

Regional GDP Compilation: Production, Income and Expenditure Approach¹

Jaroslav Kahoun² | *Czech Statistical Office, Prague, Czech Republic*

Jaroslav Sixta³ | *University of Economics in Prague, Czech Republic*

Abstract

Regional gross domestic product (GDP) per capita is one of the key indicators describing the level of regional economic disparities in individual countries. Besides it is used for international comparison as indicator for distribution of structural funds in the European Union. The aim of this article is to analyse possible methods of regional allocation of GDP on the basis of existing rules within the EU and in the Czech Republic. The scale of rules allows application of different methods and offers more varieties of conceptual approaches to regional allocation of GDP. First of all either income or production method is used exclusively for each industry in different countries differently, depending on data availability. Subsequently, possibility of expenditure approach is added. In cases of all methods there exist weaknesses, e.g. regional distribution of revenues or operating surpluses in cases of multi-regional companies and different methods of allocation mean a distinct regional view of overall economic performance.

Keywords

Regional accounts, regional GDP, gross value added

JEL code

E01, R11, R12

INTRODUCTION

Regional gross domestic product per capita is the most commonly used indicator for the comparison of regional disparities in economic performance. Analysis of regional disparities with particular emphasis on the specifics in differences between GDP and disposable income of households and their evaluation of development in time were made in some earlier studies (see e.g. Kahoun, 2010 or Chlad, Kahoun, 2011). Presented paper is aimed more at methodological issues in definition of regional GDP rather than comparing it with other indicators or its limited representativeness. It is aimed mainly at the methods of calculation of regional GDP, existing and conceptual approaches to regional GDP based on regional accounts experience in the Czech Republic and the applicable rules within the EU. The starting point for this study is the assumption that the methods of regional allocation of GDP have more varieties of conceptual

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² Czech Statistical Office, Na padesátém 81, 100 82 Prague 10, Czech Republic. E-mail: jaroslav.kahoun@czso.cz.

³ University of Economics, Nám. W. Churchilla 4, 130 67 Prague, Czech Republic. Author is also working at the Czech Statistical Office. E-mail: jaroslav.sixta@czso.cz.

approaches (mainly in regionalization of income and production items of gross value added) that can be used in different countries differently but can also in the same country offer a distinct regional view of overall economic performance. In the first two parts the general procedures used in the compilation of regional GDP and other indicators of regional accounts are briefly described together with description of current methodology of GVA allocation in the Czech Republic. There are definitions of individual methods used to regionalization of GVA: bottom-up, pseudo-bottom-up, top-down and mixed method. Main part of the article is aimed at analysis of income approach of regional allocation of GVA and at conceptual problems in regional allocation of operating surpluses in cases of multi-regional companies. Experimental regional calculation of all items of income approach for the Czech Republic is then presented in this article together with analysis of regional importance of operating surplus, compensation of employees and consumption of fixed capital. It is supplemented in final part of the article by description of possible regional allocation of GDP by expenditure method (mainly household final consumption).

1 GENERAL RULES FOR ALLOCATION OF REGIONAL GDP

For the calculation of macroeconomic indicators at the regional level there are not sufficient data for institutional units (legal entities), which are normally used in the compilation of national accounts. The information for individual local units is needed (respectively for separate units of enterprises). Since the data for local units are often not available, the statistics of regional accounts use some specific approaches for regional allocation of GDP (see Chlad, 2008). Methods of regionalization of national accounts indicators which are allowed in standard ESA 1995 (European System of Accounts) are the following:

- *bottom-up method* – is based on the necessary information about local units which are resident in the region (e.g. indicators of output and intermediate consumption for the calculation of GVA), the calculation procedure then follows the procedure used in the national accounts;
- *top-down method* – is based on the aggregates of national accounts data that are divided via the keys which are closely related to indicators measured (e.g. value added based on the structure of compensation of employees);
- *pseudo-bottom-up method* – aggregates are formed as an estimate for the local units from the institutional unit level or activity unit level (similar to top-down method but applied from the lowest level);
- *pseudo-top-down method* – the national data is allocated to regions according to the relative but not too closely related indicators;
- *mixed method* – it is a combination of several approaches and is common practice in most of EU countries.

For estimates of regional gross domestic product there is theoretically possible to apply three basic approaches as well as at the national level: production approach, income approach and expenditure approach (see ESA 1995).

Production approach measures the regional gross domestic product at market prices as the sum of gross value added at basic prices and taxes on products without the subsidies. Gross value added at basic prices is calculated as the difference between output at basic prices and intermediate consumption at purchase prices. Indicators of sales, activation and expenses are in the Czech Republic and very often also in other countries available only for the institutional units as a whole. On the other hand, almost no problem means breakdown of intermediate consumption because the costs of each activity and the local unit are usually well known. Major complication can arise with determination of the value of production of some local units. An important limitation of the multi-regional organizations is the problematic valuation of output per local unit in a typical case when the administrative unit of the company is located in one region and the entire manufacturing business activity is located in other region (problem of regional allocation of common sales).

Table 1 Regional GDP compilation by the production approach

Regional GDP by the production approach	Process of regionalization	Weaknesses
= Regional production	Regional information about sales of products and services, sales of goods for resale minus costs of goods sold, changes in inventory of own production and production for own final use	The problem is the valuation of production for the local unit in a multi-regional organizations (e.g. corporate headquarters, local units performing only administrative activity)
- Regional intermediate consumption	Regional information on material consumption, energy consumption and expenses for services incurred in making production	Usually not
+ Regional net taxes on products (not available by industries)	The usual procedure is the regionalization in the proportion of total regional GVA	Usually not

Source: Own construction

Income approach determines the regional gross domestic product at market prices through aggregation of variables in the generation of income account – compensation of employees, gross operating surplus and taxes on production and imports (without subsidies) in the regional breakdown. Information regarding employment and compensation of employees by industry is often available at regional level. This information is used for estimation of gross value added by industry either directly by income method or through the production approach. The information on gross operating surplus (including mixed income) appears to be the greatest weakness of the regional allocation of GDP by income approach. Gross operating surplus is generally not available broken down by region. Information on gross operating surplus of market producers can be derived from business surveys but usually it is not done even at national level in national accounts. Breakdown by institutional sectors and regions is usually not available in most of countries in the EU. This indicator complicates the use of the income approach for estimation of the regional gross domestic product.

Taxes on production and imports (excluding subsidies) consist of *taxes on products* (excluding subsidies) and *other taxes on production* (excluding subsidies). An allocation of taxes on products (excluding subsidies) is subject to a uniform methodology of the ESA which allows allocation of the regional structure in proportion of total regional gross value added. For other taxes on production (excluding the subsidy) data may be theoretically available by industry from business surveys or surveys based on a kind of tax or subsidy in detailed breakdown. These data may be the key for the allocation into regions or if not available the allocation can be done in the proportion of total regional GVA.

The expenditure approach is not commonly used for measurement of the regional gross domestic product in the EU countries due to the lack of information. Example of the lack of direct information is the intra-regional breakdown of exports and imports and final consumption is also disputable in terms of availability of regional data. To-date, official statistical authorities in the EU countries refused to do it with respect to the costs.

Actually, the problem of regional expenditures may be solved even with existing data sources. The key difficulties lie in the subjective and model based approaches that have to be used. It is very crucially connected with the responsible and qualified work with a lot of different data sources usually providing different results.

Table 2 Regional GDP compilation by the income approach

Regional GDP by the income approach	Process of regionalization	Weaknesses
= Regional compensation of employees paid by resident local units	Information is typically available in a breakdown by the local units and regions	Usually not
+ Regional operating surplus and mixed income, net	Auxiliary keys for regionalization (in the structure of related indicators)	Represents the biggest problem of the income approach – the issue of recording of operating surpluses in the headquarters of the companies / local units
+ Regional consumption of fixed capital	Information can be theoretically treated by local units and regions	In many countries there are no data in the regional breakdown
+ Net taxes on production and imports (taxes less subsidies)	Information can be theoretically treated or allocated in the proportion of total regional GVA	In most of countries there are no data in the regional breakdown

Source: Own construction

Table 3 Regional GDP compilation by the expenditure approach

Regional GDP by expenditure approach	Process of regionalization	Weaknesses
= Regional final consumption of households	Information from surveys in households, alternatively information from administrative sources	In many countries there are no data in the regional breakdown (the problem of representativeness of the samples)
+ Regional government expenditure	Information from administrative sources	In many countries there are no data in the relevant regional division
+ Gross capital formation (investment plus change in inventories)	The information is usually available or can be broken down by local units and regions	Need to estimate regional changes in inventories
+ Regional net exports	Information on intra-regional imports and exports	It constitutes the largest problem of the expenditure approach – the main reason why the EU countries do not use this approach

Source: Own construction

2 CALCULATION OF THE REGIONAL GVA AND GDP⁴ IN THE CZECH REPUBLIC (PRODUCTION APPROACH)

Calculation of regional gross value added in the Czech Republic is made on basis of production approach for sectors of non-financial corporations and enterprises in the sector of households (see Kahoun, 2009). Regional indicators of output and intermediate consumption are derived from the same data sources used to calculation at the national level. The calculation is broken down in the details of two-digit NACE level and a special approach of regionalization is applied to some methodological adjustments of national accounts: imputed rent, consumption of fixed capital in government sector (especially roads, highways, local roads and rail routes) and also for individual household construction and part of the illegal activities.

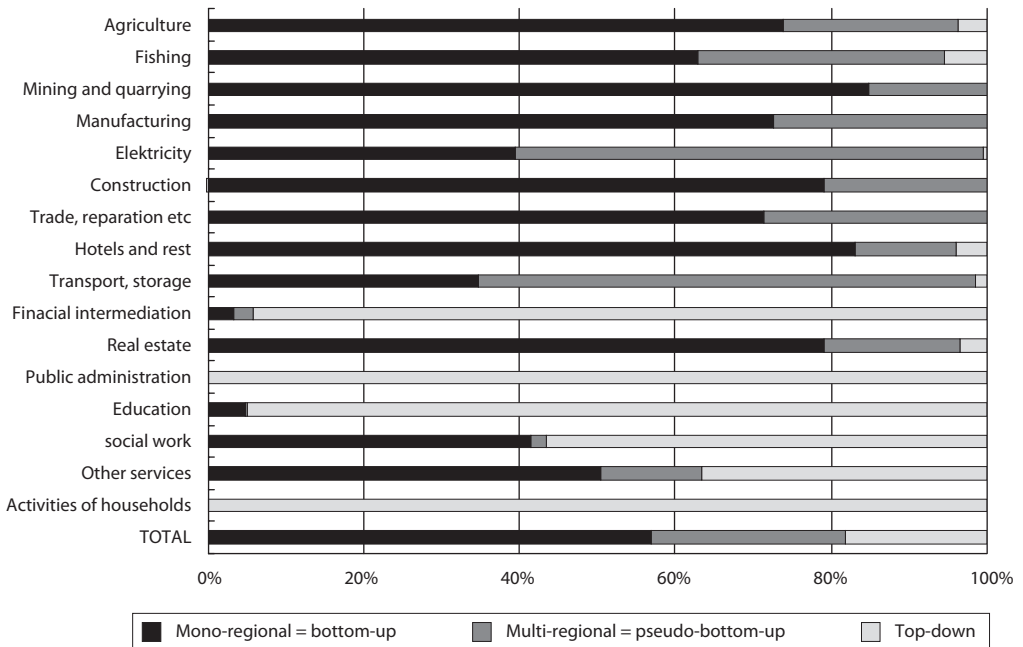
The prevailing approach for the production method is the pseudo-bottom-up process of regionalization. This procedure is based on estimates of activity data for the local unit by scheduling data for individual companies. This is similar to top-down method but not on the national level but on aggregated data for a single multi-regional institutional unit. The obtained data are then aggregated to get regional total sum in the same way as in the classical bottom-up method.

The method of pseudo-bottom-up is used for gross value added of major institutional sectors: non-financial enterprises (S.11) and households (S.14). The allocation of regional gross value added for other organizations (financial institutions, government institutions and non-profit institutions – S.12, S.13 and S.15) is done on basis of wages and salaries broken down by types of survey and required industry-regional breakdown. The structure of the wages and salaries is used as the key for top-down method of regional allocation of the remaining recorded gross value added in the national accounts (more specifically the value before methodological and other adjustments made in the final compilation of national accounts). Net top-down method based only on wages and salaries in this way is applied on 13.3 % of total national GVA in 2011.

After summarization of all the regional observed values there exists still more than one tenth of the gross value added from national accounts that remains not distributed. It is a part of the methodological adjustments of national accounts (excluding imputed rent and consumption of fixed capital for the government sector) and adjustments for exhaustiveness of the economy – includes the deliberate misrepresentation, underground economy, majority of illegal economy, units not subject to identification, etc. These data are regionally allocated according to the structure of total official regional gross value added in each sector. These estimates are mostly done at the national level without the possibility of the currently available and quality regional data. Estimates even at a national level are lacking a high degree of data accuracy. Ratios of bottom-up, pseudo-bottom-up and top-down methods of regional allocation of GVA before adjustment to National Accounts values (above mentioned) are presented in Figure 1.

Across industries there are noticeable differences in approaches to regional allocation of GVA (see Figure 1) which is caused by different approaches to the institutional sectors and different shares of institutional sectors in each industry (top-down method is used for government, financial institutions and non-profit institutions sectors and bottom-up is used for sectors of non-financial enterprises and households). While in the manufacturing, mining or energy industry almost exclusively bottom-up method is used (as well as in trade and construction), in industry of public administration and industry of financial intermediation almost exclusively top-down method is used. In total for the reference year 2006, around 49 per cent of GVA was regionalised by pure bottom-up method, almost 22 per cent by pure pseudo-bottom-up method, 9 per cent of total GVA falls on industry structure (grossing-up to National Accounts, ideal brake-force distribution for each region) and 21 per cent of total GVA (the rest) was estimated according to top-down methods.

⁴ Regional structures of GDP and GVA are the same. The difference between GDP and GVA (i.e. net taxes and subsidies on products) is allocated proportionally to the total GVA. Therefore, this chapter deals only with compilation of regional GVA.

Figure 1 Regionalisation methods of GVA according to industries in % (NACE Rev. 1)

Note: Percentage shows ratios of methods of regionalisation on total values of GVA before methodological adjustments and adjustments to National Accounts values.

Source: Czech Statistical Office, Regional GVA Inventory 2009 <http://apl.czso.cz/pll/rocnka/rocnka.indexnu_reg>

3 REGIONAL GVA AND GDP⁵ BY INCOME APPROACH

As it was already mentioned above, the calculation of regional GVA in the Czech Republic is carried out in the prevailing production method. The regional GVA of local units of multi-regional organizations (the organizations with activity in multiple regions) is based on the structure of the total wages and salaries paid by these organizations in various regions. The production method of calculation is therefore influenced by a key indicator of income method, i.e. compensation of employees. This mix of approaches is relatively consistent because compensation of employees constitutes the largest share of gross value added and they are easily detectable by the regions while the best quality identifiable data from Structural Business Survey are indicators characterizing the production method, respectively production and intermediate consumption (but not for local units). In regional accounts it is therefore necessary to find the key for the allocation of GVA for multi-regional organizations – those are the structures of wages and salaries.

An alternative approach would be to calculate the regional gross value added directly by the income approach but excluding compensation of employees it would be necessary to work with information about regional consumption of fixed capital and especially with regional operating surplus which is another important pillar of the income measurement of gross value added.

The following experimental calculation of income components of regional gross value added is made on the example of data from regional accounts of the Czech Republic for the year 2011. Assuming that the balance of production and income approaches must be balanced, *the operating surplus and mixed*

⁵ Regional structures of GDP and GVA are the same. Therefore, this chapter deals only with compilation of regional GVA.

income is equal to the difference between the total GVA established by production method and the remaining components of the income approach (compensation of employees, consumption of fixed capital and net other taxes on production and imports).

Formula for regional calculation of operating surplus and mixed income:

$$B.2n + B.3n = B.1g - D.1 - K.1 - (D.29 - D.39),$$

where:

B.2n + B.3n – regional net operating surplus and mixed income,

B.1g – regional gross value added established by production method,

D.1 – compensation of employees paid by regional resident local units,

K.1 – regional consumption of fixed capital,

D.29 – D.39 – regional net other taxes on production and imports (taxes less subsidies).

While the regional gross added value is known from regional accounts as well as compensation of employees (their regional structures make part of the obligatory data in EUROSTAT transmission programme from EU member states), there is necessary to estimate regional consumption of fixed capital and regional net taxes on production and imports.

Consumption of fixed capital (CFC) based on local units (or in regional breakdown) is not directly measured in the Czech Republic and its regional values are practically not available with current data sources. Because of these reasons it is necessary to find the appropriate key for the regional distribution of national values by top-down method (for details of methodology of CFC calculation at national level see Sixta, 2007). The traditional available statistical indicator of regional accounts is gross fixed capital formation (GFCF) – for its regionalization Czech statistics uses traditional data on regional acquisitions of tangible and intangible assets in structural business survey.

In the years 2002–2004 also a specific section on total fixed assets by region existed in the structural business survey. Fixed assets data from 2004 and their regular update on newly acquired assets and depreciation of assets until 2011 can therefore serve as the basis for the experimental calculation in this article (depreciated can be only these assets that were acquired in the past and the regional structure of total fixed assets should be very close to the regional structure of the estimated indicator). Resulted values of regional fixed assets in 2011 are therefore used as weights for the regional distribution of consumption of fixed capital from national accounts for 2011. Moreover, there was made the comparison of the regional structure of total fixed assets based on methods mentioned above with the total cumulative regional values of investments from 1993 to 2008 for which data are available in surveys (it was based on the assumption that the regional structure of consumption of fixed capital is very close to the regional structures of historical accumulated values of assets acquired or sum of GFCF) and the results indicated very similar regional structures in case of both aggregates.

Special approach is applied on CFC for dwellings where the key for distribution is estimated from the value of dwellings as a result of regional price per m² multiplied by regional area of flats in 2001 Census with updating of data on new housing construction and depreciation until 2011. Special approach is applied also on CFC for roads, highways, local roads and railways based on length of different types of routes in the regions.

Another relatively small item that has to be estimated by top-down method is *net other taxes on production* that are directly part of GVA (*D.29 – D.39*). In this case we can choose an equivalent procedure that is recommended by EUROSTAT for the production method in case of net taxes on products (*D.21 – D.31*). This recommendation allows the regional allocation of net taxes on products in the structure of the total gross value added in the regions (the shares of regional gross value added on the total national values). This procedure is allowed due to the fact that in the most countries regional data on taxes on

products is usually not available and in the case of taxes on production and imports it is usually the same in most countries (as well as in the Czech Republic). However, regional allocation of net other taxes on production is done for each sector separately and, therefore, the resulting regional structure offers a different view in comparison with total GVA (due to the importance of subsidies in each sector – the largest part of subsidies is concentrated in the agricultural sector what significantly reduce the share of the capital of Prague in comparison with other regions).

The remaining value to a total gross value added is *net operating surplus* (including mixed income). Table 4 shows the absolute amount of individual income components of gross value added in the regions NUTS 3 in the Czech Republic based on above mentioned experimental methodology (the regional structure in percentage is then showed in Table 5 in Chapter 3.1).

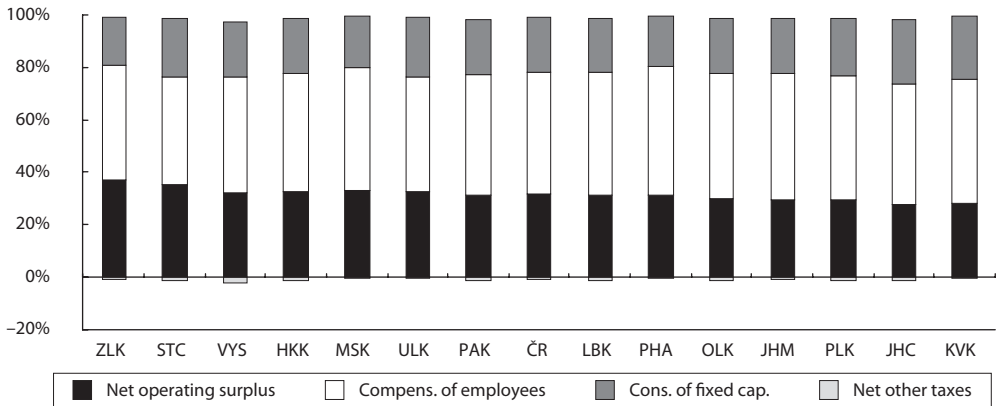
Table 4 The estimated values of the income components of the regional gross value added in million CZK, year 2011

Regions of the Czech Republic, year 2011	Compensation of employees D.1	Consumption of fixed capital K.1	Net other taxes D.29 – D.39	GVA B.1g	Net operating surplus B.2n
Česká republika	1 625 776	731 127	-30 244	3 444 465	1 117 806
Hlavní město Praha	421 870	165 884	-2 834	856 706	271 786
Středočeský kraj	157 563	85 768	-4 393	373 662	134 724
Jihočeský kraj	82 794	44 948	-2 434	175 632	50 324
Plzeňský kraj	81 954	37 661	-2 015	168 107	50 507
Karlovarský kraj	34 165	17 074	-305	71 116	20 182
Ústecký kraj	96 270	49 807	-1 226	216 366	71 515
Liberecký kraj	53 151	23 067	-1 381	110 413	35 576
Královéhradecký kraj	72 428	33 972	-1 926	157 382	52 907
Pardubický kraj	65 456	30 168	-2 109	138 484	44 969
Vysočina	64 718	31 275	-3 337	139 874	47 218
Jihomoravský kraj	176 462	76 666	-3 653	357 805	108 331
Olomoucký kraj	79 100	35 113	-1 920	162 035	49 742
Zlínský kraj	72 516	30 516	-1 128	163 939	62 035
Moravskoslezský kraj	167 329	69 207	-1 584	352 944	117 991

Source: Czech Statistical Office, own calculation (experimental)

Figure 2 shows a structure of gross value added broken down by individual components in ranking according to the shares of operating surplus on gross value added in 2011. The results logically indicate relatively higher share of operating surplus in regions with either lower share of compensation of employees or lower share of consumption of fixed capital (Zlínský, Středočeský and Vysočina). Especially historically lower level of wages and salaries can strengthen the share of operating surplus if region is economically successful at present. On the other side historically higher level of wages and salaries can be limitation for operating surplus at present (Praha, Jihomoravský) especially if the region is in phase of economic downturn (Karlovarský).

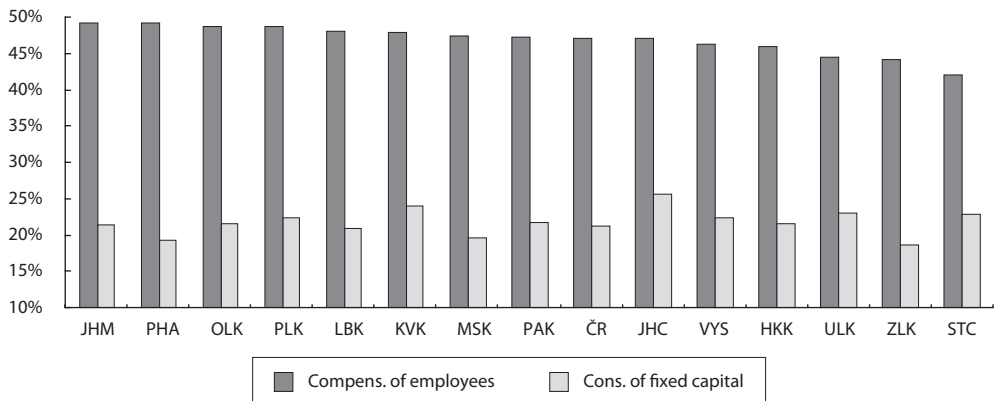
Figure 2 Structure of gross value added in regions – items of the income approach in %, year 2011



Note: Ranking by the estimated share of the operating surplus on GVA.
 Source: Czech Statistical Office, own calculation

Figure 3 shows the regions ranking according to the shares of compensation of employees in the gross value added and in comparison with the proportion of consumption of fixed capital to gross value added (second column). These two factors can be considered as labour and capital parts of GVA as they reflect the influence and involvement of these two factors of productivity in regional GVA (for more about factor productivity at national level, see e. g. Fischer, Sixta, 2009). Ranking of regions in the Figure 3 is, to a certain extent, reverse to the previous Figure 2 since regions with a high share of operating surplus (sort criteria in Figure 2) account often for a smaller share of compensation of employees. The importance of capital over wages can be expected in industrial regions and smaller in regions dominated by services (Praha). High proportion of consumption of fixed capital is in regions Karlovarský, Ústecký, Jihočeský. The specifically high level of CFC in the region South Bohemia (Jihočeský) reflects the capital adequacy in energy industry (Temelin nuclear power plant) and similar effect plays an important role in the region Vysočina (Dukovany nuclear power plant).

Figure 3 Comparison of the shares of compensation of employees and consumption of fixed capital on regional GVA (“labour” and “capital” part of the gross value added), year 2011



Note: Ranking by the share of compensation of employees on GVA.
 Source: Czech Statistical Office, own calculation

3.1 The problem of regional allocation of the operating surplus

In Table 5 in the last column the regional structure of the net operating surplus is indicated as it is based on the assumption of the balance between income and production method (the result of previous experimental calculation). Production method is, in this case, regarded as decisive for the total amount of gross value added. Nevertheless, in case of production method it is necessary to take into account the fact that the calculation of regional gross value added for multi-regional organization by pseudo-bottom-up method is based on the regional structures of wages and salaries of individual companies (because of limited data sources). This means that remaining items of the income calculation of GDP (above mentioned) are theoretically for multi-regional organization also distributed in the structure of wages and salaries (i.e. including their operating surpluses). This is pretty simplistic and made purely with regard to the absence of the necessary regional data. Moreover the operating surpluses are expected to be more important just in cases of multi-regional organizations (electricity companies, banks, telecommunication operators etc.) and also in technology-intensive regions (see Ženka, Čadil, 2009).

An alternative procedure of calculating of GDP could therefore be the allocation of income components of gross value added separately even with a rough approximation of regional structures of operating surplus, capital consumption and other indicators. The fundamental problem remains in finding a key for regional allocation of operating surplus. It makes the further progress in this direction difficult and, therefore, the calculation of regional GDP by income approach in most countries is not realized or if so, then only in a smaller part of the gross value added.

Table 5 Regional estimated structures of the income components of GDP in % of national GVA, year 2011

Regions of the Czech Republic, year 2011	Compensation of employees D.1	Consumption of fixed capital K.1	Net other taxes D.29-D.39	GVA B.1g	Net operating surplus B.2n
Česká republika	100.0	100.0	100.0	100.0	100.0
Hlavní město Praha	25.9	22.7	9.4	24.9	24.3
Středočeský kraj	9.7	11.7	14.5	10.8	12.1
Jihočeský kraj	5.1	6.1	8.0	5.1	4.5
Plzeňský kraj	5.0	5.2	6.7	4.9	4.5
Karlovarský kraj	2.1	2.3	1.0	2.1	1.8
Ústecký kraj	5.9	6.8	4.1	6.3	6.4
Liberecký kraj	3.3	3.2	4.6	3.2	3.2
Královéhradecký kraj	4.5	4.6	6.4	4.6	4.7
Pardubický kraj	4.0	4.1	7.0	4.0	4.0
Vysočina	4.0	4.3	11.0	4.1	4.2
Jihomoravský kraj	10.9	10.5	12.1	10.4	9.7
Olomoucký kraj	4.9	4.8	6.3	4.7	4.4
Zlínský kraj	4.5	4.2	3.7	4.8	5.5
Moravskoslezský kraj	10.3	9.5	5.2	10.2	10.6

Source: Czech Statistical Office, own calculation (experimental)

4 REGIONAL GDP BY EXPENDITURE APPROACH

Regional expenditure approach should be mainly connected with household consumption and gross fixed capital formation. Government consumption and NPISH consumption expenditures are from the most important part (non-market output) identical with production approach. The only remaining issue is social benefits in kind covering mainly government expenditures on health and social issues. The issue of interregional export and import may be set aside. The key advantage of expenditure method is not computation of GDP but the comparison of domestic final demand with resources (disposable income). Therefore, net export can be obtained as a balancing item between production and expenditure approach. Comparison of ratios of individual components of expenditure approach on regional GDP (final consumption of households, final consumption of government as well as net export) can then provide a completely new and useful view on regional economic disparities and drivers of economic development in the regions.

In case of GFCF the data are normally available for regions NUTS 3 and NUTS 2 in regional accounts published by the Czech Statistical Office. As the most important task it is necessary to find the suitable indicator for regional distribution of household final consumption expenditure (for each group of CZ-COICOP based on annual national accounts data). In cases where regional data are not available from administrative or other data sources, household budget survey can be used as a primary source. "Cash expenditure per capita" are the part of household budget survey for the Czech Republic published by regions NUTS 2 and the distribution of values from the NUTS 2 to NUTS 3 level can be done e. g. by the number of inhabitants in NUTS 3 regions. Demographic and other supporting indicators could be also

Table 6 Regional experimental calculation of household final consumption (HFCE) and disposable income of households (DIH)

Regions of the Czech Republic, 2009	Regional structure of HFCE in %	Regional structure of DIH in %	Regional HFCE per capita in % of national HFCE per capita	Regional DIH per capita in % of national DIH per capita
Česká republika	100.0	100.0	100.0	100.0
Hlavní město Praha	15.5	15.2	130.7	128.3
Středočeský kraj	12.5	12.7	106.1	107.7
Jihočeský kraj	5.7	5.8	93.3	96.1
Plzeňský kraj	5.1	5.3	93.5	98.2
Karlovarský kraj	2.6	2.7	89.8	90.5
Ústecký kraj	7.3	7.2	91.0	89.9
Liberecký kraj	3.8	3.9	91.8	93.5
Královéhradecký kraj	5.0	5.2	94.3	98.5
Pardubický kraj	4.6	4.7	93.7	94.9
Kraj Vysočina	4.5	4.7	91.4	94.9
Jihomoravský kraj	11.2	10.8	102.4	98.5
Olomoucký kraj	5.7	5.6	93.9	92.2
Zlínský kraj	5.4	5.3	95.3	93.8
Moravskoslezský kraj	11.1	10.9	93.1	91.6

Source: HFCE – experimental calculation (see Kramulová, Musil, 2013), DIH – official data of Czech Statistical Office

used in cases where for some groups of CZ-COICOP sufficiently large sample of households do not exist in household budget survey at regional level. The limited reliability of samples in household budget survey is unfortunately the problem in general and it is the complication for using of expenditure method not only at regional level. Social benefits in kind can be regionally allocated predominantly according to the physical or value indicators from the hospitals or value indicators from health insurance companies.

Table 6 shows the comparison of regional household consumption expenditures based on experimental calculation of experts from University of Economics in Prague with regional disposable income. Comparison of regional disposable income and household consumption in household sector leads to the description of living conditions of households. This is far away from qualitative indicators given by e.g. SILC. Analysis of disposable income in relation with consumption should lead to more reliable results. It also shows the potential of the region from the perspectives of savings. In the experimental calculation higher share of region on national disposable income than on consumption (it means higher savings) was reported mostly in the Bohemian regions (Středočeský, Jihočeský, Plzeňský, Královéhradecký, Vysočina) while in the Moravian regions except Vysočina as well as in region Praha and Ústecký the share of region on disposable income was lower than on final consumption.

CONCLUSION

The issue of regional allocation of gross value added and GDP has its bottlenecks mainly due to inability to capture all transactions between regions but still existing needs to identify all the characteristics required for the calculation of GDP whether by production, income or expenditure approach. In all cases for the calculation of regional GDP there is necessary to implement certain approximations, simplification and auxiliary keys and in all countries there is a choice of several different processes which is allowed in accounting standard ESA 1995 (or newly ESA 2010). The usual procedure in the majority of EU countries (applicable even in the Czech Republic) is the calculation of regional GVA by production method because the most identifiable data from statistical surveys are indicators characterizing the production method – i.e. the revenue and intermediate consumption for which it is necessary only to find some regional key for the allocation of data for multi-regional organizations (usually wages and salaries or number of employees, if the question on the revenues and expenses is not proceeding directly by the local units). In some countries the income approach is used as a basic especially where reliable data on the regional capital consumption are available. The example of experimental calculation of regional gross value added by income approach for the Czech Republic was illustrated in this article. There was indicated not only the regional structure of the income components of gross value added but also conceptual problems connected with estimation of the regional operating surplus. The same and even greater problems arise even in the case of application of expenditure approach how it is described in the final part of the article (especially for indicator of net export and complicated determination of reliable data source for distribution of household final consumption). These problems lead to the conclusion that the production method (despite the difficulties associated with the allocation of revenues to local businesses and the units carrying out only administrative activities of enterprises) is the most feasible procedure for calculation of regional GDP in the Czech Republic. Production method implemented in the Czech Republic calculates the total regional gross value added for uni-regional organizations in equivalent procedure as in the national accounts. This is relatively minor inaccuracy in comparison with the income approach that tackles with the problems of limited data sources for direct calculation of the regional consumption of fixed capital and both conceptual and data limitations for the calculation of regional operating surpluses and even more in comparison with the expenditure approach that tackles with problems related to limited data sources in its most important item, i.e. final consumption and finally with inability of direct measurement of net export.

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