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Session 4A: Economic Growth and Productivity Growth

THE CONTRIBUTION OF INTANGIBLE ASSETS TO THE LONG-TERM GROWTH OF THE RUSSIAN ECONOMY

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WHAT DO WE KNOW ABOUT INTANGIBLE ASSETS IN RUSSIAN ECONOMIC GROWTH?

WORLD KLEMS PROJECT

Russia KLEMS (www.worldklems.net)

- VA-based
- 34 species of NACE activities
- 1995-2014

The system of indicators of growth rates of gross output / value added

- Decomposition of gross output using the "Cost-Release" tables
- Simplified decomposition using value added

It is possible to present the rates of GDP growth in the form of the amount of sectoral contributions

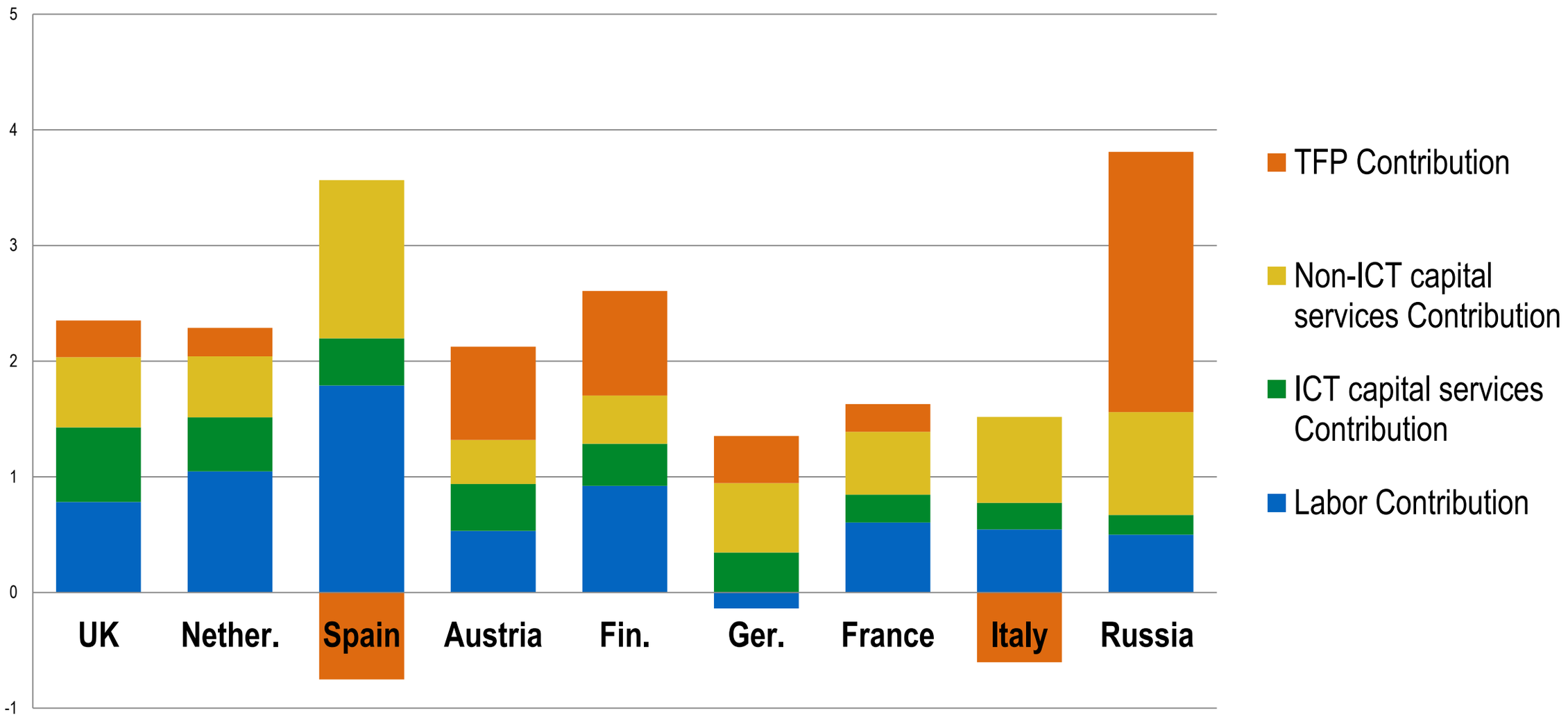
- factors of production
- effect of reducing real costs per unit of output - multifactor productivity (MFP)

Includes data on capital services

- ICT-capital (Computing equipment, Communication equipment, Software)

INTANGIBLE ASSETS IN KLEMS PROJECT

Value added decomposition, p.p., 1995-2009



Source: EU-KLEMS, 2012 release, RU-KLEMS, 2017 release

GENERAL PROBLEMS OF INTANGIBLES MEASUREMENT

- **Definition of what specifically should be attributed to intangible assets**
- **Not all intangible assets that affect economic growth are clearly visible in national statistics**
- **Limited reliable data on the actual value of a number of intangible assets**
- **National accounting standards**

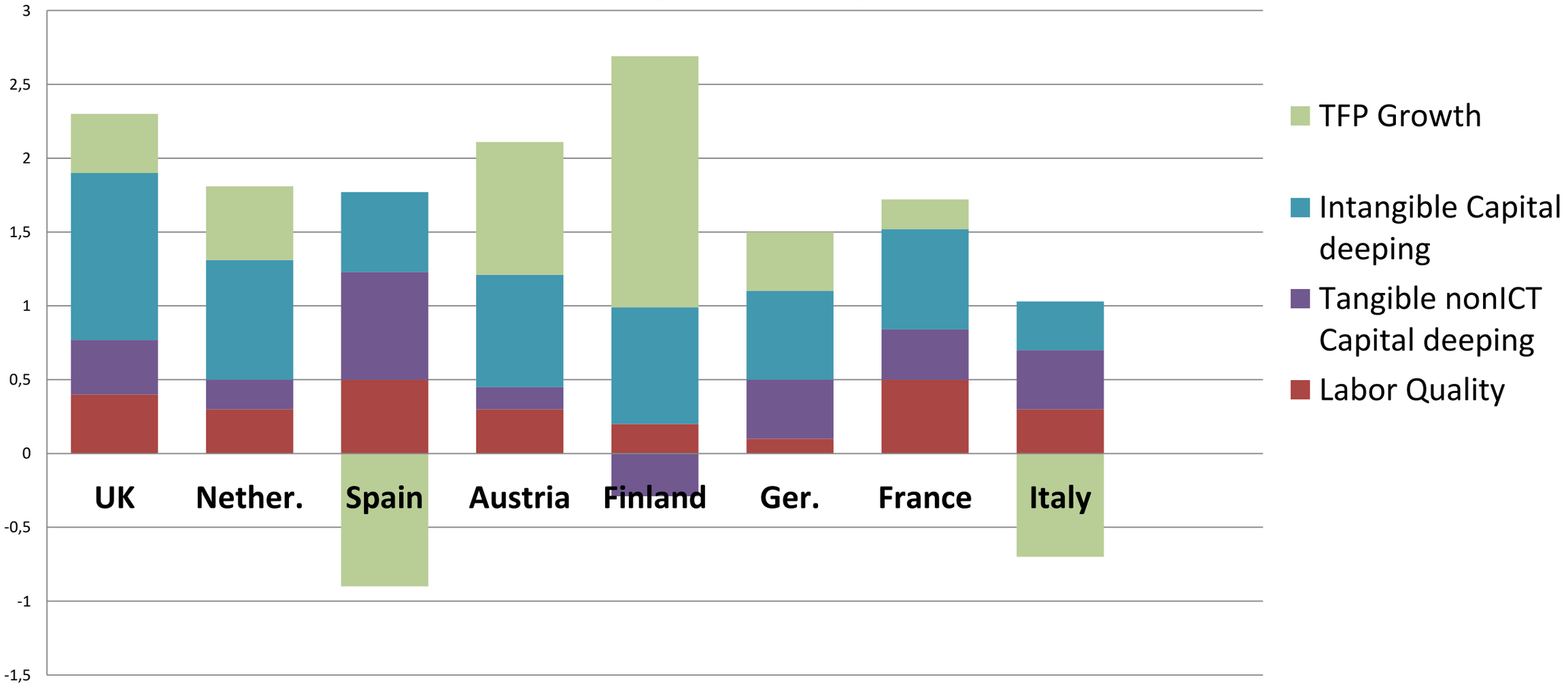
DIFFERENT APPROACH OF INTANGIBLES IN GROWTH

Corrado, C., C. Hulten and D. Sichel approach:
developed a simple three-sector model that identifies production functions for consumer goods, common investment goods and intangible assets

- measured an expanded list of intangible assets at the aggregate level in the US economy
- identified three integrated categories of intangible assets (computerized information, innovative property, including R & D, economic competence) and proposed methods for their accounting

INTANGIBLE ASSETS IN ADVANCED MODELS

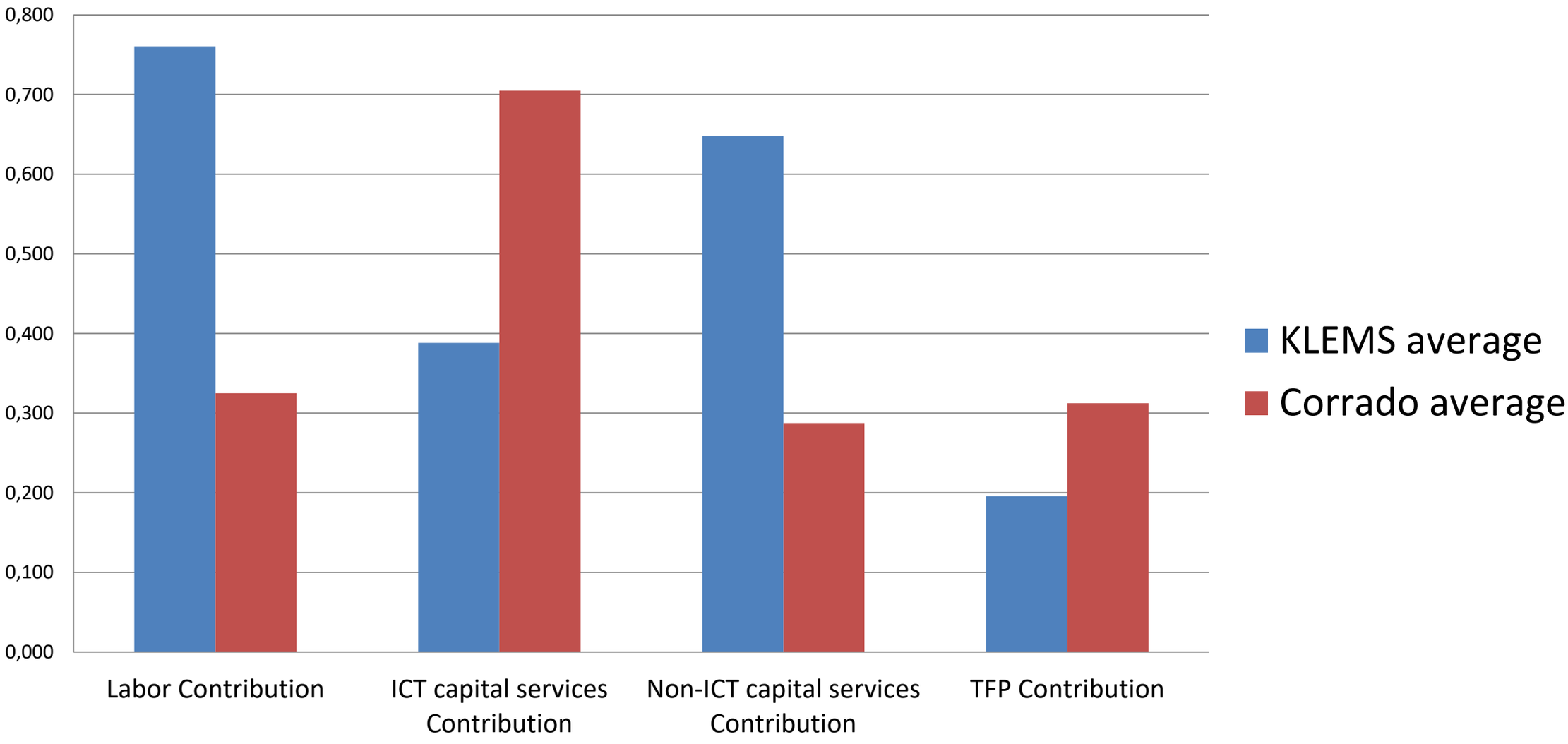
Labor productivity decomposition for business sector EU countries growth, p.p., 1995-2009



Source: Corrado et al, 2014

INTANGIBLE ASSETS IN ADVANCED MODELS

Decomposition comparison, EU countries, 1995 - 2009



Source: Corrado et al, 2014; EU-KLEMS, 2012 release

KEY QUESTIONS

- **Applying a new approach to the valuation of intangible assets in the Russian economy, and capitalized of an expanded list of intangible assets**
- **The sources of growth are compared with and without intangible assets**
- **How the inclusion of intangible assets affects the distribution of growth between capital accumulation and growth of multifactor productivity?**
- **What is the increase in growth after 2004 with intangible assets?**

EXTENDED LIST OF INTANGIBLE ASSETS

Asset type	Comment	Capitalization factor
1. Computerized information		
a. Software	Software costs for internal use (purchased and own)	**100%**
b. Databases	Database creation costs	**100%**
2. Innovative property		
a. Mineral exploration	Spending for the acquisition of new reserve	**100%**
b. R&D (scientific)	Internal R&D Costs	**100%**
c. Entertainment and artistic originals	Spending for the development of entertainment and artistic originals, usually leading to copyright or license	**100%**
d. New product/systems in financial services	New product development costs in the financial services industries not necessary leading to a patent or copyright	**8%**
e. Design and other new product/systems	Costs of new architectural and engineering projects received from specialized organizations	**100%**
3. Economic competencies		
a. Brand equity		
- Advertising	Purchases of advertising services; advertising expenditure	**40%**
- Market research	Outlays on market research for the development of brands and trademarks	**40%**
b. Firm-specific resources		
- Human capital	Investing in employee training	**100%**
- Organizational structure		
- purchased	Revenues of the management consulting industry	**80%**
- own-account	Wages in executive occupation	**20%**

Source: Based on Corrado et al, 2017

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Source: Based on Corrado et al, 2017

INTANGIBLES AND COMMENTS ON DATA SOURCE

Asset type	Included in SNA	Data source	Capitalization factor
1. Computerized information			
a. Software	Yes	Russia KLEMS	100%
b. Databases	Yes	Russia KLEMS	100%
2. Innovative property			
a. Mineral exploration	Yes	Russia KLEMS	100%
b. R&D (scientific)	Since 2008, missing from published data	Internal R&D costs (Collection «Industrial Production in Russia»)	100%
c. Entertainment and artistic originals	Yes	Russia KLEMS	100%
d. New product/systems in financial services	No	Wages of highly qualified specialists in the industry 65 OKVED (Financial intermediation)	8%
e. Design and other new product/systems	No	Form № P-1 «Information on the production and shipment of goods and services»	100%
3. Economic competencies			
a. Brand equity	No		
- Advertising		Form № P-1	40%
- Market research		Form № P-1	40%
b. Firm-specific resources	No		
- Human capital		Investing in employee training	8%
- Organizational structure			
- purchased		Form № P-1	80%
- own-account		Wages in executive occupation	20%

Source: based on official statistics from Rosstat

THE STRUCTURE OF CAPITAL EXPENDITURES IN INTANGIBLE ASSETS, %

Type of asset or expense	USA	Russia
	2000-2003	2004
1. Computerized information (mainly software)	14,1	2,7
2. Innovative property		
2.1. Scientific and technical developments	18,8	2,8
2.2. Unscientific developments	19,3	37,1
3. Economic competencies		
7. Brand equity	13,1	2,6
8. Firm-specific human capital and structural resource	34,7	54,8
GDP Percentage*	12	12,7

* Intangibles make up 5,5% of GDP in RU-KLEMS

Source: based on Corrado 2005 and author's calculations

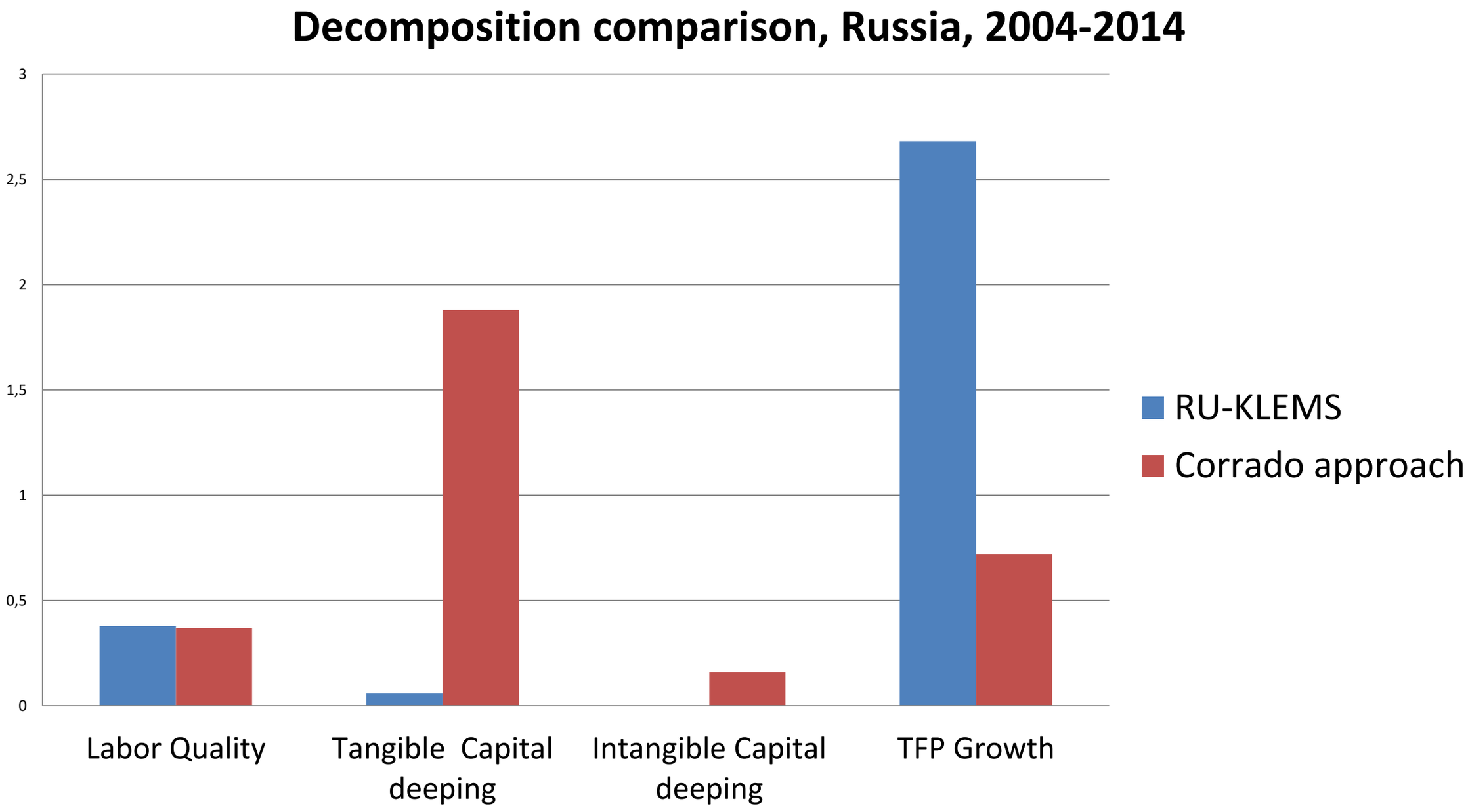
EMPIRICAL RESULTS

Decomposition of Russia's gross value added for the period 2004-2014

	2004-2008		2009-2014		2004-2014	
	RU-KLEMS	With Intangibles	RU-KLEMS	With Intangibles	RU-KLEMS	With Intangibles
Gross value added, volume indices	7,03	7,06	2,40	2,41	3,12	3,13
Growth rates						
Growth rate of Intangible capital	15,23	0,03	7,93	0,01	9,30	0,01
Growth rate of Tangible capital	61,38	0,39	26,77	0,19	38,99	0,25
Contribution to value added						
Contribution of labor (p.p.)	0,82	0,80	0,42	0,41	0,38	0,37
Contribution of Intangibles (p.p.)	0,03	0,33	0,01	0,07	0,00	0,16
Contribution of Tangible capital (p.p.)	2,80	2,12	1,95	1,72	0,06	1,88
Contribution of TFP (p.p.)	3,38	3,81	0,02	0,21	2,68	0,72

Source: Russia KLEMS, release 2017, author's calculations

EMPIRICAL RESULTS



Source: Russia KLEMS, 2017 release

CONCLUSION

Small impact of intangible assets

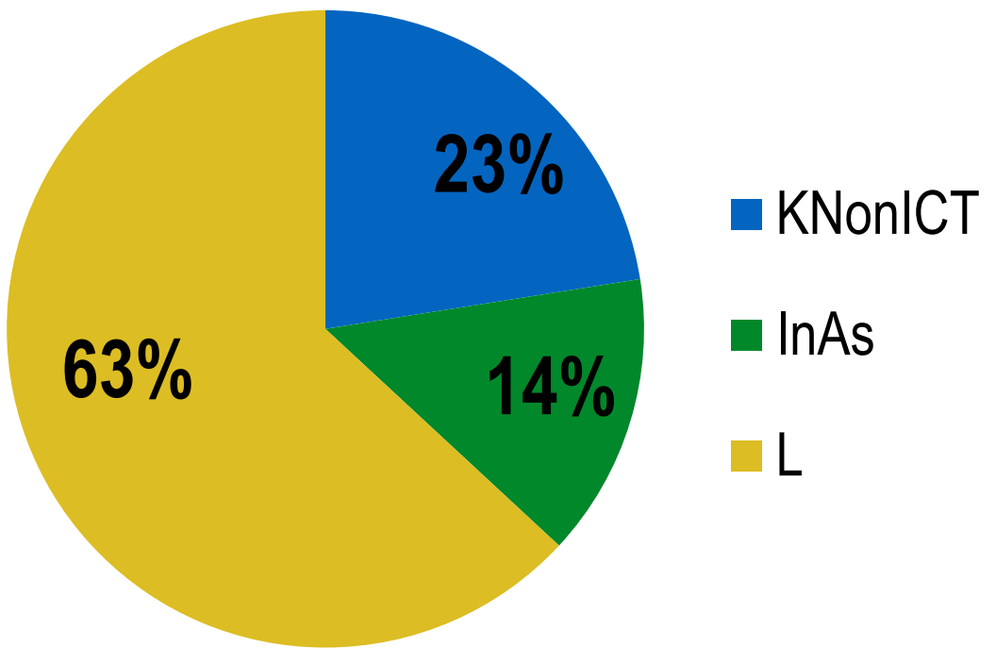
- The absence of statistically agreed price indices for investment prices for certain types of capital
- No specialized advanced survey forms for a wide range of intangible assets in Russia
- Low activity of small businesses in terms of intangible assets
- Possible inaccuracy of investment deflator system

FUTURE RESEARCH DIRECTIONS

- **For a deeper understanding of the processes occurring in the economy and related to intangible assets, it is necessary to conduct an industry analysis**
- **Working on the counting improvement of forms**
- **Working on investment deflator system**
- **Working on price indices for investment prices for certain types of capital**

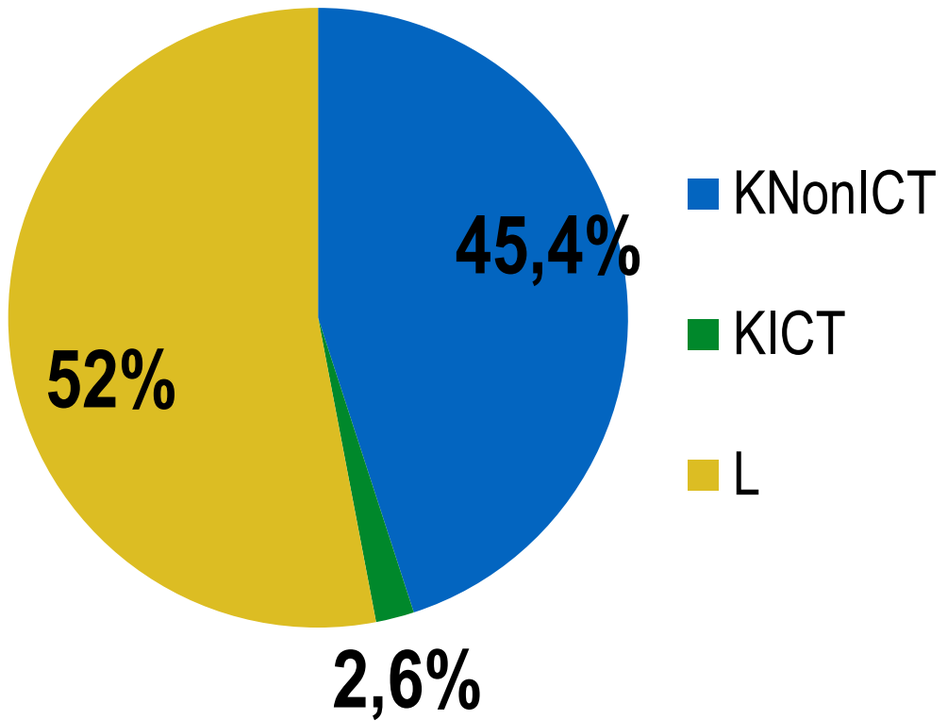
FACTORS SHARES IN VALUE ADDED (MARKET SECTOR)

According Corrado approach
10 EU countries,
1998–2007, %



Source: Corrado et al, 2017

According RUSSIA KLEMS,
1998 - 2007 %



Source: author`s calculation based on Russia KLEMS, 2017

THEORETICAL FRAMEWORK

- Growth accounting methodology (Jorgenson, Ho and Stiroh 2005)

$$Y_j = f_j\left(X_j, K_j, L_j, T\right)$$

$$\Delta \ln A_j^Y \equiv \Delta \ln Y_j - \bar{v}_{X,j}^Y \Delta \ln X_j - \bar{v}_{K,j}^Y \Delta \ln K_j - \bar{v}_{L,j}^Y \Delta \ln L_j$$

$$\Delta \ln K_j = \sum_k \bar{v}_{k,j}^K \Delta \ln K_{k,j}$$

$$v_{k,j}^K = \frac{p_{k,j}^K K_{k,j}}{p_j^K K_j}$$

$$v_{X,j}^Y = \frac{p_j^X X_j}{p_j^Y Y_j}$$

$$v_{L,j}^Y = \frac{p_j^L L_j}{p_j^Y Y_j}$$

$$v_{K,j}^Y = \frac{p_j^K K_j}{p_j^Y Y_j}$$

THEORETICAL FRAMEWORK

- Measurement of capital input based on the perpetual inventory method (PIM) with geometric depreciation profiles for each individual asset

$$S_{k,T} = \sum_{t=0}^{\infty} \partial_{k,t} I_{k,T-t}$$

$$S_{k,T} = \sum_{t=0}^{\infty} (1-\delta_k)^{t-1} I_{k,T-t} = S_{k,T-1}(1-\delta_k) + I_{k,T}$$

$$p^K_{k,t} = p^I_{k,t-1} i_t + \delta_k p^I_{k,t} - \left(p^I_{k,t} - p^I_{k,t-1}\right)$$

$$i_{j,t} = \frac{p^K_{j,t} K_{j,t} + \sum_k \left(p^I_{k,j,t} - p^I_{k,j,t-1}\right) S_{k,j,t} - \sum_k p^I_{k,j,t} \delta_{k,j} S_{k,j,t}}{\sum_k p^I_{k,j,t-1} S_{k,j,t}}$$

ANNUAL SURVEY «FORM F11» LIMITATIONS

General limitations

- do not take into account the data of small and medium enterprises
- annually made updates and changes to the form instruction

Restrictions on intangible assets

- intangible assets began to be examined as fixed assets since **2001**
- products of intellectual activity classified as fixed assets in **2011**
- research and development is classified as fixed assets in **2012**
- products of intellectual activity that have no legal or other protection are not reflected
- unfinished software development work is not reflected
- contracts, leases, licenses and the value of goodwill and business connections (trademarks and other marketing assets) are not reflected
- adherence to standards of Russian accounting of fixed assets

INTANGIBLE ASSETS IN «FORM F11»

2014 - 2012	2011	2010 - 2001	2000 - 1995
Intellectual property and IP products	Intellectual property and IP products	Intangible fixed assets (Mineral exploration; computer software; works of entertainment, literature and art originals; high technology industrial technology. Since 2010, other intellectual property.)	-
Including: research and development			
subsurface Exploration and Assessment of Mineral Reserves, including Production Intangible Exploration Assets			
software			
database			
works of entertainment, literature and art originals			

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