarters of UK tax revenues in both 2008–2009 and 2015–2016 was made up from three taxes—income tax, NICs and VAT. Corporation tax, the next biggest contributor, declined slightly in relative importance from 2008–2009 to 2015–2016.

Table 1 provides details of the revenues of individual taxes and their evolution over time. As has already been seen three taxes jointly provide about 75% of total UK tax revenues—income tax, NICs and VAT. Fuel duties have consistently yielded significant revenues (£27.6 billion in 2015–2016). A range of excise duties on tobacco and alcoholic drinks yielded a combined

	1999-00	2005-06	2009-10	2015-16
Total HMRC receipts	294,177	402,874	414,920	533,686
Income Tax	93,910	134,916	144,881	168,451
Capital Gains Tax	2,122	3,042	2,491	7,060
NICs	56,354	85,522	95,517	113,701
VAT	56,779	72,856	70,160	115,415
Corporation Tax (Onshore)	33,054	35,048	31,630	43,872
Corporation Tax (Offshore)	1,268	7,307	4,998	538
Bank Levy	-	-	-	3,392
Petroleum Revenue Tax	853	2,016	923	-562
North Sea Revenues	2,121	9,323	5,921	-24
Fuel duties	22,515	23,438	26,197	27,623
IHT	2,047	3,259	2,384	4,650
Shares	3,711	3,465	3,017	3,320
Stamp Duty Land Tax	3,184	7,454	4,886	10,682
Tobacco duties	5,683	7,959	8,813	9,485
Spirits duties	1,804	2,309	2,570	3,147
Beer duties	2,813	3,076	3,182	3,271
Wines duties	1,657	2,308	2,949	3,973
Cider duties	155	168	311	296
Betting & Gaming	1,514	1,421	1,439	2,666
Air Passenger Duty	882	905	1,856	3,077
Insurance Premium Tax	1,423	2,343	2,259	3,293
Landfill Tax	430	733	842	919
Climate Change Levy	-	744	695	1,763
Aggregates Levy	-	326	275	356
Customs Duties	2,043	2,258	2,646	3,089
Source: HMRC Statistics				

Table 1. Decomposition of UK tax revenues (£ million).

total of about £20 billion in the 2015–2016 tax year. Of the smaller taxes Stamp Duty Land Tax has shown a substantial increase in revenues between 1999 and 2016, as has capital gains tax and air passenger duty. Revenues from some taxes such as that on petroleum revenue have tended to exhibit volatility between 1 year and another but revenues from most taxes show a pattern of steady evolution over time.

In terms of tax revenues from the different types of tax levied the composition of UK tax revenues is remarkably stable. The most important contributions to UK tax revenues have remained the same for a number of years and their shares in overall revenues have changed little. Arguably the only noteworthy change between 2008 and 2009 and 2015–2016 is an increase in the relative importance of VAT receipts at the expense (mainly) of income tax and NICs.

2.2. Tax revenues by country within the UK

Figure 2 presents the composition of UK tax revenues by component country for three different time periods—2000–2001, 2007–2008 and 2015–2016.

The results show a stable pattern of UK tax receipts by country. In all three time periods Northern Ireland accounts for about 2% of total tax revenues, Wales for 3–4% and Scotland

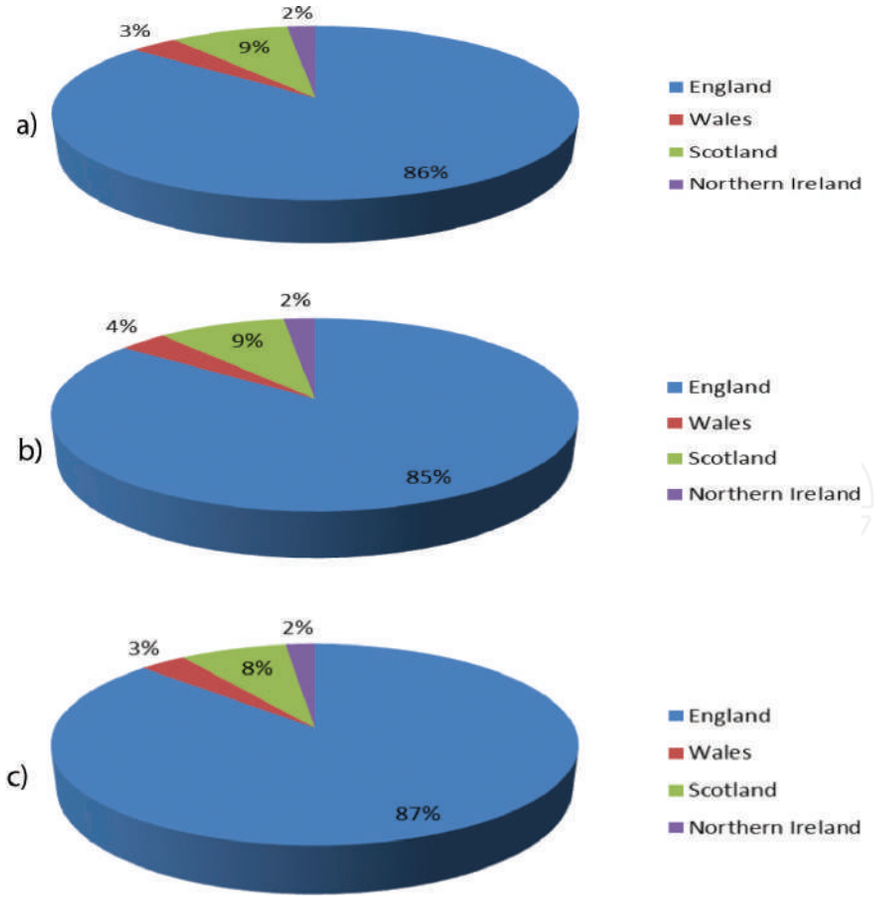

Figure 2. UK tax receipts by country (a) 2000–2001, (b) 2007–2008, and (c) 2015–2016.

for 8–9%. In each time revenues from England dominate the UK total. Receipts from England accounted for 86% of the total in 2000–2001 and 87% of the total in 2015–2016.

3. International comparisons

Figure 3 compares tax revenues as a percentage of GDP for a sample of countries for both 1995 and 2014. The UK is slightly below the average for all OECD countries (33% in 1995 and 34% in 2014). As a share of GDP the UK's tax revenues increased slightly from about 30% in 1995 to approximately 32% in 2014. For the majority of other countries in the sample such changes that occurred in the share of tax in GDP tended to be modest. In consequence, countries such as Chile, the United States and Switzerland were low tax in both 1995 and 2014. High tax countries in both 1995 and 2014 included Denmark, France and Italy.

Countries which showed significant increases in the share of tax in GDP between 1995 and 2014 included Turkey and Greece. Countries with a significant reduction in the share of tax in GDP included Slovakia and Poland.

3.1. International comparisons in tax composition

Table 2 presents comparisons between the UK and several other countries in the composition of their tax revenues at several points in the period between 1990 and 2014.

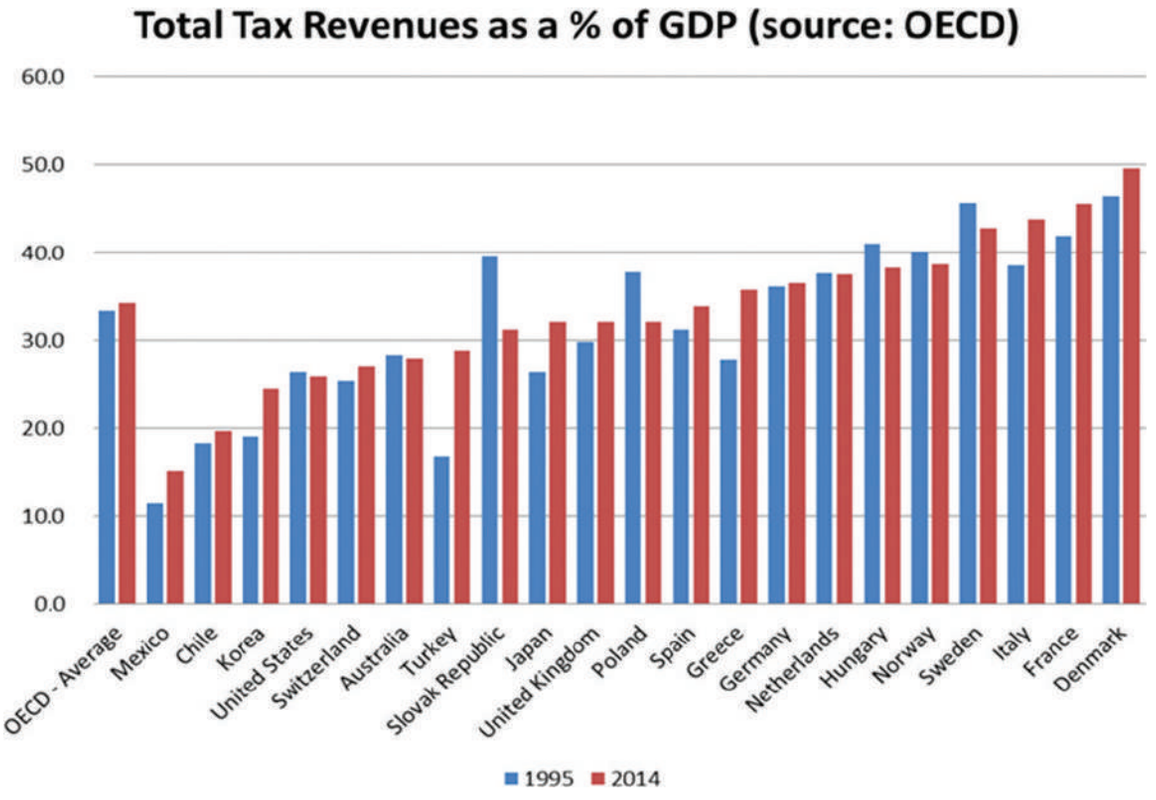

Figure 3. International comparisons of the tax burden.

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UK	1990	2000	2005	2010	2014
Taxes on income, profits and capital gains of individuals	29.4%	29.3%	29.1%	28.7%	27.4%
Taxes on income, profits and capital gains of corporates	9.9%	9.7%	9.3%	8.7%	7.5%
Social security contributions (SSC)	17.0%	17.0%	18.9%	19.0%	18.7%
Taxes on payroll and workforce	0.0%	0.0%	0.0%	0.0%	0.0%
Taxes on property	8.2%	11.6%	12.0%	12.0%	12.7%
Taxes on goods and services	31.0%	31.9%	30.3%	30.9%	33.2%
United States					
Taxes on income, profits and capital gains of individuals	37.7%	42.2%	35.4%	34.8%	39.3%
Taxes on income, profits and capital gains of corporates	7.5%	7.9%	11.0%	7.6%	8.4%
Social security contributions (SSC)	25.6%	23.6%	24.5%	26.1%	24.1%
Taxes on payroll and workforce	0.0%	0.0%	0.0%	0.0%	0.0%
Taxes on property	11.6%	10.2%	11.4%	13.1%	10.8%
Taxes on goods and services	17.6%	16.1%	17.7%	18.3%	17.4%
France					
Taxes on income, profits and capital gains of individuals	10.7%	18.0%	18.0%	17.1%	18.7%
Taxes on income, profits and capital gains of corporates	5.3%	6.9%	5.5%	5.6%	5.1%
Social security contributions (SSC)	44.1%	36.0%	37.0%	38.4%	37.4%
Taxes on payroll and workforce	1.9%	2.3%	2.7%	3.2%	3.5%
Taxes on property	6.3%	6.9%	7.7%	8.4%	8.5%
Taxes on goods and services	28.4%	25.9%	25.5%	24.9%	24.1%
Malaysia					
Taxes on income, profits and capital gains of individuals	11.0%	13.5%	9.9%	15.1%	13.9%
Taxes on income, profits and capital gains of corporates	31.4%	38.4%	46.8%	46.6%	52.6%
Social security contributions (SSC)	0.0%	1.9%	1.6%	1.7%	1.5%
Taxes on payroll and workforce	0.0%	0.0%	0.0%	0.0%	0.0%
Taxes on property	3.1%	3.4%	3.9%	4.0%	3.4%
Taxes on goods and services	51.3%	38.4%	33.4%	27.3%	22.8%
Argentina					
Taxes on income, profits and capital gains of individuals	0.1%	6.4%	5.7%	5.0%	8.8%
Taxes on income, profits and capital gains of corporates	0.0%	10.8%	13.7%	10.5%	9.3%
Social security contributions (SSC)	25.3%	15.8%	12.2%	21.2%	21.6%
Taxes on payroll and workforce	0.0%	0.0%	0.0%	0.0%	0.0%
Taxes on property	12.7%	6.4%	11.2%	9.0%	9.1%
Taxes on goods and services	55.7%	56.5%	54.6%	52.4%	49.5%
Source: OECD Tax Statistics					

Table 2. International comparisons in the composition of tax revenues.

For the US income tax is the single largest contributor to overall tax revenues, accounting for about 39% of total revenues in 2014. For the UK, in contrast, income tax was the second largest source of revenues at about 27% of the total in 2014. For the UK, VAT was the largest contributor at around 33%. In both the UK and the US the contribution of taxes on corporate income and on property are of broadly comparable significance. The US also differs from the UK with a greater contribution of social security payments but a substantially lower relative contribution from taxes on goods and services.

In France the relative contribution of social security to overall tax revenues (37% in 2014) is close to double that of the UK (19% in 2014). The UK earns proportionately more from personal income tax, corporate income tax and from taxes on goods and services than does France.

The composition of Malaysian tax revenues is almost wholly different to that of the UK. In Malaysia in 2014 receipts from taxes on corporate income accounted for about 53% of total tax revenues. The comparable figure for the UK was just 7.5%. Social security contributions and property taxes account only for a minimal share of Malaysian tax revenues but represent a more significant share of overall UK revenues. Personal income tax in the UK is approximately double the share of tax revenues of that in Malaysia (14% compared to 27% in 2014).

Argentina too has a fundamentally different composition of tax revenues than the UK. In the UK revenues from personal income tax represent the second largest share of overall receipts. In Argentina they accounted for less than 9% of the total, even less in earlier years. Taxes on goods and services are the dominant source of tax revenues for Argentina, accounting for almost 50% of total revenues. In the UK they are the single largest contributor but still account for approximately one third of the total.

4. Trends in UK tax revenues

Figure 4 plots monthly revenues from personal income tax between January 2002 and September 2016. These are measured in constant price terms, using the UK retail price index to adjust. To the extent that these tax revenues are dominated by income from employment it might be expected that monthly revenues would be fairly stable over time. In contrast, **Figure 4** shows that revenues from personal income exhibit a high degree of volatility over time To provide a clearer a trend was fitted by using a simple linear regression in Eviews7. The results of this estimated trend are also reported in **Figure 4**. This shows a slight and steady increase in the real value of revenues from personal income tax over the period.

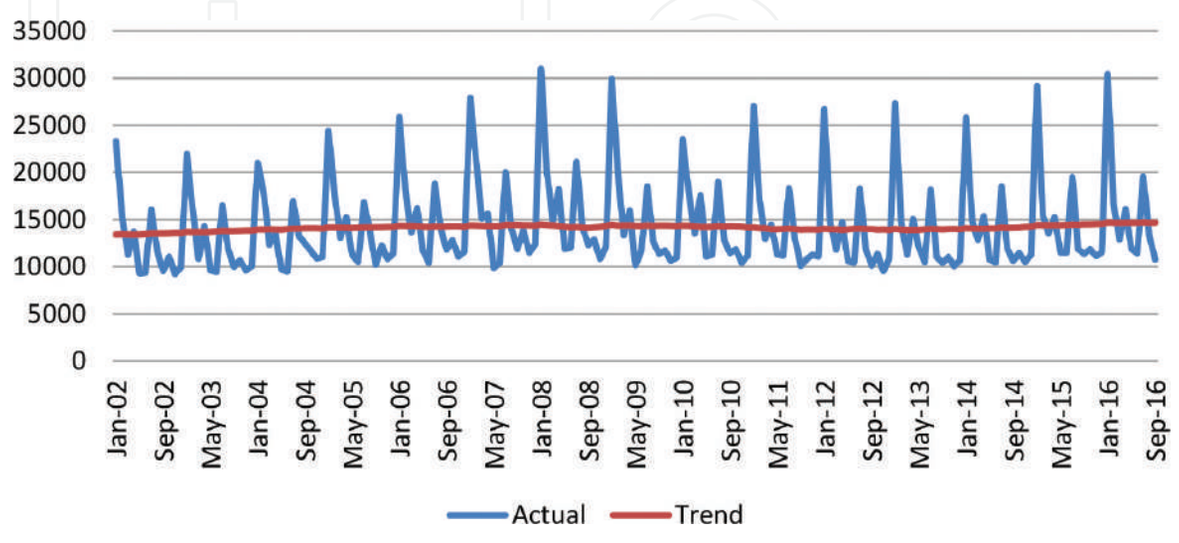

Figure 4. Personal income tax revenues in constant prices (May 2014 = 100).

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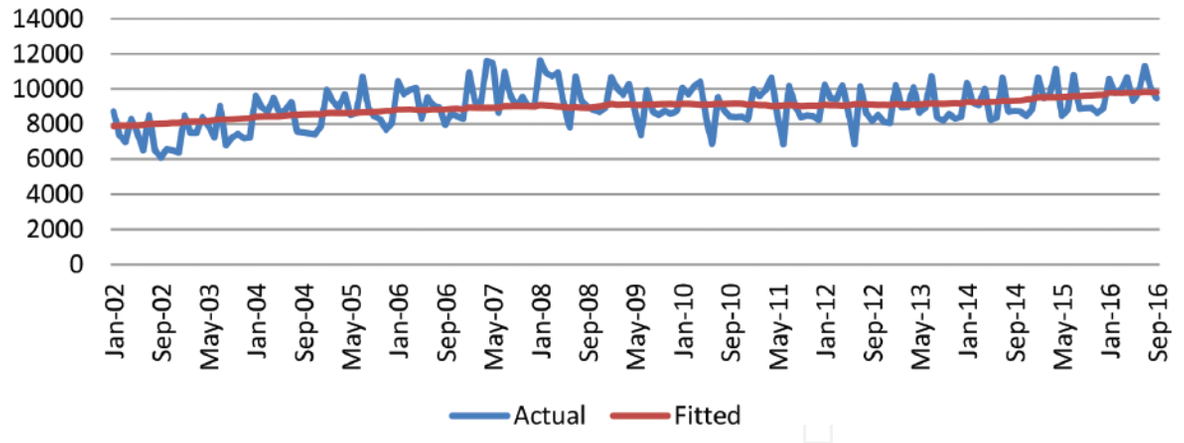

Figure 5. Monthly NIC revenues (constant prices).

Figure 5 presents a similar analysis for National Insurance Contribution (NIC) revenues over the same period (January 2002–September 2016) in constant price terms. As with personal income tax monthly revenues exhibit considerable volatility. Again a trend was fitted using an OLS regression in Eviews7. The trend, as with personal income tax, shows a steady rise in the real value of NICs over the period.

Figure 6 presents monthly data on VAT revenues from April 2008 until August 2016 (earlier data were not available). Yet again receipts show considerable volatility over time. As with both personal income tax and NICs OLS regression was used to construct a trend line. The trend, as with the other two taxes, has been for a steady but gradual increase in revenues from VAT.

Finally, **Figure 7** presents a similar graphical analysis for monthly UK tax revenues (measured in constant price terms) from the period April 2008–September 2016. As with the earlier charts a trend was estimated using OLS regression in Eviews7. Total tax revenues (as shown by the trend line) remain volatile from 1 month to another but the trend is almost constant in real terms, exhibiting a very slight and gradual increase over the period.

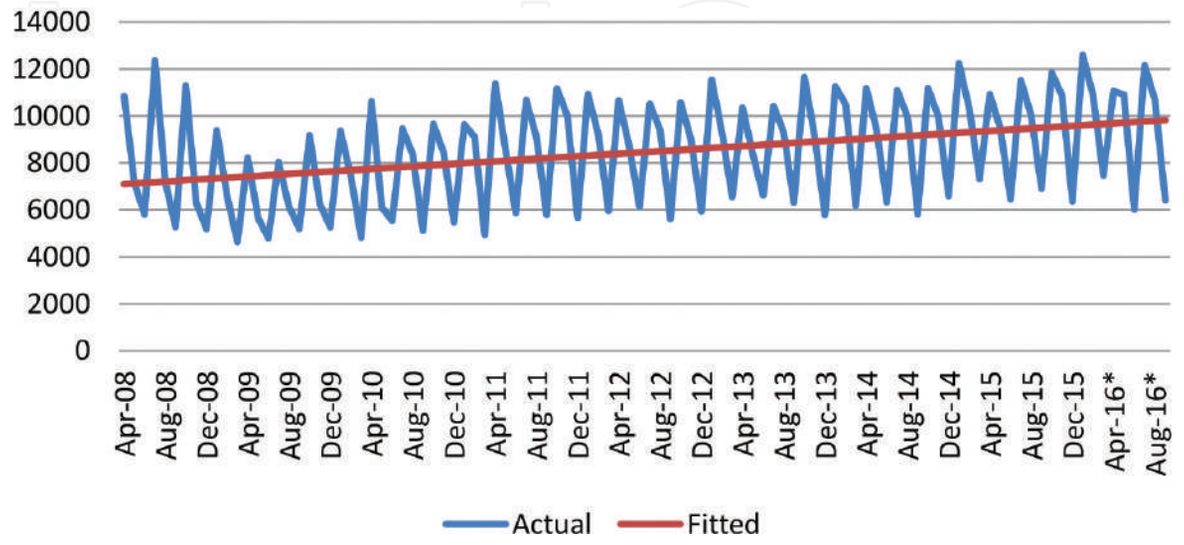

Figure 6. Monthly VAT revenues (constant prices).

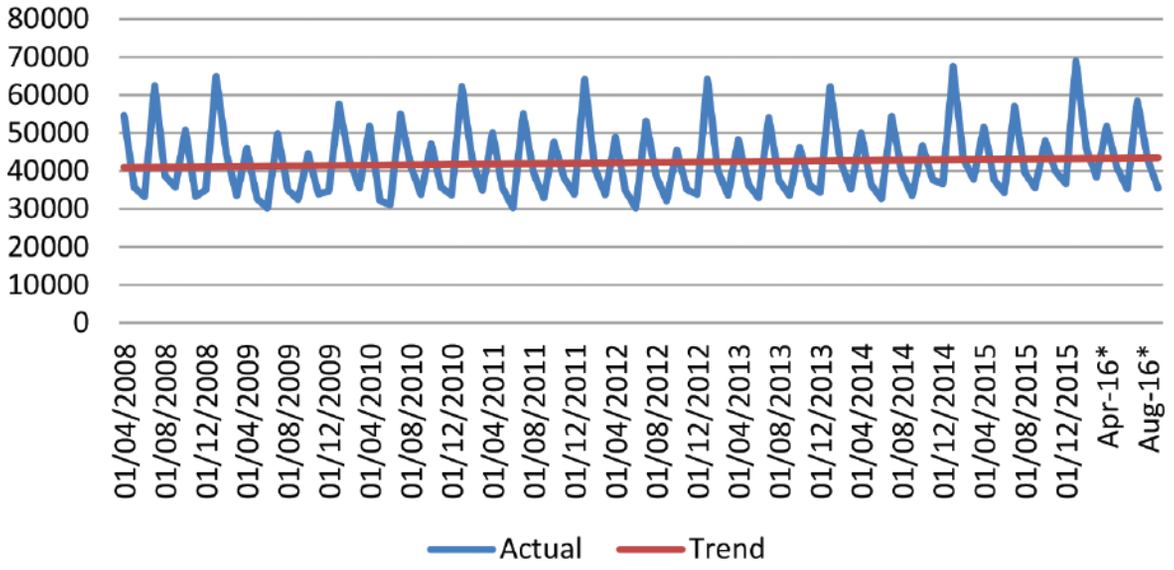

Figure 7. Total monthly tax revenues (in constant prices).

Taken overall, the figures for individual taxes and for overall tax revenues all share more or less common trends. That is, tax revenues in constant prices terms have tended to be stable over longer periods of time (the trend) but volatile between 1 month and another. The trend is for the real value of tax revenues to grow slowly and slightly i.

5. Forecasting UK tax revenues

An extensive literature exists concerning political bias in budgetary and tax revenue forecasting. Bischoff and Gohout [2] found some evidence of upward bias in tax projections in West German states. Buettner and Kauder [3], also working with data from Germany, found that Federal tax revenue forecasts were typically unbiased but still influenced by government. Jochimsen and Lehmann [4] examined national tax revenue forecasts for a sample of 18 OECD countries. They find strong support for a politically partisan effect on national forecasts of tax revenues. Brogan [5] in a study of US states found evidence of systematic under forecasting of tax revenues. Brück and Stephan [6] studied budget deficit forecasts for a sample of Eurozone countries. They found evidence of an association between politics and systematic over or under forecasting with, of course, some countries performing worse than others in this respect. Perhaps one of the most extensive and systematic studies of political influence on budget (and tax revenue) forecasting was provided by Frankel [7]. This found evidence of systematic bias in official forecasts.

Another closely related strand of the literature addresses how political influence on tax revenue forecasting might be reduced. Concern with politically influenced government revenue forecasting has led some authors such as Auerbach [8] to advocate budget rules, combined with better forecasting techniques. Frankel [7] finds budget rules not to be particularly effective but instead found the use of independent expert panels to reduce forecast bias. Frankel and

2015-16 VAT forecast errors

	£ billion					
	Forecast	Outturn	Error	*of which:*		
				Economic factors	Fiscal forecasting errors	Policy changes
March 2014 forecast	115	116.4	1.4	-1.9	3.8	-0.4
March 2015 forecast	114.3	116.4	2.1	-0.7	2.8	0

Source: Office for Budget Responsibility, October 2016 report

Table 3. Specimen OBR revenue forecast evaluation.

Schreger [9] studied government revenue and budget forecasts in Eurozone countries, finding lower bias in those countries that have adopted budget rules. Leal et al. [10] argue in favour of transparent methods in revenue forecasting combined with clear procedures. Jonung and Larch [11] analysed the link between policy and forecasts and considered how the policy framework might be reformed to reduce influence on revenue forecasts. They argue strongly that revenue forecasts should be conducted by an independent authority to reduce potential political bias.

In the UK precisely such an independent authority exists. The *Office for Budget Responsibility* (OBR) was established by government in 2010. Its function is to provide independent analysis of public finance. Specifically it has five main roles:

- To produce detailed 5 year forecasts twice per year
- Evaluation of government performance in relation to its fiscal targets
- Assessment of the sustainability of public finances
- Fiscal risk evaluation
- Scrutiny of the costing of government tax and welfare measures

The OBR produces forecasts for overall revenues and also on a tax by tax basis. They use a variety of different modelling and forecasting techniques. A crude generalization would be that those taxes most closely related to economic behaviour such as personal income tax, NICs and VAT tend to be forecasted using a detailed structural of the economy. Other, smaller taxes, less obviously related to the business cycle are sometimes forecast by time series methods.

OBR reports do not just provide forecasts but also an evaluation of errors in past forecasts. A specimen of such an evaluation from the OBR's October 2016 report [12] is reproduced below (**Table 3**).

6. Local taxes

Table 4 reports collections of the two main local taxes—council tax and non-domestic rates. The information is for England rather than the UK as a whole. Collections of both taxes are

Tax Year	Council tax		Non-domestic rates	
	Collected £ million	Relative to national tax receipts	Collected £ million	Relative to national tax receipts
2011–12	22,083	5.4%	20,824	5.1%
2012–13	22,378	5.5%	21,873	5.3%
2013–14	23,386	5.5%	22,661	5.3%
2014–15	24,052	5.4%	23,066	5.2%
2015–16	24,782	5.3%	23,621	5.1%

Source: Office of National Statistics

Table 4. Local tax collections for England.

reported both in terms of value and in relation to national tax receipts. Collections of local taxes are not included in the national tax receipts figure so the percentages are not shares, just a guide to the relative significance of local taxes.

The results show that receipts from local taxes have broadly kept pace with national tax receipts from 2011 to 2012 until the most recent tax year. The two local taxes combined have consistently raised revenues roughly equivalent to 10% of national tax receipts.

7. Conclusions

This review of the composition and trend in UK tax revenues has provided an insight into a complex system of different taxes. In the UK there are a multitude of different taxes at national level. Given such a number of different taxes looking at the revenues derived from each is important for prioritization, both from the perspective of budget planning and for analysis of the likely macro-economic impact.

In terms of overall taxation relative to GDP the UK is neither a particularly heavily taxed economy nor is it particularly lightly taxed. For the sample of countries used in **Figure 3** the UK was about mid-range in terms of tax revenues as a percentage of GDP both in 1995 and 2014. The share of tax in GDP in the UK has remained relatively stable at approximately 30%.

UK tax revenues in 2015–2016 were dominated by three taxes—personal income tax (32% of total receipts), VAT (22% of the total) and NICs (21%). These three taxes jointly accounted for ¾ of all tax revenues in that year. The composition of UK tax revenues has also tended to be stable over time. For example, the share of the three most important taxes in 2008–2009 was also a little over three quarters of the total.

In comparison to other countries UK tax revenues have a degree of similarity to the US and to France, where personal income tax, social security contributions and taxes on goods and services also dominate revenues. The source of revenues for Malaysia, where revenues are dominated by taxes on corporate income, are very different to those for the UK. Argentina is different again in that revenues from personal income tax only account for a small share of the total, with taxes on goods and services accounting for about 50% of revenues.

To further examine trends in the UK tax revenues this study examined monthly tax receipts for these three most important taxes. Monthly receipts show significant fluctuations over time so we fitted an econometric trend to these data, having first converted them to constant price terms. For all of the three main taxes the trend (in constant price terms) has been for the real value of tax revenues to increase in a slow but steady way. That is, the increase in the real value of tax revenues has more or less kept pace with growth in real GDP.

The literature on budgetary forecasting (including tax revenues) provides evidence of potential political bias in the forecasts of many countries. In the UK tax revenue forecasts are provided by the independent Office for Budget Responsibility (OBR). The OBR publish not only revenue forecasts at the level of individual taxes but also retrospective information on the sources of error in past forecasts.

Finally, the study included an examination of revenues collected in England by local government from the two main local taxes—council tax and non-domestic rates. Revenues from each of these taxes have remained stable in relation to national tax revenues. Each tax has yielded receipts roughly equivalent to 5% of national tax revenues for a period of years.

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Chapter 6

How Does a Welfare State achieves Fiscal Sustainability? A Study of the Impact of Tax Equity[1]

Ko Hyejin

Additional information is available at the end of the chapter

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Abstract

This study seeks to identify institutional characteristics of financially sustainable welfare states that focus on tax structure. Using data collected from 17 OECD countries from 1986 to 2013, this study investigates the characteristics of fiscal sustainability of each welfare state. The model of simultaneous equations (three-step least-squares method) is used for treating simultaneousness between fiscal sustainability and welfare expenditures. As a result, increasing the level of tax burden generally has a positive effect on the fiscal sustainability of the welfare state. However, the most important point that should be considered is the manner of raising tax revenue that affects the sustainability of economic, political, and social dimensions for securing fiscal sustainability. Specifically, it is necessary to raise the equity between the sources of taxation in accordance with the ability to pay principle. Improving vertical equity can also make a positive contribution to the fiscal sustainability in order to secure the political legitimacy of the tax and mitigate the regressive burden, which may result from the expansion of a consumption tax. Finally, it is beneficial to fiscal sustainability of the welfare state to diversify the financial base by combining the ability to pay principle and the benefit principle.

Keywords: fiscal sustainability, welfare state, taxation, tax equity, comparative studies

1. Introduction

his chapter begins with the question of the claim that all welfare states face financial difficulties. In other words, it stems from the question: "Are there no strategies to ensure the fiscal sustainability of the welfare state while maintaining the appropriate level of welfare spending?" Early neo-Marxists predicted that the fiscal crisis of the welfare state was unavoidable

[1]This paper is adapted from the author's doctoral dissertation (in Korean).

due to contradictions in the capitalist mode of production, which caused the conflict of accumulation and justification [1, 2]. Streeck [3] also recently argued that the 2008 global financial crisis was an inevitable consequence of an unstable combination of capitalism and democracy in capitalist countries. His argument is that the financial crisis is the result of the demolition of democratic capitalism because of capital beyond democratic control in the process of post-capitalist transition to neoliberalism in the development and reinterpretation of new Marxist claims in the present situation.

However, it is difficult to accept these claims when we remember that the recent financial crisis has not appeared in all advanced western welfare states. In particular, it is not easy to assert that the fiscal crisis of the welfare state is inevitable, considering that it is not found in the Nordic countries, which provide generous welfare benefits, but it is found in Southern Europe, where the level of welfare spending is low and the social security system is not sufficiently developed when compared to other western welfare states. Therefore, it is necessary to identify what kind of welfare state is fiscally sustainable, as well as the difference between fiscally sustainable countries and nonsustainable countries.

In fact, if the government has sufficient fiscal space and the state is able to cope with increasing debt without damaging fiscal sustainability [4] for welfare expenditures, the problem of fiscal sustainability will not rise seriously. The methods of securing financial resources include the expansion of taxes or nontax receipts, the reduction of public expenditures, the adjustment of expenditure priorities, and increase in expenditure efficiency, currency issuance, and foreign aid [5]. One of the key strategies that advanced welfare states can implement to mitigate financial tensions is to increase tax revenues or reduce welfare spending on major public expenditures. Often in high-income countries, cuts in spending are considered to be superior to revenue increases [6]. It is argued that adjustments through a reduction in public spending are less likely to lead to a recession than tax expansion and may also have a positive impact on growth. According to this assertion, the best way to ensure the fiscal sustainability of a welfare state is to reduce welfare expenditures.

Although, reducing welfare spending is not the only answer to the financial crisis facing the welfare state, because cutting public spending is not always possible and feasible. Alesiana and Giavazzi [6] point out that public spending reduction strategies that are accompanied by appropriate monetary policy play an important role in sound financing, but this is not always possible. As noted, EU countries have limited monetary policies at a single national level [7]. In addition, the sudden reduction of welfare benefits often leads to opposition from the people in the form of restrictions to the government's response to the need for welfare due to new social risks, as well as political resistance from citizens who enjoyed existing welfare benefits [8, 9]. Of course, spending rebalancing and rationalization can be a useful means of securing financial resources within a given budget in the short term. However, as time goes by, marginal returns of spending rebalancing and rationalization are inevitably reduced, and as a result, these are not a fundamental alternative [5].

Therefore, we should focus on resource mobilization in order to secure predictable and sustainable financing [5]. This study focuses on the tax system, which is the main resource for advanced welfare countries among various resource mobilization methods. First, taxation plays an important role in ensuring national policy capacity [10]. It can also lead or inhibit capital accumulation,

which is the tax base of welfare states, by changing individual and corporate investments, savings, and work behaviors [11]. In addition, since taxation acts as a key factor that regulates the members of the political community and forms a reciprocal obligatory relationship between them, how taxation is formed is closely related to political and social sustainability [12].

In Section 2, which follows, existing research on the determinants of the fiscal sustainability of the welfare state is examined in order to discuss limitations of this research and explain the approach of this study, which strives to address the limitations of existing research. Section 3 identifies the research methods adopted in this study. Section 4 describes the results of the analysis, and Section 5 discusses the implications of this study.

2. Theoretical background

2.1. Existing research on determinants of fiscal sustainability

Research on the financial issues of the welfare state is a classic theme of the welfare state. This is divided into studies focusing on economic factors and studies focusing on institutional factors.

2.1.1. Economic factors

Macroeconomic factors related to the fiscal sustainability of the welfare state include economic growth rates and interest rates, the gap between economic growth rates and interest rates, economic openness and financial market accessibility, and inflation.

At first, the fiscal sustainability of the welfare state is related to the economic growth [13–16]. If the economy grows smoothly, the tax is easily collected. In particular, progressive tax can be applied at a higher rate depending on the increase in income, so that tax rate growth is higher than the economic growth rate. In addition, inflation that accompanies economic growth can lead to a substantial decline in debt value, because debt is a nominal asset, and its value is fixed and transferred to the future. In the low growth phase, however, tax revenue was limited, and real debt burdens were likely to increase. In addition, due to the decrease in income, the debt burden was sure to increase.

The effects of interest rates on national debt have also been important [13, 16]. In the context of the emphasis on interest rates, some studies have focused on the initial level of debt [17, 18]. This is because countries with high initial debt have high interest rates on national debt, and their fiscal capacity is sensitive to changes in interest rates [19]. Therefore, there is a greater risk that fiscal sustainability will be weaker than that found in countries with low debt level.

Meanwhile, some studies have demonstrated that primary balance is important [14, 20]. Sakuragawa and Karou [14] examined the phenomenon that the real interest rate on government bonds is low, while the national debt surge is comparable to the gross domestic product in developed countries as well as Japan by incorporating the concept of intermediation cost is explained. Specifically, government bonds are not very sensitive to interest rate changes because intermediation costs lower deposit interest rates and bond return replaces deposits. Therefore, they argued the interest rate was not the primary factor, but, rather, the level of the primary balance.

Some have paid attention to access to markets where the government can borrow money [21–24]. Drelichman and Voth [23] attempted to account for the fact that eighteenth-century England, whose financial position was worse than Spain's in the sixteenth century, did not face insolvency. Specifically, England was able to borrow at a lower rate of interest than the market interest rate through financial repression, so the cost of interest was low. Thus, the interest burden on repayment of government bonds could be significantly reduced. Moreover, with financial globalization, the government took notice not only of the domestic market, but also the foreign market. In particular, low-income countries with low financial capacity can reduce the burden of foreign debt by improving access to financial markets due to globalization [13, 22, 24], while developed countries do not have a statistically significant impact of the global capital market on fiscal sustainability [24].

In the past, inflation was the main variable of fiscal soundness [25]. Because the national debt is a nominal asset, a slight rise in prices alone can significantly lower the real value of government bonds. However, recently developed countries have guaranteed the independence of the Central Bank in order to prevent inflation risks arising from the arbitrary use of monetary policy. Thus, the importance of monetary policy and inflationary taxation on fiscal soundness has weakened [26]. Especially in the case of European Union countries, it is argued that monetary policy cannot be utilized in accordance with the reality of each country, and thus, it is further argued that there is a limit to the guarantee of financial stability [13, 26].

As confidence in monetary policy weakened following, the influence of fiscal policy began to be emphasized [26]. The most important variable is the aging population. Aging of the population leads to a reduction in the number of workers who can contribute to public finance, an increase in the burden of care, and an increase in welfare spending for the elderly. This may in turn increase the financial burden of the government and undermine financial stability. However, government spending does positively affect the sustainability of national debt, depending on the sector or the form of expenditures [20, 27]. In terms of financial revenues, Kaplanoglou and Rapanos [27] demonstrate that increasing the progressive tax burden may contribute to fiscal sustainability.

2.1.2. Institutional factors

Institutional factors identified in the empirical study are divided into two areas: political systems and financial systems. The former is a form of political decision-making [28], such as the electoral system or the political decision-making, and the latter implies a condition that restricts the adoption of fiscal policy [28].

The influence of elections has been considered important in relation to political institutions [29–35]. Theoretically, as politicians have incentive to increase the likelihood their reelection by using more public spending and debt accumulation. In addition, this may cause financial instability when financial status is arbitrarily adjusted in a strategic act to hinder the ability of the next elected candidate to enact policy. The empirical research also examines the relationship between political change and national debt accumulation, but the results are not constant [36, 37]. Some authors point out that these inconstant results are related to the lack of control over the nature of political systems in each country [38], because the structure of decision-making changes the incentives of politicians [39].

At first, decentralization has become a major concern in terms of the decision-making structure of fiscal policy. When there are a large number of participants in the decision-making process, each participant may represent only a narrow range of interest groups. Therefore, it may not be easy to reach consensus due to conflicting interests among participants. Indeed, if there is a structured coalition government or a strong bipartisan system, fiscal soundness is likely to be undermined [40]. In addition, there are slight differences in operational definitions, but generally, it is argued that the higher the number of expenditure departments or the larger the size of the Cabinet, the lower the financial performance [41–44]. In addition, there is a tendency for expansion of deficit and debt when there are a large number of effective political parties in the coalition or there is a small share of the ruling party in Parliament [43, 45].

The ideological composition of the Cabinet was also affected. The greater the proportion of politicians supporting a left-wing ideology in the Cabinet, the greater the likelihood that the state's fiscal soundness will deteriorate [43]. Traditionally, politicians who support a leftist ideology are relatively supportive of public spending, particularly welfare spending, and have a tolerance for fiscal deficit [46, 47]. However, it is difficult to say with certainty that finances are unstable in the tradition of a representative system. This is consistent with Schmidt [48], who contended that the political composition or ideological differences of a government should not only lead to differences in financial performance, but that the political and economic conditions of each country should also be taken into account. In countries where a social democratic ideology is dominant within the Cabinet, social security spending is generally high, but the level of welfare spending and debt accumulation in these countries has not been high since mid-1970s [48]. While the left wing is generally favorable to a high tax burden and increased public spending, it is also true that differences in the composition of financial and tax systems have played a more important role than ideology in actual history [10].

As mentioned above, the influence of political formulations is limited, and studies focusing on financial systems have recently expanded. Since 1970s, OECD countries have pursued a series of reforms to effectively manage government spending growth and overcome fiscal deficits [49, 50]. In addition, it is necessary to establish a budget system for total budget allocations. In recent empirical studies, the introduction of a top-down budgeting system has had a positive effect on fiscal soundness [27]. In addition, the introduction of explicit fiscal rules has proved effective [51].

The introduction of a fiscal system that controls public expenditures and revenue levels is effective in promoting fiscal soundness, but caution is needed in interpreting it. First, the effectiveness of the fiscal system affects final fiscal performance in combination with the attributes of the political system in each country [52]. Indeed, Hallerberg et al. [32, 33] formulate a centralization index and a rule index for the political system and fiscal policy decision structures to determine their impact on the rate of change in national debt. According to their results, strong fiscal rules in a representative council system and a concentration of decision-making power over fiscal policy decisions in a majoritarian system or among mixed-government countries have a statistically significant effect on reducing the national debt ratio.

2.2. Limitations of existing studies and approaches of this study

There are two limitations in the existing research in identifying the determinants of fiscal sustainability of the welfare state. These are further divided into two dimensions: the measurement of dependent variables and the composition of independent variables.

2.2.1. Measuring the fiscal sustainability of the welfare state

In the previous study, the fiscal sustainability of the welfare state has been replaced by the level of the primary balance or the national debt level. However, the financial condition of the state cannot be exclusively evaluated using either values, because it means that even if deficit occurs, state can recover fiscal balance without default [53–55]. Moreover, the financial problems of the welfare state are not problems that can be solved through the technicalities that control the level of public expenditures or tax revenues. This is, in the end, a matter of politics [8]. Therefore, in order to gain a comprehensive understanding of fiscal sustainability, it should be conceptualized and measured in accordance with the economic structure and institutional capacity of the state.

Related to this, the research of Ostry et al. [56] and Ghosh et al. [57] is useful. Their research reflects the context in which public finance is embedded [58]. Changes in financial conditions do not always cause financial crises in the welfare state. We must consider the political, economic, and social contexts that might lead to a financial crisis.[2] They define the fiscal space as the gap between the debt limit and current debt level implied by the country's historical fiscal adjustment for understanding fiscal sustainability like **Figure 1** [56, 57].

First, the solid line represents the behavior of the primary balance as a function of debt. It reflects the nonlinear relationship between the primary balance and the public debt. Specifically, the primary balance shows little response to rising debt at very low levels of debt. Fiscal policy makers do react to changes in the level of public debt unless the public debt is fairly high [59], so the increase in the primary balance appears negligible. However,

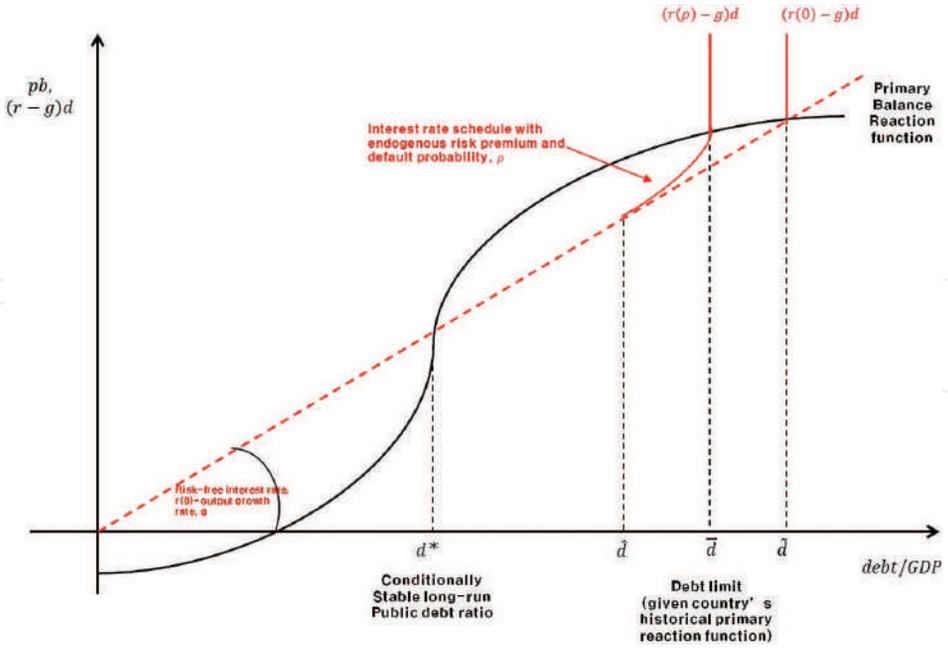

Figure 1. Determination of debt limit from Ostry et al. [56]: 8; Ghosh et al. [57]: F11.

[2]The Bohn test, which draws implications from the manner in which fiscal policy has responded to increases in public debt, is also considered the context-embedded public finance, and it has two limitations [56]. That does not address the nonlinear relationships between primary balance and public debt and does not consider endogenous relationship between interest rates and public debt.

excessively high levels of debt may make it difficult to offset debt accumulation, because the marginal response of the primary balance to public debt is lower [60] and adjustment effort peters out as tax increases or spending cuts become politically infeasible [61].

Next, the dashed line shows the effective interest rate schedule, given the interest rate-GDP growth rate differential multiplied by the debt ratio. At low levels of debt, the interest rate is the risk-free rate, by assuming that output growth is independent of the public debt or the interest rate, so this schedule is simply a straight line with a slope determined by the risk-free interest rate-growth rate differential. When there is an unexpected economic shock, there is a stronger likelihood that public debt will accumulate, which means the debt reaches the debt limit, the interest rate is rapidly increased because of risk premiums. In this case, creditors may be reluctant to buy public bonds because of concerns about the potential for the country to declare bankruptcy. To secure public finances, countries should be willing to raise the interest rate through the application of risk premiums because of the increased default risk. This is represented by the solid rising curve between $\hat{d}$ and d^{-}.

Between these two lines, there are several intersections. The lower intersection (d^{*}) defines the conditional stable point. There is positive relationship between the primary balance and the public debt, so if a shock raises the debt level above this point, then the primary balance in subsequent periods will offset the higher interest payments and the debt ratio returns to its long-run average. However, the upper intersection (d^{-}) cannot guarantee fiscal sustainability. If the debt exceeds this point, then it will rise forever, because the primary surplus will never be enough to offset the growing debt. This point represents the public debt limit, which is the critical point of debt led by the historical fiscal response without special action of the government [56]. If there is no fiscal space and a debt limit, current fiscal stance does not take the ability to afford the debt burden. That is, country is not always facing a fiscal crisis, but it is difficult to ensure the fiscal sustainability unless significant change of current fiscal stance [56].

At this point, in this study, I examine fiscal sustainability in the welfare state by calculating the fiscal space of the welfare state like Ostry et al. [56] and Ghosh et al. [57]. However, I have included some additional considerations for measuring fiscal sustainability in the welfare state. First, I select variables to estimate the fiscal reaction function based on theory and previous studies. I excluded some similar variables (openness, inflation, oil prices, and nonoil commodity prices) and replaced them with more appropriate variables to avoid multicollinearity problems. In addition, I include public welfare spending instead of total public expenditure in examining the fiscal sustainability of the welfare state. Second, the interest rate is estimated by the vector autoregressive (VAR 1) model based on Polito and Wickens [62, 63] to avoid the problems caused by arbitrary regulations as well as to reflect the endogenous relationship between debt and interest rate.

2.2.2. Determinants of fiscal sustainability of welfare states

Although the composition of the national finance has recently been pointed out as a determinant of fiscal sustainability [6, 27], empirical research has lacked reflection them. In the previous study, total public spending and total tax burden level were mostly considered, focusing on identifying whether spending cutoff strategies and tax expansion strategies are more effective to ensure fiscal sustainability [56, 64]. It is true that those were difficult to suggest specific policy measures to enhance the fiscal sustainability of the welfare state. Related to this, this study focuses on tax structure as a determinant of fiscal sustainability of welfare state.

Basically, tax is a representative resource mobilization tool of the advanced welfare state. Therefore, the level of tax burden in terms of public revenue should be discussed in relation to the fiscal sustainability of the welfare state. In order to cover welfare expenditures, a certain level of tax burden must be guaranteed, but if the tax burden is too high, it is not easy to increase the burden level [19, 65]. There are many reasons for the increase in incentives for tax avoidance and tax evasion. On the other hand, too low level of tax burden can also negatively impact fiscal sustainability. This is because there is a high possibility that sufficient financial resources are not available for public expenditure.

In addition, the structural characteristics of tax, especially tax equity, should be considered as the main factors. Because taxation inevitably violates the private ownership of a member, a lack of reasonable grounds for who owes taxes can lead to tax resistance and promote social conflict and division. Therefore, taxes must be imposed on the basis of justifiable grounds to secure political support for welfare states [12]. Indeed, the views on the taxation of the public are determined not by the level of burden but by the fairness of burden [27, 66]. The fairness of taxation can be defined as the principle of the ability to pay and the benefit principle. The former is the view that members of society are obliged to pay taxes regardless of the benefits they receive from the state as a member of the state. Accordingly, it is fair and desirable to pay taxes according to the ability to pay or to charge. On the other hand, the principle of benefit attaches importance to the exchange of benefits from tax and public goods, with the view that the taxpayer will pay the benefits of the provision of national services. In other words, it is fair to pay fair compensation for benefits.

Tax on the basis of each principle can have a different impact on the fiscal sustainability of a welfare state. First, in relation to the principle of ability to pay, direct taxation with a high tax rate can have a negative impact on economic growth by lowering incentives for labor and high tax evasion in the high-income class. On the basis of this, the enhancement of tax progressivity may hinder the fiscal sustainability of the welfare state. However, it is also true that people are not always opposed to high-level taxation [67]. In addition, the Progressive Tax System can be designed to lower income inequality by designing the higher income group to pay a higher tax burden than the low-income group, thus contributing to social sustainability by preventing conflicts between taxpayers and beneficiaries due to worsening income distribution.

Meanwhile, the horizontal equity, one part of ability to pay, is also considered. Related to this, the possibility of taxation of capital and property is lowered due to the intensification of tax competition caused by globalization [68], and advanced welfare countries have shown a tendency to rely on a consumption tax rather than an income tax. Unlike in the past, the gap between the labor and the capital is significantly increasing, while the gap between the labor and the consumption is significantly decreasing. Recalling that vertical equity and horizontal equity are inseparable, and that inequity on one side is not offset by the achievement of equity through other principles [69], the inhibition of confidence that the tax burden is fairly distributed can make it difficult and may not only lead to a lack of financial resources to support the welfare state, but also to difficulties in obtaining political support. Thus, the widening gap between tax sources have a negative effect on the fiscal sustainability of the welfare state as the level of equity is raised to the level of horizontal equity.

On the other hand, social security contributions and the contributions of the private sector are closely related to the principle of benefit. This is mainly used for specific social security

purposes so that it can maintain actuarial soundness and positively affect the fiscal sustainability of the welfare state. In addition, political support will likely be high because it pays for the benefits that will come in the future [70]. Particularly in the case of contributions by the private sector, the loyalty of the contributors may be higher because it is more exclusive than the social security tax. However, this may lead to the undesirable exclusion of low-income people, which may hinder social and political sustainability. In this sense, it is possible that the social security system is limited to a small number of full-time workers and the corporation, so it leads to unfairness in the tax burden and severe tax resistance [71–73].

As mentioned above, each aspect of equity in the tax structure may have different impacts on the fiscal sustainability of the welfare state. In addition, the tax structure may change the impact of welfare expenditures on the fiscal sustainability of a welfare state. First, increasing welfare expenditures worsens the nation's financial condition. However, if the level of welfare spending is combined with a sufficient level of tax burden and a fair tax burden, then the negative impact of welfare expenditures may decrease [61, 74]. Thus, we must examine the moderating effects of tax structure on the impact of welfare expenditures and fiscal sustainability, as well as the direct effects of tax structure on fiscal sustainability.

3. Research method

3.1. Analysis target and timing

The analysis of national finances should incorporate careful selection of the analysis target because analysis results may be different depending on which country is analyzed. Because, there is a huge gap between the high- and low-income countries' socioeconomic development levels, especially in terms of the level of public expenditures, the taxation capacity, and the tax structure, so it is necessary to analyze the two groups separately. This chapter analyses the 17 OECD countries, and considering the possibility of data access and the analysis of OECD major countries is reasonable in order to draw implications in the establishment of a welfare state with a financial balance. Specifically, the analysis includes Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

Next, this chapter analyzes the fiscal sustainability of welfare states over the course of 28 years, from 1986 to 2013, while the independent variables, including tax structure and welfare expenditures, are based on the period from 1985 to 2012, lagged term ($t - 1$), considering temporal precedence as a requirement for causality.[3] Those OECD countries have undergone a series of welfare and tax reforms to alleviate the burden of national financing, having experienced severe economic downturns during the mid to late 1970s. Since the effects of reform are not immediately

[3]This is based on the fact that the expenditures for that year are carried out in accordance with the previous year's budget plan. The analysis is also conducted by adding value from 5 years prior to reflect the medium-term fiscal plan in high-income countries as a 5-year plan. In the determinants of fiscal sustainability of the welfare state, the correlation between welfare expenditures and fiscal capacity may not be reflected within a short time frame. In particular, the impact of fiscal capacity on welfare expenditures is likely to be seen in the medium term, because in high-income countries, the level of public expenditures is usually determined through the medium- and long-term financial management of the country.

apparent, but, rather, come after a certain period of time, this study has limited its analysis to late 1980s, specifically since 1986 (independent variables since 1985). In addition, until early 1990s, most advanced welfare states demonstrated a relatively moderate increase in national debt. However, since mid-1990s, sovereign debt has soared, and concerns about the national debt have become more widespread since the 2008 global financial crisis. Therefore, it is possible to derive timely policy implications for ensuring the fiscal sustainability of the welfare state by analyzing the period when the national debt had soared and a widespread financial crisis occurred.

3.2. Method of analysis

This study constructs simultaneous equations to control the inverse causal relationship between welfare expenditures and fiscal sustainability by examining the effects of tax structure on the fiscal sustainability of the welfare state. Existing studies have focused on the impact of fiscal spending on fiscal soundness [55, 64]. It is not only welfare expenditures that affect national finances, but also the government's fiscal capacity for welfare expenditures, which will be limited if finances are not sufficient in the long term. In other words, the financial condition of the state also affects welfare expenditures. If the effect of financial power on welfare expenditures is not reflected in the analytical model, there is a possibility that the estimation will be biased due to the endogeneity problem. In this study, the simultaneous equations model is set and analyzed. Thus, this study constructs a simultaneous equations model with two dependent variables. The first dependent variable is the fiscal sustainability of the welfare state and is measured by the fiscal space of each year on each welfare state. The second dependent variable is the level of public social welfare expenditures, which reflects public welfare efforts or the level of benefits enjoyed by the public.

Model estimations are adopted as a three-step least-squares method devised by Zellner and Theil [75]. This is a combination of the two-step least-squares method and the seemingly unrelated regression model, and all of the equations comprising the simultaneous equations are simultaneously estimated so that the correlation between the error terms of each equation is reflected in the analysis [75]. Using this method, we can derive the coincidental estimator from the simultaneous equations model and find a more efficient estimator than the one using the two-step least-squares method. Additional consideration utilizing national panel data is also considered for treating the endogeneity problem caused by non-modeled factors in the use of national panel data, which may lead to bias in statistical estimation. Specifically, a fixed-effects model with national dummy variables is constructed and analyzed in each equation of simultaneous equations. Additionally, the financial capacity of advanced welfare states has undergone structural changes since late 2000s [76], so the equations analyzed reflect the effect of timing changes, including year dummy (before 2008 and after then) variables.

3.3. Operational definition of variables

3.3.1. Dependent variables

The fiscal sustainability of the welfare state, the first dependent variable, is measured as fiscal space, which can be specified by the gap between current debt levels and debt limits according to Ostry et al.'s [56] and Ghosh et al.'s [57] method of calculating. Fiscal space is not merely a source of funds to meet the current welfare needs of the public. Rather, it plays

an important role in resource mobilization to cover future spending, as well as cushioning against unexpected risks [77, 78]. In other words, the issue of fiscal space is a question of whether countries can finance their obligations, including social security, without sacrificing economic growth and stability based on fiscal sustainability [5, 50]. Therefore, fiscal space can be a useful tool in examining the fiscal sustainability of the welfare state.

In order to derive the abovementioned fiscal space as shown in **Figure 1**, it is necessary to estimate the fiscal reaction function and select the appropriate gap between the interest rate and the growth rate [57]. This is because it is necessary to determine the debt limit of each country on the basis of the intersection of the estimated base on the fiscal reaction function and the interest repayment schedule. This study estimates the fiscal reaction function through pooled time series analysis and uses a vector autoregressive model for estimation to establish the gap between the appropriate interest rate and the growth rate. The description of variables used for estimating the fiscal reaction function is shown in **Table 1**.[4]

Next, one of the most important points to be considered in determining the national debt limit, along with the estimation of the fiscal reaction function, is how to define the long-term interest rate [56].[5] This study estimates the interest rate through vector autoregulation (VAR), similar to the works of Polito and Wickens [62, 63]. This is because it not only avoids arbitrary problems, but also reflects the endogenous relationship between the interest rate and the national debt level (**Table 2**). In this study, the autoregressive model is used to model the endogenous relationship between the interest rate and the national debt, adding government revenue, government spending, debt, the economic growth rate, the inflation rate, and short- and long-term interest rates [62, 63]. The gap between these estimates and the average real growth rates of the countries from 1985 to 2013 are used to calculate the debt limit and determine fiscal space based on this. The contents and data sources of the variables used for estimating the fiscal reaction function are shown in **Table 3**.

The second dependent variable is public welfare expenditures. This is the level of public (general government) social welfare spending that reflects public welfare efforts or the level of benefits enjoyed by the public. Total public welfare expenditures divided by the gross domestic product is used to control differences in the welfare expenditure level according to the level of economic scale by country.

[4]The dependent variable is the primary balance, and the independent variables are the financial factors (national debt, public welfare expenditures, output gap, inflation rate), the economic structural factors (unemployment rate, service industry ratio, portion of involuntary part-time work, economic openness, aging rate, future old age portion), and political and financial institutional factors (election, change of ideology, mandatory political system, concentration index, fiscal rule index). In this study, it is based on the works of Ostry et al. [56] and Ghosh et al. [57], but some variables are excluded in consideration of multicollinearity.

[5]Ostry et al. [56] determined long-term interest rates in two ways. The first assumes that the observed interest rate itself reflects the perceived probability of bankruptcy of a country, so the current market rate is used as the long-term interest rate. In this case, it is possible to overestimate the maximum value of sustainable debt by overlooking the fact that the interest rate rises as the debt level approaches its limit, and the risk of bankruptcy increases. An alternative method of overcoming this limitation is to use the interest rate, which is calculated by taking into account the endogenous relationship between debt levels and interest rates. Specifically, they used the calculated interest rate, assuming a recovery rate of 90% when bankruptcy occurred. Alternative methods which they used help to accurately estimate fiscal space by reflecting endogenous relationships between interest rates and macroeconomic variables. However, the abovementioned study does not provide a clear basis for assumptions used in interest rate estimation. Therefore, it is not free of the problems caused by an arbitrary definition of the recovery rate [80]. In order to overcome these limitations, this study uses the estimates through VAR.

Categories			Definition	Sources
Dependent variable		Primary balance	Government net borrowing or net lending excluding interest payments on consolidated government liabilities/nominal GDP	OECD Economic Outlook OECD Social Expenditures database
Independent variables	Finance	Lagged debt	General government debt/ nominal GDP	
		Output gap	Difference between actual and potential (calculated using the Hodrick-Prescott filter) real GDP	
		Welfare expenditures	Public social expenditures	
		Inflation	$\triangle CPI_t/CPI_{t-1}$	
	Economic structure	Unemployment	(unemployed/labor force population) × 100	OECD Employment and Labor Market Statistics database
		Service industry	(Workers in service industry/ total employment) × 100	
		Part-time worker	(Non-voluntary part-time workers/labor force population) × 100	
		Self-employed	(Self-employed/labor force population) × 100	
		Capital openness	Chinn-Ito index	Chinn-Ito index (KAOPEN) http://web.pdx.edu/~ito/Chinn-Ito_website.htm
		Age dependency	(People over age 65/total population) × 100	OECD Employment and Labor Market Statistics database
		Future dependency	(People over age 65/population of ages 15–64) × 100, years ahead	
	Political and fiscal systems	Election	Dummy variable of election (election: 1 no election: 0)	Comparative political dataset/IMF fiscal rules database
		Political stability	Ideological differences between current and former Cabinet	
		Majority system	Majority system:1; others: 0	
		Centralization	Index of federalism, the strength of the bicameral legislature, effective number of parties, and the independence of the financial management organization	
		Fiscal rule	Index of introduction of fiscal rules, legislative base of rules, existence of the multiyear spending limit, exception and financial monitoring system	

Table 1. Variables for estimating the fiscal reaction function.

Categories			Mean	Standard deviation	Minimum	maximum
Dependent variable	Primary balance		0.249	3.693	−10.505	15.786
Independent variables	Finance	Lagged debt	71.681	28.763	16.079	166.190
		Output gap	−0.049	2.622	−13.851	9.579
		Welfare expenditures	22.763	4.857	10.565	35.517
		Inflation	2.935	2.755	−0.900	23.015
	Economic structure	Unemployment	7.636	3.940	0.457	24.885
		Service industry	2.679	0.793	1.232	5.384
		Part-time worker	3.071	1.649	0.295	9.714
		Self-employed	15.987	9.116	6.536	50.708
		Capital openness	1.929	0.908	−1.188	2.390
		Age dependency	15.466	2.015	10.255	21.080
		Future dependency	31.238	5.987	18.478	51.991
	Political and fiscal systems	Election	0.292	0.455	0.000	1.000
		Political stability	0.353	0.772	0.000	3.000
		Majority system	0.177	0.382	0.000	1.000
		Centralization	0.672	0.115	0.370	1.000
		Fiscal rule	0.419	0.172	0.242	0.908

Table 2. Descriptive statistics of variables for estimating fiscal reaction function.

3.3.2. Independent variables

Tax structure, a major independent variable, is divided between the ability to pay principle and the benefit principle. The former is divided into horizontal equity and vertical equity. In the following section, the operation of each principle is described in detail.

Variables	Definition	Sources
Public debt	General government public debt as a percentage of GDP	OECD Economic Outlook No. 97 (Edition 2015/1)
Government revenue	Total government revenue as a percentage of GDP	
Government expenditure	Total government expenditure as a percentage of GDP	
Output gap	Difference between actual GDP and potential GDP	
Inflation	The annual percentage change in the cost to the average consumer of acquiring a basket of goods and services	
Long-term interest rate	Interest rate of government bonds maturing in 10 years	
Short-term interest rate	Interest rate which is money market rate	

Note: Each variable in the estimated variables is included from $t-1$ to $t-n$. $t = 1, \ldots, 27$.

Table 3. Variables for estimating long-term interest rate.

3.3.2.1. Measurement of horizontal equity

Horizontal equity identifies the tax rate gaps between labor and assets and labor and consumption, which are major tax sources because guaranteeing horizontal equity means that equity is ensured among the tax bases [69]. In particular, despite the weakening of the tax base, labor taxation is the most basic tax in all countries, so horizontal equity is defined based on the labor tax. Specifically, each tax rate on the labor, capital, and consumption of households is derived, and the tax rate differences between labor and capital taxation and labor and consumption tax are calculated based on the method proposed by Macdaniel [79].[6] According to the study, the government's tax revenue is divided into labor tax, capital tax, private consumption tax, and private investment tax. Moreover, the average tax rate of each tax base is calculated by dividing each tax revenue from each source into the corresponding tax sources [79].

3.3.2.2. Measurement of vertical equity

Vertical equity, one aspect of the ability to pay principle, is measured by the relative ratio of the marginal tax rate among income groups. In the comparison of tax progressivity among countries, a structural approach has been utilized to compare statutory tax rates, as well as comparisons within specific income groups. In this study, the structural approach is used for cross-country comparisons, although it is recognized as a valid criticism that it is difficult to reflect differences in taxable income using this [84, 85]. This study reflects the differences between progressivity in the low-income class (67% of the average wage and the average wage) and progressivity in the high-income class (comparison between the average wage and the average wage of 167%) considering data accessibility. In addition, this study measures the actual burden level, excluding benefits by subtracting the transfer of cash so as to more accurately measure the progressivity. For the values which are calculated as mentioned above, the higher the value, the stronger the progressivity, and the lower the value, the more regressive it is. This approach has the advantage of reflecting the degree of progressivity. The marginal tax rate data among the income groups for estimates of progressivity were used by Nickell [86] and the OECD Taxing Wages Database. That database provides marginal tax rates for OECD countries between 1960 and 2004. On the basis of this, the OECD has calculated the marginal tax rates of each country since 2000, and this study combines both datasets.

3.3.2.3. Measurement of the benefit principle

The benefit principle is specified by the share of social security contributions in GDP [73]. The social security contribution is a welfare state resource that is provided through contributions made by both employers and employees. This is a fixed use, and it is based on a burden corresponding to the benefits, so it is related to the benefit principle [73]. In addition, the proportion of private contributions to welfare resources supplements the benefit principle.

[6]The reason for using this method is as follows. First, it uses only one dataset, OECD national accounts, so it resolves the problem of differences in reflection times in the figures according to the differences in accounting methods by using two datasets, OECD national accounts and revenue statistics, similar to the existing studies of Mendoza et al. [81] and Carey and Rabesona [82, 83]. Second, this method overcomes the overestimation of consumption tax, one of the limitations of existing methods caused when consumption and investment taxes are not separated. In this method, the consumption tax remains separate from taxation on investments so that it can be more accurately measured.

Categories		Variables		Definition	Sources
Equation. 1	Dependent variable	Fiscal sustainability		Fiscal space	OECD National account
	Independent variables	Welfare expenditures		Total public welfare expenditures/ nominal GDP	OECD Social Expenditure Statistics
		Tax burden		Total tax revenue/nominal GDP	OECD Tax Dataset
		Ability to pay principle	Horizontal equity	Gap between effective tax rate on labor and capital Gap between effective tax rate on labor and consumption	OECD National account
			Vertical equity	((1 − marginal tax rate of average wage 67%)/(1 − marginal tax rate of average wage 100%)) − 1 ((1 − marginal tax rate of average wage 100%)/(1 − marginal tax rate of average wage 167%)) − 1	Nickell [86] OECD Tax Dataset
		Benefit principle		Social security contribution/ nominal GDP Mandatory private contribution/ total social security revenue	OECD Revenue Statistics: financing of social security benefits
Equation 2	Dependent variable	Welfare expenditures		Total public welfare expenditures/ nominal GDP	OECD Social Expenditure Dataset
	Independent variables	Fiscal sustainability		Fiscal space	OECD National account
		Generosity of public pension		Index of public pension considering the replacement rate, qualifications, scope or coverage, and waiting period	Scruggs et al. [88] CWED2
		Generosity of public unemployment insurance		Index of unemployment insurance considering the replacement rate, qualifications, scope or coverage, and waiting period	
		Generosity of sickness insurance		Index of sickness insurance considering the replacement rate, qualifications, scope or coverage, and waiting period	

Table 4. Variables for estimating determinants of fiscal sustainability of welfare state.

Private contributions are generally designed to benefit contributors and are not reflected in government finances, but they can have a positive impact on the maintenance of public welfare programs. Thus, this study uses the share of social security contributions and the share of private contributions as proxies of the benefit principle.

3.3.2.4. Measurement of the generosity of the welfare system

To identify the simultaneous equations model, the second equation, which has welfare expenditures as a dependent variable, requires additional exogenous variables, excluding the fiscal sustainability variable with endogeneity.[7] In this study, it is possible to identify the model by introducing the generosity of the public pension, unemployment insurance, and disease insurance of the Comparative Welfare Entitlement Dataset 2 (CWED2). These variables are calculated by taking into account the replacement rate, qualifications, scope or coverage, and waiting period [87, 88] (**Table 4**).

4. Determinants of fiscal sustainability in welfare state

In the first equation, where fiscal space as the proxy of fiscal sustainability is a dependent variable, welfare expenditures have a negative impact on the fiscal sustainability of the welfare state at a statistically significant level. Moreover, although the magnitude of the negative impact of welfare spending in the lagged term is somewhat smaller, the increase in welfare spending in the medium term tends to lower fiscal space even further. On the other hand, the results of the second equation with welfare expenditures as a dependent variable demonstrate that welfare expenditures increase as the fiscal space increases at a statistically significant level in the medium-to-long term. This supports the argument that it is essential to secure fiscal space for the continuation of the welfare state in the long term [5].

If we look only at the results of the first equation, it may be argued that public welfare spending must be reduced, because welfare spending lowers the nation's fiscal space. However, considering the political resistance that may be caused by the reduction of welfare expenditures, it is necessary to examine how financial resources can positively influence fiscal sustainability. At first, increase of tax revenue may offset the negative impact of welfare expenditures on the fiscal sustainability of the welfare state as well as positively affect the fiscal sustainability of the welfare state (**Table 5**).

It is noted that the perception of tax burden is not absolutely influenced by the level of the burden, but, rather, it is influenced by equity [27, 66]. This study examines the level of tax burden and the taxation specified by the fairness principle and analyzes the effects of taxation on the fiscal sustainability of the welfare state. In addition, the impact of welfare expenditures on fiscal sustainability may change according to tax structure characteristics. Even if increases in welfare expenditures negatively affect national finances, the public may be willing to accept

[7]In the process of estimating the fiscal space of the welfare state not only are the demand factors reflected, which are likely to drive welfare expenditures. In this situation, if these variables included to estimate fiscal sustainability are used, there is the possibility that the endogeneity problem will occur. Therefore, it is necessary to include variables with high relevance to welfare expenditures while minimizing the problem of endogeneity.

Dependent variables	Independent variables	Model 1		Model 1	
		Coefficient	Standard error	Coefficient	Standard error
Fiscal sustainability Equation 1	Welfare expenditure ($t-1$)	−4.32	0.35***	−3.74	0.34***
	Welfare expenditure ($t-5$)			−1.79	0.39***
	Tax burden	1.01	0.50*	1.84	0.52***
	Gap between effective tax rate on labor and capital	1.64	2.23	−2.66	4.07
	Gap between effective tax rate on labor and consumption	−83.60	22.70***	−131.0	22.53***
	Progressivity (low income group)	−23.78	8.80**	−31.50	9.79**
	Progressivity (high income group)	4.37	7.72	−0.18	7.51
	Social security contribution	3.80	1.21**	4.75	1.17***
	Mandatory private contribution	0.97	0.22***	0.99	0.21***
	Welfare expenditures * tax burden			0.24	0.05***
	Welfare expenditures * gap between effective tax rate on labor and capital			−4.32	3.50
	Welfare expenditures * gap between effective tax rate on labor and consumption			−11.85	3.97**
	Welfare expenditures * progressivity (low income group)			3.36	2.04
	Welfare expenditures * progressivity (high income group)			−0.77	1.56
	Welfare expenditures * social security contribution			0.29	0.12*
	Welfare expenditures * mandatory private contribution			0.08	0.04*
	Constant term	139.13	24.05***	141.22	23.26***
Welfare expenditures Equation 2	Fiscal sustainability ($t-1$)	−0.07	0.01***	−0.07	0.01***
	Fiscal sustainability ($t-5$)	0.05	0.01***	0.05	0.01***
	Generosity of public pension	0.44	0.16**	0.40	0.16*
	Generosity of public unemployment insurance	0.42	0.16*	0.42	0.17*
	Generosity of sickness insurance	0.65	0.24**	0.65	0.24**
	Constant term	11.67	2.51***	11.66	2.52***

Dependent variables	Independent variables	Model 1		Model 1	
		Coefficient	Standard error	Coefficient	Standard error
Number of obs	Equation 1	304		303	
	Equation 2	304		303	
F value	Equation 1	792.60***		779.06***	
	Equation 2	122.71***		123.37***	

*p < 0.05.
**p < 0.01.
***p < 0.001.
†p < 0.1.

Table 5. Determinants of fiscal sustainability on welfare state.

the financial burden in the long run by recognizing the tax burden differently, considering the benefits of the fiscal expenditure and the fairness of the tax burden [61, 74]. For example, a fair tax burden may offset the negative effects of welfare spending and may also have a positive impact on fiscal sustainability. For this reason, this study focuses on the moderating effect of the tax structure on the relationship between welfare expenditures and fiscal sustainability, as well as the direct effect of the tax structure on fiscal sustainability.

Specifically, the gap in the tax base, especially the gap between labor taxation and consumption taxation, hinders the fiscal sustainability of the welfare state in terms of horizontal equity. In addition, the negative effect of welfare expenditures on fiscal sustainability tends to become larger as the gap between labor and consumption increases. On the other hand, the direct effect of the gap between labor and capital taxation does not have a statistically significant effect. Although the impact of the gap between labor and capital taxation on fiscal sustainability is not statistically significant, the negative effects of welfare expenditures on fiscal sustainability intensify when tax equity is not guaranteed. In other words, if the tax burden is not distributed fairly among the tax base (labor, capital, and consumption), it is difficult to guarantee the fiscal sustainability of the welfare state.

Second, the effect of the level of vertical equity on the fiscal capacity of the welfare state is mixed. The increase of the progression in low-income groups has a statistically significant negative impact on fiscal capacity, while the increase of progressivity in the high-income group is not statistically significant, although it demonstrates a positive impact. In addition, the latter also alleviates the negative impact of welfare expenditures at a statistically significant level. Related to this, it is worth noting that severe income tax burdens on low-income households may have a negative impact on improvements to the fiscal sustainability of the welfare state.

It is important to point out the relationships between the ability to pay principle and fiscal sustainability of the welfare state. This is also associated with mixed analysis results in vertical equity. The golden age of the welfare state, from 1930 to 1960, had been supported by the ability to pay principle. As the principle of social justice based on equity was expanded, demand for redistribution expanded, and income tax assumed stronger progressive characteristics. This is due to the fact that in the reality of social ills caused by the monopoly of the capital growth process, the state faithfully tries to tame the working class and to correct the

unfairness of disparity. In this way, it is difficult to say the more progressive taxation makes always the more tax avoidance of the high-income class [67].

However, if progressive tax burdens are recognized to be unfair, their impact may vary, because the excessive burden can foster tax evasion [67]. As it is actually known, in 1970s, taxes were raised faster than income, political rebellion became fierce, and most high-income countries stopped raising income taxes to prevent capital from being exported abroad (businesses) and the emigration of productive workers. The problem is that lowering the tax burden on capital raises the risk of hindering horizontal equity with labor taxation and the reduction of tax progressivity [68]. In this manner, if the ability to pay principle is not guaranteed, it is possible to both diminish tax progressiveness and increase the possibility of tax avoidance.

This is because vertical equity and horizontal equity are inseparable. Both principles have goals that seek to achieve, and one principle cannot replace the other. In other words, inequalities caused by each equity principle are not offset by the achievement of equity through other equity improvements, so that each principle must be resolved directly to the unfairness of the respective side [69]. When vertical equity does not guarantee tax breaks for capital (businesses) and high-income earners, the fair burden condition may be violated, which will enhance the tax resistance of the people and promote tax evasion, even if horizontal equity is raised. Therefore, fairness of the burden according to the ability to pay can be realized when horizontal equity and vertical equity realize their respective goals. Taxation will then work to contribute positively to fiscal sustainability.

On the other hand, in terms of the benefit principle, the increase of social security contributions has a positive effect on the fiscal sustainability of the welfare state and also has the effect of offsetting the negative impact of welfare expenditures on fiscal sustainability. In addition, the increase of mandatory private contributions positively affects fiscal sustainability, even though this is not included in the government's finances. These public finance sources related to the benefit principle carry high political acceptability, because it is easy to secure political support for the burden in terms of direct benefit to the person [89]. In addition, private mandatory contributions can alleviate the fiscal burden of a country without public welfare efforts. Therefore, in order to secure the fiscal sustainability of the welfare state, it appears necessary to diversify the financial structure of the welfare state by making appropriate use of both social security contributions and private contributions.

5. Conclusion

This study identifies determinants of fiscal sustainability of the welfare state by focusing on tax structure. As confirmed by the results of the study, it is essential to secure financial resources to maintain the welfare state. In the short term, fiscal space may not drive the expansion of welfare expenditures, but it nonetheless leads to this in the medium-to-long term. The problem is that an increase in welfare spending may worsen fiscal sustainability, and it is not always an appropriate solution to reduce welfare expenditures in order to increase fiscal space, which is in keeping with the arguments of welfare state opponents. It is impossible

to cut welfare spending thoughtlessly because many social problems should be addressed through collaborative social efforts, and it is also not a suitable alternative to increase welfare spending indefinitely while worsening fiscal space because this may over time dismantle the financial base of the welfare state. It is therefore important to seek ways to maintain welfare spending while ensuring fiscal sustainability.

As can be seen from the analysis results, the level of tax burden is an important aspect of fiscal sustainability in the welfare state. Tax revenue is the funded basis for maintaining the welfare state, so increasing tax compliance to offset the negative impact of increasing welfare spending will promote social cohesion. However, the national financial effort to maintain the welfare represents more than collecting additional taxes. The excessive burden does not always have a positive impact on fiscal sustainability, and it is not always possible for a country to collect more tax revenues to expand welfare. Thus, the most important aspect of total tax revenue that should be considered is the manner in which tax revenue is raised because depending on which method is adopted, the impact of taxation on the sustainability of economic, political, and social dimensions varies. As indicated in this study, it appears that securing tax fairness contributes to the fiscal sustainability of the welfare state. The following aspects of the tax structure may positively contribute to fiscal sustainability of the welfare state.

First, in terms of the ability to pay principle, the achievement of equity between the tax base and improvements in progressivity may play a positive role in the fiscal sustainability of the welfare state. It appears obvious that the reduction of the gap between labor taxation and consumption taxation plays a significantly positive role in ensuring fiscal sustainability. Consumption tax may play a more positive role than taxation on labor in terms of social and political sustainability, as well as economic sustainability. In fact, advanced welfare countries have been interested in indirect taxation, including consumption tax, for which it is easy to secure public revenues in order to overcome the financial crisis, while it is difficult to secure tax revenue from direct taxes such as income tax and corporation tax, which are sensitive to economic changes [90–93]. In addition, it can contribute to the achievement of intergenerational equity by relieving elderly households, which are often more heavily burdened [94]. Moreover, in the event that the labor taxation base is broken due to labor market dualization and declining employment rates, a consumption tax based on universal solidarity is one way to secure a wide tax base.

However, if we rely only upon the expansion of the consumption tax, it can place an excessive burden on the low-income class due to the regressive tax burden. Therefore, it is necessary to ensure sufficient welfare benefits for low-income people, along with progressive taxation, in order to relax the regressive burden and to narrow the gap between the consumption tax and the labor tax. Specifically, improving vertical equity may also result in a positive contribution to the fiscal sustainability of the welfare state and will secure the political legitimacy of the tax and mitigate the regressive burden that may result from the expansion of a consumption tax. In particular, it is worth noting that a progressive tax on high-income earners does not always cause tax evasion. For example, if the tax burden is in accordance with appropriate benefits that are provided by the state, a progressive tax increases tax compliance. Thus, broadening the tax base by means of the consumption tax must be done in a manner that allocates the fair burden to all citizens according to the ability to pay, which ultimately ensures the fiscal sustainability of the welfare state.

Finally, diversifying the financial base of the welfare state by combining the ability to pay principle and the benefit principle is advantageous to the fiscal sustainability of the welfare state. Raising social security contributions or private contributions also has a positive effect on fiscal sustainability according to these principles. However, public services through these sources are limited to a small number of regular employees, and this may cause labor tax resistance and the social exclusion of low-income or irregular workers, as well as unemployed. Thus, it must be implemented by diversifying the funding base of the welfare state with a combination of the ability to pay principle and the benefit principle to maintain solidarity.

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