How Digital Trade Restrictions Affect China's Employment

The Role of Regulatory Differentials with the EU

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July 2025

Background

Differences in Digital Trade Regulations between China and the EU (Examples)

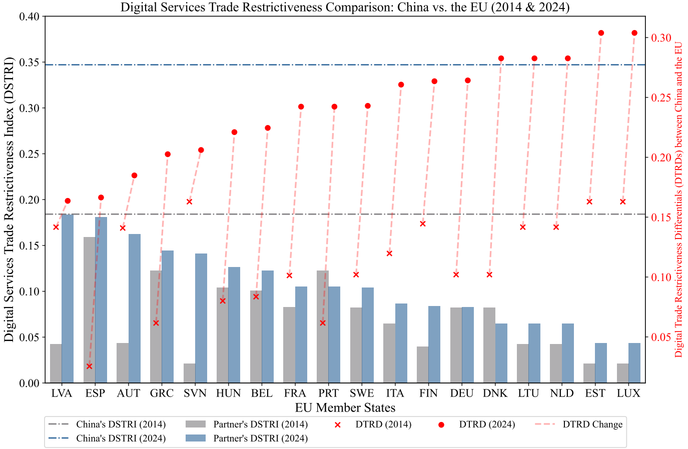
Domain	China	the EU
(1) **Cross-border data flow and localization**	Requiring certain types of data to be stored domestically	Emphasizing user privacy but allowing compliant data flows
(2) **Source Code Protection**	No explicit commitment to source code protection	Prohibits forced disclosure of source code
(3) **Market Access for Digital Services**	Foreign digital service providers face market-entry barriers	A relatively open market

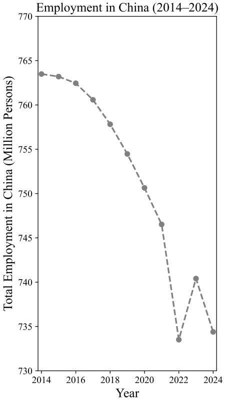
Disputes in Digital Trade Regulations between China and the EU

Date	Dispute
May 2018	GDPR took effect, requiring Chinese companies to comply with strict data protection rules
September 2024	Germany drafted regulations for Chinese online discounters
January 2025	The EU filed a WTO case against China over IP royalty practices

Source: Chen (2018); Reuters; *China-Enforcement of intellectual property rights*, WT/DS611/9.

Background (continued)





Notes: DSTRI refers to the Digital Services Trade Restrictiveness Index (OECD). DTRD is computed as $DSTRI_{\text{CHN},t} - DSTRI_{j,t}$. Data for the left figure comes from the OECD, while data for the right figure comes from National Beureau of Statistics of China.

Research Differentials & Question

Literature Review

- **Measurement of digital trade restrictiveness** (Ferracane et al., 2018; Ferencz, 2019)
- **Impact of digital trade regulations on international trade and GVC participation** (Li and Zhu, 2023; Bellucci et al., 2023; Suh and Roh, 2023; Liu, 2024; Nikensari, 2024; Wang and Liu, 2025)
- **Economic and employment effects of digital trade regulations** (Bauer et al., 2014)

Research Gap

Existing studies have rarely examined how digital trade regulations affect employment. In particular, the impact of cross-country regulatory differentials on employment remains unclear.

Question

To what extent have digital trade restrictiveness differentials between China and the EU affected employment in China?

Main Contributions & Findings

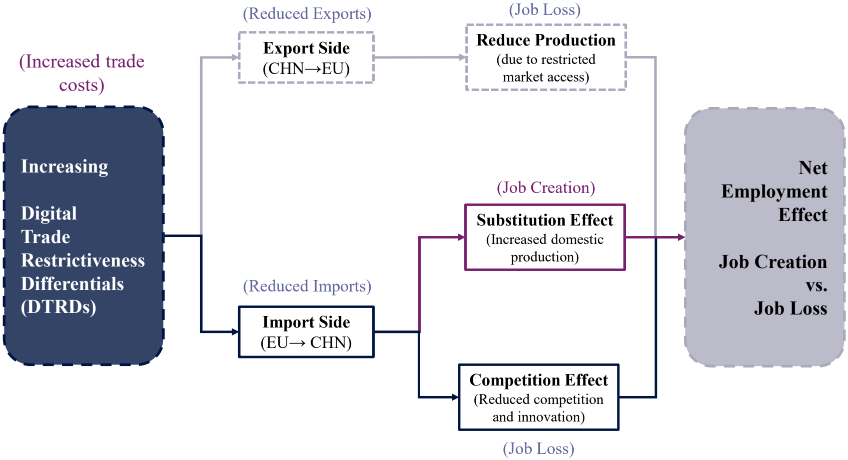
Main Contributions

- Proposing the concept of **digital trade restrictiveness differentials (DTRD)** to measure regulatory differences in digital trade between China and the EU.
- Integrating DTRD and employment outcomes within **a unified theoretical framework**.
- Quantifying employment effects under two scenarios with a hybrid method including gravity modeling and input-output analysis.

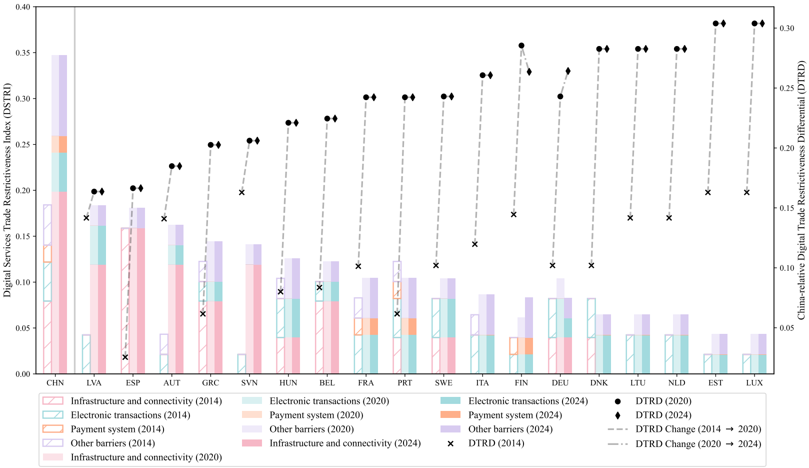
Main Findings

- Export side (CHN → EU): Increasing DTRDs would have caused about **0.74 million job losses**, mainly in the service sector but driven by manufacturing exports.
- Import side (CHN ← EU): The same differentials **would have created around 0.47–0.52 million jobs**, mainly in **services**, driven by fewer EU service imports boosting domestic production.
- Net impact: These differentials lead to a total loss of about **0.22–0.26** million jobs, mainly in manufacturing.
- Key dimension: The largest employment impacts originate from DTRDs in the infrastructure and connectivity dimension.

Conceptual Framework



Digital Trade Restrictions & Restrictiveness Differentials

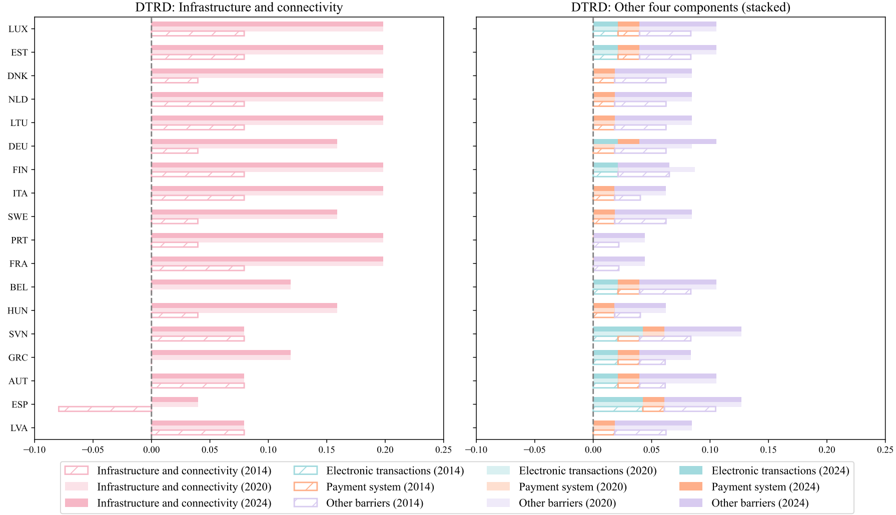


China-related DTRD

$$DTRD_{j,t} = DSTRI_{\text{CHN},t} - DSTRI_{j,t}$$

asymmetric differences may cause even greater harm than the restrictions themselves (Evenett and Fritz, 2022; Weymouth, 2023).

Digital Trade Restrictions & Restrictiveness Differentials (continued)



Methodological Framework

Step 1: Gravity Model

Main Points

How do digital trade restrictiveness differentials (DTRDs) **affect intermediate** (z) **and final goods** (f) **flows** between China and the EU?

Main Results

If DTRDs remain at their t_1 levels, while other factors reflect their t_2 levels, the model yields:

$$\text{CHN} \Rightarrow \text{EU} \begin{cases} \tilde{z}^{k,s}_{\text{CHN},j,t_2,t_1}, & j \in \text{EU} \quad \forall k,s \\ \tilde{f}^{k}_{\text{CHN},j,t_2,t_1}, & j \in \text{EU} \quad \forall k,s \end{cases} \qquad \text{EU} \Rightarrow \text{CHN} \begin{cases} \tilde{z}^{k,s}_{i,\text{CHN},t_2,t_1}, & i \in \text{EU} \quad \forall k,s \\ \tilde{f}^{k}_{i,\text{CHN},t_2,t_1}, & i \in \text{EU} \quad \forall k,s \end{cases}$$

Hence, we derive **the hypothetical technical coefficients** (a) :

$$\tilde{a}^{k,s}_{\text{CHN},j,t_2,t_1} \qquad \tilde{a}^{k,s}_{i,\text{CHN},t_2,t_1}$$

Step 2: Partial Extraction Input-Output Analysis

Main Points

Under each hypothetical scenario, we **re-estimate China's internal trade**:

$$\text{CHN} \Rightarrow \text{CHN} \begin{cases} \tilde{z}^{k,s}_{\text{CHN},\text{CHN},t_2,t_1}, & \forall k,s \\ \tilde{f}^{k}_{\text{CHN},\text{CHN},t_2,t_1}, & \forall k,s \end{cases}$$

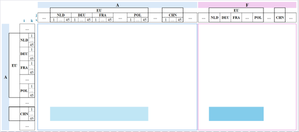
We then obtain hypothetical technical coefficients:

$$\tilde{a}^{k,s}_{\text{CHN},\text{CHN},t_2,t_1}$$

Main Results

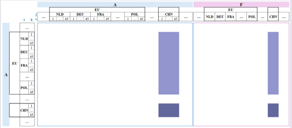
Export-Side Employment Effects of DTRD Changes:

$$\tilde{\mathbf{L}}^{\text{CHN},EX}_{t_2,t_1} \equiv \Lambda_{t_2}\left(\mathbf{I}-\mathbf{A}_{t_2}\right)^{-1}\mathbf{F}_{t_2}\mu - \Lambda_{t_2}\left(\mathbf{I}-\tilde{\mathbf{A}}^{\text{CHN},EX}_{t_2,t_1}\right)^{-1}\tilde{\mathbf{F}}^{\text{CHN},EX}_{t_2,t_1}\mu$$



Import-Side Employment Effects of DTRD Changes:

$$\tilde{\mathbf{L}}^{IM,\text{CHN}}_{t_2,t_1} \equiv \Lambda_{t_2}\left(\mathbf{I}-\mathbf{A}_{t_2}\right)^{-1}\mathbf{F}_{t_2}\mu - \Lambda_{t_2}\left(\mathbf{I}-\tilde{\mathbf{A}}^{IM,\text{CHN}}_{t_2,t_1}\right)^{-1}\tilde{\mathbf{F}}^{IM,\text{CHN}}_{t_2,t_1}\mu$$



Step 1: Gravity Model for Quantifying the Impacts of Restrictiveness Differentials on Bilateral Trade

Structural Gravity Model (Anderson and Van Wincoop, 2003)

$$X_{i,j,t}^{k} = \frac{Y_{i,t}^{k} E_{j,t}^{k}}{Y^{k}} \left\{ \frac{\tau_{i,j,t}^{k}}{\Pi_{i,t}^{k} P_{j,t}^{k}} \right\}^{1-\sigma_k} \tag{1}$$

$$\Pi_{i,t}^{k} = \sum_{j \in \mathrm{WLD}} \left\{ \frac{\tau_{i,j,t}^{k}}{P_{j,t}^{k}} \right\}^{1-\sigma_k} \frac{E_{j,t}^{k}}{Y^{k}} \tag{2}$$

$$P_{j,t}^{k} = \sum_{i \in \mathrm{WLD}} \left\{ \frac{\tau_{i,j,t}^{k}}{\Pi_{i,t}^{k}} \right\}^{1-\sigma_k} \frac{Y_{i,t}^{k}}{Y^{k}} \tag{3}$$

Step 1: Gravity Model for Quantifying the Impacts of Restrictiveness Differentials on Bilateral Trade (continued)

Reformulate Eq.1 as follows:

$$X^k_{i,j,t} = \exp\left[\log Y^k_{i,t} + \log E^k_{j,t} - \log Y^k + (1-\sigma_k)\left(\log \tau^k_{i,j,t} - \log \Pi^k_{i,t} - \log P^k_{j,t}\right)\right] \tag{4}$$

In particular, $(1-\sigma_k)\log \tau^k_{i,j,t}$ can be broken down into the following components (Yotov et al., 2016; Kox et al., 2005; Ferencz, 2019):

$$\begin{aligned}(1-\sigma_k)\log \tau^k_{i,j,t} = &\beta_1 \ln DIST_{i,j} + \beta_2 CNTG_{i,j} + \beta_3 LANG_{i,j} + \\ &\beta_4 CLNY_{i,j} + \beta_6 \ln Tariff_{i,j,t} + \beta_7 DTRD_{i,j,t} + \beta_8 \tau_{i,j,t}\end{aligned} \tag{5}$$

Therefore, once $\hat{\beta}_7$ is estimated, we can isolate the percentage change in bilateral trade attributable to the gap shift from t_1 to t_2 as:

$$\frac{\Delta X^k_{i,j,t_2,t_1}}{X^k_{i,j,t_1}} = \exp\left[\hat{\beta}_7 \Delta DTRD_{i,j,t_2,t_1}\right] - 1 \tag{6}$$

Step 1: Gravity Model for Quantifying the Impacts of Restrictiveness Differentials on Bilateral Trade (continued)

Since $X_{i,j,t}^{k} = \sum_s z_{ij,t}^{k,s} + f_{ij,t}^{k}$, we assume the same percentage change applies to both intermediate (z) and final (f) goods:

The Impacts of *DTRD* on Bilateral Trade

$$\Delta z_{i,j,t_2,t_1}^{k,s} = \left\{\exp\left[\hat{\beta}_7 \Delta DTRD_{i,j,t_2,t_1}\right] - 1\right\} z_{i,j,t_1}^{k,s} \tag{7}$$

$$\Delta f_{i,j,t_2,t_1}^{k} = \left\{\exp\left[\hat{\beta}_7 \Delta DTRD_{i,j,t_2,t_1}\right] - 1\right\} f_{i,j,t_1}^{k} \tag{8}$$

Following Feenstra and Sasahara (2018), under a scenario where *DTRD* remains at its t_1 level, while all else reflects t_2, we obtain:

The Hypothetical Technical Coefficients

$$\tilde{a}_{ij,t_2,t_1}^{k,s} = \frac{z_{ij,t_2}^{k,s} - \Delta z_{i,j,t_2,t_1}^{k,s}}{y_{j,t_2}^{s}} \tag{9}$$

Step 2: Input-Output Analysis for Estimating Employment Effects Associated with DTRD Changes

The balance between intermediate and final goods flows is expressed as follows:

$$\underbrace{\begin{bmatrix} y^{1}_{\text{ARG},t_2} \\ y^{2}_{\text{ARG},t_2} \\ \vdots \\ y^{k}_{i,t_2} \\ \vdots \\ y^{45}_{\text{ROW},t_2} \end{bmatrix}}_{\mathbf{y}_{t_2}} = \underbrace{\begin{bmatrix} z^{1,1}_{\text{ARG,ARG},t_2} & \cdots & z^{1,s}_{\text{ARG},j,t_2} & \cdots & z^{1,45}_{\text{ARG,ROW},t_2} \\ z^{2,1}_{\text{ARG,ARG},t_2} & \cdots & z^{2,s}_{\text{ARG},j,t_2} & \cdots & z^{2,45}_{\text{ARG,ROW},t_2} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ z^{k,1}_{i,\text{ARG},t_2} & \cdots & z^{k,s}_{i,j,t_2} & \cdots & z^{k,45}_{i,\text{ROW},t_2} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ z^{45,1}_{\text{ROW,ARG},t_2} & \cdots & z^{45,s}_{\text{ROW},j,t_2} & \cdots & z^{45,45}_{\text{ROW,ROW},t_2} \end{bmatrix}}_{\mathbf{Z}_{t_2}} \mu + \underbrace{\begin{bmatrix} f^{1}_{\text{ARG,ARG},t_2} & \cdots & f^{1}_{\text{ARG},j,t_2} & \cdots & f^{1}_{\text{ARG,ROW},t_2} \\ f^{2}_{\text{ARG,ARG},t_2} & \cdots & f^{2}_{\text{ARG},j,t_2} & \cdots & f^{2}_{\text{ARG,ROW},t_2} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ f^{k}_{i,\text{ARG},t_2} & \cdots & f^{k}_{i,j,t_2} & \cdots & f^{k}_{i,\text{ROW},t_2} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ f^{45}_{\text{ROW,ARG},t_2} & \cdots & f^{45}_{\text{ROW},j,t_2} & \cdots & f^{45}_{\text{ROW,ROW},t_2} \end{bmatrix}}_{\mathbf{F}_{t_2}} \mu$$

Following standard IO theory, we derive employment at t_2 ($\mathbf{L}$) as:

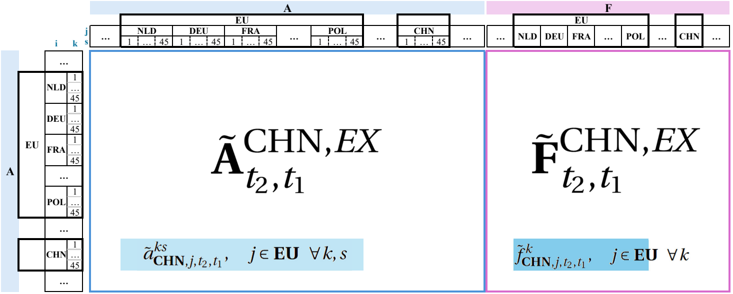
$$\mathbf{L}_{t_2} = \Lambda_{t_2} (\mathbf{I} - \mathbf{A}_{t_2})^{-1} \mathbf{F}_{t_2} \mu \tag{10}$$

Step 2: Input-Output Analysis for Estimating Employment Effects Associated with DTRD Changes (continued)

Export-Side Employment Effects of DTRD Changes (Los et al., 2015)

$$\tilde{\mathbf{L}}_{t_2,t_1}^{\mathrm{CHN},EX} \equiv \Lambda_{t_2}\left(\mathbf{I}-\mathbf{A}_{t_2}\right)^{-1}\mathbf{F}_{t_2}\mu - \Lambda_{t_2}\left(\mathbf{I}-\tilde{\mathbf{A}}_{t_2,t_1}^{\mathrm{CHN},EX}\right)^{-1}\tilde{\mathbf{F}}_{t_2,t_1}^{\mathrm{CHN},EX}\mu \tag{11}$$

Where $\tilde{\mathbf{A}}_{t_2,t_1}^{\mathrm{CHN},EX}$ and $\tilde{\mathbf{F}}_{t_2,t_1}^{\mathrm{CHN},EX}$ are illustrated as follows:

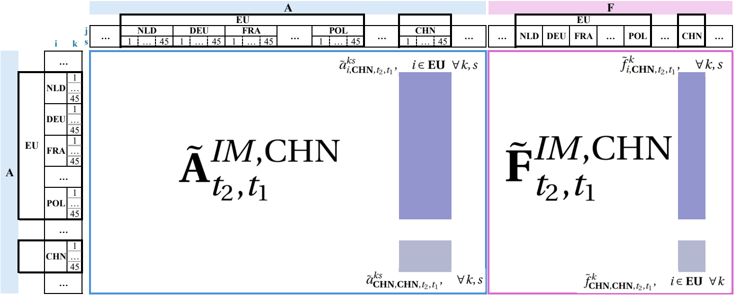


Step 2: Input-Output Analysis for Estimating Employment Effects Associated with DTRD Changes (continued)

Import-Side Employment Effects of DTRD Changes (Feenstra and Sasahara, 2018)

$$\tilde{\mathbf{L}}_{t_2,t_1}^{IM,\mathrm{CHN}} \equiv \Lambda_{t_2}\left(\mathbf{I}-\mathbf{A}_{t_2}\right)^{-1}\mathbf{F}_{t_2}\mu - \Lambda_{t_2}\left(\mathbf{I}-\tilde{\mathbf{A}}_{t_2,t_1}^{IM,\mathrm{CHN}}\right)^{-1}\tilde{\mathbf{F}}_{t_2,t_1}^{IM,\mathrm{CHN}}\mu \tag{12}$$

Where $\tilde{\mathbf{A}}_{t_2,t_1}^{IM,\mathrm{CHN}}$ and $\tilde{\mathbf{F}}_{t_2,t_1}^{IM,\mathrm{CHN}}$ are illustrated as follows:



Step 2: Input-Output Analysis for Estimating Employment Effects Associated with DTRD Changes (continued)

Hypothetical Scenarios (Feenstra and Sasahara, 2018)

$$\textbf{Scenario 1:} \begin{cases} \tilde{z}^{k,s}_{\textbf{CHN},\textbf{CHN},t_2,t_1} & \equiv z^{k,s}_{\textbf{CHN},\textbf{CHN},t_2} + \sum_{i\in \text{EU}} \left(z^{k,s}_{i,\textbf{CHN},t_2} - \tilde{z}^{k,s}_{i,\textbf{CHN},t_2,t_1} \right), \\ \tilde{f}^{k}_{\textbf{CHN},\textbf{CHN},t_2,t_1} & \equiv f^{k}_{\textbf{CHN},\textbf{CHN},t_2} + \sum_{i\in \text{EU}} \left(f^{k}_{i,\textbf{CHN},t_2} - \tilde{f}^{k}_{i,\textbf{CHN},t_2,t_1} \right) \end{cases} \tag{13}$$

'

$$\textbf{Scenario 2:} \begin{cases} \tilde{z}^{k,s}_{\textbf{CHN},\textbf{CHN},t_2,t_1} \equiv \underbrace{\frac{z^{k,s}_{\textbf{CHN},\textbf{CHN},t_2}}{\sum_{i\in\textbf{EU}} \tilde{z}^{k,s}_{i,\textbf{CHN},t_2} + \sum_{i\notin\textbf{EU}} z^{k,s}_{i,\textbf{CHN},t_2}}}_{\text{Hypothetical share of Chinese producers}} \times \underbrace{\sum_{i\in \text{WLD}} z^{k,s}_{i,\textbf{CHN},t_2}}_{\text{Total intermediate-good demand in China}} \\ \tilde{f}^{k}_{\textbf{CHN},\textbf{CHN},t_2,t_1} \equiv \underbrace{\frac{f^{k}_{\textbf{CHN},\textbf{CHN},t_2}}{\sum_{i\in\textbf{EU}} \tilde{f}^{k}_{i,\textbf{CHN},t_2} + \sum_{i\notin\textbf{EU}} f^{k}_{i,\textbf{CHN},t_2}}}_{\text{Hypothetical share of Chinese producers}} \times \underbrace{\sum_{i\in \text{WLD}} f^{k}_{i,\textbf{CHN},t_2}}_{\text{Total final-good demand in China}} \end{cases} \tag{14}$$

Econometric Specification and Data

PPML-Based Econometric Specification (Silva and Tenreyro, 2006)

$$\begin{cases} X^k_{i,j,t} = \exp[\alpha^k_0 + \alpha^k_1 \ln Tariff^k_{i,j,t} + \alpha^k_2 DTRD_{j,t} + \alpha^k_3 Corr_{j,t} + \alpha^k_4 \ln E^k_{j,t} + \alpha^k_5 \ln R^k_{j,t} + \sigma_t + \eta^k_t + \gamma_{i,j}] + \epsilon^k_{i,j,t}, \\ \qquad i = \text{CHN} \quad j \in \text{EU} \\ X^k_{i,j,t} = \exp[\beta^k_0 + \beta^k_1 \ln Tariff^k_{i,j,t} + \beta^k_2 DTRD_{i,t} + \beta^k_3 Corr_{i,t} + \beta^k_4 \ln Y^k_{i,t} + \beta^k_5 \ln R^k_{i,t} + \sigma_t + \eta^k_t + \gamma_{i,j}] + \epsilon^k_{i,j,t}, \\ \qquad i \in \text{EU} \quad j = \text{CHN} \end{cases} \tag{15}$$

- $Tariff^k_{i,j,t}$ (Bouët et al., 2004, 2008):[1]

$$Tariff^k_{i,j,t} = \sum m \in k \left(\frac{Weight^m_{i,j,t}}{Weight^k_{i,j,t}} \times MaxAVE^m_{ij,t} \right), \quad Weight^m_{i,j,t} = X^m_{i,Ref(j),t} \frac{X_{\cdot,j,t}}{X_{\cdot,Ref(j),t}}$$

- $DTRD$[2]; $Corr$ (Gil-Pareja et al., 2019)[3]

[1] Source: CEPII-BACI, MAcMap
[2] Source: OECD
[3] Source: ICRG

Econometric Specification and Data (continued)

PPML-Based Econometric Specification (Silva and Tenreyro, 2006)

$$\begin{cases} X_{i,j,t}^{k} = \exp[\alpha_0^k + \alpha_1^k \ln Tariff_{i,j,t}^k + \alpha_2^k DTRD_{j,t} + \alpha_3^k Corr_{j,t} + \alpha_4^k \ln E_{j,t}^k + \alpha_5^k \ln R_{j,t}^k + \sigma_t + \eta_t^k + \gamma_{i,j}] + \epsilon_{i,j,t}^k, \\ \qquad i = \text{CHN} \quad j \in \text{EU} \\ X_{i,j,t}^{k} = \exp[\beta_0^k + \beta_1^k \ln Tariff_{i,j,t}^k + \beta_2^k DTRD_{i,t} + \beta_3^k Corr_{i,t} + \beta_4^k \ln Y_{i,t}^k + \beta_5^k \ln R_{i,t}^k + \sigma_t + \eta_t^k + \gamma_{i,j}] + \epsilon_{i,j,t}^k, \\ \qquad i \in \text{EU} \quad j = \text{CHN} \end{cases} \tag{16}$$

- $E_{j,t}^k, Y_{i,t}^k$:[4] $E_{j,t} = \sum_i \sum_s Z_{ij,t}^{k,s} + \sum_i f_{ij,t}^k, \quad Y_{i,t} = \sum_j \sum_s Z_{ij,t}^{k,s} + \sum_j f_{ij,t}^k$
- $R_{j,t}^k, R_{i,t}^k$ (Suh and Roh, 2023):[5] $R_{j,t}^k = \sum_i \left[\frac{GDP_{i,t}}{GDP_{\cdot,t}} \cdot distw_{ij,t} \cdot \mathbb{1}_{X_{ij,t}} \right], \quad R_{i,t}^k = \sum_j \left[\frac{GDP_{j,t}}{GDP_{\cdot,t}} \cdot distw_{ij,t} \cdot \mathbb{1}_{X_{ij,t}} \right]$
- $\gamma_{i,j}$ (Baier and Bergstrand, 2007): the use of country-pair fixed effects can eliminate endogeneity from omitted variables.

[4] Source: OECD

[5] Source: OECD, WDI, CEPII-Gravity

Econometric Specification and Data (continued)

- Time period: 2014–2020
- Country coverage: 18 EU member states[6] & China (CHN)
- Sector coverage: 45 sectors as defined by OECD. Specifically, A01_02–B09 belong to natural resources sectors; C10T12–C31T33 belong to manufacturing sectors; D–T belong to services sectors

Descriptive Statistics

Variable	Obs.	Mean	SD	Min	Max	Variable	Obs.	Mean	SD	Min	Max
Panel A: CHN to EU						Panel B: EU to CHN					
X	5670	339.4	1311	0	31000	X	5670	298.6	1221	0	25000
lnTariff	5670	0.0250	0.0400	0	0.457	lnTariff	5670	0.0430	0.0450	0	0.499
DTRD	5670	0.194	0.0710	0.0250	0.326	DTRD	5670	0.194	0.0710	0.0250	0.326
Corr	5670	4.104	1.009	2.042	5.917	Corr	5670	4.104	1.009	2.042	5.917
lnE	5670	8.785	1.975	1.390	13.35	lnY	5670	8.621	2.249	0	13.39
lnRj	5670	8.487	1.245	0.00100	9.174	lnRi	5670	8.431	1.531	0	9.184

[6] Austria (AUT), Belgium (BEL), Denmark (DNK), Estonia (EST), Finland (FIN), France (FRA), Germany (DEU), Greece (GRC), Hungary (HUN), Italy (ITA), Latvia (LVA), Lithuania (LTU), Luxembourg (LUX), Netherlands (NLD), Portugal (PRT), Slovenia (SVN), Sweden (SWE), Spain (ESP)

Empirical Results

Panel A: Estimation Results for China's Exports to the EU

	(1) All	(2) Manufacturing	(3) Services
lnTariff	-2.239	-0.143	
	(2.332)	(2.283)	
DTRD	-0.465**	-0.424**	-0.832***
	(0.183)	(0.211)	(0.180)
Corr	0.108***	0.103**	0.095**
	(0.039)	(0.041)	(0.047)
lnE	0.693***	0.552***	1.217***
	(0.089)	(0.070)	(0.221)
lnRj	4.596***	3.230*	6.816
	(1.434)	(1.777)	(4.901)
Constant	-40.472***	-26.708*	-67.198
	(12.786)	(15.978)	(42.696)
t FE, k,t FE, i,j FE	Yes	Yes	Yes
N	5,040	2,772	2,268
ll	-1.13e+05	-65947.06	-36790.77

Std. errors clustered by country pair, in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Key Findings (Export-Side)

1. On average, a 0.1-point increase in the DTRD is associated with a 4.55% reduction in China's exports to the EU (All sectors).
2. China's **services exports** to the EU (-7.98%) are more negatively affected than **manufacturing exports** (-4.16%).

Empirical Results (continued)

Panel B: Estimation Results for China's Imports from the EU

	(1) All	(2) Manufacturing	(3) Services
lnTariff	-0.015	-0.994	
	(0.819)	(1.078)	
DTRD	-0.380**	-0.187	-0.634***
	(0.167)	(0.246)	(0.214)
Corr	0.080	0.035	0.131*
	(0.052)	(0.065)	(0.071)
lnY	1.413***	1.653***	1.095***
	(0.067)	(0.073)	(0.100)
lnRi	2.153	2.709	3.455
	(1.847)	(1.860)	(4.064)
Constant	-27.720*	-34.718**	-36.056
	(16.637)	(16.478)	(36.449)
t FE, k,t FE, i,j FE	Yes	Yes	Yes
N	5,544	2,772	2,772
ll	-1.65e+05	-83316.42	-68555.87

Std. errors clustered by country pair, in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Key Findings (Import-Side)

1. DTRD has a **significant negative effect** on the EU's total (−3.73%) and services (−6.15%) exports to China, while the effect on manufacturing exports (−1.86%) is not statistically significant.[a]
2. Compared with the export-side results, these **import-side effects are generally smaller in magnitude**.

[a] We still include these point estimates in subsequent IO analysis to maintain consistency across sectors.

Empirical Results (continued)

Estimation Results: DTRD (Infrastructure Connectivity)

	China's Exports to the EU			China's Imports from the EU		
	(1)	(2)	(3)	(4)	(5)	(6)
	All	Manufacturing	Services	All	Manufacturing	Services
DTRD_1	-0.448**	-0.412**	-0.815***	-0.370**	-0.160	-0.629***
	(0.177)	(0.200)	(0.164)	(0.147)	(0.224)	(0.181)
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
t FE, k,t FE, i,j FE	Yes	Yes	Yes	Yes	Yes	Yes
N	5,040	2,772	2,268	5,544	2,772	2,772
ll	-1.13e+05	-65944.07	-36788.38	-1.65e+05	-83316.51	-68552.98

Standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Key Findings (by DTRD dimension)

Compared to other dimensions, DTRD in the infrastructure and connectivity dimension contributes the most to the overall negative effects on China-EU bilateral trade.

Export-Side Employment Effects of DTRD Changes

	DTRD				DTRD_1
	Resources	Manufacturing	Services	All	All
Trade in natural resources	-13.524	-14.651	98.377	70.202	65.198
Trade in manufacturing	-110.183	-236.788	-153.132	**-500.103**	-407.090
Trade in services	-20.898	-18.579	-267.020	-306.498	-254.113
Trade in all sectors	-144.605	-270.019	**-321.775**	**-736.399**	**-596.006**

Notes. Rows represent the sector of trade; columns represent impacted employment sectors. All figures are employment changes in thousands of workers.

1. A rise in DTRD would have resulted in approximately **0.74 million** job losses in China, with the services sector (-0.32 million) most severely impacted.
2. The primary channel of employment losses is through trade in manufacturing sectors, accounting for about **0.50 million** job losses.
3. Employment losses are predominantly driven by DTRD in the infrastructure and connectivity dimension.
4. In the services trade scenario, **54%** of job losses would have stemmed from intermediate goods exports, a higher proportion than in the overall (48%) or manufacturing trade scenario (46%).

Import-Side Employment Effects of DTRD Changes

Import-Side (Scenario 1, S1): Estimated Employment Effects in China

	DTRD				DTRD_1
	Resources	Manufacturing	Services	All	All
Trade in natural resources	23.104	50.749	-87.781	-13.928	-5.585
Trade in manufacturing	26.4	59.647	45.803	131.85	94.735
Trade in services	33.788	23.928	345.318	**403.034**	337.421
Trade in all sectors	83.292	134.324	**303.34**	**520.956**	426.571

Notes. Rows represent the sector of trade; columns represent impacted employment sectors. All figures are employment changes in thousands of workers.

1. DTRD expansion under **S1** would have added about **0.52** million jobs in China, with services experiencing the largest gains (**0.3** million). In **S2**, the total gain would have reached **0.47** million, also led by services (**0.27** million).
2. Most of these gains would have occurred through trade in service sectors, reaching **0.40** million in S1 (0.36 million in S2).
3. Unlike on the export side (dominated by final goods), **import-side** effects would primarily come from intermediate goods imported from the EU (63% in both senarios).

Import-Side Employment Effects of DTRD Changes (continued)

Import-Side (Scenario 2, S2): Estimated Employment Effects in China

	DTRD				DTRD_1
	Resources	Manufacturing	Services	All	All
Trade in natural resources	22.59	47.051	-76.485	-6.844	0.045
Trade in manufacturing	24.713	54.817	42.092	121.622	87.412
Trade in services	29.647	20.725	306.675	**357.046**	298.945
Trade in all sectors	76.949	122.593	**272.282**	**471.825**	386.401

Notes. Rows represent the sector of trade; columns represent impacted employment sectors. All figures are employment changes in thousands of workers.

Key Insight

Even under different assumptions about China's internal trade (whether fully substitutable or only partially so), the import-side employment outcomes remain largely unchanged. This suggests the robustness of our results between S1 and S2.

Net Employment Effects of DTRD Changes

Estimated Net Employment Effects in China

Trade type	**Sector of employment**	**Scenario 1**	**Scenario 2**
Trade in all sectors	Resources	-61.314	-67.656
	Manufacturing	**-135.695**	**-147.425**
	Services	-18.435	-49.493
	All	**-215.443**	**-264.574**
Trade in natural resources	Resources	9.579	9.066
	Manufacturing	36.098	32.400
	Services	10.596	21.892
	All	**56.274**	**63.358**
Trade in manufacturing	Resources	-83.783	-85.470
	Manufacturing	-177.142	-181.971
	Services	-107.329	-111.040
	All	**-368.253**	**-378.481**
Trade in services	Resources	12.890	8.748
	Manufacturing	5.349	2.146
	Services	78.298	39.655
	All	**96.537**	**50.549**

Notes. All figures are employment changes in thousands of workers.

Key Findings

1. Overall, widening DTRD implies net job losses in China (-0.22 to -0.26 million), primarily concentrated in **manufacturing employment**.
2. Employment losses are largely driven by manufacturing-sector trade, accounting for approximately -0.37 million jobs in both scenarios.
3. However, these negative effects are partially offset by employment gains from trade in services and natural resources sectors.

Conclusions

- Export side (CHN → EU): Increasing differentials would have resulted in **0.74 million job losses** in China, primarily affecting the services sector (**0.32 million losses**). Manufacturing exports would account for over 68% of these losses.
- Import side (CHN ← EU): The same differentials would have created 0.47–0.52 million jobs, again mostly in services (0.27–0.30 million), due to fewer service imports from the EU stimulating domestic production.
- Net impact: About 0.22–0.26 million in total job losses, primarily in manufacturing (0.14 million losses). While manufacturing final goods exports would have borne the brunt, part of the loss would have been offset by gains from trade in services and natural resources.
- Employment effects are mainly driven by digital trade restrictiveness differentials in the infrastructure and connectivity dimension, underscoring its critical role in shaping China-EU digital trade and labor market outcomes.

Discussions

China's Personal Information Protection Law (PIPL), along with the Cybersecurity Law (CSL) and Data Security Law (DSL), ensures robust data security but introduces more complexity than the EU's GDPR.[7]. To mitigate adverse employment effects of restrictiveness differentials, it is advisable to reference GDPR's **multiple cross-border transfer frameworks, simplify approval procedures, and coordinate multi-department rules**.

This balanced approach can narrow the regulatory differential, thereby reducing potential job losses while still safeguarding national data interests. In particular, streamlining data handling requirements and selectively aligning with international standards can help sustain manufacturing competitiveness.

[7] `https://www.dlapiperdataprotection.com/index.html?c=CN&t=law`

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Thank You

Q&A

Special thanks to Prof. Cuihong Yang and Prof. Erik Dietzenbacher for their valuable guidance and support.

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