

# **A Nonparametric Examination of the Prices Low-Income Students Face and the Payment Strategies They Utilize.**

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# Motivation

- ▶ Limited evidence on how tuition and financial aid trends varied by a student's financial resources.
- ▶ Underutilization of NPSAS data.
- ▶ Reliance upon comparisons of mean trends across three student groups.

# Overview

- ▶ Thorough analysis of how financial aid varies by the financial resources of the student.
- ▶ I use all six years of NPSAS data: 1986/87, 1989/90, 1992/93, 1995/96, 1999/00, and 2004/05.
- ▶ I use nonparametric regression techniques.

# Overview: Variables of Interest

- ▶ Tuition & Fees, Other Costs, Total Costs, Net Tuition & Fees, Net Costs.
- ▶ Total Grants, Total Loans, Total Work Study.
- ▶ Grants: Federal, State, Institutional, Other, Pell, SEOG.
- ▶ Loans: Stafford Subsidized, Stafford Unsubsidized, Perkins.
- ▶ Family Income, Expected Family Contribution.

# Overview: Sample

- ▶ Full-time, full-year dependent undergraduates who only attend one institution during the academic year.
  - Restriction made for simplicity.
- ▶ Sample size: Between 14,007 and 23,611 students each year.

# Preparing NPSAS data

- ▶ Goal: Comparability across years
  - Approach #1: Review variable documentation in ECBWs and adjust variables to create comparability.
  - Approach #2: Obtain revised variables from the DAS system and merge those variables with the restricted-use data.

# Integrating DAS Variables

- ▶ Review DAS for any new variables.
- ▶ For old variables, compare means from restricted-use CDs with means from the DAS system to identify updated variables.
- ▶ Request the new and updated variables from NCES.

# DAS Use Across NPSAS Years

- ▶ 100% of variables from NPSAS:87 are from the DAS system.
- ▶ 100% of variables from NPSAS:00 and NPSAS:04 are from the original restricted-use data set.
- ▶ In other NPSAS years (90, 93, 96), some variables are from the DAS system and some are from the original restricted-use data.



# Mean Trends

- ▶ Steady growth in tuition and fees throughout the period.
- ▶ Growth in grants with the largest increases occurring for institutional grants.
- ▶ Even faster growth in loans due to the introduction of the unsubsidized Stafford loan in the early 1990s.

# Measuring the Financial Resources of Students

- ▶ Changes in the formula for Expected Family Contribution (EFC) complicate comparisons across time.
- ▶ Consequently, family income is used.

# Nonparametric Regression I

- ▶ Past work simply compared means across three or four different income groups.
- ▶ Regression analysis does not require such groupings, but the most commonly-used regression models utilize a specific functional form when describing relationships.
- ▶ Nonparametric regression models allow data to characterize their own shape.

# Nonparametric Regression II

- ▶ Local linear regression is the most common nonparametric approach.
  - Estimates separate kernel regressions for a number of different values of parental income.
  - Kernel regressions are essentially weighted least squares regression where data points further away from the particular value of parental income receive less weight than closer data points.

Figure 1: 1986/87 and 2003/04 Tuition and Fees

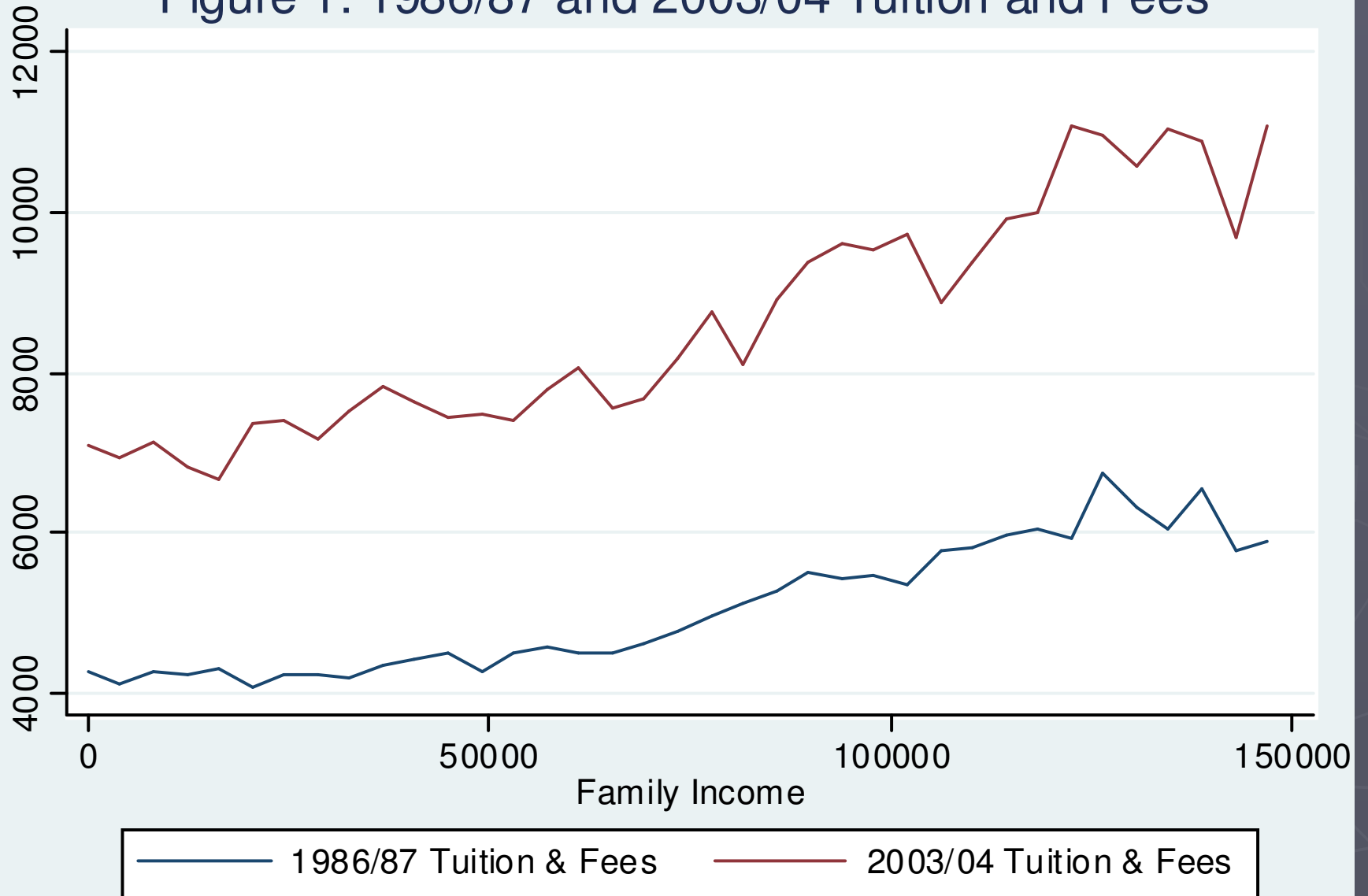
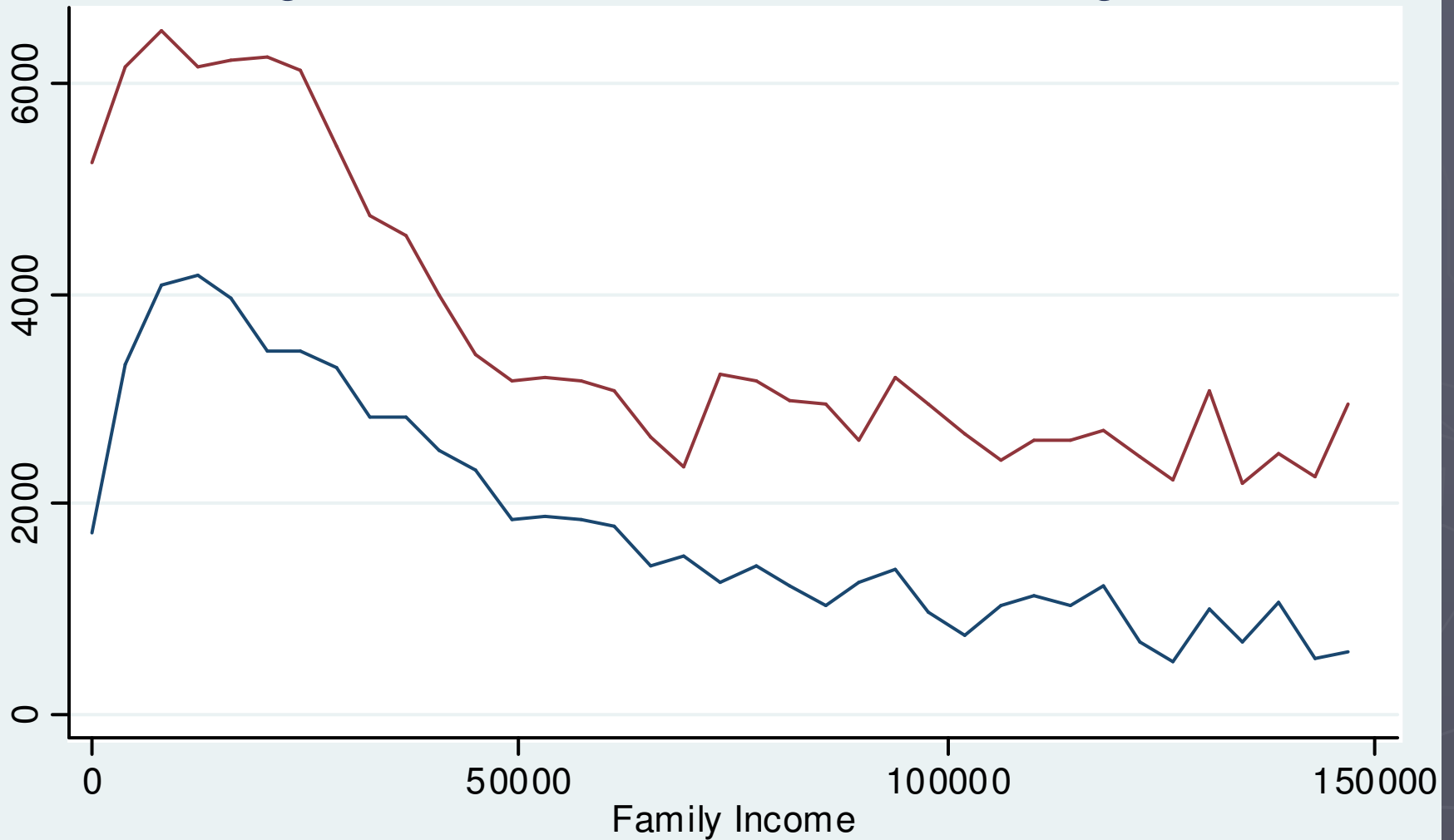


Figure 2: 1986/87 and 2003/04 Total grants



— 1986/87 Total Grants      — 2003/04 Total Grants

Figure 3: 1986/87 and 2003/04 Federal grants

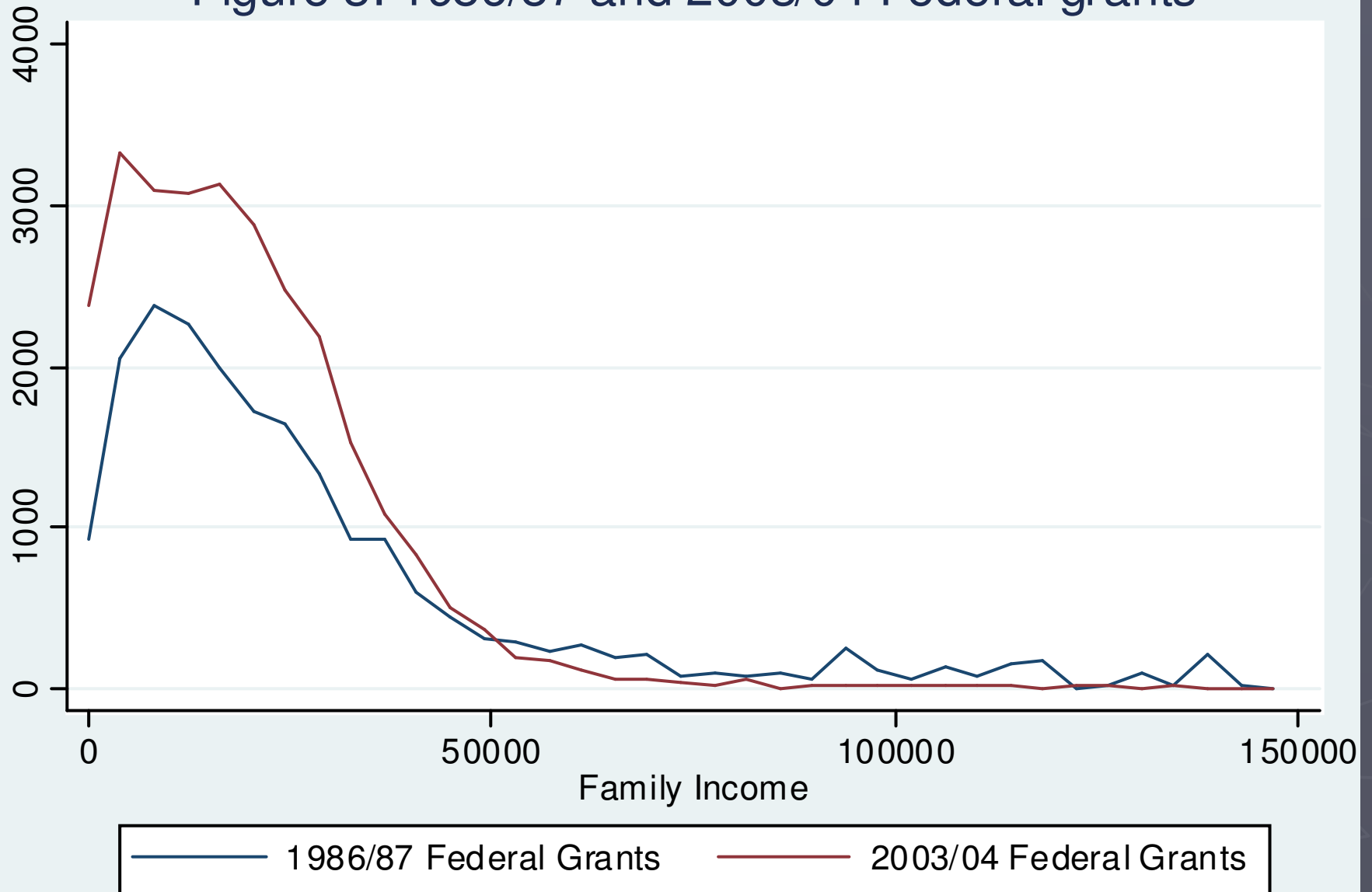


Figure 4: 1989/90 and 2003/04 Federal grants

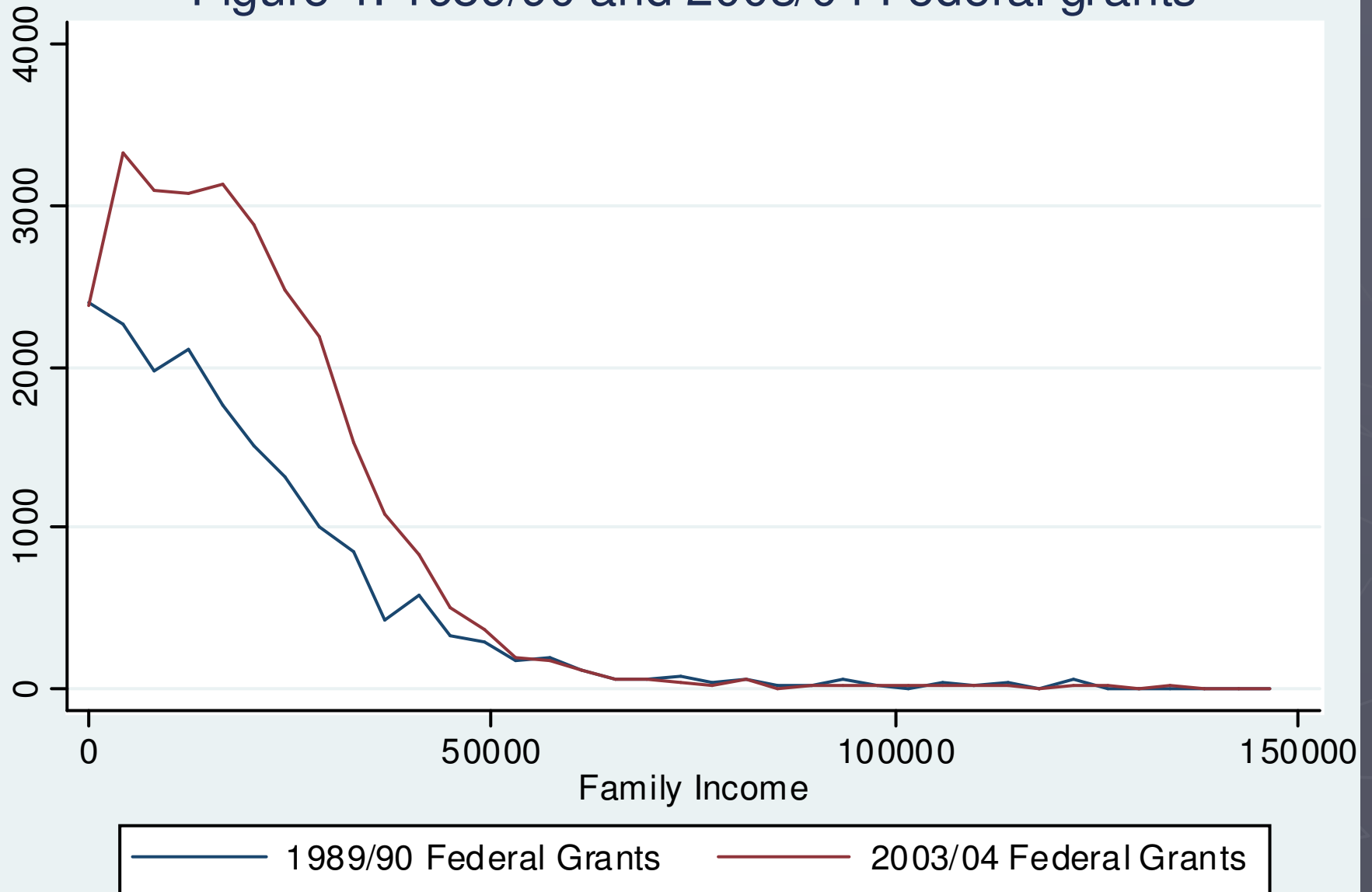
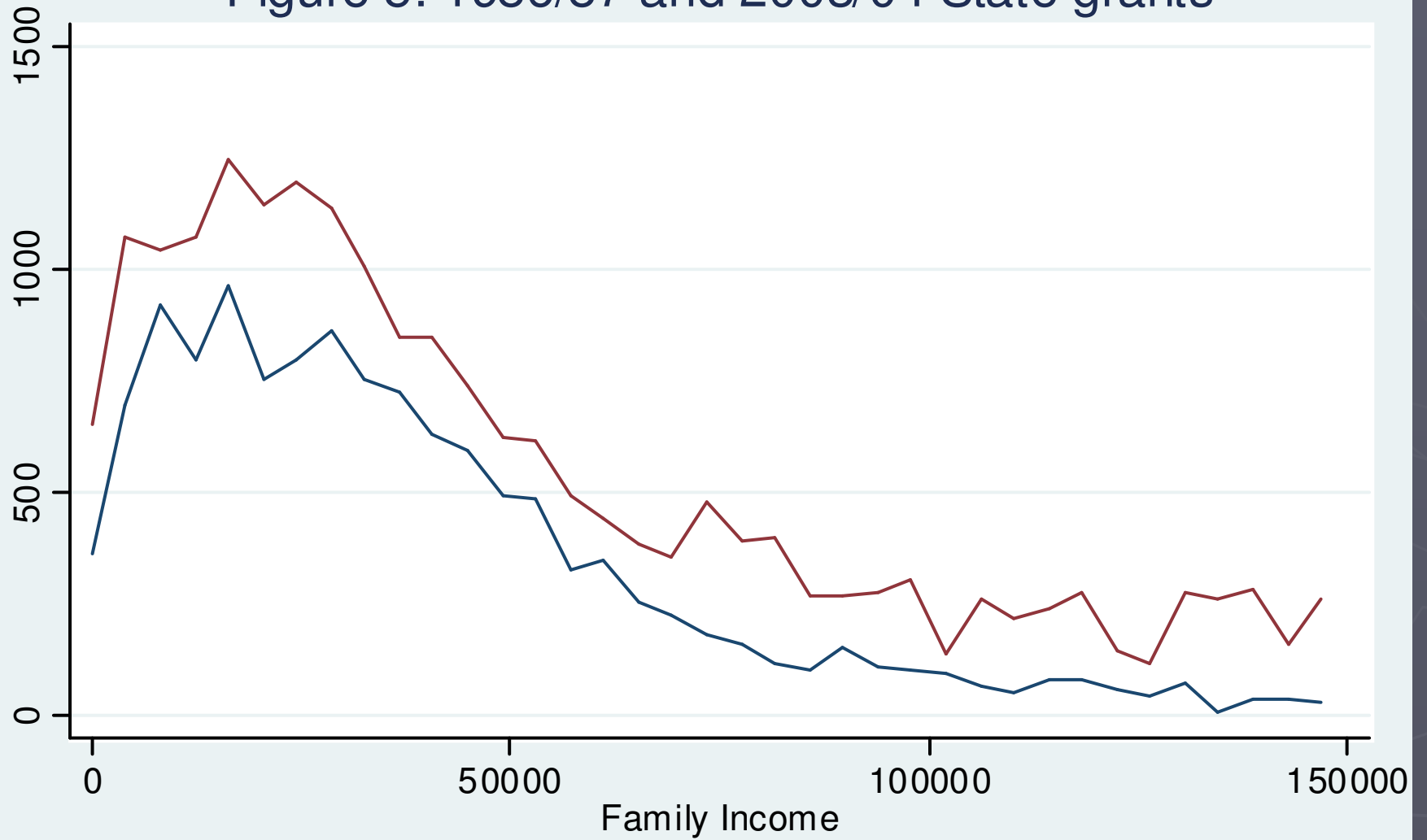




Figure 5: 1986/87 and 2003/04 State grants



— 1986/87 State Grants      — 2003/04 State Grants

Figure 6: 1992/93 and 2003/04 State grants



Figure 7: 1986/87 and 2003/04 Institutional grants



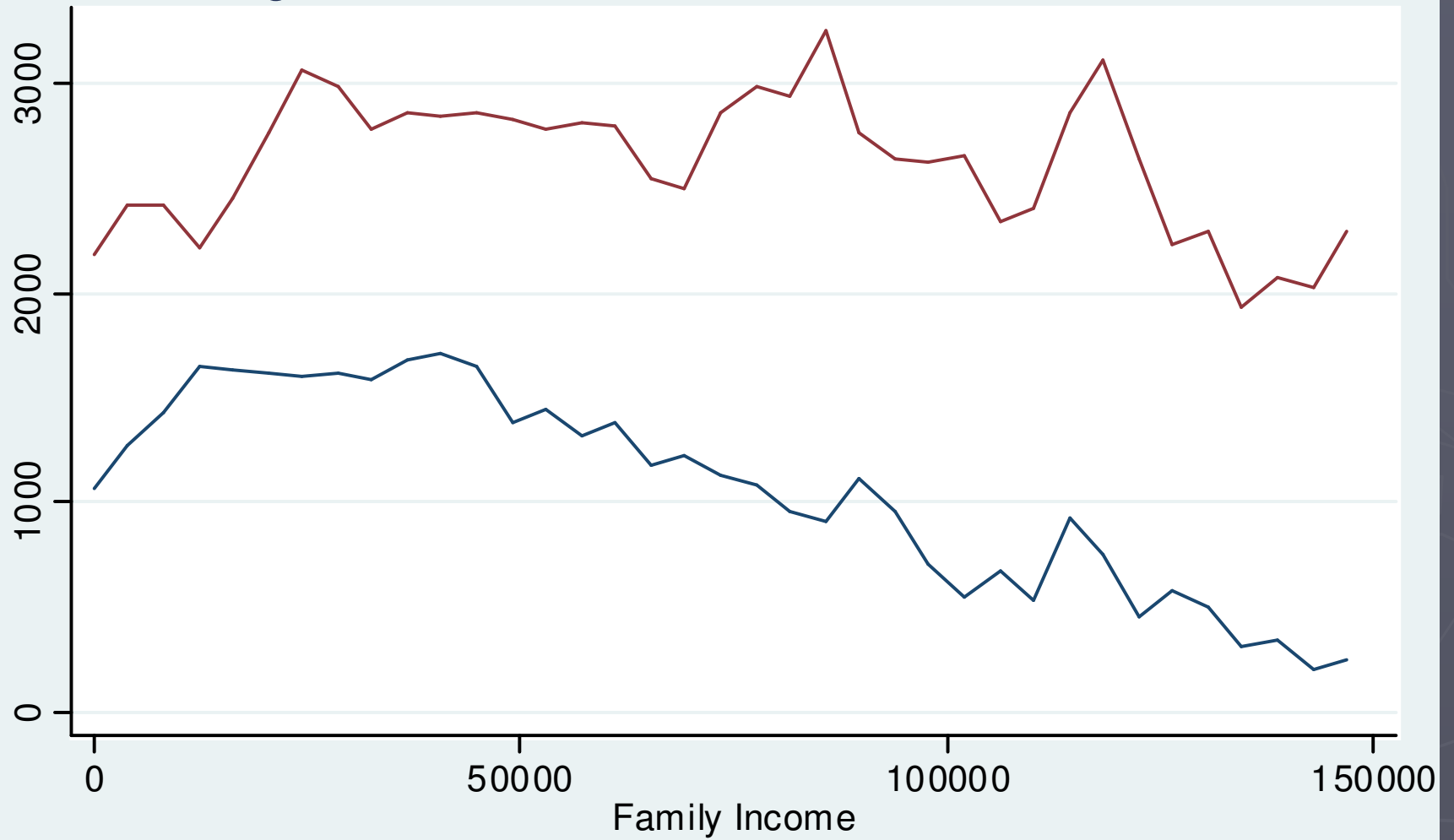
Figure 8: 1989/90 and 2003/04 Institutional grants



Figure 9: 1995/96 and 1999/00 Institutional grants

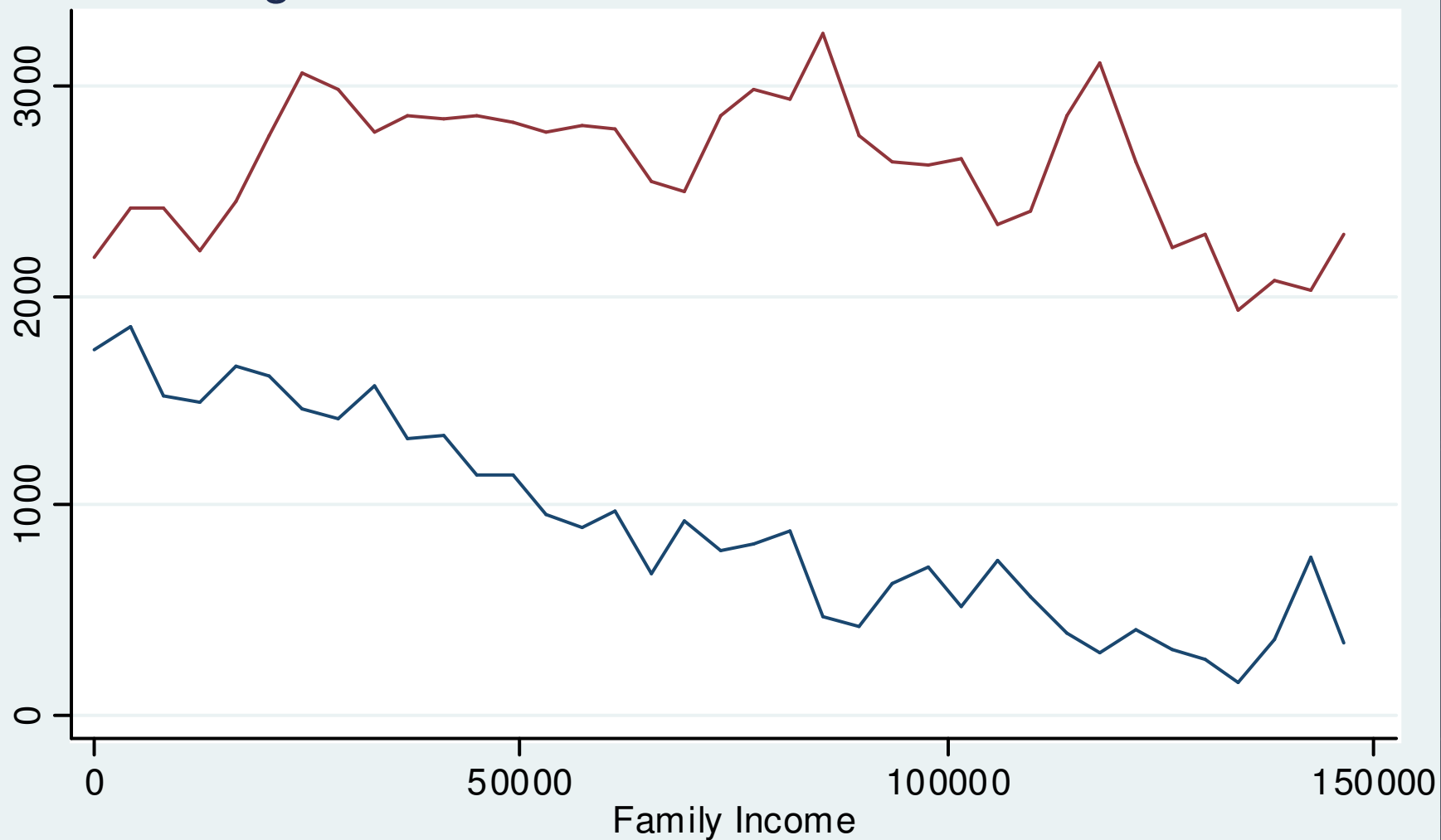


Figure 10: 1986/87 and 2003/04 Total Loans



— 1986/87 Total Loans — 2003/04 Total Loans

Figure 11: 1989/90 and 2003/04 Total Loans



— 1980/90 Total Loans      — 2003/04 Total Loans

Figure 12: 1986/87 and 2003/04 Total Subs. Stafford Loans





Figure 13: 1989/90 and 2003/04 Stafford Unsubs. Loans



# Conclusion I

- ▶ Tuition and fees have steadily risen across the distribution of parental income.
- ▶ Federal grant aid has remained concentrated on low-income students.
  - Surprise?: The same is roughly true for state grant aid.
- ▶ Institutional aid has grown more among students with higher levels of parental income, especially during the late 1990s.

# Conclusion II

- ▶ Loan aid has grown substantially.
  - The growth has primarily occurred for students with parental incomes above \$60,000, due to the introduction of the Stafford unsubsidized loan.

# Future Research I

- ▶ Examination of part-time, part-year, and/or independent students.
- ▶ Examination of financial need.
  - Establishing comparability of EFC across time is needed.
- ▶ Analysis of tax credits.
  - NPSAS does not contain sound measures.

# Future Research II

- ▶ Simulations that compare alternative governmental or institutional policies.
- ▶ Examination of the role played by college choice.
- ▶ Treatment of NPSAS as an “institution-level” panel data set.