

**WOMEN'S EMPLOYMENT IN MANUFACTURING:
AN ANALYSIS OVER A PERIOD OF
ASIANIZATION
AND
DE-INDUSTRIALIZATION**

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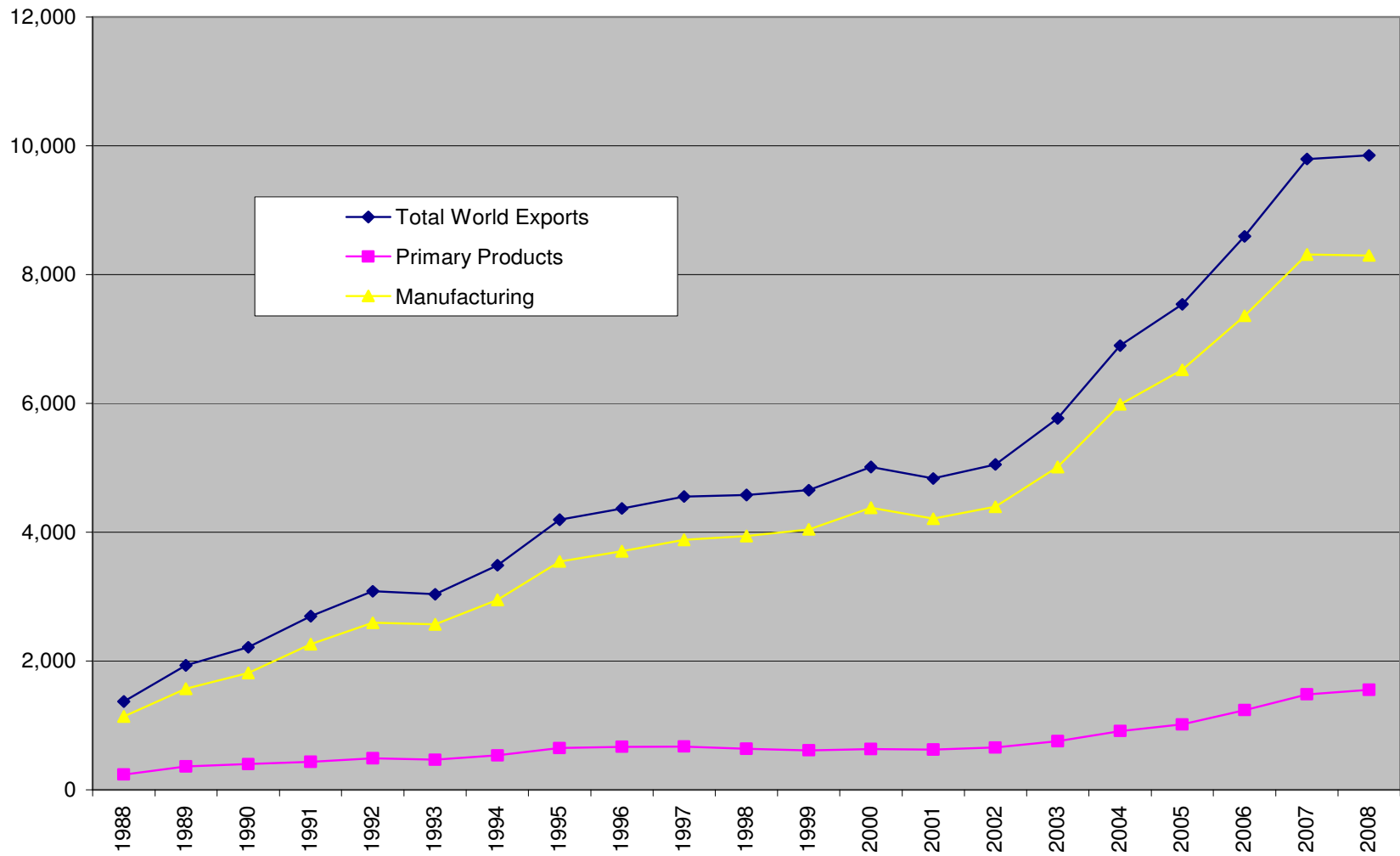
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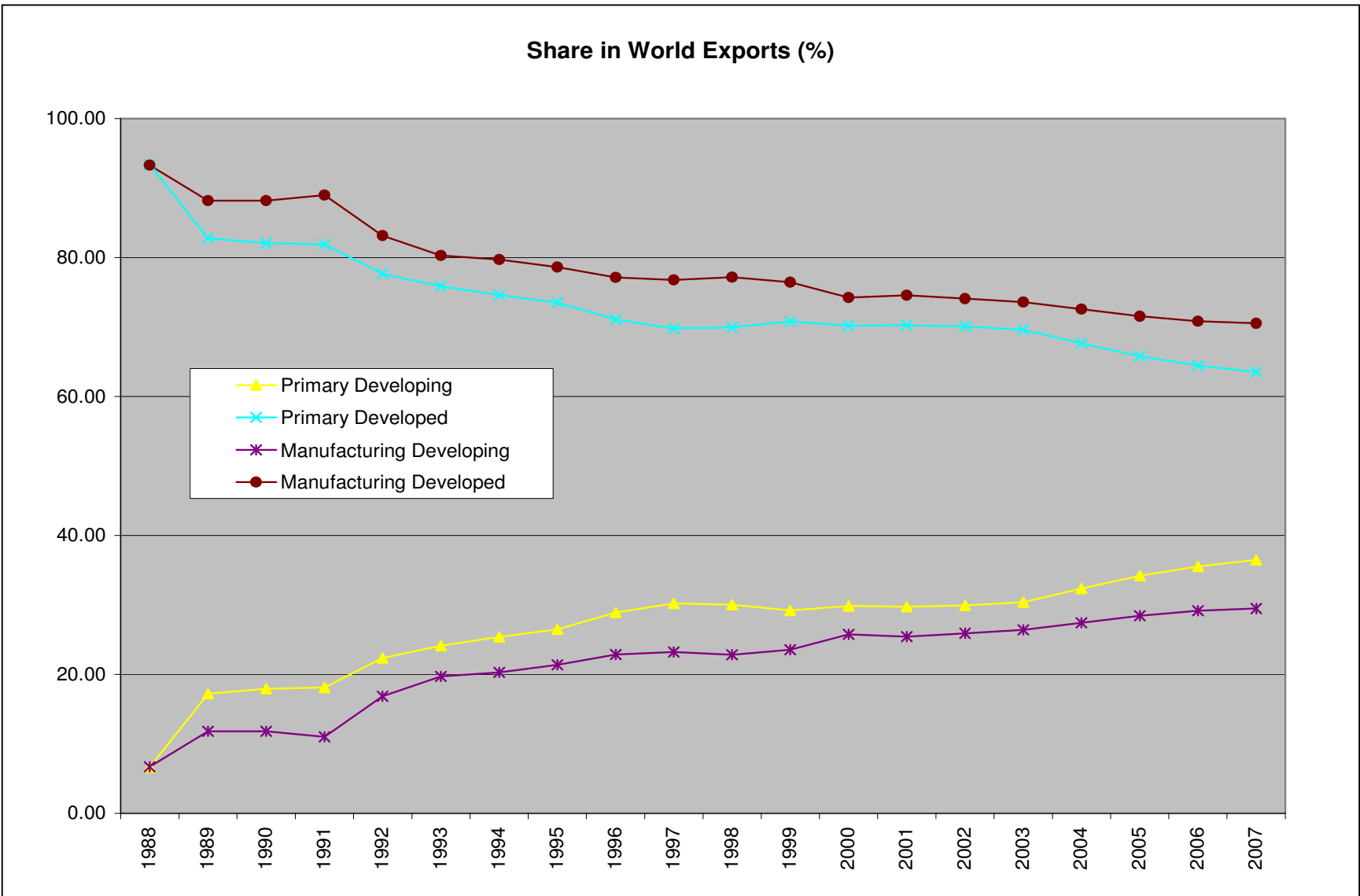
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Motivation

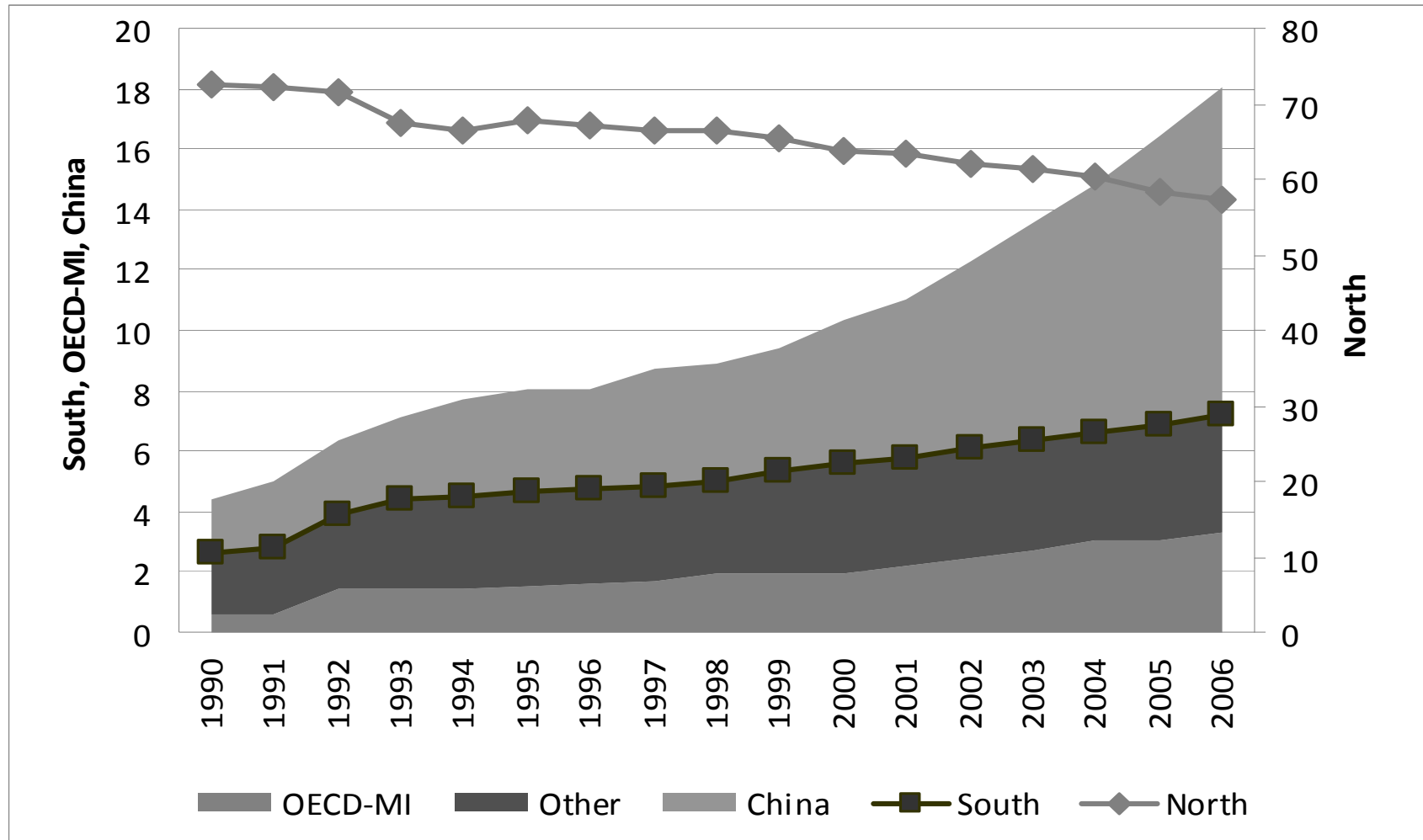
- Factors driving post 1980's-global integration (trade expansion, technological change, internationalization of production) have changed the production modes along with employment for developed countries as well as developing countries.
- In terms of global division of labor, this transformation process has crucial consequences for labor allocation at regional, country and even sectoral level.
- **The issue of women's employment within the context of employment impacts of production and foreign trade pattern changes....**

Value of World Exports (billions US \$, 1988-2008)





Share in World Exports (%)



Import Penetration Rates (%)

Country of Origin	North			South		
	1990s	2000s	% Change	1990s	2000s	% Change
China	0.8	2.2	176	0.7	2.9	292
North	25.9	26.3	2	26.5	30.9	17
South	3.5	4.9	38	9.3	12.3	32
<i>OECD MI</i>	<i>1.2</i>	<i>2.1</i>	<i>85</i>	<i>3.4</i>	<i>4.8</i>	<i>44</i>
<i>Other</i>	<i>2.4</i>	<i>2.8</i>	<i>15</i>	<i>6.0</i>	<i>7.5</i>	<i>25</i>
<i>All</i>	<i>30.2</i>	<i>33.4</i>	<i>11</i>	<i>36.6</i>	<i>46.2</i>	<i>26</i>

Import penetration rate = Imports/(Output + Imports - Exports)

Motivation

- Trends in women's employment affected by the forces shaping the global integration...
 - Increased economic activity of women (LFPR) by the expansion of the global economy and increased foreign trade in 1980s and 1990s
(e.g. Mehra and Gammage, 1999; Krueger 1983).
 - Increased share of total female employment in manufacturing in developing countries (Asia, sub-Saharan Africa and Latin America,
Increased share of total female employment services in developed countries (OECD) in 1970s and 1980s
(e.g. Mehra and Gammage, 1999; Kucera and Milberg, 2000; Standing, 1989 and 1999) *

Motivation

- **Asymmetric effects of foreign trade on female employment in export-oriented sectors:**
 - Negative effect on female employment in developed countries, (Schumacher, 1984; Baldwin, 1984) for 1970s.
 - “Wood Asymmetry”: Trade between developed and developing countries corresponded to an increased female intensity of employment in developing countries with no noticeable negative effect on developed, for 1968-1981, Wood (1991).*
 - Re-visiting “Wood Asymmetry”: Trade with developing countries results in employment declines that disproportionately affects women in developed countries; the gender bias associated with developments in ***Textiles, Apparel, Leather and Leather Goods sectors*** for 1978-1995, (Kucera and Milberg, 2000 and 2003).

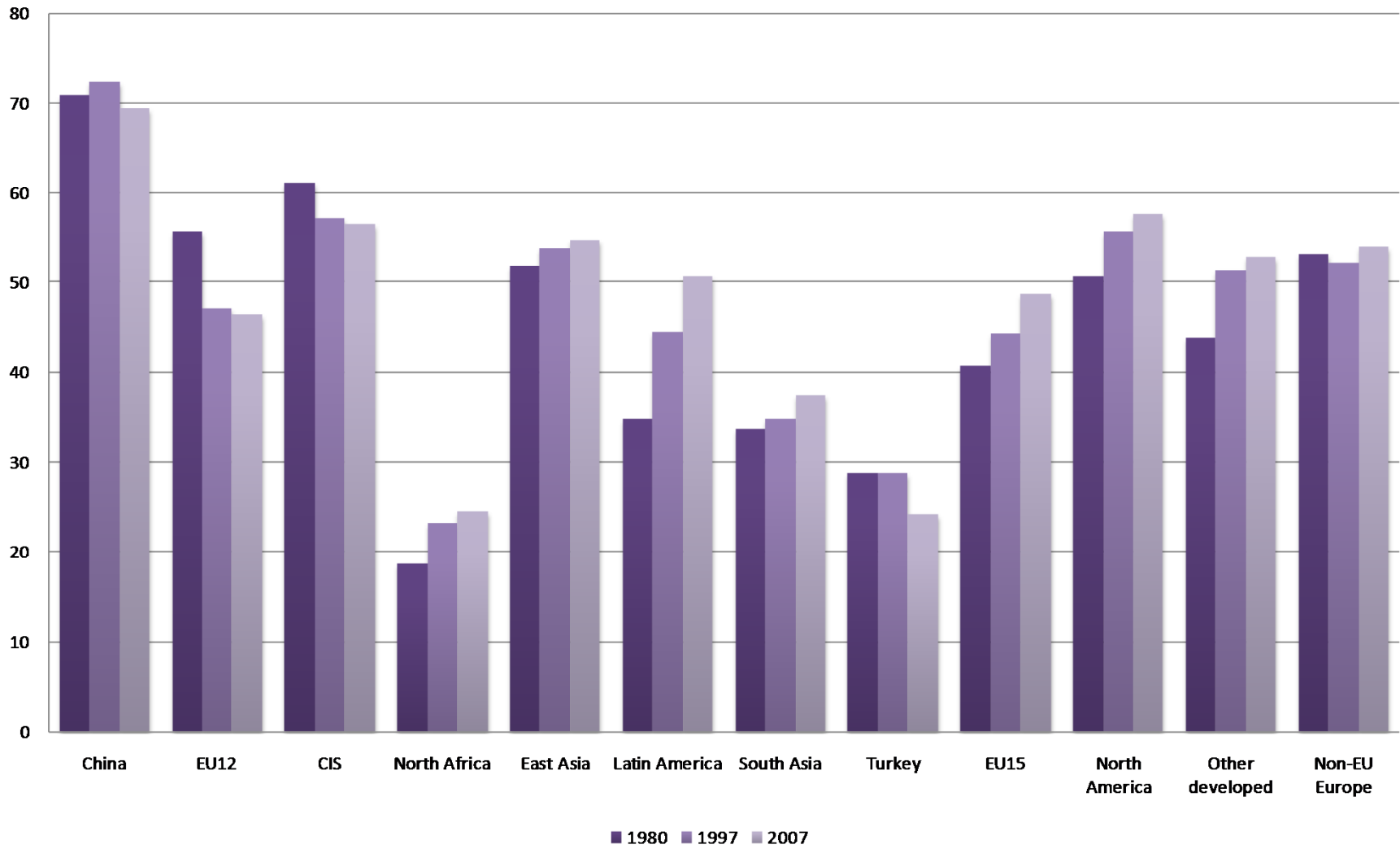
Motivation

- Sectoral allocation of women's employment in relation to trade...
 - Maintaining competitiveness in global markets: substitute female for male workers in sectors that are more exposed to trade. (Joeques and Moayed, 1987, Mehra and Gammage, 1999).
 - For some developing countries demand for female labor appears to be declining as export production is re-structured and becomes more technologized. Demand for more specialized skills transforming into demand for male labor (Kim and Kim, 1995).
 - Decomposing the effect of Intra-sectoral Change vs. Inter-sectoral Change (Schultz, 1989)

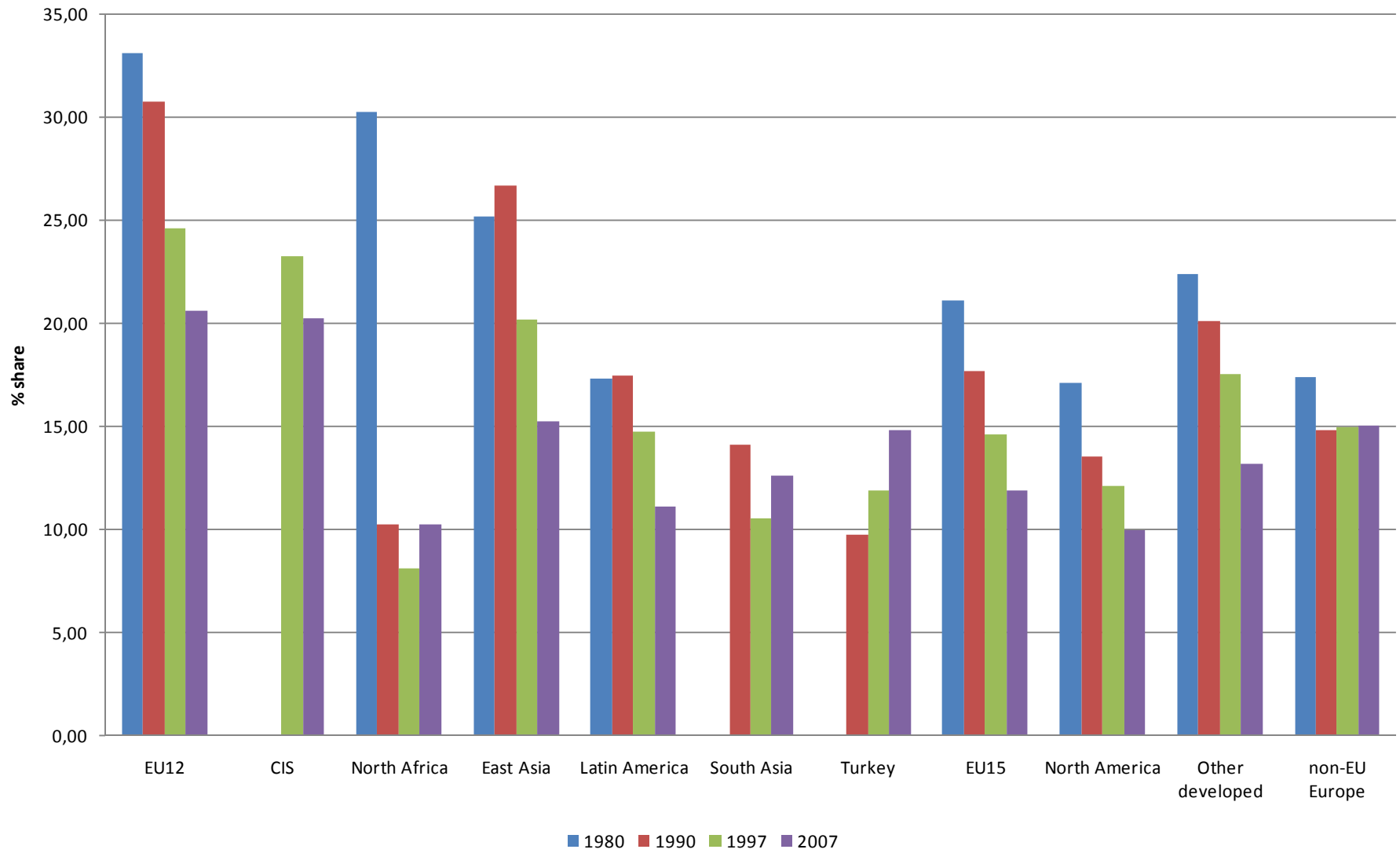
Outline

- ✓ Motivation
- ✓ Literature
- Trends in global integration as defined by patterns of international trade
 - Changing patterns in female employment
 - Changing trade patterns
- Decomposition Analysis
- Factor Content Analysis (Wood, 1991; Kucera and Milberg, 2000, 2003)
- Further Agenda

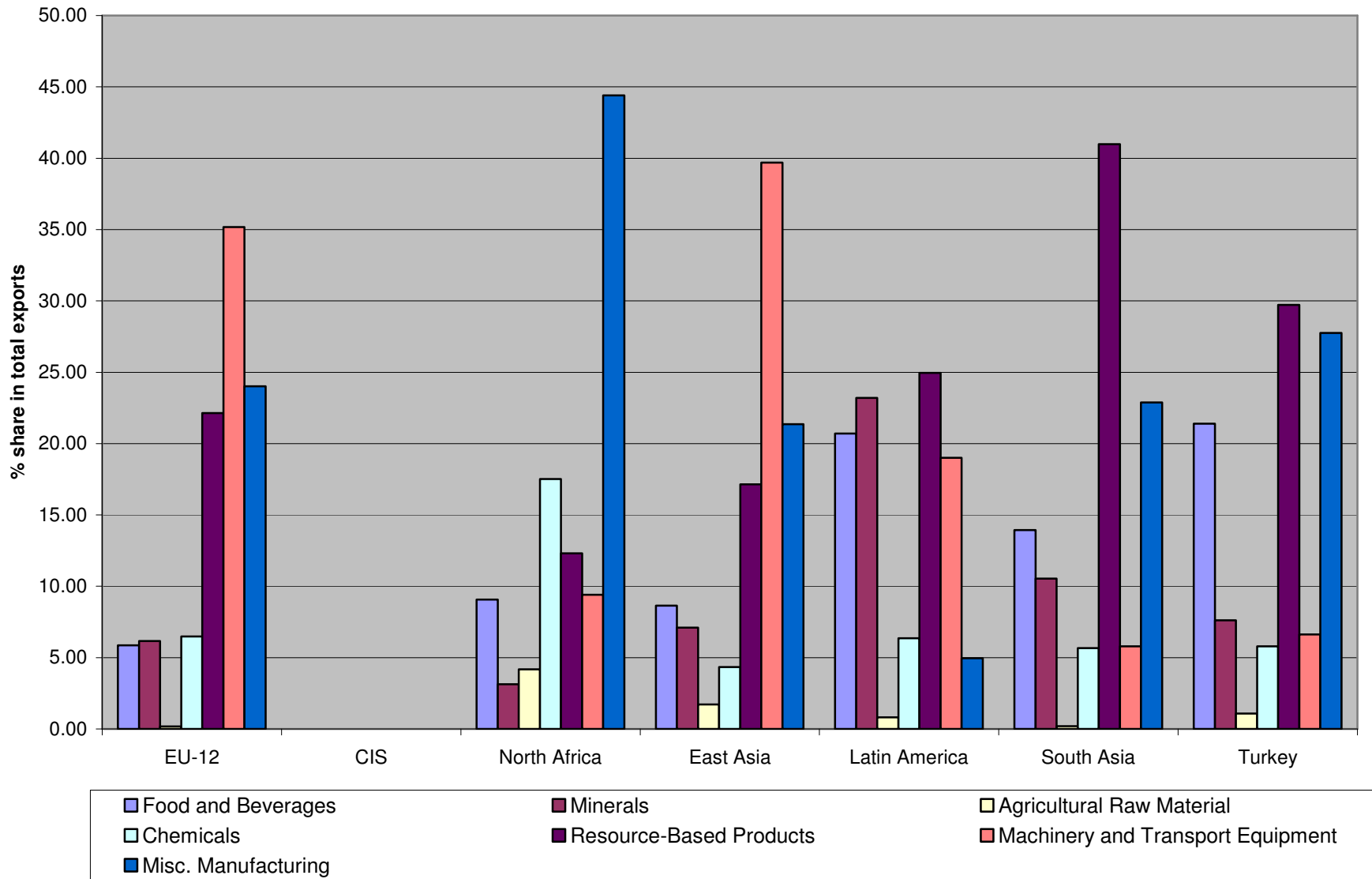
Female Labor Force Participation Rate (%)



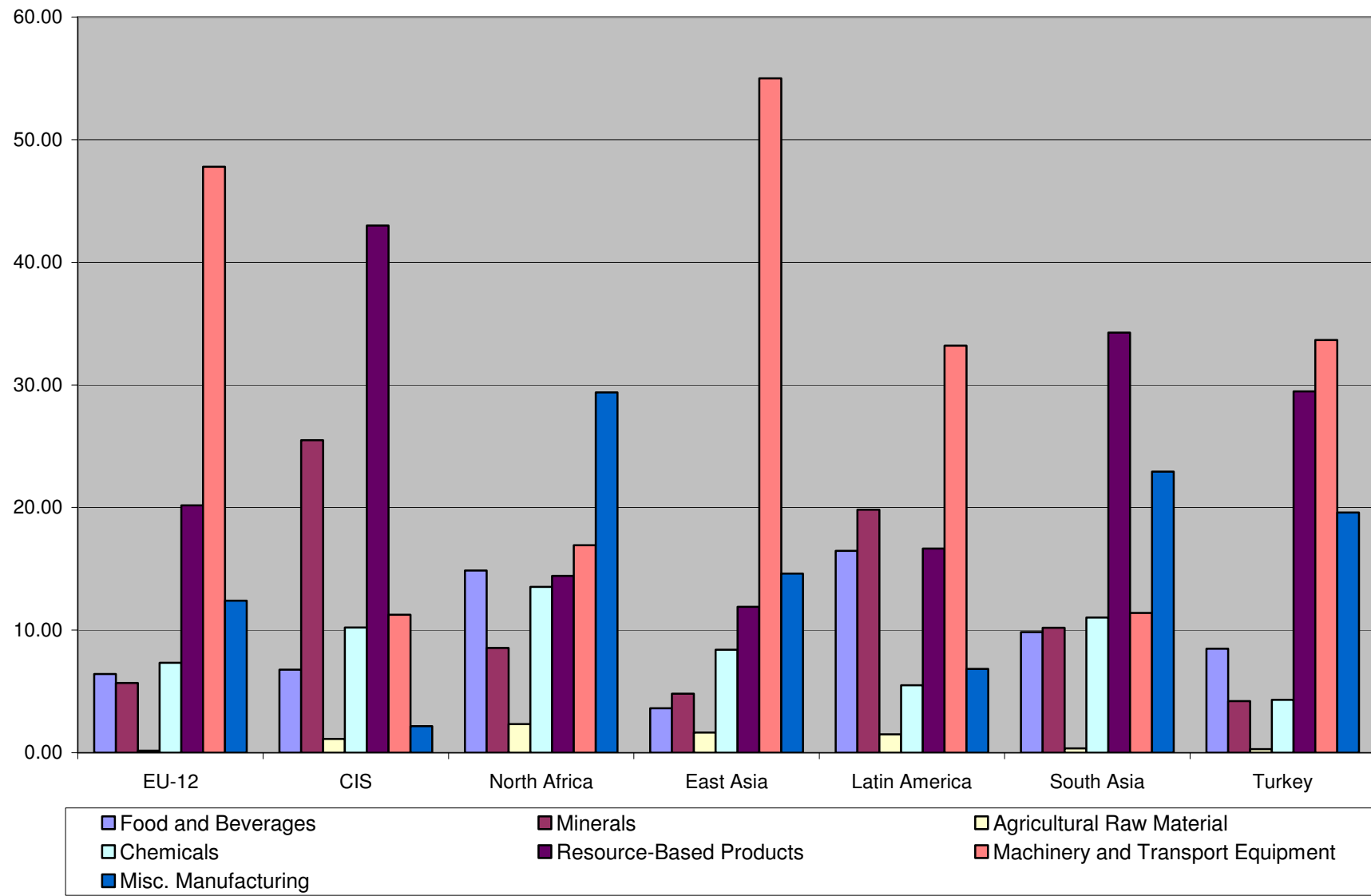
Industrial Employment in Total Female Employment (%)



Export Structures, Developing Countries, 1990



Export Structure, Developing Countries, 2007



- **We examine..**

- The effects of changes in the patterns of production processes and foreign trade on female employment
- considering various aspects such as
 - the variations in the decomposition of female employment;
 - the contribution of changes in foreign trade patterns to changes in female labor demand;
 - the gender bias that arise due to shifts in foreign trade modes.

Data...

- UNIDO-INDSTAT 4 (2010)
- GTAP
- UN COMTRADE

Compiled a harmonized dataset for 31 Countries, 23 ISIC Rev.3 2-digit manufacturing industry statistics on number of male and female employees, value of output, value of country exports and imports, and manufacturing input-output coefficients..

- 1985-2008, unbalanced
- Averages of 1990s and 2000s

Decomposition of Changes in Women's Share of Total Employment in Manufacturing (Schultz, 1989)

$$\left(\frac{WE}{TE}\right)_i = \sum_j \frac{WE_i^j}{TE_i^j} \frac{TE_i^j}{TE_i}$$

– Define

$$w_i^j = \frac{WE_i^j}{TE_i^j} \quad s_i^j = \frac{TE_i^j}{TE_i}$$

$$w_i = \sum_j w_i^j s_i^j$$

$$\Delta w_i = \sum_j w_i^j \Delta s_i^j + \sum_j \Delta w_i^j s_i^j + \sum_j \Delta w_i^j \Delta s_i^j$$

Decomposition of Changes in Women's Share of Total Employment in Manufacturing

$$\Delta w_i = \sum_j w_i^j \Delta s_i^j + \sum_j \Delta w_i^j s_i^j + \sum_j \Delta w_i^j \Delta s_i^j$$

- 1st Term: Change in Structural Composition of Employment
- 2nd Term: Within-Sector Change in WE/TE ratio
- + residual

	WE/TE (First Year)	WE/TE (Last Year)	% Change in WE/TE	% Change Due to		
				Change in Structural Composition of Employment (Term I)	Within-sector Change in Employment Pattern (Term II)	Residual (Term III)
EU 15/OECD High Income Countries						
Austria	0.27	0.28	0.45	-31.26	28.53	102.73
Denmark	0.36	0.36	0.18	-181.67	298.91	-17.25
Finland	0.34	0.30	-12.49	66.88	30.23	2.89
France	0.30	0.33	7.83	62.05	32.47	5.48
Germany	0.28	0.28	-0.01	26512.87	-17759.33	-8653.53
Italy	0.30	0.30	-1.01	636.19	-475.62	-60.57
Ireland	0.33	0.34	3.31	-1.11	105.82	-4.72
Netherlands	0.23	0.25	6.90	-51.48	135.79	15.69
Sweden	0.30	0.27	-11.07	79.55	28.52	-8.07
UK	0.28	0.26	-5.49	69.38	42.66	-12.03
Greece	0.37	0.32	-13.38	103.34	9.60	-12.94
Portugal	0.46	0.45	-2.03	255.85	-183.83	27.98
Spain	0.23	0.25	10.38	-89.42	188.08	1.34
Japan	0.35	0.34	-3.40	28.78	75.62	-4.39
Rep. of Korea	0.34	0.31	-8.91	51.61	54.01	-5.62
USA	0.32	0.31	-4.14	56.74	57.25	-13.99
OECD Middle Income Countries						
Czech Republic	0.48	0.44	-7.02	75.18	33.57	-8.75
Hungary	0.41	0.40	-2.17	282.55	-146.29	-36.26
Slovakia	0.53	0.39	-26.76	27.63	72.40	-0.03
Slovenia	0.41	0.38	-6.72	82.82	24.55	-7.38
Turkey	0.22	0.20	-6.89	-34.72	37.96	96.76
Other Developing						
Bulgaria	0.50	0.51	1.57	667.24	-583.42	16.17
India	0.12	0.11	-4.42	-141.47	225.15	16.32
Indonesia	0.48	0.49	0.57	46.46	11.69	41.85
Kazakhstan	0.38	0.34	-9.79	26.51	75.51	-2.03
Jordan	0.10	0.14	41.12	56.66	19.57	23.78
Lithuania	0.49	0.50	1.99	-206.94	334.77	-27.82
Malta	0.41	0.28	-32.40	62.56	24.19	13.25
Philippines	0.48	0.52	8.62	83.46	15.23	1.30
Romania	0.44	0.47	7.77	113.74	-12.92	-0.82
Thailand	0.56	0.54	-4.43	-24.02	118.49	5.53

Factor Content Analysis (Sachs and Schatz, 1994)

- Calculation of “changes in female employment” associated with trade:

$$T = \left[X^{2000's} - \left(X^{2000's} \left(\frac{x^{1990's}}{x^{2000's}} \right) \right) - M^{2000's} - \left(M^{2000's} \left(\frac{m^{1990's}}{m^{2000's}} \right) \right) \right]$$

- T : vector of changes in total trade intensity
- X, M : vectors of export and import values
- x, m : vectors of export and import propensities

Factor Content Analysis

$$T = \left(X^{2000's} - M^{2000's} \right) - \left(X^{1990's} - M^{1990's} \right) \left(\frac{D^{2000's}}{D^{1990's}} \right)$$

- D : vector of domestic production

$$L = \hat{E} \left[(I - A)^{-1} \right] T \quad L^f = \hat{G} L$$

- L : vector of changes in total employment associated with changes in the structure of trade
- L^f : vector of change in female employment associated with changes in the structure of trade
- E : matrix of labor coefficients
- A : technical coefficients matrix
- G : female coefficients of employment

			% Change Due to Change in Structural Composition of Employment		% Change Due to Employment Effects from Trade		Gender Bias (Female%-Male%)
	% Change in WE/TE						
EU 15/OECD High Income Countries							
Austria	0.45		-31.26		12.4		-1.67
Denmark	0.18		-181.67		0.5		5.25
Finland	-12.49		66.88		-8.9		-11.21
France	7.83		62.05		-4.4		0.13
Germany	-0.01		26512.87		3.9		-0.4
Italy	-1.01		636.19		-6.7		2.05
Ireland	3.31		-1.11		-5.4		-0.09
Netherlands	6.90		-51.48		4		-5.75
Sweden	-11.07		79.55		2		3.51
UK	-5.49		69.38		-5.9		-0.42
Greece	-13.38		103.34		-6.9		-12.37
Portugal	-2.03		255.85		-0.6		-5.14
Spain	10.38		-89.42		-11.4		-0.34
Japan	-3.40		28.78		-2		-3.15
Rep. of Korea	-8.91		51.61		4.6		-4.27
USA	-4.14		56.74		-9.7		-0.62
OECD Middle Income Countries							
Czech Republic	-7.02		75.18		19.5		6.2
Hungary	-2.17		282.55		8.5		-4.91
Slovakia	-26.76		27.63		277.3		48.19
Slovenia	-6.72		82.82		-1.8		-6.77
Turkey	-6.89		-34.72		-14.2		-25.21
Other Developing							
Bulgaria	1.57		667.24		-119.7		30.25
India	-4.42		-141.47		-1.8		1.59
Indonesia	0.57		46.46		13.7		0.04
Kazakhstan	-9.79		26.51		-7.1		18.25
Jordan	41.12		56.66		193.9		145.82
Lithuania	1.99		-206.94		62.2		-21.25
Malta	-32.40		62.56		-12.4		-16.14
Philippines	8.62		83.46		6.5		1.47
Romania	7.77		113.74		-11.5		11.66
Thailand	-4.43		-24.02		7.3		-13.11

FCA - Country and manufacturing sub-sector level female manufacturing employment effects from change in trade structure (%) (North)

																	South	
		Spain	USA	Italy	UK	Ireland	France	Denmark	Finland	Sweden	Japan	Greece	Portugal	Germany	Netherlands	Korea	Austria	
23	Coke, Petroleum.etc.		-1		-2		-4				7					22		
35	Other Transport	-14		-10	2		1				3			-7		7		
27	Basic Metals	-21	-23	-36	-8		-11				12			4		-25	4	
34	Motor Vehicles	-32	-8	-21	-5		-5			-6	9		2	14		16	48	
20	Wood Prod.	-16	-7	-2	-3		-5		-5		-2		1	11		-5	19	
28	Fab. Metal Prod.	-20	-12	-8	-6	-3	-7	-9	-5	-9			3		5	13	7	
26	Mineral Prod.	-7	-5	-11	-5	-34	-6	-7			1	-10	2	8		2	15	
29+31+33	Machiney & Equip.	-14	-5	-4	-6	30	-5	3	1	3	2	20	0	6	23	27	16	
36+37	Furniture, Recy.	-15	-4	-11	-14	-34	-5	-5	-6		-1	5	5	3	2	-6	9	
24+25	Chemicals	-7	-12	-6	-4	7	-2	4	-1	19	-2	-9	4	2	9	16	25	
21+22	Paper, Publishing		-7	-3	-1	-36	-1	3	-8	4	-1	26	-2	6	7	2		
30+32	Office Mac., Radio & TV	-68	-37	-32	-14	-13	-19	-12	-44	2			39	-3	5	15	30	
15+16	Food & tobacco	-1	-2	2	-6	-2	1	-3	-4		-1	-1	3	1	2	5	24	
19	Leather	-13	-36	-7	-27		3				-15	-10	-3	10		-17	4	
17	Textiles	-20	-21	-4	-13	-112	-13	12	-9		-10	-23	5	2	-3	-11	-6	
18	Wearing App.	-12	-15	-6			-9	18	-21		-20	-18	-7	4	-43	-13		
Total		-11	-10	-7	-6	-5	-4	0	-9	2	-2	-7	-1	4	4	5	12	

Further Agenda

- Diverging patterns of female employment w.r.t global division of labor...
- Further agenda includes analyses at the sectoral level including
 - Estimating the Determinants of Component Changes...