



# Economic Values of Data and Data Flows and Global Minimum Tax

*Wendy C.Y. Li*

*Moon Economics Institute*

*Date: January 7, 2022*

*2022 ASSA/SGE Sessions*

# Global Minimum Tax

- 136 countries have recently agreed to impose a 15% global minimum tax on any multinational firm that meets
- The two criteria:
  - 1) an annual revenue more than 20 billion euros, and
  - 2) a profit margin more than 10%.
- The problem: Amazon's reported profit rate in 2020 is only 6.3% - may not be applicable

- Data is the heart of Big Tech's competitiveness.
  - daily operations
  - scalability
  - diversification; enter adjacent industry
- Data-driven business model
  - ❖ few bases to deliver global digital services
  - ❖ cross-border data flows

# Research Questions

- What is the economic value of global data flow?
- How does the capitalization of data affect Big Tech's profitability?
- What are the economic values of cross-border data flows?
- How is the distribution of the economic values of cross-border data flows?

# What is the Value of Data?

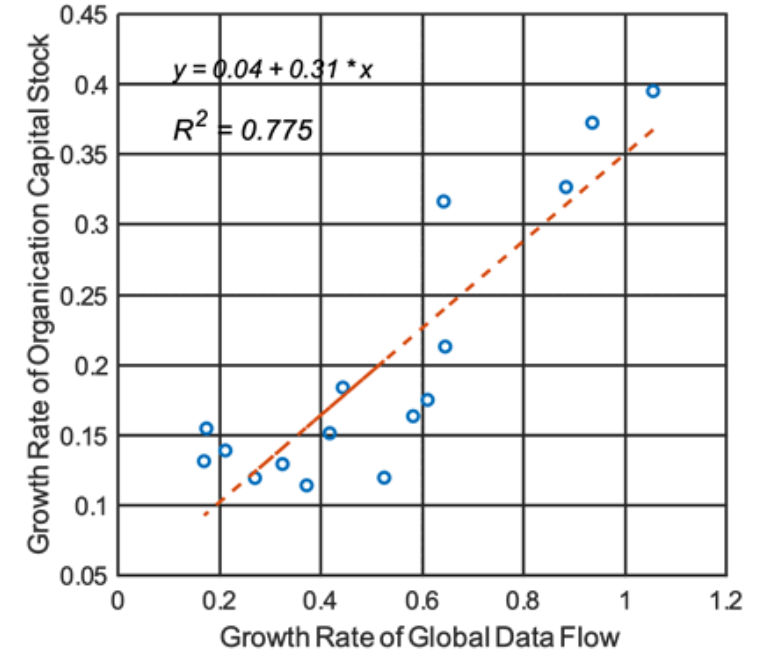
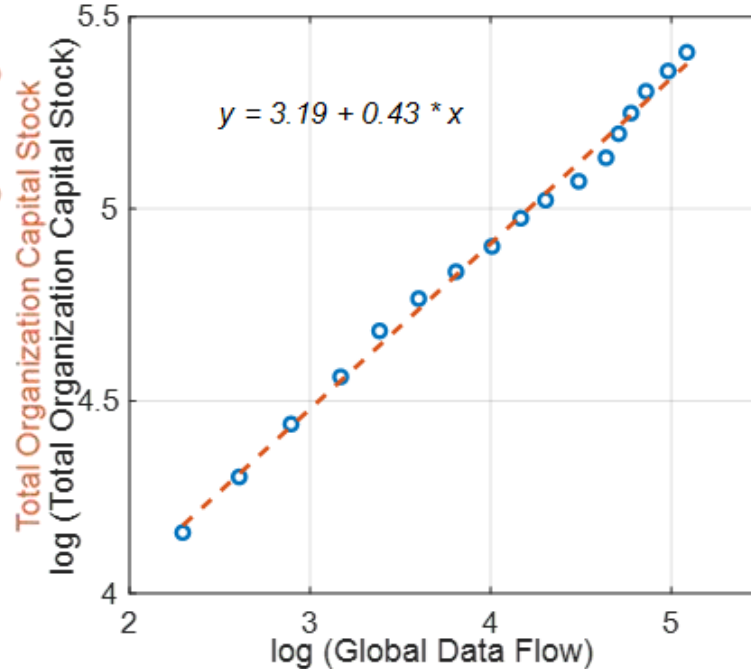
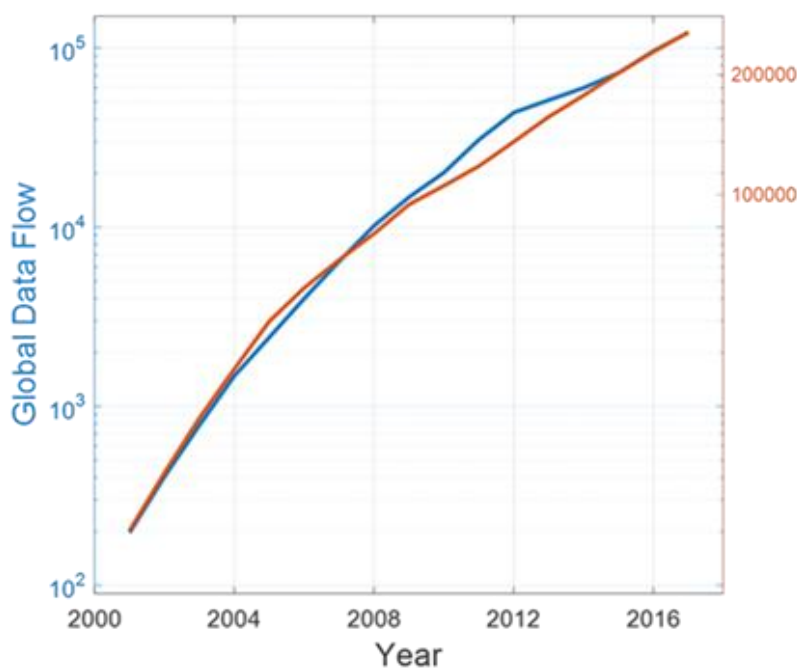
- **Definition** (Prescott and Visscher, 1980) Accumulated Information of the Firm
- **Operational Definition** (Lev and Radhakrishnan, 2005): firm-embodied/competitive advantage that cannot be completely codified, transferred to other firms, and imitated by other firms.

- **Information Pyramid**



➔ Knowledge guides firm how to produce, compete, and grow  
= Accumulated Information of the Firm  $\equiv$  Organizational Capital (OC)

# Law of Big Tech's Value of Data



## Li's Law of Value of Data:

When the global data flow increases by five folds, Big Tech's value of data doubles.

Note: Big Tech companies include Microsoft, Amazon, Apple, Google, Facebook, Alibaba, and Tencent.

# How to Measure?

- **Perpetual Inventory Method** (Hall, 1993)
  - Widely adopted measurement approach for intangible capital
  - Elements needed:
    - Data: Investment data
    - Key parameters
      - Price index: GDP deflator
      - **Depreciation rate of intangible capital** (Li and Hall, 2020)



- Investment in organizational capital:  
[Selling, General and Administrative (SG&A) Expense]  
– [R&D Expense]
- Data Sources:
  1. Big Tech's public income statements. The data cover years from 2002 to 2017.
  2. Data source of global data flow is Cisco System and the period is from 2002 to 2017.
  3. Data source of cross-border data flows are the International Telecommunication Union (ITU) and TeleGeography. The period selected in this study is 2020.

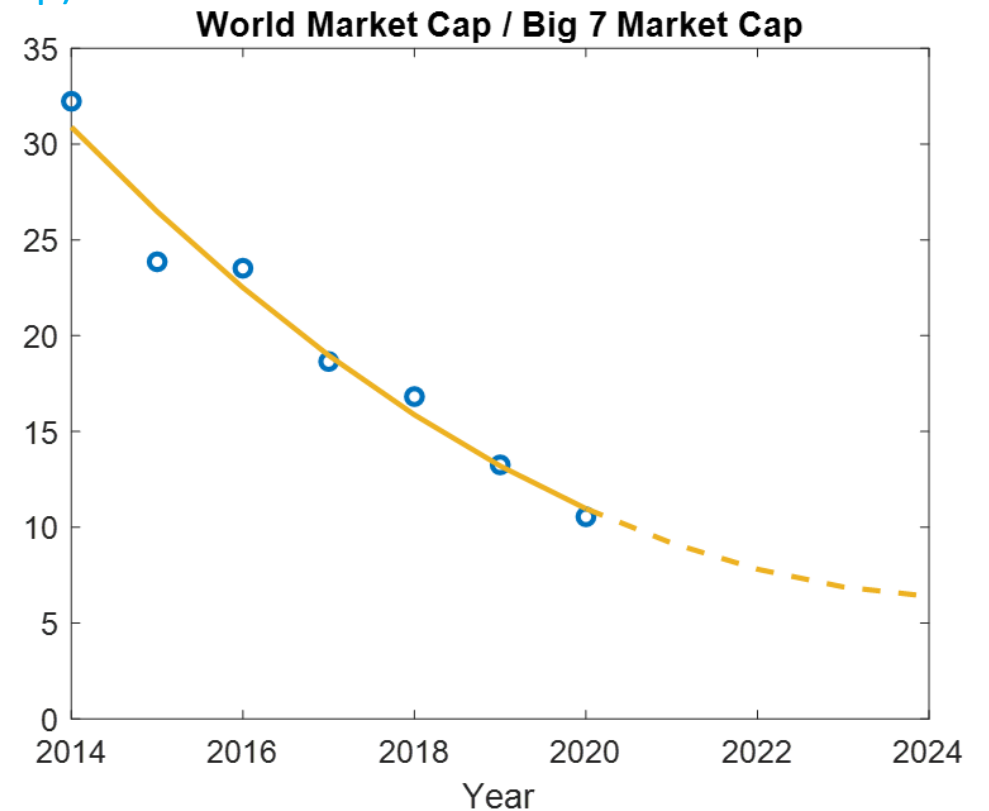
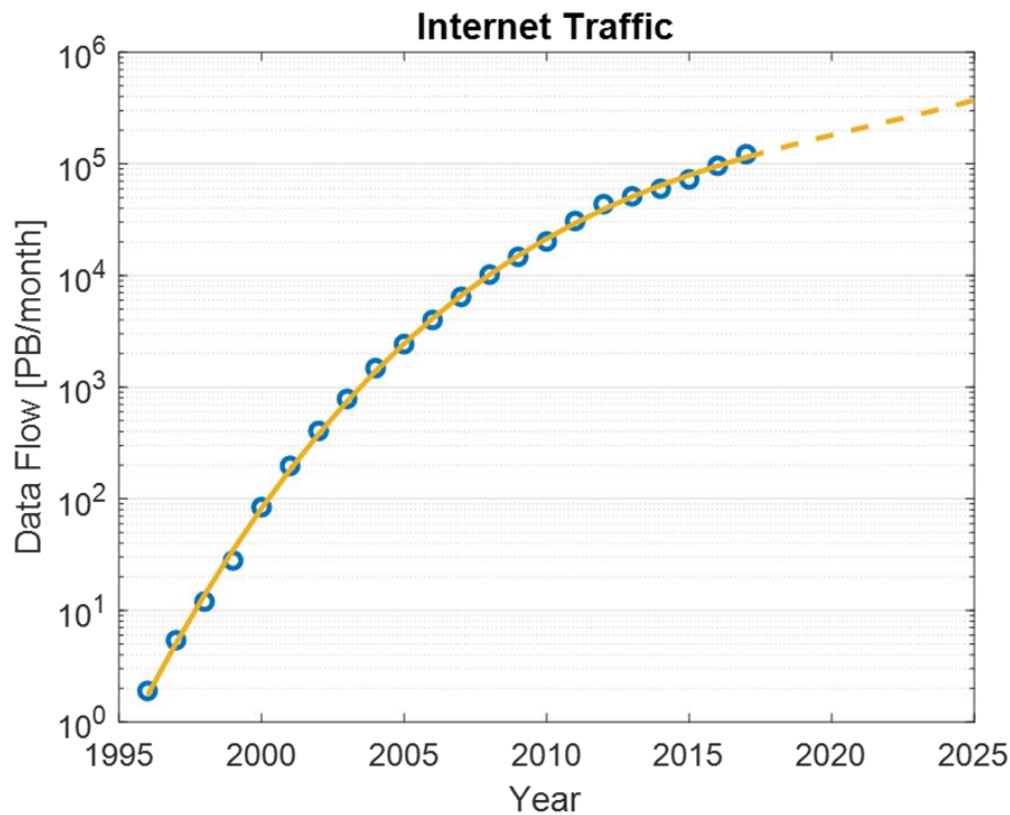


# Global Value of Data: \$3 trillion in 2020

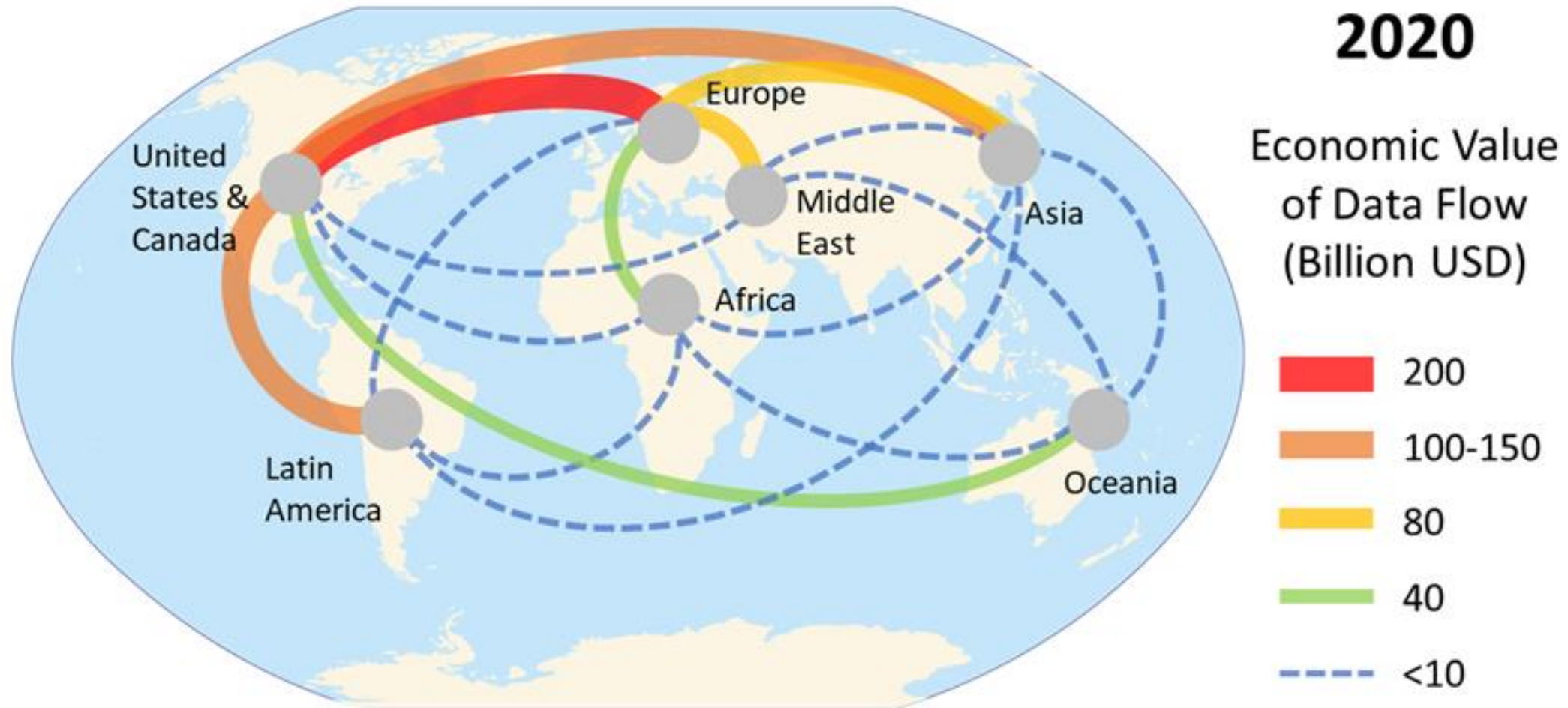
Law of Value of Data:  $\log K = 3.19 + 0.43 \times \log V$  K: OC stock [million USD]  
V: Internet traffic [PB/month]

⇒ Big Tech's Value of Data ⇒ Global Value of Data

(Big Tech's proportion  
based on market cap)



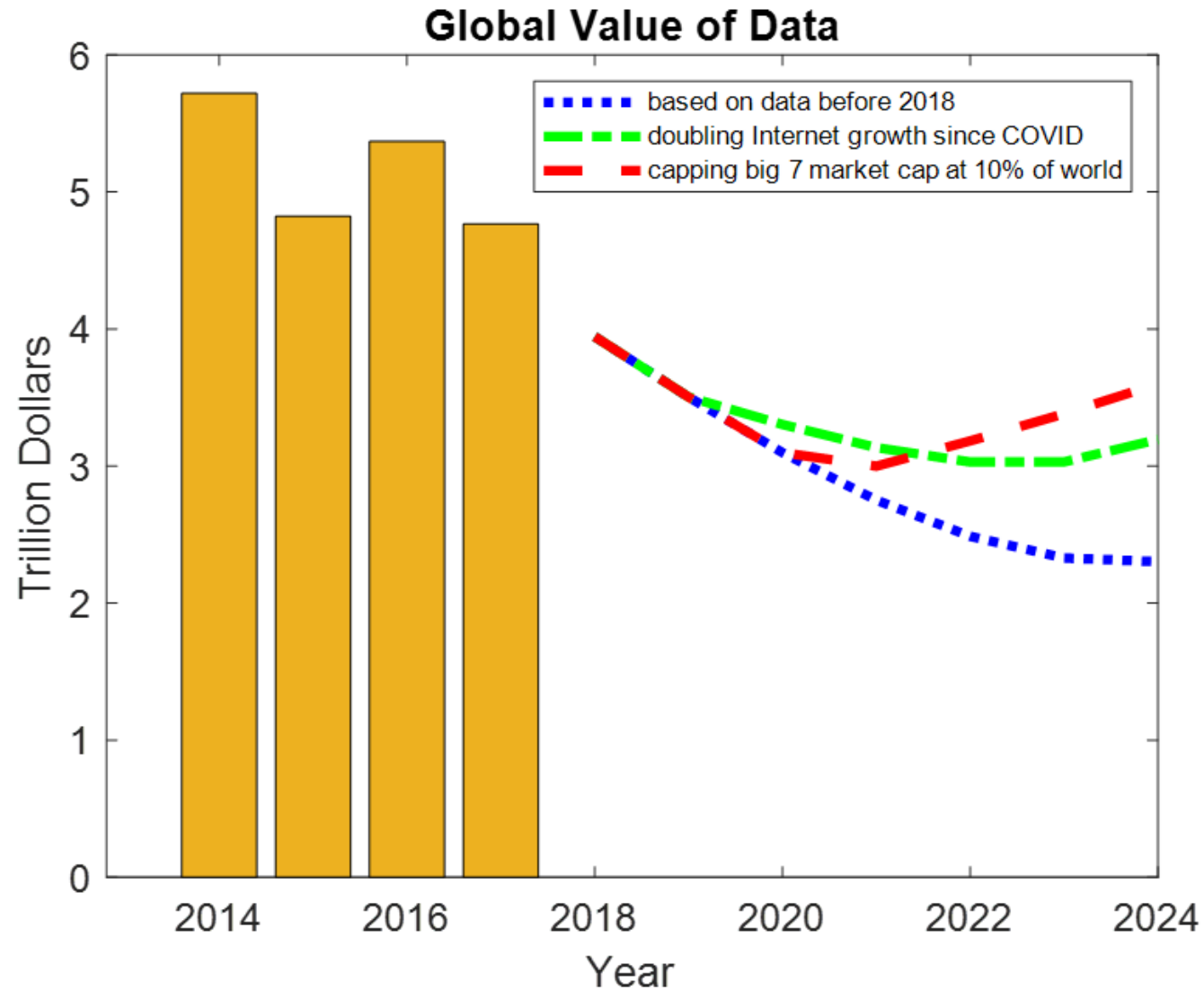
# Economic Values of Cross-region Data Flows



# Profitability

	Delta (OC)	$(A_t - B_t)/\text{Sales}_t$ mean value	$A_t - B_t$ mean value*	$\Sigma(A_t - B_t)$ mean value*	$\Sigma(A_t - B_t) / \Sigma(\text{Sales}_t)$
Alibaba	47.7%	0.174	1155	3447	0.154
Tencent	46.1%	0.103	1288	4677	0.110
Microsoft	12.9%	0.085	6662	10155	0.137
Apple	63.2%	0.025	3865	21487	0.026
Facebook	52.2%	0.152	1966	5841	0.141
Amazon	43.6%	0.167	16504	59878	0.132
Alphabet	42.4%	0.095	5927	31292	0.100
Average		0.114	5338	32597	0.114

# Data Inequality vs. Global Value of Data



# Conclusions

- Capitalizing the value of data can increase Big Tech's profitability significantly and make them qualify the threshold of 10% profit margin in the global minimum tax easily.
- Global of value of data is tremendous, but the growth of the global value of data can be suppressed or become negative if the concentration ratio of global data use and access continues to increase rapidly.
- This study provides the first estimate of the economic values of cross-region data flows. The values are enormous.
- Uneven distribution of the economic values of cross-region data flows