

EVALUATION OF THE IMPACTS OF RURAL DEVELOPMENT POLICY MEASURES ON THE LOCAL ECONOMY IN THE CZECH REPUBLIC

DOI: 10.18267/j.pep.545

Zuzana Bednaříková*

Abstract:

The objective of the paper is to analyse and evaluate the impact of measures supporting job creation, within the Rural Development Programme of the Czech Republic for 2007–2013, on regional production, income and employment in the Vysočina region by using structural input-output analysis. The regional input-output model built on the example of the Vysočina region serves as a tool for the analysis. To perform the impact analysis a regional input-output table for the Vysočina region was constructed by using GRIT method. A part of the analysis is the identification of factors that influence the size of the impacts found. The main findings show that analysed measures have positive impact on regional economy of the Vysočina region, mainly in terms of impacts on production. However, final impacts on production, income and employment are very low. Impact analysis indicates that investment in tourism represents an important factor leading to the improvement of Vysočina region's economy.

Keywords: input-output analysis, impact analysis, GRIT, regional economy, rural, Vysočina Region

JEL Classification: R15

1. Introduction

Rural areas undergo major economic and social changes. Many rural areas, particularly peripheral and structurally affected areas, are facing population decline, difficulties in developing new and maintaining existing jobs, declining economic performance and social exclusion (Ballas *et al.*, 2006). On the other hand, rural areas offer real opportunities for a creation of new industries, developing tourism, offer a suitable environment for life and work, serve as a reservoir of natural resources and have a very valuable landscape (European Commission, 2006).

Efforts to stabilize rural areas and their social structures are supported in the European Union (EU) Member States and thus in the Czech Republic, too. The main role of rural development policy is to establish a sustainable and coherent framework for the future of European rural areas. The scope of intervention in these areas is growing; from an approach that was solely focussed on agriculture it has changed to one supporting balanced and sustainable development in rural areas in the EU. Based on Agenda 2000, the rural development policy was established as the second pillar of the Common Agricultural Policy of the EU. For the period 2007 – 2013, rural development is implemented through one fund and the objectives of the policy have been simplified.

* Zuzana Bednaříková, Institute of Agricultural Economics and Information, Prague, Czech Republic (zuz.bednarik@gmail.com).

The objectives are focussed on the three thematic axis: improving the competitiveness of agriculture and forestry (Axis 1), improving the environment and the countryside (Axis 2), improving the quality of life in rural areas and encouraging diversification of economic activity (Axis 3). Pillar 1 of the CAP consists of EU aid guaranteed by the farmers in the form of direct payments.

Although the rural development policy deals with rural development, majority of all measures are focussed on farming and promoting restructuring and diversification. Only few measures encourage non-agricultural activities (Korf and Oughton, 2006). Rural policy has impacts not only on agriculture, food production and rural economy but also on sectoral issues, such as community sustainability, transport, housing, health and education. This wide range of interests “draws variety of groups with competing interests and tends to increase politicization and conflict” (Keating and Stevenson, 2006). However, the multipurpose rural and agricultural policy reputedly aiming at the provision of a large set of heterogeneous public goods will be likely confirmed and reinforced even in the next decade (Esposti a Sotte, 2013). Hierarchical and centrally prescribed CAP does not allow to tailor instruments and delivery to local needs and opportunities (Dwyer *et al.*, 2007). This leads to insufficient acceptance of regional differences in rural regions (Bednaříková, 2009). An assessment of the impacts of interventions in the form of rural development policy measures helps to re-design a policy programmes to make it more effective and efficient (by taking into consideration costs of intervention) (European Commission, 2010). It is also important for planning the development strategy for rural areas. Rural development policy in the EU is implemented through national Rural Development Programmes. In the case of the Czech Republic it concerns the National Strategic Rural Development Plan of the Czech Republic for the period 2007–2013, which is implemented through the Rural Development Programme of the Czech Republic for the period 2007–2013 (RDP).

While rural development policy covers a wide range of aims, including protection of the environment, in many countries the emphasis focuses on the economic viability of rural regions (Midmore *et al.*, 2010). In the context of the economic viability of rural regions, in rural development policy attention focuses on public expenditure impacts on economic growth, income, and employment in rural areas (Johnson *et al.*, 2010).

The analysis carried out in this work focussed on selected measures of Axis 3 of Pillar 2 of the EU CAP which support job creation in rural areas and try to address the fall in job opportunities in agriculture and the food production sector by supporting other activities. 50% of the funding of Axis 3 has been allocated to these measures.

The reason for analysing these measures is firstly their importance when resolving the drop in work opportunities in the agricultural and food sector by supporting other activities, in particular diversification of agricultural activities, setting up micro-enterprises and entrepreneurship in tourism. Secondly, impacts of these measures on production, incomes and employment in a region are measurable. Thirdly, it is necessary to highlight the fact that a higher rate of unemployment and efforts to create new and support existing jobs are one of the highly discussed topics among rural development issues. Small and middle enterprise is a part of the regional economy and an important source of employment (Meccheri and Pelloni, 2006) and increases in income (Skuras *et al.*, 2005).

The objective of the paper is to analyse and evaluate the impacts that measures supporting job creation in the RDP have on regional production, incomes and employment

in the predominantly rural Vysočina Region. Specifically, it concerns the measures in the framework of Axis 3 of Pillar 2 of the CAP supporting diversification into non-agricultural activities (Measure 311), small business (Measure 312) and the development of tourism (Measure 313). The regional input-output model serves as an analysis tool.

The impacts of measures supporting job creation in the framework of the RDP are ascertained *via* an input-output model based on Leontief input-output analysis (Leontief, 1966). To analyse the impact it is necessary to construct a regional commodity input-output table for the Vysočina Region. To regionalise a national input-output table and obtain a regional input-output table the Generation of a Regional Input-Output Table (GRIT) technique is used (Jensen *et al.*, 1979).

2. Background to the Studied Region

The Vysočina Region was chosen as a case region because it has typical rural characteristics and, in accordance with the OECD classification (DG AGRI, 2009a), it is the only predominantly rural region in the Czech Republic. In addition, Vysočina makes significant use of funds from the RDP.

The Vysočina Region has a central position in the Czech Republic. It differs from the neighbouring regions by the segmentation of the territory, its higher altitude and low population density. With a population density of 75.7 inhabitants/km² the region is far below the average for the Czech Republic (133 inhabitants/km²). The fragmented settlement structure contributes, in some cases, to a depopulation of the smaller municipalities and negative migration of young and qualified inhabitants. In accordance with the OECD classification it is the only predominantly rural region in the Czech Republic.

Historically the Vysočina Region has a high proportion of agricultural production and currently has an agro-industrial character. Despite a drop of the primary sector's share in the overall economy, its share was 8.2% in 2009, which was the largest of all the regions in the Czech Republic. Small and medium-sized businesses predominate in industry. Development trends, however, are determined by large industrial enterprises. Particularly important sectors in the region's industrial production are engineering and metalwork, textiles, wood processing and food. In 2010 the Vysočina Region had the lowest registered number of business entities *per* 1,000 inhabitants of all 14 regions in the Czech Republic, which illustrates the lower degree of entrepreneurial activity.

The region's economic performance is lagging behind the national average. Its share in the Czech Republic's gross domestic product has recently been around 4%. In 2010 the region's gross domestic product *per capita* amounted to 81.5% of the average for the Czech Republic.

The impacts of the economic crisis were manifested in a sectoral division of the workforce. From the start of the 1990s up to 2008 the number of those employed in the secondary sector predominated (49%). From 2009 onwards, due to job losses in industry, the tertiary sector slightly predominates.

The Vysočina Region offers suitable conditions for the development of tourism, recreation and sport, mainly due to its diverse landscape. Nevertheless, the region's tourism potential is insufficiently used, primarily due to the low quality of services and the transport infrastructure.

The Vysočina Region is among the top three regions in the Czech Republic, which make most use of subsidy funds from EU programmes. Almost CZK 1.67 billion (EUR 64.2 mil.) of funds from the monitored RDP measures supporting job creation were used in 2007–2012, which was the most of all the 14 regions of the Czech Republic. Likewise, the Vysočina Region dominated in the number of approved projects, with a total of 231 projects.

3. Modelling Framework

3.1 Methodology

Johnson *et al.* (2010) pointed out that empirical models must reflect the specific characteristics of the rural economy if they are to be a suitable analytical tool for evaluating rural development policy. These features include the fact that the rural economy is often dependent on relatively few sectors; the residential function of rural areas is growing, while not all rural residents contribute to the local workforce or spend all their income in the given location, and there is a strong interaction between the town and the countryside in many rural areas.

In recent years impact analyses of development policies were carried out by using different approaches such as CGE models (Pouliakas *et al.*, 2007; Balamou *et al.*, 2009; Psaltopoulos *et al.*, 2011), HERMIN model (Bradley, 2006), Johansen's type of model (Doyle *et al.*, 1997), custom-built budget model and land use model DG AGRI (2009b), Leontief models *etc.*

Until now most of the analysis of agricultural and rural development policies impacts on rural economy has been based on Leontief models which are aimed at the mutual economic links that exist in the economy. Leontief models can either be based on an input-output table (Gould and Kulshreshtha, 1986; Mattas and Shrestha, 1991; Gilchrist and St. Louis, 1994; Bonfiglio, 2005; Thomson and Psaltopoulos, 2005; Mattas *et al.*, 2010), in this case the focus is on inter-sectoral relations, or a social accounting matrix SAM (Roberts 1998; Psaltopoulos *et al.*, 2004; Psaltopoulos *et al.*, 2006), this model incorporates transactions between different types of economic actors, such as firms, households and the government.

There are several reasons for choosing an input-output model. Input-output models are popular and convenient tools for assessing the regional economic impacts associated with rural development policy measures including the measures that are analysed in this paper. An input-output model can be applied to any region, for which the data on sectoral employment are available. The model creates many different indicators, which are specific for evaluating the regional effects of measures from Axis 3 of the Rural Development Programme and can show the impacts of these measures on production, incomes and employment in individual sectors and the observed economy.

Records on the impacts of the CAP and the rural development policy outside the agricultural sector are, however, still very few (OECD, 2010). Data difficulties and the fact that the economic effects of rural development policy measures are probably low (even in the case of small open rural economies), due to the small financial recourses allocated to Pillar 2 in comparison with Pillar 1 and other national and EU policies affecting rural areas (Hill and Blandford, 2008), may influence the interest of researchers. The impacts of rural development policy in Romania were monitored in the work of Bonfiglio (2005),

which assessed the impacts on employment and employees' income. In contrast to other small open countries or regions, the realisation of rural development policy in regions in Romania will lead to large positive impacts on income and employment. Economic impacts of CAP measures have been evaluated in the paper by Psaltopoulos *et al.* (2006). Impacts of support to diversification in the Greek study rural area Archanes on output and income are lower than expected for a small open local economy and reach 0.4% and on employment 0.7%. Psaltopoulos *et al.* (2011) found significantly lower impacts of support to diversification in the Czech rural area Bruntál. Output increases only by 0.06% and employment increases by 0.19%. The results of impact analysis made by Bergmann *et al.* (2009) show that Axis 3 expenditure has positive effects in near-urbanised regions in Central Europe, however, in peripheral region is unlikely to be sustainable without continued EU support.

The impacts ascertained by using an input-output model are attributed solely to policy measures; therefore interpretation of the results is simple. These impacts arise by means of linear behaviour and the absence of price impacts, resulting in the primary factors in each sector being easily available. These prerequisites are necessary primarily due to the lack of knowledge about non-linear relations (Armstrong and Taylor, 2000).

3.2 Application

The impact analysis is based on an input-output model. To perform an input-output analysis of the Vysočina Region, it is necessary to have a regional input-output table for the Vysočina Region. This input-output table is the data source for the input-output model, through which an input-output analysis can be performed. Since regional input-output tables are not available in the Czech Republic, it was necessary to construct this input-output table.

The mechanical part of the GRIT (Generation of Regional Input-Output table) methodology (Jensen *et al.*, 1979) was used for the regionalisation of the national input-output table to obtain a regional input-output table for the Vysočina Region.

This method was chosen primarily because, according to Johns and Leat (1987), the GRIT method is particularly suitable for small regions, as it allows more accurate detection of the (expected) low values of the multipliers that characterize a small regional economy. Thanks to this, GRIT can be used to create regional input-output tables even for very small regions, such as, for instance, the Vysočina region.

At the same time GRIT is a popular regionalisation technique used in many studies involved in evaluating policy impacts, *e.g.* West *et al.* (1979), Hubbard and Brown (1979), Johns and Leat (1987), Psaltopoulos and Thompson (1993), Tzouvelekas and Mattas (1999), Ciobanu *et al.* (2004), Sila and Juvančič (2005). A further advantage of GRIT is its relatively small demands on time and finances, because most of the data for the regional input-output table can be obtained by mechanical calculations and then the regional data can be elaborated from available sources in the final stage.

Due to the lack of primary data, the regional symmetrical input-output table for the Vysočina region was derived from national commodity input-output table of the Czech Republic for 2007 (CZSO, 2012). The year 2009 was determined by the availability both national input-output table and data from other secondary resources. National input-output table consists of 59 commodities defined by Standard Classification of Production

valid from 1st January 2003.¹ Commodities were transferred to industries whose products they are. Sectors correspond to Sectoral Classification of Economic Activities.² The process of regionalization of a national commodity input-output table was based - with regard to data availability - on data on national and regional sectoral employment in 2009 provided by the Czech Statistical Office. The result is a symmetric 15 sectoral regional input-output table for the Vysočina Region for 2009. The regional symmetric input-output table thus created (Annex 1) contains 13 of the most important sectors for the regional economy, the remaining sectors are aggregated into “other industry” and “other services” depending on their focus.

Data on gross value added of individual sectors and the value of the gross fixed capital for the year 2009 was available from Regional Accounts. The new values of gross value added and gross fixed capital were split according to the original values between individual sectors included in the created regional input-output table for Vysočina Region. Data on regional export for the year 2009 was collected from the Statistical Yearbook of the Vysočina Region (CZSO, 2010). Data on regional export is considered only as informative since regional export represents export to the rest of the world in the regional input-output table. This means that it includes export from the region to the rest of the Czech Republic as well as outside the Czech Republic. When creating regional input-output tables for the Vysočina Region the lack of regional input data was manifest, in particular the values of regional sectoral production, regional incomes and the import of goods to the various sectors.

One of the main uses of the information from the input-output model is to identify the impact of exogenous changes in demand for regional production. Among the most commonly used multiplier are those that probe the impacts of exogenous changes on demand for (a) the production sector in the observed economy, (b) household incomes in each sector due to a change in production and (c) employment (in physical units) that occurs due to changes in production (Miller and Blair, 2009).

The importance of multipliers is based on the difference between the initial or direct impact of exogenous changes and the total impact of these changes. The overall impact can be defined as either direct and indirect effects (these can be traced in the input-output model, which is open with regards to households) or direct, indirect and induced impacts (these can be traced in an input-output model, which is closed with regards to households). In an open input-output analysis households are separated (exogenous households) from manufacturing sectors and household consumption is separated from the labour supply. In a closed input-output analysis households are treated as if they were manufacturing sectors (endogenous households). This means that they are included in the technical coefficients matrix and an increase in household income can lead to increased consumption of local goods and services by households.

The impact analysis is based on the inverse Leontief matrix B in the case of exogenous households and the inverse Leontief matrix B^* in the case of endogenous households.

1 For statistical purposes the Standard Classification of Production has been replaced by Classification of Production (CZ-CPA) since 1st January 2008.

2 Sectoral Classification of Economic Activities has been replaced by Classification of Economics Activities (CZ-NACE) since 1st January 2008.

In the case of exogenous households the model's form is:

$$\mathbf{X} = (\mathbf{I}-\mathbf{A})^{-1} \mathbf{Y} = \mathbf{B}\mathbf{Y} \quad (1)$$

where \mathbf{X} represents a vector of the output of each sector, \mathbf{I} is an identity matrix, \mathbf{A} is a matrix of technical coefficients, \mathbf{B} is the inverse Leontief matrix and \mathbf{Y} is a vector of final demand.

The Leontief inverse matrix can be used during a change in final demand, which can be demonstrated in the following example. Let us have a vector of changed final demand $\Delta\mathbf{Y}$, which can be interpreted as a vector of the change in final demand for the production of a certain sector by 100 units (*e.g.* agriculture):

$$\Delta\mathbf{Y} = \begin{pmatrix} 100 \\ 0 \\ 0 \end{pmatrix} \quad (2)$$

Let's assume that the vector for final demand contains a hundred units of agricultural production and nothing else. The inverse matrix elements of \mathbf{B} are designated as b_{ij} . We can then calculate the requirements for a new total production $\Delta\mathbf{X}$ using a model, which is in the form:

$$\Delta\mathbf{X} = (\mathbf{I}-\mathbf{A})^{-1}\Delta\mathbf{Y} = \mathbf{B}\Delta\mathbf{Y} \quad (3)$$

In a matrix form the model becomes:

$$\Delta \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} \begin{pmatrix} b_{11} & b_{12} & b_{13} \\ b_{21} & b_{22} & b_{23} \\ b_{31} & b_{23} & b_{33} \end{pmatrix} \begin{pmatrix} 100 \\ 0 \\ 0 \end{pmatrix} \quad (4)$$

The first column of inverse matrix \mathbf{B} gives the gross production of each sector needed to create one unit of final output of product 1. Similarly, requirements for the production of a unit of product 2 and product 3 are shown by the second and third column of the inverse matrix. By multiplying the inverse matrix \mathbf{B} and the changed final demand vector we get the new total output vector.

By multiplying the new total output vector by direct income coefficients we get the new total household income.

By multiplying the total output vector by the direct employment coefficients we get the new total number of employed.

In the case of endogenous households the model's form is:

$$\mathbf{X}^* = (\mathbf{I}-\mathbf{A}^*)^{-1} \mathbf{Y} = \mathbf{B}^* \mathbf{Y}^* \quad (5)$$

where \mathbf{B}^* is the inverse Leontief matrix containing the range of household services and \mathbf{Y}^* is the final demand vector including the demand for household services. In the event of a change to final demand the model has the form

$$\Delta\mathbf{X}^* = (\mathbf{I}-\mathbf{A}^*)^{-1}\Delta\mathbf{Y}^* = \mathbf{B}^* \Delta\mathbf{Y}^* \quad (6)$$

In matrix form, model (6), which is based on Miller and Blair (2009), can be expressed as follows:

$$\Delta \begin{pmatrix} X^*_{1} \\ X^*_{n+1} \end{pmatrix} = \begin{pmatrix} I - A^* & -h_s \\ -h_r & (1-h) \end{pmatrix}^{-1} \Delta \begin{pmatrix} Y^* \\ Y^*_{n+1} \end{pmatrix} \quad (7)$$

where ΔX^* is the new final output vector including household services, $I-A^*$ is the Leontief matrix, A^* is the matrix of technical coefficients incorporating households, h_r is a row vector of workforce entry coefficients, h_s is a column vector of household consumption coefficients, ΔY^* is a vector of changed final demand including the demand for household services.

By multiplying the new total output vector by direct income coefficients we get the new total household income.

By multiplying the total output vector by the direct employment coefficients we get the new total number of employed.

3.3 Specification of Investment Impacts for the Vysočina Region

The situation of the impact of funds from the monitored measures can be demonstrated in the example of Measure 313 – encouragement of tourism activities. In contrast to estimates of direct impacts from tourism, which may be generated rather subjectively, the direct impacts of new production units (*e.g.* new accommodation facilities) are available from a relevant feasibility study of a project. The data associated with the investment impacts are easily ascertainable. When using a supply approach, which uses a combination of endogenous and exogenous versions of the Leontief input-output model, the impacts of projects in the framework of individual rural development policy measures can be ascertained for the entire region's economy.

To ascertain the impacts, funds from the individual measures were ranked by sectors and regarded as an input of funds to the local economy, that being from European Union resources and from national resources. Input-output multipliers and coefficients were subsequently applied to these funds to ascertain the impacts on the regional economy through changes in production, incomes and employment.

The modelled shocks refer to the expenditure from three Axis 3 measures of the RDP, whose overall objective is to promote job creation in rural areas. It concerns implementing projects financed from the following measures.

- 311 – Diversification of agricultural activities into non-agricultural activities
- 312 – Creation and development of micro-enterprises
- 313 – Encouragement of tourism activities

The impacts of implementing the observed measures were ascertained through the increase in demand for investment goods. It means that the investment funds obtained for approved applications are considered to be growth in demand for goods needed for implementing the project.

Data for the impact analysis was provided by the State Agricultural and Interventional Fund. In order to make the analysis data on the approved applications (SAIF, 2013) for the Vysočina Region for the period 2007–2012 (Table 1) was used. Specifically amounts of financial resources allocated to the approved projects within the individual measures

were taken into account. The number and size of rejected applications were not officially available. However, this information does not affect results of the impact analysis. As the financial resources allocated for the monitored measures are quite limited, the strong competition among applicants exists. Therefore the date of submission of project application is crucial. In general, the number of rejected applications is quite high mainly due to non-performance of conditions for submitting a project application.

From the Table 1 it can be seen that, in the case of Measure 311 aimed at diversification of farm activities, 83 % of all the funds awarded were allocated to constructing biogas plants.

Table 1 | An Overview of the Funds Approved for the Individual Investment Aims of Measures 311, 312 and 313 of Axis 3 of the RDP, in CZK

Measures	Funds approved in the period 2007–2012, (CZK)	Investment aim
311	1, 000, 535, 246	Non-agricultural activities (repair work, carpentry, manufacturing activities, etc.), constructing a biogas plant, construction of biomass boiler rooms, production of biofuels and biomass use
312	453, 338, 539	Setting up and developing existing micro-enterprises primarily in the area of processing and production, including crafts and traditional production, biogas plant construction, the construction of biomass boiler rooms, the production of biofuels and biomass use
313	226, 327, 307	Pedestrian routes, wine trails and horse trails accommodation, sport

Source: SAIF, 2013

Investment aims within the framework of Measure 312 focussed on creating and developing micro-enterprises are mostly focussed on creating and developing existing micro-enterprises, above all in the area of processing and production, including crafts and traditional production (84%). The focus of projects included in this investment aim is much differentiated, during an analysis of the individual projects, however, it was shown that 72% of investment was directed towards purchasing machinery and equipment and 27% of the investment for construction and reconstruction, *i.e.* for building work.

99% of investment projects under Measure 313, which focuses on developing small-scale tourism, are directed towards constructing small-capacity accommodation and catering facilities.

In order to apply the relevant methodology to determine the economic impacts of investment (construction phase), the following steps were carried out:

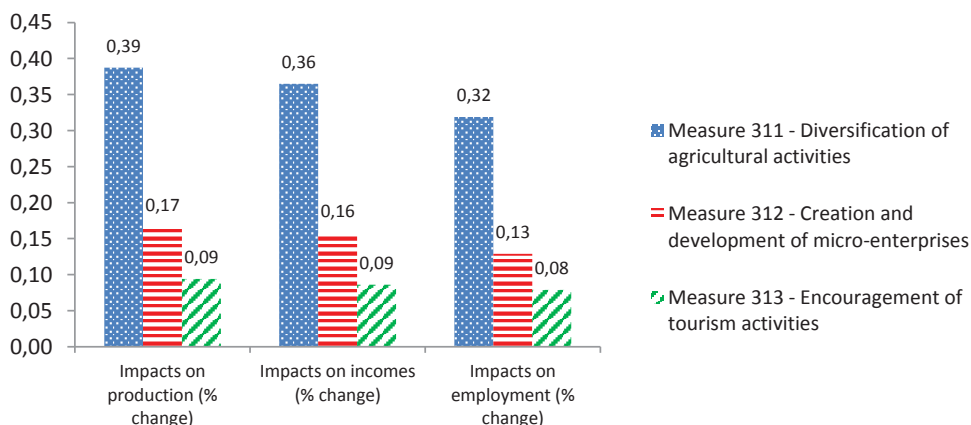
- a) Obtaining data on the amount of funding approved for projects for each measure analysed during the period 2007–2012.
- b) In the next step there was a specification of the sectors whose products were in demand by the investment activity. In order to obtain this information, data from specific projects was used in the format of “annual expenditures for the project”.

c) Data found were considered to be a “shock” and placed in the exogenous part of the input-output model (final demand vector). The impacts on production, incomes and employment in the Vysočina Region were subsequently elicited using the traditional Leontief approach described in the methodological part of this section.

4. Results of Impact Analysis

The paper analysed and evaluated the impacts that arise during a change in the final demand for the production of a given sector and which can be measured as changes in production, incomes or employment. The size of each shock corresponds to the total value of the funds (*i.e.* to the values of the interventions) allocated to the observed measure. The distribution of the shock follows the distribution of the project costs characteristic for each measure observed. The impacts are attributed to the funds realized from the measures analysed.

Figure 1 | Impacts on Production, Incomes, and Employment in the Vysočina Region Resulting from RDP Measures (in %)



Source: own calculations

An empirical analysis of the impact carried out on the example of the Vysočina Region and elaborated using a regional input-output model gave the following results.

From Figure 1 it is clear that the impacts increase production, incomes and employment in the Vysočina Region. The size of this change is rather low, not exceeding 0.39%.

The biggest impact can be observed in Measure 311 promoting the diversification of agricultural activities. The reason for this is the amount of the funds realized in the framework of the measure, which for the period 2007–2012 came to CZK 1,000.5 million. The investment impacts of Measure 311 caused an increase in production of 0.38%, an increase in incomes of 0.36%, and an increase in employment of 0.32%. The impacts on production, incomes and employment for the other two measures are lower, and the lowest impact can be observed for the measure that promotes tourism, where the impacts did not exceed 0.1%.

The resulting impacts of the funds realized for the observed measures triggered changes that are in the region of tenths or hundredths of a percent. With respect to the regional economy, the impacts on production, incomes and employment are very small, it does not mean, however, that they are insignificant. The resulting impacts indicate the direction of the reaction to the policy measures, which is positive. A linear relationship of the production functions is manifested here, which means that with a decrease in funds the impacts also decrease.

To summarize the results of the analysis, the impacts of the observed measures on production, incomes and employment in the Vysočina Region are positive, but very small. In the case of investment impacts, production in the Vysočina Region increased, on average, by 0.27%, incomes by 0.2% and employment by 0.17%. Subsidies of CZK 1.67 billion brought about a change in production, incomes and employment in the Vysočina Region of just 0.2% on average. These results are in agreement with the literature, which indicates that the impacts on production, incomes and employment stemming from rural development policy measures are rather low, this means that the resulting changes are in the region of tenths or hundredths of a percent (Psaltopoulos *et al.*, 2011; DG AGRI, 2009b; Hill and Blandford, 2008; Bradley, 2006; Shucksmith *et al.*, 2005).

Sensitivity analysis was conducted to test the extent to which changes in policy shocks influence the value of impacts on production, income and employment. The input-output methodology assumes linearity of productive relationships. Any increase of financial resources by 10% within each monitored measure evokes changes as shown in the Table 2.

From the resulting table, it is evident that the alternation of selected conditions has changed model results insignificantly. There are also no qualitative changes in terms of the direction of impacts.

Table 2 | Impacts of Changes in Policy Shocks by 10% - Sensitivity Analysis

Measure	Impacts on production (% change)	Impacts on incomes (% change)	Impacts on employment (% change)
311	0.039	0.036	0.032
312	0.017	0.016	0.013
313	0.009	0.009	0.008

Source: own calculations

Effects of changes in parameters of the input-output model can also be tested, namely changes in a sectoral composition of the input-output table and consequently changes in coefficients in relation to the GRIT methodology. This analysis goes beyond the scope of this paper, however, it represents the extension of the sensitivity analysis for further research.

5. Conclusion

This paper reports on the construction of input-output model for Vysočina Region. The economic impacts of selected CAP measures implemented in Vysočina Region have been evaluated in terms of generated output, income and employment.

As well as in other methods, the modelling method used in this study contains number of limitations. The drawbacks include a tendency to overvalue the consequences of economic stimuli and thus the impacts arising from policy measures. In addition, it is static and short-term so changes as a result of implementing public funds in the longer term cannot be followed (Miller and Blair, 2009). The static input-output model takes the national or regional economy to be in a long-term equilibrium at a given point in time. Simulations in the input-output model therefore test how exogenous shocks change the long-term position of the economy. Based on the characteristics of the input-output model, these changes appear in the short term, *e.g.* the next year. To determinate long-term changes in the economy as a result of changes in final demand, it is necessary to use forecasting.

Input-output model captures the direct, indirect and induced effects of an exogenous demand shocks to the economy. However, the model does not indicate the net effect of policy or exogenous shocks related to the economy. Therefore the input-output models are more likely to overvalue the real effect from the shocks as they do not consider certain economic feedbacks and behavioural adjustments. Avoiding this drawback, the accuracy of multipliers was increased by completion of available regional data into mechanically built transaction table. The character of the input-output model allows the impacts uncovered to be attributed exclusively to the observed policy measures. Therefore, the model's results do not reflect exogenous influences, such as the synergy effects of other policies. The model does not enable the financial crisis of 2009 to be taken into account, which had a very negative impact on foreign investment and employment in the Vysočina Region. The resulting numbers of jobs created, as determined from the model, do not, therefore, reflect the numbers of jobs lost as a result of the financial crisis.

The results of the analysis carried out during the work provided several important findings that can be interpreted in the broader context of rural development in the Vysočina Region. First, the overall effects arising from monitored measures are very small in Vysočina Region, since the regional economy is rather big and agriculture small. Also the rural development policy interventions are low in respect to the regional GDP (about 5.4% of the regional GDP) and in particular the size of Axis 3 is minor (0.9%). However, the impacts are positive especially in the light of the impacts on production and are not negligible for agriculture itself and some sectors (*e.g.* food processing, rural tourism) if larger investments are directed here.

The resulting impacts on production, incomes and employment are lower than can be expected for a small open regional economy. The literature dealing with rural development states that from the inter-sectoral relations point of view the rural economy tends to be relatively open and therefore weak in obtaining benefit from developing local activities resulting from changes in demand for sectoral production (Roberts, 1998; Vázquez-Barquero, 1999). This fact is also reflected in the case of the rural Vysočina Region.

Second, this paper has shown that it is important to study the mutual relationships between the sectors of a regional economy. The development of tourism, by means

of an impact analysis, has been shown to be an important element for strengthening the economy of the Vysočina Region. Implementing projects from the measures aimed at the diversification of agricultural activities, developing micro-enterprises and tourism can strengthen the development of agro-tourism and, in general, the development of services related to the development and use of the Vysočina Region's tourist potential.

Third, in connection with monitored measures and agricultural tradition in the Vysočina Region it is useful to point the position of agriculture in the economy of the region. The results of the analysis can be summarized that the economic benefits of the agricultural sector is not negligible. Although the growth of agricultural production does not significantly affect the total production of the region, it can positively affect the income situation in the region. Strong supply relationships with the food processing sector, which has a key role in the regional economy, may subsequently increase income and employment in the economy of Vysočina Region and positively influence the development of rural areas in the region.

The causes of small impacts of monitored measures on output, income and employment in Vysočina region were identified and tested as a part of the analysis. In accordance with literature a small amount of expenditure under Pillar 2 compared with Pillar 1 and compared with other national and EU policies affecting rural areas (Hill and Blandford, 2008) was confirmed as a reason for low impacts. Other reasons for small impacts mentioned in the literature - a relatively low importance of the agricultural sector and rural households in many countries of the EU (Shucksmith *et al.*, 2005) and a strong agricultural lobby (OECD, 2006) cannot be confirmed in the Vysočina Region.

As regional causes of small impacts of monitored measures on production, income and employment in the Vysočina Region can be identified one-sided focus of investment projects on construction of biogas plants, small investments in tourism and the fact that the investments of the observed measures are not aimed at all sectors that based on the analysis are crucial for the regional economy.

The method used offers policy-makers the possibility of identifying restrictions in the economy, which may reduce the positive impacts of regional development strategies. Moreover, the results of input-output analysis can be used as a basis for the effective allocation of financial resources from the national and European funds and for creating a development strategy that would promote a sector with a strong potential for further development.

References

- Armstrong, H., Taylor, J.** (2000), *Regional Economics and Policy*. 3rd Ed. Oxford: Blackwell Publishing.
- Balamou, E., Saktina, D., Meyers, W. H.** (2009), "Targeting Lagging Territories with EU Rural Support Policy: Case Study in Latvia." Paper presented at the 113th EAAE Seminar "The Role of Knowledge, Innovation and Human Capital in Multifunctional Agriculture and Territorial Rural Development", Belograd, Serbia.
- Ballas, D., Clarke, G. P., Wiemers, E.** (2006), "Spatial Microsimulation for Rural Policy Analysis in Ireland: The Implications of CAP Reforms for the National Spatial Strategy." *Journal of Rural Studies*, Vol. 22, No. 3, pp. 367–378.

- Bednaříková, Z.** (2009), "Vývoj a nástroje politiky rozvoje venkova v České republice (History and Instruments of Rural Development Policy in the Czech Republic)." *Regionální studia*, Vol. 3, No. 1, pp. 34–42.
- Bergmann, H., Dax, T., Hocevar, V., Hovorka, G., Juvancic, L., Kröger, M., Thomson, K. J.** (2009), "Reforming Pillar 2 – Towards Significant and Sustainable Rural Development." Paper for the 8th International Conference of the European Society for Ecological Economics "Transformation, Innovation and Adaption for Sustainability – Integrating Natural and Social Sciences." University of Ljubljana, Slovenia.
- Bonfiglio, A.** (2005), "Analysing EU Accession Effects in Romania by a Multiregional I-O Model. Quaderno di ricerca. 226, Department of Economics, Faculty of Economics "G. Fua", Polytechnic University of the Marche, Ancona.
- Bradley, J.** (2006), "Evaluating the Impact of European Union Cohesion Policy in Less-Developed Countries and Regions." *Regional Studies*, Vol. 40, No. 2, pp. 189–199.
- Ciobanu, C., Mattas, K., Psaltopoulos, D.** (2004), "Structural Changes in Less Developed Areas: An Input–Output Framework." *Regional Studies*, Vol. 38, No. 6, pp. 603–614.
- CZSO** (2010), *Statistical Yearbook of Vysočina Region for the Year 2010*. Jihlava: Czech Statistical Office.
- CZSO** (2012), *Symmetric Input-Output Table of the Czech Republic for the Year 2009*. Prague: Czech Statistical Office Prague.
- DG AGRI** (2009a), *Rural Development in the European Union – Statistical and Economic Information – Report 2009*. European Union: Directorate-General for Agriculture and Rural Development, December 2009.
- DG AGRI** (2009b), *Study on the Economic, Social and Environmental Impact of the Modulation Provided for in Article 10 of Council Regulation (EC) No. 1782/2003*. Directorate General for Agriculture and Rural Development, Contract No. 30-CE-0162480/00-47. LEI, the Hague – IEEP London.
- Doyle, C., Mitchell, M., Topp, K.** (1997), "Effectiveness of Farm Policies on Social and Economic Development in Rural Areas." *European Review of Agricultural Economics*, Vol. 24, No. 3–4, pp. 530–546, <http://dx.doi.org/10.1093/erae/24.3-4.530>
- Dwyer, J., Ward, N., Lowe, P., Baldock, D.** (2007), "European Rural Development under the Common Agricultural Policy's "Second Pillar": Institutional Conservatism and Innovation." *Regional Studies*, Vol. 41, No. 7, pp. 873–887.
- European Commission** (2010), *Approaches for Assessing the Impacts of the Rural Development Programmes in the Context of Multiple Intervening Factors*. Brussels: European Evaluation Network for Rural Development (EENRD), European Commission, March 2010.
- European Commission** (2006), *Council Decision 2006/144/EC of 20 February 2006 on Community Strategic Guidelines for Rural Development (programming period 2007 to 2013)*. Brussel: European Commission.
- Esposti, R., Sotte, F.** (2013), "Evaluating the Effectiveness of Agricultural and Rural Policies: An Introduction." *European Review of Agricultural Economics*, Vol. 40, No. 4, pp. 535–539, <http://dx.doi.org/10.1093/erae/jbt014>

- Gilchrist, D. A., St. Louis, L. V.** (1994), "An Equilibrium Analysis of Regional Industrial Diversification." *Regional Science and Urban Economics*. Vol. 24, No. 1, pp. 115–133, [http://dx.doi.org/10.1016/0166-0462\(94\)90022-1](http://dx.doi.org/10.1016/0166-0462(94)90022-1)
- Hill, B., Blandford, D.** (2008), "Where the US and EU Rural Development Money Goes." *Eurochoices*, Vol. 7, No. 1, pp. 28–29.
- Hubbard, L. J., Brown, W. A. N.** (1979), "The Regional Impacts of the Irrigation Development in the Lower Waitaki." Research Paper No. 99, Cantenbury: Agricultural Economics Research Unit, Lincoln College.
- Jensen, R. C., Mandeville, T. D., Karunarante, N. D.** (1979), *Regional Economic Planning: Generation of Regional Input-Output Analysis*. London: Croom Helm.
- Johns, P. M, Leat, P. M. K.** (1987), "The Application of Modified GRIT Input-Output Procedures to Rural Development Analysis in Grampian Region." *Journal of Agricultural Economics*, Vol. 32, No. 2, pp. 243–256, <http://dx.doi.org/10.1111/j.1477-9552.1987.tb01044.x>
- Johnson, T. G., Roberts, D., Wojan, T. R.** (2010), "Model-Based Evaluation of Rural Development Policy. *Eurochoices*, Vol. 9, No. 1, pp. 30–36.
- Keating, M., Stevenson, L.** (2006), "Rural Policy in Scotland after Devolution." *Regional Studies*, Vol. 40, No. 3, pp. 397–407.
- Korf, B., Oughton, E.** (2006), "Rethinking the European Countryside – Can We Learn from the South?" *Journal of Rural Studies*. Vol. 22, No. 3, pp. 278–289, <http://dx.doi.org/10.1016/j.jrurstud.2005.09.005>
- Leontief, W.** (1966), *Input-Output Economics*. New York: Oxford University Press.
- Mattas, K. A., Shrestha, C. M.** (1991), "A New Approach to Determining Sectoral Priorities in an Economy: Input-Output Elasticities." *Applied Economics*, Vol. 23, No. 1, pp. 247–254, <http://dx.doi.org/10.1080/00036849108841069>
- Mattas, K., Arfini, F., Midmore, P., Schmitz, M., Surry, Y.** (2010), "CAP's Impacts on Regional Employment: A Multi-Modelling Cross-Country Approach." Paper presented at OECD workshop "Disaggregated impacts of CAP reforms" in Paris.
- Midmore, P., Partridge, M. D., Olfert, M. R., Ali, K.** (2010), "The Evaluation of Rural Development Policy: Macro and Micro Perspectives." *Eurochoices*, Vol. 9, No. 1, pp. 24–29.
- Miller, R. E., Blair, P. D.** (2009), *Input-Output Analysis: Foundations and Expectations*, 2nd Ed. New York: Cambridge University Press.
- Meccheri, N., Pelloni, G.** (2006), "Rural Entrepreneurs and Institutional Assistance: An Empirical Study from Mountainous Italy." *Entrepreneurship and Regional Development*, Vol. 18, No. 5, pp. 371–392, <http://dx.doi.org/10.1080/08985620600842113>
- OECD** (2006), *The New Rural Paradigm: Policies and Governance*. Paris: Organization for Economic Cooperation and Development.
- OECD** (2010), "Evaluation of Agricultural Policy Reforms in the European Union: Draft Report." TAD/CA/APM/WP(2010)26. OECD Workshop, Paris, November 2010.
- Pouliakas, K., Phimister, E., Roberts, D., Thomson, K. J., Balamou, E., Psaltopoulos, D., Hyttiä, N.** (2007), "Application and Results of individual CGE Analysis." European Project No. FP6-SSP-2005-006469 TERA WP5, Deliverable No. 9".

- Psaltopoulos, D., Thomson, K. J.** (1993), "Input-Output Evaluation of Rural Development: a Forestry-centred Application." *Journal of Rural Studies*, Vol. 9, No. 4, pp. 351–358, [http://dx.doi.org/10.1016/0743-0167\(93\)90047-N](http://dx.doi.org/10.1016/0743-0167(93)90047-N)
- Psaltopoulos, D., Thomson, K. J., Efstratoglou, S., Kola, J., Daouli, A.** (2004), "Regional Social Accounting Matrices for Structural Policy Analysis in Lagging EU Rural Regions." *European Review of Agricultural Economics*, Vol. 31, No. 2, pp. 149–178.
- Psaltopoulos, D., Balamou, E., Thomson, J. T.** (2006), "Rural-Urban Impacts of CAP Measures in Greece: An Inter-regional SAM Approach." *Journal of Agricultural Economics*, Vol. 57, No. 3, pp. 441–458, <http://dx.doi.org/10.1111/j.1477-9552.2006.00059.x>
- Psaltopoulos, D., Balamou, E., Skuras, D., Ratinger, T., Sieber, S.** (2011), "Modelling the Impacts of CAP Pillar 1 and Pillar 2 Measures on Local Economies in Europe: Testing a Case Study-Based CGE-Model Approach." *Journal of Policy Making*, Vol. 33, No. 1, pp. 53–69, <http://dx.doi.org/10.1016/j.jpmod.2010.09.005>
- Roberts, D.** (1998), "Rural-Urban Interdependencies. Analysis Using an Inter-Regional SAM Model." *European Review of Agricultural Economics*, Vol. 25, No. 4, pp. 506–527, <http://dx.doi.org/10.1093/erae/25.4.506>
- Shucksmith, M., Thomson, K. J., Roberts, D.** (2005), *CAP and the Regions: Territorial Impact of Common Agricultural Policy*. Wallingford: CAB International.
- Sila, U., Juvančič, L.** (2005), "Regional Input-Output Table – The Case of Eastern Slovenia." *Jahrbuch der Österreichischen Gesellschaft für Agrarökonomie*, Vol. 13, pp. 121–134.
- SAIF** (2013), "Data on the Funds Approved for the Measures 311, 312 a 313 for the Period 2007–2012," State Agricultural Intervention Fund Prague.
- Skuras, D., Meccheri, N., Moreira, M. B., Rosell, J., Stathopoulou, S.** (2005), "Entrepreneurial Human Capital Accumulation and the Growth of Rural Businesses: A Four-Country Survey in Mountainous and Lagging Areas of the European Union." *Journal of Rural Studies*, Vol. 21, No. 1, pp. 67–79.
- Thomson, K. J., Psaltopoulos, D.** (2005), "Economy-Wide Effects of Forestry Development Scenarios in Rural Scotland." *Forest Policy and Economics*, Vol. 7, No. 4, pp. 515–525, <http://dx.doi.org/10.1016/j.forpol.2003.07.005>
- Tzouvelekas V., Mattas K.** (1999), "Tourism and Agri-Food as a Growth Stimulus to a Rural Economy: The Mediterranean Island of Crete." *Journal of Applied Input-Output Analysis*, Vol. 5, pp. 69–81.
- Vázquez-Barquero A.** (1999), "Inward Investment and Endogenous Development. The Convergence of the Strategies of Large Firms and Territories?" *Entrepreneurship and Regional Development*, Vol. 11, No. 1, pp. 79–93.
- West, G. R., Wilkinson, J. T., Jensen, R. C.** (1979), *Generation of Regional Input-Output Tables for the State and Regions of South Australia*. Brisbane: Department of Economics, University of Queensland.

Appendix

Regional Symmetric Input-Output Table for the Vysočina Region, 2009

	01	02	10-12	13	16	24-25	28	35-39	41-43	45	49-53	55-56
Agriculture	1 485,425	60,678	4 245,281	124,488	0,000	0,000	0,000	23,192	0,000	5,989	0,342	404,403
Forestry	0,127	823,645	7,202	1,445	1 788,074	0,000	0,000	2,487	0,000	0,220	4,057	0,295
Food processing	1 650,918	0,125	4 802,330	0,814	0,000	3,024	0,063	6,306	0,000	0,000	0,440	1 542,584
Textile	1,293	0,000	8,517	1 294,084	0,000	3,173	39,036	0,000	26,261	0,000	2,737	10,655
Timber processing	20,161	78,081	12,087	0,000	1 827,955	293,144	13,659	6,131	309,588	0,000	13,784	32,162
Basic metals	16,410	21,566	64,846	7,932	38,868	8 314,958	3 699,916	246,595	1 337,943	17,798	33,042	53,128
Machinery and equipment	104,718	25,153	34,819	4,105	7,912	169,104	907,157	93,642	242,762	27,694	33,042	53,128
Energy	114,206	10,159	311,510	100,894	95,569	690,003	250,658	3 418,936	212,368	135,786	547,210	244,633
Construction	34,967	59,411	46,783	4,401	18,751	14,733	15,403	156,281	15 906,712	41,808	889,108	184,308
Wholesale and retail trade	71,049	57,532	102,975	13,023	30,827	143,622	25,716	122,930	359,192	199,686	714,158	96,092
Transport	206,852	63,004	500,805	47,754	159,196	382,862	219,805	377,477	580,142	153,477	6881,064	53,131
Tourism	32,064	11,097	44,928	2,013	12,816	24,453	10,459	34,227	150,536	29,068	444,009	319,260
Public services	29,745	3,871	6,805	1,426	0,856	10,635	0,611	40,918	0,000	0,000	60,142	0,000
Other industry	503,618	150,049	703,812	172,539	224,772	1 393,510	1 275,866	2 612,869	3 402,308	1 727,588	941,066	360,975
Other services	569,477	105,078	1 978,277	215,783	265,871	1 261,519	855,516	817,957	4 753,772	760,840	1 657,670	1 329,815
Intermediate consumption (BP)	4 841,031	1 469,449	12 870,977	1 990,702	4 471,466	12 704,741	7 313,865	7 959,945	27 281,585	3 099,954	12 188,828	4 644,012
Net tax on production	390,351	79,932	17,598	22,586	107,173	244,162	25,676	108,216	331,257	24,178	644,654	120,545
Intermediate consumption (PP)	5 231,382	1 549,381	12 888,574	2 013,288	4 578,639	12 948,903	7 339,541	8 068,161	27 612,842	3 124,132	12 833,481	4 764,557
Wages	3 215,536	526,017	4 399,201	1 310,040	1 933,572	6 260,640	2 104,294	863,274	4 704,426	775,600	3 855,380	1 146,437
Other net taxes on production	-3 491,869	-52,839	-97,018	-6,528	-6,708	-16,825	-22,044	-35,780	40,420	5,894	2,217	-4,878
Fixed capital consumption	1 679,718	194,944	1 817,341	635,815	727,848	2 204,922	433,535	1 268,800	880,897	173,973	2 914,239	199,433
Net operating surplus	3 502,896	940,475	4 727,513	601,048	1 909,563	1 942,841	874,988	2 636,772	5 023,257	206,014	1 336,323	1 109,710
Gross value added (BP)	4 906,281	1 608,597	10 847,037	2 540,375	4 564,275	10 391,577	3 390,774	7 833,066	10 649,000	1 161,481	8 108,159	2 450,701
Production (BP)	10 137,663	3 157,978	23 735,611	4 553,663	9 142,914	23 340,480	10 730,315	12 801,227	38 261,842	4 285,613	20 941,640	7 215,258
Import	14 092,970	1 839,121	3 579,065	1 924,440	139,403	7 399,497	14 080,354	4 090,593	6 503,197	1 248,216	7 460,906	3 595,648
Total resources	24 230,633	4 997,099	27 314,676	6 478,103	9 282,317	30 739,977	24 810,669	16 891,821	44 765,039	5 533,830	28 402,546	10 810,907

Regional Symmetric Input-Output Table for the Vysočina Region, 2009 - continuation

	03, 05-09, 14-15, 17- 23, 26-27, 29-33	84	46-47, 58- 66, 68-82, 85-88, 90-99	Total	House- holds	Govern- ment	Non- profit associa- tions	Gross fixed capital	Stock changes	Export	Final use total	Total use
01	Agriculture	0,000	18,719	105,730	6 668,659	0,736	15,166	361,652	-437,176	11 147,347	17 756,385	24 230,633
02	Forestry	0,326	94,508	1,202	2 723,587	2,787	3,547	0,000	451,472	1 709,000	2 273,340	4 997,099
10-12	Food processing	33,657	17,334	168,377	8 225,972	0,000	4,133	0,000	286,071	5 702,521	19 088,724	27 314,676
13	Textile	0,000	874,429	115,476	2 375,662	0,000	0,000	4,032	-106,845	3 533,703	4 103,598	6 478,103
16	Timber processing	0,000	1 088,280	510,392	170,398	0,000	0,000	0,000	211,428	4 683,069	5 064,895	9 282,317
24-25	Basic metals	29,093	3 726,237	554,575	18 089,305	0,000	0,0506	51,467	-633,980	11 865,052	12 091,999	30 739,977
28	Machinery and equipment	0,000	834,753	360,053	2 898,043	131,886	0,075	0,000	6 036,493	16 802,543	22 544,512	24 810,669
35-39	Energy	251,289	878,911	1 498,484	8 760,617	3 839,496	2,873	0,000	92,066	4 132,942	8 136,111	16 891,821
41-43	Construction	329,926	747,899	2 386,868	20 837,359	154,420	2,009	0,431	16 237,896	8 114,060	24 291,979	44 765,039
45	Wholesale and retail trade	2,812	700,546	694,547	3 334,708	967,217	1,813	109,561	-0,220	1 052,858	2 150,461	5 533,830
49-53	Transport	377,111	1 478,278	2 870,702	14 351,660	2 917,731	0,342	83,549	0,000	7 825,346	14 087,385	28 402,546
55-56	Tourism	128,963	99,206	1 432,338	2 775,438	4 412,049	5,0231	0,000	0,000	3 570,946	8 038,332	10 810,907
84	Public services	369,893	32,804	90,514	648,220	23,069	13 154,677	0,000	0,000	158,960	13 336,707	13 977,918
03, 05-09, 14-15, 17-23, 26-27, 29-33	Other industry	173,080	24 973,015	3 817,739	42 432,808	7 758,099	77,074	7 159,667	-1 341,906	37 058,340	51 380,217	111 611,646
46-47, 58-66, 68- 82, 85-88, 90-99	Other services	1 793,068	6 408,702	20 800,650	43 573,996	18 023,956	760,988	2 481,684	91,538	17 147,390	55 203,724	99 432,232
	Intermediate consumption (BP)	3 489,218	41 973,622	35 407,649	181 707,044	59 151,631	33 926,010	33 126,000	-2 030,873	134 504,078	259 548,368	459 279,412
	Net tax on production	575,140	329,535	1 398,232	4 419,234							
	Intermediate consumption (PP)	4 064,358	42 303,157	36 805,880	186 126,278							
	Wages	5 389,871	10 685,106	20 613,592	67 782,984							
	Other net taxes on production	13,752	-304,349	-28,610	-4 005,165							
	Fixed capital consumption	2 790,860	4 152,150	7 590,176	27 664,650							
	Net operating surplus	-279,104	6 673,111	14 297,122	45 502,530							
	Gross value added (BP)	7 915,379	21 206,018	42 472,279	136 945,000							
	Production (BP)	11 979,738	63 509,176	79 278,160	323 071,278							
	Import	1 998,181	48 102,471	20 154,072	136 208,135							
	Total resources	13 977,918	111 611,646	99 432,232	459 279,412							

Notes: BP – basic prices, PP – purchase prices Source: CZSO, 2012; own work