

# Measuring the Digital Economy of Japan in 2015

An exercise prepared for the Capacity Building Workshop:  
Trade and Trade Policy Analysis for the Post COVID-19 Recovery

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# Recap of key concepts

- The measurement framework is rooted in **input-output analysis**.
- The **Leontief Inverse**,  $\mathbf{B}$ , gives the total output requirements from each industry in order to meet final demand for a specific time period.
- Using the  $\hat{\mathbf{v}}\mathbf{B}\hat{\mathbf{y}}$  matrix, value-added contribution of the digital economy to the whole economy can be traced.



# The core digital economy equation

$$\text{GDP}_{\text{digital}} = \underbrace{i^T \hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}}}_{\text{row 1}} \boldsymbol{\varepsilon}_1 + \underbrace{i^T (\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}})^T}_{\text{row 2}} \boldsymbol{\varepsilon}_1 - \underbrace{[\text{diag}(\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}})]^T}_{\text{row 3}} \boldsymbol{\varepsilon}_1 + \underbrace{(\mathbf{1} - \boldsymbol{\varepsilon}_1)^T \hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}} \hat{\mathbf{r}}}_{\text{row 4}} \boldsymbol{\varepsilon}_2$$

$\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}} =$

$\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}}_{11}$	$\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}}_{12}$	$\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}}_{13}$	$\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}}_{14}$
$\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}}_{21}$	$\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}}_{22}$	$\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}}_{21}$	$\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}}_{21}$
$\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}}_{31}$	$\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}}_{31}$	$\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}}_{33}$	$\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}}_{31}$
$\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}}_{41}$	$\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}}_{41}$	$\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}}_{41}$	$\hat{\mathbf{v}} \mathbf{B} \hat{\mathbf{y}}_{44}$

# The fourth term

- AKA: The proportionate share in the backward linkage of nondigital sectors that supply fixed capital to the core digital sector
- Why count this?



## Sample input-output table

	Core Digital Sector	Nondigital sector 1	Nondigital sector 2	Final consumption	Fixed capital of nondigital sectors	Fixed capital of core digital sector	Gross output
Core Digital Sector							
Nondigital sector 1							
Nondigital sector 2							
Value-added							
Gross output							

Corresponding backward linkage is included in the fourth term

Consumption of fixed capital

# Exercise

- Economy: Japan
- Year: 2015
- Objective: To estimate  $\text{GDP}_{\text{digital}}$  as a percentage of economy-wide GDP

# Thank you!

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