Globalization of IT:
Economic Gains & Policy Challenges

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

Twenty-ninth Annual AAAS Forum
on Science and Technology Policy
April 23, 2004
Gains from Global Sourcing of IT Hardware

a model for understanding channels of gains

Macroeconomic Gains

.... Reduced IT hardware prices by 10-30% more than if produced only in US

.... Diffused IT investment through US sectors due to demand elasticity greater than 1.0

.... Accounted for more than ½ of accelerated productivity growth

.... Raised GDP growth 0.3/yr (95-2000) & added at least $230 billion to GDP
Gains from Global Sourcing of IT Hardware

Macroeconomic Gains

.... Reduced IT hardware prices by 10-30% more than if produced only in US

.... Diffused IT investment through US sectors due to demand elasticity greater than 1.0

.... Accounted for more than 1/2 of accelerated productivity growth

.... Raised GDP growth 0.3%/yr (95-2000) & added at least $230 billion to GDP

Catherine L. Mann, Institute for International Economics
Sectors that invested a lot in IT capital also hire a lot of IT workers.

**Computer and Math Occupations**

Employment Rank of 276 Industry Sectors

<table>
<thead>
<tr>
<th>Rank</th>
<th>Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>#2, 29</td>
<td>Securities Holding Activities</td>
</tr>
<tr>
<td>#4</td>
<td>Insurance Carriers</td>
</tr>
<tr>
<td>#5, 32, 43</td>
<td>Wholesale Activities</td>
</tr>
<tr>
<td>#14</td>
<td>Deposit Credit Institutions</td>
</tr>
<tr>
<td>#16, 17, 34, 37, 38</td>
<td>Telecommunications Activities</td>
</tr>
<tr>
<td>#25</td>
<td>Semiconductors/other Elec. Component Manuc.</td>
</tr>
<tr>
<td>#36</td>
<td>Electricity Transmission and Distribution</td>
</tr>
</tbody>
</table>

Source: BLS 2002 Occupational Employment and Wage Estimates, National 4-digit NAICS Industry Specific Estimates

**Figure 1:** IT Intensity and Contribution to GDP per FTE Growth 1989-2000

(Proportionate share of GDP By Individual Sector)
And these sectors *also* are net exporters
IT jobs: Microcosm of cyclical & structural changes

- **Cyclical factor of IT investment**
  - IT jobs in IT sector move in lock-step, but, 2/3 of IT jobs are in non-IT sectors and have held up better than IT sector

- **Structural factor:**
  - Rising skill demands from changing technology & trade

---

Catherine L. Mann, Institute for International Economics
Two-Pronged Strategy for American Innovation & Growth

Domestic strategy:

- New-jobs policies for displaced workers:
  - *Wage insurance*

- Entry and up-skilling policies within a career-ladder, esp. sci/tech jobs where human capital depreciates quickly
  - *Human-capital investment tax credit*

- Movement/flexibility policies mitigate costs of adjustment
  - *Health care and pension portability; better information on job availability;*
The Human-Capital Investment Tax Credit

Invest in people for a competitive economy

- The ITC instrument fits a ‘classical’ economics case
  - Private benefit captured by firms is less than national (social) benefit
  - Is the rationale for the R&D tax credit & accelerated depreciation / investment tax credit.
- H-ITC for incumbent workers to move up career ladder
  - An H-ITC mitigates the firm’s disincentive to train workers for fear of losing them to a rival firm that does not train
- H-ITC for entry level workers
  - A internship credit mitigates students’ concern about technical careers and recognizes that the ‘first job’ may no longer be US
Two-Pronged Strategy for American Innovation & Growth

External strategy:

– Foreign macro demand & exchange rate policies
  • Collapse in exports is a key problem today
– Get back to the trade negotiating table
  • Open markets abroad for internationally competitive US services
  • Off-shoring of some services increases competitiveness of others
Conclusion

• Gains from global sourcing of IT hardware:
  – *Global sourcing, productivity growth, job creation go hand-in-hand.*

• Future gains from deeper global engagement of IT:
  – *Global sourcing of software & services generates cheaper tailored applications, diffused to lagging sectors.*
  – *Opening service markets abroad promotes two-way trade*

• The jobs challenge:
  – *Adjustment to new careers; and different-skill jobs*
  – *IT skill needs to design, market & apply IT to lagging sectors*
Jobs Lagging For A Variety of Reasons

Assessment & remedy require cutting through boom-bust

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing¹</td>
<td>17,277</td>
<td>17,175</td>
<td>15,702</td>
<td>14,899</td>
<td>14,324</td>
<td>14,310</td>
</tr>
<tr>
<td>Private Service Providing¹</td>
<td>85,417</td>
<td>87,071</td>
<td>86,227</td>
<td>86,332</td>
<td>86,823</td>
<td>87,225</td>
</tr>
<tr>
<td>Business and Financial Occupations²</td>
<td>na</td>
<td>5,180</td>
<td>5,389</td>
<td>5,320</td>
<td>5,568</td>
<td>5,622</td>
</tr>
<tr>
<td>Computer and Mathematical Occupations²</td>
<td>na</td>
<td>3,325</td>
<td>3,397</td>
<td>3,032</td>
<td>3,291</td>
<td>3,072</td>
</tr>
<tr>
<td>Architecture and Engineering Occupations²</td>
<td>na</td>
<td>3,012</td>
<td>2,839</td>
<td>2,798</td>
<td>2,606</td>
<td>2,629</td>
</tr>
<tr>
<td>Unemployment Rate (16y and above)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Average</td>
<td>4.2%</td>
<td>4.0%</td>
<td>4.8%</td>
<td>5.8%</td>
<td>6.0%</td>
<td>na</td>
</tr>
<tr>
<td>End-of Period</td>
<td>4.0%</td>
<td>3.9%</td>
<td>5.8%</td>
<td>6.0%</td>
<td>5.7%</td>
<td>5.7%</td>
</tr>
</tbody>
</table>

¹ Data from the BLS Current Employment Survey. Annual data from the month December, seasonally adjusted
² Data from the BLS Current Population Survey. Annual data from the month of February, seasonally unadjusted


Manufacturing continued decline=> adjustment policies
White collar & high skills reviving=> skill-matching policies