Fuels Taxation in the Context of Tax Reforms in the Czech Republic

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ABSTRACT

The article evaluates the development of the tax burden and its influence on fuel consumption in the Czech Republic in the years 2001–2022. Petrol and diesel are subject to universal and selective indirect taxation. Using the methods of analysis, description, comparison, synthesis and regression and correlation analysis, it is analysed whether the tax burden of these products is constant despite minimal tax reforms or whether it is changing. To assess the real tax burden, the effective tax rate indicator is calculated. Input data for the analysis consists of average fuel prices and tax rates in the analysed period. Compared to the first analysed year – 2001 and the last analysed year 2022, the value-added tax rate increased by one percentage point. Selective excise duty rates also increased by about 1 CZK., The results of the analysis examining the development of the tax burden using the effective tax rate show that the tax burden on fuel is constantly changing. However, this is not due to many tax reforms in this area of taxation. The reason is mainly the unit type of tax rate for excise duties. This fact causes the increase in the price of fuel leads to decrease the percentage of tax to the total price of fuel, and the tax burden thus develops regressively. Excise duties and value-added tax have a negative effect on consumption. In the context of tax theories, one of the reasons for the higher tax burden on fuels is the limitation of their consumption. It can thus be concluded that in the Czech Republic, these taxes are fulfilled. At the same time, the high tax burden creates relatively stable revenues for the state budget. This fact confirms the importance of excise duties.

KEYWORDS

diesel, effective tax rate, excise duty, petrol, tax burden, tax reform, value-added tax

JEL C10, H29, H31, K34, Q41

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Налогообложение топлива в контексте налоговых реформ в Чешской Республике

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АННОТАЦИЯ

В статье оценивается налоговая нагрузка на топливо и ее влияние на потребление топлива в Чешской Республике в 2001–2022 гг. Бензин и дизельное топливо подлежат универсальному и селективному косвенному налогообложению. С помощью методов анализа, описания, сравнения, синтеза и регрессионно-корреляционного анализа анализируется, остается ли налоговая нагрузка на топливо постоянной, несмотря на минимальные налоговые реформы, или она меняется. Для оценки реальной налоговой нагрузки рассчитывается показатель эффективной налоговой ставки. Исходными данными для анализа явля-

ются средние цены на топливо и налоговые ставки за анализируемый период. По сравнению с первым анализируемым 2001 г. и последним анализируемым 2022 г. ставка НДС увеличилась на один процентный пункт. Выборочные ставки акцизного сбора также увеличились примерно на 1 крону. Результаты анализа динамики налоговой нагрузки с использованием эффективной налоговой ставки показывают, что налоговая нагрузка на топливо постоянно меняется. Однако это не связано со налоговыми реформами в этой области налогообложения. Причиной в основном является изменение налоговой ставки по акцизам. Этот факт приводит к тому, что рост цены на топливо приводит к уменьшению доли налога в общей стоимости топлива, а налоговая нагрузка при этом развивается регрессивно. Акцизы и НДС отрицательно сказываются на потреблении топлива. В контексте налоговых теорий одной из причин более высокой налоговой нагрузки на топливо является ограничение его потребления. Таким образом можно сделать вывод, что в Чешской Республике эти налоги уплачиваются. В то же время высокая налоговая нагрузка создает относительно стабильные доходы государственного бюджета. Этот факт подтверждает важность акцизов на топливо.

КЛЮЧЕВЫЕ СЛОВА

дизельное топливо, эффективная налоговая ставка, акциз, бензин, налоговая нагрузка, налоговая реформа, налог на добавленную стоимость

1. Introduction

Fuels such as petrol or diesel are burdened in their sales price by indirect taxes such as value-added tax and excise duties, specifically tax on mineral oils. Tax reforms changing tax rates on mineral oils are not very frequent in the Czech Republic or many other European countries. However, the research question remains whether the tax burden of these commodities is also unchanged.

In the Czech Republic, the Excise Tax Act governs the taxation of mineral oils. Nowadays a valid law was created as part of the tax reform on January 1, 2004. However, fuel was also subject to excise duty until this date. From 2004 until the end of 2022, the provisions of the law regarding tax rates changed minimally. The tax reform in 2010 increased the burden on both commodities by CZK 1.

In 2021, the excise duty rate for diesel has been reduced to the value originally valid in 2004–2009. Due to the increase in fuel prices in 2022, there was a temporary reduction in excise duties rates on mineral oils by CZK 1.50. Compared to other taxes, it can be assumed at first sight that the tax burden on fuel is constant and unchanging since few reforms were changing this tax rate. The development of excise duties tax rates on diesel or gasoline since 2000 is documented in Figure 1.
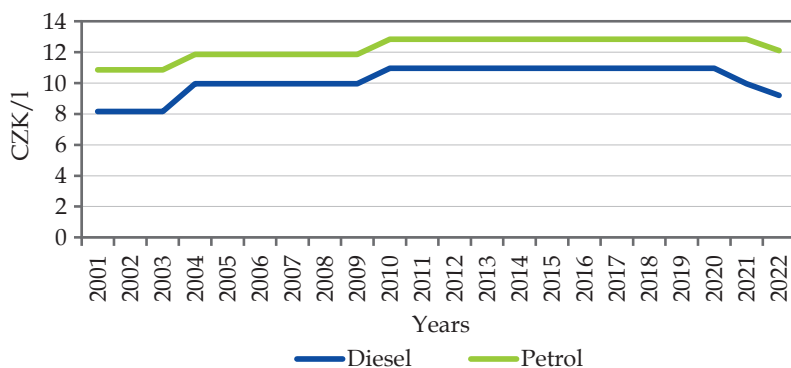

Figure 1. **Tax rate for diesel or petrol**

Source: own processing

Mineral oils are subject to selective tax and universal indirect tax, i.e., value-added tax. There have been more changes in this area compared to excise duties. Tax rates varied only in the order of one percent. More detailed information is provided by Figure 2.

The article aim is evaluating the development of the tax burden on fuel in the Czech Republic from 2001 to the end of 2022.

Are there only minimal changes in the tax burden, or is the real amount of the tax burden changing even though no tax reform has taken place? How does the tax rate affect fuel consumption? The following analysis in this article will answer all these questions. In the article, the first analysed year is 2001, and the last is 2022, representing a time series of 22 years. Such a long time series provides a reliable basis for performing the analysis. The examined period is also limited by the availability of data on prices, or fuel consumption, which the Czech Statistical Office has fully published since 2001.

Another goal is to evaluate the development of fuel consumption – petrol and diesel in the context of the implemented tax reforms affecting the fuels tax burden. Does the consumption of these fuels increase as the tax burden decreases?

The structure of the article is as follows. The introduction mentions the basic aspects of the issue and the research questions. The following section deals with an overview of research studies already carried out in this area. The main part is the chapter evaluating the tax burden and fuel consumption development. The final part

is focused on summarizing new findings from this analysis.

Following the above analysis of the current situation, it is possible to formulate the *hypothesis* that the tax burden on fuel does not change significantly in the Czech Republic. The reason for this hypothesis is only minimal tax reforms in excise duties.

2. Literature

Several studies have analysed aspects of fuel taxation. For example, the price elasticity of fuels in connection with the taxation of these products was examined.

Hammar et al. [1] or Damania & Fredriksson [2] mentions that fuel demand is highly price elastic. It follows that if the goal is to reduce fuel consumption, the way to achieve this goal is to increase the tax burden. When determining the tax burden, it is necessary to consider and distinguish price elasticity in the short and long term [3]. This study also mentions the need to consider the specifications and differences of each country. This is confirmed by the findings of Ghoddusi et al. [4].

The above studies show that price elasticity is essential in imposing any tax. This elasticity affects the consumption of the commodity that is burdened by the tax.

According to the conclusions of Akkaya & Hepsag [5], on the contrary, the demand for fuels is rather a price inelastic, so an increase in the tax burden on petrol or diesel does not lead to a drastic reduction in consumption. The fact that a tax reform increasing the fuel tax rate may not lead to a more significant re-
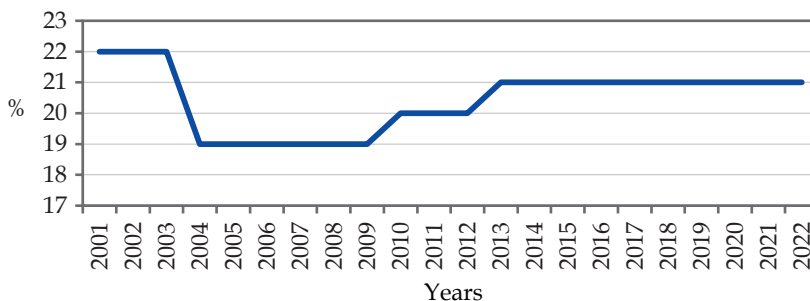

Figure 2. **Tax rate of value-added tax**

Source: own processing

duction in the consumption of these products is also evidenced by the analyses carried out in research Harju et al. [6] or Coglianese et al. [7].

Harju et al. [6] among other things, emphasize that the factor that determines consumption is, for example, territory. The consumption and price elasticity of fuel in a big city differs from the price elasticity in villages. These differences arise especially when the price of fuel increases, and it can take up to one year for these differences to balance out.

Coglianese et al. [7] also mention that it is necessary to consider whether the possible tax reform will increase or decrease the tax burden. If, for example, a reduction in the tax burden is expected, consumers will postpone fuel consumption.

Porcher & Porcher [8] chose an alternative approach – the Markov-switching approach – when investigating the effect of the tax burden on fuel consumption. The conclusions of the analysis indicate that consumers react quite strongly to an increase in the tax burden on fuels.

Using the Markov-switching approach, Boroumand et al. [9] confirmed that higher price elasticity is when fuel prices rise. And that, whether with an increase in the tax burden or an increase in oil price. Conversely, fuel sellers and consumers react less flexibly to a decrease in the tax burden of oil prices.

One of the reasons for applying excise duties, in general context of tax theories, is the reduction of the consumption of harmful products. The consumption of fuel is characterized according to Parry et al. [10] by certain harmfulness, and thus it can be stated that the goal of a higher tax burden is the reduction of consumption.

Stinson et al. [11] mention that it is also possible to approach the construction of excise duties in an alternative way. This consists of the existence of tax advantages and reliefs. However, this approach has not been widely adopted in the field of excise duties, which is also evidenced by the results of the David [12].

David [12] also discovered that the amount of excise duties cannot be imposed precisely in the amount of damage caused by the consumption of a specific commodity burdened with an excise tax. In that case, the tax burden would have to be four times greater.

Kamruzzaman & Mizunoya [13] investigated the effect of fuel taxation on consumption in Bangladesh. It was found that by taxing fuels, their consumption decreased by approximately one-fifth.

Similar conclusions regarding the effect of fuel taxation on fuel consumption in China were found by Xiao & Ju [14]. The effects of fuel taxation on consumption were also analysed by other studies, e.g., in Japan by Tanishita [15], which also states that the tax burden on fuels reduces their consumption. Despite this fact, however, fuel consumption is developing in an increasing trend. The study does not agree with the idea of an alternative approach, e.g., in the form of tax reliefs or higher taxation of cars, for example, stated by [11].

Studies analysed fuel taxation from a more comprehensive perspective of several countries, e.g., in the countries of the European Union were also done. According to Kantarci [16], the average tax burden on gasoline in the countries of the European Union is around 66%, and on diesel around 61%.

Shao et al. [17] also mention a high tax burden, which, on the one hand, is beneficial to limit environmental harm. On the other hand, such a high tax burden can reduce economic growth.

Fukui & Mioyshi [18], analysing the effect of fuel taxation on consumption in the USA, states that when the tax burden increases, consumption of these fuels decreases in the short term. On the contrary, when assessing these effects in the long term, the decrease in consumption is less significant than in the short time.

Gordeev & Galeeva [19] investigated fuel taxation in Russia. An increase in excise duty by about 0.4 rubbles per litre would be reflected in a decrease in consumption by about 1%.

As Bjertnaes [20] mentioned, ecological aspects should also be considered at legislation of fuel taxes. In practice, as the study states, this would mean a reduced

tax rate for vehicles with lower average fuel consumption.

According to Shao et al. [21], another way to increase the tax burden of these commodities through indirect taxes could be stimulating the behaviour of economic subjects towards ecologically desirable activities in the form of subsidies.

During reforms dealing with fuel taxation, it is desirable to discuss according to results Carvalho & Guillen [22] not only the issue of tax rates. Tools for changing the consumption of commodities can be, for example, the elimination of cases in which the use of items such as petrol or diesel is exempt from excise duties.

Hájek et al. [23], using multi-panel regression analysis, found that emission allowances are a tool to limit the consumption of environmentally harmful commodities.

During tax reforms changing the tax burden of excise duty commodities, the government must consider the commodity's tax burden and the impact on state budget revenues and adjust the tax mix accordingly. This is also related to changes in other direct or indirect taxes. Janoušková & Sobotovičová [24] found that, for example, land taxation in the Czech Republic is very low compared to other countries. Municipalities have the option of applying coefficients to increase tax revenue. However, only approximately 10% of municipalities use this option.

The results of the study by Andrejovská & Glova [25] show that a high tax quota can have a negative effect on economic growth. There are cases when a higher tax burden is justified, e.g., by the exclusivity or attractiveness of a specific place or product.

Thottoli & Mamari [26] mention that when setting up new taxes or changing existing ones, communication between the government and citizens is necessary so that citizens understand the meaning and purpose of the tax changes.

From the overview of research studies, it follows those fuels, unlike e.g., basic foodstuffs, are characterized by a higher tax burden. This tax burden ensures stable tax revenue, on the other hand, it also limits fuel consumption.

Limiting fuel consumption is positive from an ecological point of view, but it can cause a reduction in economic growth. Thus, studies confirm that there is dependence between fuel consumption and the level of taxation.

3. Data and Methodology

3.1. Data

The input data for the analysis is a database for the period from 2001 to 2022. The availability of data limits the analysed period.

To fulfil the objective of the article, the following data are used for analysis:

1) Average price of diesel and petrol[1];
2) Diesel and petrol consumption in analysed years[2];
3) Excise duty rates for diesel and petrol, and value-added tax rates.

The average price of diesel, petrol and the consumption of diesel and petrol were obtained from the above sources. Value added tax rates from the applicable Value Added Tax Act, petrol, or diesel tax rates from the Excise Act. The total tax burden of 1 litre of diesel or petrol was also calculated for analysis purposes. Furthermore, the effective tax rate was determined.

3.2. Methodology

The article uses standard scientific methodology including methods of description, analysis, synthesis, and comparison. To assess the real tax burden on petrol, or for diesel, the effective tax rate indicator (1) is used,

$$ETR = \frac{T_{VAT} + T_{ED}}{P_i}, \qquad (1)$$

where ETR is the effective tax rate, T_{VAT} is value-added tax, T_{ED} is excise duty and P_i is the price of 1 litre of fuel in an analysed year. In contrast to the nominal tax rate, it is possible to display the real tax burden using the effective rate indicator [27; 28].

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[1] Average price of Petrol and Diesel. Prague: Czech Statistical Office, 2023. Available at: https://www.czso.cz/csu/czso/ceny-pohonnych-hmot-od-roku

[2] Consumption of Diesel and Petrol. Prague: CEPRO, 2023. Available at: https://www.cappo.cz/cisla-a-fakta/spotreba-pohonnych-hmot-v-cr

The tax rate on diesel and petrol is of unit type, while the value-added tax rate is of ad-valorem type [29; 30]. To determine whether the tax burden on fuel is constant, progressive, or regressive according to the development of the price of a litre of fuel, can be formulated (2–4),

$$ETR_H < ETR_L, \tag{2}$$

$$ETR_H > ETR_L, \tag{3}$$

$$ETR_L = ETR_H, \tag{4}$$

where ETR_H is the effective tax rate expressing the tax burden on fuel at a higher selling price, and ETR_L is the effective tax rate at a lower selling price. If equation (2) applies, the tax burden develops regressively. Equation (3), on the contrary, confirms the progressive development of the tax burden. Equation (4) shows the constant development trend.

Modelling the dependence of fuel consumption on the tax burden of excise duty and value-added tax will be performed using regression analysis [31; 32]. The equation expressing the dependence of petrol consumption on excise duty and value-added tax is determined by the formula (5),

$$Y = b_0 + b_1 \cdot X_1 + b_2 \cdot X_2, \tag{5}$$

where Y is the amount of the petrol consumption, X_1 is the amount of excise duty on petrol per 1 liter and X_2 is the amount of value-added tax per 1 liter of petrol. The dependence of diesel consumption on the amount of excise duty on diesel and

value-added tax can be expressed similarly. It is captured by equation (6),

$$Y = b_0 + b_1 \cdot X_1 + b_2 \cdot X_2, \tag{6}$$

where Y is the value of diesel consumption, X_1 is the amount of excise duty on diesel per 1 litre, and X_2 is the amount of value-added tax on 1 litre of diesel.

4. Results

4.1. Descriptive statistics

Before performing the dependency analysis, a section containing the basic descriptive statistics of the analysed variables in Table 1 is sorted, i.e., the price of diesel, the price of petrol, the consumption of diesel, the consumption of the petrol, the rate of excise duty per litre of diesel, the rate of excise tax per litre of petrol, the value- added tax on 1 litre of diesel, or the value-added tax on 1 litre of petrol.

4.2. Evaluation of the development of the tax burden on fuel

Fuels such as petrol and diesel have the same tax rate in the context of universal indirect tax – value-added tax. What differs, on the other hand, is the excise duty rate. For both commodities, it is of the unit type, but its amount is different. Diesel has a lower rate. From the point of view of value-added tax, the standard tax rate is applied for the entire analysed period 2001–2022. From 2001 to 2003, it was 22%. In 2004 decreased to 19%, from 2013 to the present, the rate is 21%.

Table 1

Descriptive statistics

	Unit	Mean Value	Median	Minimum	Maximum
Price of diesel	CZK/Litre	30.173	30.03875	21.743	43.438
Price of petrol	CZK/Litre	30.885	30.27	24.364	41.743
Consumption of diesel	Kilotons	4145.227	4125.5	2561	5154
Consumption of petrol	Kilotons	1790.591	1783.5	1468	2103
Rate of excise duty for diesel	CZK/Litre	10.170	10.45	8.15	10.95
Rate of excise duty for petrol	CZK/Litre	12.260	12.84	10.84	12.84
Value-added tax of diesel	CZK/Litre	6.168	6.072	4.734	9.122
Value-added tax of petrol	CZK/Litre	6.318	6.170	5.089	8.766

Source: own calculation

Assessing the tax burden only based on nominal tax rate values is incorrect. Better reporting power is provided by the effective tax rate. The development of these rates for petrol and diesel is shown in Figures 3 and 4.

The tax burden on petrol has changed in the analysed period. Tax reforms increasing the rate of excise duty on petrol took place in 2004 and 2010. Despite this fact, when the nominal tax rate increased, the real tax burden, on the contrary, decreased. The most significant decrease occurred at the end of the analysed period. In 2022, on the other hand, the excise duty rate was reduced, and the petrol price increased simultaneously. These facts caused the real tax burden to fall. Conversely, the value-added tax burden in percentage terms remains almost unchanged over the analysed period.

Also, the results presented in Fig. 4 confirm that the tax burden on diesel does not change linearly. The excise tax reform between 2003 and 2004 increased the rate of excise duty on diesel, which also led to an increase in the effective tax rate. On the contrary, the value added tax rate was reduced by three percentage points. This fact caused the overall tax burden on diesel to decrease.

In 2010, the rate of excise duty on diesel was increased by CZK 1. Paradoxically, the effective tax rate has decreased. Nominal tax rate was unchanged until the end of 2020. Nevertheless, according to Fig. 4 there are changes in the real tax burden. The reason for this is the fact that it is a unit-type tax rate. Thus, the tax burden of 1 litre of fuel does not change only in terms of an absolute figure. A factor significantly affecting the value of the effective tax rate is the price of this product.
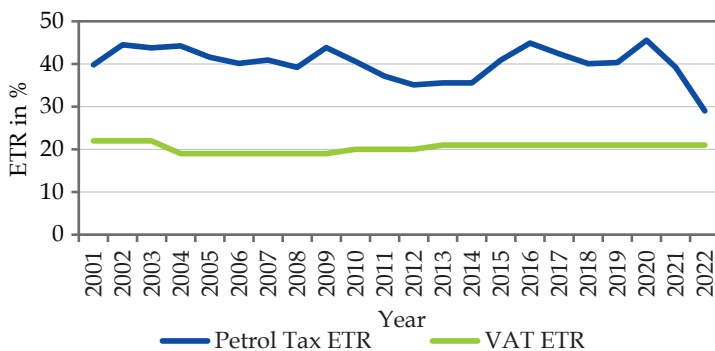

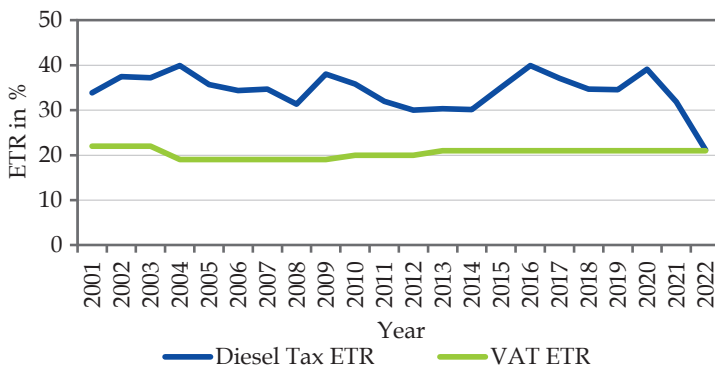*Figure 3.* **ETR petrol**
Source: own calculation

Figure 4. **ETR diesel**
Source: own calculation

If both effective tax rates (value-added tax rate and excise duty rate) were added together, the value of the total effective tax rate for petrol would be close to 60%, and for diesel around 55%. In the case of petrol, these are values that are also common in other countries, in the case of diesel, the tax burden is slightly lower. On average, the tax contributes to the price of fuel, according to the results of Kantarci et al. [16] around 60%.

Using the correlation analysis in Table 2, it will be evaluated whether there is a dependence between the effective tax rate and the price of petrol and diesel. If confirmed, it will subsequently be determined whether this dependence is direct i.e., the tax is progressive or indirect, indicating the regressive character of the development of the tax liability.

From the data of the correlation matrix presented in Table 2, it follows that there is an indirect degree of very high dependence between the price of the commodity – petrol and diesel and the effective tax rate. As the price for each litre of fuel increases, the real tax burden thus decreases. And this is although no tax reform adjusting tax rates took place. For this reason, the overall tax burden on fuel is developing regressively. Conversely, if there is a decrease in fuel price, the percentage of tax on the price increases. The reason is that the amount of excise duty remains the same in absolute terms. Thus, when the price increases, only the value-added tax increases absolutely, the same when it decreases, only the value-added tax decreases absolutely.

Table 2

Correlation analysis

	Diesel price	Petrol price	ETR diesel	ETR petrol
Diesel price	1			
Petrol price	0.986	1		
ETR diesel	–0.855	–0.844	1	
ETR petrol	–0.887	–0.887	0.975	1

Source: own calculation

4.3. Evaluation of the impact of the tax burden on consumption

The results of the partial analysis showed that, although tax reforms in fuel taxation were rare, the tax burden was different in the analysed years. Not only the tax burden changed, but also the volume of fuel consumption. The research question of this part is whether this tax burden affects the level of fuel consumption. The answer to this question is provided by the results of the regression analysis in Table 3. The dependence of petrol or diesel consumption on the tax burden of excise duty and value-added tax is analysed.

Table 3

Regression analysis

	Model 1 – Diesel		Model 2 – Petrol	
	Coef.	Sig.	Coef.	Sig.
X_1 – Value-added tax	–281.8	0.018	–105.6	0.007
X_2 – Excise duty	–417.8	0.003	–145.09	0.005
Constant	1842.01	0.122	4236.9	0.001
Observation	22		22	
R^2	0.790		0.832	
F-test	15.8	0.001	21.3	0.001
Durbin-Watson test	1.880		1.918	

Source: own calculation

In the case of model 1 expressing the dependence of diesel consumption on the tax burden, the equation has the form (7),

$$y = -281.8x_1 - 417.8x_2 + 1842.01. \quad (7)$$

In the equation, both variables are statistically significant. The R^2 coefficient expressing the quality of the regression model indicates that the model describing the dependence of diesel consumption on the tax burden is of sufficient quality. The value of the F-test and the result of the Durbin-Watson test are also statistically in accordance with the requirements for regression modelling. More about the F-test e.g. [33], about the Durbin-Watson test e.g. [34]. In accordance with the recommendation of O'Gorman or Pinelis [35; 36], a significance level of 5% is chosen.

It follows from equation (7) that the tax burden on fuels reduces their consumption. This can be stated based on the negative values of the coefficients X_n in the equation. Regarding the strength of the effect on consumption, this value is higher for the excise duty. This conclusion is logical since excise duty also had a higher effective tax rate than value-added tax. The stated results agree with the results of studies [14; 21; 37].

The model of the dependence of petrol consumption on the tax burden is captured by equation (8),

$$y = -105.6x_1 - 145.09x_2 + 4236.9. \quad (8)$$

The conclusions of the analysis regarding the effect of taxation on petrol consumption are identical to the research regarding diesel. Value-added tax and excise duty reduce this consumption. Again, a higher negative effect is demonstrated for excise duty, as coefficient X_2 increases more than coefficient X_1.

On the contrary, what is different between equations (7) and (8) are the values of these coefficients in the regression equations. Taxation of diesel has a more significant effect on consumption than petrol. This is related to the different price elasticity of demand for petrol and diesel [38].

The conclusions thus agree, for example, with the study by Tang & Sjoquist [39] that the effects of the same tax on different fuels may not be the same, even if the principle of how the tax works is similar. One of the reasons why this tax is part of the tax system is to limit the consumption of petrol or diesel [40], which, as the results of this analysis confirm, is fulfilled in the case of the Czech Republic.

5. Discussion

Excise duty and value-added tax make up more than half of the final sales price. In the context of comparison with other countries, it was found that the Czech Republic does not show significantly higher or lower values in this regard. The above can be compared, for example, with the results of the study Kantarci [16]. Especially tax burden of petrol is at a similar level to other OECD countries.

A study investigating the fuel tax burden in the context of consumption in the Czech Republic has not yet been conducted. However, the results found can be compared with those of other studies. The regression analysis results confirmed that excise duty, particularly, impacts fuel consumption and that the tax burden is a factor in reducing this consumption. These results agree with studies [1; 10]. On the contrary, these conclusions deviate from the findings of studies [5–7]. It is precisely the high tax quota for petrol and diesel that aims to limit the consumption of these fuels. It must be emphasized that the reduction of this consumption is not only due to excise duties but also to value-added tax. Although, as the analysis results show, the value-added tax's effect on reducing consumption is smaller. In the context of the fuel type, the tax burden has a higher impact on diesel consumption than petrol consumption. This is valid although tax rate for diesel is lower than tax rate for petrol.

It is thus also possible to identify with the conclusions of studies [13–15]. It is also necessary to consider that diesel and gasoline do not have the same degree of price elasticity of demand, which agrees with the study's conclusions of Akkaya & Hepsag [5]. Based on the data on the development of fuel consumption, it is in accordance with the conclusions Boroumand et al. [9] about the different degrees of price elasticity when fuel prices rise and fall.

The relatively high tax burden on fuel can be viewed from two points of view. One of them is the fact that the high tax burden limits the consumption of these products. This is a positive from an ecological point of view. However, the conclusions of studies [20-22] demanding consideration of environmentally friendly behaviour have not yet been implemented into the tax legislation regulating this area of taxation.

Currently, there are no plans to implement discounts or tax bonuses into the legislation governing excise duties.

Progue et. al [41] or Pedrosa et al. [42] also recommend subsidizing public transport or other ecological activities. On the other hand, ecological elements are implemented in the tax system in the Czech Republic in a certain way. These are specifically environmental taxes that burden natural gas. This tax burden is lower than the excise duties on fuels. Electric cars are also subject to a lower tax burden. Tax reforms in the Czech Republic are different from the path recommended, for example, by the studies mentioned above [11; 18; 21]. Respecting the age of the vehicle in the tax burden, as recommended by e.g. Leontyeva & Mayburov [43], was in the legislation regulating road tax in the Czech Republic until the end of 2021. From 2022, this ecological aspect was abolished.

In the beginning of the text of the study, the hypothesis was formulated that the tax burden on fuel does not change due to only minimal changes in tax rates. This hypothesis is not accepted. In this case, the factor that changes the tax burden on fuel is not so much the tax rates or the way the tax base is constructed. The selling price of fuel is a decisive factor. This price is not constant and as the final selling price develops the tax burden changes accordingly.

It was found that the tax burden on fuel from the point of view of the effective tax rate is changing, while tax reforms are not the only factor affecting this fact. Due to the specific type of excise duty rate – the unit rate – the nominal value of the rate did not change except the years when tax reforms took place. However, this was not the case for the effective tax rate. It was found that the factor affecting this fact is not only the nominal tax rate but also the amount of fuel selling price.

The data for analysis were obtained for the period 2001–2022. The period examined may be a limitation of this study. Specifically, the first year analysed was 2001. This fact is due to the limit of availability of fuel consumption data. Even so, it can be concluded that the analysed period has a sufficiently long time series, this is also confirmed by the tests on regression models.

6. Conclusion

The aim of the article was to evaluate the impact of the tax burden on fuel consumption in the Czech Republic in 2001–2022. Another goal was to evaluate the development of the tax burden on 1 litre of fuel – petrol and diesel in the context of the implemented tax reforms affecting the tax burden on fuel.

The effective tax rate was used to assess the tax burden on fuel. Comparing the first analysed year, 2001, and the last, 2022, the tax burden on fuel decreased in the context of the share of tax on the sales price. It can therefore be stated that the tax burden on fuel has developed degressively in many cases. As the value of fuel increases due to the unit rate of excise duty, this tax contributes to the final price to a lesser extent.

This does not apply if it is another indirect tax that also taxes fuel, i.e., value-added tax. Here, on the other hand, the tax burden develops linearly, the reason being the way the tax base is constructed and the nominal and real linear rate of this tax. In the case of the absolute amount of excise duty, this rate increased in the case of diesel from CZK 8.15 in 2001 to CZK 10.95 in 2020. From 2021, on the other hand, the tax reform reduced this rate by CZK 1. The absolute tax amount of petrol also increased from CZK 10.84 to CZK 12.84. This has been the case since 2010, except for the last analysed year, when the petrol tax rate was temporarily reduced.

Further tax reforms can be expected in the future, not only in excise duty and value-added tax. In addition to classic changes such as tax rates or how the tax base is constructed, it is also possible to approach the reform of fuel taxation in another way. This could be, for example, the creation of a so-called uniform tax, which would be a direct income of the municipal budgets and would include a specific fuel tax for the city [44]. However, according Söllner [45], it is necessary to respect many general principles of taxation as well as, for example, compatibility with the law of the European Union.

The potential for further research can be directed in this direction. Another direction of research in this area may consist in extending the length of the researched period and conducting a comparative study in the future. This conducted study can then be a treasure for comparing the results.

Excise duties and value-added tax will continue to be important indirect taxes not only in the tax system of the Czech Republic. As with other taxes, even with excise duty or value-added tax, further tax reforms can be expected in the future. This reform would impact the tax burden and thus fuel consumption.

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