

Information Technology & Financial Services: Productivity Growth and Global Trade

Dr. Catherine L. Mann, Senior Fellow
Institute for International Economics
CLMann@IIE.com

ASBACE

Brasilia, December 7, 2005

IT marketplace: The global picture

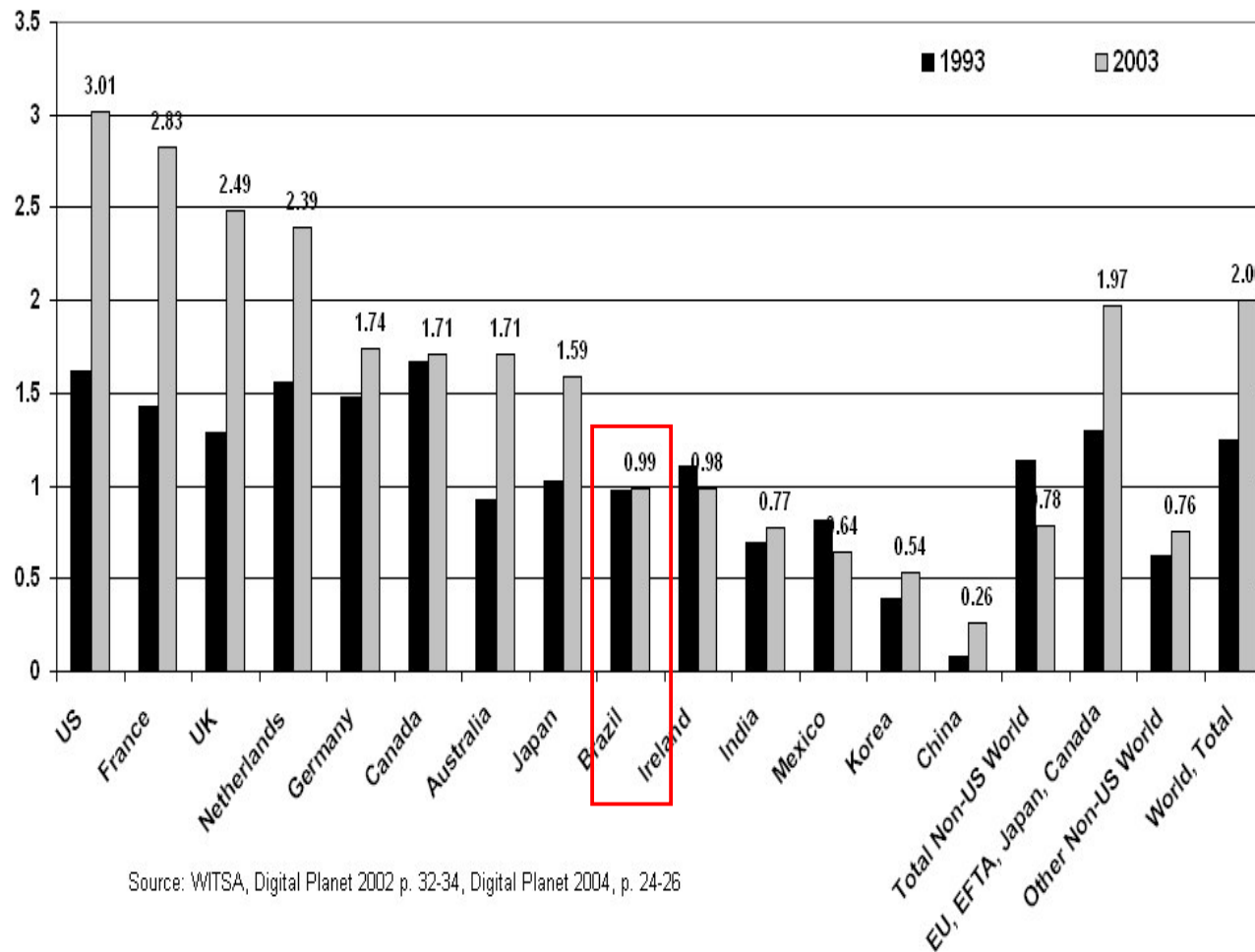
Table 1.3 Large and Growing Markets for IT

IT Spending ¹					IT Hardware ²					IT Services ²					IT Software ²				
World Ranking	Country	2003 Expenditure US\$m	CAGR 1993-2001	CAGR 2001-2003	World Ranking	Country	2003 Expenditure US\$m	CAGR 1993-2001	CAGR 2001-2003	World Ranking	Country	2003 Expenditure US\$m	CAGR 1993-2001	CAGR 2001-2003	World Ranking	Country	2003 Expenditure US\$m	CAGR 1993-2001	CAGR 2001-2003
1	US	\$ 480,436	7.6%	2.0%	1	US	\$ 119,725	6.7%	-1.4%	1	US	\$ 107,080	11.7%	4.5%	1	US	\$ 253,632	14.4%	2.6%
2	Japan	\$ 132,232	2.8%	-3.9%	2	Japan	\$ 51,043	2.4%	-11.0%	2	Germany	\$ 16,192	7.9%	10.7%	2	Japan	\$ 66,900	7.7%	1.3%
3	Germany	\$ 76,916	5.9%	5.8%	3	Germany	\$ 28,006	7.5%	0.4%	3	UK	\$ 15,194	14.8%	11.1%	3	UK	\$ 37,391	15.3%	9.1%
4	UK	\$ 73,716	8.4%	5.5%	4	China	\$ 24,857	29.2%	22.2%	4	Japan	\$ 14,289	5.3%	3.1%	4	France	\$ 33,147	14.4%	8.3%
5	France	\$ 59,994	6.4%	6.3%	5	UK	\$ 21,130	9.2%	-3.2%	5	France	\$ 11,183	9.7%	10.2%	5	Germany	\$ 32,728	12.6%	8.8%
6	China	\$ 31,298	29.1%	26.1%	6	France	\$ 15,664	5.6%	0.3%	6	Italy	\$ 5,605	7.9%	8.7%	6	Italy	\$ 14,329	7.1%	6.7%
7	Italy	\$ 29,015	8.2%	3.3%	7	Canada	\$ 10,006	7.6%	5.4%	7	Canada	\$ 4,833	7.7%	7.5%	7	Canada	\$ 12,290	14.2%	5.6%
8	Canada	\$ 27,129	5.9%	1.5%	8	Italy	\$ 9,881	7.5%	-3.6%	8	Netherlands	\$ 4,569	10.4%	9.6%	8	Netherlands	\$ 6,998	14.6%	8.2%
9	Netherlands	\$ 16,408	7.4%	5.4%	9	Korea	\$ 9,829	10.2%	8.8%	9	China	\$ 3,107	39.2%	36.9%	10	Australia	\$ 5,974	11.7%	7.3%
10	Korea	\$ 15,089	9.3%	14.0%	10	Brazil	\$ 7,520	13.5%	8.4%	10	Australia	\$ 2,994	11.0%	11.7%	11	Brazil	\$ 5,555	18.9%	7.7%
11	Brazil	\$ 14,942	11.6%	7.6%	11	Australia	\$ 5,249	5.0%	0.9%	14	Brazil	\$ 1,866	13.2%	4.8%	14	Korea	\$ 3,900	19.4%	22.5%
12	Australia	\$ 14,217	5.5%	5.7%	13	Netherlands	\$ 4,842	9.5%	-1.5%	18	Korea	\$ 1,360	9.6%	21.6%	16	China	\$ 3,333	48.5%	54.9%
18	Mexico	\$ 6,728	7.5%	0.8%	14	Mexico	\$ 1,006	8.8%	12.7%	21	Taiwan	\$ 860	10.9%	13.6%	20	India	\$ 2,171	30.7%	25.2%
19	India	\$ 6,626	18.7%	20.0%	17	India	\$ 3,736	20.1%	16.3%	23	South Africa	\$ 934	8.9%	17.0%	21	Mexico	\$ 1,809	6.2%	8.4%
22	Taiwan	\$ 5,753	11.7%	13.7%	18	Taiwan	\$ 3,667	12.5%	12.6%	24	India	\$ 720	19.0%	25.7%	23	South Africa	\$ 1,711	14.8%	12.5%
24	South Africa	\$ 4,426	7.1%	8.2%	20	Russia	\$ 2,424	-2.2%	7.3%	25	Mexico	\$ 633	7.9%	7.4%	26	Russia	\$ 1,354	6.6%	17.6%
25	Russia	\$ 4,280	1.8%	10.9%	27	South Africa	\$ 1,782	5.2%	2.2%	28	Russia	\$ 503	0.8%	12.8%	27	Taiwan	\$ 1,225	19.4%	14.8%
33	Malaysia	\$ 2,372	9.2%	12.7%	31	Malaysia	\$ 1,440	11.9%	8.2%	30	Ireland	\$ 464	10.8%	9.1%	35	Ireland	\$ 689	19.3%	8.1%
34	Ireland	\$ 2,325	12.3%	5.2%	34	Ireland	\$ 1,172	16.6%	2.3%	33	Malaysia	\$ 409	10.6%	16.2%	41	Malaysia	\$ 522	14.4%	24.5%
38	Thailand	\$ 1,564	2.7%	14.2%	37	Thailand	\$ 900	6.0%	8.2%	36	Thailand	\$ 368	4.0%	31.8%	47	Thailand	\$ 307	15.9%	19.7%
World Total (70 countries) \$ 1,121,902					World Total (70 countries) \$ 374,167					World Total (70 countries) \$ 215,820					World Total (70 countries) \$ 215,820				

*US is the by far the largest market, but not the fastest growing.
 Developing countries did not have a 'tech bubble or a bust'.
 Services/software is larger than hardware; growing faster.
 US firms in the global marketplace respond to these market signals.*

Global Spending on IT Software/Services

Figure 1.1 Ratio of (Software+Services) to (Hardware) Spending, 1993 and 2003

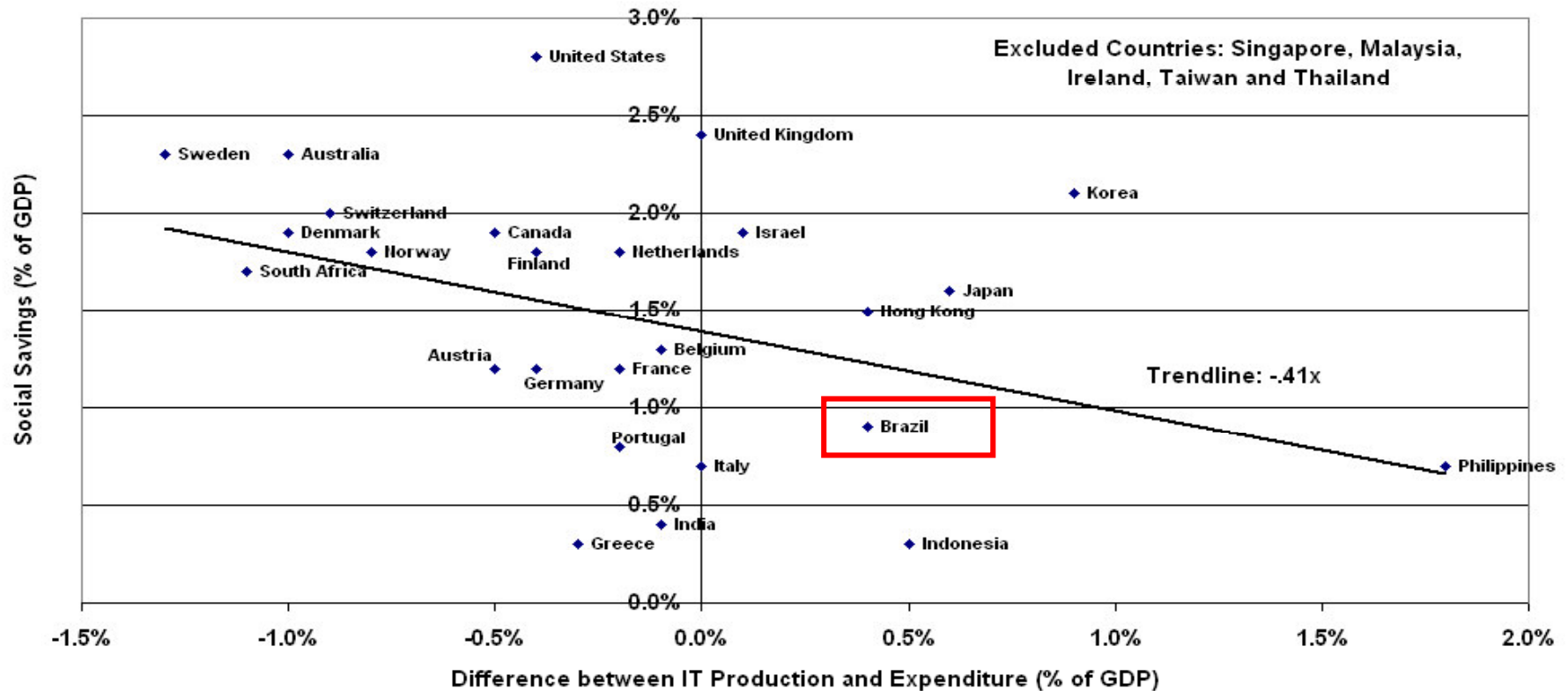


Source: WITSA, Digital Planet 2002 p. 32-34, Digital Planet 2004, p. 24-26

- Rising share of services /software spending
- Esp. industrial but even for developing
- Growth potential for trade in IT services & software btw developing countries.

Is it 'Better' to Produce or Buy IT?

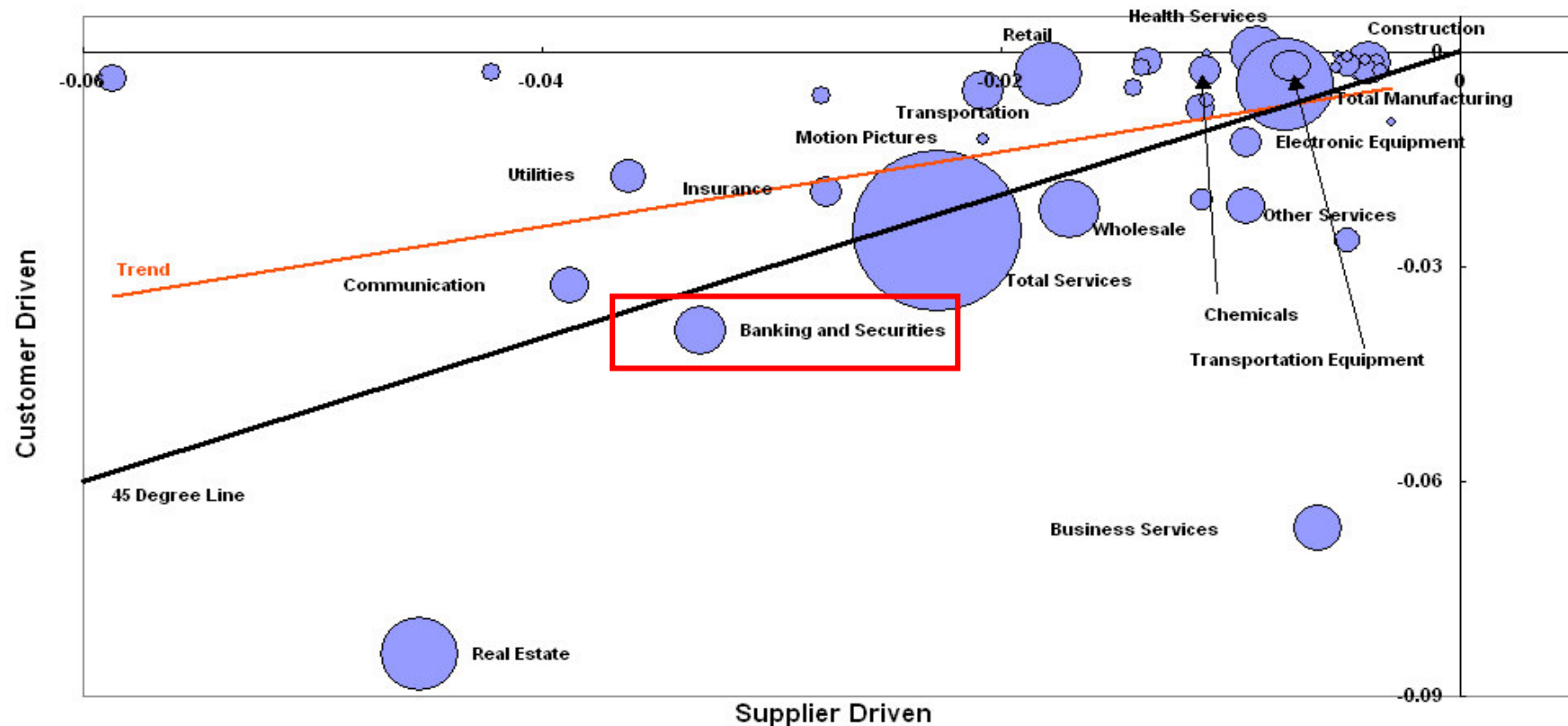
Figure 2.11B The Difference between IT Production and Expenditure and Social Savings



'Social savings': a measure of the gains from buying a product that declines in price.
Trend line: Effectiveness of domestic use of IT

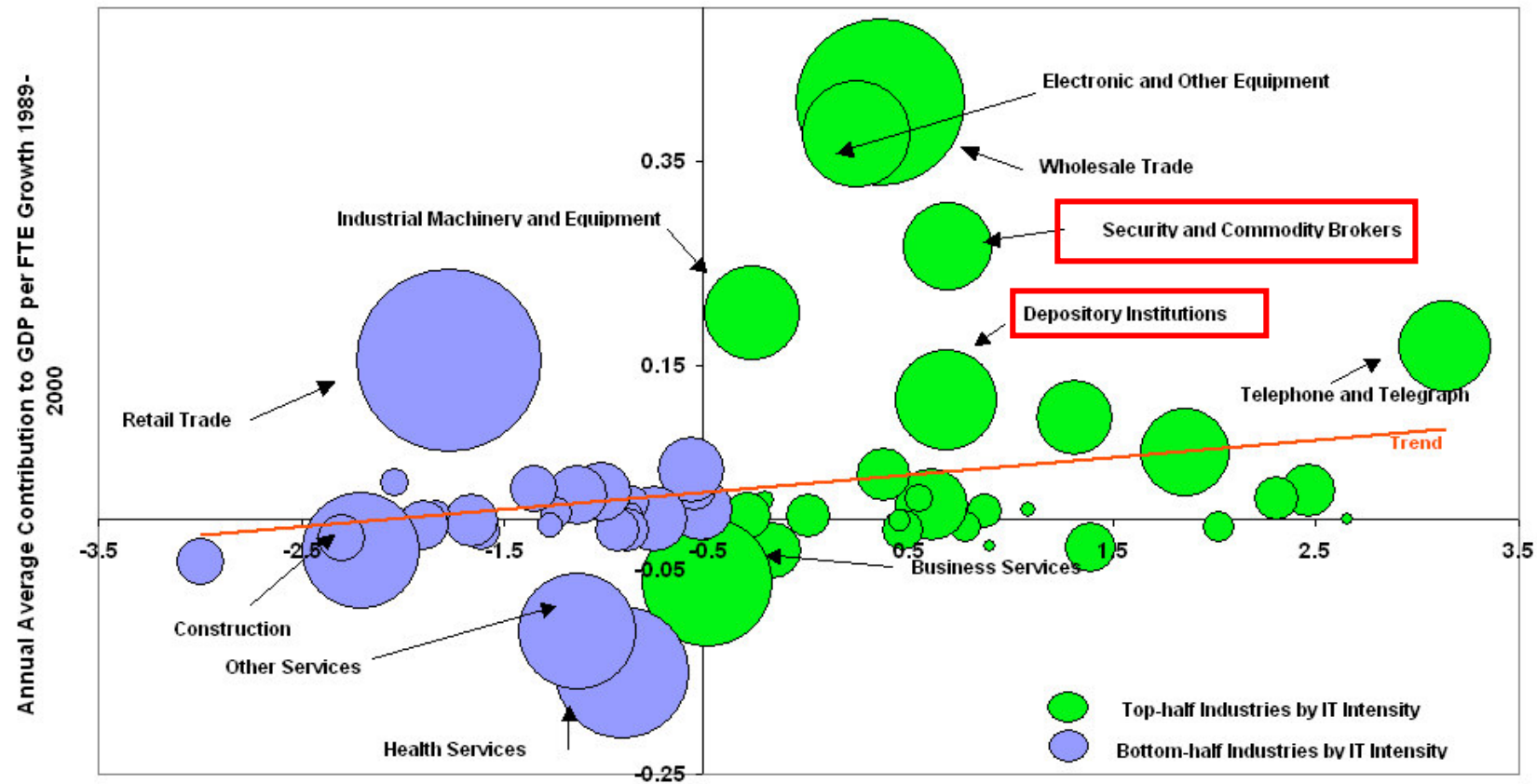
Financial services & IT: The US picture

Reduction In Own Costs From IT Use by Suppliers and Customers



*Transactional linkages are the key way IT reduces costs for a firm;
 Transactional linkages are stronger for services than for mfg.
 Multiple, diverse 'forward' linkages in services yields more cost reductions
 than for mfg which has more 'backward' linkages to fewer suppliers.*

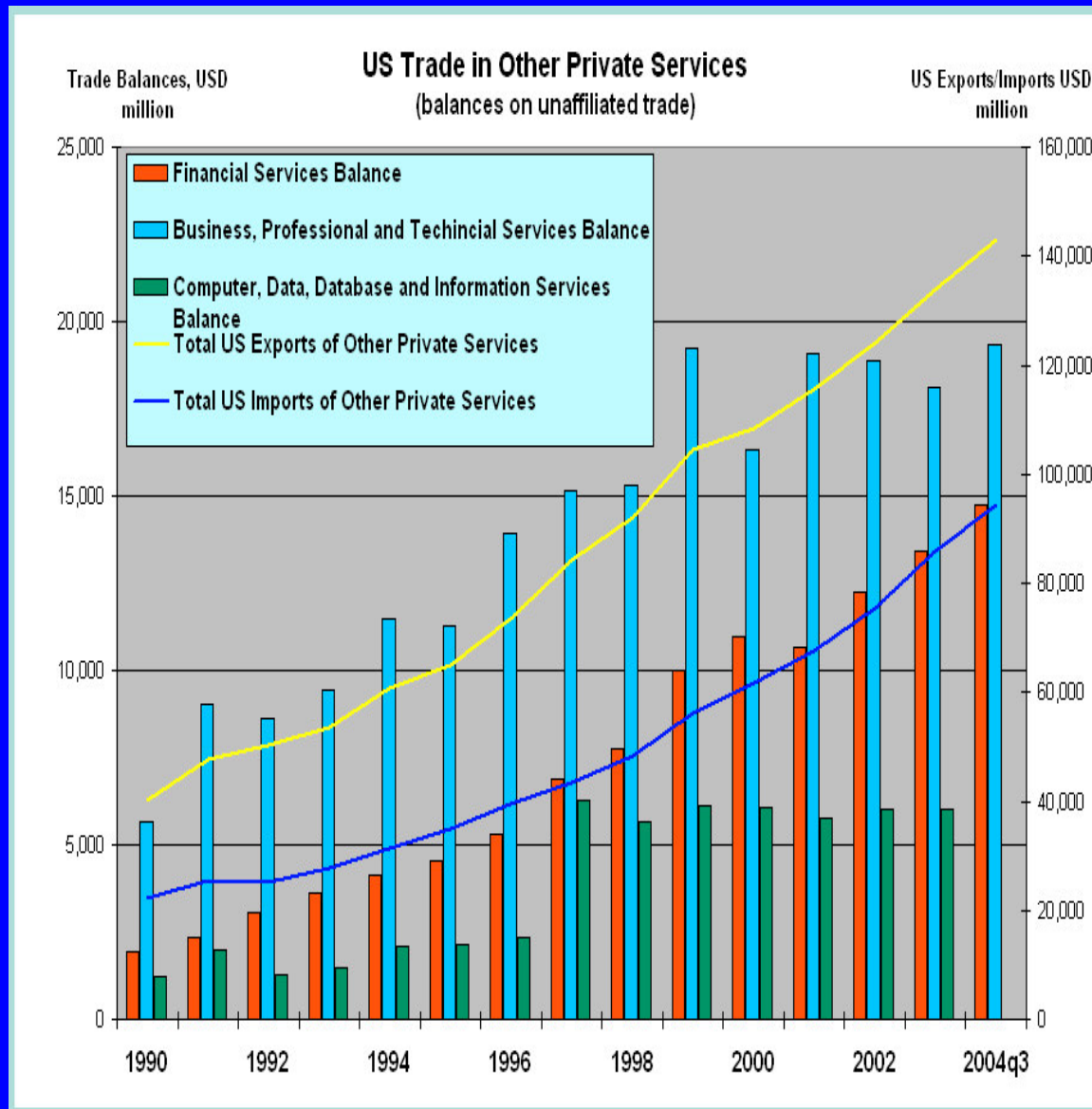
Financial services, IT Intensity & Productivity Growth: US



Source: Economics and Statistics Administration, U.S. Department of Commerce, DE2002 Table A.4.4

*The more IT intensive sectors contribute more to productivity growth.
 Leading and lagging sectors both are services.
 Leading sectors—already networked, common software 'platform'.
 Lagging sectors—diverse firm sizes, complex relationships, regulations.*

Finance and Private Services Trade: US



Macro Factors

- Income elasticities
For OPS $X > M$;
Slow growth abroad
=> disproportionately hurts X
Faster foreign growth
=> disproportionate X gain

Trade Policy Factors

- Market access restrictions abroad limit export growth
- Prof. Licensing esp. for BPT
- Indications of off-shoring in computer/info-tech trade?

Data Factors

- Affiliated and unaffiliated limited to post 2001

Financial services & IT: The US vs. Europe

Table 2.4 Average Annual Growth of GDP per Hour Worked of ICT-producing, ICT-using and non-ICT Industries in EU and US 1979-1995 and 1995-2002

	1979-1995		1995-2002	
	EU-15	US	EU-15	US
Total Economy a)	2.3	1.2	1.8	2.5
ICT Producing Industries	6.8	7.2	8.6	9.3
ICT Producing Manufacturing b)	11.6	15.1	16.2	23.5
ICT Producing Services	4.4	2.4	5.9	2.7
ICT Using Industries c)	2.3	1.6	1.8	4.9
ICT Using Manufacturing	2.7	0.8	2	2.6
ICT Using Services	2	1.9	1.7	5.3
of which				
Wholesale Trade	2.4	3.5	1.5	8.1
Retail Trade	1.7	2.4	1.5	7.1
Financial Services	1.9	1.5	2.3	5
ICT-intensive Business Services	0.8	-0.9	0.6	0.7
Non-ICT Industries	1.9	0.4	1.1	0.2
Non-ICT Manufacturing	3.2	2.3	2.1	1.2
Non-ICT Services a)	0.8	-0.3	0.5	0.2
Non-ICT Other	3.4	1.4	2.1	0.4

a) excl. real estate

*Substantial domestic imbalance in productivity growth by sector,
Compared to the US, much less productivity acceleration in services.*

*Evidence is that Europe invests a bit less in IT, but more importantly,
Structural rigidities make workplace transformation more difficult.*

exact grouping.

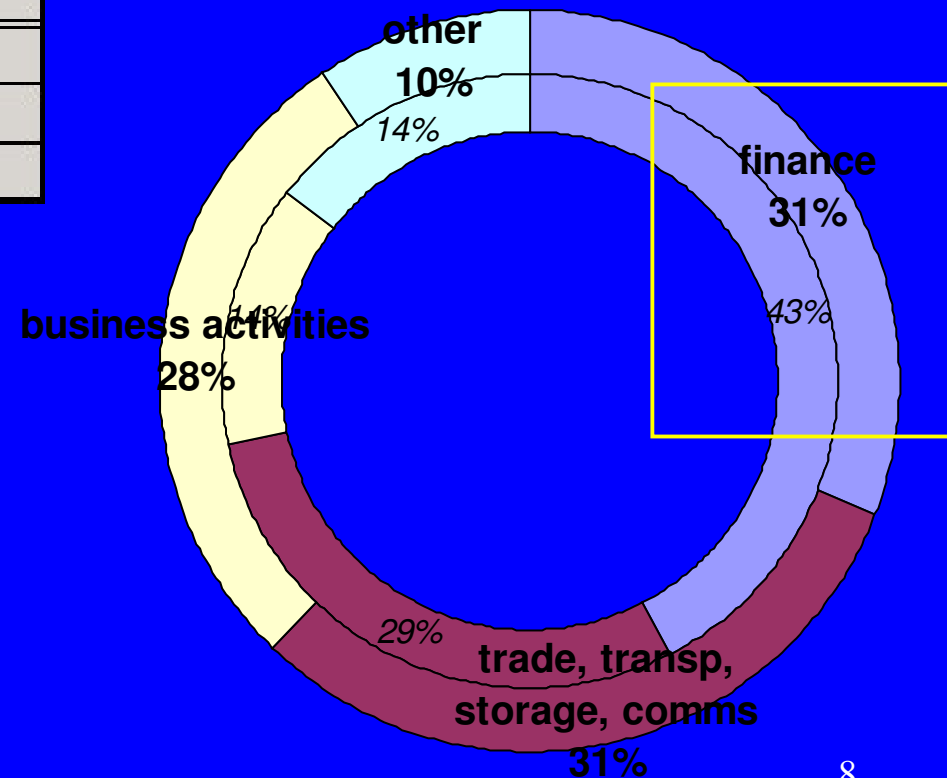
Source: van Ark (2005), table 4.

Global Perspective: International Services

Fast growing cross border and trade & investment linkages

Global Services Trade	Growth 96 to 02 (in percent)
(IMF data)	
transportation, passenger, travel, govt	14
other services	36
memo: global goods trade	20

FDI outward stock: services
(1990: \$948 billion; 2002: \$4363 billion)



Trade, Services, and Trade Facilitation

	Full sample	South to north trade	South to south trade
Tariff rates	-1.555***	-1.512	-1.5***
Port Efficiency, Importing Country	0.307*	0.344	-0.283
Port Efficiency, Exporting Country	0.924***	0.845***	0.949***
Customs Env., Importing Country	0.472**	1.041	0.202
Regulatory Env., Importing Country	0.281*	-1.120*	0.816***
Regulatory Env., Exporting Country	0.620***	2.437***	0.827***
E-commerce Infra., Importing Country	0.729***	2.134***	0.866
E-commerce Infra., Exporting Country	1.943***	2.124***	3.133***
Adjusted R-squared	0.758	0.702	0.649
Number of the observations	7,904	2,188	3,094

Note: Significance levels at 10%, 5% and 1% denoted by “*”, “**”, and “***”, respectively.

Source: Wilson, Mann, Otsuki. “Assessing the Potential Benefit of Trade Facilitation: A Global Perspective”

- Tariff reductions raise trade, and are very important
- Improved TF, esp. e-commerce infrastructures, has greatest elasticity of trade
 - South-to-North trade particularly hampered by poor South measures of TF
 - South gains from exports to OECD are largest in dollar terms

Conclusions

- **IT marketplace is growing more in software and services than hardware**
- **Information technology raises productivity growth through transformation of activities**
- **Financial services raise productivity growth through disciplined selection of projects**
- **Information technology & financial services work together to further raise productivity growth**
- **High quality services are key to improved trade through trade facilitation**

www.IIE.com
Institute for International Economics