Primary School Ivanja Reka nominee for the Mies van der Rohe Award – an example of public investment

Different scenarios of estimating the consumption of fixed capital for the government sector with possible impact on gross national income

The United Nations Conference of European Statisticians

DRŽAVNI ZAVOD ZA STATISTIKU
CROATIAN BUREAU OF STATISTICS

Nikola Motik

motikn@dzs.hr

Contents

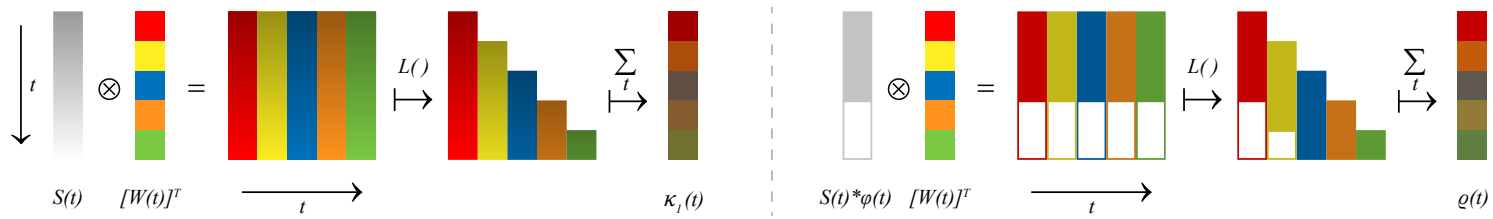
All links, marked blue, valid as of 23 April 2024. All graphs and results compiled in the R.

Introduction

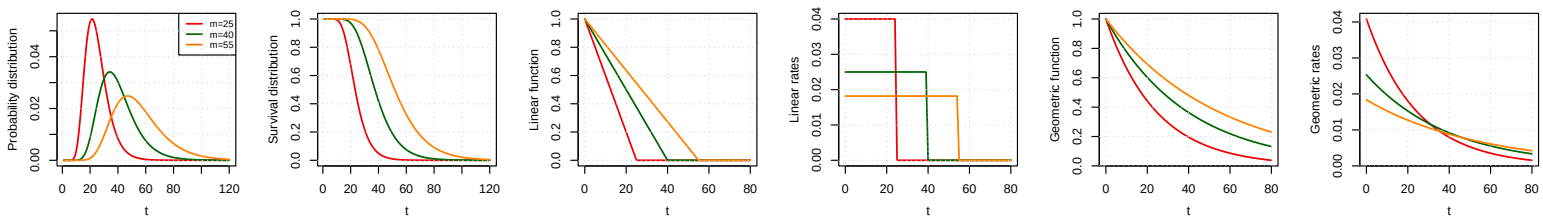
- CFC for government sector → affects GNI
- Depreciation from administrative sources → not aligned with SNA/ESA → modelling techniques, but with . . .
- . . . constraints → impacts to be simulated on Croatian data:
  - Different depreciation functions: geometric vs. linear
  - Available levels of aggregation → first GFCF might differ
  - Imputed vs some preliminary GFCF backward series
- More details in the supporting paper

Computation concept

- Through the algebra of matrices:



- Using functions on the revalued GFCF:



- The rates of linear function combined with the survival function (not valid for geometric function)

Simulations and impact

- Short description of what is about
- Graphs[1] $\rightarrow$ basic scenario vs the other ones
- The impact $\epsilon(t)$, with threshold 0.1%, is

$$\epsilon(t) = \frac{\Delta\varrho(t)}{G(t)}, \quad \Delta\varrho(t) = |\varrho_j(t) - \varrho_v(t)|$$

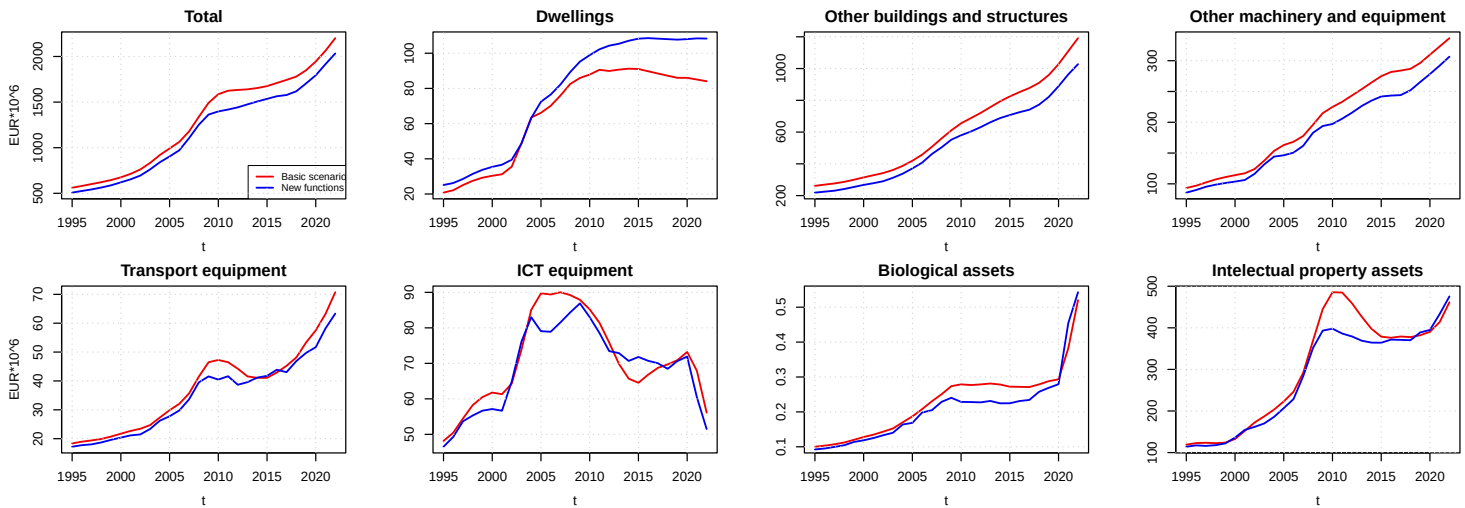
$\varrho_j(t) \rightarrow$ CFC resulting from the other scenarios
$\varrho_v(t) \rightarrow$ CFC included in currently valid GNI $G(t)$

- Graphs 1995-2022, impacts 2013-2021

[1] Basic type of assets only, computation more detailed.

Altering depreciation functions

- Geometric depreciation only for dwellings, other assets linear
- Swap of the functions: dwellings linear, other assets geometric

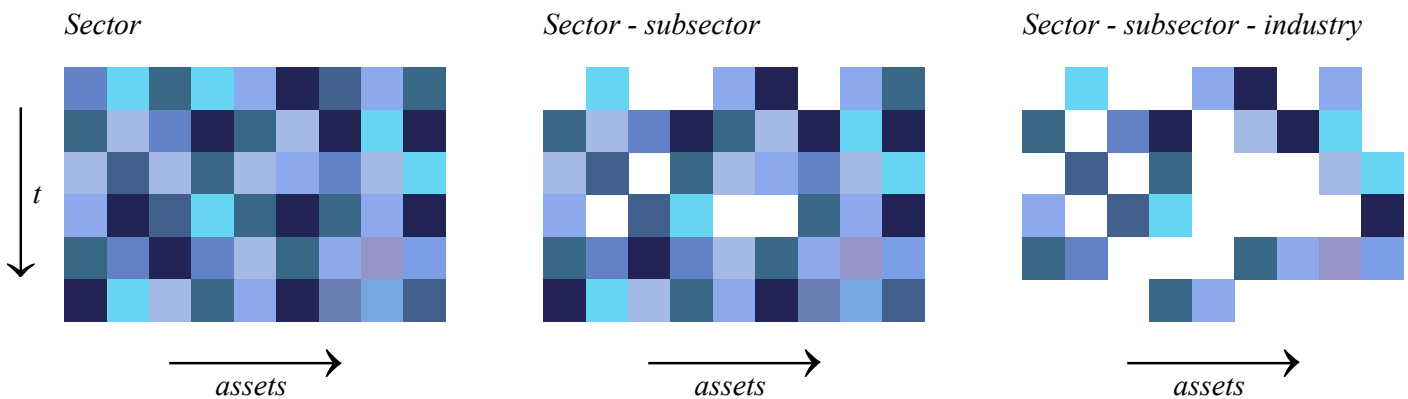


- The impact:

Indicator	2013	2014	2015	2016	2017	2018	2019	2020	2021
$\epsilon(t)$ %	0,38	0,33	0,30	0,31	0,34	0,31	0,26	0,29	0,25

Different levels of aggregation: concept

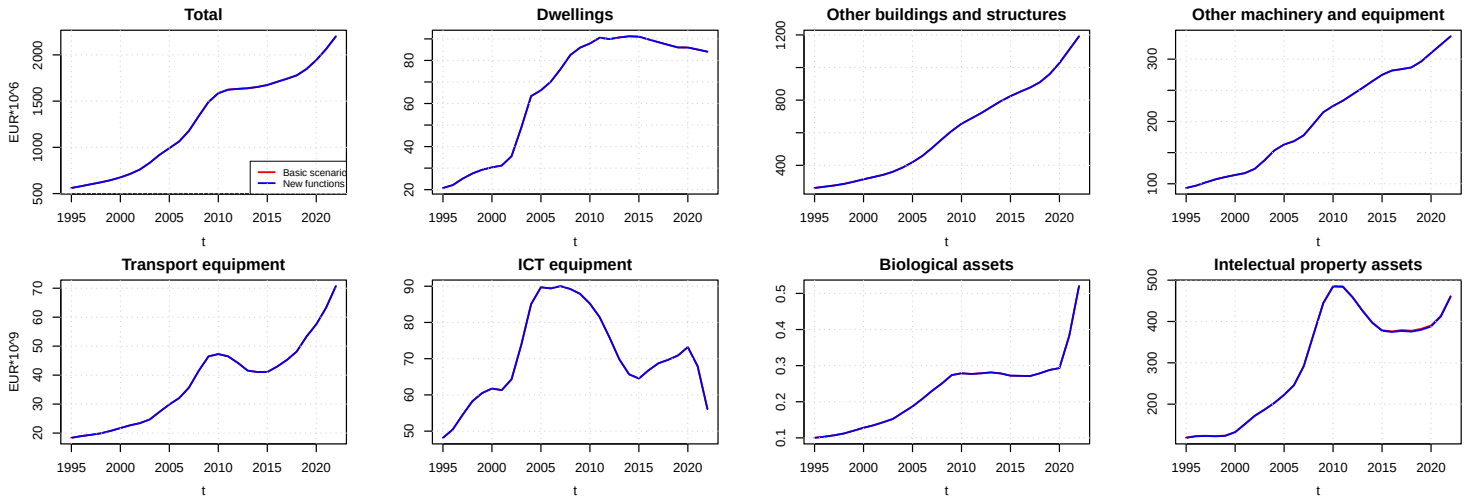
- GFCF might not be available at NACE, sub(sectors)
- Imputation begins at different time points



- Sector-subsector-industry → basic scenario (included in GNI)
- Simulations for sector and sub-sector

Different levels of aggregation: sub-sectors

- GFCF filtered for sub-sectors → aggregated CFC

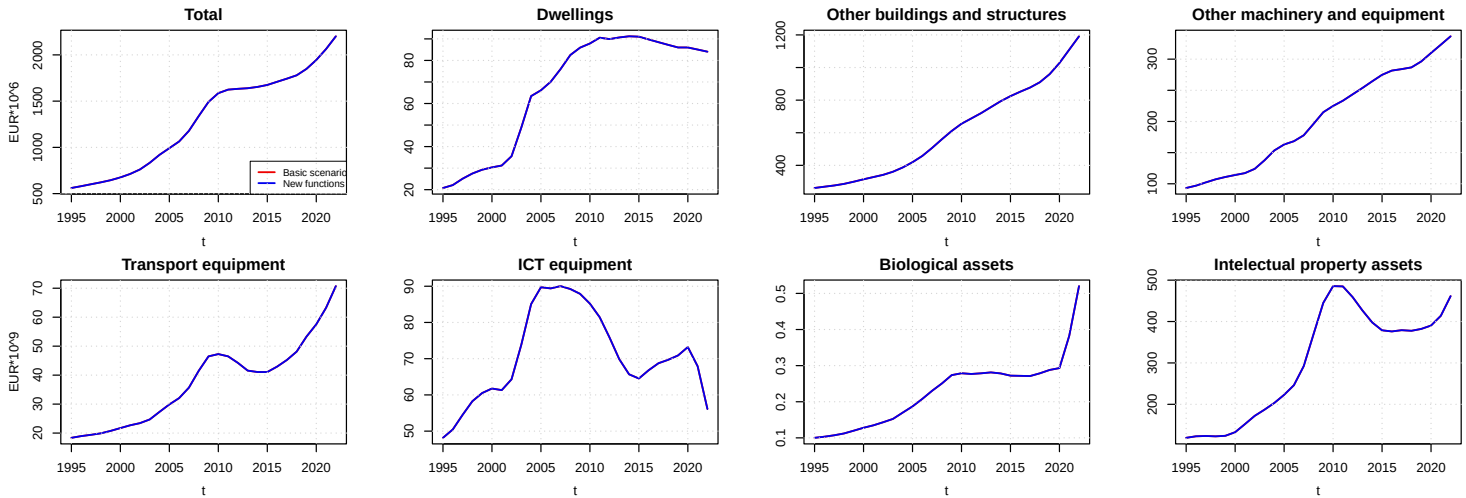


- The impact:

Indicator	2013	2014	2015	2016	2017	2018	2019	2020	2021
$\epsilon(t)$ %	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

Different levels of aggregation: sectors

- GFCF filtered for sectors → aggregated CFC

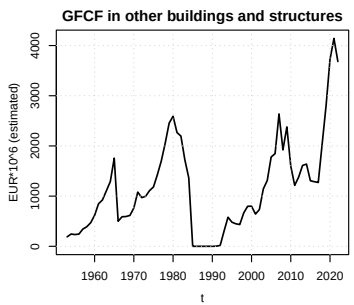


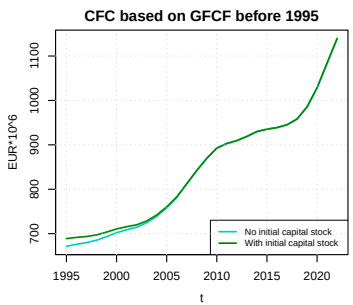
- The impact:

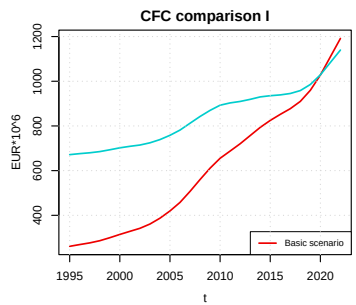
Indicator	2013	2014	2015	2016	2017	2018	2019	2020	2021
$\epsilon(t)$ %	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

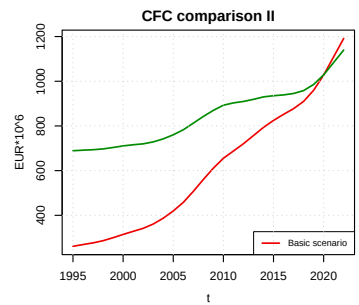
Preliminary estimated GFCF back to 1953

- GFCF: buildings other than dwellings and other structures vs ...
- ...imputation $\iota(t) = \left|-\lambda\rho_0 e^{-\lambda t}\right|$ with ρ_0 initial stock, λ long term growth rate









- The impact:

Indicator	2013	2014	2015	2016	2017	2018	2019	2020	2021
$\epsilon(t)$ %	0,37	0,31	0,24	0,19	0,14	0,09	0,05	0,00	0,00

- Caveat: mixed economy, currency denominations, different currencies, NACE classifications, revaluation

Conclusion

- Depreciation data from the sources do not follow ESA/SNA
- Modelling techniques with some constraints, therefore . . .
- . . . sensitivity of the CFC to GNI:
  - Altering depreciation functions and preliminary GFCF back to 1953 $\rightarrow$ impact
  - Only to sector and subsectors $\rightarrow$ no impact
- Further analysis of historical data (1953-1994)

Thank you for your attention!