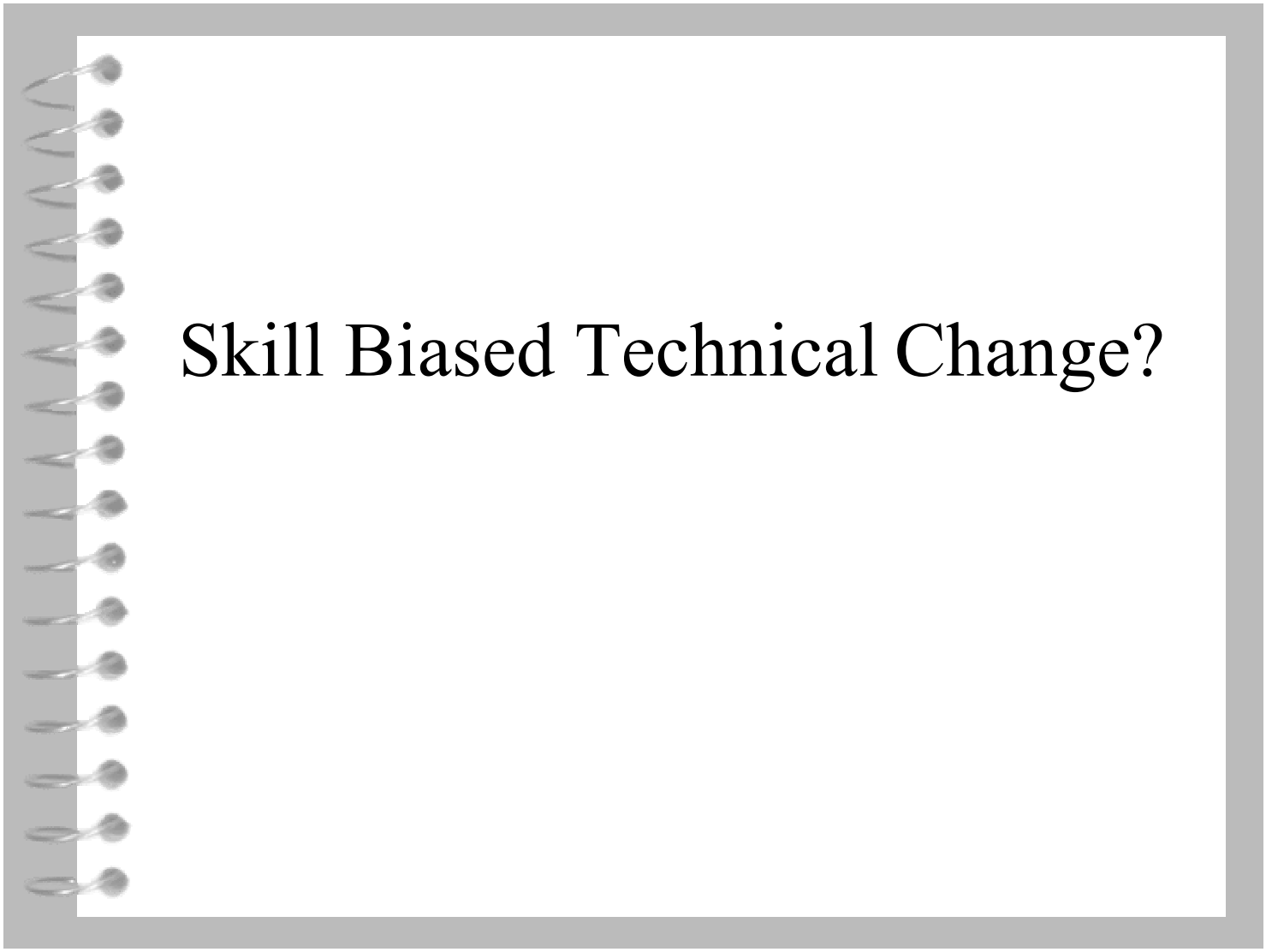
Skill Biased Technical Change?

Issues

- ✓ With What Skills Are Computers Complements?
- ✓ Did Computers Change Job Content or Institutional Structures?
- ✓ Has Demand for College Educated Grown Faster in Industries Where Technological Change Has Been Fastest?
- ✓ Was Impact Greater in 80's than in 70's?

The Empirical Debate -- First Round

- ✓ Residual analysis of determinants of growth in wage premium
- ✓ Rapid diffusion of PC coincides with growth in wage inequality
  - – From 1984 to 1993, fraction of employed persons using a computer increased from 25.1% to 46.6%.
- ✓ Wages of computer users higher than wages of other workers, but wages of pencil users also higher than wages of other workers (DiNardo and Pischke, 1997)

Computers and Job Content

- ✓ Routine Tasks
  - Computers can perform at economically feasible costs
  - Calculing total bill at Burger King
- ✓ Exceptions
  - Computers perform at higher costs if at all
  - “Have It Your Way” Customers

Analysis of Custodian Accountant

- ✓ Levy and Murnane, AER, Vol 86, #2, pp. 258-262, May 1996
- ✓ Firm hires college graduates, but not necessarily accounting majors
- ✓ The Job
  - Keep Ledgers
  - Data Rework
  - Valuation
  - Morning Cash Calculation, NAV Calculation and Report-Writing
  - Analysis (error checking)

Impact of Computers

- ✓ No data transfer, little data entry, few computations
- ✓ Custodian once handled one account a day. Now handles several
- ✓ Data rework, valuation, and analysis still required. Jobs require the ability to build a base of analogies, to reason by analogy, to conduct searches and to communicate
- ✓ Change in training system

Computers and Workplace Organization

- ✓ Bresnahan, "Computerization and Wage Dispersion: An Analytical Reinterpretation," Unpublished paper Stanford University, August 1997 (recently published in *Economic Journal)*
- ✓ Computers increased demand for "people" skills or soft skills
  - Telephone Operator Example
  - Front Office Workers
- ✓ Computers decrease monitoring costs
  - Telephone operators
- ✓ Computers increase demand for cognitive skills
  - Marketing managers

Have Computers Changed the Labor Market?

- ✓ Shift Share Analysis
  - Acceleration in growth in employment and wage shares of college graduates in the 70's and 80's driven by within industry increases.
  - This is consistent with broad skill biased technological change and changes in work organization
- ✓ Computers and Skill Upgrading
  - Regression Analysis for beginners
  - Problem with identifying causality
  - Autor et al find evidence that computer use higher in industries with more rapid skill upgrading

Computers vs Trade

- ✓ Autor et al (Table VIII) find that computer investment explains 1/3 of increase in within-industry skill upgrading in the United States, even with controls for import penetration and outsourcing.
- ✓ Strong correlation between expanding export shares and non-production payroll share

Cross-Country Comparisons

- ✓ Machin, Stephen and John Van Reeen, *The Quarterly Journal of Economics*, November 1998, pp. 1215-1244.
- ✓ More R&D intensive industries have seen faster skill upgrading in U.K., U.S., Sweden, Japan, Germany, France and Denmark
- ✓ However, effect on R&D on skill upgrading smaller in U.K. and in U.S. than in other countries and these two countries have had fastest growth in wage inequality.