





Center
of Excellence
in Finance

Quantification of impact of ERP structural reforms

Methods and examples



Funded by the European Union.

Fiscal Implications of Structural Reforms

Overview

- 1) **Introduction and overview of methods**
- 2) Simple examples – structured expert judgement



The ERP Guidance Note

Asks for expected impact of each reform on:

- **Competitiveness** – GDP growth, exports, sectoral impact – **quantified** and captured by high-level indicators
- **Social outcomes** – employment, poverty, equality, gender, access to health care – **qualitative or quantitative**
- **Environment** – in line with Green Deal targets and commitments – **quantified**, in short, medium and long term

Our aim is to encourage you to provide at least some quantification of some impact – for a start.



The process of impact quantification

Develop the **qualitative logic of impact** – how the the measure will lead to expected impact (called also the ‚intervention logic‘ or the ‚theory of change‘).

Express your measure with an ‚**intervention variable**‘ – a variable that captures the immediate effect (e.g. reduction of admin. costs or costs of finance, spending on labour market policy, subsidies to businesses).

Quantify the impact in terms of **expected changes of outcome variable(s)** induced by the changes in the intervention variable.

Economic models

Most often developed and used by ministries of finance, central banks or economic institutes.

Useful for capturing complex, long-run and second-order effects.

Require advanced technical skills

Good communication between LMs (knowledge of measure) and MoF (technical skills) is required.

EXAMPLES FROM ERPs

- KOS* - general equilibrium model used to estimate impact of 4 SR (energy efficiency, informal economy, training of unemployed, court efficiency)
- MNE – macroeconomic model used to estimate impact of planned investment (but not yet for SR)

Learning material in the OLC:

- *use of DG ECFIN model **QUEST** (ppt)*
- *use of KOS* **CGE model** (ppt, video) for estimating impact of SR.*



Econometric estimations

Typical examples:

- Impact of the intervention variable and other factors on the outcome variable
- ‚Treatment effect‘ – beneficiaries of the measure compared to a control group

Usually only capture the direct impact, but require less skill than models and can be tailored to the specific measure.

Every MoF in the region estimates a ‚production function‘ as part of the fiscal analysis.

*Learning material in the OLC:
DG ECFIN **paper** estimating impact of reduction of the **skills-mismatch** on productivity. Includes useful indicators of skills-mismatch.*

SUGGESTION FOR ERPs

A production function links GDP to:

- **Human capital** (employed labour force, sometimes weighed by years of schooling)
- **Physical capital**
- **Multifactor productivity** (effects of innovation, technology etc.)

Could be used for impact of SR which

- increase human capital:
employment and education
- improve the productivity trend:
RDI and digitalization



Structured expert judgement

Can be used by experts in LMs with good knowledge of their policy area and some data skills.

Can capture a lot of specific knowledge about the country's economy and institutions.

May be perceived as biased and naive, but is often the best possible option and better than no quantification.

TYPICAL EXAMPLES

- Adapting results of **existing studies** to your measure and country
- Scenario building based on **benchmarking** with comparative countries
- Scenario building based on **past trends** and the change introduced by the measure
- Transforming **target indicators** into expected impact

The rest of the presentation provides examples of these simpler methods

Overview

1) Introduction and overview of methods

2) **Simple examples of structured expert judgement**

- Adapting results of **existing studies**
- **Benchmarking** with comparative countries
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Example from the ERP

SR MEASURE

Development of the broadband infrastructure for digital economy

Referring to study “The Impact of Digital Transformation on the Western Balkans”, broadband investments could potentially contribute to the dynamics of new job openings **in Western Balkan economies**. It is estimated that **broadband investments of 100 million euro could induce new jobs in a range from 3,000 to 10,000.**

As result of lower labour productivity (more labour is required per unit of output), employment potential of broadband investments is the highest **in Albania**, about 10,000. According to the study, a **demand stimulus through 100 million euro broadband investments would induce additional GVA (gross value added) up to 0.9% in Albania.**

What could still be done? Relate the impact quantification to the actual investment planned in this measure.



Example: using OECD estimations of impact

*Learning material in
the OLC:
Full OECD study on
the impact of SR.*

Policies	supply-side channel	Size of reform	OECD countries	non-OECD countries
PRODUCT MARKET REGULATION				
Product market regulation (OECD PMR indicator)	MFP	-0.58	2.27%	OECD
	K/Y	-0.58	1.55%	4.37%
	Employment	-0.58	0.99%	1.20%
Time of insolvency procedures (WB Doing Business indicator)	MFP	-1.23	10.67%	
	Employment	-1.23	2.26%	
LABOUR MARKET REGULATION & POLICIES				
Employment protection legislation (EPL permanent contracts)	K/Y	-0.83	3.64%	OECD
	Employment	-0.83	3.70%	2.32%
Spending on active labour market policies (ALMP)	MFP	3.18	1.27%	OECD
	Employment	3.18	0.27%	OECD
Tax wedge	Employment	-2.28	0.67%	OECD
Excess coverage (p.p.)	Employment	-1.89	0.15%	OECD
Minimum wage (% of median)	Employment	-2.48	0.70%	OECD
Unemployment benefits (% of earnings)	Employment	-1.42	0.45%	OECD
QUALITY OF INSTITUTIONS				
Rule of law	MFP	1.01	35.50%	43.4%
Cost of contract enforcement (Doing Business indicator)	MFP	-15.91	7.96%	
	K/Y	-15.91	11.76%	
OTHER POLICIES				
R&D investment	MFP	0.10	0.40%	OECD
Trade openness	MFP	4.01	2.80%	OECD
Corporate income tax (% of GDP)	K/Y	-0.98	1.25%	OECD

Estimate the impact of improving insolvency procedures

1) Quantify the reform in terms of a variable included in the OECD estimations

- Variable: time for insolvency procedures (Doing Business, in years)
- Set the target – for example: move to the level of the best performer in the region, make a change similar to what comparable countries have already achieved, ask experts what they think is achievable etc. – for this, you will need to look at the Worldbank Doing Business database online
- Assume you choose the target of reducing the time from 2 to 1 year

2) Read the expected impact from the table:

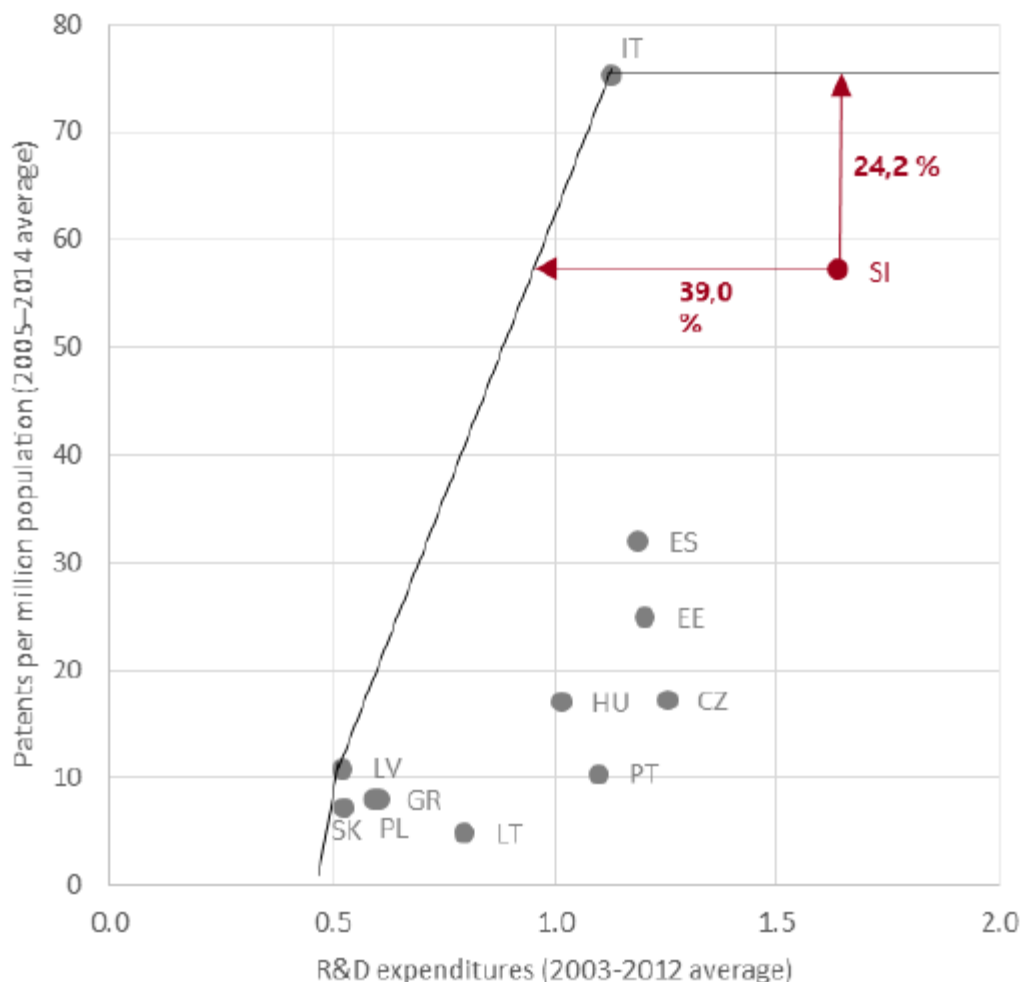
- Table: reduction by 1.23 years increases employment by 2.26%
- Your reform: $1/1.23$ years = 81% of the effect in the table = employment +1.8%
- Ask the MoF to plug the increase in employment into their estimated production function – to get the impact of increased employment on the GDP
- Discuss whether the impact in your country is likely to be lower or higher

Note: effects of some other variables in the table are expressed by capital/output ratio (K/Y) or multi-factor productivity (MFP) – also elements of the production function.

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Example: Benchmarking to the efficiency frontier



The ,**efficiency frontier**' (the **hard line**) connects the countries with the most efficient combination of R&D spending and patent applications per population.

The line can be estimated or simply plotted – use comparable countries and averages over several years.

The arrows show the position of **Slovenia** – with the same spending, but better policies, we could produce **25% more patent applications**.

Very good for **policy debate** – do we need more money or better policies?



Estimate the impact of increased efficiency of R&D spending

1) How IMAD used it in their study?

- They referenced the study which found that ,a 25% increase in the number of patent applications raises annual GDP growth by 0.1 percentage points in the long term (in a period of 50 years)‘
- Their conditional estimate: if we increase the efficiency of spending to the level of the best performing peers, our GDP could increase by 1% over the next 10 years – calculated as a cummulative effect of a 0.1 p.p. higher annual growth

2) What you can do:

- First, of course, design the reform in the best possible way to increase efficiency – consult experts and practioners (innovative businesses, good researchers)
- Set a realistic target – by comparing your performance with comparable countries and, again, consulting experts on the realism of the target
- From here, use the same study as IMAD did to estimate impact – or even better, find additional studies and use their average, or the most plausible result

Learning material in the OLC:

IMAD study which estimates impact of an array of SR using different methods (ppt, paper).

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Example from the ERP

SR MEASURE

Support for innovative start-ups and digital transformation of companies

An assessment of business performance undertaken by the Innovation Serbia Project (IPA 2011) between 2012 and 2017 revealed **a tangible increase in operating revenues by businesses receiving financial support** in this area, from EUR 7.7 million in 2012 to EUR 20.2 million in 2017.

The **survival rate of new innovative businesses** stands at a very high 89.5%, with 34 of the 38 supported companies still operating. From early 2016 to late 2017 (following the completion of the programme), the supported companies **increased their operating revenues by nearly 60% relative to 2015** (from EUR 4.3 million to EUR 7.4 million).

What could still be done?

Use these results of past evaluation for calculation of expected impact of the current measure.



Estimate impact of providing vocational skills training to 5% of unemployed youth – based on results of programmes in the past

- 1) **Gather data on effectiveness of similar measures in the past**
 - If such training was provided in the past, what share of beneficiaries had a job, say, 6 months or 1 year after the training?
 - If such data are not collected, make a survey among past beneficiaries
 - If such training was not implemented in the past, look for data on similar measures – for example, any type of training provided as part of active labour market policy

- 2) **Make a wide-range of possible ,what-if‘ calculations**
 - What if the measure will be as effective as in the past, how many trainees are likely to have a job in 6 months after the training (and still have it after 1 year)?
 - What if the measure will be 10% more effective, because you will make changes (reform) to the way how training is delivered?
 - What if the measure will be 10% less effective, because the more beneficiaries you include, the less likely will the ,marginal ones‘ be to find employment?
 - What if, because of lack of funding or institutional capacity, you manage to include only 3% instead of 5% of unemployed youth?
 - And so on (use your imagination)

- 3) **Through expert discussion, decide which ,what-if‘ result is most plausible, and express it in terms of, for example, the increase of youth employment rate**

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Example from the ERP

SR MEASURE

Structural changes in the agricultural sector

Indicator	Basis 2019	Intermediate target	Target 2023
Share of export of agricultural products (1-24) in total export (1-98)	17.1%	20%	23%
Share of import of agricultural products (1-24) in total import (1-98)	21.7%	18.9%	16.8%
Increase of areas with agricultural crops	21%	23%	26%

What could still be done?

Use these targets for share of exports and imports also as a quantification of expected impact – there are quite some measures in ERPs where the indicators could also be used as quantification of impact.

Calculate the impact of expected growth of agricultural exports on total exports of the country and the GDP growth.

Calculate impact on GDP based on the target indicator

1) Calculate the impact on the growth of exports

- Assume that non-agriculture export will grow with the same rate as in past five years; for the purpose of example, assume this is 5% per year
- Calculate by how much agricultural exports would need to grow to increase its share from 17.1 to 23% from 2019 to 2023
- The result is a growth rate of agricultural exports of 15.2% per year
- The same calculation also shows that the annual growth rate of total exports in this period would be 7.0%
- The difference between this growth (7%) and the growth in the past (5%) is the contribution of your measure to the growth of total exports
- Thus, **assuming that the indicator target is realistic**, you may say that the impact of your measure will be an increase in the growth rate of the country's export by 2 percentage points

2) Ask the macroeconomic projections team how much an increase of exports by 2 p.p. would increase the GDP, or the growth rate of GDP

FILE WITH CALCULATIONS FOR THIS EXAMPLE:



Microsoft Excelov
delovni list



Some final remarks

PREPARE FOR FLEXIBILITY AND SPEED

- Well-organized **databases** you can quickly access and use
- Assure internal traceability and transfer – **keep a track record** of past estimations, data files, programme files, write short technical memos
- Develop models / estimations / calculations which **can be easily re-used**

DEVELOP A STRATEGY FOR DEVELOPMENT OF SKILLS AND TOOLS

- **Consider** the strengths and stability of your team, possible technical assistance (projects), and the main request/expectations you need to serve
- Decide where you want and need to **focus** the development of the team skills and tools
- **Liase** with other experts – central banks, research institutes, researchers – and develop a stable long-run cooperation with them

And good luck!

