



Measuring the Impact of Trade in Services: Prospects and Challenges

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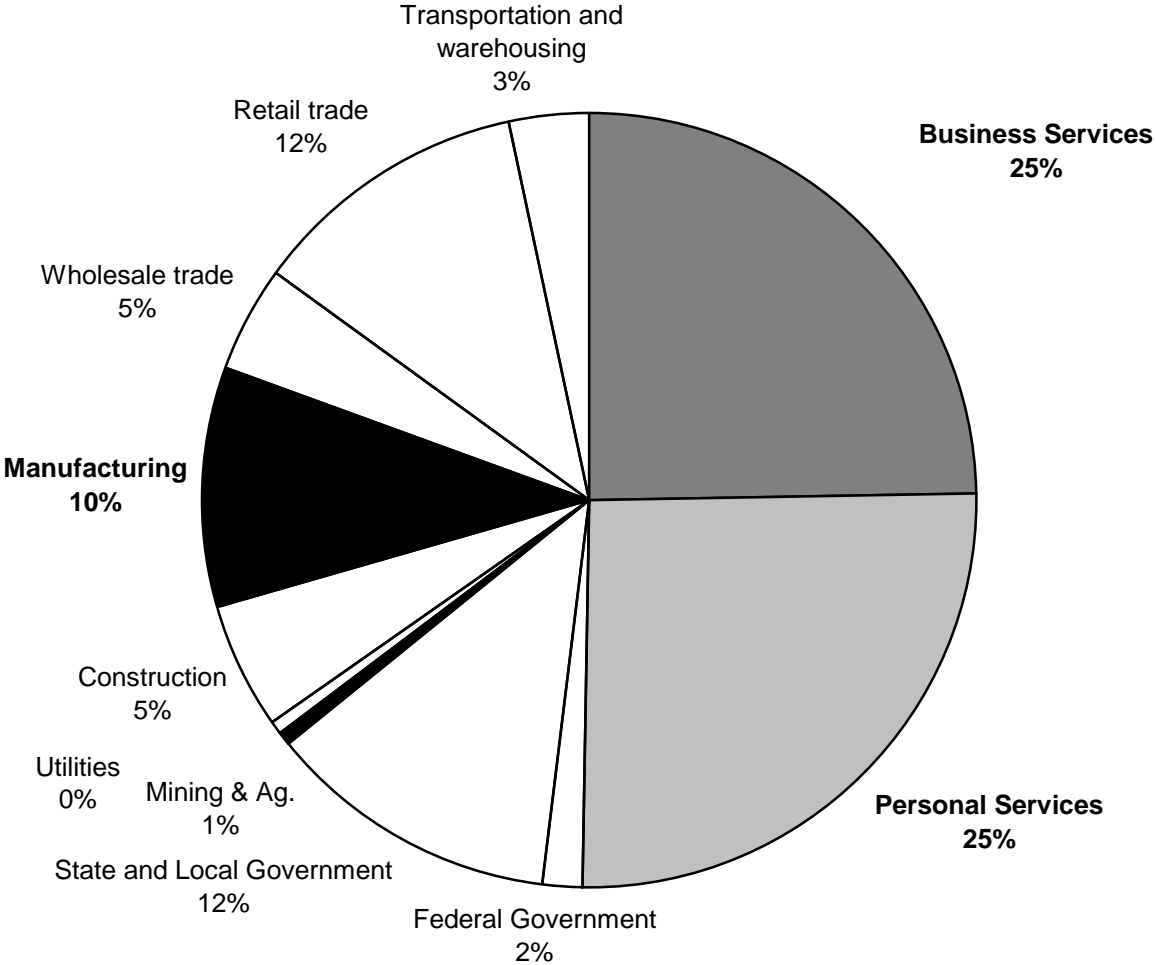
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Overview

- **Does services trade have the potential to affect the U.S. economy?**
- **If so, how would one analyze the impact?**
- **Is this currently possible? If not, what data improvements are necessary?**

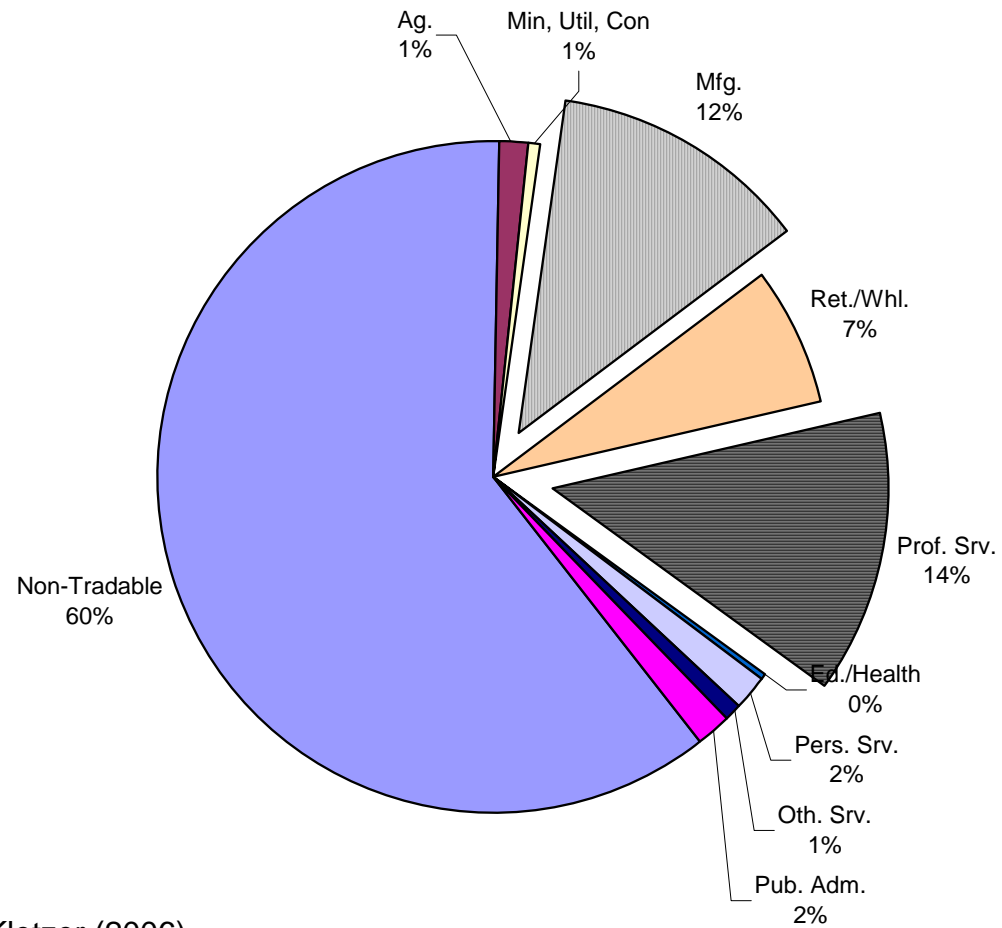
Potential Impact?



Source: 2007 Economic Census, Census of Governments and 2006 Occupational Employment Survey

Employment Shares in Tradable Industries

Tradable Industries' Share of Employment



Source: Jensen and Kletzer (2006)

Education, Earnings, and Skill in Tradable Services

Workers in tradable service industries have higher education levels:

Tradable Manufacturing:

College Degree	19.6%
Advanced Degree	5.6%

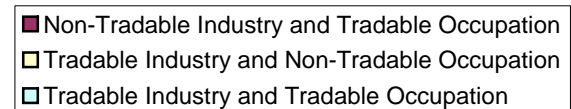
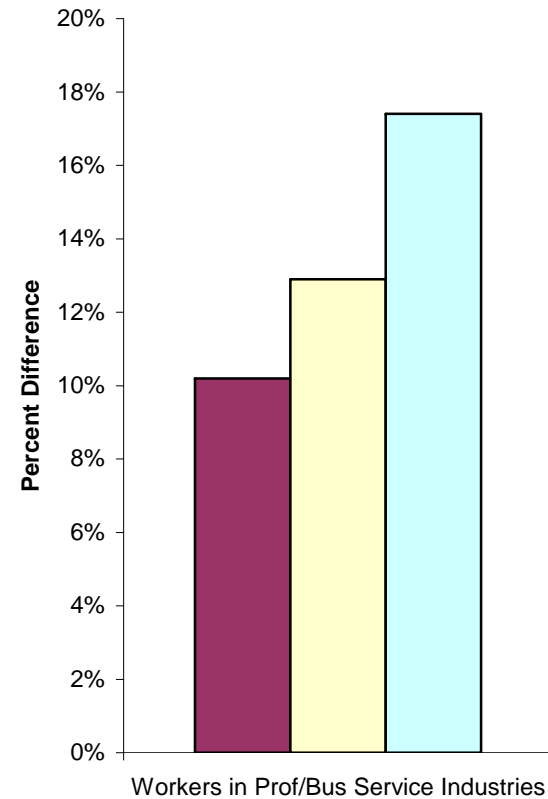
Tradable Services:

College Degree	42.2%
Advanced Degree	14.1%

Tradable services tend to be in sectors with relatively high wages...

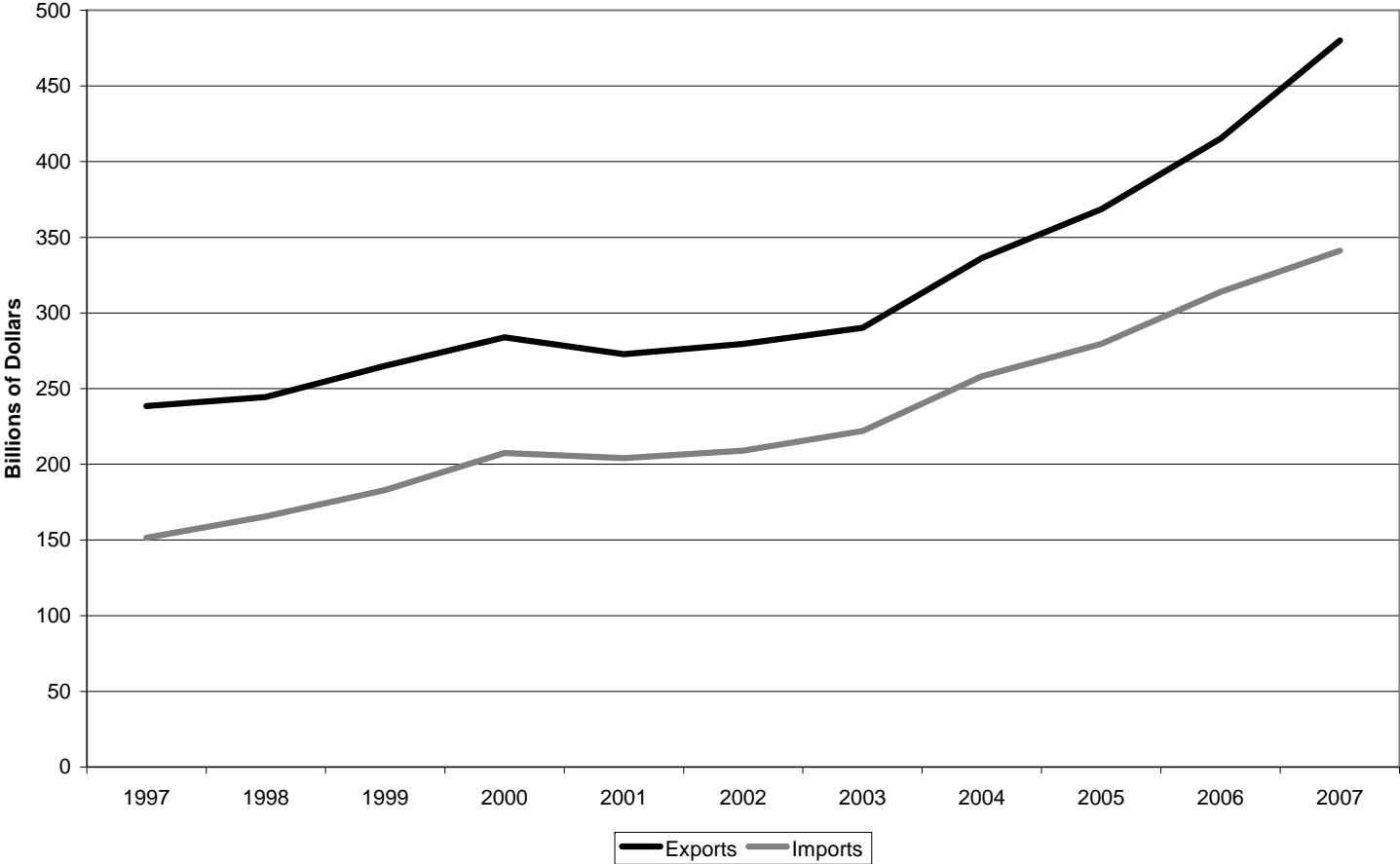
Source: Jensen and Kletzer (2006)

Industry and Occupation Income Premia
Controlling for Worker Characteristics



Potential Impact?

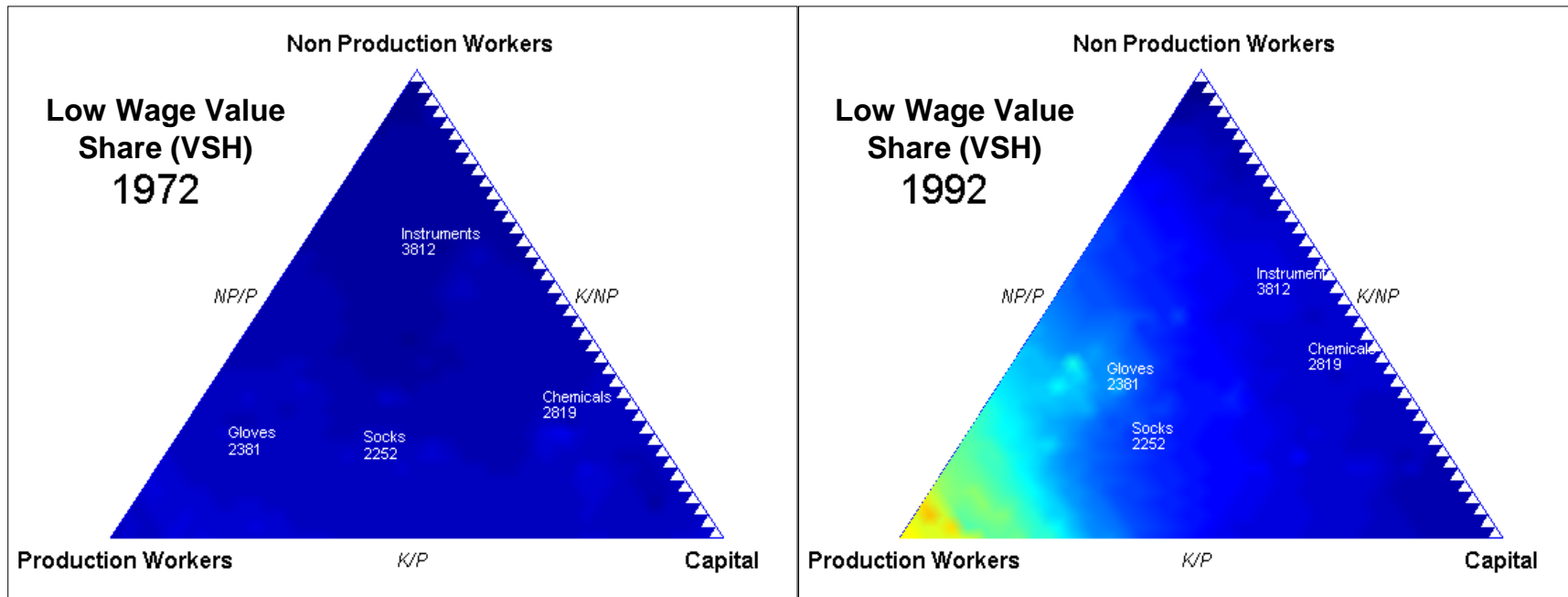
US Services Trade 1997 - 2007



Source: Bureau of Economic Analysis

Lessons from Manufacturing

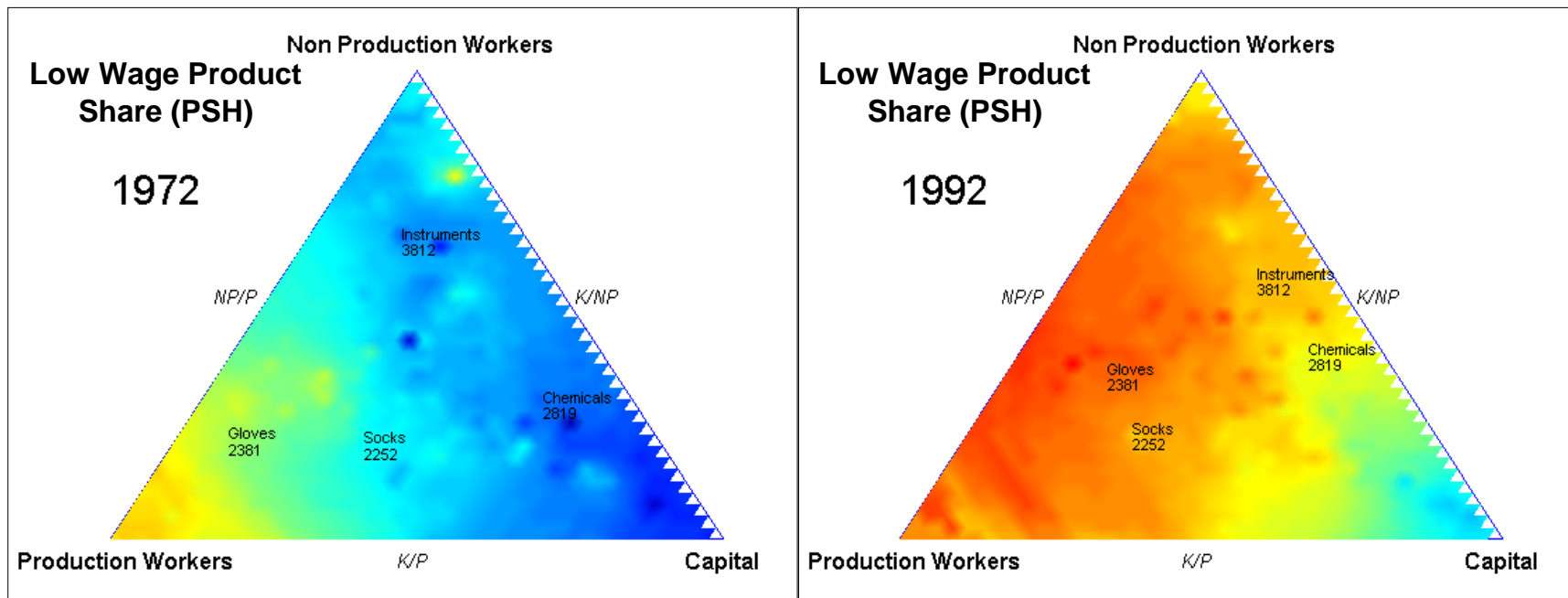
Evolution of *Value Share* of Imports from Low Wage Countries



■ VSH = 0 ■ VSH = 1

Source: Bernard, Jensen, and Schott (2006)

Evolution of *Product Share* of Imports from Low Wage Countries



■ VSH = 0 ■ VSH = 1

Source: Bernard, Jensen, and Schott (2006)

Regression Analysis

- Regress outcomes from t to t+5 on plant characteristics, industry characteristics, and interactions of plant and industry characteristics at time t

$$\text{Outcome}_{p,t:t+5} = f(Z'_{pt}, C'_{it}, X'_{ipt})$$

Plant Outcomes from t:t+5

Failure t:t+5
 Employment Growth t:t+5
 Output Growth t:t+5

Plant Characteristics at t

Age_{pt}
 Size_{pt}
 Capital Intensity_{pt}
 Skill Intensity_{pt}
 Productivity_{pt}

VSH_{it}

VSH - Plant Interactions

VSH_{it}*Capital Intensity_{pt}
 VSH_{it}*Skill Intensity_{pt}
 VSH_{it}*Productivity_{pt}

Probit (df/dx Coefficients): Plant Death t:t+5

Independent Variables	Plant Death _{t:t+5}	Plant Death _{t:t+5}	Plant Death _{t:t+5}	Plant Death _{t:t+5}
log(Employment _{pt})	-0.044 ***	-0.058 ***	-0.044 ***	-0.058 ***
Age _{pt}	-0.005 ***	-0.004 ***	-0.005 ***	-0.004 ***
log(TFP _{pt})	-0.073 ***	-0.074 ***	-0.072 ***	-0.073 ***
log(K/P _{pt})	-0.024 ***	-0.013 ***	-0.016 ***	-0.010 ***
N/P Wagebill Ratio _{pt}	0.000	0.000	0.000	0.000
Low Wage Value Share (VSH _{it})	0.321 ***	0.163 ***	0.687 ***	0.344 ***
x log(TFP _{pt})			-0.030	-0.036
x log(K/P _{pt})			-0.141 ***	-0.073 ***
x N/P Wagebill Ratio _{pt}			0.000	-0.001 **
Industry Fixed Effects	None	SIC4	None	SIC4
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	443,755	443,756	443,757	443,757
Log Likelihood	-245,466	-239,976	-245,231	-239,936

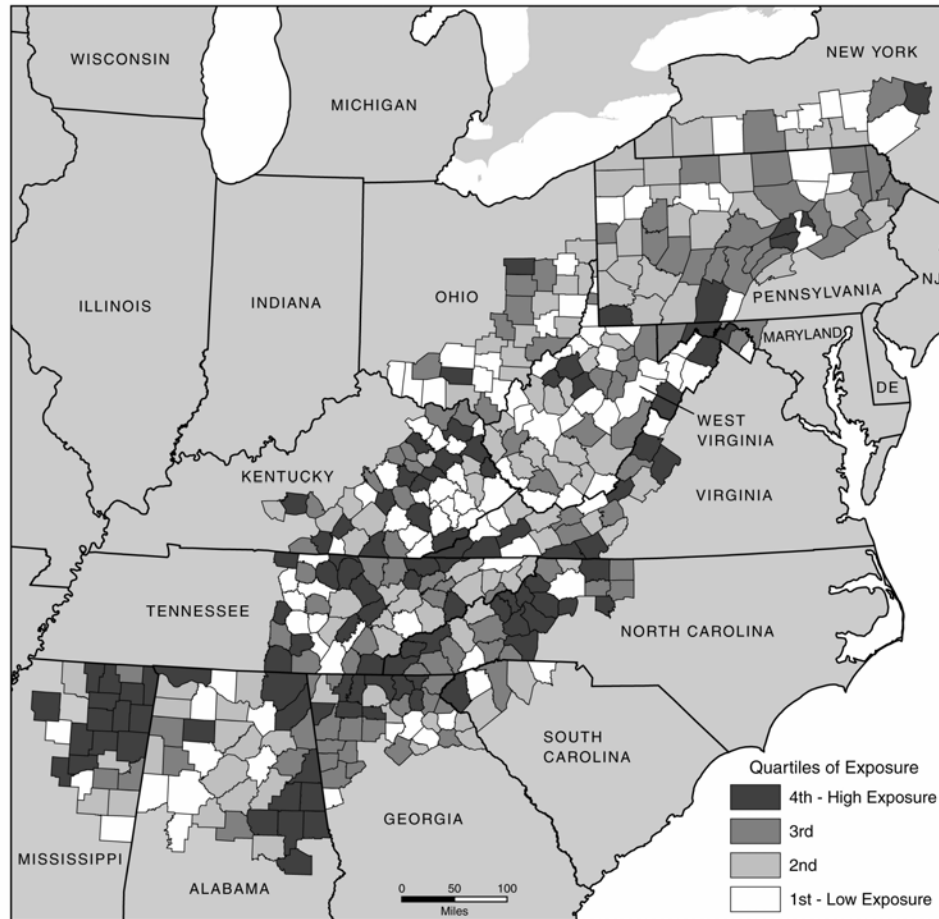
Notes: Plant-level probit regression results where the reported coefficients represent the change the marginal probability of plant death at the mean of the regressors. Robust standard errors adjusted for clustering at the plant level are in parentheses. Dependent variable indicates plant death between years t and t+5. N/P Wagebill Ratio is total plant wages paid to non-production workers (N) divided by total plant wages paid to production workers (P). VSH is the share of U.S. import value originating in countries with less than 5% of U.S. per capita GDP. Final three control variables are interactions with VSH. Regressions cover four panels: 1977-82, 1982-87, 1987-92 and 1992-97. ***Significant at the 1% level; **Significant at the 5% level; *Significant at the 10% level. Coefficients for the regression constant and dummy variables are suppressed.

OLS: Plant Employment Growth t:t+5 (Table 5)

Independent Variables	Δ Employment _{t:t+5}	Δ Employment _{t:t+5}	Δ Employment _{t:t+5}	Δ Employment _{t:t+5}	Δ Employment _{t:t+5}
log(Employment _{pt})	0.010 ***	0.013 ***	0.010 ***	0.013 ***	-0.096 ***
Age _{pt}	0.001 ***	0.001 ***	0.001 ***	0.001 ***	-0.011 ***
log(TFP _{pt})	0.050 ***	0.050 ***	0.050 ***	0.050 ***	0.033 ***
log(K/P _{pt})	0.018 ***	0.016 ***	0.014 ***	0.015 ***	0.008 ***
N/P Wagebill Ratio _{pt}	0.000	0.000	0.000	0.000	0.000
Low Wage Value Share (VSH _{it})	-0.125 ***	-0.071 ***	-0.310 ***	-0.149 ***	-0.467 ***
x log(TFP _{pt})			-0.003	-0.002	0.049 ***
x log(K/P _{pt})			0.069 ***	0.030 ***	0.094 ***
x N/P Wagebill Ratio _{pt}			0.000	0.000	-0.008
Industry/Plant Fixed Effects	None	SIC4	None	SIC4	Plant
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	443,755	443,756	443,757	443,757	443,757
R ²	0.04	0.06	0.04	0.06	0.77

Notes: Plant-level OLS regression results. Robust standard errors adjusted for clustering at the plant level are in parentheses. Dependent variable is normalized plant employment growth between years t and t+5 (see text for normalization). N/P Wagebill Ratio is total plant wages paid to non-production workers (N) divided by total plant wages paid to production workers (P). VSH is the share of U.S. import value originating in countries with less than 5% of U.S. per capita GDP. Final three control variables are interactions with VSH. Regressions cover four panels: 1977-82, 1982-87, 1987-92 and 1992-97. ***Significant at the 1% level; **Significant at the 5% level; *Significant at the 10% level. Coefficients for the regression constant and dummy variables are suppressed.

Regional Exposure to Increased Low-Wage Imports



Source: Bernard, Jensen, and Schott (2005)

Lessons from Manufacturing

- **Factor intensities matter**
 - Of countries, industries, and producers
- **Producer heterogeneity matters**
- **Need to link detailed information on trade and producers to examine impact**
 - Regional analysis requires establishment level data

**Service Sector:
Needs and Impediments**

10,000 HS categories

**\$38M at FTD
\$10M at CBP**

**470 6-digit NAICS codes
28,000 workers/industry**

**Capital and skill measures
at establishment level**

**FY 2009 \$17.8M
\$60/establishment**

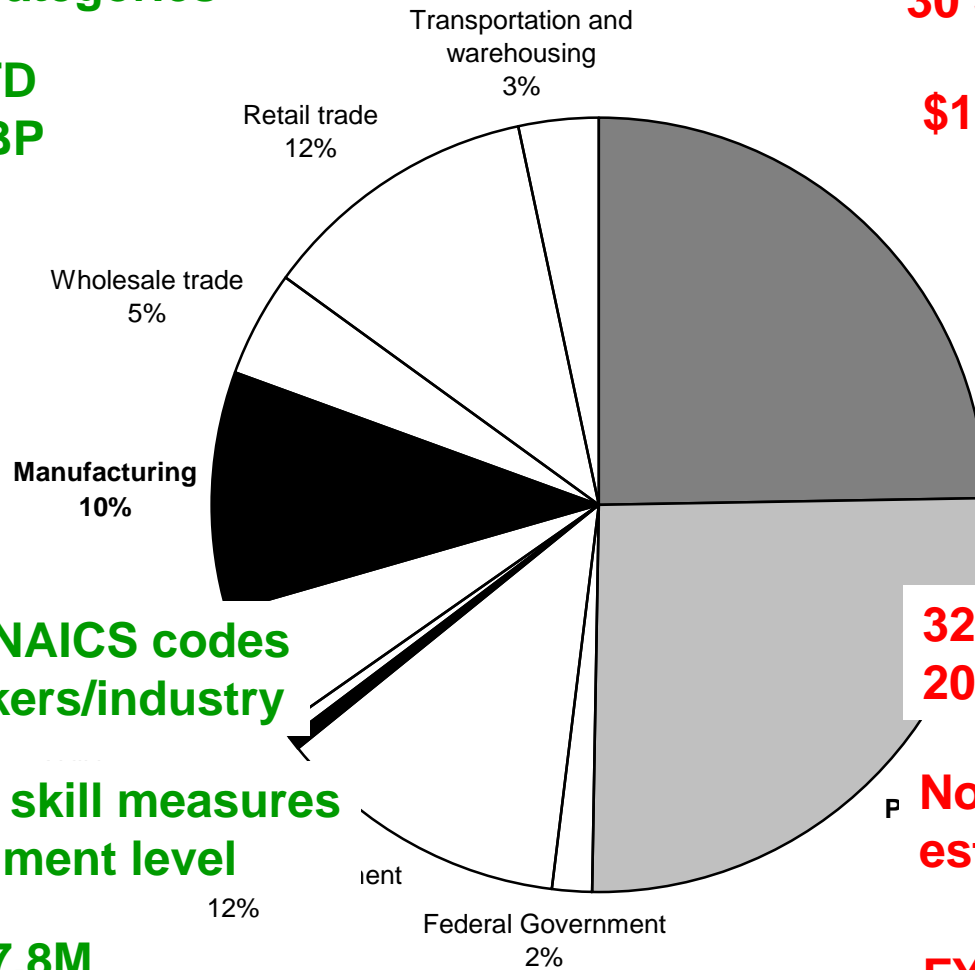
30 Services categories

\$14M at BEA

**325 6-digit NAICS Codes
208,000 workers/industry**

**No measures of inputs at
establishment level**

**FY 2009 \$39.9M
\$9/establishment**



Source: 2007 Economic Census, Census of Governments and 2006 Occupational Employment Survey

More Detailed Trade in Services Data

- **Objective of trade in services collection**
- **BEA does not have access to an adequate sampling frame**
 - Confidential Information Protection and Statistical Efficiency Act, 2002 (CIPSEA)
 - Companion legislation to modify 6103(j) of Title 26 governing the use of federal tax information (companion “j-bill”)
 - Does it make sense for BEA to conduct surveys?
- **Exemption levels are too high**

More Detailed Data on Service Sector Inputs

- **Skilled labor**

- Collect Exempt/non-exempt similar to production/non-production in Census of Manufactures

- **Capital at establishment level**

- Collect capital stock information similar to Census of Manufactures

- **Purchased Inputs at establishment level**

- Collect purchased inputs similar to material trailer information in Census of Manufactures

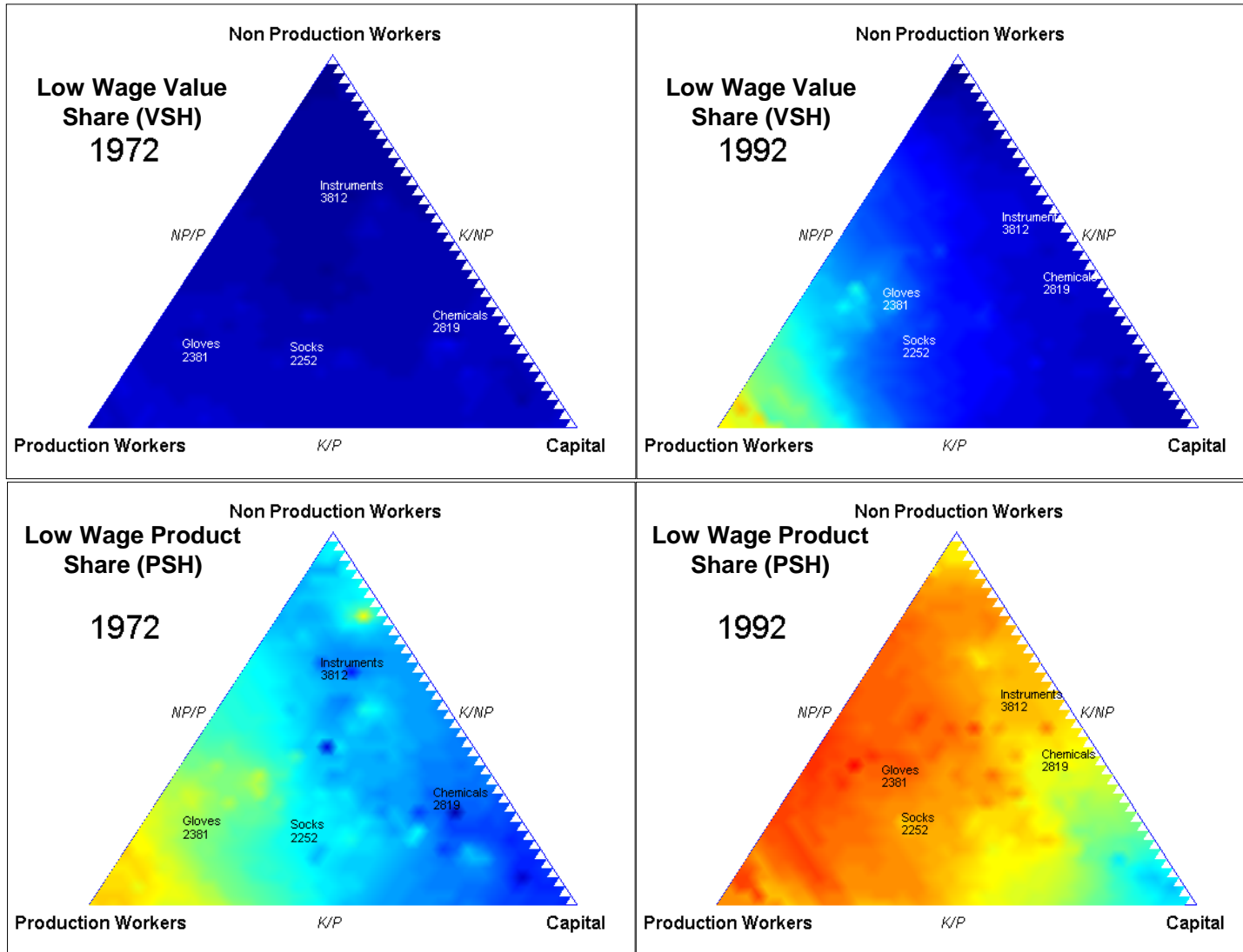
Priorities

- **Collect and publish more detailed trade in services data**
 - More resources for more surveys, lower thresholds
 - Sampling frame issues
 - Examine costs and benefits of moving trade in services data collection from BEA to Census Bureau
- **Collect and publish more detailed information on inputs to services production**
 - More resources for more detailed surveys
 - Exempt/non-exempt employees
 - Capital information at the establishment level
 - Purchased service inputs on NAPCS basis



Thank you

More Triangles



How?

Travel ²	
Passenger fares ³	
Other transportation.....	
Royalties and license fees.....	
Other private services ^{4 15}	
Education ⁵	
Financial services ¹⁶	
Insurance services ⁶	
Telecommunications ⁷	
Business, professional, and technical services ¹⁶	
Computer and information services ^{8 16}	
Management and consulting services ⁹	
Research and development and testing services ⁹	
Operational leasing ¹⁶	
Other business, professional, and technical services ^{10 16}	
Accounting, auditing, and bookkeeping services.....	
Advertising.....	
Architectural, engineering, and other technical services.....	
Construction	
Industrial engineering.....	
Installation, maintenance, and repair of equipment.....	
Legal services.....	
Medical services ¹¹	
Mining ¹²	
Sports and performing arts.....	
Trade-related services ¹³	
Training services.....	
Other ¹⁴	
Other services.....	
Film and television tape rentals.....	
Other.....	

2001

How?

Travel ²

Passenger fares ³

Other transportation.....

Royalties and license fees.....

Other private services ^{4 15}

Education ⁵

Financial services ¹⁶

Insurance services ⁶

Telecommunications ⁷

Business, professional, and technical services ¹⁶.....

Computer and information services ^{8 16}

Management and consulting services ⁹

Research and development and testing services ⁹

Operational leasing ¹⁶

Other business, professional, and technical services ^{10 16}

Medical services ¹¹

Other services.....

 Film and television tape rentals.....

 Other.....

1997

How?

- Travel ²
- Passenger fares ³
- Other transportation.....
- Royalties and license fees.....
- Other private services ^{4 15}
- Education ⁵
- Financial services ¹⁶
- Insurance services ⁶
- Telecommunications ⁷
- Business, professional, and technical services ¹⁶.....
- Computer and information services ^{8 16}

- Operational leasing ¹⁶
- Other business, professional, and technical services ^{10 16} ..

- Medical services ¹¹

- Other services.....
- Film and television tape rentals.....
- Other.....

1992

How?

- Travel ²
- Passenger fares ³
- Other transportation.....
- Royalties and license fees.....
- Other private services ^{4 15}
- Education ⁵

- Insurance services ⁶
- Telecommunications ⁷

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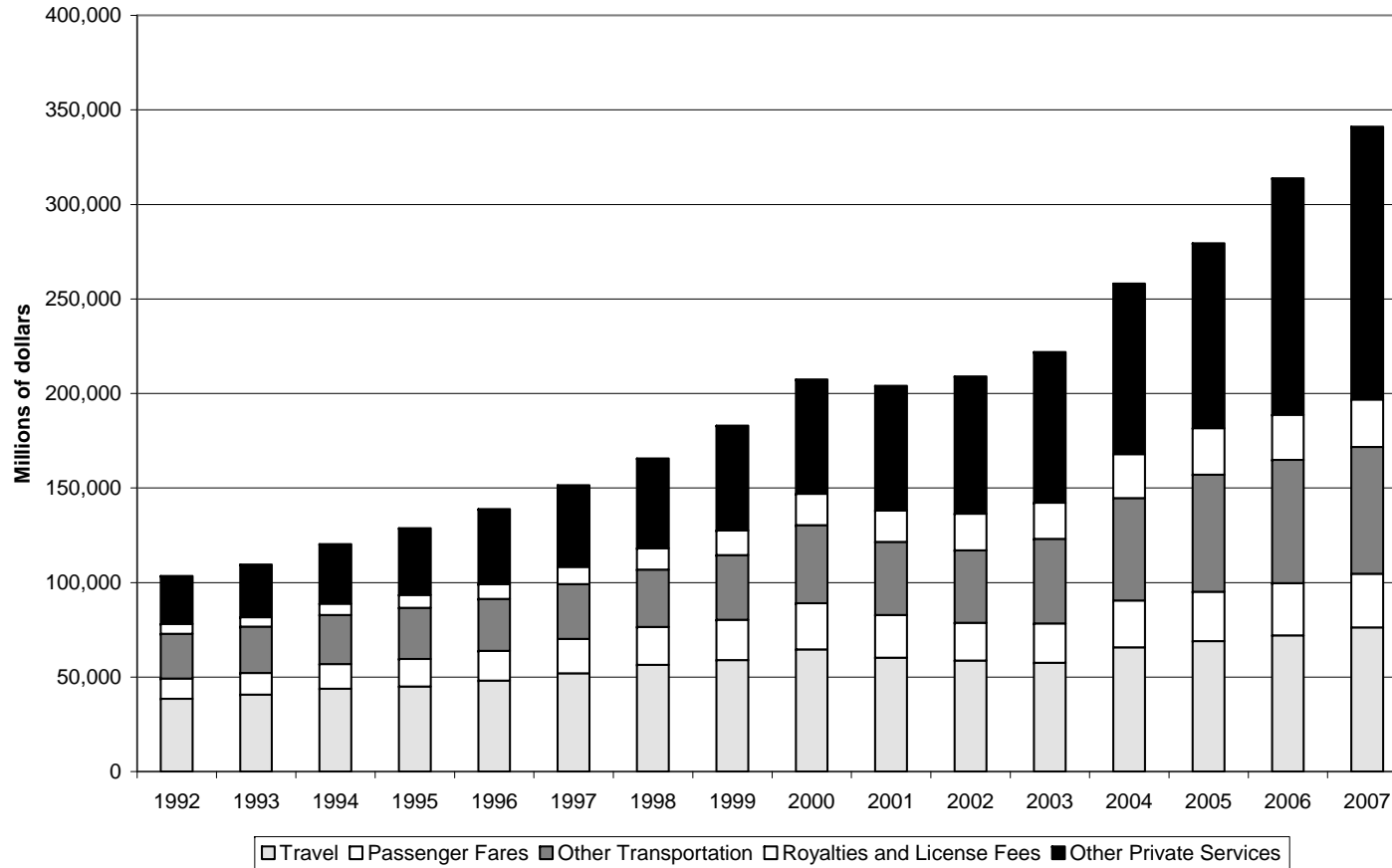
Medical services ¹¹

...

- Other services.....
 - Film and television tape rental
 - Other.....
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Why?

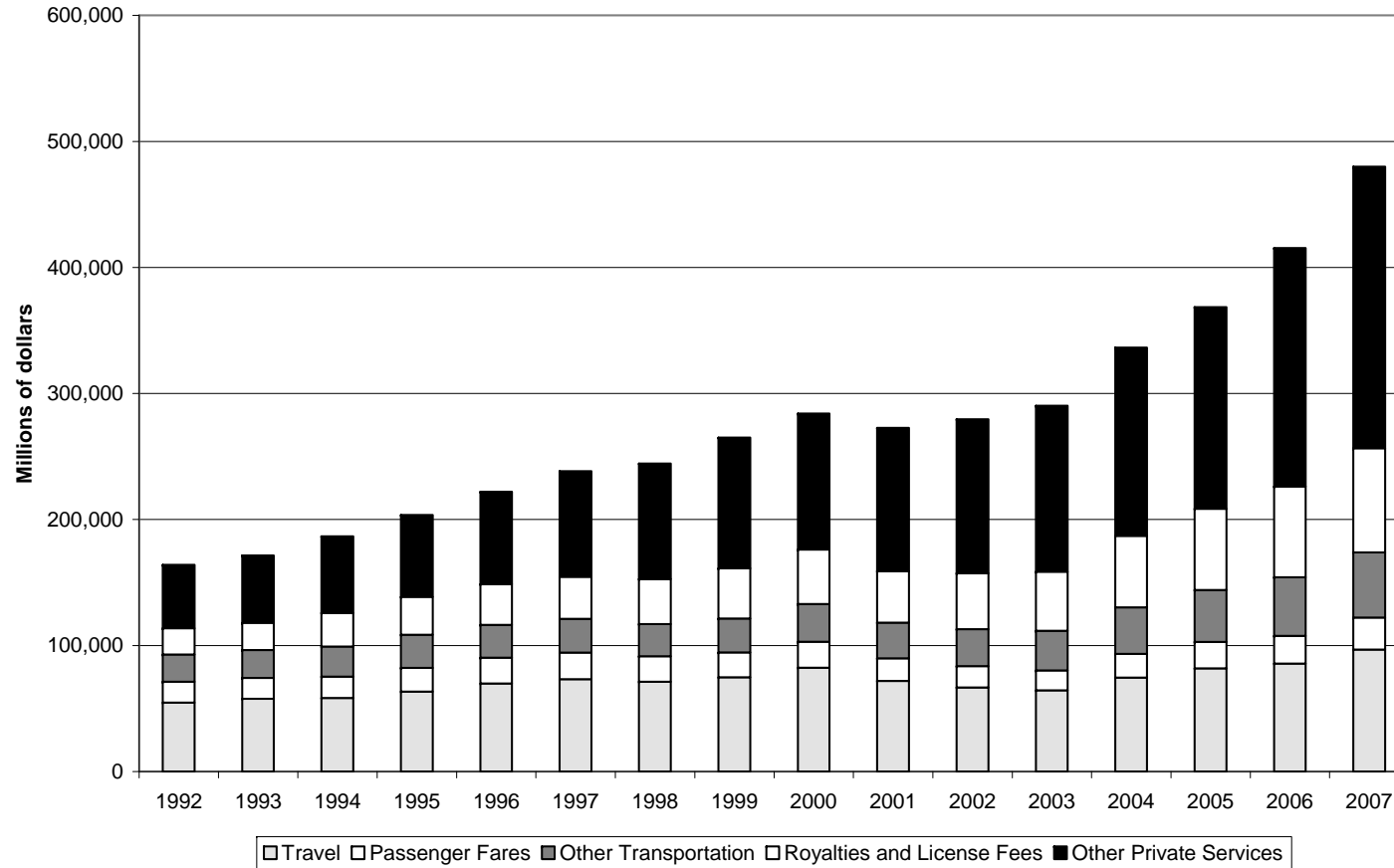
Composition of US Service Imports



Source: Bureau of Economic Analysis

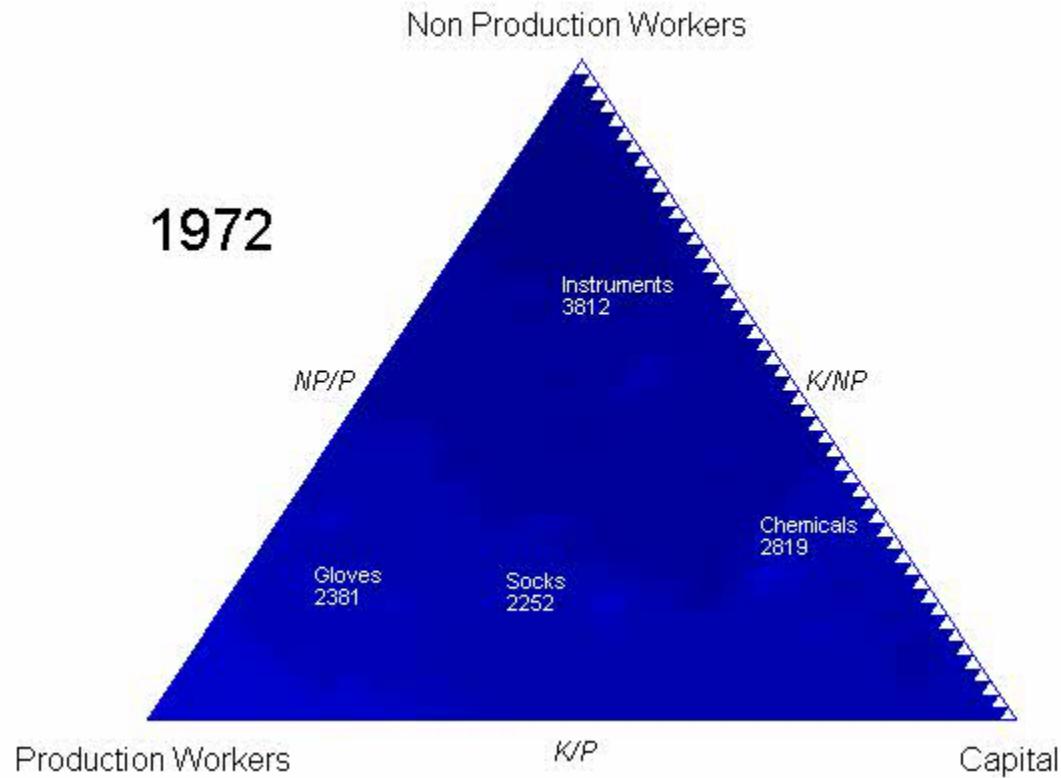
Why?

Composition of US Service Exports



Source: Bureau of Economic Analysis

Evolution of *Value Share* of Imports from Low Wage Countries

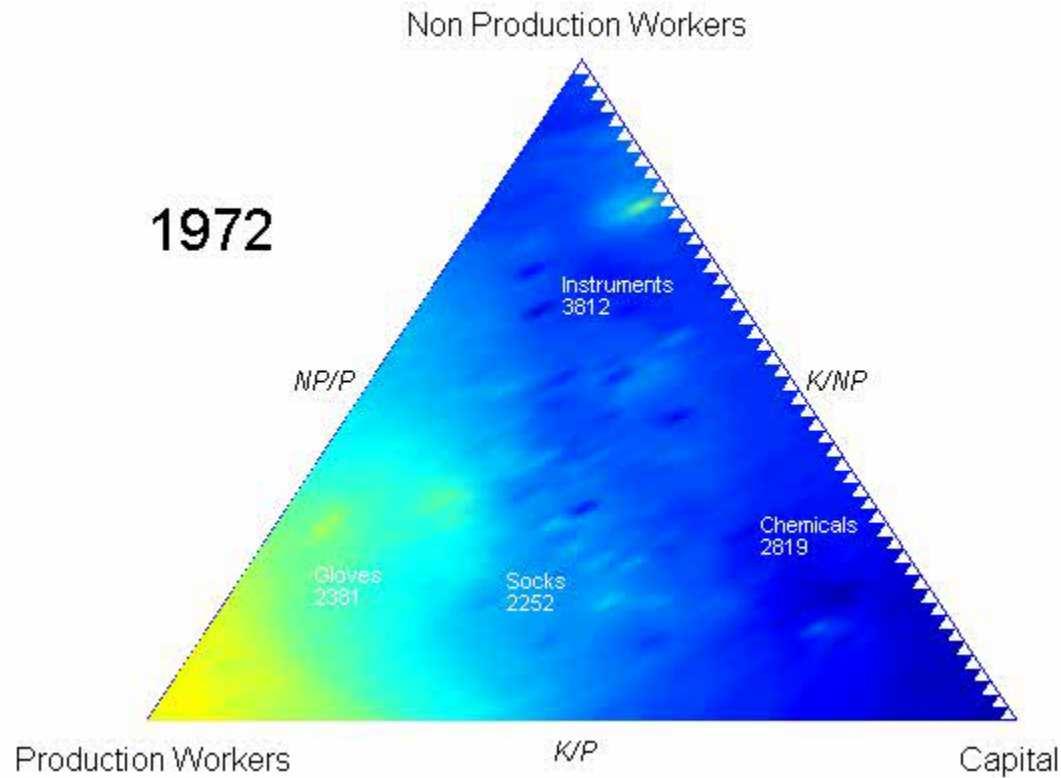


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Source: Bernard, Jensen, and Schott (2006)

Evolution of *Product Share* of Imports from Low Wage Countries



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