# Regional Input-Output tables AND InTER-REGIONAL MODEL FOR THE CZECH REPUBLIC

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**Abstract**

Construction of input-output tables (IOTs) have a long tradition in the former Czechoslovakia because these tables were used frequently for central planning during the socialist era dating back to the 1960s. Three types of tables originating from this era include the federal IOT for Czechoslovakia and separate Czech and Slovak IOTs. These tables also include inter-regional trade between the Czech and Slovak Republics and they can be regarded as regional input-output tables (RIOTs). After the revolution in 1989, IOTs were not prioritized by the governmental official statistics office of either of the new republics since the tables were irregularly constructed and the stigma of a socialist planning instrument caused very limited interest between economists. Increasingly however, contemporary interest in correcting the biased interpretation and exploring the possibilities of input-output analysis and all its extensions grew, especially after the turn of the new millennium. The situation made a significant turn when the Czech Statistical Office (CZSO) fully implemented the national accounts’ standard ESA 95 in 2004, see (Sixta, 2013)

Increasing interest and demand for symmetric input-output tables (SIOTs), especially from the environmental economics sector, caused sustainable improvement of both official supply and use tables and symmetric input-output tables. Currently, supply and use tables are compiled annually six months after a reference year. SIOTs are compiled every two or three years in relatively high detail. RIOTs are no longer compiled by official statistics, but qualified users particularly in academia continue to construct input-output based models on a regional level, using either national technical coefficients or some distribution methods such as GRIT (Jensen et al., 1979).

While the potential of regional input-output analysis became known in Czech scientific circles, an appropriate data source remained elusive. Therefore, for our research, we decided to construct regional input-output tables for all fourteen regions of the Czech Republic. Since we constructed RIOTs on the basis of scientific research, we were not able to conduct any regional survey on costs, production etc. We decided to use existing national SIOTs and supply and use tables and to combine these tables with officially published regional accounts. As much as possible, our aim was to follow the procedures of CZSO.

With respect to the absence of regional surveys, regional accounts provide key structural information. The resulting tables are therefore a combination of model approach and extrapolation. Since users demand more detailed IOTs in directions of all dimension, we selected NUTS 3 level (14 regions) product by product tables as the optimal choice in terms of detail provided for our computations. The dimension of all RIOTs is 82 products (CZ-CPA) valued at basic prices. RIOTs were constructed for 2011 (extended sets of tables) and for 2013 (reduced set of tables) and it allows us to compare these tables in time.

Since we developed these tables from officially published data, several assumptions had to be adopted. One crucial point is the definition of the statistical unit that is needed for the interpretation of the figures. The first assumption is that the level of independence in decision making of local units is not irrelevant since no intercompany sales are recorded. The second, with respect to the practice of the CZSO, only local units instead of local kind-of-activity units are recorded. In practice, it means the headquarters of companies and subsidiaries are classified according to the principal activity of the whole company. For example, it means that products include also services associated with production that are not separately invoiced on the market. The third assumption reflects inter-regional trade that is estimated for all regions in order to keep each RIOT balanced. The product is either exported or imported since inter-regional trade is estimated on the basis of excess or deficit of regional resources. Subsequently, this means that all other parts of RIOTs are independently estimated.

From the practical point of view, the construction of regional output vectors is the most important task at hand. Output vectors are not covered by regional accounts and therefore it has to arise from a combination of regional and national accounts. By extension, national technology taken over from SIOT can be applied on regional tables in the most available detail, 2 digits of CPA classification.

The whole process of creating a RIOT can then be described in three stages. The first stage represents the combining of data sources from the core national accounts and regional accounts, the construction of regional output vectors, and the calculation of intermediate and regional gross value added. In the second stage we balanced gross value added between model approach (application of national technology) and published regional accounts after transformation from industries to products. The third stage consisted of creating estimates for the regional vectors of final use and regional imports through alternative methods, see Musil et al. (2014). In this last stage, we combined all the estimates, balanced them in the form of RIOTs, and consulted the results with experts on regional economy. Our approach is in some aspects close to GRIT methods but the difference lies in the statistical matter. We did not concentrate on the regional relationships only; we also focus on compilation issues which should cover the SIOTs/RIOTs procedure as much as is possible. The details are described in Sixta and Vltavská (2016).

All the results of our RIOTs for both 2011 (compiled in ESA 95 methodology) and 2013 (compiled in ESA 2010 methodology) were published on our website[[3]](#footnote-3) and the tables are intended for free download. The extended set of tables for 2011 covers total tables, use of regional output and use of imported products. The basic set of tables for 2013 covers only total RIOTs and an extension of it is planned.

Initially, we focused on the compilation of RIOTs and we did not directly solve the problem of addressing the lack of specific detailed information regarding regional import and export between regions. This issue is a subject of our further research to construct inter-regional input-output model, see Šafr (2016). We started with the estimates of inter-regional flows. So far, we have tested gravity models, entropy based models or models based on statistical surveys and we developed a specific mixed approach for characteristic Czech data. We can conclude that a main model provides similar results. Entropy-based models on optimization provided the largest difference in results between all the tests models.

In some countries, RIOTs or at least technical coefficients are constructed by official statistical agencies such as in the US or Finland, see BEA (2016) or Official Statistics of Finland (2016). In our case, RIOTs are a statistical exercise for academic research since they are not included in the lists of priorities for the CZSO. The first set of RIOTs was published in 2015 and we have continuous positive feedback from the users since inception. We hope that our estimates will find more users to promote using IOTs for regional economic analysis and policies, see Sixta and Fischer (2015).

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3. http://kest.vse.cz/english/science-research/results-of-the-funding-projects/regionalization-of-gdp-estimate-by-the-expenditure-approach/ [↑](#footnote-ref-3)