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The role of an industry in the economy

25th INFORUM World Conference
Riga 2017



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How to measure the role of an industry



Two perspectives:

Impact models

Content approach – based on factor content of trade

Three kinds of impact: direct, indirect, and induced

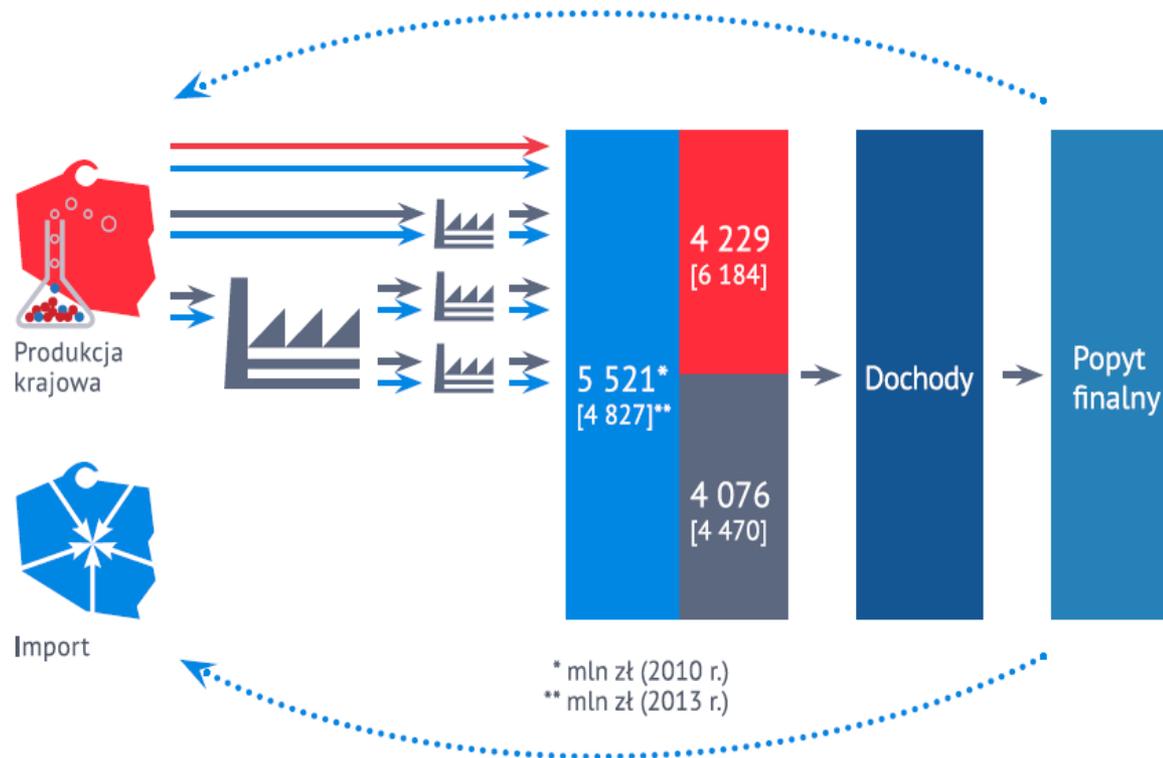


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Report for pharmaceutical industry



Łączny efekt:
2010 r. = 13 826 (0,98% PKB)
2013 r. = 15 481 (0,93% PKB)

Source: DELab UW, PZPPF (2015), *Makroekonomiczne aspekty znaczenia sektora farmaceutycznego dla polskiej gospodarki*



Impact models



The question about impact is: what would have happened if all domestic production of particular branch were replaced by imports. The answer may be given by a counterfactual simulation. So, the result depend on the model.



Simple Leontief model



$$x = Ax + y$$

$$x = (I - A)^{-1}y = Ly$$

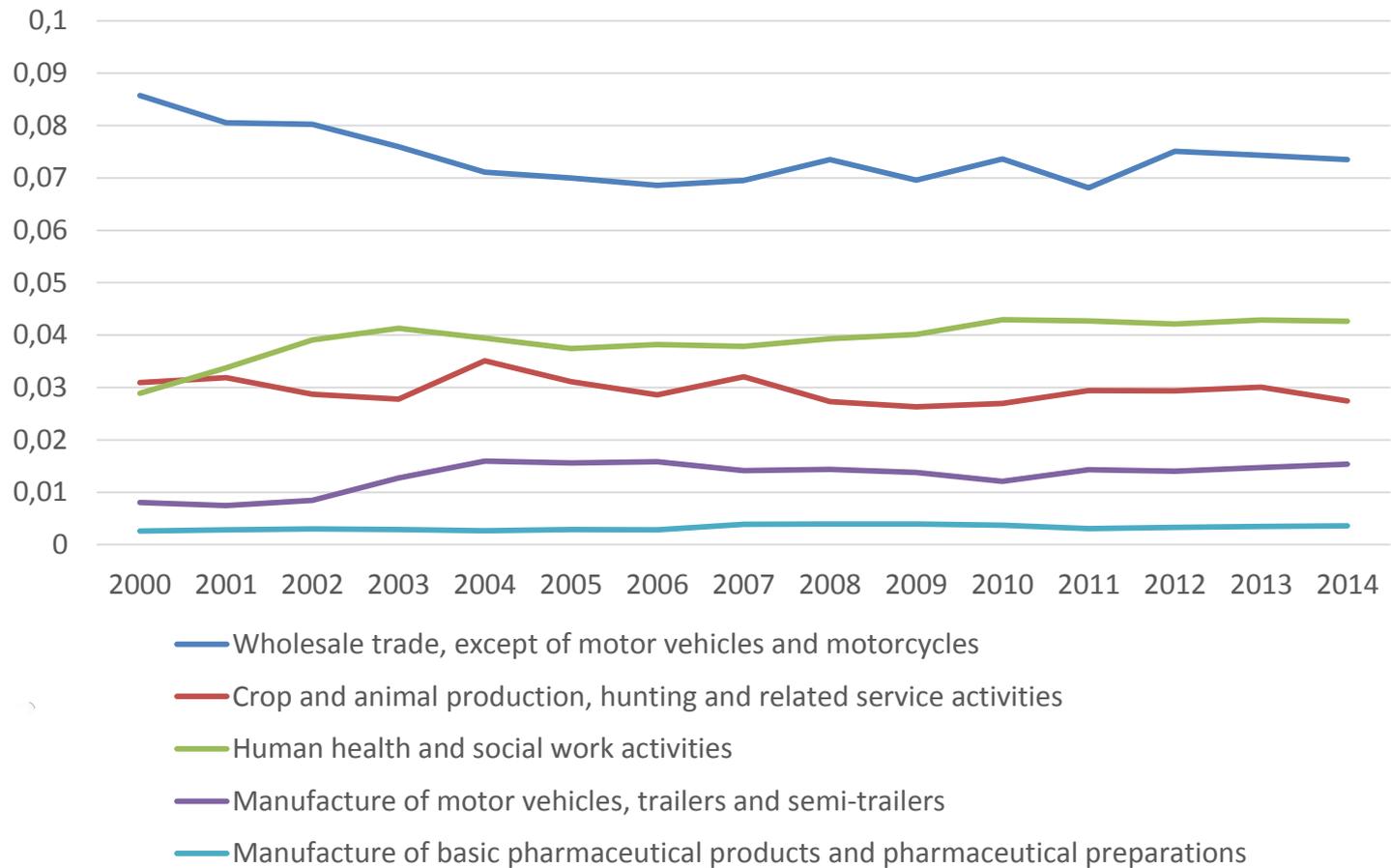
$$v = VLy$$

v – value added + taxes less subsidies on products

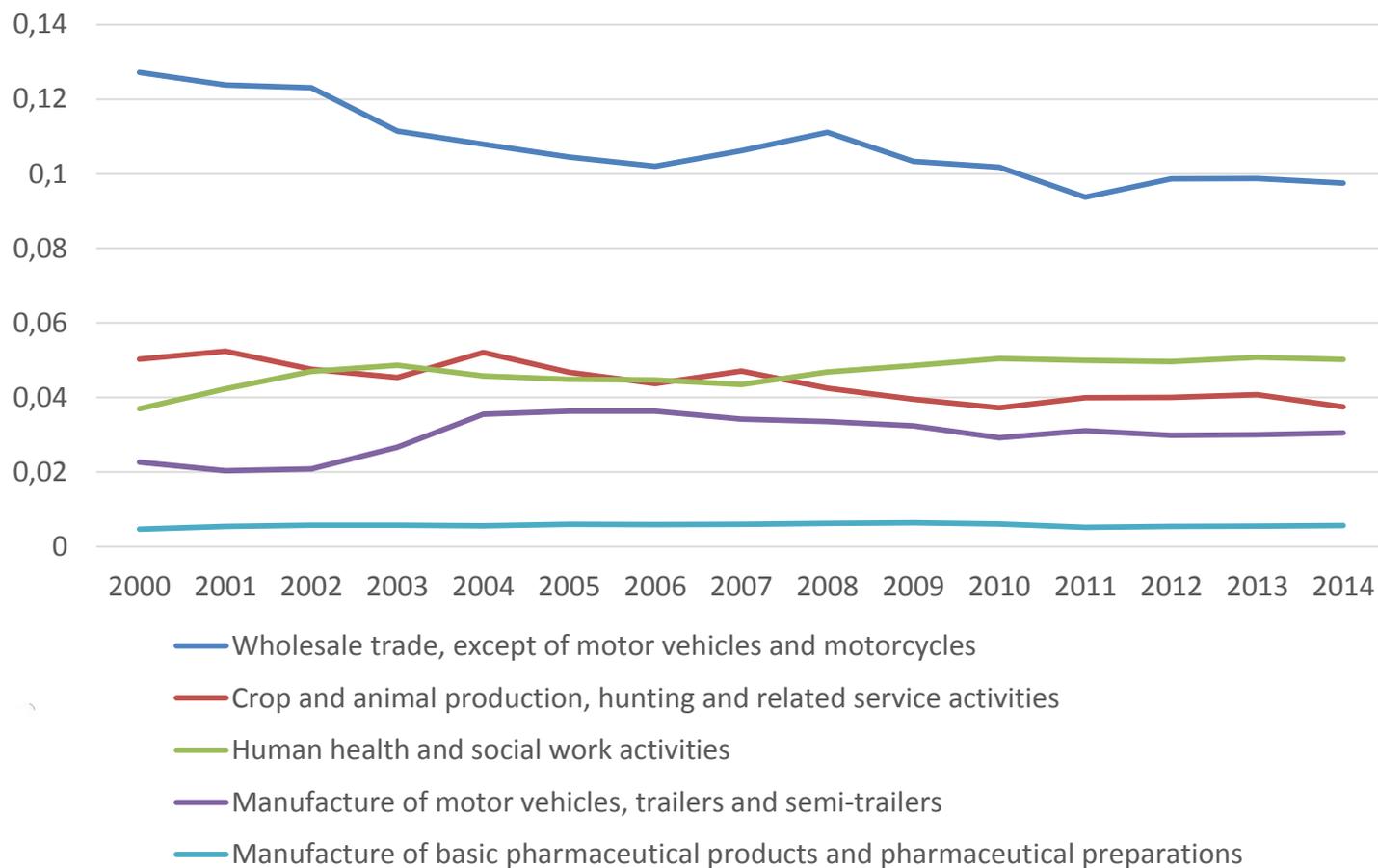
V – the same per unit of output (diagonalised vector)



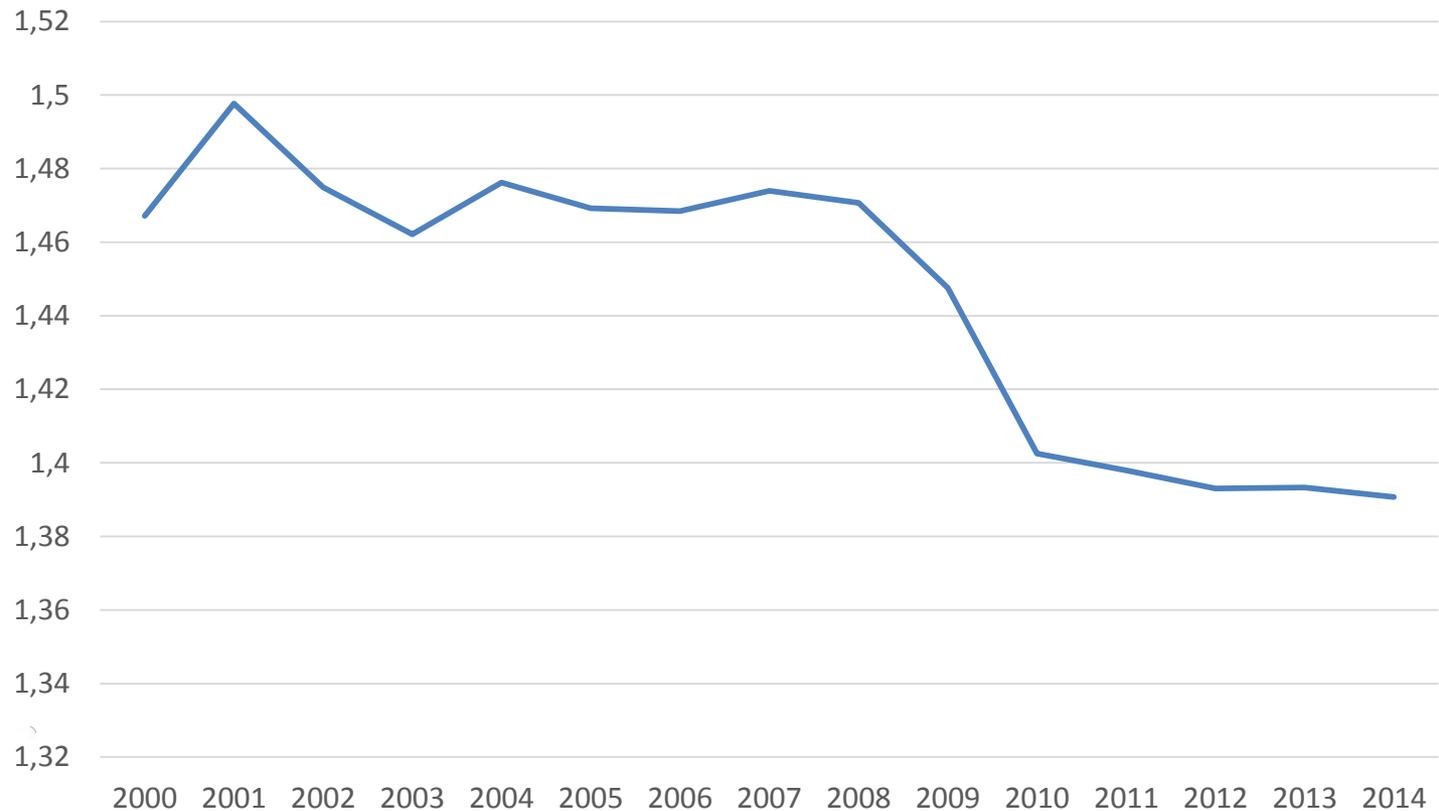
Direct effects on GDP



Direct and indirect effects on GDP



Direct and indirect impact of all branches on GDP

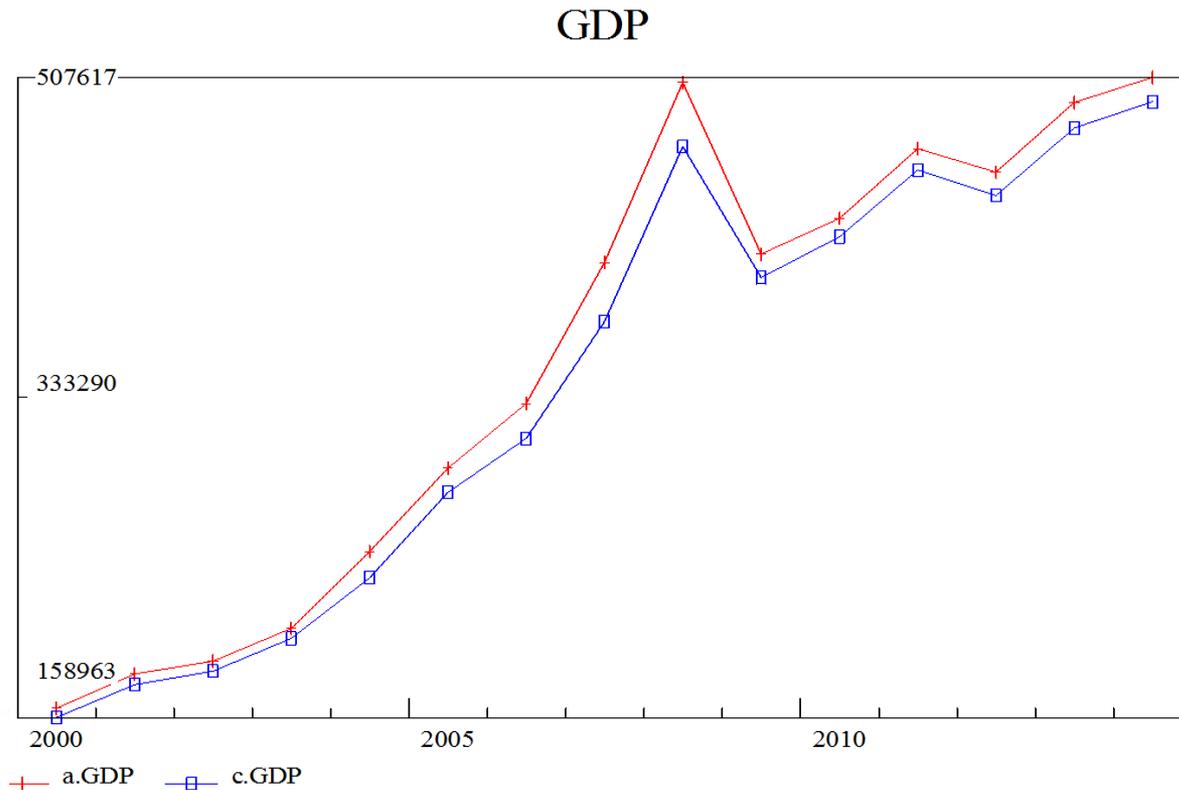


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Total impact of crop and animal production etc.



Definition of KIBS



In the present study KIBS are defined according to the narrowest approach, as comprising services delivered by divisions:

62-63 Computer programming, consultancy and related activities;
information service activities

69-70 Legal and accounting activities; activities of head offices;
management consultancy activities

71 Architectural and engineering activities; technical testing and analysis

72 Scientific research and development

73 Advertising and market research



Basic problem: value added or output



Should we estimate how much value added produced in firms belonging to KIBS sector is embodied in trade?

Or should we estimate how much KIBS were produced for the purpose of export?



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Joseph Francois, Miriam Manchin, Patrick Tomberger,
Services Linkages and the Value Added Content of Trade,
The World Economy, 2015, pp. 1631-1649

From the point of view of national statistics, exports (as other final products) is the last stage of value chain, where the value added is accumulated.

It means, that the value of export is equal to value added embodied in it. Thus, estimating value added embodied in export is actually splitting this value added into imported and domestically produced value added.

The disadvantage of the method based on output is its sensitivity for outsourcing.



Method



$$\mathbf{x} = \mathbf{Ax} + \mathbf{y}$$

$$\mathbf{x} = (\mathbf{I} - \mathbf{A})^{-1}\mathbf{y} = \mathbf{Ly}$$

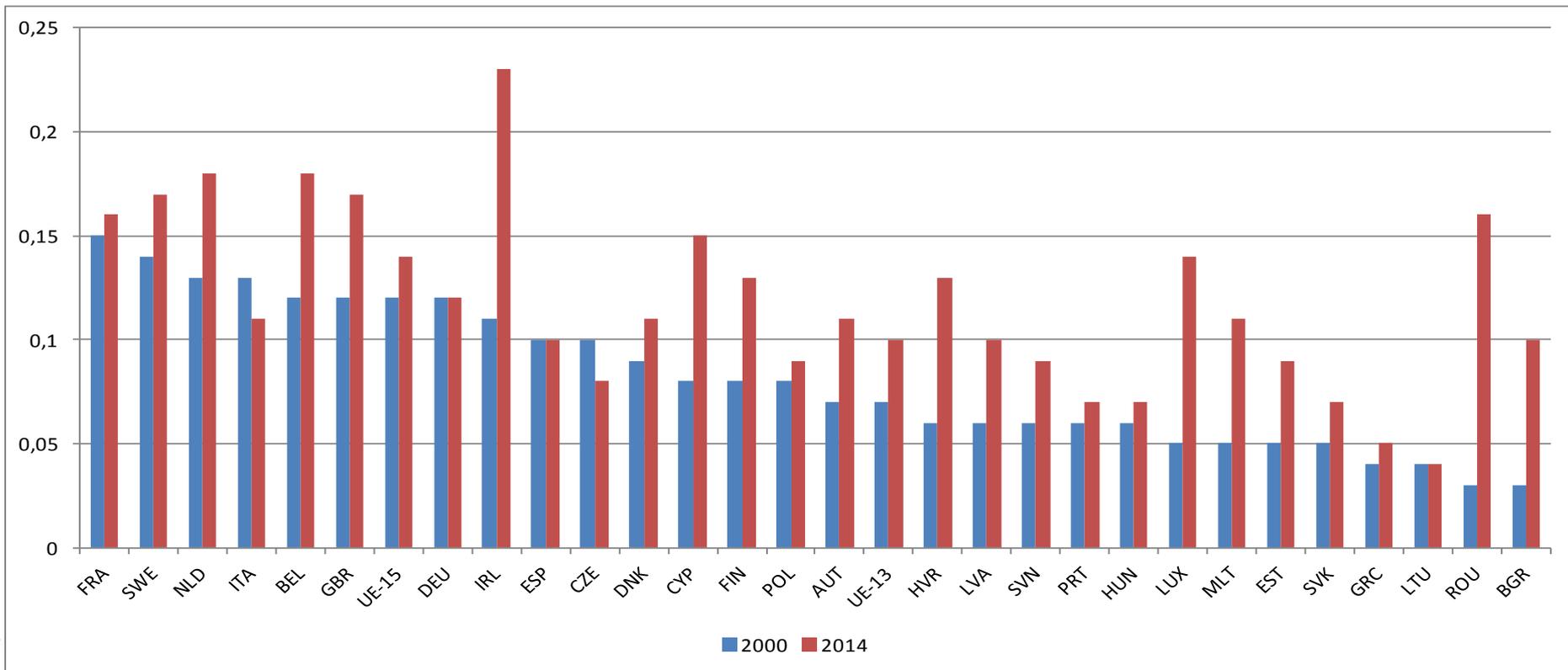
$$\mathbf{x} = \mathbf{x}_D + \mathbf{x}_E = \mathbf{Ly}_D + \mathbf{Ly}_E$$

$$\mathbf{v} = \mathbf{v}_D + \mathbf{v}_E = \hat{\mathbf{V}}\mathbf{Ly}_D + \hat{\mathbf{V}}\mathbf{Ly}_E$$

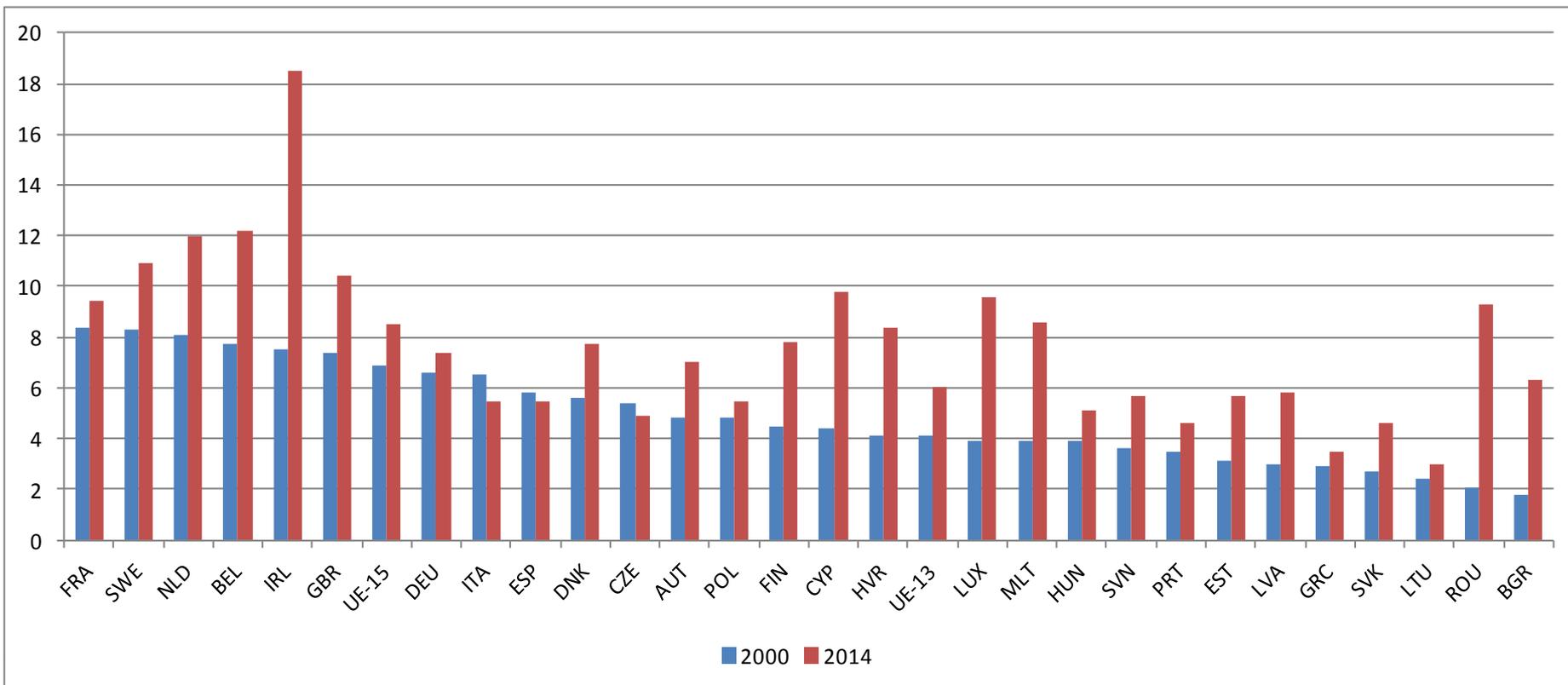
i -th element of vector \mathbf{x}_E tells how much output of sector i is needed for producing exports.



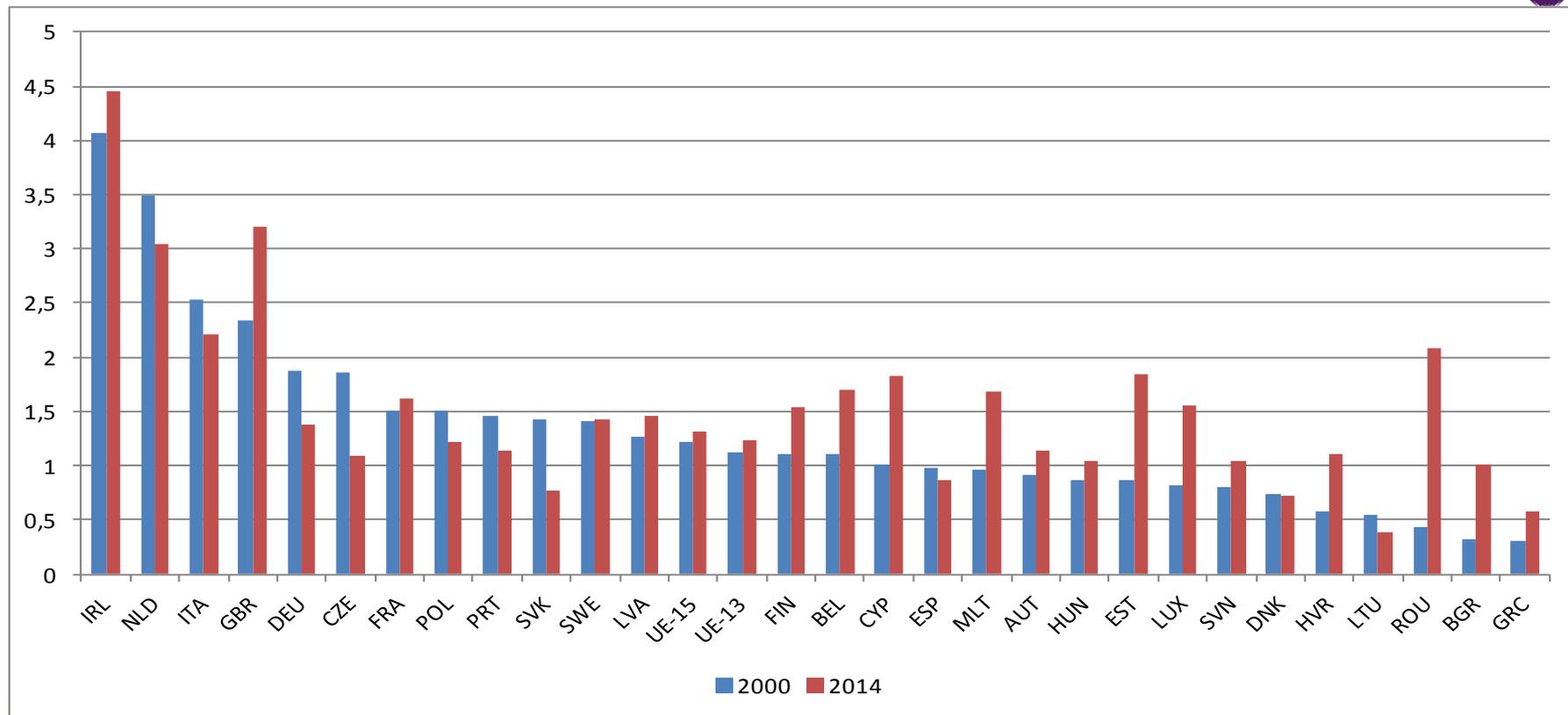
Value of KIBS sector output imputed to 1 USD of export – the KIBS intensity of export



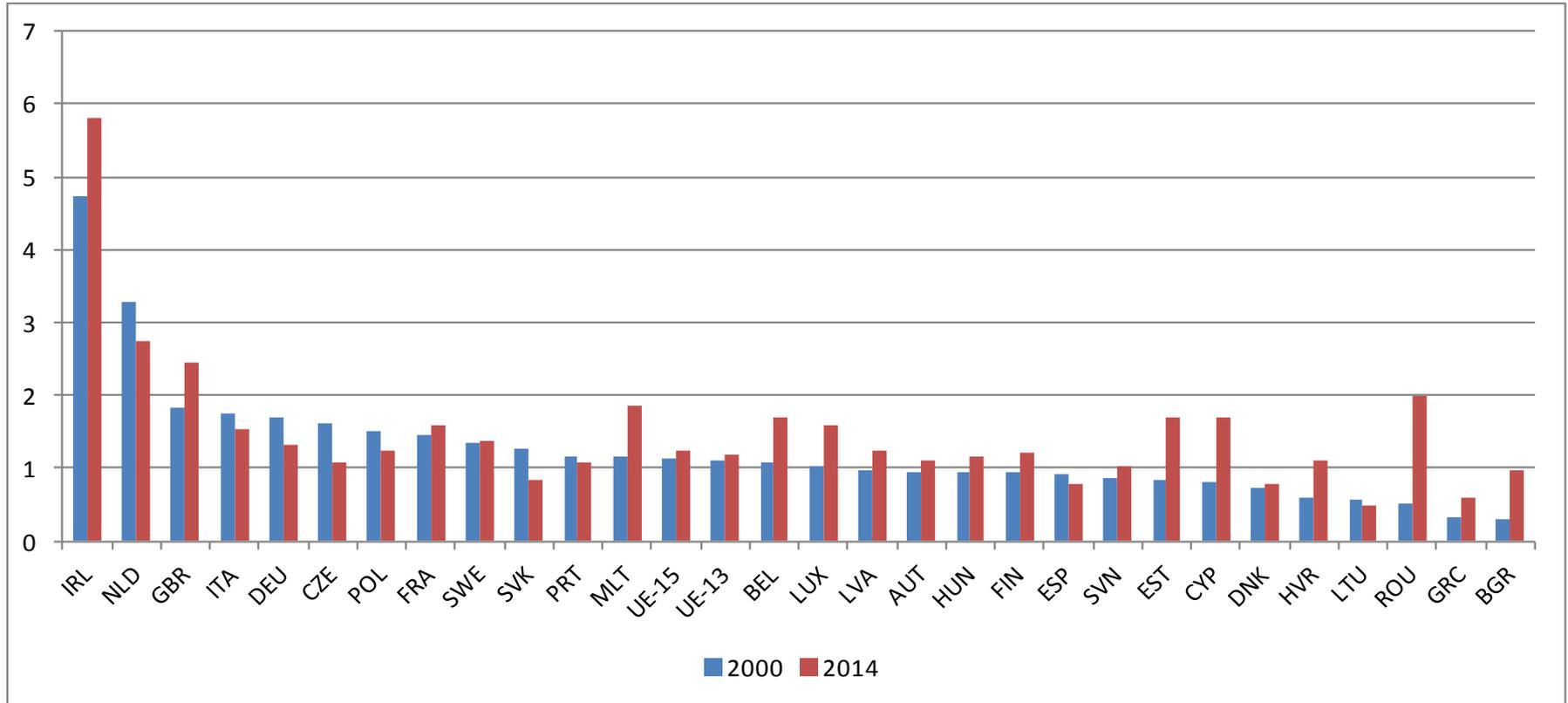
Share of KIBS sector in all output imputed to export – the importance of KIBS for export



Value of KIBS sector output imputed to 1 USD of export over the value of KIBS sector imputed to 1 USD of domestic final demand – relative KIBS intensity of export



Share of KIBS sector in all output imputed to export over the share of KIBS sector in all output imputed to domestic final demand – relative importance of KIBS



Conclusions



1. The value of output of KIBS sector necessary for producing a unit of export increased in most of the EU countries. It decreased for Italy and Czech Republic only.
2. Initially (2000), these values for the old EU members were highest than for the new members. The highest value (France) reached 0.15, the lowest (Romania and Bulgaria) was 0.03.
3. In 2014 Romania moved from the last to the seventh place. The average for the EU-15 was still significantly higher than for the EU-13, but this difference was reduced.
4. Similar conclusions can be drawn upon the share of KIBS sector in all output imputed to export.

The importance of KIBS increased. The average share for the old EU members rose from 6.9% to 8.5%. For the new members it grew from 4.1% to 6%.



Conclusions



1. The value of KIBS sector output imputed to 1 USD of export is slightly higher than the same imputed to 1 USD of domestic final demand. The difference between EU-15 average and EU13 average is rather small. Both averages went up. The variation is high. **Export is more KIBS intensive than production for domestic final demand. This difference is not much, but its growing.**
2. Ireland is an outlier, the highest dynamics can be noticed in the case of Romania.
3. Similar conclusions can be drawn upon the last figure. The average ratio for the old EU members rose from 1,13 to 1,24. For the new members it grew from 1,1 to 1,18.

KIBS are more important for export than domestic final demand.

