What Do We Really Know About Changes in Wage Inequality?

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Motivation

- Very well known that wage inequality has grown substantially since the 1970s

- Series of influential papers published in the early 1990s, in particular Katz and Murphy (1992) and Juhn, Murphy and Pierce (1993) laid down the main facts and possible explanations.

- What have been the main changes in wage inequality since then?

- What does this tell us about possible explanations for inequality changes?

Some specific issues addressed here

- **Measurement issues, do they matter?**
  - March vs. MORG CPS
  - Growing importance of wage allocation (35% in latest MORG)
  - Top-coding
- **Explanations: Demand and supply and beyond**
  - Secular changes in the nature of relative demand
  - Wage setting institutions (minimum wage, unions, performance pay)
  - What is going on at the very top end (rent-extraction, social norms, market of executives, etc.)

Data issues

- I mostly focus on the May/MORG instead of the March CPS for a number of reasons
  - Larger samples (12 rotation groups vs. 4 plus oversamples)
  - Direct measure of hourly wages for workers paid by the hour (over half of workforce)
  - Cannot go back as far (1960s in March vs 1973 in May) but less important with the passage of time
  - Union status available in most years
- May-ORG vs. March mostly matters of within-group inequality
  - Does not increase in the 1970s
  - Plays less of a role in the overall inequality growth
  - But all other findings highly robust

Data choices for most of the paper

- Use May (1973-78) and ORG (1979-2006) supplements of the CPS
- Hourly wage rate: direct measure for hourly workers, earnings divided by hours for others
- No wage allocation in 1973-78, throw out allocators in ORG to be consistent (but lose 1994 and 8 months of 1995)
- 1.4 adjustment for top-coded observations
- Weight by hours of work times CPS weight

Measurement model

- Cut the data in 6 education groups and 22 two-years experience cells (separately for men and women)

- Can control for composition effects by holding shares in each cell at its average value for the whole 1973-2006 period

- Within (dispersion around cell mean) and between (dispersion across cell means) straightforward to compute

Computing Wage Differentials

- Hold composition constant when computing education and experience wage differentials (and between-group variance, a relevant summary measure)

- Education differentials: Hold experience distribution constant to its average 1973-2006 value (for all education groups)

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Price and Quantity Effects

- Quantity effects estimated by comparing actual dispersion to dispersion with constant shares of workforce in each cell (reweighted)

- (Observable) price effects obtained by setting mean cell wage to average 1973-2006 level

  - Natural procedure when looking at the variance, not completely clear what to do with percentiles

- Similar in spirit to Juhn, Murphy and Pierce decomposition

Descriptive Facts

- Variance: within and between decomposition
- Wage differentials
- Within-group variance by education and experience
- Beyond the variance: analysis by percentiles and JMP decomposition for 50-10 and 90-50 gap

Figure 1a: Total Variance, Men
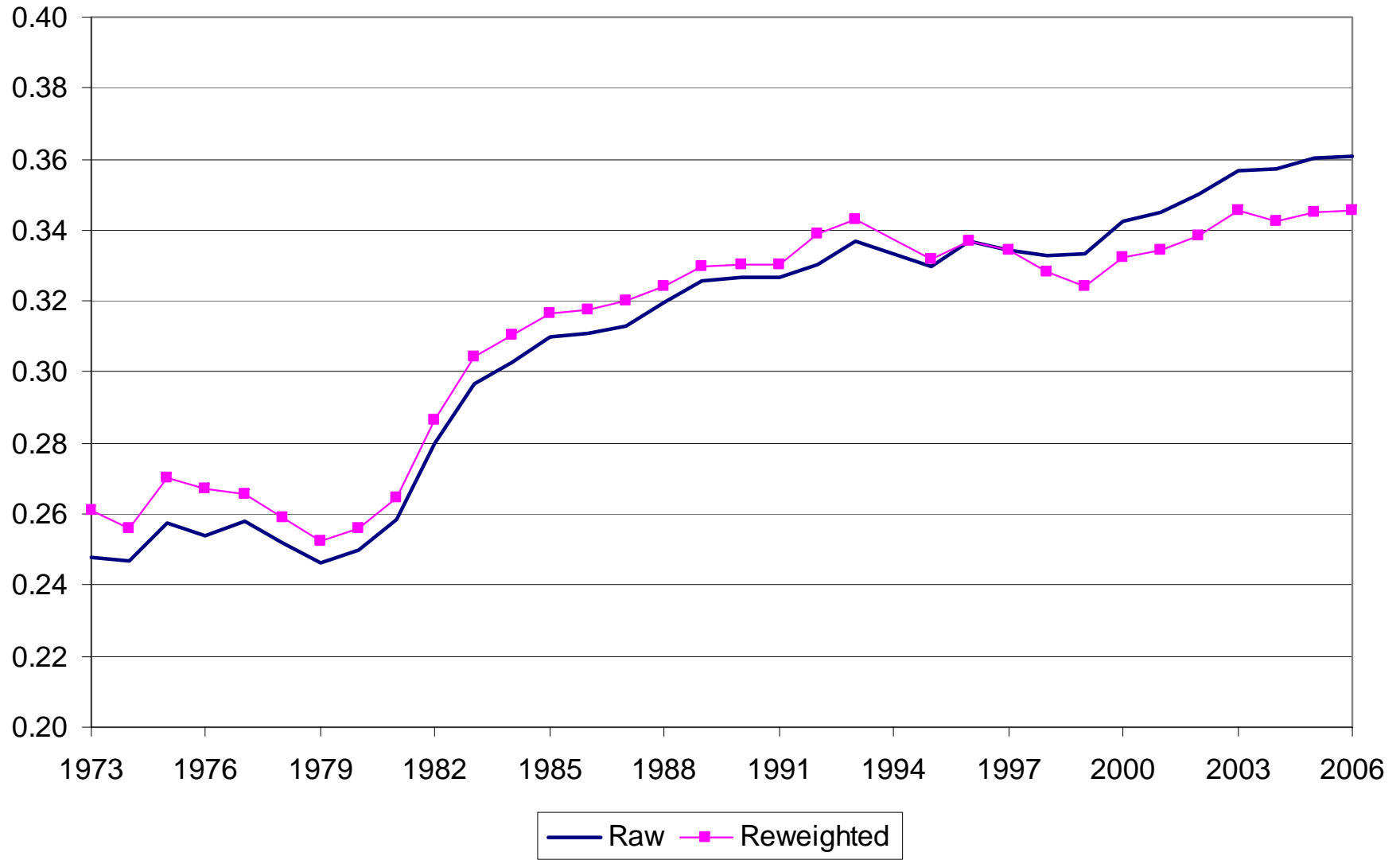
Figure 1b: Total Variance, Women

Legend: — Total, raw —■— Total, reweighted
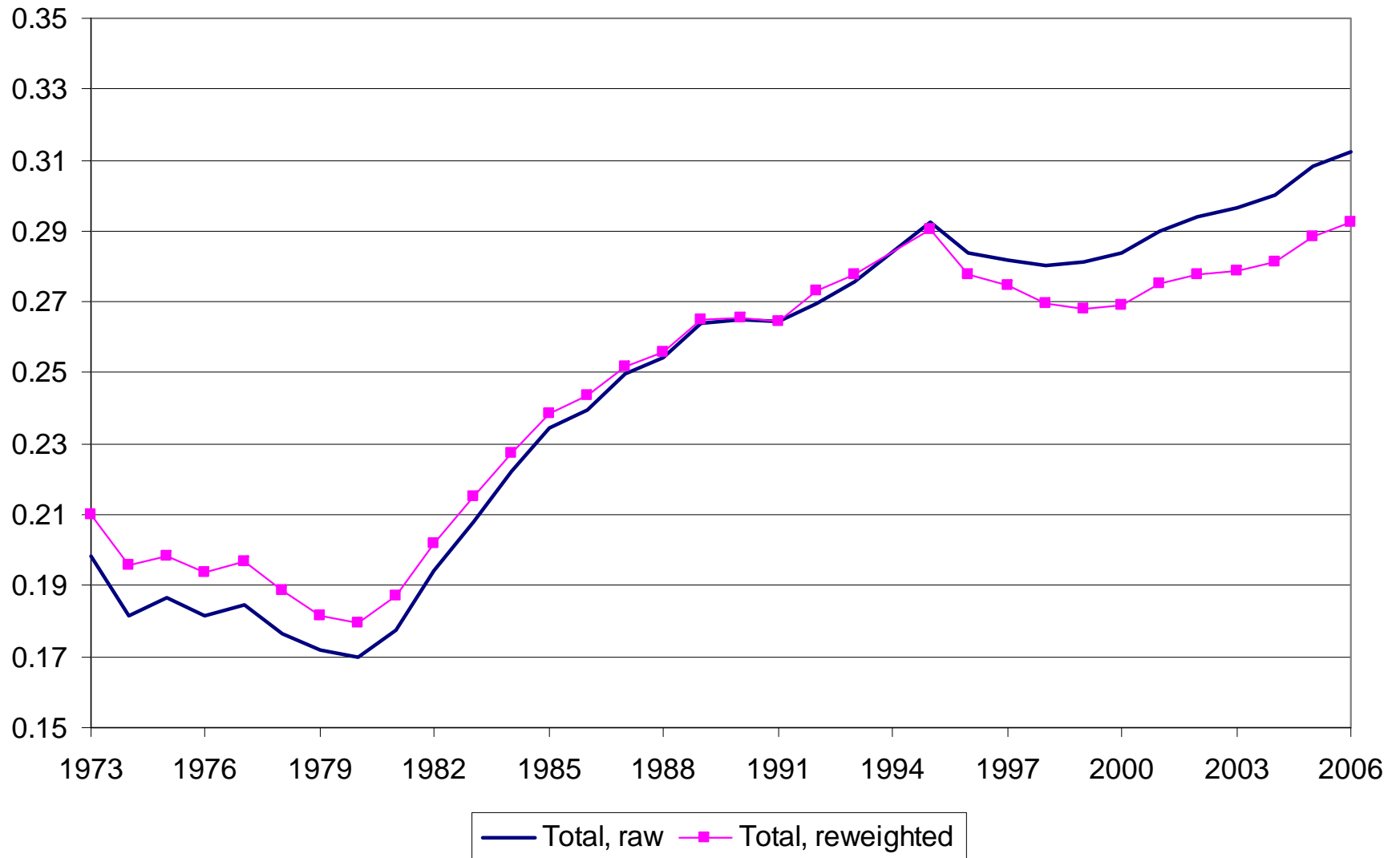
Figure 2a: Within- and Between-group Variances, Men
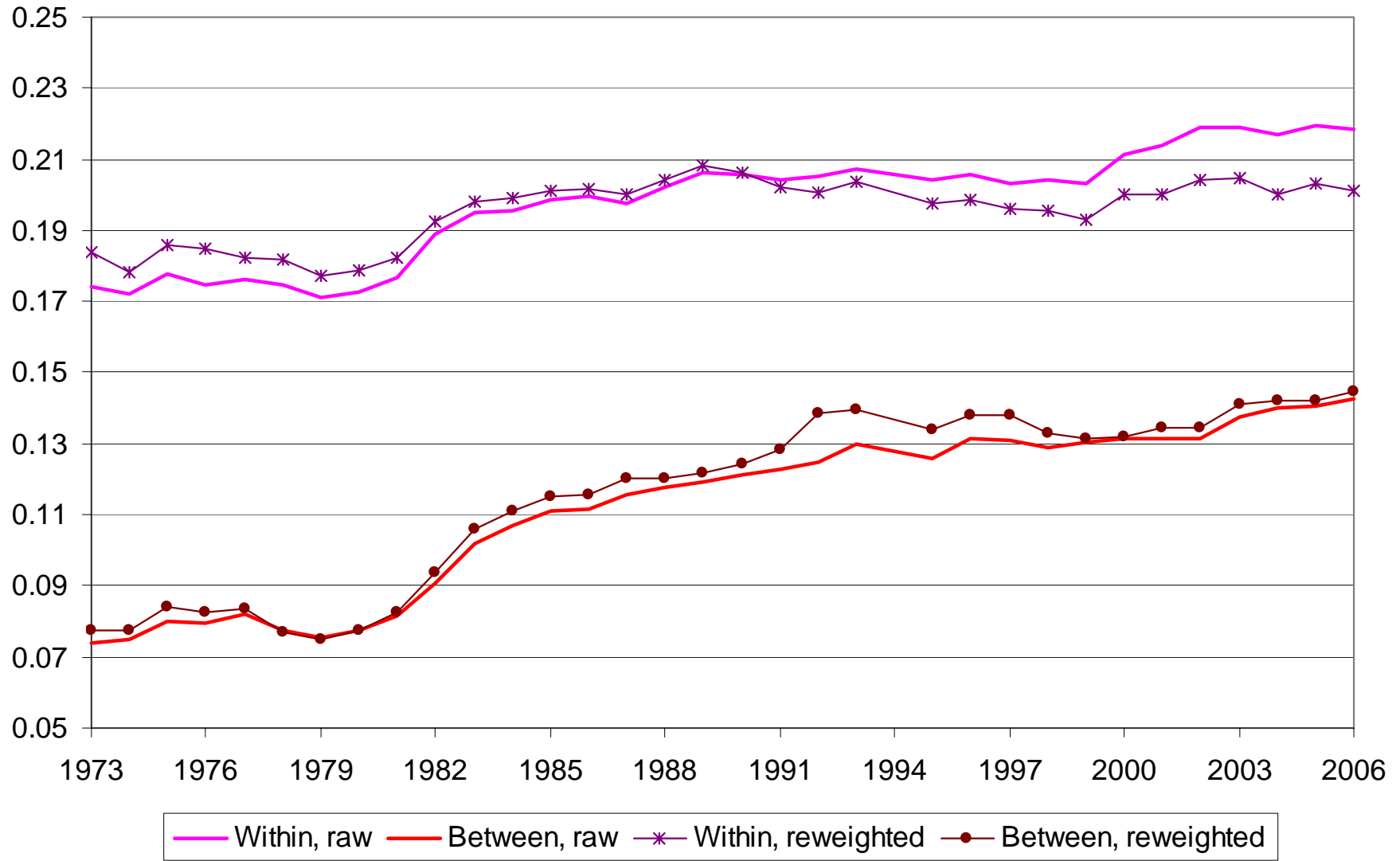
Figure 2b: Within- and Between-group Variances, Women

Legend: Within, raw — Between, raw — Within, reweighted — Between, Reweighted
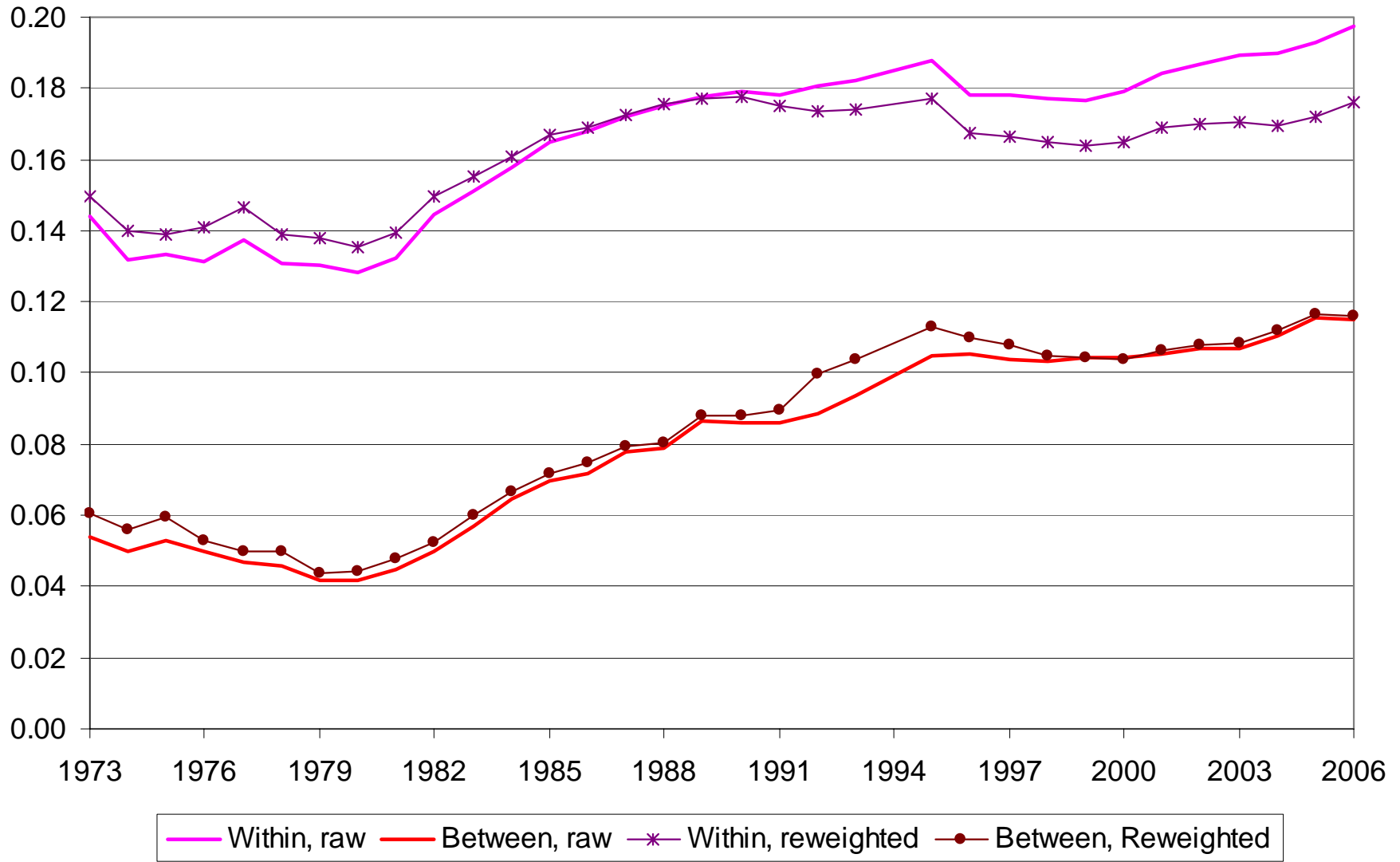
Figure 3a: Education Wage Differentials (Relative to High School Graduates), Men

Legend: Elementary · Dropout · Some college · College · Post-graduate
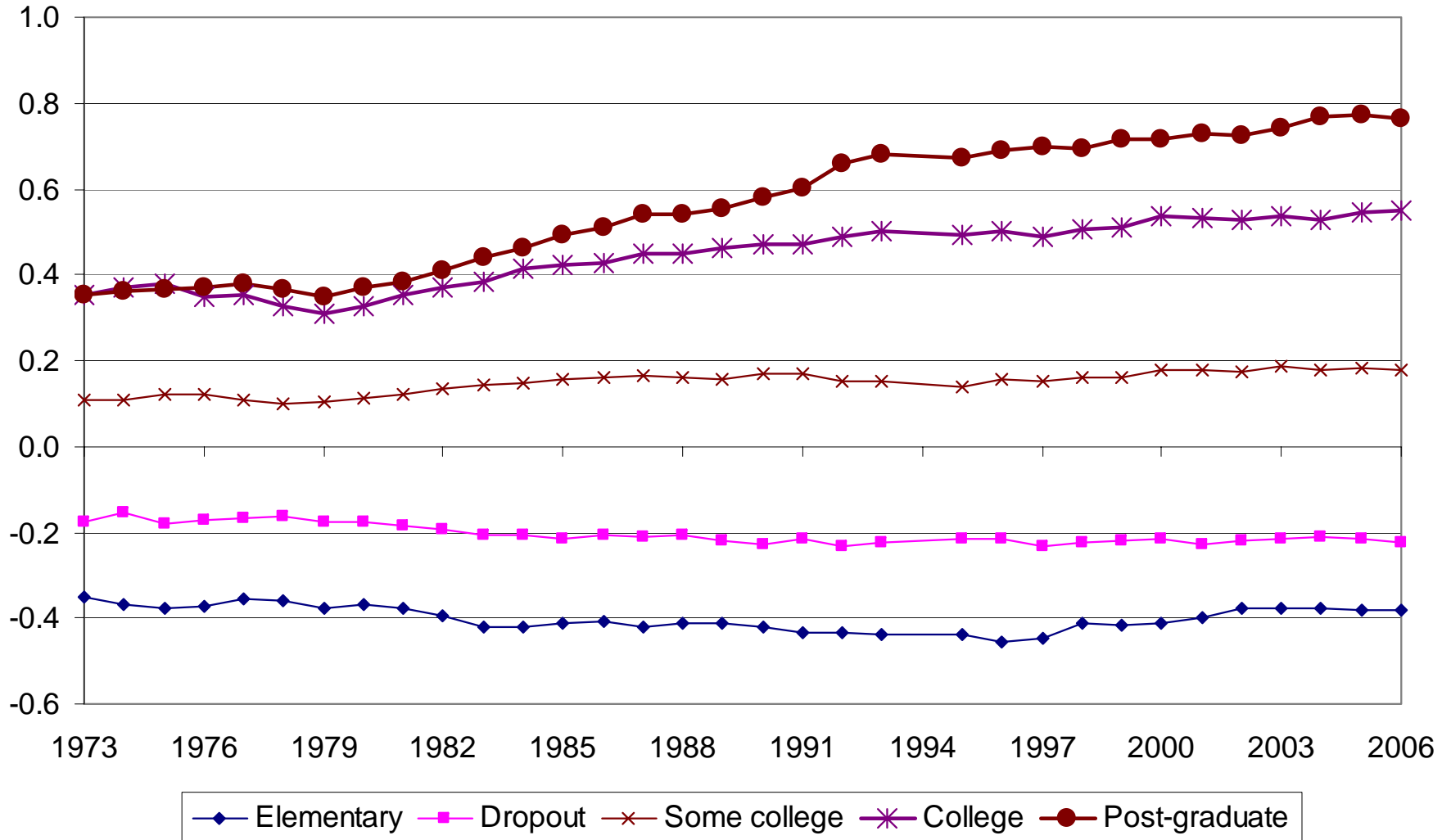
Figure 3b: Education Wage Differentials (Relative to High School Graduates), Women

Elementary ◆ Dropout ■ Some college ✕ College ✱ Post-graduate ●
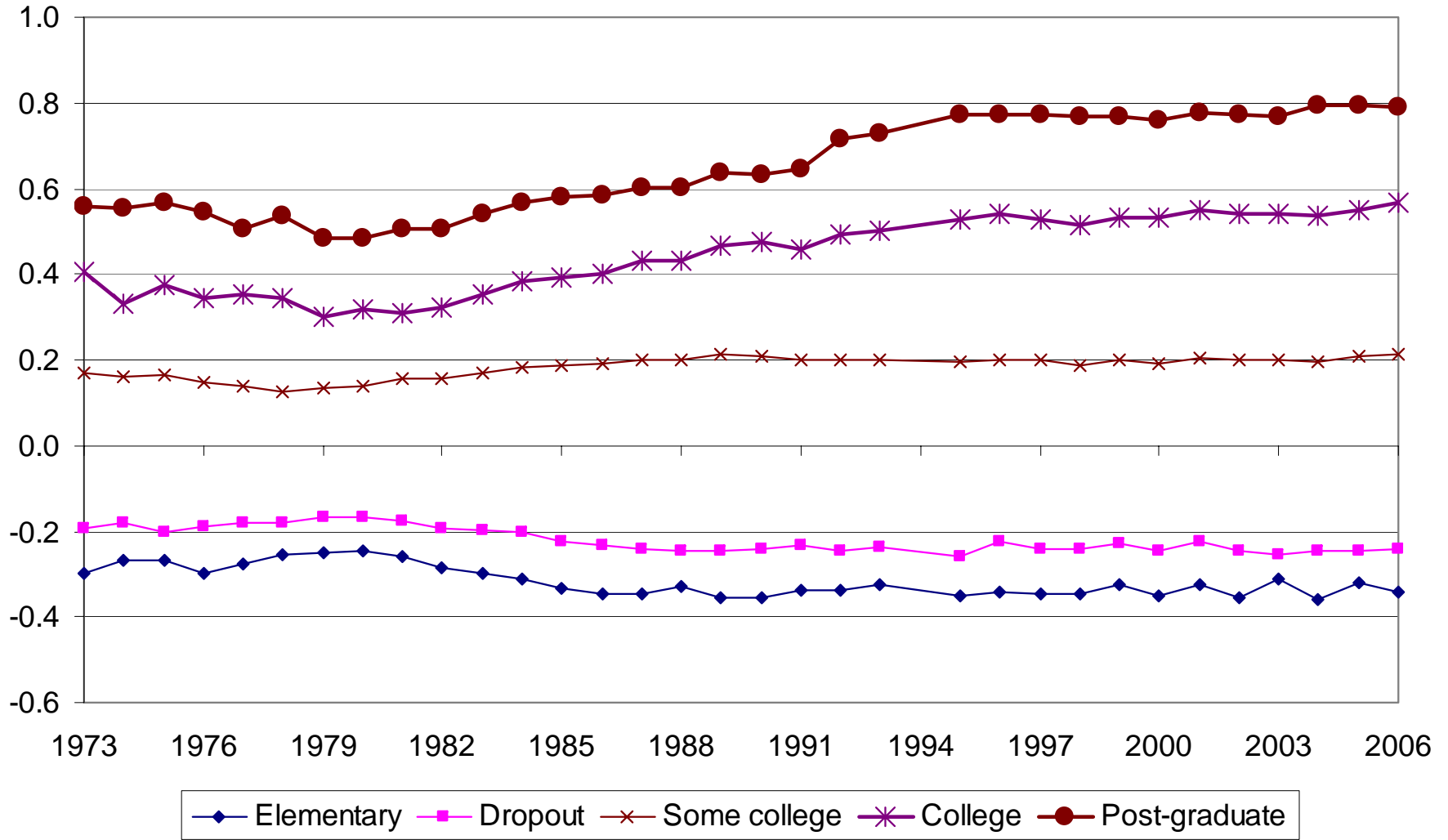
Figure 4a: Experience Wages Differentials (Relative to 20-29 Years of Experience), Men
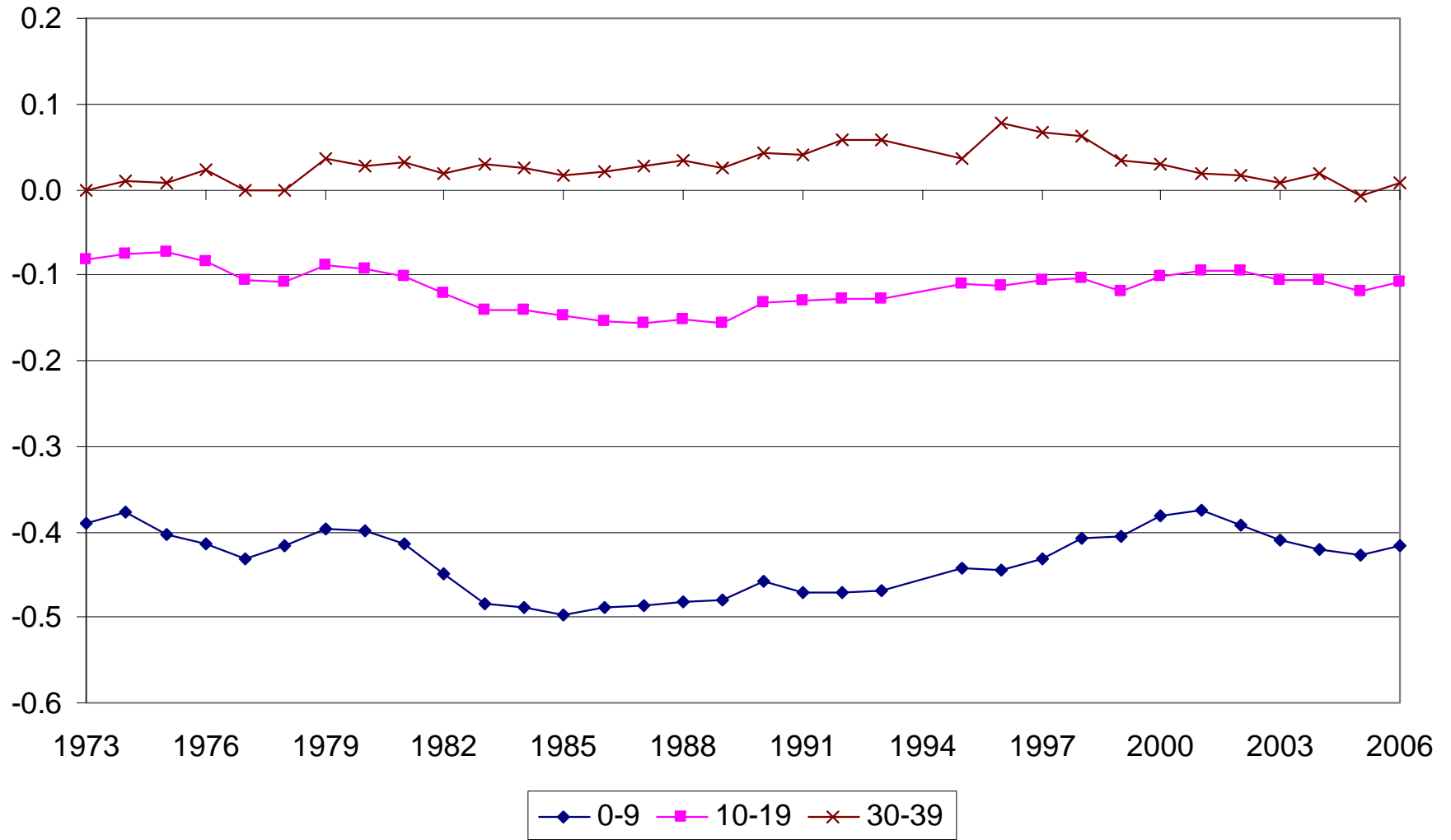
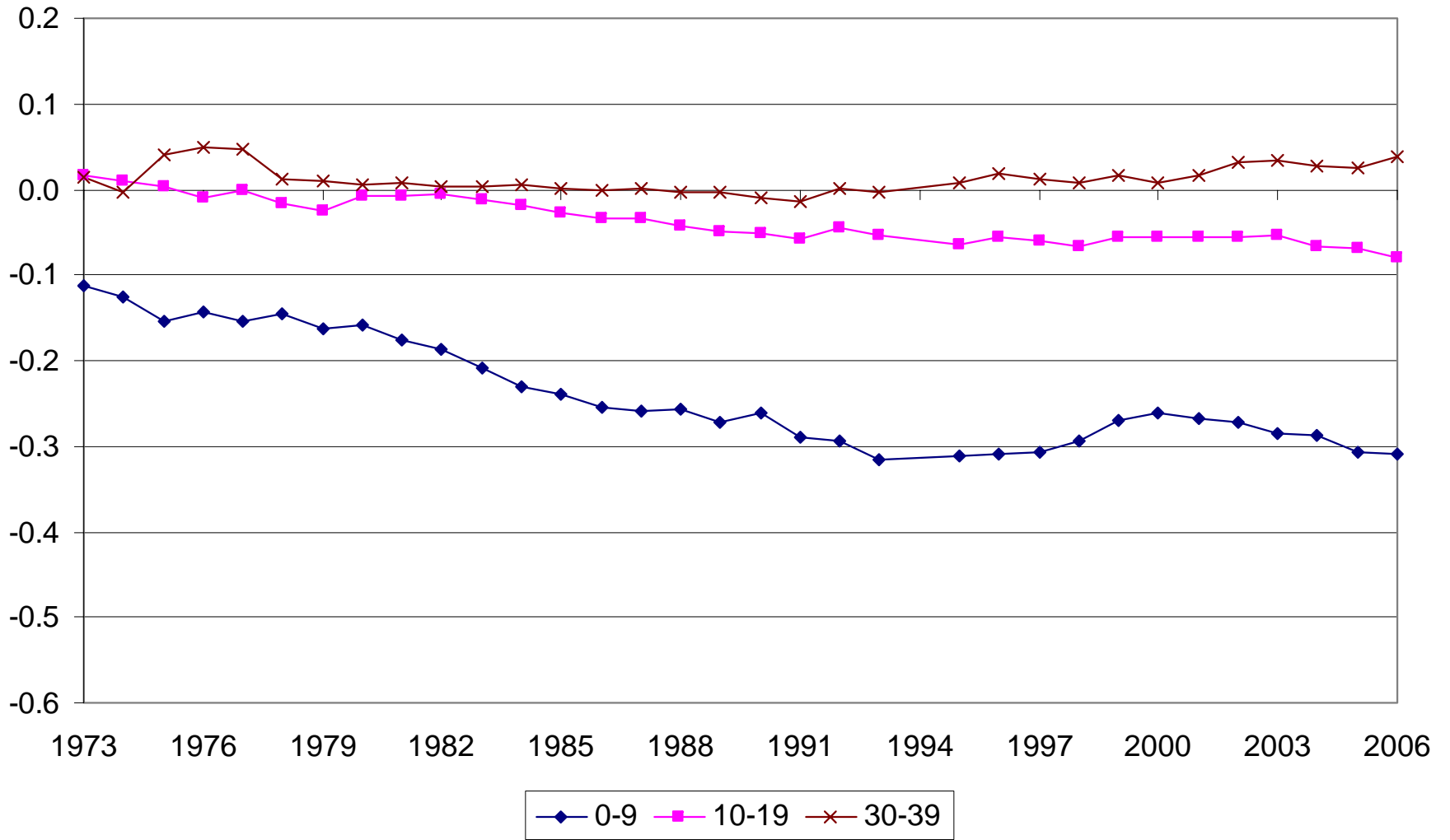Figure 4b: Experience Wage Differentials (Relative to 20-29 Years of Experience), Women
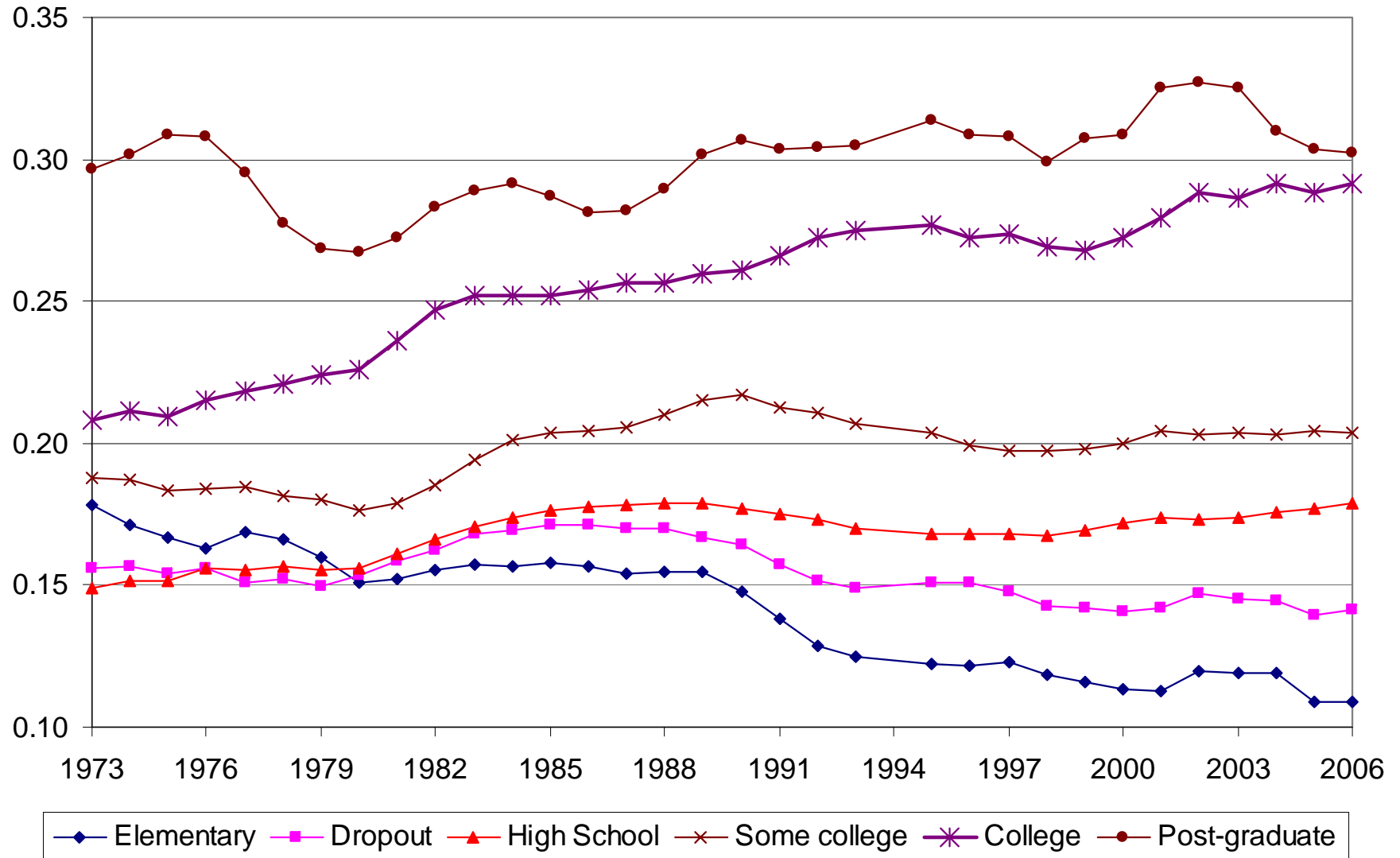
Figure 5a: Within-Group Variance by Education Groups, Men

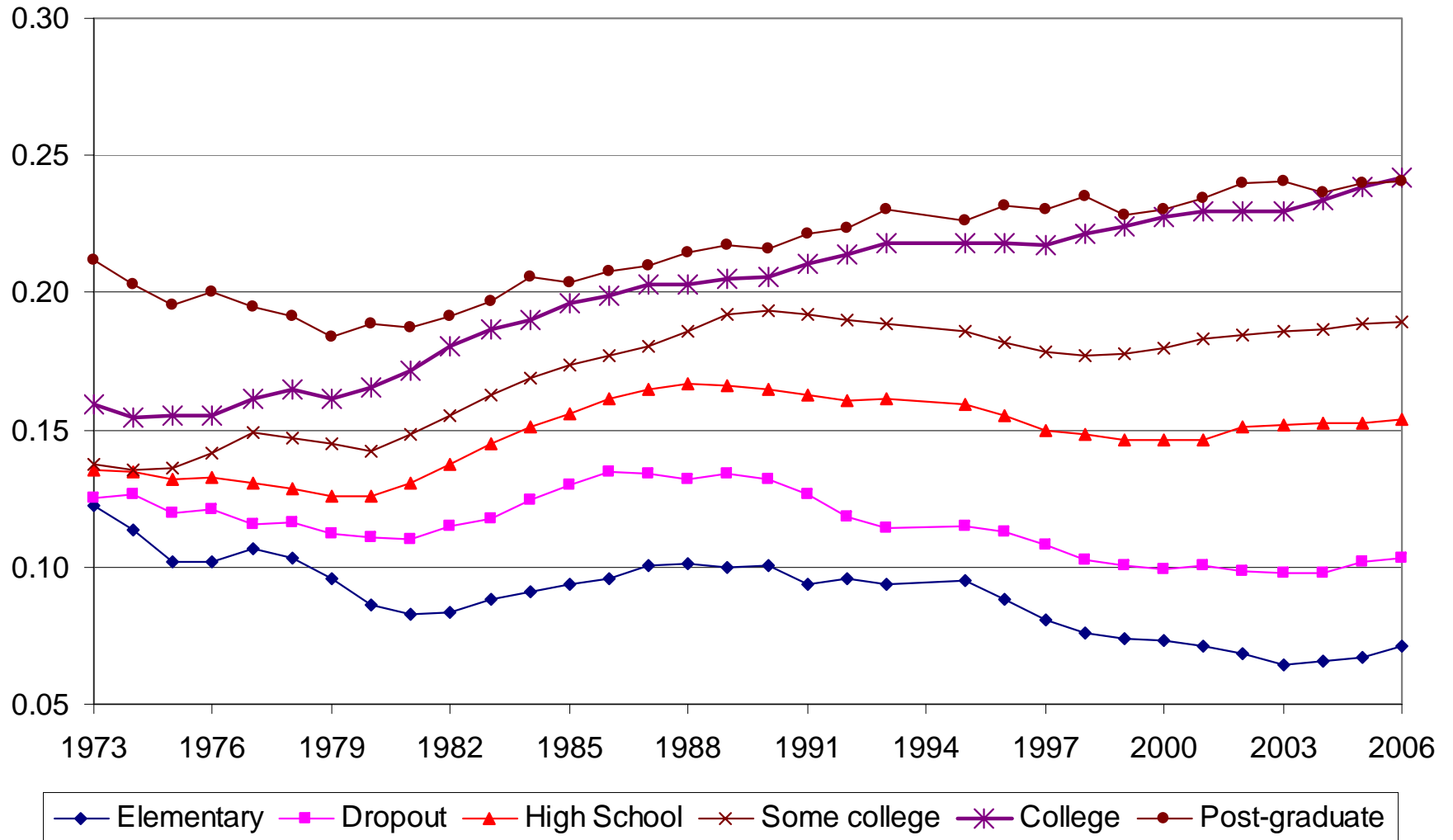**Figure 5b: Within-Group Variance by Education Groups, Women**

Legend: Elementary, Dropout, High School, Some college, College, Post-graduate
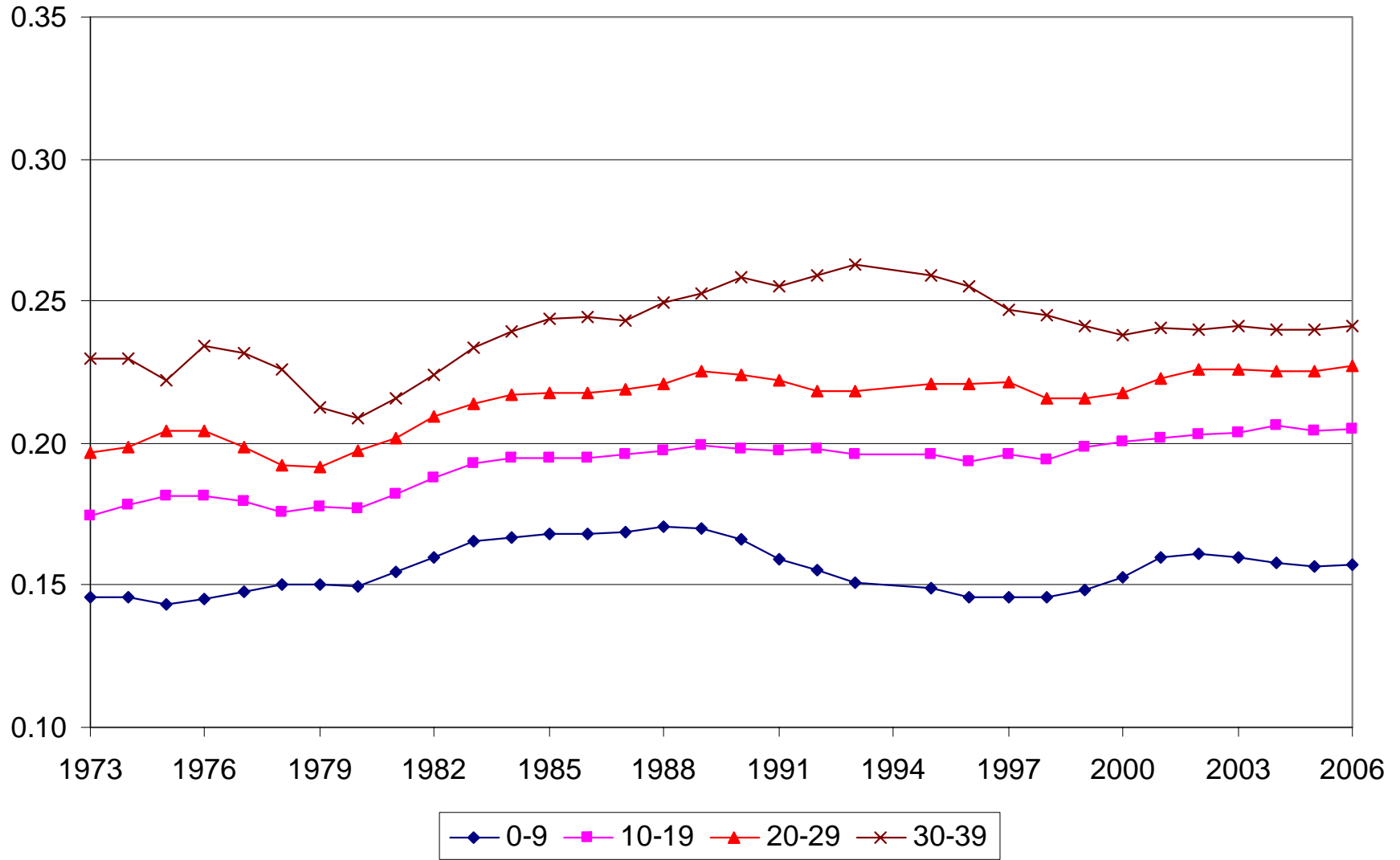
Figure 6a: Variance by Experience Groups, Men

Figure 6b: Variance by Experience Groups, Women
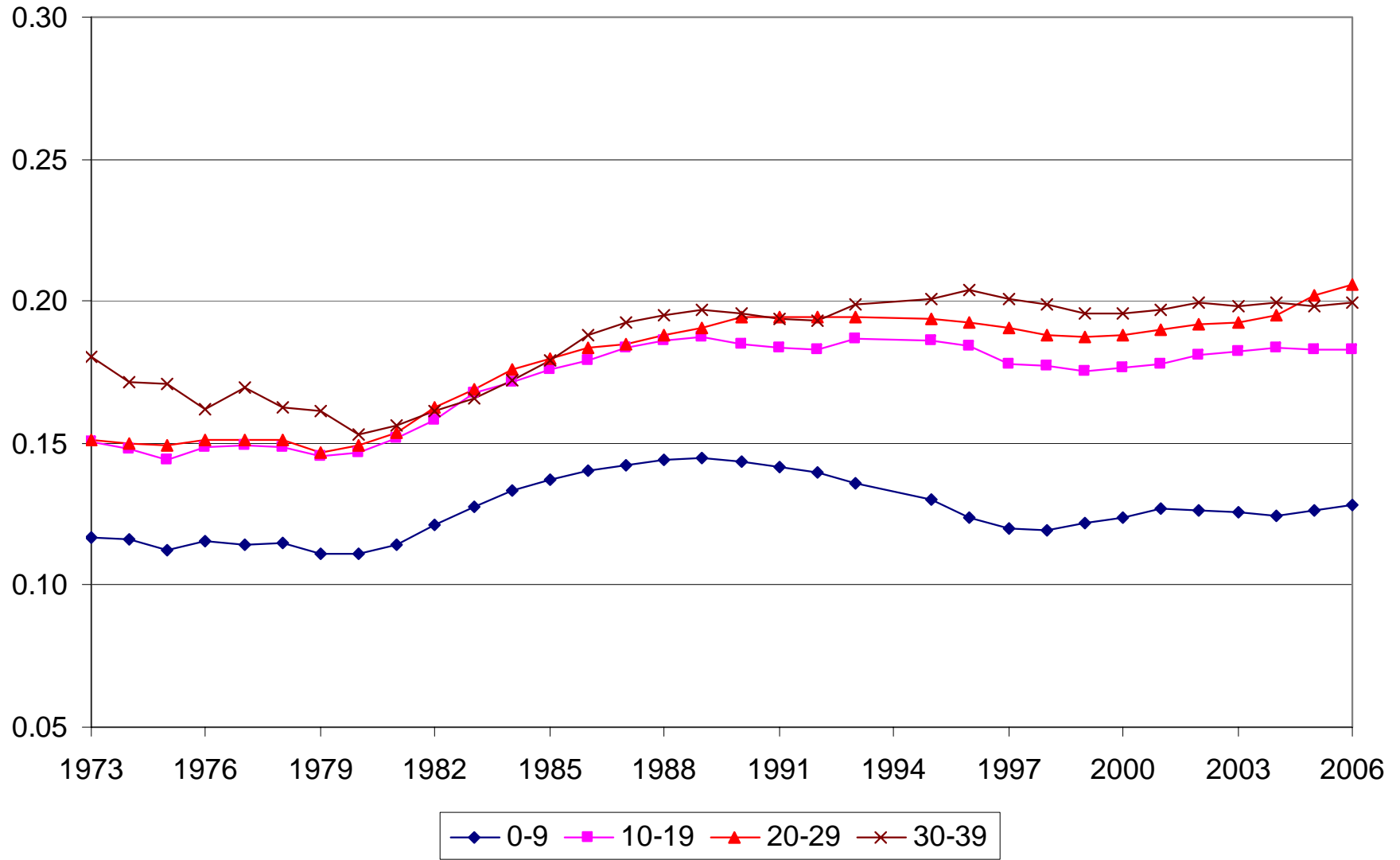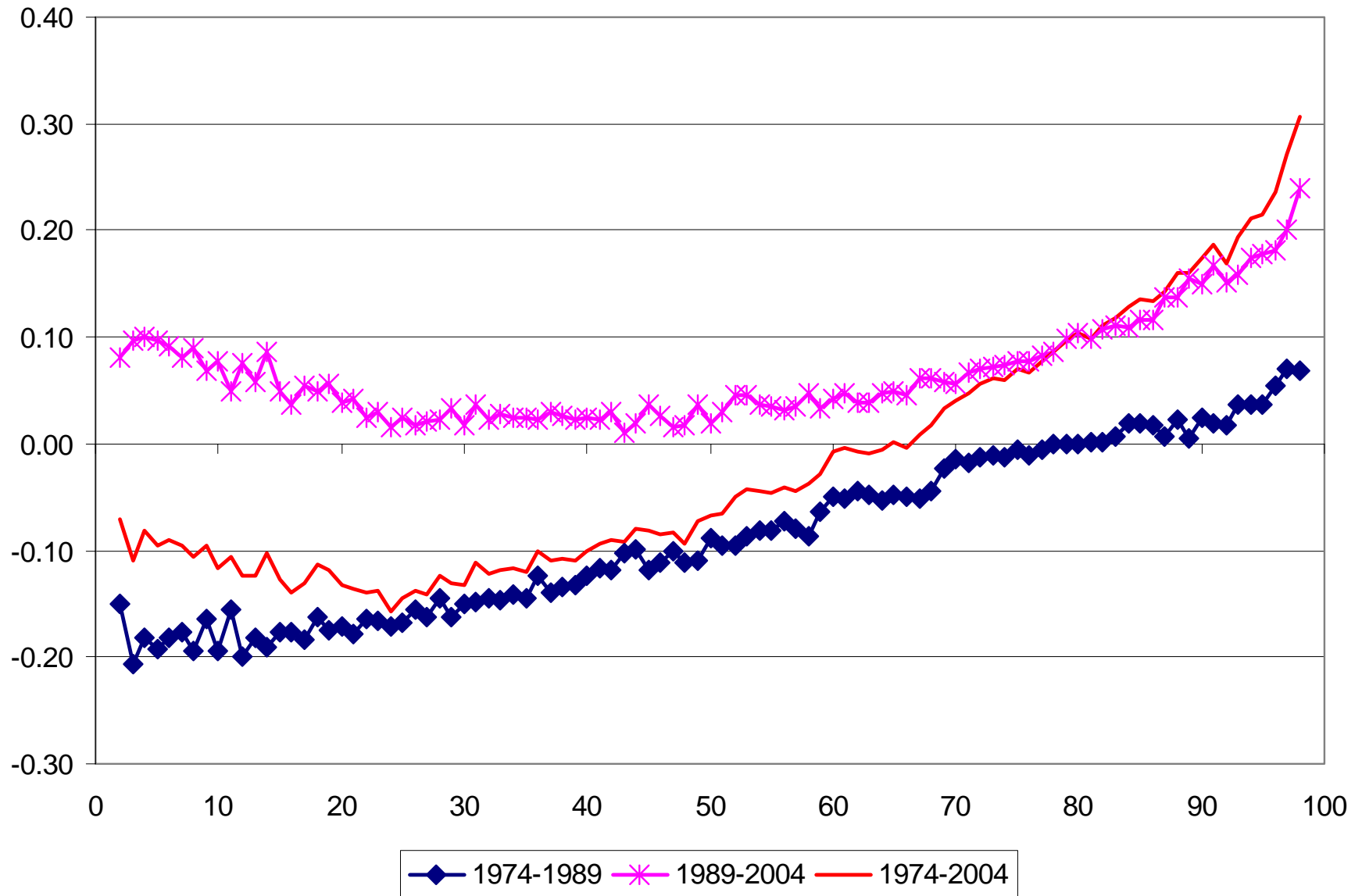
Figure 7a: Change in Real Wages by Percentile, Men

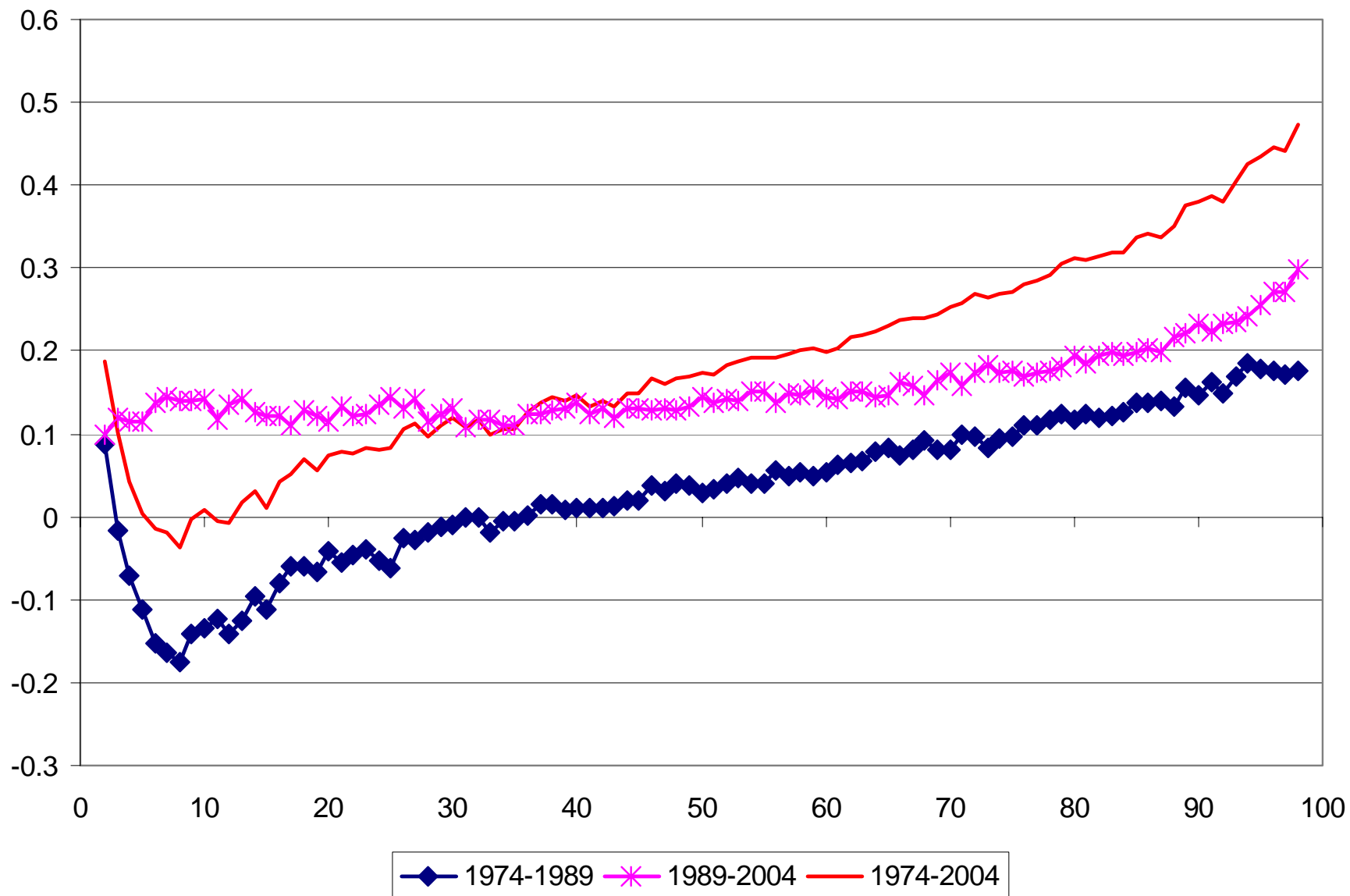**Figure 7b: Change in Real Wages by Percentile, Women**

Legend: 1974-1989 · 1989-2004 · 1974-2004

Figure 8a: Change in Wages Residuals by Percentile, Men

Legend: 1974-1989 ◆ 1989-2004 ✱ 1974-2004 —
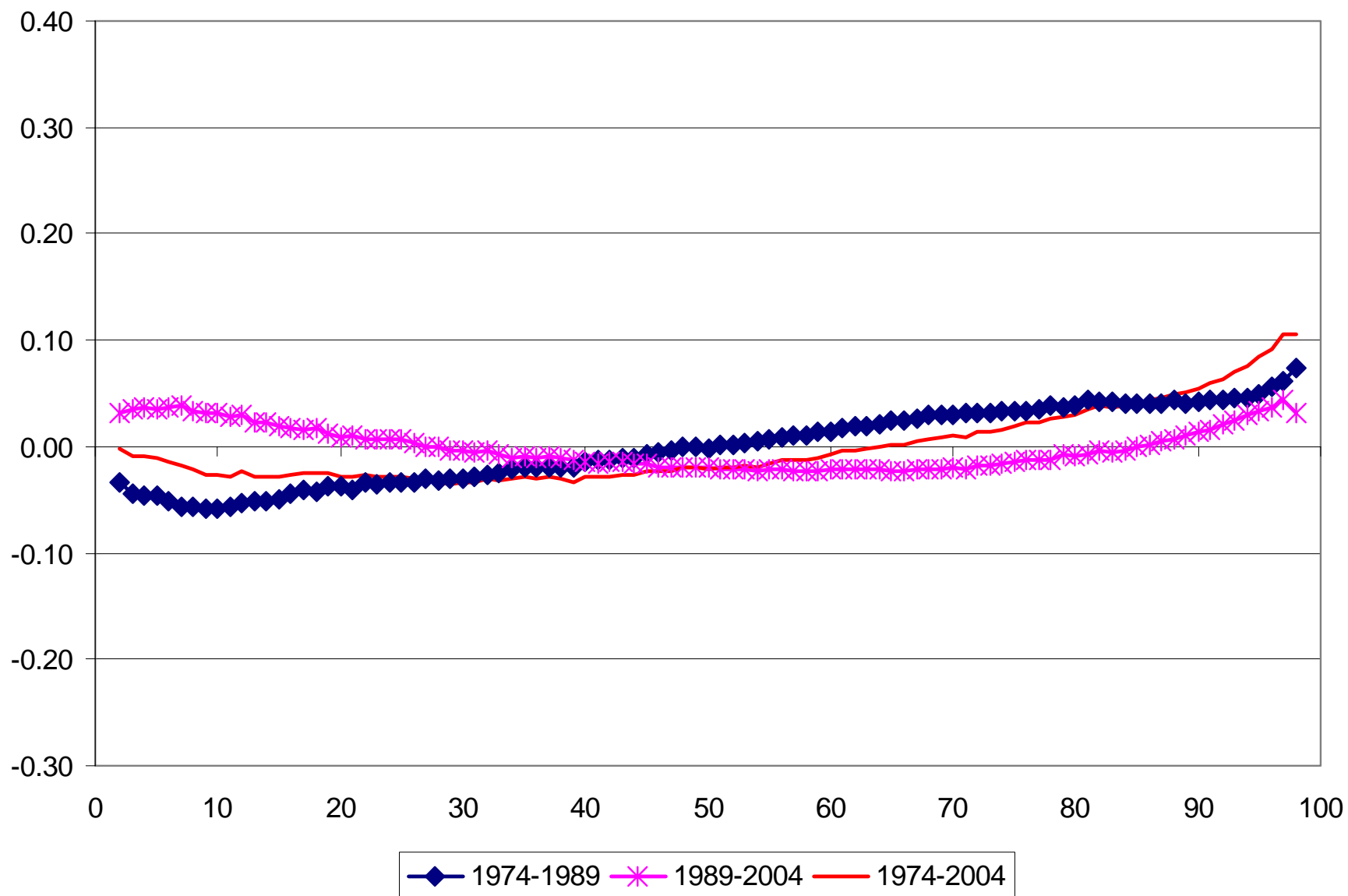
Figure 8b: Change in Wages Residuals by Percentile, Women

Legend: 1974-1989, 1989-2004, 1974-2004
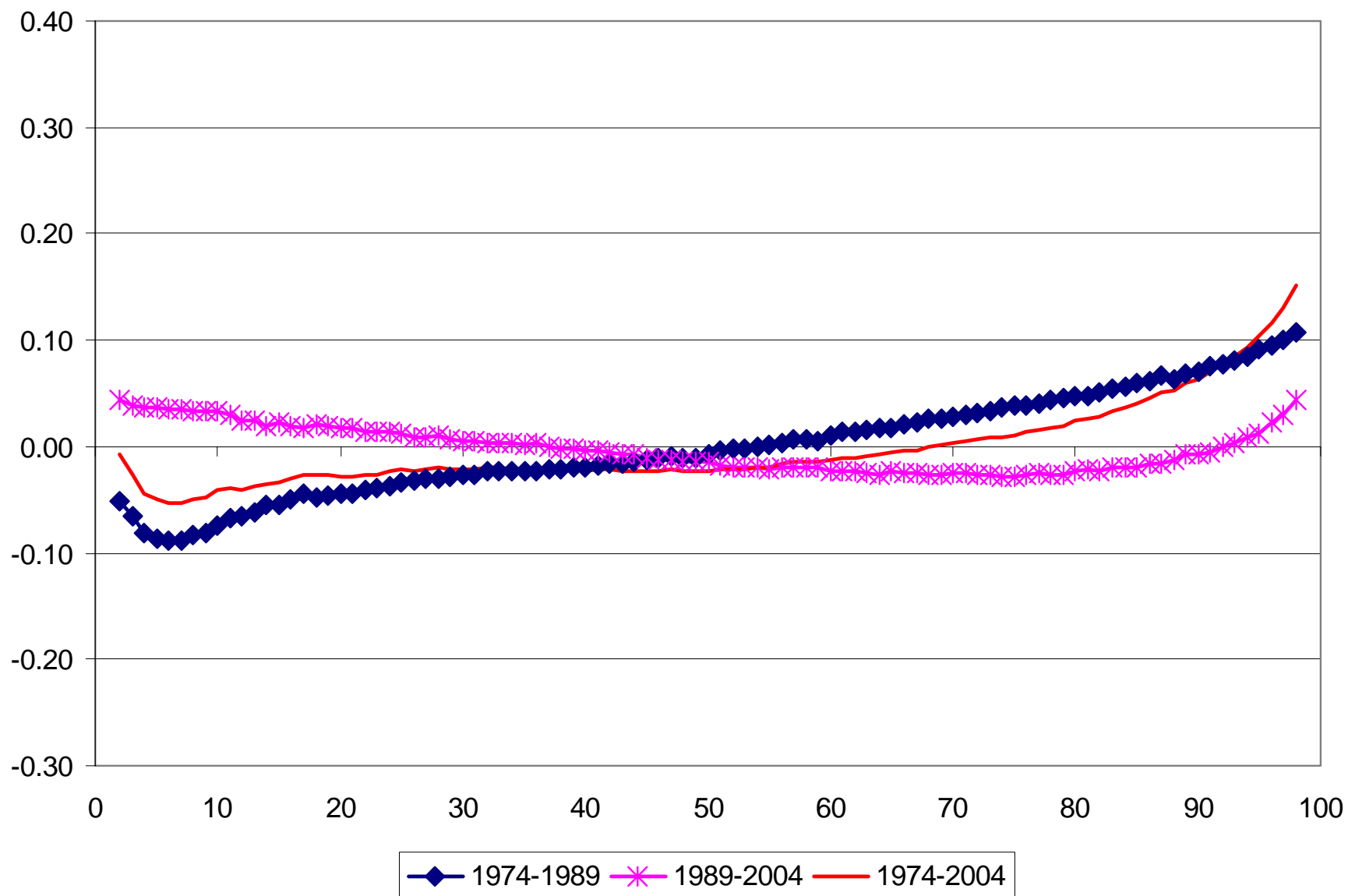
Figure 9a: Decomposition of Changes in 90-50 Gap, Men

Legend: Raw change — Quant. Adjusted — Price and quant. adjusted
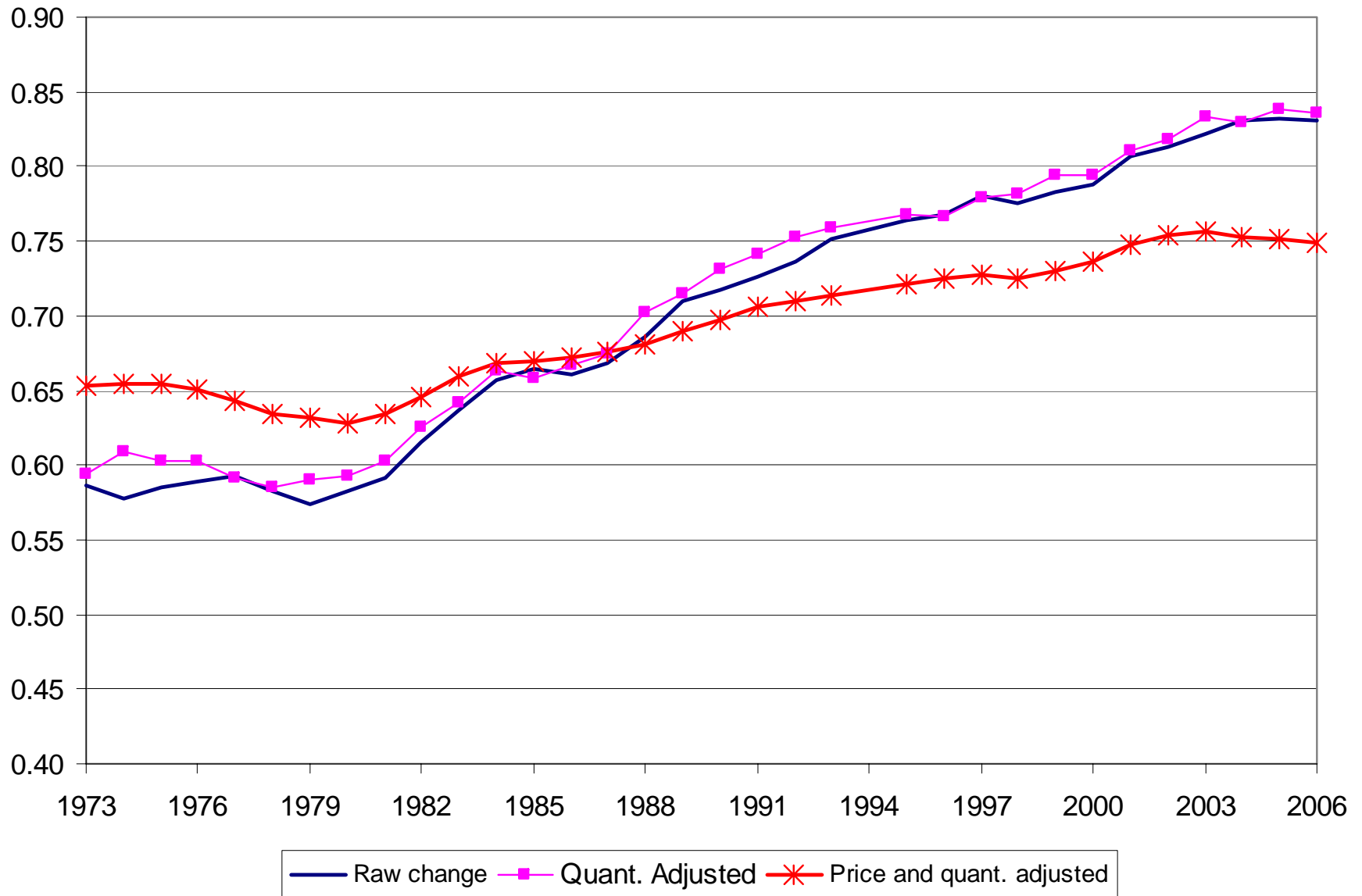
Figure 9b: Decomposition of Changes in the 50-10 Gap, Men

Legend: Raw change — Quant. Adjusted — Price and quant. adjusted
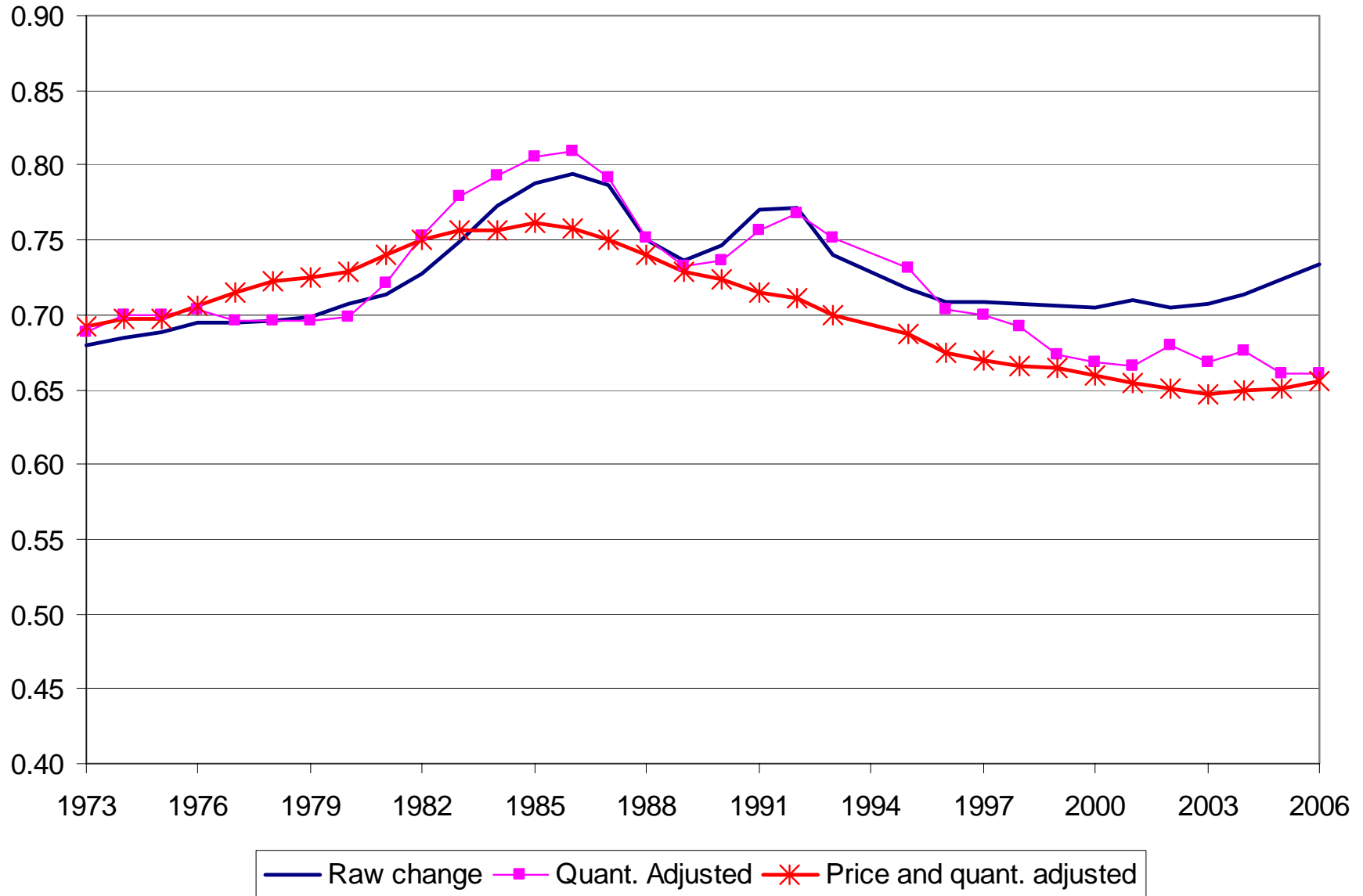
Figure 9c: Decomposition of Changes in 90-50 Gap, Women

Raw change — Quant. Adjusted — Price and quant. adjusted
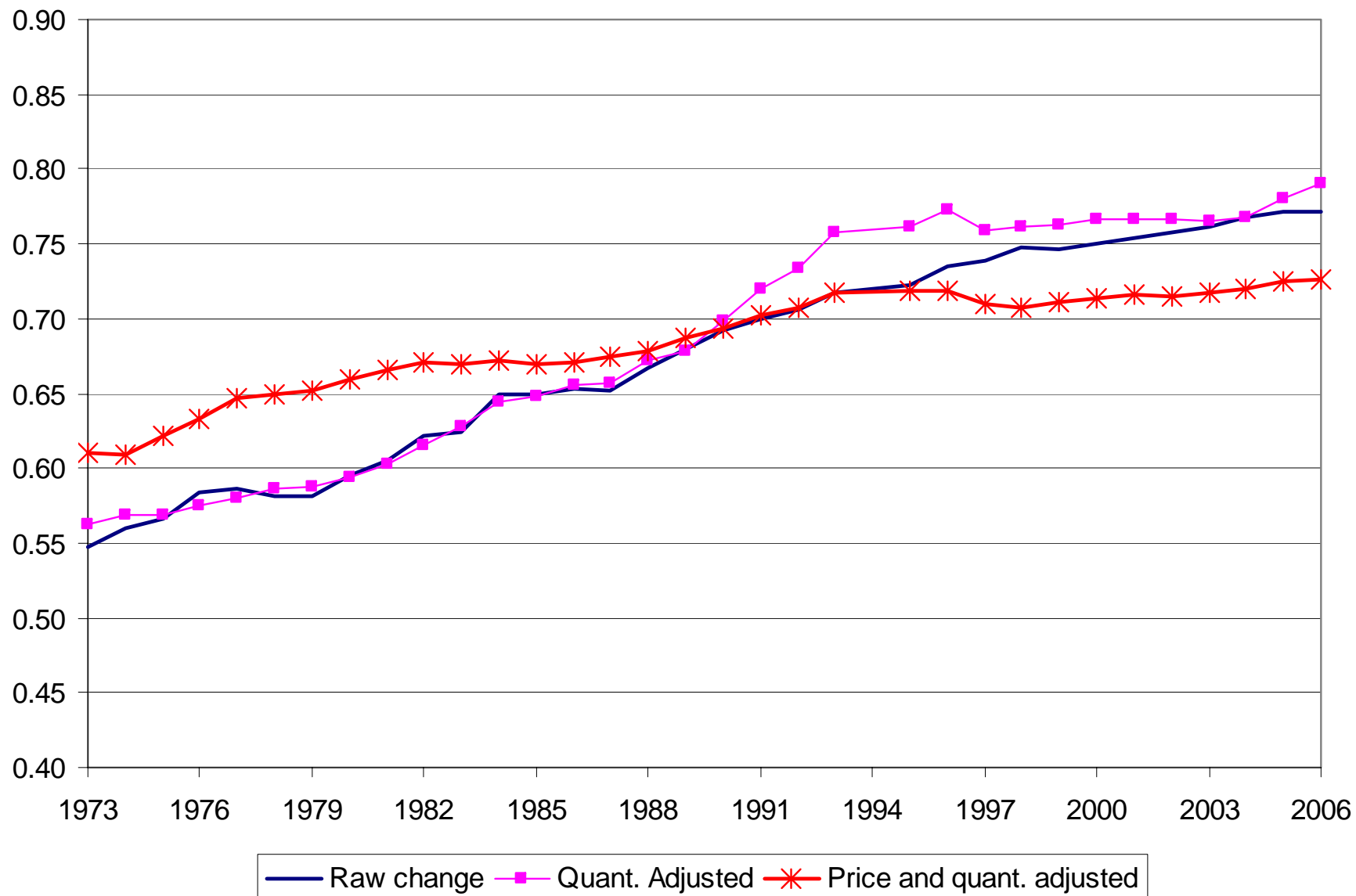
Figure 9d: Decomposition of Changes in 50-10 Gap, Women

Legend: Raw change — Quant. Adjusted — Price and quant. adjusted
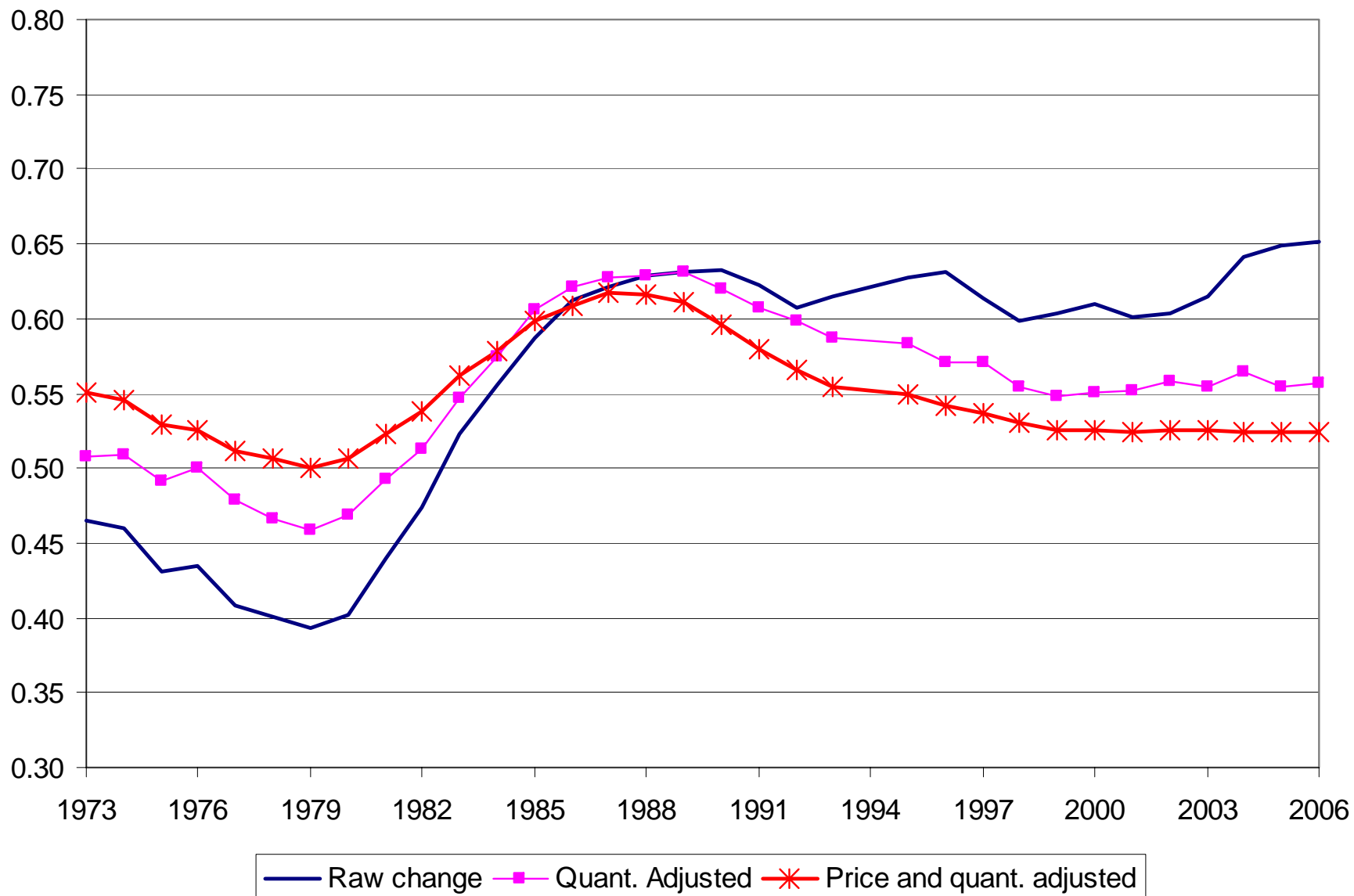
Main findings

- Within does not play much of a role in the growth in overall dispersion, especially after controlling for composition effects
    - But top and low end of residual distribution moving in opposite directions
- Most of the growth in inequality linked to between-group component
    - Men: relative wages of college and post-graduates
    - Women: same plus experience gap
- Most of the growth in the 1980s, though continuing growth at top end in the 1990s/2000s

Robustness to measurement issues

- Allocators or no allocators?
- Top-coding
- March or May-ORG?

Figure 10a: Variance with and without Allocated Wages, Men

Legend: Within, alloc out — Between, alloc out — Within, alloc in — Between, alloc in
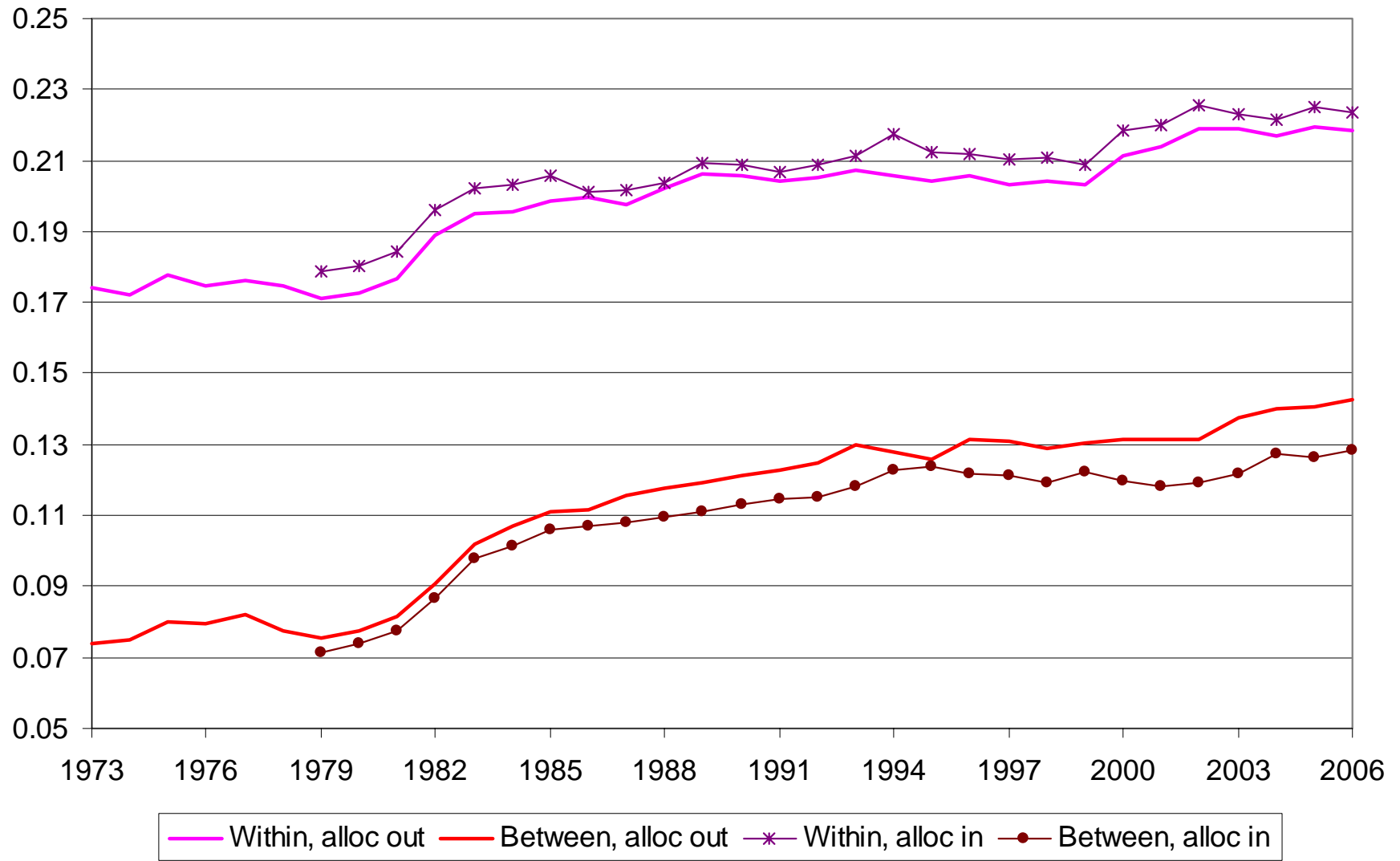
Figure 10b: Variance with and without Allocated Wages, Women

Legend: Within, alloc out — Between, alloc out — Within, alloc in — Between, alloc in
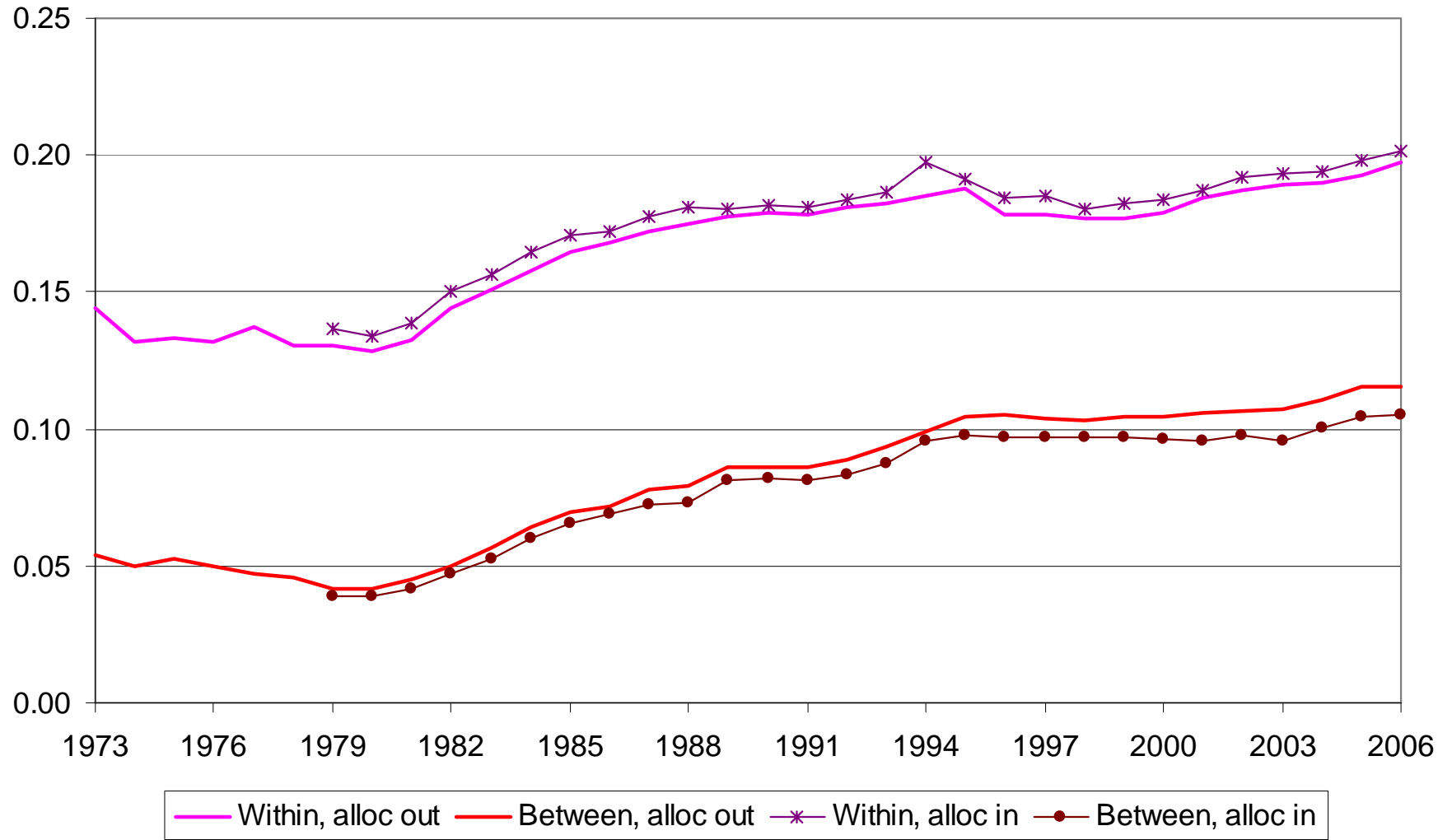
Figure 11a: Effect of Top-coding Adjustment, Men

Within, 1.4 adjustment — Between, 1.4 adjustment

Within, unadjusted — Between, unadjusted
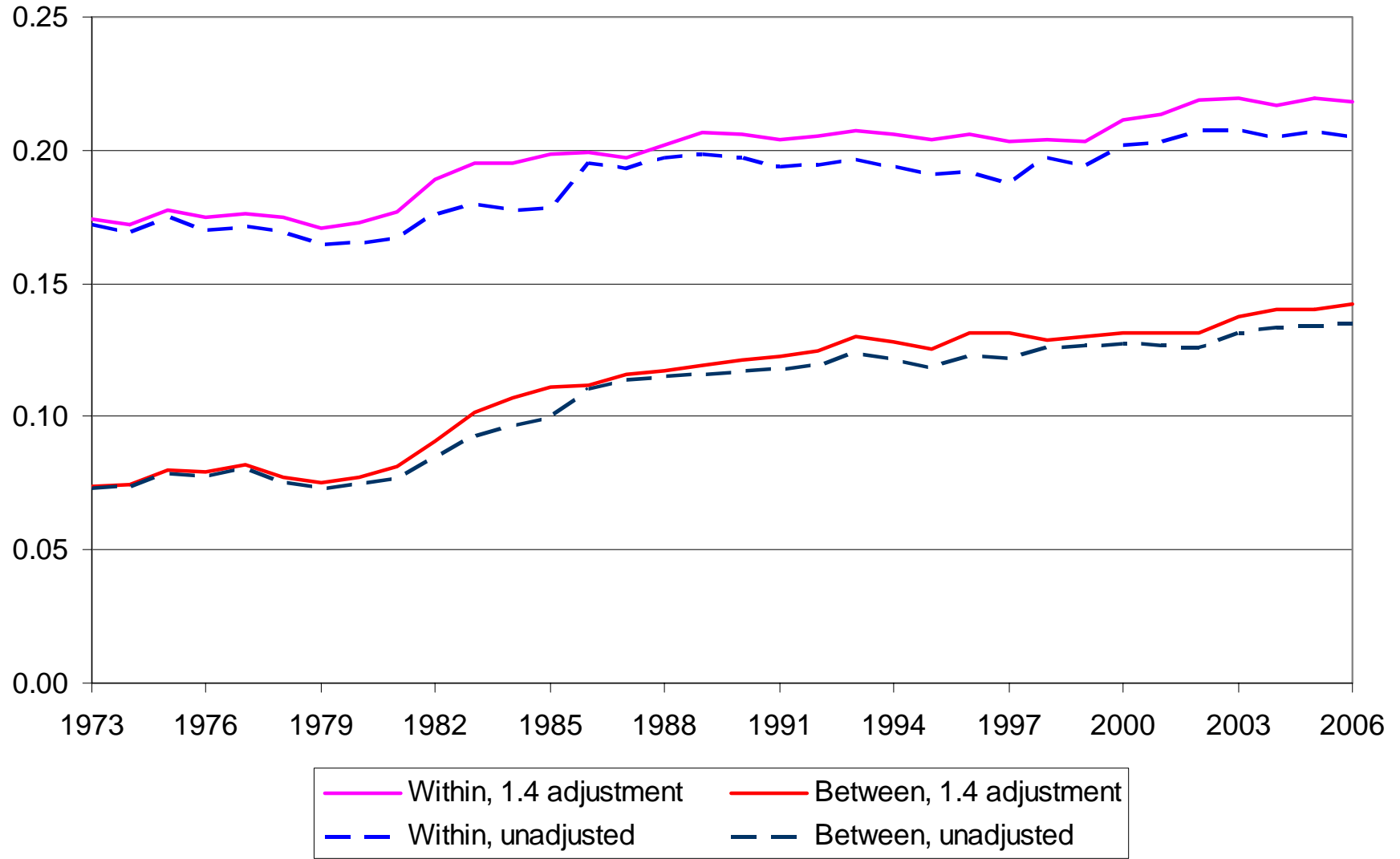
Figure 11b: Effect of Top-coding Adjustment, Women

Legend:
- Within, 1.4 adjustment
- Between, 1.4 adjustment
- Within, unadjusted
- Between, unadjusted
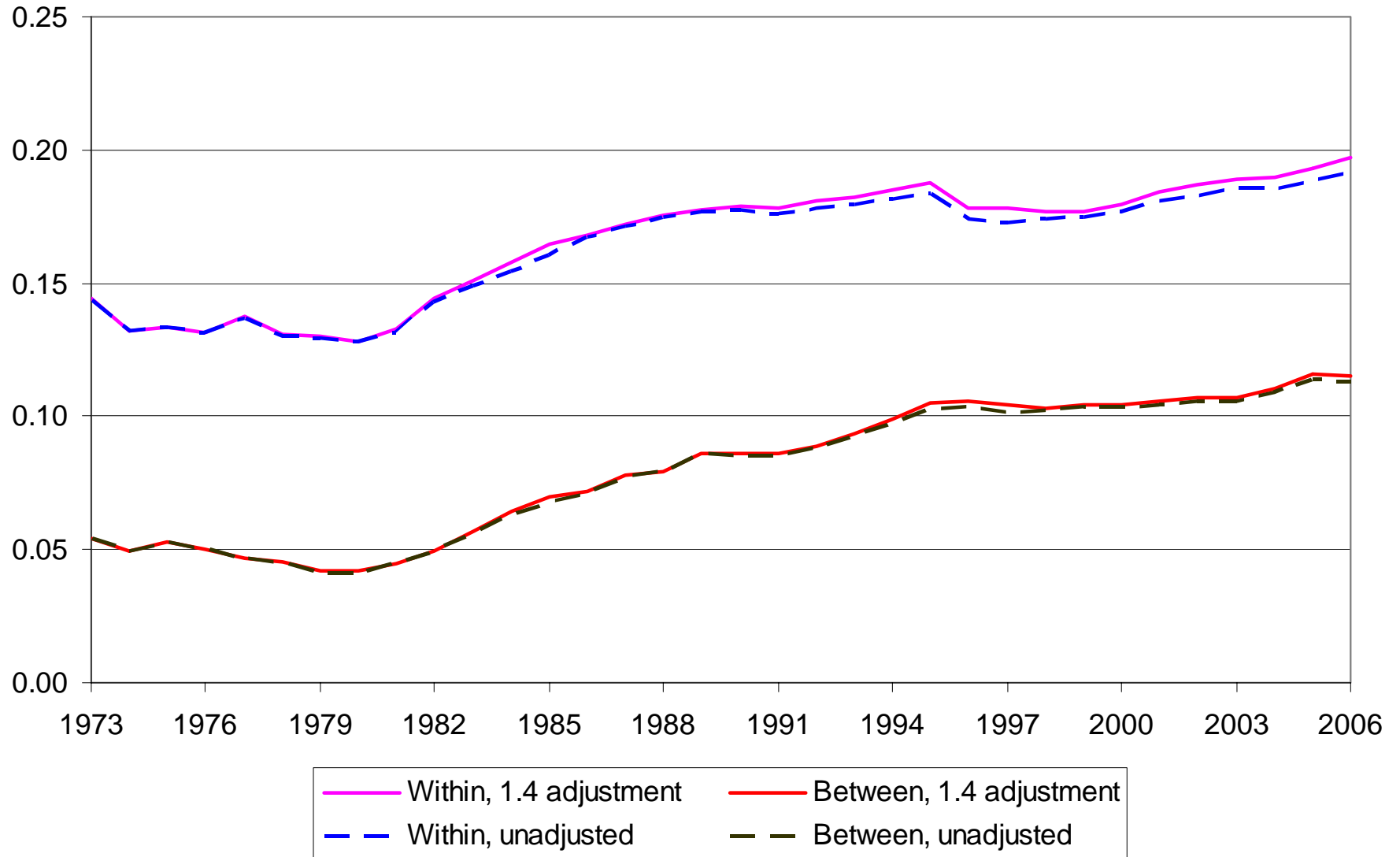
Figure 12a: Variance in May-ORG vs. March CPS, Men

Legend: Within, May-ORG — Between, May-ORG — Within, March — Between, March
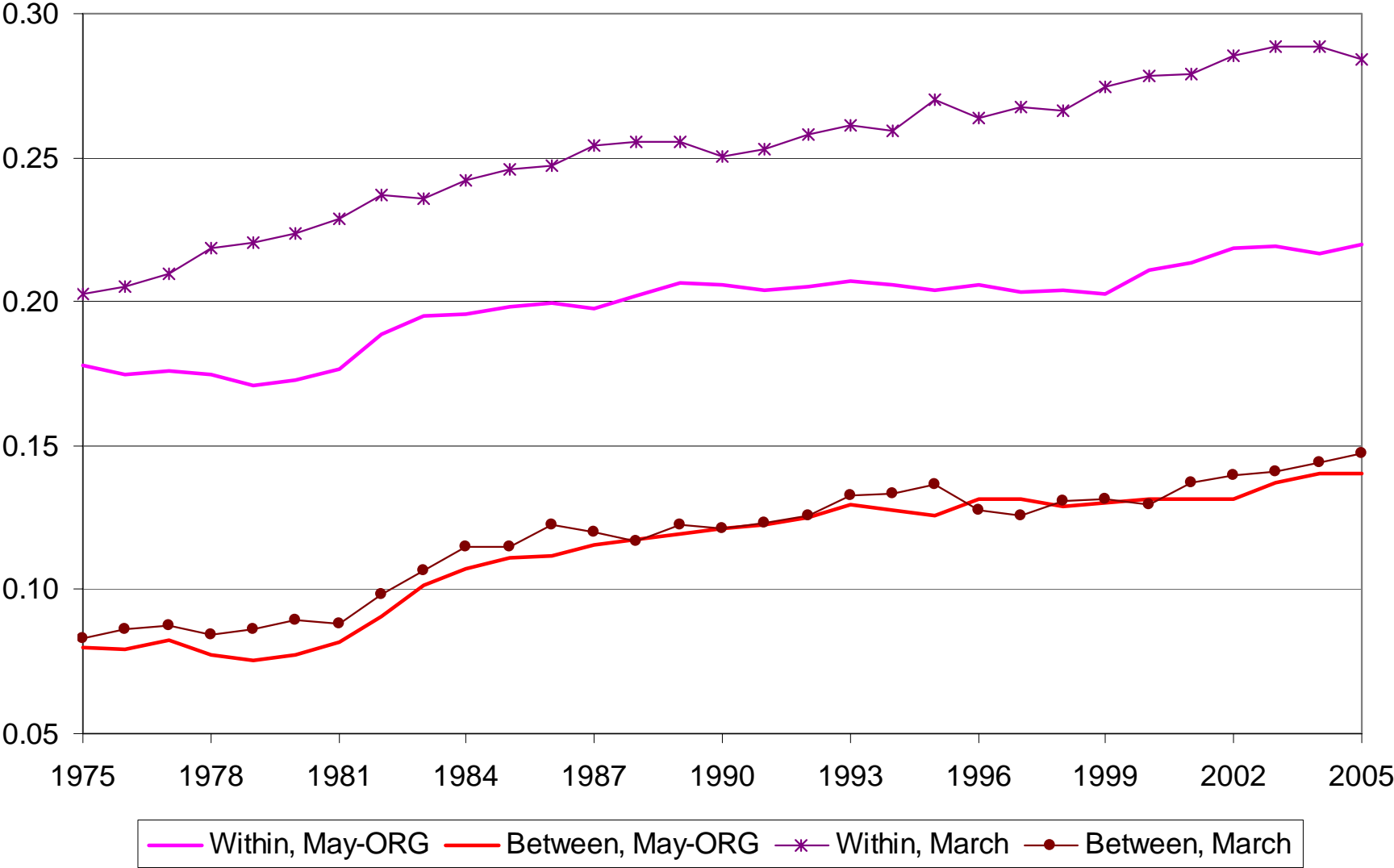
Figure 12b: Variance in May-ORG vs. March CPS, Women

Legend: Within, May-ORG — Between, May-ORG — Within, March — Between, March
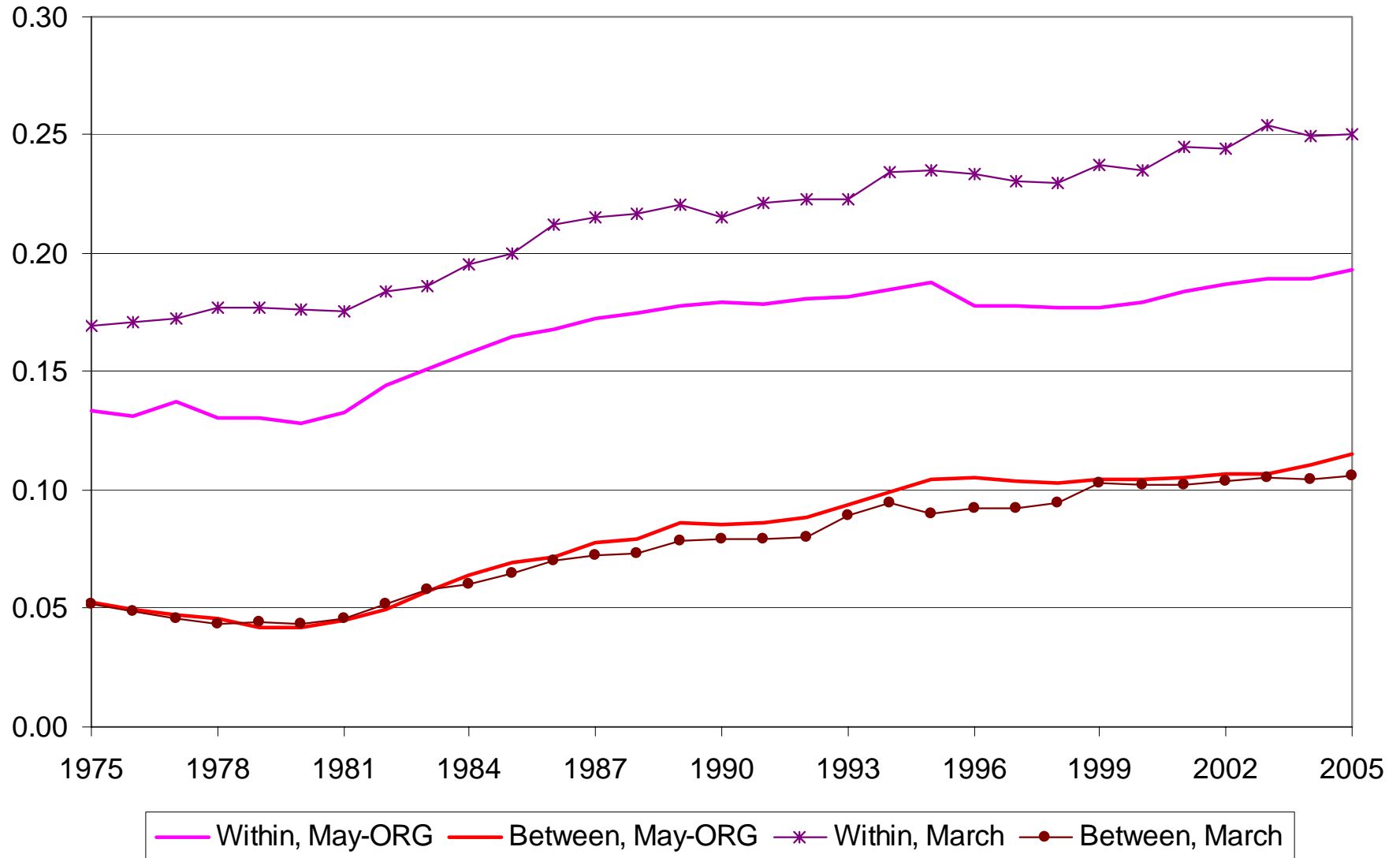
Figure 13a: Top-coding Adjustments in March CPS, Men

Legend:
- Within, 1.4 factor
- Between, 1.4 factor
- Within, unadjusted
- Between, unadjusted
- Within, stochastic
- Between, stochastic
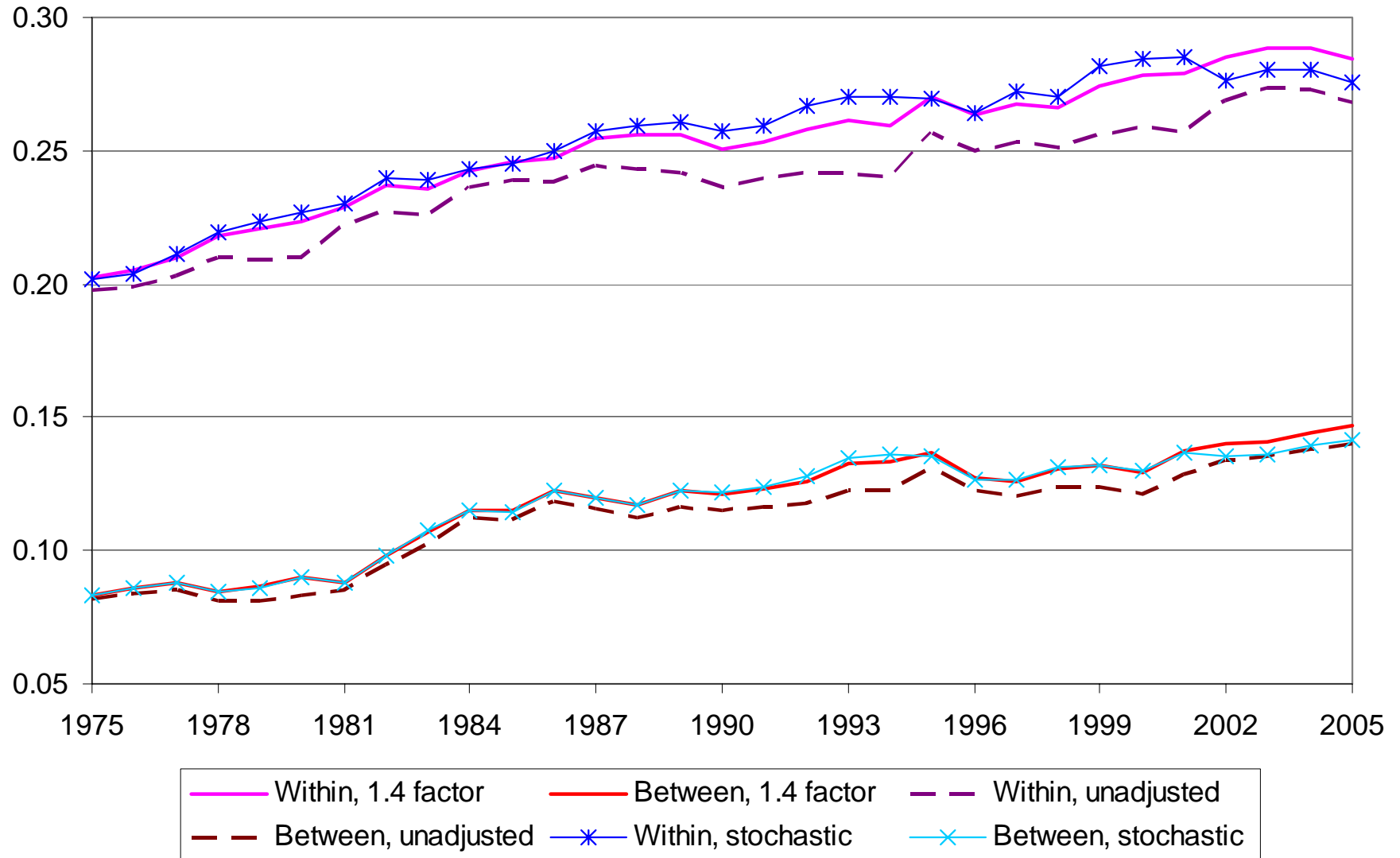
Main findings

- Evidence for between-group variance/wage differentials extremely robust to these measurement issues
- Main difficulty is the difference in the level and trend in within-group inequality between May-ORG and March CPS
  - Level differences well explained by noisy measurement of hourly wage for workers paid by the hour in the March CPS
  - Trend differences a bit of a mistery
- Should not based too much of proposed explanations on the within component

What is to be explained

- No longer clear that within-group inequality grew in the 1970s: Problem for JMP story?

- Major slowdown in inequality growth in the 1990s/2000s, but inequality still growing at the top-end

- What is so special about post-secondary education?

- Why such an explosion in earnings at the very top-end?

Within-inequality in the 1970s: Problem for JMP?

- Not really: if unobservable ability and education are close substitutes the various "prices" should move in tandem
- Offsetting factors at play: e.g. growing minimum wage for women
- Does not really cause problems for the basic supply and demand story
- But makes the "episodic" nature of the growth in inequality (1980s) more salient

Top-end vs low-end inequality 1

- Autor and co-authors: computerization mostly negatively affects "routine" but often "skilled" tasks in the middle of the wage distribution

- Plausible but still needs further probing

  - Most of inequality growth concentrated in 1980s: do you need institutional factors (unions and minimum wages) to get this?

  - Direct evidence of wages impacts not quite there yet

Top-end vs. low-end inequality 2

- De-unionization does this too…

- Unions mostly move (for men) workers from lower middle to middle: 50-10 up, 90-50 down

- De-unionization can account for about 25% of the decline in 50-10 and growth in 90-50 since the late 1980s (Firpo, Fortin, Lemieux, 2007)

- Other changes in wage setting institutions (performance pay) also help explain some of the growth at the top-end (Lemieux, MacLeod, and Parent, 2007)

What is so special about post-secondary education?

- Provides you with cognitive/non-routine skills?

- Stagnation/low growth in supply for men?

- Elasticity of substitution low are higher level, high at lower levels? Plausible for highly specialized post-graduate degrees?

Stunning growth at the real top end

- Unfortunately CPS/Census not too useful because of top-coding

- PSID not top-coded but too small

- Tax data is great but little demographics, in particular education

- March CPS now collects non-topcoded earnings? If so progress could be made using master data.