ADB

The People's Republic of China's Evolving Role in Global Supply Chains

A Value Chain Analysis Using Multi-Region Input-Output Tables

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Part 1

The PRC in the global economy



1a. Trends in economic indicators



Source: WDI



1b. Trade networks



Source: Diakantoni and others 2017, based on the UN Comtrade database (https://comtrade.un.org).

Note: Includes the 61 economies in the Organisation for Economic Co-operation and Development-World Trade Organization Trade in Value-Added database and their most important bilateral gross trade flows. The color of the nodes (and their export flows) is from blue to red, blue indicating the highest degree of centrality.

1b. Trade networks



source: Global Value Chain Development Report 2017

1c. Sector specific exports



Part 2

Value chains



2a. The unbundling phenomenon



2b. Production fragmentation



2c. Production sharing

2.1.6 The cost structure of a jacket



Part 3

The conceptual framework



3a. Value-added



3b. Value chains in the IO framework



3b. Value chains in the IO framework

	Intermediate use	Industrial S	ectors as Co	nsumers (j)	Final use		Rest of t	he World)W)	
		1	2	3		Domestic	Imports	Exports	Total demand
ndustrial	1	p ₁₁ X ₁	p ₁₂ X ₁	p ₁₃ X ₁		F ₁	-M1	E1	X1
ectors as	2	p ₂₁ X ₂	p22X2	p23X2		F ₂	-M2	E ₂	X2
Producers (i)	3	p31X3	p32X3	p33X3		F ₃	-M3	E ₃	X3
	Labor, capital, and entrepreneurship								
	Government								
	Total value added	V ₁	V ₂	V ₃					
	Total output	X1	X ₂	X ₃					
		where 0 <)	2. < 1						

3b. Value chains in the IO framework

 $p_{11}X_1 + p_{21}X_2 + p_{31}X_3 + V_1 = X_1$

 $p_{21}X_1 + p_{22}X_2 + p_{23}X_3 + V_2 = X_2$

 $p_{31}X_1 + p_{32}X_2 + p_{33}X_3 + V_3 = X_3$

Where $0 \le p_{ij} < 1$ and $V_j > 0$. Solving the system of equations results in

$$X_{1} = \frac{p_{21}((1 - p_{33})V_{2} + p_{23}V_{3}) - p_{31}(p_{22}V_{3} - V_{3} - p_{32}V_{2}) - (p_{33} + p_{22}(1 - p_{33}) + p_{23}p_{32} - 1)V_{1}}{p_{11}(p_{33} + p_{22}(1 - p_{33}) + p_{23}p_{32} - 1) - p_{33} + p_{22}(p_{33} - 1) + p_{21^{2}}(p_{33} - 1) - p_{23}p_{32} + p_{21}p_{31}(-p_{32} - p_{23}) + (p_{22} - 1)p_{31^{2}} + 1}$$

$$X_{2} = \frac{p_{11}((p_{33}-1)V_{2}-p_{23}V_{3}) + p_{21}p_{31}V_{3} + p_{23}V_{3} + (1-p_{33})V_{2} - p_{31^{2}}V_{2} + (p_{21}(1-p_{33}) + p_{23}p_{31})V_{1}}{p_{11}(p_{33}+p_{22}(1-p_{33}) + p_{23}p_{32} - 1) - p_{33} + p_{22}(p_{33}-1) + p_{21^{2}}(p_{33}-1) - p_{23}p_{32} + p_{21}p_{31}(-p_{32}-p_{23}) + (p_{22}-1)p_{31^{2}} + 1p_{31^{2}}(p_{33}-1) - p_{33}p_{32} + p_{33}p_{33} + p_{33}p_{$$

$$X_{3} = \frac{p_{11}(p_{22}V_{3} - V_{3} - p_{32}V_{2}) - p_{22}V_{3} - p_{21^{2}}V_{3} + V_{3} + p_{32}V_{2} + p_{21}p_{31}V_{2} - ((p_{22} - 1)p_{31} - p_{21}p_{32})V_{1}}{p_{11}(p_{33} + p_{22}(1 - p_{33}) + p_{23}p_{32} - 1) - p_{33} + p_{22}(p_{33} - 1) + p_{21^{2}}(p_{33} - 1) - p_{23}p_{32} + p_{21}p_{31}(-p_{32} - p_{23}) + (p_{22} - 1)p_{31^{2}} + 1}$$

3c. Globalized value chains in the IO framework



3c. Globalized value chains in the IO framework



3d. Measuring GVC participation using the IO framework

 b_{12}^{ss} b_{11}^{sr} b_{12}^{sr} 0 0 0 0 b_{21}^{ss} b_{21}^{sr} b_{22}^{sr} 0 0 0 $\hat{VBY} =$ b_{12}^{rr} b_{11}^{rs} b12 b_{11}^{m} 0 0 0 0 0 b_{21}^{m} b_{22}^{rs} 0 0 0 0 0 v1 b12 v2 $v_1^{s}b_{12}^{s}y_2^{s}$ $v_1^{s}b_{11}^{sr}y_1^{r}$ $v_{2}^{s}b_{21}^{sr}y_{1}^{r}$ $v_{2}^{s}b_{22}^{sr}y_{2}^{r}$ v2b22V2 Origin of value added $v_1'b_{11}''y_1$ $v_1'b_{12}''y_2'$ Forward linkage $v_{2}b_{21}^{\prime\prime}v_{1}$ Backward linkage

3e. Wang, Wei and Zhu export decomposition framework



3e. Wang, Wei and Zhu export decomposition framework

$$\begin{aligned} E^{sr} &= (V^{s}B^{ss})^{T} \# Y^{sr} & (1) DVA_{FIN} \\ &+ (V^{s}L^{ss})^{T} \# \left[A^{sr}B^{rr}Y^{rr} \right) & (2) DVA_{INT} \\ &+ (V^{s}L^{ss})^{T} \# \left[A^{sr}\sum_{t=s,r}^{G} B^{rt}Y^{tt} + A^{sr}B^{rr}\sum_{t=s,r}^{G} Y^{rt} + A^{sr}\sum_{t=s,r}^{G} B^{rt}Y^{tu} \right] & (3) DVA_{INT}rex \\ &+ (V^{s}L^{ss})^{T} \# \left[A^{sr}B^{rr}Y^{rs} + A^{sr}\sum_{t=s,r}^{G} B^{rt}Y^{ts} + A^{sr}B^{rs}Y^{ss} \right] & (4) RDV \\ &+ \left[(V^{s}L^{ss})^{T} \# \left(A^{sr}\sum_{t=s,r}^{G} B^{rs}Y^{st} \right) + (V^{s}B^{ss} - V^{s}L^{ss})^{T} \# (A^{sr}X^{r}) \right] & (5) DDC \\ &+ \left[(V^{r}B^{rs})^{T} \# Y^{sr} + \left(\sum_{t=s,r}^{G} V^{t}B^{ts} \right)^{T} \# Y^{sr} \right] & (6) FVA_{INT} \\ &+ \left[(V^{r}B^{rs})^{T} \# (A^{sr}L^{rr}Y^{rr}) + \left(\sum_{t=s,r}^{G} V^{t}B^{ts} \right)^{T} \# (A^{sr}L^{rr}Y^{rr}) \right] & (7) FVA_{INT} \\ &+ \left[(V^{r}B^{rs})^{T} \# (A^{sr}L^{rr}E^{r^{*}}) + \left(\sum_{t=s,r}^{G} V^{t}B^{ts} \right)^{T} \# (A^{sr}L^{rr}E^{r^{*}}) \right] & (8) FDC \end{aligned}$$

3f. Data source

- ADB multi-region input-output tables (ADB MRIOT)
 - WIOD +
 - 48 economies + ROW
 - 35 economic sectors
 - Years covered: 2000, 2005, 2008, 2011 and 2015
 - August 2017 update: 60 economies, 2000 2016
 - Environmental indicators (SEEA) to be integrated in 2018



Part 4

General trends from MRIOT



- PRC usage share
 - **2000: 7%**
 - **2015: 26%**
- Losing shares
 - USA
 - Japan
 - EU
- Gaining shares
 - BRICS
 - Developing Asia
 - South America, Africa

			С	har	nge	s in	ec	onc	omi	es'	sha	re	of ir	nter	me	ediat	te u	ise [.]	fro	m 2	000) to	202	15			
_	GBR	DEU	FRA	ΙΤΑ	NLD	ESP	TUR	SWE	BRA	RUS	PRC	IND	BAN	ТАР	IDN	MAL	PHI	тна	VIE	JPN	KOR	AUS	USA	MEX	CAN	RoW	тот
GBR	-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%
DEU	0%	-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-2%
RA	0%	0%	-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%
TA	0%	0%	0%	-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%
NLD	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SP	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
UR	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SWE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BRA	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
RUS	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
PRC	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	18%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%
ND	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
BAN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
ΓAΡ	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
MAL	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
РΗ	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
ΉА	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
/IE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
PN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-9%	0%	0%	0%	0%	0%	0%	-9%
OR	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
N US	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
JSA	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-10%	0%	0%	0%	-10%
VIEX	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CAN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
RoW	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	4%
тот	-1%	-2%	-1%	-1%	0%	-1%	0%	0%	1%	1%	19%	1%	0%	0%	1%	0%	0%	0%	0%	-9%	0%	0%	-10%	0%	0%	3%	0%

4a. Intermediate use

- PRC usage share
 - **2**000: 4%
 - 2015:14%
- Losing shares
 - USA
 - Japan
 - EU
- Gaining shares
 - BRICS
 - Developing Asia
 - South America, Africa
- The PRC's Intermediate final share gap
 - 2000: 3 percentage points
 - 2015: 12 percentage points



				C	nar	ige	es ir	i ec	on	om	les	sn	are	OT	TIN	aru	se	ror	n z	000	to	20	12				
	GBR	DEU	FRA	ITA	NLD	ESP	TUR	SWE	BRA	RUS	PRC	IND	BAN	ТАР	IDN	MAL	PHI	THA	VIE	JPN	KOR	AUS	USA	MEX	CAN	RoW	
GBR	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
DEU	0%	-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
FRA	0%	0%	-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
ITA	0%	0%	0%	-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
NLD	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
ESP	0%	0%	0%	0%	0%	-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
TUR	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
SWE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
BRA	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
RUS	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
PRC	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
IND	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
BAN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
ТАР	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
IDN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
MAL	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
PHI	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
THA	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
VIE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
JPN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-9%	0%	0%	0%	0%	0%	0%	
KOR	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
AUS	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
USA	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-7%	0%	0%	0%	
MEX	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	0%	0%	
CAN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
RoW	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	
тот	0%	-1%	-1%	-1%	0%	-1%	0%	0%	0%	1%	11%	1%	0%	0%	1%	0%	0%	0%	0%	-9%	0%	1%	-7%	0%	0%	5%	

4c. Gross value added



4c. Gross value added



4c. Gross value added



4d. Output decomposed



Nationally,

- GVA = unduplicated domestic value-added
- Domestic intermediates = duplicated domestic value-added
- Imported intermediates = foreign value-added

4d. Output decomposed



Nationally,

- GVA = unduplicated domestic value-added Intermediate inputs = domestic intermediates + imported intermediates Domestic intermediates = duplicated domestic value-added Imported intermediates = foreign value-added

4e. Re-emergence of the local market?



Part 5

Trends in value-added indicators

5a. Import content in exports



- FVA = unduplicated foreign value-added
- FDC = duplicated foreign value-added
- RDV_B = domestic value-added returned via imports to be ultimately consumed locally

5b. Direct and indirect exports



5c. GVC participation indicators



5c. GVC participation indicators



5d. Backward linked indirect exports



5e. Forward linked indirect exports



Part 6

Exports of selected sectors



6a. Value-added exports



6b. Textiles: gross exports decomposed



6c. Transport equipment: gross exports decomposed



6d. Electrical and optical equipment: gross exports decomposed



6e. Post and telecommunication: gross exports decomposed





Revealed comparative advantage



7a. Value-added based RCA of selected sectors



7b. Value-added and traditional RCA measures compared



7c. Trends in RCA indicators



7d. Trends in RCA indicators: textiles in Asia



Part 8

GVCs and FDIs



- Sample from Worldbase, Dun & Bradstreet
 - Links the global ultimate headquarter and its affiliates located around the world at the 4 –digit Standard Industrial Classification (SIC) level
 - Records if an affiliates is engaged in international trade activity (plus data on sales and employment)
 - Indicator of GVC-FDI: Foreign-owned affiliates that both export and import
 - Country coverage: GUHs located in OECD + emerging countries; affiliates located in Asia i.e. GVC-FDI into Asia
 - Sectoral coverage: Manufacturing, Mining and Business Services

8c. Patterns—GVC-FDI: Most common country pairs

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Destination	Origin	No. of Affiliates that Import and Export	% of Affiliates that Import and Export
1. PRC	Japan	2,260	81%
2. PRC	Hong Kong, China	1,314	76%
3. PRC	United States	646	74%
4. PRC	Germany	625	76%
5. PRC	Taipei,China	401	79%
6, PRC	Korea	358	86%
7. PRC	Singapore	337	71%
8. Viet Nam	Japan	306	72%
9. Thailand	Japan	258	64%
10. Indonesia	Japan	214	53%
11. Taipei, China	Japan	212	74%
12. PRC	France	177	77%
13. Malaysia	Japan	175	78%
14. Philippines	Japan	171	69%
15. Singapore	Japan	164	54%

8d. GVC FDI: Most common industries

Affiliate industry	Number of affiliates that import & export
1. Motor Vehicle Brake System	1,925
2. Other Electronic Component	1,358
3. Plastics Pipe and Pipe Fitting	980
4. Pharmaceutical Preparation	859
5. Paint and Coating	710
6. Semiconductor and Related Device	694
7. Custom Computer Programming Services	542
8. Telemarketing Bureaus	532
9. Farm Machinery and Equipment	490
10. Ethyl Alcohol	477
11. Plastics Material and Resin	465
12. All Other Petroleum and Coal Products	434
13. All Other Miscellaneous General Purpose Machinery	433
14. Other Engine Equipment	395
15. Computer Systems Design Services	391

8e. GVC-FDI: Destination economies of largest investors



8f. GVC-FDI into Asia: Host Economies (% of economy total)

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8g. GVC-FDI from Asia: Source economies

% of economy total



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Number of FDI Firms by Origin of Global Ultimate Headquarters

	Asia	Outside Asia	Selected Emerging Asia Economies	Rest of the World	PRC	India
All plants	203,132	26,998	86,094	144,036	31,297	52,008
Foreign plants (share of total)	5%	37%	1%	14%	0.7%	0.5%
Percentage that exports	73%	52%	43%	63%	35%	48%
Percentage that imports	76%	53%	37%	66%	27%	37%
Percentage that imports and exports	67%	45%	29%	58%	21%	32%

FDI = foreign direct investment, PRC = People's Republic of China.

Note: The selected emerging Asian economies in this list include the PRC, India, Indonesia, Malaysia, and Thailand. Source: Dun & Bradstreet. D&B Worldbase.

8i. Top destination of PRC's and India's GVC-FDI

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Source: PRC	% share
1. Viet Nam	29
2. Hong Kong, China	24
3. Singapore	16
4. Philippines	7
5. Australia	7
	~ .
Source: India	% share
	/o share
1. Singapore	41
1. Singapore 2. PRC	41 14
 Singapore PRC Australia 	41 14 10
 Singapore PRC Australia Indonesia 	41 14 10 9
 Singapore PRC Australia Indonesia Japan 	41 14 10 9 5
 Singapore PRC Australia Indonesia Japan Thailand 	41 14 10 9 5 5 5

FDI = foreign direct investment, GVC = global value chain, PRC = People's Republic of China.

8j. GVC-FDI and Average Country Characteristics

5	Q
J	O

	Averag	ge Country
	Charc	
Affiliates with:	imports &	only domestic
	exports	sale
Integration variables		
Irade restrictiveness index	0.05	0.05
burden of custom proc.	4.43	4.77
cost to export (\$ per container)	577	752
cost to import (\$ per container)	622	804
# documents to export	6.74	5.24
# døcuments to import	5.35	5.83
logistics performance index	3.48	3.57
quality of port infrastructure	4.55	4.93
applied tariff rate	3.53	2.48
RTAs	0.34	0.36
BITs	0.55	0.38
BITs, investor-state-of-dispute	1.9	1.7
DTTs	0.91	0.78
Comparative advantage varial	oles	
real GDP p.c. (rgdpl)	13,006	24,227
K-L ratio	76,379	156,101
avg year schooling	7.61	8.73
log rgdpl, host rel. to source	-1.32	-0.75
log K-L ratio, host rel. to source	-1.51	-0.78

	Average Charac	Country teristics
Affiliates with:	imports & exports	only domestic sale
Institutional variables		
rule of law	-0.09	0.68
regulatory quality	0.05	0.76
government effectiveness	0.27	0.87
control of corruption	-0.05	0.69
political stability	-0.29	0.23
voice & accountability	-0.95	0.12
Policy Variables		
days req to enforce a contract	390	353
# proc. to register a biz start-up	6.6	4.45
cost of biz start-up proc. (% of GNI)	8.6	4.7
days to get electricity	57.9	58.9
days req to register property	27.1	16.4
days req to start biz	17.1	8.2
time spent dealing w/Gov. reg.	0.9	0.9
hours req to prepare and pay taxes	304	168
priv.credit (% of GDP)	0.46	0.91
GVC-trade variables		
dva share	0.72	0.79
fva share	0.21	016

8k. SEZs and GVC-FDI

Economy	2005-2007 (Pre-GFC annual average)	2013	2014	2015
Thailand	13.7	15.6	3.5	11.0
Indonesia	6.1	6.4	7.5	5.4
Malaysia	16.4	14.1	12.4	14.3
Southeast Asia	21.1	18.6	18.1	18.6
Developing Asia	11.0	6.2	6.3	7.4
Developing Economies	11.8	7.6	7.6	8.7
World	11.6	7.8	6.7	9.9

FDI = foreign direct investment, GFC = global financial crisis. Source: UNCTAD (2016).

Table 6.17: Special Economic Zones and GVC-FDI

	Number of SEZ	SEZ per km ²	GVC-FDI (%)
Bangladesh	8	0.00006	10
Cambodia	14	0.00008	41
India	199	0.00007	47
Kazakhstan	10	0.000004	100
PRC	1,475	0.00016	82
Philippines	312	0.001041	66
Sri Lanka	12	0.00019	36

PRC = People's Republic of China, FDI = foreign direct investment, GVC = global value chain, km² = square kilometer, SEZ = special economic zones. Notes: The number of SEZs is for 2014. GVC-FDI refers to the fraction of foreign affiliates in the economy that exports. Sources: ADB calculations using data from Dun & Bradstreet. D&B

Worldbase; and ADB (2015).

	Dependent variable: DVA as % of gross exports					
	(1)	(2)	(3)	(4)	(5)	(6)
export upstreamness	0.052***	0.081***	0.099***	0.164***	0.242***	0.216***
Ops	183,068	79,597	5,362	42,195	20,539	1,249
R-sq	0.670	0.577	0.420	0.690	0.675	0.647
sample industries	all	mfg	mining	all	mfg	mining
sample countries	all	all	all	Asia	Asia	Asia

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8m. Determinants of GVC–FDI: Country Characteristics

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Dependent variable: D(exports>0 & imports >0)

	(1)	(2)	(3)	(4)
Log capital-labor ratio	-0.495***	-0.173*	-0.777***	-1.056***
Private credit		0.227***		
Trade restrictiveness index			-3.446***	
Export upstreamness				-0.548***
Control Variables	Yes	Yes	Yes	Yes
Observations	17,126	8,581	15,458	12,256
R-squared	0.351	0.283	0.355	0.200

*** significant at 1%, ** significant at 5%, * significant at 10%.

FDI

= foreign direct investment, GVC = global value chain.

Note: A linear probability model estimated using Ordinary Least Squares. GVC-FDI refers to Global Value Chain-FDI. The dependent variable is a dummy variable equal to 1 if the affiliate firms report export and import activity. The variable "private credit" refers to country-level private credit as share of GDP. The variable "export upstreamness" is derived from Antras et al. (2012). Trade restrictiveness index is from the World Bank. Other Control Variables include country characteristics such as GDP, GDP per capita, average years of schooling, measures for attachment to value chains amongst a host of others. Also included are affiliate industry fixed effects.

8n. Production Fragmentation and GVC-FDI

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	Dependent Variable				
	Log affiliate sales	Number of affiliates that import and export	log(Share of foreign affiliates)	Log(Share of trade-oriented foreign affiliates)	
dr _{ap}	0.221**				
dr _{pa}	0.286***				
Number of affiliates with dr _{ap} >0 & dr _{pa} >0		0.547***			
Log (share of domestic affliliates with dr _{ap} >0 & dr _{pa} >0			0.279***	0.065*	
Observations	6787 6787	8741	451	407	
R-sq	0.039 0.056	0.634	0.866	0.588	
Sample	Foreign Foreign	Foreign			

80. GVC-FDI is strongly associated with Green-field investment in Asia

Determinants of GVC-FDI (ordinary least squares) Dependent variable: log of GVC-FDI, bilateral sectoral level

	(1)	(2)	(3)	
log (M&A to Greenfield) (counts)	-0.095** (0.026)	-0.076*** (0.025)	-0.049 (0.076)	
Control Variables	Yes	Yes	Yes	
Number of observations	416	266	38	
R-squared	0.548	0.387	0.609	
Sample	All	Manufacturi ng	Mining	

*** = significant at 1%, ** = significant at 5%, * = significant at 10%.

FDI = foreign direct investment, GVC = global value chain, M&A = merger and acquisition.

Notes: Estimated using Ordinary Least Squares. Other Control Variables include country characteristics such as GDP, GDP per capita, average years of schooling, measures for attachment to value chains, amongst a host of others. Also included are affiliate industry fixed effects.

8p. Effect of Ease of Doing Business & Governance on FDI

Dependent variable: 3-year averaged number of FDI projects

	Greenfield investment				Cross-border M&A			
Source	High	High-income Emerging		High-income		Emerging		
Host	High- income	Developing	High- income	Developing	High- income	Developing	High- income	Developing
Overall Ease of Doing Business Index - host	0.005	0.022***	-0.002	-0.001	0.004	0.009	-0.007	-0.014
Overall World Governance Index - host	0.026***	0.043***	0.031*	0.021***	0.042***	0.072***	0.044***	0.051***
Observations	3096	6792	1290	2830	3096	6792	1290	2830
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.641	0.841	0.610	0.543	0.696	0.798	0.636	0.527

*** significant at 1%, ** significant at 5%, * significant at 10%.

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EoDB = World Bank's Ease of Doing Business Indicators, FDI = foreign direct investment, WGI = World Governance Indicators.

Note: Estimated using Poisson Pseudo-Maximum Likelihood (PPML). Control variables include dyadic variables, and host country characteristics. Also included are time-varying source country-period, host country and period fixed effects.

8q. Interaction effects of Ease of Doing Business and World Governance Indicators on greenfield FDI flows from highincome to developing

Dependent variable: 3 year averaged number of Greenfield FDI

EoDB	0.096***
EoDB*WGI_ave	-0.002***
WGI_ave	0.140***
Control Variables	Yes
*** significant at 1%, ** significant at 5%, * significant at 10 EoDB = Ease of Doing Business Indicators, FDI = foreign dire Indicators. Note: Estimated using Poisson Pseudo-Maximum Likelihood (and host country characteristics. Also included are time-varyin fixed effects.	D%. Sect investment, WGI = World Governance PPML). Control Variables include dyadic variables ig source country-period, host country and period

Key Empirical Findings

- Determinants of FDI are diverse across different mode of entry, motivation, sectors, and source economies
- Export downstreamness, labor abundance, low trade barriers, access to credit and strong domestic value chains foster GVC FDI in the context of Asia
- Relatively speaking GVC-FDI is undertaken more through greenfield investments, while market-seeking FDI takes the M&A mode of entry
- Governance is the most important factor for both greenfield FDI and M&A, more so for M&A. Governance also matters most for North-South FDI.
- Improving business environment could supplement low governance in developing countries; it is vital in fostering productive private investment both domestic and foreign