

Fragmentation of Czech Tax System as a Source of Tax Illusion

Iveta Ratmanova¹, Tomas Wroblowsky²

Abstract

Many studies, both theoretical and empirical, show that tax subjects are not able to fully recognize their tax liabilities. Such wrong perception of taxation, usually called the „tax illusion“, can have several reasons. Low level of economic literacy, high costs of information or complexity of the tax system can be mentioned as examples.

This paper is focused on the complicatedness of the Czech tax system and its development in the 2003 – 2011 period. Using the Herfindahl – Hirschman Index, it is concluded that the level of fragmentation of the system is quite high. However, the index is increasing through the observed period, which means that the role of tax system complexity as a cause of the tax illusion is declining. There is also documented that the introduction of new taxes to the system (energy taxes in 2008), which (against the assumptions) doesn't cause a significant drop of the HHI and an increase of the tax system complexity.

Key words

Fiscal illusion, tax illusion, Herfindahl – Hirschman index, tax system complexity, tax system fragmentation

JEL Classification: H11, H21

1. Introduction

There have been many papers – both theoretical and empirical – in the field of so called fiscal illusion recently. It is frequently mentioned that the more fragmented, incomprehensive to taxpayers or generally complicated is the tax system of an economy, the more is the fiscal illusion likely to be present there.

The goal of this paper is to analyze one of possible sources of fiscal illusion, the fragmentation of Czech tax system. Using the Herfindahl – Hirschman index, there is documented and discussed the development of the system fragmentation during the 2003 – 2011 period.

2. Tax Illusion

Generally, the fiscal illusion can be defined as a situation, where the agents do not realize the real value of fiscal measures. However, the term fiscal illusion has been used in different meanings in the economic literature since 1903, when it was introduced by Amilcare Puviani in his *Illusione Finanziaria*³. This paper is focused especially on the tax illusion as a part of fiscal illusion. For its purposes, the tax illusion is understood as a situation where the taxpayers do not fully realize their tax liabilities. There are several possible causes of such

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³ For further details, see the work of Mourão (2006, 2007) or Fasora (2010)

situation. The two main causes of tax illusion – the income elasticity of tax revenues and tax system complexity - are going to be described in following section.

Taxes have usually the role of automatic stabilizers in the economy. This role can become the source of illusion. If the nominal income grows, appropriately set taxes can draw off higher share on total income. It means that although the marginal tax rates remain unchanged, the average tax rates are higher. However, this factor depends on how the taxes are constructed. The more is the tax construction similar to the flat tax, the lower is the role of income elasticity of tax revenues as a source of fiscal illusion.

The more complicated the tax system is, the more it is likely to be a source of tax illusion. The taxpayers are either unable or unwilling to fully understand the information contained in the tax system. There are three main factors, which make the tax system more complicated (and less understandable for the taxpayers). These are the tax system fragmentation, visibility of taxes and the space for tax liability minimization.

As mentioned above, this paper focuses on the tax system fragmentation. The more it is fragmented (i.e. the more different taxes create the total tax liability) the less it is understandable for the taxpayers. Buchanan (1987, p. 135) says that „*To the extent that the total tax load on an individual can be fragmented so that he confronts numerous small levies rather than a few significant ones, illusory effects may be created. If, for example, all taxes paid by an individual are concentrated into a single levy on personal income, the individual would surely be more conscious of the sacrifice that he undergoes, presumably, in support of government services*”. Of course, there is a question how to measure the degree of tax system fragmentation. Wagner (1976) suggested to use the Herfindahl – Hirschman index (HHI), which is usually used to measure the size of firms in relation to the industry and as an indicator of the level of competition among them.

The HHI, adjusted for the measurement of tax system fragmentation, can be computed as a sum of squares of particular tax to total tax revenues ratios.

$$HHI = \sum_{i=1}^N t_i^2, \quad (1)$$

where the N in formula 1 denotes the number of taxes in the system and t_i represents the share of the tax i on the total tax revenues. It is clear that the index value must be between 0 and 1. The lower is the value of HHI, the higher is the degree of tax system fragmentation. The value of HHI is influenced by two factors – the number of taxes in the system and the differences in the shares of each tax to the total tax revenues.

3. Fragmentation of Czech Tax System

As mentioned above, the Herfindahl – Hirschman index can be generally used as a measure of concentration (or fragmentation, it depends on point of view). However, there are some problems connected with this measure, which must be clarified first.

First of all, the value of the index depends on the definition of tax division in the system. When wide groups are used (for example direct, indirect taxes and social contributions), the value will be much higher, than when the system is divided into more narrow groups. The choice is arbitrary, but of course, it can significantly influence (and bias) the obtained results. In this paper, the structure was chosen with the respect to Czech legal system, meaning that the taxes are divided according to the Czech tax law. Moreover, the social security and health insurance contributions are also included, because they have the character of taxes.

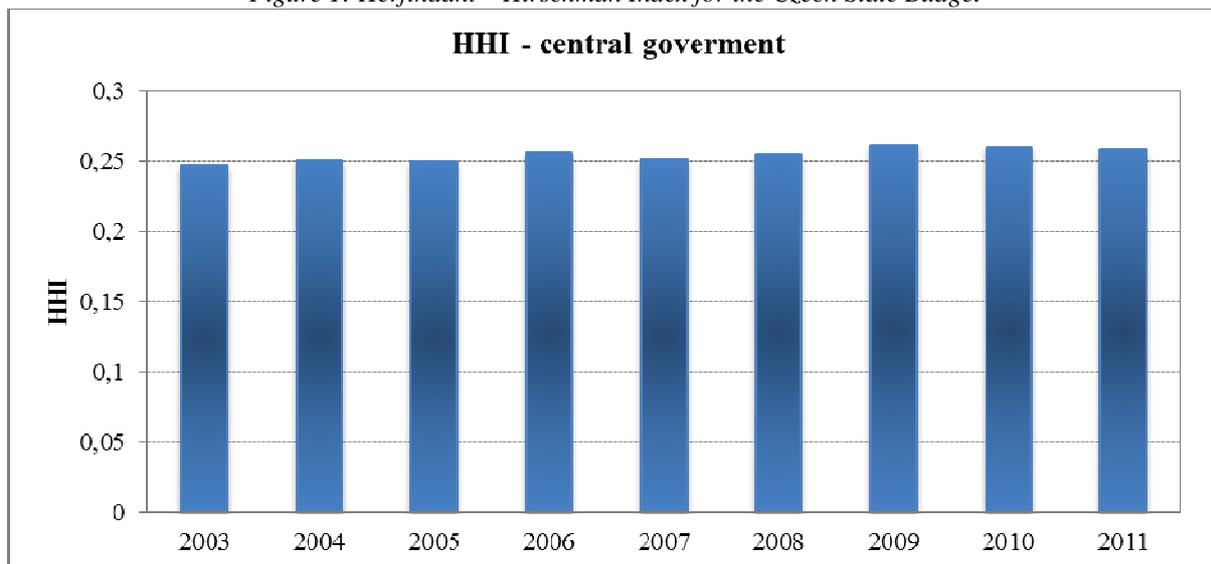
Because not all tax revenues are a part of the state budget, it is also necessary to use appropriate part of tax revenues to the level of public finance, which has to be analyzed. That's why there is distinguished between the HHI of the state budget only and the HHI for the whole Czech public finance. The Czech Ministry of Finance is the source of all data used

in this paper. To ensure the reliability and the same methodology of data used, the 2003-2011 period is examined⁴.

3.1 System fragmentation using HHI for the central government

All the studies, which use the Herfindahl – Hirschman index, construct this measure only for the central government. Following this approach, the values and development of the HHI are presented in figure 1.

Figure 1: Herfindahl – Hirschman Index for the Czech State Budget



There are several facts, which can be derived from obtained results. At first, the value of the HHI is quite low, meaning that the Czech tax system level of fragmentation is quite high⁵, so there is a significant space for the tax illusion appearance. Less visible, but still important is that the trend of the HHI through the analyzed period is increasing. Although the increase is not very significant, it can be said that the space for the tax illusion is getting smaller.

The question is, if such measure is a correct one for examining the sources of tax illusion. When analyzing the Czech tax system, the real estate tax and road tax are not contained in the HHI, as well as the health insurance contributions.

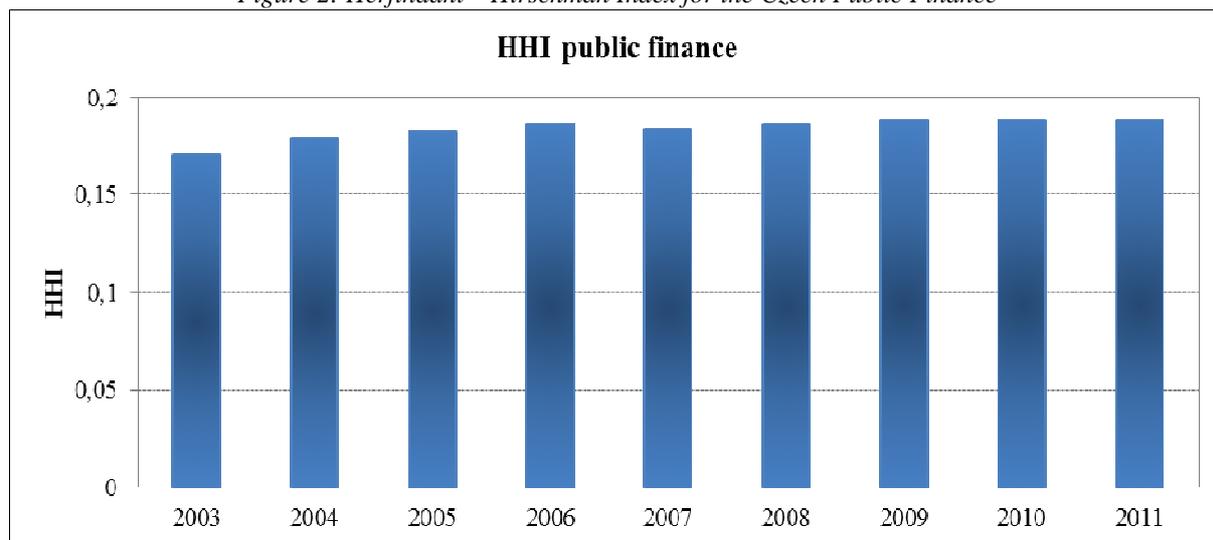
3.2 System fragmentation using HHI for the whole public finance

Although the state budget is the most important and most visible part of the public finance, the taxpayers usually do not distinguish between taxes paid to the central government and to the other parts of public finance. They realize only the decrease of their disposable income, no matter what purchases at which level of public sector are financed from their taxes. That's why it is argued that the HHI computed for all taxes paid to the system of public finance is much better measure for analyzing the possible sources of tax illusion. The HHI for all taxes is shown in figure 2.

⁴ Data provided by Czech Ministry of Finance have different structure for earlier years

⁵ Using the same methodology, the HHI for Slovakia is almost 0,4 for the year 2011

Figure 2: Herfindahl – Hirschman Index for the Czech Public Finance



It is visible that the results (not the trend, but the values) are different to those derived only from the taxes included in the state budget. The interpretation is obvious. Taxes not contained in the state budget are not a significant part of total public finance income. This causes huge decrease of the HHI (compared with central government only), meaning that the level of fragmentation is higher.

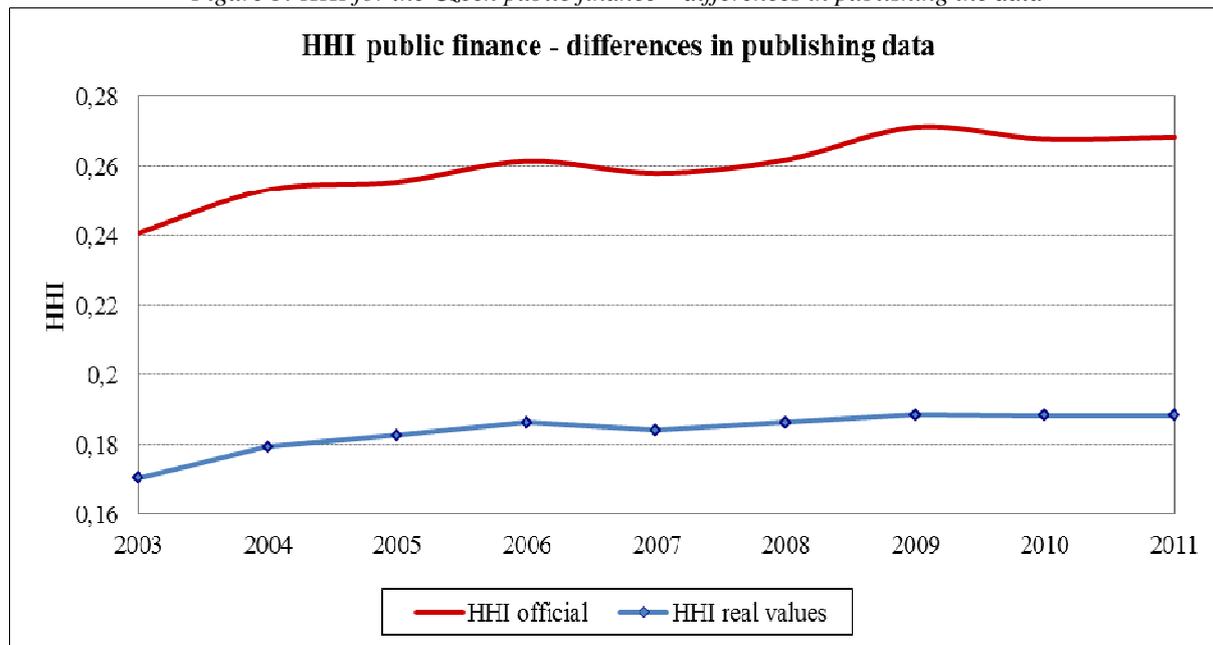
3.3 System fragmentation after the appearance of new taxes

In the year 2008, a new type of taxes appeared in the Czech tax system. These are the energy taxes. Generally, adding a new type of taxes to the system, the level of fragmentation (measured by HHI) should increase. However, this phenomenon is not present in the Czech Republic. The reason is that the income from energy taxes to the budget is negligible, compared to the total tax income. For a comparison, the values of the hypothetical HHI for the years 2008-2011 were computed as if the energy taxes haven't been present in the system. These values were higher than the real ones, as one could expect, but the difference was almost zero (the highest difference between the two compared HHI values was 0,001 in the year 2009).

However, there's one more interesting fact about the Czech system fragmentation. Until now, the sources of tax illusion were analyzed only from taxpayers' point of view. But there is an evidence, that the government creates another source of such illusion by the way how it publishes the data about the tax revenues.

The Czech government publishes the data about the consumption tax revenues and energy tax revenues in official documents (such as State final account) together, as one value. But although these taxes have similar characteristics, they are different taxes for the taxpayers. It means that grouping the two values of tax revenues into one can significantly bias the measures of tax system fragmentation. This is clearly visible in following graph.

Figure 3: HHI for the Czech public finance – differences in publishing the data



It is evident that the HHI values are significantly different. The real values (dotted line) are significantly lower than those computed when using the officially published data. Although taxpayers are not affected by the tax system construction, they can underestimate the level of tax system fragmentation due to „data gimmicks“ provided by the government when publishing the data.

4. Conclusion

This paper analyzes the fragmentation of Czech tax system. As the Herfindahl – Hirschman index, used for the analysis of fragmentation, is increasing, it can be concluded that the level of fragmentation is decreasing. Thus, the role of tax system fragmentation as a possible source of tax illusion is getting smaller.

Because the HHI for the central government revenues only doesn't seem to be a good measure of the fragmentation (due to some kinds of taxes missing) the HHI for the decentralized public finance is also provided. Values of so constructed HHI are significantly lower than those for the state budget only, meaning that the fragmentation is much higher, when analyzing all the taxes which the taxpayers have to pay.

Last, but not least, the appearance of new kind of taxes (energy taxes in 2008) is analyzed. Comparing the real HHI development with the HHI if new taxes would not have appeared, it can be stated that this change is almost unobservable. The reason is that the energy taxes revenues are very small compared to the total amount of tax revenues. However, another possible source of tax illusion was observed during the analysis. The government publishes the data about some tax revenues (consumption tax and energy tax) as one value. Such approach significantly biases the final values of Herfindahl – Hirschman index, which means that the taxpayer's perception of the whole system construction can be incorrect.

References

- [1] BUCHANAN, J. M. *Public Finance in Democratic Process*. The University of North Carolina Press, 1987. ISBN 978-0-807-84190-7.

- [2] KIRCHLER, E. *The economic psychology of tax behaviour*. 1 ed. Cambridge: Cambridge University Press, 2007. 274 p. ISBN 978-0-521-87674-2.
- [3] HEYNDELS, B. a SMOLDERS, C. *Tax complexity and fiscal illusion*. *Public Choice*, 1995, No 85, pp. 127 – 141.
- [4] WAGNER, R. E. *Revenue structure, fiscal illusion and budgetary choice*. *Public Choice*, 1976, vol. 25, No. 25, pp. 45 – 61.
- [5] FASORA, O. Fiskální iluze jako součást daňových systémů. In *Sborník příspěvků z V. ročníku mezinárodní vědecké konference: Hospodářská politika nových členských zemí EU*. Ostrava: VŠB – TU Ostrava, 2005, 7 p.
- [6] FASORA, O. Iluze a omezená racionalita. In *Sborník příspěvků z mezinárodní vědecké konference: Ekonomické znalosti pro tržní praxi*. Olomouc: Univerzita Palackého v Olomouci, 2008, pp. 92 – 100.
- [7] FASORA, O. Fiskální iluze a daňové kánony Adama Smithe. In *Sborník vybraných příspěvků: Finanční řízení podniků a finančních institucí*. Ostrava: VŠB – TU Ostrava, 2009, pp. 51 – 58.
- [8] FASORA, O. *Daňová iluze jako nedílná součást daňové teorie a praxe*. Dissertation. Ostrava: VŠB-TU Ostrava, 2010.
- [9] Ministry of Finance of the Czech Republic. <http://www.mfcr.cz>.
- [10] Ministry of Finance of the Slovak Republic. <http://www.finance.gov.sk>.
- [11] MOURÃO, P. R. Towards a Puviani's Fiscal Illusion Index. In *Hacienda Pública Española*, vol. 187, No. 4, Madrid, 2008, pp. 49–86. Available at: www.ief.es/Publicaciones/Revistas/Hacienda%20Publica/187reis.pdf.
- [12] MOURÃO, P. R. Sins of the older: the case of Fiscal Illusion in democracies. In *Annual International Conference on Macroeconomic Analysis and International Finance*, University of Crete, 2009. 13 p. Available at: http://economics.soc.uoc.gr/macro/docs/Year/2009/papers/paper_2_116.doc.
- [13] OATES, W. E. On the Nature and Measurement of Fiscal Illusion: A Survey. In G. Brennan, et al. *Taxation and Fiscal Federalism: Essays in Honour of Russel Mathews*. Australian National University Press, Sydney, 1988, pp. 65 – 82. Available at: www.econ.umd.edu/research/papers/347/download/196.

Summary

Řada studií, ať už teoretických či empirických, dochází k závěru, že daňové subjekty nejsou schopny plně odhadovat skutečnou výši své daňové povinnosti. Takovéto mylné vnímání zdanění, obvykle nazývané jako „daňová iluze“, může mít řadu příčin. Příklady mohou být například nízká úroveň ekonomické gramotnosti, vysoké náklady na získávání informací či složitost daňového systému.

Tento příspěvek je zaměřen na komplikovanost daňového systému České republiky a její vývoj v období 2003-2011. Pomocí Herfindahlova – Hirschmanova indexu je dokumentováno, že roztržitost daňového systému v ČR je poměrně vysoká. Jelikož se však hodnota indexu postupně zvyšuje, lze konstatovat, že se význam složitosti daňového systému jako jednoho z možných zdrojů daňové iluze snižuje. V příspěvku je rovněž analyzováno zavedení energetických daní v roce 2008, které oproti předpokladům nezpůsobuje pokles HHI a tedy výrazně nezvyšuje složitost daňového systému.