



Database of Swedish Businesses and Competitiveness Approximation Model



Background

- We are tasked at performing analyses at two stages:
 1. Analyses on how *planned or proposed* EU law will affect Swedish businesses – to be used by the Government while negotiating such EU law within the EU
 - **As soon as possible**
 2. Recommendations on how to implement EU law into national legislation *when proposed EU law has been decided*
 - **Within four weeks**
- In the economic-related analyses we need:
 - The number of Swedish businesses that are impacted and in what way
 - Wanted: **A data base of Swedish businesses at industry level**
 - Estimations of administrative and compliance costs of regulatory impact on businesses, as well the impact on Swedish competitiveness
 - Wanted: **A model capable in short time to cover both standard cost and aggregate impact on GDP/Value Added at industry level**

Background

- Our idea: to perform quick (reasonable) in-depth economic analyses, not only to fulfill our task but also to be used (and further developed) when impact assessments (and similar assessments) are thereafter developed
 - Evidence based, in line with European Commission (2023), *Better Regulation Toolbox*
- The procedure:
 - Initially an assignment to **Jönköping International Business School** (Lars Pettersson and Peter Njekwa Ryberg), then further developed in cooperation with the Swedish Implementation Council and **The Swedish Agency for Economic and Regional Growth** (Tomas Lööv)
 - In mid-November we went public with the data base/model and published ***Calculation examples for affected business sectors – input to Sweden's position ahead of EU negotiations on the revision of the Deforestation Regulation***
 - <https://implementeringsradet.se/wp-content/uploads/2025/11/Eng251112Calculation-examples-for-affected-business-sectors.pdf>

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The Implementation Council
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Kopia KN NIM

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Calculation examples for affected business sectors – input to Sweden's position ahead of EU negotiations on the revision of the Deforestation Regulation

The Implementation Council's contribution to the Swedish position refers to calculation examples for affected business sectors in terms of administrative costs and impact on Swedish competitiveness. The assumptions made are presented in full in section 8.

The Council's calculation basis in summary is:

	Manufacture of furniture (SNI31)	Manufacture of paper and paper products (SNI17)	Maritime transport (SNI50)	Forestry (SNI02)
Impact (hours on an annual basis)	120	180	120	20
Administrative costs (MSEK)	45,2	13,7	14,4	107,0
Competitiveness impact (MSEK)	-57,2	-32,7	-18,3	-151,0

1. The Implementation Council's task

The Implementation Council is tasked with assisting the Government in its efforts to strengthen the competitiveness of Swedish companies by avoiding implementation above the minimum level and counteracting unjustified regulatory burdens, as well as reducing administrative costs and other

STATENS OFFENTLIGA UTREDNINGAR

Database

- **National accounts data** – key for future aggregate estimates
- Data extracted from Statistics **Sweden's MONA system** (Microdata ONline Access), specifically the **FRIDA database** (Business Register & Individual Database)
- Based on **SNI2/5** (SNI2007) classifications (Swedish Standard Industrial Classification; connected to **NACE**)
- Currently uses **2022 data**; 2023 data expected May/June
- Covers all businesses with an annual turnover of at least **one price base amount** (48,300 SEK in 2022)
- Industries included only if they have **minimum 5 businesses**



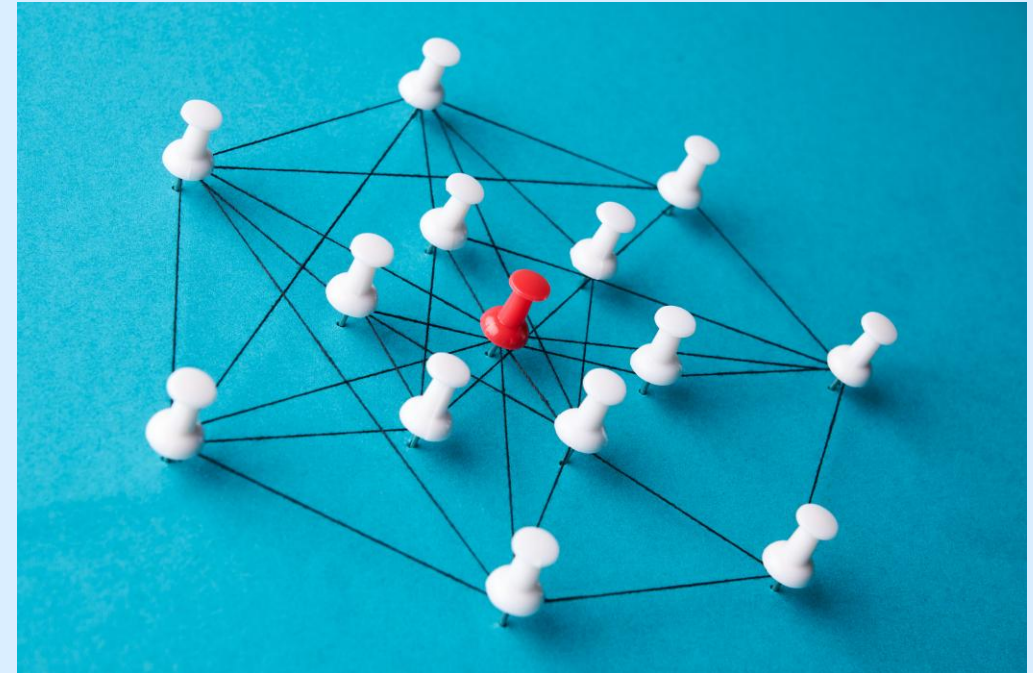
Database

Variables for each industry:

- Turnover
- Value added
- Number of employees
- Number of companies
- Salary
- Exports
- Fixed assets

Company size categories:

- Solo, micro, small, medium, small mid-caps and large



Growth model

- **Exogenous** growth model
 - Technological development and productivity growth are exogenous (not explained within the model)
 - In **the Solow-Swan** growth model, the economy's aggregate production function is seen as expressing aggregate production ($Y = \text{GDP}$) as a function of the production factors
 - We assume **the Cobb-Douglas** productivity function for Solow-Swan, depends on production factors K and L

Cobb-Douglas production function for Solow -Swan:

$$Y = A \cdot K^{\alpha} \cdot L^{\beta}$$

Y is production volume (GDP, Value Added, etc.)

K is capital

L is labor

A is a constant that can be interpreted as the level of technology (total factor productivity, TFP)

Elasticity : A measure of how sensitive one variable is to changes in another variable.

In the Cobb-Douglas function, the elasticity of K and L is given by α and β .

Growth model

When **estimating the Cobb-Douglas function**, one first rewrites it into *ln*-form:

$$\ln Y = \ln(A \cdot K^\alpha \cdot L^\beta) = \ln A + \alpha \cdot \ln K + \beta \cdot \ln L$$

We can then linearly estimate $\hat{\alpha}$ and $\hat{\beta}$.

With an estimate of $\hat{\beta}$ we can use it as elasticity of Y (given change in L) and then approximate (for a small change in L):

$$\Delta Y = \hat{\beta} \cdot \Delta L$$

→ **We must first arrive at ΔL , and then calculate ΔY** (i.e., the impact on GDP)

Example: To Standard Cost

Industry		
SNI01	Agriculture	
Impact		
Fixed	40 hours per business	
Variable	1 hour per SEK 100,000 in turnover	
<i>Number of businesses (2022) by industry</i>	28 375	
Total turnover for industry	98 100 000 000 kr	
Total fixed impact	1 135 000	
Total variable impact	981 000	
Total impact (hours)	2 116 000	
Annual working hours	1808	226 working days
<i>Salary (Agricultural and forestry machinery operator)</i>	210.40 kr	31 700 kr
<i>Salary incl. LKP (wage cost surcharge)</i>	387.13 kr	84%
Standard cost (SC)	819 172 885 kr	

Example: Add Impact on Competitiveness

Annual working hours	1 808	226 working days
Full-time work equivalent	1 170.35	
<i>Number of employees (2022) by industry</i>	26 299	
ΔL	0.045	
β	0.662	*** (153 obs.)
ΔY	0.0295	
<i>GDP/value added (VA)(2022) by industry</i>	37 100 000 000 kr	
Impact on VA	1 092 974 177 kr	
VA/SC	1.334	

The Estimates

- Estimates are made based on data for 2018-2022
- Removed industries with negative VA
- For estimation at two-digit SNI-level, it is the industries at five-digit SNI-level that are the observations.
- Estimates with pooled OLS (panel data)

Variables	All industries	Agriculture
Constant	11.25*** (0.293)	8,802*** (0.425)
in K	0.188*** (0.0158)	0.341*** (0.027)
in L	0.804*** (0.0184)	0.662*** 0.032
Number of observations	3520	153
Degree of explanation (R ² -adj.)	0.95	0.96

Reflections: On the model

▪ Advantage:

- **Manageable and quick** model, both in terms of the data needed and making estimates
- For us:
 - We have access to data where we can estimate $\hat{\alpha}$ and $\hat{\beta}$
 - We can start from a standard cost methodology (in line with the Danish Business Authority's simplified SC) and then with the help of $\hat{\alpha}$ and $\hat{\beta}$ obtain what the impact is on Y (GDP/Value Added)
 - Y can be linked to approximate competitiveness
 - An **add-on** module

▪ Limitations:

- Cobb-Douglas is based on the shares of labor and capital in total output are **constant** over time
- Macro economists of today are more focused on **endogenous** growth models; technological development is the only factor driving long-term growth
 - Empirical studies for endogenous growth require extensive data collection on factors/variables which are challenging (and we don't have access to)
- **Partial equilibrium model**
 - Cover a couple of industries at two-digit SNI-level (four?) and for small changes in L

Reflection: Linking value added and competitiveness

- **Value added:** the value of a business's output minus the value of the inputs used in the production process
- Value added is closely related to **profit margin**
 - When we sum up the value added for an industry, we get an answer to the question of how much the industry contributes to the country's GDP.
- Through profit margin, one can make **the investments needed to be able to compete** in different markets. This can be viewed as connecting to **competitiveness**
 - A kind of temporary profit persistence (one is currently doing a good as a business, a (sufficiently) lasting cost advantage, $p > MC$)
- Hence, we can **see change in value added as as connected to the impact on Swedish competitiveness** given the current industry.

Current work

- **Capital:** $\Delta Y = \hat{\alpha} \cdot \Delta K$
 - We need more detailed data on fixed assets
- More detailed information on the **connection** between size of businesses and their value added
- How to efficiently access workable and appropriate **data/information from business organisations and businesses**
- We also have data on:
 - **Hirshman-Herfindal Index** (HHI; market concentration)
 - Signals the national level of competition, to what extent the productivity is driven by competition
 - **Balassa Index** (Revealed Comparative Advantage (RCA))
 - Signals Sweden's comparative advantages
- **Update** to data for 2023





Thank you!

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