Policy Debates:
Free Trade vs. Protectionism
From GATT/WTO and Trade Blocs to Trade Wars

Ping Wang

Washington University in St. Louis

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What happened?

- Rising trade protectionism since the Great Recession:
    - Brexit
    - Battled renegotiations of the NAFTA
    - Recently exacerbated U.S.-China trade war
    - Ongoing Japan-Korea trade war
    - Possible US-EU trade war

U.S.-China Trade War

- As tweeted by Trump: "trade wars are good and easy to win," but really?

Source: Financial Times

Peace

Multilateralism and Regionalism

- Moving to global frictionless trade requires multilateralization of regionalism:

- The US's 1930 Smoot-Hawley tariff => tariff wars and defensive trade blocs (Kindleberger 1989), with peak sector-weighted average tariffs of some major GATT participants at:
  - 24.4% (US)
  - 47.7% (UK)
  - 29.4% (France)

- The General Agreement on Tariffs and Trade (GATT) was signed by 23 nations in Geneva on 10/30/1947, and took effect on 1/1/1948

- The World Trade Organization (WTO) was signed by 123 nations in Marrakesh on 4/14/1994, of the Uruguay Round Agreements started in 1986, and established on 1/1/1995, replacing GATT.

Tariff Reduction: from GATT to WTO

- Average tariff for major GATT participants were about 22% in 1947, reduced to 5% after the Uruguay Round in 1999 (Bown-Irwin, 2015 NBER): % cut – domino effect

Implementation Period	Round Covered	Weighted Tariff Reduction
1948	Geneva (1947)	-26
1950	Annecy (1949)	-3
1952	Torquay (1950-51)	-4
1956-58	Geneva (1955-56)	-3
1962-64	Dillon Round (1961-62)	-4
1968-72	Kennedy Round (1964-67)	-38
1980-87	Tokyo Round (1973-79)	-33
1995-99	Uruguay Round (1986-94)	-38

Tariff Reduction: from GATT to WTO

- Average tariff for all countries (Findlay-O'Rouke, 2007 Princeton U Press):

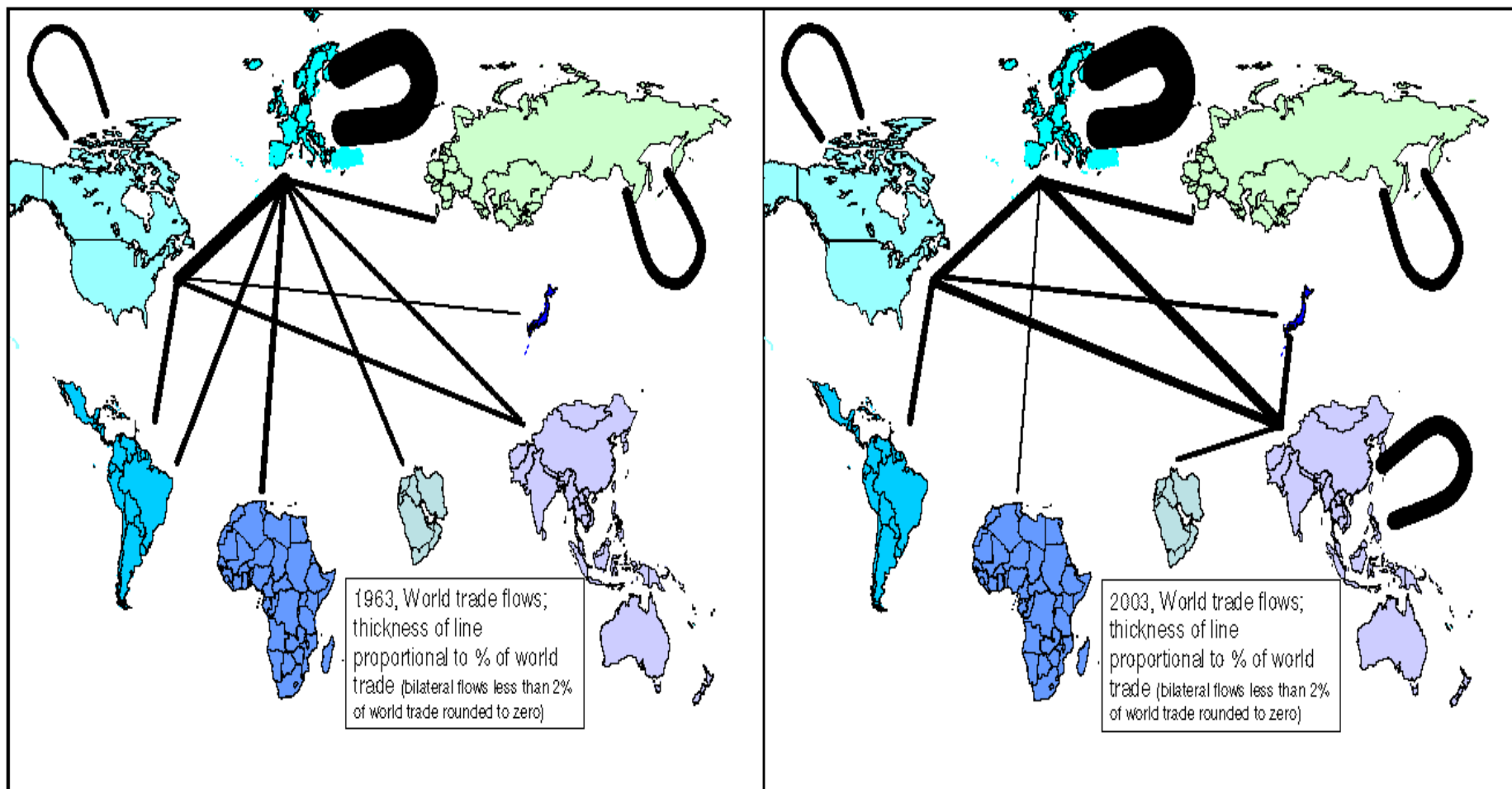| %	Early 1960s	2000
Asian Average	31.0	9.0
China	43.0 (in 1990)	16.0
Taiwan	30.0	6.0
European Average	14.0	4.2
North American Average	17.0	4.0

Differential Tariffs by Sectors

- Tariff rates on agriculture, food and light industries are much higher than other industrial, especially in East Asia

Sector:	Exporter to East Asia		
	East Asia	North America	EU
Mining products (HS25-27)	1.7	2.6	1.7
General machinery (HS 84)	1.5	1.9	2.5
Electrical machinery (HS 85)	1.4	1.5	2.2
Others	1.4	1.7	2.6
Wood and paper	1.4	1.3	1.5
Precision apparatus	1.2	1.3	2
Agriculture	41	29.7	30.9
Light industry	26.8	8.3	12.8
Food and beverages	21.8	26.4	25.8
Textiles and clothing	7.3	7.6	7.8
Transportation machinery	4.6	2.8	8.6
Pottery products	2.9	3.6	4.4
Chemicals	2.4	3	2.7
Basic metals	1.8	2.6	2.3
All products	7.4	5.5	7.2

Source: Baldwin (2006 NBER)

World Trade Flows:
From Pre-Kennedy Round to Post-WTO

1963, World trade flows; thickness of line proportional to % of world trade (bilateral flows less than 2% of world trade rounded to zero)

2003, World trade flows; thickness of line proportional to % of world trade (bilateral flows less than 2% of world trade rounded to zero)

Source: Baldwin (2006 NBER)

Tariff-Free Trade Network (2004)

	Europe	NAFTA	Asia	Middle East	Africa	S. & C. America	World
Europe	33%	7%	8%		2%		45%
NAFTA		8%	9%				15%
Asia			13%	3%			27%
Middle East							4%
Africa							3%
South and Central America							3%
World	44%	21%	23%	3%	2%	3%	100%

Source: Baldwin (2006 NBER)

RCEP:
Regional Comprehensive Economic Partnership

- 10 ASEAN countries + 6 additional countries (Australia, China, India, Japan, South Korea, and New Zealand)

RCEP COUNTRIES REPRESENT

Often referred to as a "trade" pact, the Regional Comprehensive Eonomic Partnership (RCEP) deals with more than just trade – a large portion of the agreement will give rich countries and their corporations power to delve into non-trade issues that have far-reaching implications across sectors and communities.

Brunei
Cambodia
Indonesia
Laos
Malaysia
Philippines
Singapore
Thailand
Vietnam
Australia
China
India
Japan
South Korea
New Zealand

29% OF WORLD TRADE

38% OF THE WORLD ECONOMY

2013 - Official start of negotiations comprised of 10 ASEAN member states + 6 of its major trading partners

2016 - Target year of completion

UNDER RCEP...
- Farmers access to seeds will be further restricted
- Race to the bottom for labor rights standards
- The poor wil be deprived of access to cheap medicine
- Corporations will have the power to sue governments for social protection measures that "hurt" profit-making
- And many more...

APRN
ASIA PACIFIC RESEARCH NETWORK
114 TIMOG AVENUE, QUEZON CITY
PHILIPPINES
+632 927 6981

Why Forming Trade Blocs?

- Trade liberalization is welfare improving
- Trade blocs as coordination-device resolving the prisoner's dilemma (Snidal, 1985 & 1991 APSR)
- Baldwin (1995 Cambridge U Press): domino theory of regionalism in two-stage political equilibrium
- Ethier (1998 EJ, 1998 JPE): interactions among unilateralism, regionalism and multilateralism
- Bagwell-Staiger (1999 AER): subgame perfect equilibrium in a repeated game with punishment
- Freund (2000 QJE): game-theory foundation for measuring gains from regionalism

How Large Are Welfare Gains from Trade?

- While trade liberalization is commonly perceived as welfare improving, recent accounting-based studies show modest gains
- Arkolakis–Costinot–Rodriguez-Clare (ACR; 2012 AER): modest welfare gains from trade (< 2% even compared with autarky world)
- Hsieh-Ossa (2016 JIE): Using data from 1995 to 2007, the spillover effects of China's productivity growth on its trading partners' real income are positive but small (only about 0.1% increase on average)
- Lai-Riezman-Wang (2016 RIE): Upon its accession to the WTO, China's trade dependence has risen from about 35 to 65%, but
    - most of its gains from trade were incurred from 1997 to 2002 when tariffs were reduced sharply
    - import industries, especially ICT and Office industries, enjoyed largest dynamic gains (4.2% and 7.1% from 1997 to 2007)
    - most exporting industries suffering losses (textile, wood/paper, plastic/rubber & metal product, ranging from -0.24 to -0.78%)

What if Productivity Changes Endogenously?

- Technology diffusion via learning & spillovers:
  - Sampson (2016): 3.6% total gains when compared with autarky, with a dynamic share of 68.5%
  - Perla-Tonetti-Waugh (2015): 13.3% total gains
- Process innovation:
  - Bloom-Romer-Terry-Van Reenen (2016): 16.3% total gains
  - Impullitti and Licandro (2017): dynamic share 51.2%
- Global creative destruction of GPT innovation & quality ladder
  - Hsieh, Klenow and Nath (2019): 12.2% total gains, with dynamic share 71.3%
- Capital accumulation:
  - Bond-Riezman-Wang (2017): 2.3-2.7% real income gains for tariff reduction in China from 33.5% (pre-1995) to 5.8% (post-WTO) – larger gains 1995-2001 (2.7%) than after accession
  - Ravikumar-Santacreu-Sposi (2018): dynamic share 57.4%

Dynamic Gains from Trade Revisited: Hsu-Riezman-Wang (2019 NBER)

- Consider an innovation-based endogenous growth model of North-South trade where trade can affect the incentives for technological advancement
- The driver of growth is innovation by the North to upgrade the general purpose technology (GPT)
  - it is then widely applied to benefits both the North and the South in advancing entrepreneurial knowledge for developing differentiated products
- Trade environment: Bernard-Eaton-Jensen-Kortum (BEJK; 2003 AER)
- Other important mechanism:
  - occupational choice (innovator-worker, entrepreneur-worker)
  - endogenous royalty (from the South to the North)

Dynamic Gains from Trade Revisited: Hsu-Riezman-Wang (2019 NBER)

- GPT innovation is beneficial to all but comes with costs:
  - Creative destruction of incumbent firms
  - Labor reallocation toward innovation reducing production
  - Stiff competition from the South facing the North (a key motivation by politicians in the North to create a trade war)
- The connection between trade and innovation generates an R&D multiplier, which rises with trade, leading to:
  - A reinforcing spiral effect on growth
  - 3 channels through which trade liberalization may affect welfare:
    - a typical static (ACR) channel
    - an income-gains (IG) channel for the North because its GPT firm receives payments from the South
    - an endogenous growth (GR) channel via incentivizing the GPT innovation

Dynamic Gains from Trade Revisited: Hsu-Riezman-Wang (2019 NBER)

- Gains from trade when compared to autarky:

| Total Gains from Trade (%)	ACR	IG	GR	Dynamic Share
5.34%	0.44%	0.63%	4.22%	
Share	8.4%	12.0%	79.6%	78.1%

- Moving from autarky to the current level of trade cost narrows the North-South welfare gap by 3.6%
- Moving to free trade from current further reduces the gap by 45.7%
- The South gains more from trade when paying GPT at market price
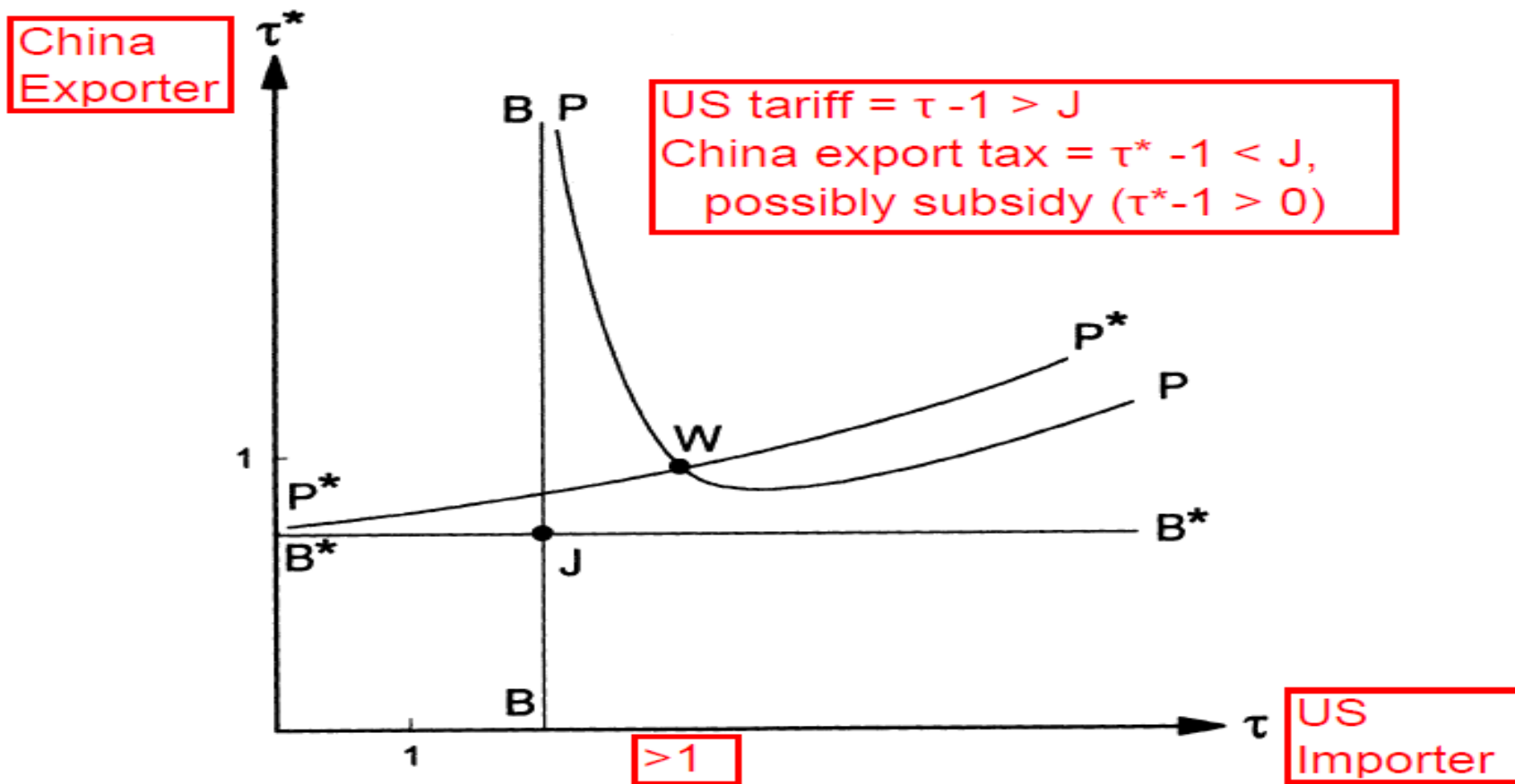- Large countries gain more – scale effect

War

Theory of Trade Wars

- Large & more advanced countries can manipulate international prices and control key upstream supplies => more likely to win the wars (Kennan and Riezman,1988 IER)
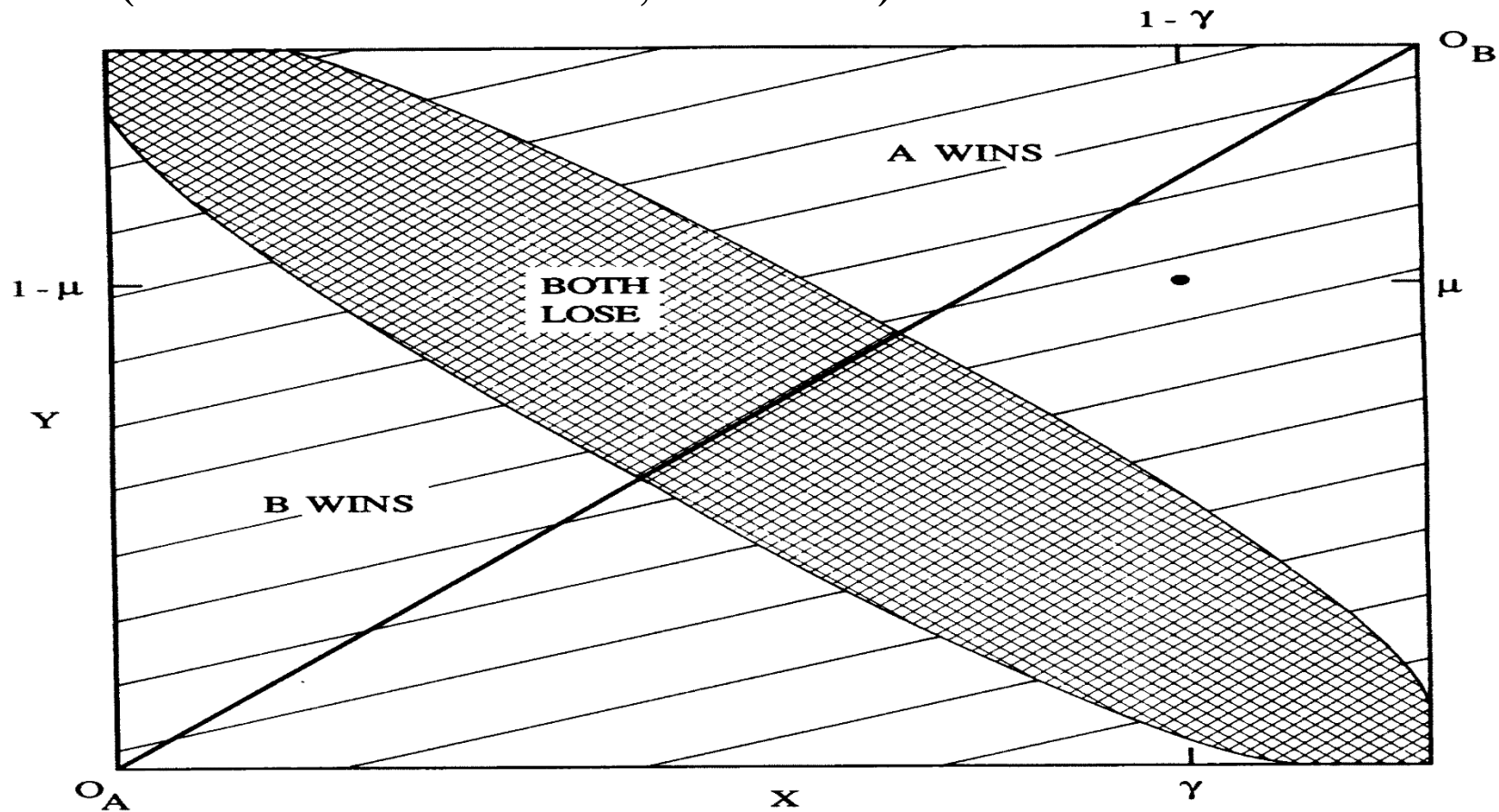
Trade Wars in Political Equilibrium

- In political equilibrium, importing country optimally sets higher tariff than the Johnson (1954 REStud) benchmark (J), and lower export tax (possibly subsidy) than J (Grossman-Helpman, 1995 JPE)

China Exporter

τ^*

B P

US tariff = $\tau - 1 > J$
China export tax = $\tau^* - 1 < J$,
   possibly subsidy ($\tau^* - 1 > 0$)

P*

P

W

1

P*

B*

B*

J

B

τ

US Importer

1

>1

Quantitative Analysis of Trade Wars

- Ossa (2014 AER) – a unified dynamic general equilibrium model of trade wars with or without political lobbying:
    - Under Nash tariffs when all countries retaliate optimally, such a trade war would lead to median tariffs at upper 50 percent (58.6, 59.6 and 59.1 percent for China, U.S. and EU)
    - It only generate a modest welfare loss (about 2% in China/U.S. & 2.6% for EU), together with a small profit loss ($< 1\%$) and a wage gain (0.5-6.3%)
- Steinberg (2018 WP) – a dynamic general equilibrium model with policy uncertainty:
    - Brexit leads to an average of 4.5% increase in tariffs for UK and the remaining EU members, with uncertainty of larger scales
    - It only generate a modest welfare cost by Britain households in the range of 0.4-1.2%
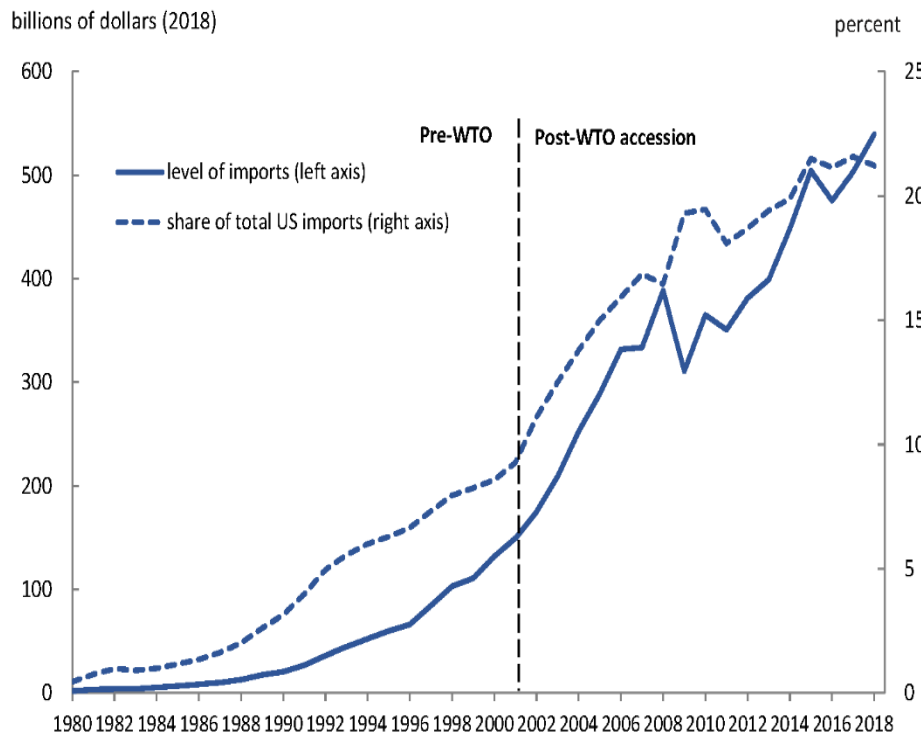
Surprising Phenomena of Recent Trade Wars

- Such trade protection acts have been originated from high income countries (the North) which were major participants in GATT/WTO
- Broad ranges of tariff imposed on intermediate products
  - In the U.S., nearly 90% of intermediate imports from China face increased tariff (cf. Bown 2019)
  - Violation of the Diamond and Mirrlees (1971) Intermediate Goods Principle of Optimal Taxation – taxing intermediate goods creates much larger distortions, more harmful for economic development
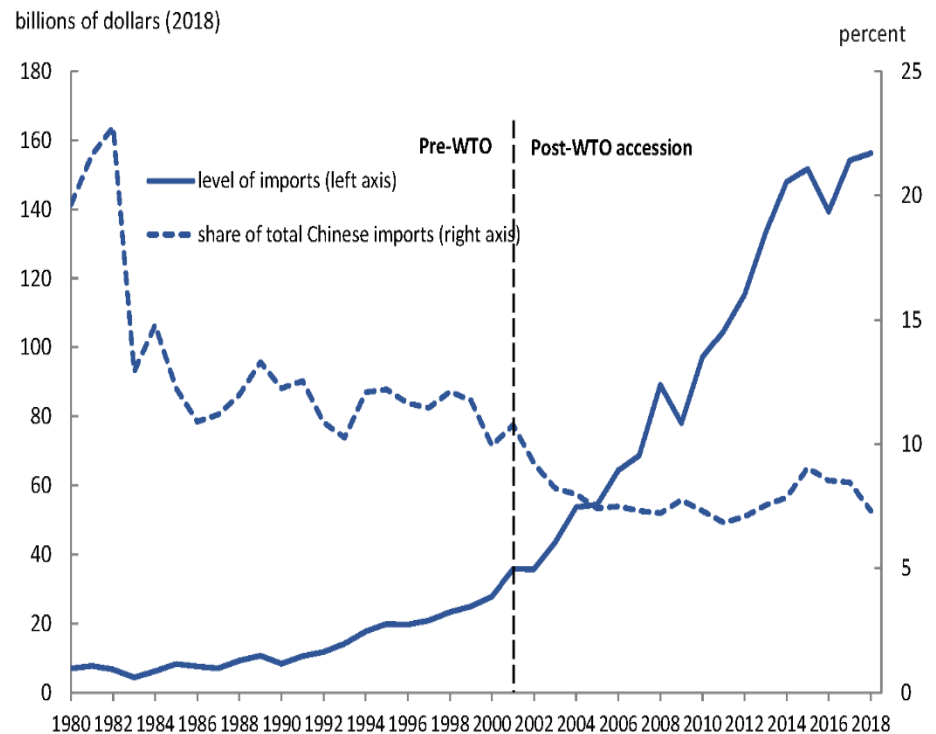
Pre- and Post-WTO U.S.-China Trade

- While value and volume of trade increased, U.S. imports become more China-dependent but China less U.S.-dependent (Bown 2019 WP)

a. US imports from China

billions of dollars (2018)   percent

Pre-WTO | Post-WTO accession

— level of imports (left axis)
- - - share of total US imports (right axis)

b. China's imports from US

billions of dollars (2018)   percent

Pre-WTO | Post-WTO accession

— level of imports (left axis)
- - - share of total Chinese imports (right axis)
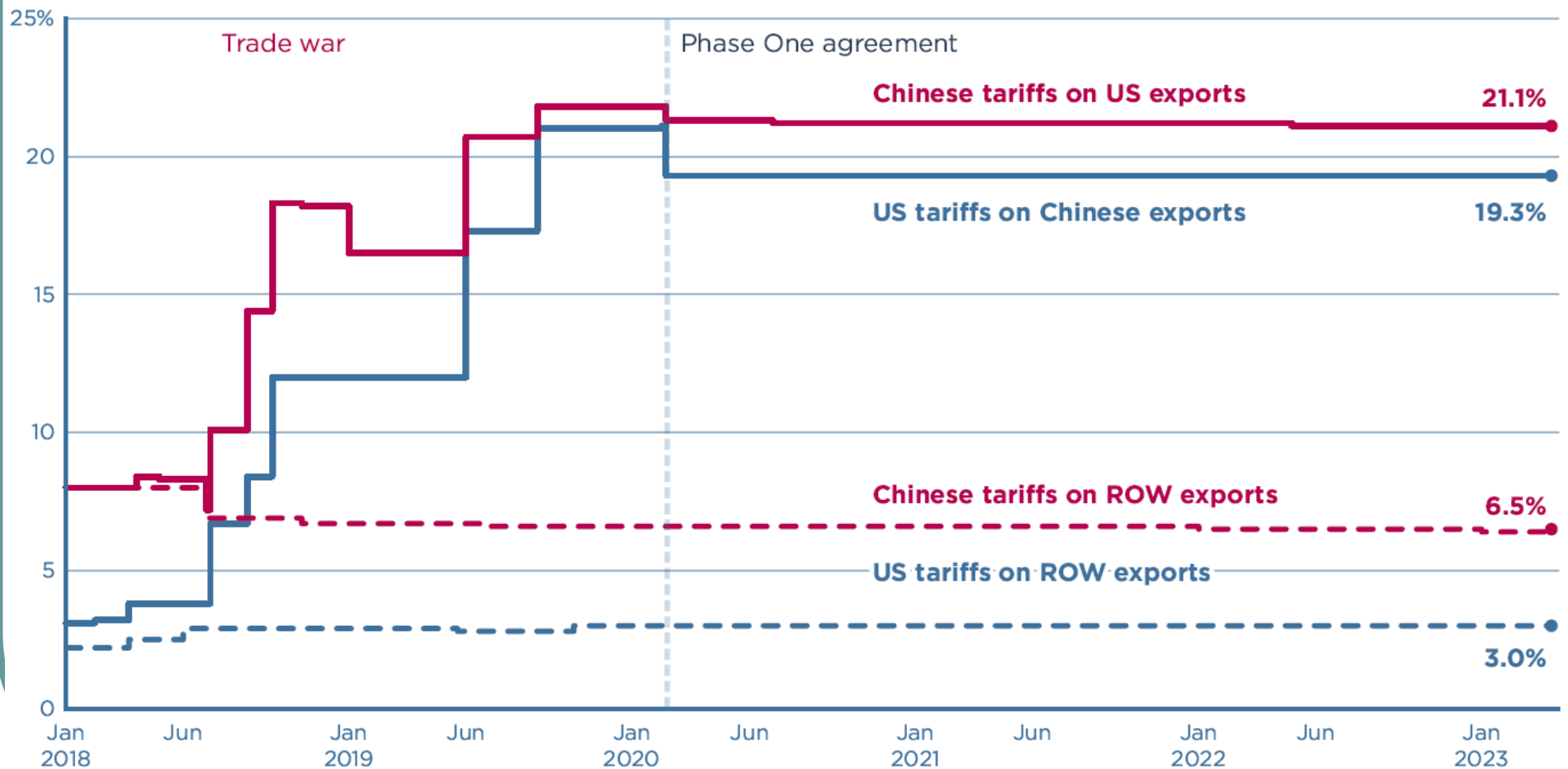
Current U.S.-China Trade War

- Under the current U.S.-China trade war, average tariffs raise from 5% to 12% in the U.S. and from 15% to 20% in China (Bown 2019 WP)

Country	MFN tariffs, 2017		MFN + 2018 special tariffs**		MFN + antidumping duties		MFN + antidumping duties + 2018 special tariffs	
	Simple average	Trade-weighted*	Simple average	Trade-weighted*	Simple average	Trade-weighted*	Simple average	Trade-weighted*
United States	3.4	3.1	12.5	12.4	10.4	13.6	19.5	22.9
China	9.6	8.0	18.1	19.6	9.8	8.5	18.3	20.1

Current U.S.-China Trade War

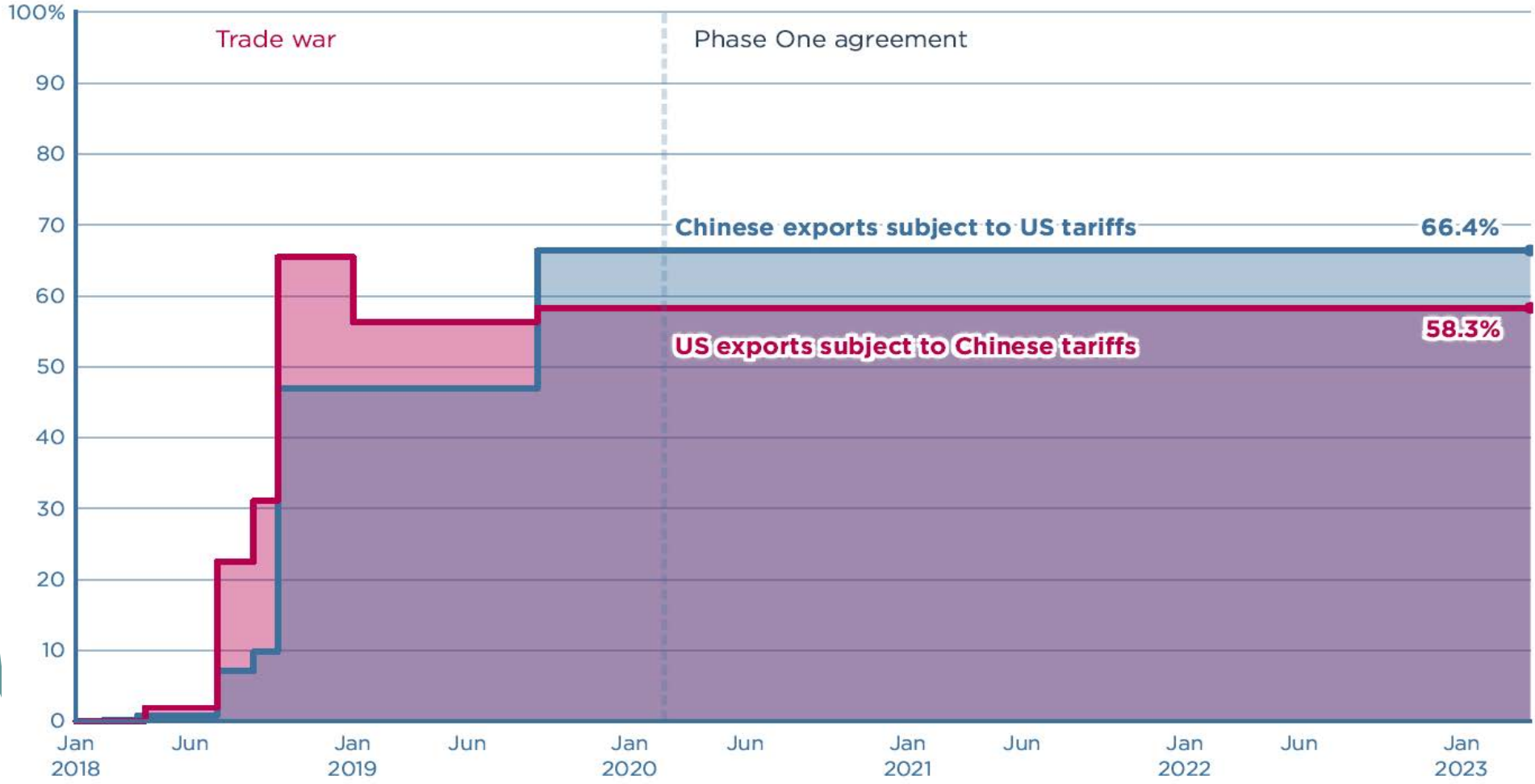- The timeline of the tariff war (Bown 2023 Policy Report)

a. US-China tariff rates toward each other and rest of world (ROW)

Current U.S.-China Trade War

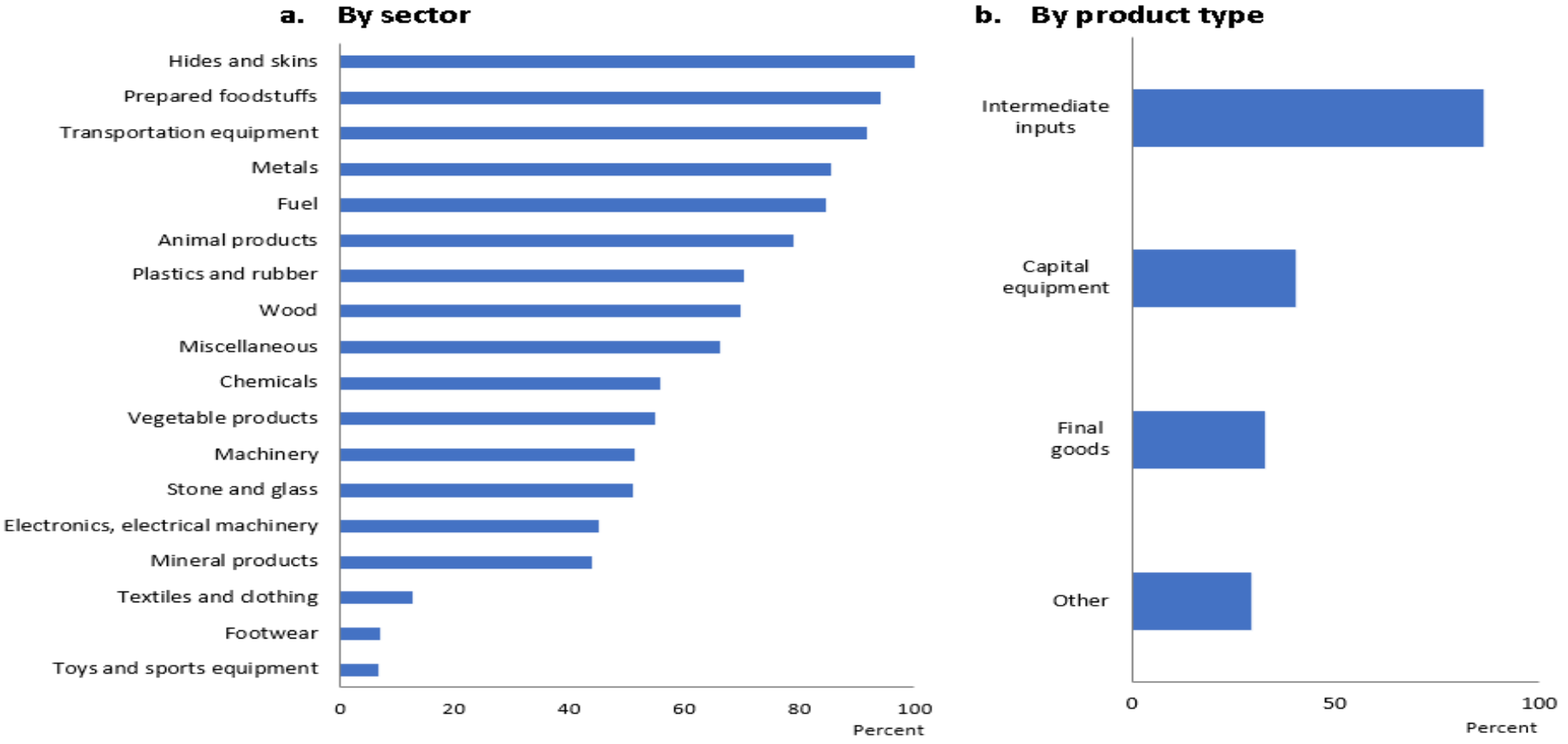- The timeline of the tariff war (Bown 2023 Policy Report)

b. Percent of US-China trade subject to trade war tariffs

Trade war — Phase One agreement

Chinese exports subject to US tariffs — 66.4%

US exports subject to Chinese tariffs — 58.3%

Current U.S.-China Trade War

- About 90% of intermediate goods imports from China are covered by the 2018 special tariff, with > 70% of animal/food/transport/metal/petro/plastic/wood covered

a. By sector

Sector	Percent
Hides and skins	~100
Prepared foodstuffs	~93
Transportation equipment	~91
Metals	~85
Fuel	~84
Animal products	~78
Plastics and rubber	~70
Wood	~69
Miscellaneous	~66
Chemicals	~56
Vegetable products	~55
Machinery	~52
Stone and glass	~51
Electronics, electrical machinery	~45
Mineral products	~44
Textiles and clothing	~13
Footwear	~7
Toys and sports equipment	~7

b. By product type

Product type	Percent
Intermediate inputs	~88
Capital equipment	~42
Final goods	~34
Other	~30

Source: Bown (2019 WP)

China's contribution to U.S. demand: Cheng-Wang (2022)

- China's contribution to U.S. demand (FDR/IDR %):
  - To U.S. final demand (FDR)
  - To U.S. intermediate demand (IDR)

Food	Textiles	Wood	Paper	Printing
0.8/0.2	**29.5**/4.9	7.2/1.9	2.4/1.4	0.9/0.4
Petroleum	Chemicals	Pharmaceutical	Plastic	Minerals
0.2/0.6	1.1/3.8	2.1/0.8	8.4/2.7	9.8/3.4
Basic Metals	Metal Products	ICT	Electrical	Machinery
26.0/1.1	**10.9**/2.4	**26.1/13.6**	**26.0/11.7**	6.7/7.3
Motor	Transport	Furniture	Machinery Repair/Installation	
0.9/3.6	1.5/1.1	**11.6**/2.6	0.0/0.0	

Decomposing U.S. final demand: Cheng-Wang (2022)

- Impact Intensity (million US$): U.S. final demand for China's products
  - Assume constant I-O coefficients based on the 2016 WIOD and complete passthrough (Amiti-Redding-Weinstein 2019)
  - Exposure rate of country s to country d's tariff increase:
    ER^s_{dj} = FDR^d_{sj} * country d's tariff coverage rate in sector j TCR^d_j * 9.3%
  - Trade war impact intensity facing country s to country d's tariff increase:
    II^s_{dj} = ER^s_{dj} * trade elasticity of country d's sector j TE^s_{dj} * US final demand for sector j

Food	Textiles	Wood	Paper	Printing
-986	**-3733**	**-614**	0	0
Petroleum	Chemicals	Pharmaceutical	Plastic	Minerals
-2781	-398	-261	-438	-154
Basic Metals	Metal Products	ICT	Electrical	Machinery
-744	**-3323**	**-12085**	**-10560**	**-1138**
Motor	Transport	Furniture	Machinery Repair/Installation	
-667	-328	**-15950**	0	

Sectoral impact of trade war (mil$): Cheng-Wang (2022)

WIOD Sector	DWL	Leakage Rate (0.2) * Tariff	Total Loss = DWL + Tariff Leakage
A01-03: Primary	11.62	27.09	38.71
C10-12: Food	39.51	331.15	370.67
C13:15: Textile	16.00	431.60	447.60
C16: Wood	26.02	51.02	77.04
C17: Paper	45.30	51.88	97.18
C18: Printing and Media	3.04	3.48	6.52
C19: Petroleum	46.12	0.79	46.91
C20: Chemicals	46.56	561.64	608.21
C21: Pharmaceutical	8.77	105.74	114.51
C22: Plastic and Rubber	21.37	394.79	416.17
C23: Non-metallic Mineral	6.26	117.05	123.30
C24: Basic Metals	52.14	378.19	430.33
C25: Metal Products	169.38	497.33	666.72
C26: Electronic and Optical	522.47	2,575.14	3,097.61
C27: Electrical Equipment	206.16	612.25	818.42
C28: Machinery	35.12	1,033.87	1,068.99
C29: Motor Vehicles	60.08	761.87	821.94
C30: Other Transport	3.56	225.38	228.94
C31-32: Furniture and Other	135.94	1,044.79	1,180.73
C33: Repair and Installation	0.00	0.00	0.00
Total	1,455.42	9,205.06	10,660.48

Global value chain revisited

- Final goods are produced with intermediate goods along an internationally fragmented production line
- Intermediate goods are embodied with differentiated technologies
  - The North owns more advanced technology
  - The South is less advanced, but can upgrade along the value chain through
    - intermediate imports (Chen-Cheng-Peng-Riezman-Wang 2023)
    - global sourcing, joint venture or multinational (Cheng-Riezman-Wang 2019, 2023)
    - investment in own technologies (unrewarding if inferior ones)

Impact of trade war revisited: Chen-Cheng-Peng-Riezman-Wang (2023)

- With the South responding to a trade war by advancing in technologies via the composition of intermediate trade even if it cannot manipulate international prices, the South need not lose:
  - The South final goods producers can counter a trade war by adjusting the mix of intermediate goods, importing those embodied with superior technologies and lengthening & moving up along the value chain, an extensive margin effect
  - This entails a scale-scope trade-off in response to protectionism

Impact of trade war revisited: Chen-Cheng-Peng-Riezman-Wang (2023)

- Dynamic general equilibrium effects of a trade war on the South based on the size of the current U.S.-China war (without/with technology restrictions)

	Production Line	Volume of Export	Value of Export	Volume of Import	Value of Import
% change	35%/17%	121%/-17%	103%/-22%	-50%/-39%	-56%/-42%
	Export Range	Import Range	Average Technology	Average Profit Markup	Domestic Intermediate Production Ratio
% change	65%/-6%	-53%/-27%	11%/5%	15%/4%	17%/4%

Impact of Trade War Revisited: Chen-Cheng-Peng-Riezman-Wang (2019 NBER)

- Thus, the South need not lose if it adjusts the mix of intermediate goods by importing those embodied with superior technologies and lengthening & moving up along the value chain
- Trade war does reduce the volume and the value of trade (exports and imports) substantially
- As a result of the scale-scope trade-off induced by technology-embodied intermediate goods trade
  - Average technologies both rise
  - Average productivity is higher
  - Average profit markup is larger
  - The value-added and consumption ratios both increase
  - But all such changes are modest quantitatively