Issues of Tax Burden Measuring Using Tax Quota

Problematika měření daňové zátěže pomocí daňové kvóty

KVĚTA KUBÁTOVÁ[1]

Abstract

In spite of the existence of internationally applied tax quota calculation methodologies there are certain factors which can cause incomparability of the tax quota indicator among countries, and at some circumstances even within a country in time. The inconsistencies in the reported tax quotas are negligible sometimes but in some cases they are likely to be very significant. The inconsistencies in tax quotas due to methodical inaccuracies can, at certain circumstances, be expected to represent a difference on the order of percent points or even tens of percent points. This paper is intended to analyse the main causes of the imperfect comparability of tax quotas and their quantitative impacts. The method applied to this end was the comparative analysis of various techniques used to measure the tax quotas and factors determining the quota level.

Keywords

tax quota, tax expenditures, government regulations, tax quota metodology

JEL classification

H20

Abstrakt

Přesto, že existují mezinárodně používané metodiky pro výpočet daňové kvóty, jsou zde určité faktory, které mohou způsobit nesrovnatelnost ukazatele mezi státy, ale za určitých okolností i u jedné země v čase. Tyto rozdíly ve vykázané daňové kvótě jsou někdy zanedbatelné, jindy mohou být pravděpodobně velmi významné. Můžeme předpokládat, že v jistých situacích se bude daňová kvóta v důsledku metodických nepřesností lišit v řádu procentních bodů a možná i desítek procentních bodů. V tomto článku se pokusíme analyzovat hlavní příčiny nedokonalé srovnatelnosti daňových kvót a jejich kvantitativní dopady.

Klíčová slova

daňová kvóta, daňové výdaje, vládní regulace, metodologie daňové kvóty

Introduction

The best way to measure the tax burden of national economy is the application of tax quota indicator which is tax revenue ratio to GDP. This dimensionless indicator is compa-

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rable in time and space and is not affected by inflation (or does not need to be refined). As far as the comparability is concerned, a detailed methodology has been prepared by IMF and OECD and adopted to compare the tax quota in many countries. Eurostat has also its methodology which is very similar to that of OECD and the calculated tax quotas differ on the order of tens of percent points.

The tax quota is understood as tax ratio to GDP in certain period (typically a calendar year).

This implies the tax quota is calculated using the following formula:

$$\frac{\text{tax revenue}}{\text{GDP}}$$

The result will depend on what will be covered by the "tax" term and on the quality of the gross domestic product estimate made in the concerned country. We shall focus on the analysis of methodological problems with the numerator in the formula above, i.e. "tax revenue". We shall handle also the nominator – GDP – but only with respect to the calculation problem in terms of the tax quota, otherwise this article would exceed the space allocated to it.

The "tax revenue" includes all taxes which are defined as obligatory payments to a public authority without any entitlement to consideration (James, Nobes, 2006, p. 10).

The OECD methodology drawn up for statistical purposes offers almost the same definition (OECD, 2008, p. 310): "In the OECD classification the term "taxes" is confined to compulsory, unrequited payments to general government. Taxes are unrequited in the sense that benefits provided by government to taxpayers are not normally in proportion to their payments."

The definitions above indicate the obligatory contributions to social security are classified as taxes and will influence the tax quota level. However, this approach to the contributions is not applied by all authors and institutions. The difference in quotas including and excluding the contributions is very high in some countries; in case of OECD countries it averages at 25 % of the tax quota amount, i.e. 9 percent points with the highest value in the Czech Republic – 40 % the tax quota amount, i.e. 14 percent points.

For example, in past the Ministry of Finance of the Czech Republic published also so-called tax quota I which excluded both the social and health insurance contributions and tax quota II which included the social insurance contributions and not included the health insurance contributions. Tax quota III (also known as aggregate tax quota) includes all taxes plus both insurance contributions.

1 Causes of imperfect comparability of tax quotas

1.1 Causes of imperfect international comparability according to messere

Messere (1993) states several reasons for which the international comparison of tax quotas is not accurate. The reasons are as follows:

1) Different government intervention tools. The government can intervene through direct government expenditures, or support certain activities by way of tax expenditures. The tax expenditures are taxes which have not been paid because the taxpayer obtained a tax relief for certain activity. In this case, if the tax expenditures are not added, the tax quota is lower although the taxpayer's burden is the same. Messere notes the tax expenditures are apparently the most important element of the international incomparability of tax quotas.
Other interventions of this kind are government guarantees for loans which make the loans cheaper, obligation of the private sector to collect contributions for certain social benefits, government regulations due to which the private sector incurs costs or saves costs (environmental control, bank regulations, etc.). The government can also collect revenues from certain activities which are not classified as taxes such as revenues from lotteries which can be both tax income and non-tax income (government lottery).

2) Taxes paid by the government to the government. In other words, taxes paid between governments at different levels such as local real estate tax paid by the central government or payment by a government level to the same government level such as VAT included in the government purchases. According to the OECD statistics such payments are not excluded but they are enumerated, if possible. This is normally done in case of the contributions to social security paid by government officials but not in case of excise taxes.

3) Shadow economy. No taxes are paid from the shadow economy but its value is not reflected in the GDP estimation. The GDP reported by countries with a high share of non-market economy (i.e. illegal economy elements such as tax evasions as well as legal economy elements such as mutual assistance, values created at home, etc.) is underestimated which implies these countries report a higher tax quota than corresponding to the actual tax burden of the economy.

4) International comparability in tax quota measurement. This category includes a question whether the tax quota formula nominator should be GDP or GNP. In many countries the difference is negligible but in some it is considerable.
Messere also points out that if the GDP as the nominator is replaced by company profits for corporative tax, private consumption for excise taxes, etc. it would be more apposite expression of the tax burden. At present, so-called effective or implicit tax rates are recorded in the statistics for this purpose (European Union, 2009).
Although there is an international methodology for the measurement of indicators it is clear some incomparability caused by differing application of the methodology cannot be avoided. In addition, the data is not available in the same disaggregation for all countries.

1.2 Cash and accrual principle

The gross domestic product is reported based on the accrual principle according to ESA95 methodology, i.e. the items are recorded on accrual & deferral basis where each item is allocated to a calendar year to which it is related in terms of time and subject (a principle

known from the double-entry accounting), and not to a year when the related income/expenditure was accrued/incurred.

By contrast, the tax revenues can be set also on the cash basis. Under the cash approach the tax revenues are determined according to the amount which is recorded on the government accounts in the respective year and this recording does not depend directly on the time when the entity incurred the liability to pay the tax. The application of cash principle to determine the government tax revenues is easier than the application of accrual principle but it is inconsistent with the determination of GDP to which the taxes are measured. In the Czech Republic the cash principle is used for the state budget and state financial statement purposes because of the easy availability of the indicator.

OECD, IMF and Eurostat use the accrual methodology. This principle requires a good tax revenue estimation method because some taxes are often paid only after many years from the time when the taxpayer incurred the payment liability and other are not paid at all. If the accrual principle is applied the actual government revenues for a year can be determined only many years later which would be inefficient for the government. This is commented by Leoš Vítek: "The accrual reporting is fictitious and unverifiable to high extent. Any movements up to some 10 billion CZK are de facto unverifiable and dependent on the expert estimation of those preparing the data." (Vítek, 2006, p. 1). The methods applied include, for example, adjusted cash income. (For the estimation of government tax revenues based on the accrual principle see also OECD, 2004).

2 What are the quantitative implications of imperfect comparability of tax quotas?

It has already been mentioned the contributions to social security account for 40 % of the total tax quota in the Czech Republic. The issue of tax quotas I, II and III will not be handled in this paper any more and we shall stick to the tax definition according to OECD. However, we shall try to define an approximate range within which the tax quotas can differ as a result of other inconsistencies, as listed above.

The actual differences caused by differing methodologies or impossibility to cover certain tax quota sections in various countries and years by the methodology cannot all be detected. In a favourable case, which is quite probable, the incomparabilities will be largely set off while in the worse, less probable, case they will be cumulated so that the "distorted" tax quota will be incomparable with any other quota.

The most serious tax quota distortion will be caused by the tax expenditures and the shadow economy not included in the GDP calculation. In both cases ten of percents are involved according to the available estimates.

As indicated in the previous section, the tax expenditures are understood as amounts which reduce the tax paid as a result of a tax relief granted (deduction, credit, tax holiday, etc.). The tax expenditures are reported explicitly by some countries which makes the tax quota a more transparent indicator. For example, the inclusion of tax credits is handled by the OECD classification methodology (OECD, 2004, p. 28) in the following way:

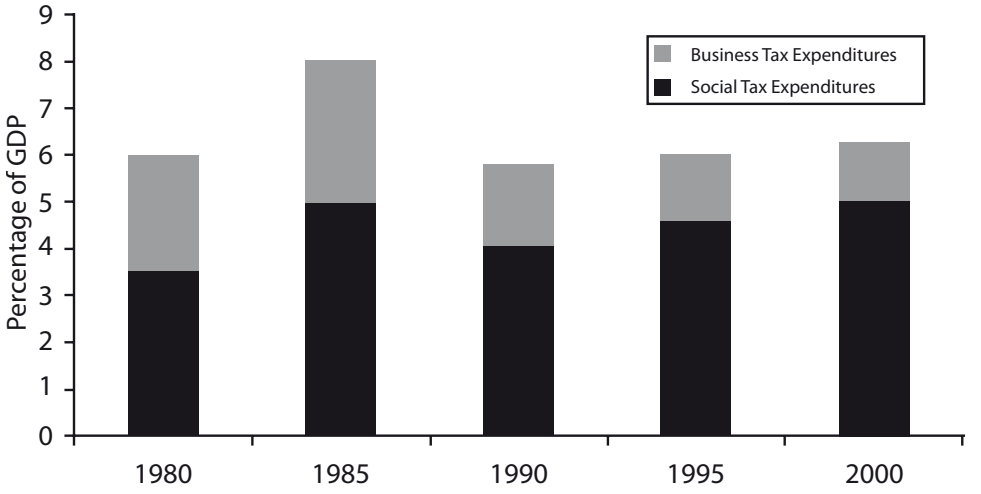
a) Wastable tax credits – included up to the tax liability amount.
b) "Non-wastable tax credits are tax credits that can give rise to a payment to taxpayers when the credit exceeds their liability for that tax. They are sometimes referred to as "payable" or "refundable" tax credits." They must be recognized as an expenditure item and not deducted from the tax revenues.

This information, i.e. tax expenditures for some taxes (personal income tax, corporate income tax) is reported only by some (predominantly Anglo-Saxon) OECD countries.

Annex 1 shows the tax levels in the United Kingdom. For instance, in 2006 the "tax expenditure component" of "non-wastable tax credits" accounted for about 1 % of the taxes. **Annex 2** indicates the Czech Republic does not publish this information (does not record this information in statistical reports).

Figure 1 illustrates the tax expenditure levels in USA between 1980 and 2000. In this case they amount to 6 – 8 percent points of the tax quota depending on the period.

Figure 1: Trends in tax expenditures 1980-2000 (as percent of GDP)



Sources: U.S. Office of Management and Budget (2000), Toder (1999)

Source: Burman (2003, p. 16).

According to the Figure 1, the highest tax expenditure level in USA was 8 % of GDP; in other countries it can be even higher. The tax expenditures in the amount of 8 % of GDP reduce the tax quota by 8 percent points.

As far as the shadow economy is concerned, there are various methods to estimate its value (for the discussion on the shadow economy value estimation see e.g. Schneider and Enste, 2002 or Orviská et al., 2006) and it is notorious that its size differs according to the regions. For instance according to Rettmen (2009) the shadow economy accounts for 10 – 18 % of

the official GDP in North Europe and Scandinavia and 20 – 25 % in the Mediterranean. Many post-communistic countries have the same size of shadow economy as the Mediterranean states while the shadow economy estimates for Estonia, Latvia, Romania and Bulgaria range from 36 – 39 %. And in Belarus, Moldova and Ukraine, the EU neighbours, more than half of the economic activities is not subject to taxation. The inclusion of shadow economy into the nominator when calculating the tax quota reduces the reported tax burden. (On this topic Rettmen notes in 2006 Greece included also the estimate of relatively high shadow economy value into its GDP aiming to circumvent the European fiscal discipline rules. This calculation was rejected by the Commission.) If, for example, Orviská et al. (2006) estimate the shadow economy value in the Czech Republic in 2002 at about 22 %, this means that the reported tax quota for 2002 would be reduced from 36.3 % (estimate by OECD) to 29.7 %, i.e. about 6 percent points, after the inclusion of grey economy into the GDP.

Based on the experience in the crisis which emerged in the autumn of 2008, it can be expected the cost of government regulations and guarantees as well as government non-tax revenues from activities carried out on the government account (such as lotteries) will represent a considerable item in many countries. This involves high sums with a strong redistribution function which are, unlike the taxes, hard to estimate. Therefore in USA, for example, there is the Regulatory Right-to-Know Act of 2001 which requires that the Federal Government submits to the Congress an annual report on costs of and benefits from the federal regulations. During fiscal year 2008 the benefits and costs for 14 major rules were quantified and monetized. These rules yielded from 8.6 to 39.5 billion USD of yearly benefits and represented from 8 to 9.3 billion USD of yearly costs. The main items are regulation of environmental protection, health care and humanity services, and transport (Draft 2009 Report, 2009).

The taxes paid by government are represented mostly by the contributions to social security. In the Czech Republic these taxes, which, in fact, should not be regarded as taxes because they result only in redistribution between budgets, amounted to about 51 billion CZK (see OECD, 2008, p. 235), equal to 4 % of the tax revenues and 1.5 percent points of the tax quota. In other countries it will be less since in the Czech Republic the level of the contributions to social security is one of the highest in the world (in relation to the GDP).

Minor differences can be found in case of the tax revenues calculated on the accrual or cash basis. The application of the two different principles may cause certain small differences in the tax quota level. The differences in a stable system will be smaller than in a system subject to frequent tax modifications or big year-by-year fluctuations in the GDP. Nevertheless the OECD statistical reports show not only accrual but also cash tax revenues of the individual member countries, if available (see OECD, 2008). The differences are on the order of p.p.m. to percents; in the Czech Republic, for instance, the yearly difference was 1.5 % of the tax revenues, i.e. also of the quota, which represents tenths of p.pm. points on the tax quota as such (see Annex 1)!

Conclusion

Although detailed international methodologies for the tax revenue and tax quota calculation are used in the long term (IMF, OECD) the tax quota indicator is not fully com-

parable in space and time. This is caused by the nature of the indicator which cannot encompass some factors both in the numerator (quantifying the tax revenues) and nominator (GDP but also GNP). The biggest inconsistencies, not to mention the contributions to social and health insurance which can be included or not, are caused by the existence of tax expenditures, shadow economy and government interventions, regulations and guarantees. Minor inconsistencies can arise due to the application of accrual or cash data on the selected taxes, taxes paid by a government to other government and in case of some countries also differences between the GDP and GNP. (In the global world the differences between the GDP and GNP are likely to grow also in other countries.)

The differences in the calculation arising for the reasons above are either set off or cumulated; in the worst case the difference in the tax quota can rise up to tens of percent points.

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Annex 1

Supplementary tax revenue data according to OECD for the Czech Republic (2003-6)

Pro-memory				
Customs duties paid to the EU			5 586	5 516
Total tax revenue on cash basis	553 499	772 272	1 127 973	1 168 195
Conciliation with National Accounts				
Total tax revenue on accrual basis (including EU custom duties)	550 230	773 422	1 121 600	1 193 117
Additional taxes included in National Accounts	-	-	5 024	5 384
Compulsory injury insurance			5 024	5 384
Driving licence fees			-	-
Tax excluded from National Accounts	- 21 762	- 37 207	- 19 209	- 17 245
Tax on use of public space	- 702	- 645	- 611	- 615
Waste deposit fee	- 1 123	- 454	- 5 179	- 5 163
Misc licence and permit fees	- 1 907	- 2 301	- 3 411	- 3 699
Radioactive waste fee	-	- 642	- 1 256	- 1 306
Health insurance: non-employed	- 144	- 483	- 1 607	- 1 848
Health insurance: government	- 13 302	- 27 464	-	-
Soc Security contr employers: Penalties	- 3 400	- 3 293	- 3 858	- 1 280
Soc Security contr Self-employed or non-employed:	- 229	- 172	- 211	- 130
Licence for lorry transport	-	-	-	-
Highway fee	- 955	- 1 753	- 3 076	- 3 204
Difference in treatment of tax credits	-	-	-	-
Capital transfer for uncollected revenue	-	-	-	-
Voluntary Social security	757	1 112	895	915
Miscellaneous differences	1 309	2 162	-	-
Compulsory social security contributions	-	-	-	-
VAT Own Resource	-	-	-	-
Other	1 309	2 162	-	-
National Accounts: Taxes and Actual social contributions	530 534	739 489	1 160 310	1 182 171
Imputed social contributions	123	423	397	423
National Accounts: Taxes and all Social contributions	530 657	739 912	1 108 707	1 182 594

From 1995 data are on accrual basis.
Source: Ministry of Finance, Economic Department.

Annex 2

Pro-memory										
Custom duties paid to the EU								1800	1909	2000
Non-wastable tax credits against 1110[1]						7454	3171	4651	16925	19386
Tax expenditure component						6973	2929	1233	4434	4407
Transfer component						481	242	3419	12391	13979
Non-wastable tax credits against 1210[1]						-	-	1	641	668
Tax expenditure component						-	-	-	462	508
Transfer component						-	-	1	179	160
Total tax revenue on cash basis	10945	19080	37343	81153	133701	202400	245706	351779	446161	479109
Conciliation with National Accounts										
Total tax revenue on accrual basis (including customs duties)						202579	249597	355313	447900	484032
Additional taxes included in National Accounts						1323	1901	2062	3303	3468
Tax excluded from National Accounts						-	-	-	-	-
Difference in treatment of tax credits						308	2913	1204	501	548
Capital transfer for uncollected revenue						-	-	-	-	-
Voluntary Social security contributions						39	53	90	82	117
Miscellanous differences						-	-	-	-	-
National Accounts: Taxes and Actual social contributions						204247	254364	359669	451796	489165
Imputed social contributions						396	5430	7889	7377	7283
National accounts: taxes and all social contributions						208213	259794	366557	459163	495449

Year ending 31st December.

From 1990 data are on accrual basis.

The community charge replaced domestic rates in Scotland in April 1989 and vas extended to England and Wales in April 1990. Since the tax is lump-sum levied on each adult in a hosehold, it has been classified in heading 6200 (domestic rates classified in heading 4100).

Heading 1210: The corporate tax figures include company income tax from 1990 onwards. Heading 2000 includes some voluntary contributions which cannot be separately identified.

1. The treatment of these figures in the data are consistent with the guidelines. The following method is adopted separately for Working Families "Tax Credit and Disabled Persons Tax Credit" paid from 1999 to 2009. For each calendar, a random sample of awards over-lapping the quarter is taken. Each recipient family's income tax liability for the fiscal year within which the quarter falls is calculated, based on the earned income reported for the award (updated to the middle of the overlap period). And the result multiplied by the number of days in the overlap period divided by 365. The tax expenditure component is defined as the minimum of this amount and the total amount of award paid in the overlap period. The total amount of award paid and the tax expenditure component are each summed over the sample cases, and the ratio is taken as the tax expenditure ration for the quarter. From 2003, the equivalent breakdown for Child and Working tax credits is based on household survey data.

Survey data is used to estimate the breakdown into the tax expenditure and the transfer components for the smaller tax credits.

Source: National Income and Expenditure, Central Statistical Office, Annual reports of the Inland Revenue and Customs Excise Department.

Source: OECD (2008, p. 219).

Contact address/Kontaktní adresa
prof. Ing. Květa Kubátová, CSc.
University of Finance and Administration, Prague
University of Economics, Prague
(kubatova@vse.cz)