

What Factors Account for Increases and Decreases in Student Enrolment at Post-Secondary Institutions?

Overview

The purpose of this question scan was to determine the feasibility of conducting a systematic review of the literature devoted to identifying factors that account for increases and decreases in student enrolment in post-secondary institutions.

Searches applying a broad range of applicable search terms to four major databases initially yielded a total of 158 potentially relevant articles. Subsequent examination of article abstracts reduced this number to 105. A search of government and professional/sectoral organisation websites yielded an additional 2 documents.

Two major themes are revealed within the literature devoted to this question.

1. Labour market supply and demand effects on enrolment.
2. Socio-economic and financial effects on enrolment.

Included within the first theme are references to labour market fluctuations, increases and decreases in labour supply needs for certain fields such as technology or teaching, and general discussions of the skills requirements of a new, global economy.

Much literature devoted to the second theme examines fiscal factors affecting enrolment patterns. Most articles focus on the influences of: tuition fees; levels of financial aid and student debt; government funding to universities; and, students' socio-economic standing's mediation of the effects of government and university policies.

A third minor theme is demographic, for example (im)migration, ethno-cultural background, age and gender, effects on enrolment.

Observations

Quantitative: 45 articles- Included under this heading is any scholarly literature that marshals statistical evidence to make its case. These articles include experimental, quasi-experimental and large scale descriptive studies (surveys and questionnaires).

Fiscal factors appear to be the major focus of these articles. Buss *et al.* (2004), Fitzgerald (2004), and Vasigh and Hamzasee (2004) identify the interacting influences among tuition, financial aid policies and students' socio-economic status. Buss *et al.* (2004) state that students who are more economically advantaged possess "tuition elasticity close to unity", meaning "a 1% increase in tuition will lead to about a 1% decrease in enrolment yield." However, the findings are much more extreme for students requiring financial assistance. Tuition and room and board costs show a greater negative effect on enrolment for more economically disadvantaged students, while grants and loans have a stronger positive effect. Likewise, Vasigh and Hamzasee (2004) examine tuition, income, financial aids and unemployment as factors which may affect enrolment. In the private university they studied, enrolment increased despite increases to tuition,

suggesting those who can most afford university do not seem to make enrolment decisions based on tuition costs.

A corollary of the tuition and student loan effect on enrolment is the effect of student debt. In *Rising Debt Hits Access Efforts*, Goddard (2000) suggests student debt deters enrolment of poorer students more than advantaged students. Millett (2003) reveals that “students with debts of \$5000 or more were significantly less likely to apply to graduate or first professional schools than their peers who did not have educational debt”.

Qualitative: 13 articles - Included under this heading are descriptive case studies, narratives and interviews, generally published in academic journals. Theoretical models, critiques and evaluations of programs, and non-statistical analyses are also included under this heading.

Most articles address the responsive relationship between the economy and labour market needs and enrolment in post secondary. The focus tends to be on the positive relationship between demand for people to fill high-level professional jobs such as those in technology and engineering, and enrolment in corresponding post-secondary disciplines. See for example, Eckstein *et al.* (1988) *University Policies Under Varying Market Conditions*; Esnault (1992) *From Higher Education to Employment*. Mangan (2002), *Professional-School Enrollments Boom as Many parts of the Economy Tank*, takes a slightly different approach. She explored workers’ enrolment into professional programs as a mean of upgrading and making themselves more marketable. Other articles attend to social factors affecting enrolment such as family income levels, academic achievement and ethnicity (Mooney, 1987; Grassmuck 1990).

Reports: 47 documents – These generally include government produced or government initiated studies regarding enrolment patterns, and discuss factors affecting enrolment in post-secondary.

Many reports examine the role of labour market supply and demand factors in post-secondary (Ludwig *et al.* 1986; Murray, 1985), while others evaluate and examine socio-economic influences on student enrolment patterns. For instance, *Economic Segregation of Higher Education Opportunity, 1973-2001* (2003), “describes the way higher education enrolments in U.S. colleges and universities are rapidly being sorted by family income and social class.” In *Changes in the Wage Structure, Family Income and Children’s Education* (2000), the authors state that the substantial enrolment increases that occurred between 1982 and 1992 were concentrated among students from upper income families, while enrolments by students from lower income families remained stagnant. Other articles examining the connection between enrolment and socio-economic (dis)advantage are Berkner and Chevez (1997), Braunstein *et al.* (1998), and Halstead (1998).

Grey Literature: 2 documents- Grey literature includes documents located on Canadian government, professional, trade and student organization websites devoted to post-secondary education, and may subsume any of the above genres.

O’Heron (1997) attempts to explain why, after 1993, Canadian post-secondary enrolment “levelled off.” He begins by “exploring the factors that influence demand for a university education.” Spencer (2001) examines the problematic supply and demand situation facing the Ontario university system in terms of the demands placed on it by the incoming “baby boom echo” generation, and the large numbers of retiring faculty.

Further pervasive themes

Many of the themes mentioned above crosscut the genres. Other as yet unmentioned factors identified as influencing enrolment include:

- The role of government funding to universities and overall costs of post-secondary education (Oulton, 1995; Berger & Kostal, 2002; Council of Ontario Universities, 1999; Finn, 1989; Cochran et al, 2000);
- Immigration and migration (Ellois & Mulvey, 1994);
- Ethno-cultural background (Nova Southeastern University, 2001; Ludwig *et al.*, 1986; Grubb, 1986);
- Gender (Grubb, 1985);
- Age (Ludwig et al, 1986);
- Rural/Urban dynamics (Conlon & Kirby, 2005); and,
- Changes to the value that society places on education (Giroux, 2004).

Summary

There is a substantive amount of empirical work devoted to analyzing factors which influence increases or decreases in post-secondary enrolment. In general, these findings suggest that present economies, labour demands, government student aid policies, and university tuition fees play major roles in effecting enrolments. Furthermore, the research appears to support the suggestion that students who are most economically disadvantaged are also those who are most affected by tuition costs and student financial aid policies.

Feasibility

The volume and diversity of the empirical literature in this domain is sufficient to warrant a systematic review of the literature. It is estimated that such a review can be undertaken in approximately 1 person month at an approximate cost of \$6500.

Appendix A: Included References

References - Canada

Conlon, Michael, & Kirby, Dale. (2005). Comparing the Economic Experiences of Rural and Urban University Students. *Alberta Journal of Educational Research*, 51(1), 4.

A 1998 postsecondary indicators document published by the Government of Newfoundland and Labrador reported that most postsecondary-bound high school graduates from the province's most populous region, the Avalon Peninsula, attended the province's only university (Newfoundland and Labrador, 1998). The main campus of Memorial University of Newfoundland also happens to be located in this region of the province. In contrast, most postsecondary students from the rural regions of the province were attending the province's public college rather than the university. Annual reports of first year student performance issued by Memorial University of Newfoundland have consistently shown that students from urban backgrounds obtain significantly higher first-semester averages than students of rural origin (Memorial University of Newfoundland, 1996, 1997, 1998, 1999, 2000, 2001). It is also important to note that the new matriculants from rural backgrounds at Memorial University of Newfoundland consistently perform at a lower academic level during their first semester although as a group they have higher high school averages than their urban peers. The lower academic performance of first-year rural students at the university suggests that they will experience difficulties in competing on a level playing field with urban students. Not surprisingly, the student attrition rate is also higher for rural students than for urban students. Both the Canada Student Loans Program and the Newfoundland Student Loans Program were developed in keeping with the philosophy that student financial need should not be a barrier to Canadian students wishing to enroll in postsecondary studies. In the light of this and the findings of the current study, which has highlighted the significant financial disparity between university students from the rural and urban regions of Newfoundland and Labrador, it is reasonable to suggest that students in rural parts of the province are more likely to be disadvantaged by government's existing financial assistance policies. In comparison with the urban students in this study, the heightened prospect of debt accumulation for rural students may deter them from undertaking university studies. Indeed statistics have shown that residents of rural areas of Newfoundland and Labrador are more likely to enroll at one of the campuses of the province's public college rather than attend Memorial University (Newfoundland and Labrador, 1998). If they do decide to attend university, students in rural Newfoundland and Labrador are more likely to borrow and face the prospect of a debt repayment period following graduation because their financial needs are greater. From a policy standpoint, additional financial aid measures might partly ameliorate the disparate financial situation confronting Newfoundland and Labrador's rural students. In keeping with the intention of the government student assistance programs, such measures could help to ensure that financial need is in fact not a barrier to university study for all students in Newfoundland and Labrador. Targeted postsecondary grants for high-need rural students could ensure greater equality of opportunity for both rural and urban students to undertake university

studies. The allocation of these grants could be easily integrated into government's existing loan eligibility assessment processes. Alternatively, if grants are not the preferred mechanism for providing additional non-repayable financial assistance to rural students, government could investigate the possibility of providing additional debt relief for students of rural origin. Another possible route for addressing the needs of rural students is for government to amend its current student loan assessment and eligibility policies in order to take into account the higher costs that must be incurred by rural students.

Council of Ontario Universities, Toronto. (1999). *Ontario Universities - 1998: Resource Document* No. COU628). Canada; Ontario: Council of Ontario Universities.

This report on the financial status of Ontario (Canada) universities notes that Ontario's universities continue to receive less than universities in any other Canadian province in per capita funding and have had the largest two-year decline in public funding of any jurisdiction in Canada or the United States. It notes that although total operating grants increased by 4.2 percent in 1998-99, these additional funds were generally restricted to specific new initiatives. The two most notable of these were approximately \$35 million for an Access to Opportunities Program designed to increase enrollment in high-demand computing and engineering programs, and \$10 million for a Fair Funding Grant to address an historic funding inequity. The report also notes that Ontario universities are now entering a decade in which substantial growth in enrollment demand is expected. Following a section of highlights, the report presents tables and graphs detailing financial information in the following areas: (1) grants and revenue Ontario; (2) grants and revenue inter-jurisdictional comparisons; (3) comparisons with other sectors; (4) research support; (5) tuition fees; (6) student financial assistance; (7) university infrastructure; (8) faculty and staff; and (9) education and the job market. Seven appendices provide additional tables including various price indexes and explanations of methodology.

Giroux, J. R. (2004). Enrolment Demand Versus Accessibility at Canada's Universities. *The Canadian Journal of Higher Education*, 34(1), 83.

University participation rates also will continue to be influenced significantly by the growth of the knowledge economy and its emphasis on highly qualified professionals. Canadians have recognized and are increasingly responsive to these labour market signals. Similarly, participation rates are affected by Canadians' assessment of the value of a university education. While there is clearly concern about the growing costs of university, polls confirm that the public continues to believe in the value of the experience. For example, in a recent poll conducted for AUCC by Ekos Research Associates, 78 percent of respondents felt a university degree improves one's personal growth and quality of life, while 82 percent said it improves lifetime earnings and career advancement opportunities (AUCC, 2004). These beliefs are not misplaced: an AUCC analysis of the 2001 Census data reveals that a typical university graduate will earn, on average, \$1 million more over the course of his or her career compared to an individual with no postsecondary education. It is now time, and equally essential, that the educational mission of our universities be similarly revitalized. Institutional capacity -- universities' ability to

accept more students and offer them a quality educational experience -- must be increased. But the issue is not just one of capacity, but also of accessibility. Universities need to have the resources necessary not just to respond to growing enrolment demand, but to ensure that Canadians from all walks of life have equitable access to a university education. We anticipate that during the next decade students from lower income backgrounds and other traditionally disadvantaged groups will increasingly seek the economic and social advantage that a university education affords. If universities are to ensure that there is a place for these individuals, they must have the capacity to accept and support them. There are two components to the capacity challenge that universities face in responding to growing demand. First, universities need more teachers. Second, they need more classroom and laboratory space. AUCC estimates that universities will need to hire almost 40,000 new faculty members by 2011 (AUCC, 2002). This is made up of at least 10,000 more faculty members to respond to the enrolment growth we expect. An additional 20,000 faculty will be needed to replace those who will leave the system, mainly due to retirement, but also through simple attrition. And universities will need to find up to 10,000 more faculty members to meet the growing demand for university research and to improve the quality of the educational and research experiences of those who will attend university in the coming years.

Press, H. L. (1990). *Toward 2000. Trends Report II: Elementary-Secondary Projections*. Canada; Newfoundland:

Comprehensive, systematic planning provides the overall direction for education through the development of policies and objectives. An understanding of demographic, social, and economic trends is necessary for educators to make decisions for the future. The 1986 demographic forecasts for the province of Newfoundland are updated in this report, which focuses on the changing character of the teacher work force, the current status of teacher supply, and the future demand for teachers. Population and enrollment trends of the last 20 years are analyzed to make education projections. Demographic and economic trends suggest that the province will experience a period of contraction in education in the 1990s. Although a decline in population will accompany a decline in the teacher work force, the likely outcome is a general teacher surplus with a marginal shortage in some areas. Viewing teacher supply and demand as a single entity is therefore counterproductive. Recommendations are offered for coping with problems associated with the aging of the teacher work force. The report contains 32 tables and 16 figures based on the Department of Education's computerized databases. Appendices describe the general methodologies employed in the study as well as the survey instruments used to assess demand for various teaching and administrative positions and to measure teacher hirings and vacancies.

References - USA

Economic Segregation of Higher Education Opportunity, 1973 to 2001.(2003).

Postsecondary Education Opportunity, (136).

The first report in this issue, "Economic Segregation of Higher Education Opportunity 1973 to 2001," describes the way higher education enrollments in U.S. colleges and universities are rapidly being sorted by family income and social class. Students born into different economic class backgrounds are increasingly concentrated in distinct segments of the higher education system, with students from low and lower middle income families concentrated in 2-year colleges, especially public 2-year colleges, and students from upper middle and higher income families concentrated in 4-year colleges. This analysis focuses on these changing enrollment patterns by looking at recipients of federal Pell Grants. The second report, "Admissions Selectivity of 4-Year Colleges and Universities 1986 to 2003," discusses a shift in from expanding higher education opportunity to redistributing it that is occurring in 4-year colleges and universities. Both public and private 4-year colleges and universities have grown more selective between 1986 and 2003, but they have done so in a growing market with increasing numbers of high school graduates to choose among. In the long run, the growing divergence between changing demographics and growing labor market needs for better trained workers will have consequences. Some are already evident: the rapid growth of proprietary education and the erosion of world leadership in college participation rates. More will appear in the future.

Acemoglu, D., & Pischke, J. (2000). *Changes in the Wage Structure, Family Income, and Children's Education*. U.S.; Illinois.

This paper examines changes in the distribution of family income over 30 years, estimating the effect of parental resources on college education, and noting the fact that families at the bottom of the income distribution were much poorer in the 1990s than the 1970s, while the opposite was true for families in the top quartile. Data came from three longitudinal surveys of high school graduates during the 1970s-90s. Each survey examined parent educational background and family income during the senior year of high school. Follow-up information was collected 2 years after respondents' senior year of high school. This provided information on college attendance. There was little increase in the percentage of students attending four-year colleges between 1972-82. Between 1982-92, there was a substantial increase, though it was concentrated among children in the upper two quartiles. Family incomes only rose for families in the top quartile during the study period. They stagnated for the middle two quartiles and fell slightly for the lowest quartile. Income substantially affected enrollment. There was a much weaker contrast across quartiles when examining the percentage ever attending any college (versus those attending a four-year college).

Acemoglu, D., & Pischke, J. (2000). *Changes in the Wage Structure, Family Income, and Children's Education*. U.S.; Illinois.

This paper examines changes in the distribution of family income over 30 years,

estimating the effect of parental resources on college education, and noting the fact that families at the bottom of the income distribution were much poorer in the 1990s than the 1970s, while the opposite was true for families in the top quartile. Data came from three longitudinal surveys of high school graduates during the 1970s-90s. Each survey examined parent educational background and family income during the senior year of high school. Follow-up information was collected 2 years after respondents' senior year of high school. This provided information on college attendance. There was little increase in the percentage of students attending four-year colleges between 1972-82. Between 1982-92, there was a substantial increase, though it was concentrated among children in the upper two quartiles. Family incomes only rose for families in the top quartile during the study period. They stagnated for the middle two quartiles and fell slightly for the lowest quartile. Income substantially affected enrollment. There was a much weaker contrast across quartiles when examining the percentage ever attending any college (versus those attending a four-year college).

Alva, J. K. (2000). Remaking the academy. *EDUCAUSE Review*, 35(2), 32.

Higher education around the world must undergo a dramatic makeover if it expects to educate a workforce in profound transformation. In the forty years between 1950 and 1991, the percentage of skilled workers in the workforce increased by 25%. Yet this unprecedented feat in economic history is expected to be nearly duplicated in the same years between 1991 and 2000, when the same sector of skilled workers is projected to increase by 20%. This dramatic upheaval in the labor force and, therefore, in its educational and training needs reflects the great shift that has taken place in the corporate world: from an overwhelming reliance on physical capital, fueled by financial capital, to an unprecedented focus on human capital as the primary productive asset. Not surprisingly, a new education paradigm has arisen to fit the needs of the progressively more knowledge-based economy.

Asteriou, D., & Agiomirgianakis, G. M. (2001). Human capital and economic growth: Time series evidence from Greece. *Journal of Policy Modeling*, 23(5), 481.

The relationship between human capital and economic development in Greece is examined. Assuming that the principal institutional mechanism for developing human skills is the formal education, the long-run relationship between educational variables and gross domestic product (GDP), as well as the causal direction between them, are examined. There exists a cointegrating relationship between education as measured by enrollments rates in primary, secondary, and higher education and the GDP per capita while causality runs through educational variables to economic growth, with the exception of higher education where there exists reverse causality.

Baum, S. R. (1994). Financing Liberal Education in America: Public and Private Responsibilities. *New Directions for Higher Education*, (85), 101-106.

This commentary on McPherson (HE 534 036) argues that the affluent are being subsidized too heavily by current financing schemes, resulting in enrollment trends that favor middle- and especially upper-income students attending college, and

exclude lower-income students. Higher income families should bear more of the cost of higher education, with greater assistance provided to those with lower incomes.

Berger, M. C., & Kostal, T. (2002). Financial Resources, Regulation, and Enrollment in US Public Higher Education. *Economics of Education Review*, 21(2), 101-10.

While total financial resources for higher education have been rising, there has been a significant shift in the share of resources coming from tuition and fees and a decline in the share coming from state appropriations. We seek to understand the enrollment consequences of this shift and to explore policy options using the results of a two-stage least-squares model of the demand for and supply of enrollment in public higher education. We estimate the model using 1990-95 data for the 48 continental US states. Tuition, average wage levels, and average education levels significantly affect enrollment demand, while state appropriations, other revenue, number of institutions, and the level of regulation significantly affect enrollment supply. Our simulations of policy options illustrate the difficulty of maintaining enrollment levels in the face of tuition increases. If tuition continues to rise, states are faced with reducing supply through lower state appropriations, or attempting to maintain current supply by increasing the amount of regulation in higher education.

Berkner, L., & Chavez, L. (1997). *Access to Postsecondary Education for the 1992 High School Graduates. Postsecondary Education Descriptive Analysis Reports. Statistical Analysis Report No. NCES98105*. U.S.; District of Columbia: U.S. Government Printing Office.

This report uses data from the National Education Longitudinal Study of 1988 to examine 1992 high school graduates' access to postsecondary education in 1994, 2 years after high school graduation. An overview of the postsecondary enrollment rates of graduates by family income, race/ethnicity, and parental levels of education is followed by an analysis of the factors associated with the relatively low four-year college enrollment rates of Hispanic, black, and low-income students. The findings include: (1) the differences by income and race/ethnicity in the four-year enrollment rates of college-qualified high school graduates are eliminated among those students who have taken college entrance examinations and completed an admission application; (2) high school graduates with low-income parents are able to attend four-year colleges at the same rates as students from middle-income families, if the low income students follow the usual requirements for consideration and admission; (3) college-qualified low-income students, once accepted to four-year colleges, are as likely to enroll as middle- and high-income students; and (4) barriers to a four-year college education for low-income high school graduates appear to include low educational expectations and poor academic preparation. Appendix A is comprised of a glossary and Appendix B is comprised of technical notes and methodology.

Blau, J. R., McVeigh, R., & Land, K. C. (2000). The expansion of two-year colleges: a dynamic, multilevel model. *Community College Journal of Research and Practice*, 24(2), 127-143.

A study examined the expansion of two-year postsecondary schools between 1942 and 1970, the period of their post rapid growth. A dynamic, multilevel model is

proposed in order to distinguish the influence of variables derived from the three theoretical perspectives of organizational ecology, institutional theory, and political economy and state theory. Results indicated that the founding of two-year institutions was shaped by legitimization and competition processes and was responsive to levels of public demand. In addition, results demonstrated that the founding of two-year postsecondary schools was responsive to business elites, state affluence, the job creation and labor demands associated with a diverse economy, and Democratic Party pluralities.

Braunstein, A., Lesser, M., McGrath, M., & Pescatrice, D. (1998). *Measuring the Impact of Income and Financial Aid Offers on College Enrollment Decisions*. U.S.; New York:

A study at Iona College (New York) analyzed the impact of demographic, socioeconomic, and financial factors on the enrollment behavior of accepted college applicants. The data base consisted of observations on accepted applicants to the college for the 1991-92, 1993-94, and 1995-96 academic years and included 2,198, 2,553, and 2,353 students (respectively). Regression analysis of the data yielded the following results: (1) Upper income applicants were least likely to enroll; (2) based on SAT scores, Iona attracted better students in 1995-96 than in 1991-92; (3) for every \$1,000 increase in the amount of financial aid offered, the probability of enrollment increased between 1.1 and 2.5 percent; (4) while each \$1,000 increase in student loans raised the probability of enrollment to more than 5.0 percent, a similar increase in grant money enhanced enrollment prospects by only 3.0 percent; (5) financial aid solely in the form of work-study did not appear to entice prospective students, but, particularly in the latest period, work-study support did contribute to an attractive financial aid package when mixed with grants and loans; and (6) combinations of financial aid types must contain some grant money to be attractive to accepted applicants. Data tables for each cohort are included.

Bruce, G. D., Edgington, R., & Olkin, J. M. (2003). Apply & demand: How the economy affects graduates' career choices. *Selections*, 3(1), 5.

Many believe demand for the MBA degree runs counter to the economy. The economic downturn and spike in application volume last year seem to give credence to this theory, but do they really? Is the relationship between the economy and demand for an MBA really that simple? Those questions led to an examination of what influences student demand for the MBA degree, what attracts graduates to certain industries, and what effect the economy has on employers who hire new MBAs. It would be impossible to create an economic model to explain and project demand for the MBA degree on the part of students and the employers who hire them. A purely economic explanation would not account for the complex motivations of MBA students or their perceptions of the job market they will face when they complete their degrees.

Buss, C., Parker, J., & Rivenburg, J. (2004). Cost, Quality and Enrollment Demand at Liberal Arts Colleges. *Economics of Education Review*, 23(1), 57-65.

This paper examines the effects of cost, quality and macroeconomic factors on the

demand for higher education (represented by the share of admitted freshmen choosing to enroll) at a group of selective liberal arts colleges over the period from 1988 to 1998. Students are segregated by their financial-aid status with different demand equations estimated for each. Students who have no financial need or did not apply for aid are found to have a tuition elasticity close to unity, implying that a 1% increase in tuition will lead to about a 1% decrease in enrollment yield. The analysis of aid recipients suggests that both relative tuition and financial-aid levels play a significant role in determining the enrollment yield of a college. Tuition and room and board levels negatively affect the enrollment yield of this group of students, while grants and loans increase the likelihood of enrollment of admitted students. The evidence on the effects of school quality variables and macroeconomic factors is weak. There is some evidence that a higher ranking in the US News and World Report college guide increases yield, but specific quality measures such as SAT scores have little statistical significance.

California Community Colleges, Sacramento. Office of the Chancellor. (1986). *Study of Fee Impact: Progress Report*. U.S.; California:

In 1984, the California State Legislature enacted a mandatory enrollment fee and a new student financial aid program for California's community colleges. In 1986, a study was conducted to assess the fee's impact on student enrollments; ethnic and income distributions of students; distributions of full- and part-time students; changes in staffing requirements and administrative costs; the availability of federal, state, and other sources of financial aid to community college districts; and the administration and distribution of state financial aid. Study findings included the following: (1) the fee contributed to the 7% enrollment loss in 1984, a loss nearly twice that of community colleges across the country; (2) blacks were affected by the fee to a greater extent than other racial or ethnic groups, as evidenced by a 1984 enrollment decline of 18%; (3) enrollment losses were greatest in districts where residents reported the lowest household incomes; (4) on average, each college added 0.6 full-time equivalent staff to help administer the new fee; and (5) estimated costs of administering the fee were higher than the portion of the revenues allocated for this purpose. Appendixes provide data on the impact of the fee in relation to ethnic distribution of students, national enrollment trends and fees, distinct changes, student socioeconomics, and fee administration.

Coates, D., & Humphreys, B. R. (2002). The Supply of University Enrollments: University Administrators as Utility Maximizing Bureaucrats. *Public Choice*, 110(3-4), 365.

The supply of enrollments in higher education has received relatively little attention in both theoretical and empirical economic research. To address this, we formulate and test a model of the supply of enrollments in higher education in which administrators are modeled as utility maximizing bureaucrats. We find evidence that individual presidents and provosts have a significant effect on enrollment supply and faculty demand in a panel of eleven public colleges and universities in Maryland from 1988 to 1996, implying that institutions have enough market power to permit the preferences of administrators to influence enrollment supply and faculty demand.

Cochran, H. C., Jr, Hall, L. M., & Hodgin, G. L. (2000). *Innovative Approaches To Attract Majors in Economics*. U.S.; Tennessee.

Despite some recent reversals in enrollment trends, the number of baccalaureate degrees in Economics has declined substantially from the beginning of the 1990s. The combination of declining enrollments and the rising costs of higher education has placed pressure on Economics departments to increase their numbers, especially in upper-division courses. Consequently, Economics faculty must consider new ways of attracting students if the discipline is to remain a significant element of the university experience. This paper focuses on the intentional efforts of the part of the Economics program at Belmont University, Nashville, Tennessee, to implement a multidiscipline, multifaceted approach to curriculum and program development. These strategies seek, among other tactics, to overcome current enrollment and cost inefficiencies through program and course integration with a number of other disciplines within the social sciences and humanities. Appendixes describe the Bachelor of Science programs in International Economics, Political Economy, and Business Administration at Belmont University.

Colorado Commission on Higher Education, Denver. (1994). *Access to Success: Accommodating Student Enrollment Demand for Colorado Higher Education*. U.S.; Colorado.

This report examines the consequences of increased student demand for higher education in Colorado, in light of constrained resources for state-supported higher education, and offers strategies to address this demand. The report describes enrollment trends at Colorado colleges and universities, workforce training needs, and trends in state funding of higher education in Colorado. It argues that the state must solve this enrollment /funding dilemma in order to avoid enrollment limits, excessive tuition increases, erosion of educational quality, or damage to graduate education. It then discusses criteria for evaluating strategies that address the increasing demand for higher education. The report recommends that the state implement the following changes at the undergraduate level: (1) institutional productivity enhancements; (2) systemwide productivity measures; (3) flexible personnel, purchasing, contracting, and administrative procedures; (4) revenue enhancement measures; and (5) measures to increase institutional capacity.

Cooper, S. (2004). Does Education Matter? Myths about Education and Economic Growth. *Journal of Economic Education*, 35(1), 98.

Davis, G. W. (1995). Tuition and fee increases and community college enrollments. *Community College Journal of Research and Practice*, 19, 13-21.

An analysis of the relationship between tuition increases and enrollment trends at 39 of the 40 districts in Illinois is presented. The analysis suggests that the recent tuition increases are not responsible for the 1993 losses in statewide enrollments. It was found that a significant number of colleges actually had enrollment growth in a year when tuition fees rose. The same conclusion was reached when the evidence provided by lower-income groups was examined. Possible reasons for the enrollment decline in 1993-94 are that citizens are doubting whether college pays dividends,

more citizens are looking for full-time work, community colleges have reduced support services to students, community college efforts to improve transfer to universities may actually be moving students from community colleges to senior-level institutions, and recent initiatives have resulted in the elimination of small classes and their enrollments.

Ellis, S. D., & Mulvey, P. J. (1993). *Graduate Student Survey, 1991-92* No. AIPR20725). U.S.; New York: American Institute of Physics.

This report presents 1991-92 data on enrollment trends in graduate physics as well as the educational backgrounds of physics and astronomy students, the proportions in which they chose their research specialties, career opportunities in terms of employers, and work activities and starting salaries. Highlights from the report show the following: that foreign physics doctoral graduates increased from 420 to 650 between 1987 and 1992; that doctorate recipients of the class of 1992 faced such employment difficulties that 10 percent of them took part-time or temporary (non-postdoctoral) positions; and that the median salary paid to physics doctoral graduates who accepted permanent positions rose by 5 percent. Among the information revealed by the data are the following: (1) the characteristics of physics graduate students, (2) comparative data of the characteristics of U.S. minorities with those of foreign graduate physics students; (3) numbers of graduates by subfields; (4) distribution of subfield and citizenship of doctorate recipients; (5) initial employment of physics doctorate recipients by citizenship; (6) employment characteristics and use of physics training of 1991-92 master's degree recipients; (7) initial employment status for physics doctorate recipients, in the United States by major subfield, type of research, and citizenship; and (8) median and monthly starting salaries paid by U.S. employers to new physics doctorate recipients.

Finn, M. G. (1989). *Trends in Science and Engineering Education and the U.S. Labor Market. Background Paper No. 3*. U.S.; District of Columbia.

A search of literature was conducted to address whether and how the Federal Government should do more to encourage U.S. students to complete degrees, especially graduate degrees, in science and engineering. Science was defined to include all of natural science, including mathematics and computer science, but to exclude social and behavioral sciences. The study found that the number of U.S. citizens earning doctorates in science and engineering in 1987 was 9,724. This number is not enough to replace scientists and engineers who die or retire, but the number is greatly augmented by foreign residents who receive doctorates and remain in the United States. The level of science and engineering doctorate awards to U.S. citizens has been constant since 1976. Until now, the number of degrees awarded has usually been sufficient to meet employment needs, with the labor market expanding and contracting and student enrollments following suit, after a lag. However, although shortages are not widespread at present, there are general persistent shortages of personnel in computer science and engineering, and sometimes in mathematics and environmental and physical sciences. Federal intervention in the science and engineering job market can be made through graduate fellowships and traineeships, research assistanceships, forgivable loans, precollege programs, tax

incentives, undergraduate assistance, and employee educational assistance, but such intervention has both pros and cons.

Fitzgerald, B. K. (2004). Missed Opportunities: Has College Opportunity Fallen Victim to Policy Drift? *Change*, 36(4), 10-19.

An article presenting the findings of two recent reports, *Access Denied* and *Empty Promises*, which systematically evaluate the degree to which low- and moderate-income high school graduates can gain access to a four-year college and attain a bachelor's degree. Although college enrollment rates have increased for all income groups during the past three decades, it remains difficult to achieve progress toward closing the opportunity gap for low- and moderate-income families. Despite federal investments in student aid, as well as tax credits exceeding \$70 billion and state expenditures for institutions and students exceeding \$65 billion, recent changes in tuition and financial aid have created record high financial barriers that have prevented hundreds of thousands of college-qualified high school graduates from enrolling in college. The writer discusses the financial barriers that limit college opportunity for low- and moderate-income families, the policy drift that has produced these barriers, the implications of these trends for the U.S. economy and society, and the steps that might be taken to address these problems.

Florida Inst. of Education, Jacksonville., Florida State Dept. of Education, Tallahassee. Coll. Reach-Out Program. (1988). *The College Reach-Out Conference. A Summary of the Proceedings of the Annual Meeting (2nd, Orlando, Florida, May 4-6, 1988)*. 99.

The conference addressed a trend in the education of minority students in Florida and the nation. While high school graduation rates of minorities have increased, minority enrollment in postsecondary education has decreased. A statewide study of 811 randomly selected high school seniors was undertaken to identify variables which may influence a student's decision to attend college. The study appears in its entirety in this monograph and addresses such topics as: the relationship among variables like career aspirations, career goals, and aspiration to attend college; the relationship between variables related to family circumstances and aspiration toward college; and the relationship between gender and educational and academic variables. Discussion of the findings related to these topics served as the focal point for the conference. Study findings include the following: more than 70% of the respondents wanted to go to college, but only 31.9% of them applied; the vast majority of those surveyed believe college is necessary for success and want a good job in 5 years earning over \$20,000; and family circumstances were related to aspiration to attend college (students from families earning over \$20,000 per year tended to want to go to college more frequently). More majority students' fathers had gone to college, were in managerial or professional positions, and had a total family income of over \$20,000 per year. Almost identical numbers of minority and majority students applied for college.

Florida State Postsecondary Education Commission, Tallahassee. (1987). *Veterinary Medical Education in Florida. Report and Recommendations of the Postsecondary*

Education Planning Commission, Report No. 3, 1987. U.S.; Florida:

A report on veterinary medical education in Florida and the need for veterinary care in Florida is presented. Overviews of the veterinary profession and veterinary medical education are also given, including the areas of history, careers in the field, licensure, salaries, animal disease research, accreditation, curriculum, enrollment, educational contracts, and tuition and fees. Information on the labor market for veterinarians in the United States, the South, and Florida is presented. There is information on the University of Florida's veterinary education program, with attention to admissions, the curriculum, degrees, the veterinary medical teaching hospital and educational facilities, minority access and retention, faculty, and continuing education and extension services. Consideration is also given to the veterinary technician profession, earnings in private practice, the nature of veterinary technology education, and veterinary technology programs in Florida. The issue of the large number of veterinarians who are trained in foreign veterinary schools and who seek licensure by examination in Florida is also addressed.

Gill, J. I., & Alvarez de Testa Lilian. (1995). *Understanding the Differences: An Essay on Higher Education in Mexico and the United States. Comparative Report. A Working Paper Series on Higher Education in the U.S. and Mexico* No. WICHE2A265). U.S.; Colorado: Western Interstate Commission for Higher Education.

The goal of this comparative essay on higher education in Mexico and the United States is to provide a description of the common issues within the different contexts of each country to facilitate discussions of new binational programs. Government and business sectors of both countries have acknowledged the need to reform their education, scientific, and technological systems as well as workforce training capabilities. Factors contributing to the need for reform include: a perceived decline in educational quality; increasing enrollment demands; increasing social, economic, and skill diversity within the workforce; rapid advances in technology; and global economic competition. Both countries are seeking a balance in several areas including responding to individual needs versus societal needs, maintaining institutional autonomy while increasing accountability, improving program quality while opening access, addressing global concerns while maintaining national identity, balancing conflicting economic needs, reinventing the university, and developing innovative ways to collaborate between institutions and countries in a global context.

Grassmuck, K. (1990). Fewer Students from Middle Class Enrolling in College.

Chronicle of Higher Education, 37(11), A1,40.

Fewer students from families with moderate incomes are enrolling at colleges and universities with the drop greatest for highly selective private and public institutions. The trend may be a result of increasing costs of college attendance and of fewer numbers of families in the middle-income group.

Grubb, W. N. (1989). *The Causes and Consequences of Enrollments in Higher Education: Evidence From the National Longitudinal Study of the Class of 1972. Final Report.* U.S.; California:

An examination of the probability of enrolling in postsecondary education, the likelihood of completing various types of credentials, and the effects of these credentials on wage rates, earnings, and other adult outcomes was conducted using data derived from the National Longitudinal Study of the Class of 1972. The followup survey in 1986 suggested that while enrollment in postsecondary education has been stable, or in some cases increased, the probability of completing a B.A. degree declined. There was shown to be an increased tendency to drop out of postsecondary education, particularly among minority students. Finally, the study indicated that the rate at which adults are enrolling in higher education has apparently increased, but it was difficult to detect the benefits, either economic or non-economic, for this group. It is concluded that postsecondary education has failed to materialize the great promise of economic and other benefits historically assigned to getting advanced degrees, while higher education policy pretends that the postsecondary market works, with well-informed students facing a labor market that can absorb all its graduates. Includes supporting bibliography of 104 references.

Grubb, W. N., & Jaussaud, D. (1985). *Vocationalizing Higher Education: The Causes of Enrollment and Completion in Two-Year Colleges, 1970-1980*. U.S.; Texas: An analysis is provided of patterns of community college enrollments between 1970 and 1980, with particular emphasis on variations among the states in enrollment and completion rates. Section I looks at recent trends in community colleges, focusing on enrollment, numbers of degrees conferred, vocational enrollments, curriculum changes, and the effects of economic and labor market conditions. Section II identifies possible causes of enrollment patterns, focusing on demand-related factors, such as direct costs, high-status employment opportunities, and access; supply-related factors, including tax capacity, educational attainment levels, and migration; and demographic factors. Section III analyzes the relationship between the demand- and supply-related variables and community college enrollments, section IV looks at the interaction of two- and four-year college enrollments, and section V examines the determinants of degrees conferred. Finally, section VI draws conclusions, including the following: (1) community college enrollments were only weakly related to labor market conditions; (2) prospective students were more sensitive to direct costs than to the earnings benefits of attending community colleges; (3) the state's overall tax effort and the educational level of the population influenced community college enrollments; (4) enrollment patterns tended to perpetuate themselves over time, regardless of other economic or political conditions; (5) completion rates tended to be less responsive to economic conditions than enrollment rates; (6) states with high levels of four-year college enrollments tended to have lower two-year college enrollments; and (6) several economic variables, such as the earnings differentials associated with higher education and the opportunity cost of attending community college, were more significant influences among women than among men.

Halstead, K. (1998). *Tuition Fact Book 1998. A Compendium of Data and Analyses.*, Report: ISBN-1-883298-06-7. 152.
This report presents findings on the role of tuition in financing higher education and

as payment by students and parents. The content is organized into 11 chapters grouped into six parts. Part 1 is an enrollment profile of students who opt to attend college. Topics covered include starting conditions, such as student academic skills, family income, and place of residence; and enrollment (including enrollment of marginally qualified students) and persistence. Part 2 covers the value and cost of college attendance. Data tables illustrate how earnings increase with educational level and the range in student costs (by institution and by state). Part 3 examines changing affordability and institutional finances. Tables record the inflationary history of student charges, trends in public and private tuition affordability, and salary trends in selected occupations. Part 4 is on state policies and practices in pricing public higher education, including data on state differences in the role of tuition. Part 5 is on price and quality: its best college buys looks at the role of tuition at public and private research and doctorate universities, public and private master's universities, and bachelor colleges. Part 6 is on financing college costs, and it details trends in student financial aid, projection of student charges, and saving for college.

Hand, C. A., & Prather, J. E. (1987). *Predicting Institutional Choice: Patterns of Enrollment in the Higher Education Student Market*. U.S.; Georgia: Factors affecting college choice of beginning college freshmen were studied. The influence of academic background and performance of students residing in a metropolitan area was assessed from 1983 to 1986 with 33 institutions of a statewide university system. Using multivariate discriminant analysis, institutions attended were predicted using the following independent variables: Scholastic Aptitude Test verbal and mathematics scores, high school grade point average (GPA), and cumulative GPA. The analysis was performed for all students and for gender and minority status groups. For the sample of 187,923 students, it was possible to accurately predict college choice for 15% of the students, 16% for black females, 16% for black males, 14% for white females, and 17% for white males. The total structure coefficient from the discriminant analysis were similar across the five analyses. The findings support the conclusion that for students in general, institutional choice exhibits similar patterns across minority status and gender groupings.

Hardesty, L. L. (2002). Future of Academic/Research Librarians: A Period of Transition-To What? *Portal: Libraries and the Academy*, 2(1), 79-97. Analyzes available data to determine the validity of explanations offered for the shortage of qualified academic librarians. Highlights include recruiting academic/research librarians; library school enrollment trends; placement data; future possibilities; salary and working conditions; and professional issues.

Harrington, P. E., & Sum, A. M. (1988). Whatever Happened to the College Enrollment Crisis? *Academe*, 74(5), 17-22. The 1980s college enrollment crisis never materialized because demographics are not the sole determinant of enrollment trends. The actual employment and earnings experiences of graduates will heavily influence the economic well-being of most

postsecondary institutions. If private investment in postsecondary education remains high, enrollments will stabilize.

Hearn, J. C. (1988). Attendance at Higher-Cost Colleges: Ascribed, Socioeconomic, and Academic Influences on Student Enrollment Patterns. *Economics of Education Review*, 7(1), 65-76.

Socioeconomic and ascriptive factors clearly influence high school students' academic performance, which in turn influences eventual college choice. This study shows that the socio-economically disadvantaged who survive academically prior to high school graduation are attending colleges costing approximately the same as those of more advantaged students with similar talents and accomplishments.

Heller, D. E. (1998). *A Comparison of the Tuition Price and Financial Aid Responsiveness of First-Time Enrollees and Continuing College Students*. ASHE Annual Meeting Paper. U.S.; Michigan:

This study examined student price responsiveness by comparing the tuition and financial aid sensitivity of first-time college enrollees with that of continuing college students. Data were obtained from the National Center for Education Statistics Higher Education General Education Information Survey (HEGIS) and Integrated Postsecondary Education Data System (IPEDS) surveys for 1976 through 1994; Bureau of the Census and intercensal population estimates; annual surveys of tuition prices; surveys of state grant program expenditures; and Bureau of Labor Statistics. Cross-sectional and time-series econometric techniques revealed that for most racial groups and at most levels of public institutions, tuition price responsiveness was greater for continuing students than for first-time enrollees, with the largest difference in the community college sector. State grants appeared to help students attend college for the first time but were not as influential in the continuing enrollment of most groups of students. State grants appeared to be most influential in the first-time college attendance of Hispanic students, particularly those in community colleges.

Heller, D. E. (1996). *Rising Public Tuition Prices and Enrollment in Community Colleges and Four-Year Institutions*. ASHE Annual Meeting Paper. U.S.; Massachusetts:

This research examined the impact of state policies regarding tuition rates and financial aid budgets on access to public higher education. The study addressed two specific issues: (1) whether undergraduate enrollment rates of students in different racial groups changed during the period 1976-94, and (2) the impact of increased tuition at public colleges and universities on students of different races. The study first analyzed trends in public higher education enrollment rates, and then applied a fixed-effects model utilizing cross-sectional and time-series data. The study's conclusions, consistent with those of earlier studies, included the following: (1) community college students seem to be more sensitive to changes in need-based state funding than are four-year students, but the impact of changing economic conditions varies depending on the type of institution and (2) in four-year institutions, enrollment appears to be inversely related to unemployment rates, with the opposite being true in community colleges. Enrollment trend data are

summarized in text and 11 figures; additional tables and figures synthesize some of the model data. An appendix provides a list of Census Bureau regions.

Heller, D. E. (1996). *Tuition, Financial Aid, and Access to Public Higher Education: A Review of the Literature*. U.S.; Massachusetts:

This paper reviews the literature on the relationship between rising tuition and access to public higher education in the United States. It reviews research on the relationship between tuition and enrollment in higher education, noting that every study considered has found an inverse relationship between tuition and enrollment rates. The evidence suggests that a tuition rise of \$100 is consistent with a 0.5 to 1.0 percentage drop in enrollment. The paper also considers the relationship between financial aid and enrollment, noting that the findings in this area are more complex than in the area of tuition, with some studies finding some students less sensitive than others to increases or decreases in financial aid. It then examines the effects of tuition and financial aid on students of different incomes, races, and college sectors. These studies have indicated that lower-income, black, and community college students are more sensitive to changes in tuition and financial aid than their counterparts. Appendixes provide information on tuition and fees at public colleges and universities; summaries of the relationship between tuition, financial aid, and enrollment; and a summary of income, race, and sector effects.

Humphreys, B. R. (2000). Do business cycles affect state appropriations to higher education? *Southern Economic Journal*, 67(2), 398.

An analysis of state appropriations to higher education, enrollment in 2- and 4-year public colleges and universities, and state-specific measures of the business cycle for all 50 states over the period 1969-1994 shows that state appropriations to higher education are highly sensitive to changes in the business cycle. A 1% change in real per capita income was, on average, associated with a 1.39% change in real state appropriations per full-time equivalent student enrolled. This implied decline in state government funding, coupled with the increase in enrollment in higher education during recessions reported by Betts and McFarland (1995), suggest that public institutions of higher education may experience fiscal stress during economic downturns.

Jacobsen, R. K. (1996). A novel plan for putting higher-ed students first. *Puget Sound Business Journal*, , 1.

This winter, state lawmakers will attempt to address the impending crisis of shrinking college opportunities for young people and workers in need of retraining. Over the past several years, state support for higher education has taken up an increasingly smaller chunk of the state spending pie. If this trend continues, by the year 2010, nearly 84,000 Washington students who hope to earn a degree at one of our community colleges or four-year universities in our state will be unable to because of a lack of space and money. The coming millennium should breed the hope of higher earnings and wages, increased job opportunities, and technological innovation for the stewards of our state's bustling economy. Instead, it could sound the alarm for all Washington businesses, whether large or small, who depend on

bright, intelligent and creative workers. How lawmakers respond to this issue will determine whether we look to the future with hope or with dismay, as well-educated, qualified job applicants quite possibly could become our state's next endangered species.

Kao, J. (2004). Knowledge Economics in the Information Age.

While many economists and social scientists agreed that knowledge is important and the study of its influences upon the society and economy should be emphasized, limited research has been done on the economical impact of knowledge. By looking at the statistics and charts from various studies, the numbers tell us that the trend shifting the traditional industrial-based economy to a knowledge-based economy is inevitable. Hence, I focus my dissertation in finding: what is the relevance of knowledge capital and what are its economic implications to our society, and whether significant relationship between economic growth and knowledge capital investment can be found? In the theoretical part of my dissertation I established an overlapping generation model for the analysis of the knowledge capital accumulation and transfer. The model is intuitive; nevertheless, it suggests many important results that explain social economical phenomenon. Furthermore, I believe the model can be applied toward business organization to proxy the behavior of technological development investment decision making. The results of the model should provide insightful hints to academia and business for further research in the field of knowledge economics. In the empirical study part of my dissertation I found that there is a general decline in the enrollment rate of university level science and engineering (S&E) degree awarded decades in the United States, and the enrollment rate in the S&E displays a ten year cyclical pattern. This pattern can predict future trends in U.S. higher education and change in the economic structure. In addition, federal R&D spending has positive correlation with GDP growth, but non-federal R&D does not have significant correlation with GDP growth. The statistical data indicates that when economy grows more people will pursue Master's and Ph.D. level degrees. This suggests that in a highly developed economy, there is a higher demand for well-trained and highly-educated knowledge workers. Consequently, the increasing supply of knowledge workers in the total labor force shall push the economy more away from a traditional industrial-based economy to a knowledge-based economy.

Karger, H. J., & Stoesz, D. (2003). The Growth of Social Work Education Programs, 1985-1999: Its Impact on Economic and Educational Factors Related to the Profession of Social Work. *Journal of Social Work Education*, 39(2), 279-295.

Using a modified labor market analysis, examines the impact of growth of social work programs on educational standards, the human services labor market, and the salary structure of graduates. Suggests that a perceived surplus of social work education programs has been detrimental to the income potential of entry-level social workers, to the quality of social work education, and to the competence of the graduates of social work education programs.

King, J. (1993). The Demand for Higher Education in Puerto Rico. *Economics of Education Review*, 12(3), 257-65.

Enrollment models are estimated for three Puerto Rico university systems. The opportunity cost and benefit to education are both measured as expected wage rates, a formulation which appears appropriate given the island's historically high unemployment rates. From the consumption function literature support is found for short-term, rather than a future oriented, decision framework to underlie the models. The models also include variables to test a market segmentation hypothesis. The empirical estimates mostly have good statistical properties, and the hypothesis that the universities are not substitutes for one another is accepted. The study also replicates findings that explain student decisions to undertake higher education in terms of reward motivated behavior. The higher education demand function can be identified since universities in Puerto Rico generally finance their expansion by long-term loans and bond issues, rather than through tuition hikes.

LaFleur, R. A. (1985). 1984: Latin in the United States Twenty Years after the Fall. *Foreign Language Annals*, 18(4), 341-347.

Examines enrollment trends in high school and college Latin language and literature courses, as well as other indicators of interest in Latin. It is noted that the steady increase in enrollment since 1976 has resulted in a shortage of qualified Latin teachers. Measures are proposed for alleviating the teacher shortage problem.

Ludwig, M., & Others. (1986). *Public, Four-Year Colleges and Universities: A Healthy Enrollment Environment?*. U.S.; District of Columbia: American Association of State Colleges and Universities.

Enrollment patterns for campuses belonging to the American Association of State Colleges and Universities and the National Association of State Universities and Land-Grant Colleges are reported. A total of 473 colleges (85% response rate) provided estimates of enrollments expected for fall 1985. Attention is directed to enrollment trends for undergraduate and graduate students, first professional students, and first-time freshmen. Regional enrollment trends are also reported. Enrollment is analyzed in the context of other trends affecting higher education: an aging population, growth of minority groups, academic preparation of students for college, and employment patterns. Employment data for 1984-1985 are included on: the fast growing technician occupations for 1984-1985 (number of paralegal personnel, computer programmers, engineering, and medical records technicians); and number of teaching positions at the elementary, secondary, college, adult education, and vocation education levels. Trends in selected research occupations and professional fields are also reported. Another area of consideration is enrollment trends and conditions at historically public black colleges and universities that are members of the Office for the Advancement of Public Black Colleges. Data are reported for the total sample and for individual institutions.

Mazumder, B. (2003). Family Resources and College Enrollment. *Federal Reserve Bank of Chicago Economic Perspectives*, 27(4), 30-41.

This article reviews the literature on the effects of family income and tuition costs on

college enrollment and finds mixed evidence in support of tuition subsidies. The author also presents new evidence showing that college enrollment is especially sensitive to income for families with modest amounts of wealth, suggesting that borrowing constraints may be a factor in limiting access to higher education.

McIntyre, C. (1986). *Enrollment Trends: Preliminary Analysis of Fee Impact*. U.S.; California:

This two-part analysis of enrollment trends in California's community colleges focuses on general trends during the past decade and on enrollment in 1984 (i.e., the year that mandatory student enrollment fees were first implemented). Following background information on the implementation of the first-ever community college fee in California, the report assesses the general status of educational opportunity in the state, and reviews 1975-80 enrollment trends and trends seen during the 1980s. The next section of the report analyzes enrollment changes in 1984 and the impact of the new fee. Finally, policy implications related to fee changes, financial aid problems, employment and course scheduling conflicts, and losses in minority enrollments are discussed. Among the findings highlighted in the report are the following: (1) community college enrollments dropped by 7% in 1984 due to several factors, including the new enrollment fee, employment improvement, and declining numbers of high school graduates; (2) the new Board of Governor's financial aid program did not have the impact expected because of inadequate local staffing and complex application procedures; (3) enrollment increases were experienced in a few suburban and rural colleges, while the largest losses were reported in large urban districts; (4) students enrolled after the fee was imposed reported higher incomes than those enrolled prior to the imposition of the fee; and (5) disproportionate losses of Hispanics and younger Blacks appear to have been due to financial considerations.

McPherson, M. S., & Schapiro, M. O. (1999). *Reinforcing Stratification in American Higher Education: Some Disturbing Trends* No. NCPITR302). U.S.; California: National Center for Postsecondary Improvement.

This report examines the decade of change in the U.S. system of finance for higher education, which has resulted in a set of programs and policies that are highly responsive to the demands of middle- and upper-income families for help but which are less well equipped to respond to the needs of lower-income families for assistance with their college investments. This paper documents this trend and examines the relationship between financing trends and trends in the enrollment patterns of U.S. high school students (e.g., college access and college choice). The paper also comments on the political economy of the developments being documented (e.g., forces that appear to be leading public policy in the directions identified and circumstances that might produce a different, and perhaps more favorable, outlook for financing policy). The paper concludes that, in most circumstances, when colleges and universities get more revenue, the result is that they do more social good. It claims that the intrinsic benefits of college to students are of at least as much importance as the gain in relative position that accrues from college education.

- McPherson, M. S., & Schapiro, M. O. (1994). *College Choice and Family Income: Changes over Time in the Higher Education Destinations of Students from Different Income Backgrounds*. U.S.; California:
This study used data on the distribution of college students by income background to analyze college choice, particularly examining how family income and college choice correlations have changed over time. The study, using data from the national American Freshmen Survey, compared results from 1993 and computed their constant dollar equivalents in two previous years, 1989 and 1980. Data were analyzed to examine the distribution of students in a particular income group across institutional types and to examine the income distribution of students attending a particular type of institution. Results showed that, while the share of middle income students in all of higher education declined, in 1980 21.5 percent of middle income students were enrolled at private, four-year colleges and universities and in 1993, 21.2 percent were in those institutions. Low income students were increasingly represented at public two-year colleges, while representations of middle and upper income students in these colleges declined. Also the number of middle income students at public two-year institutions has declined and the number at public four-year institutions has increased. Private four-year colleges have been enrolling a declining share of upper income students, and public colleges' share of wealthier students has increased. Thus private colleges have a steady proportion of middle income students but a decline in upper income students.
- Millett, C. M. (2003). How Undergraduate Loan Debt Affects Application and Enrollment in Graduate or First Professional School. *The Journal of Higher Education (Columbus, Ohio)*, 74(4), 386-427.
A study examined the effect of undergraduate loan debt on graduate or first professional school application and attendance for students who say that they expect to achieve a doctoral degree. Data on 1,982 students drawn from the Baccalaureate and Beyond Longitudinal Study of 1992-1993 college graduates were analyzed. Results revealed that students with debts of \$5,000 or more were significantly less likely to apply to graduate or first professional school than their peers who did not have educational debt. However, financial indebtedness did not appear to have an adverse effect on the decisions of those students who had applied to and were accepted by graduate or first professional degree programs to enroll in those programs. The implications of the results for educational policymakers are considered.
- Mooney, C. J. (1987). U.S. Report Adds Fuel to Heated Debate over College Attendance by Blacks. *Chronicle of Higher Education*, 33(33), 21,26.
A Department of Education study suggests that academic achievement is a more important factor than family income in determining whether or not blacks will attend college, removing support from the argument that a shortage of federal student aid is discouraging black enrollment.
- Mortenson, T. G. (1990). *The Impact of Increased Loan Utilization among Low Family Income Students* No. ACT901). U.S.; Iowa: ACT Publications.

This study used economic investment theory and attitudinal survey data to examine the relationship between the decline in low-income participation in higher education and the substitution of loans for grants in federal student financial aid programs. Loans are seen to substantially decrease the net benefits of college attendance to low-income students because of these students' greater risk of academic failure and the addition of fees and interest charges to existing cost barriers. Survey data found that far fewer persons from family incomes of less than \$20,000 felt the lifetime return on a college education was greater than its cost. Additionally, low family income is related to less willingness to assume debt for educational or other expenses and to reluctance to take financial risks for investment purposes. Examination of behavioral data revealed that college enrollment rates of students from poor family backgrounds increased when net college attendance costs were decreased due to availability of grants, that students from poorer backgrounds were likely to select less expensive higher education options, and that the poorest students incurred the greatest growth in indebtedness. It is concluded that only grants achieve desired enrollment gains by low-income students. Appendixes detail the data.

Mortenson, T. G. (1989). *Family Income, Children, and Student Financial Aid. ACT Student Financial Aid Research Report Series 89-1*. U.S.; Iowa: ACT Publications. This document, the fourth in a series of student financial aid research reports, focuses on need analysis in student financial aid. Nearly all of the family contribution expected by the analysis of ability to pay is produced by family income, and the Congressional Methodology implemented for the 1988-89 academic year places even greater emphasis on income and less on assets than did the Uniform Methodology which it replaced. Student financial aid policy, funding, and administration are affected by growth in the proportion of poor families in the population during the last two decades. A growing proportion of financial aid applicants and college freshmen are poor. Increasingly, the poorest college students are concentrated in public two-year colleges with very few attending public and private universities during the last decade. Matching of the family income profile against college attendance costs through need analysis finds that more than four out of five children would require financial assistance to be able to attend college today, even the least costly college, with less than 1 in 10 able to attend an average cost private college without financial aid. Results are detailed in narrative, graphic, and tabular form in sections on the following topics: (1) family income, (2) impact of the family income shift on aid applicants, (3) college enrollment shifts by family income, and (4) college attendance costs and expected family contribution. Eleven figures and eight tables are appended.

Mortenson, T. G. (1987). *Why Student Financial Aid? ACT Student Financial Aid Research Report Series 87-1*. U.S.; Iowa: ACT Publications. This report, the first in a series on student financial aid, develops a public policy justification for needs-tested higher educational subsidies targeted specifically to students, and offers evidence to support the argument that financial aid is a worthwhile use of public monies. Traditionally, public subsidies for students have been directed to institutions; in the mid-1960s, however, federal and state

governments began to subsidize higher education of students directly via needs-tested grants and other forms of aid. Currently more than \$20 billion is spent on student aid. Five sections look at: student demand for higher education; differences in abilities to pay college costs; the effect of price on student enrollment decisions (discussing student enrollment responses to price and to financial aid); the public policy commitment to equalize higher educational opportunity (discussing federal and state commitments); and society's interest in improving educational opportunity (discussing labor force renewal and preservation of social peace through hope). It is concluded that higher education is essential to current and future prosperity of both individuals and the larger society. Signals from the labor market indicate a current oversupply of workers with less than a college education and an undersupply of workers with college degrees. Today, student financial aid addresses simultaneously two social issues: (1) the fulfilling of the aspirations of citizens wishing to climb the ladder of opportunity and (2) the enormous human capitalization requirements of the evolving world economy and the role of the United States in that system.

Murray, D. R. (1985). *Conditions of Teacher Education in the Commonwealth of Kentucky: A Special Report on Estimating Supply/Demand and Related Issues*. U.S.; Kentucky:

This report provides a general overview of the supply and demand of public school teachers in the Commonwealth of Kentucky. Both actual data for 1980-85 and projected estimates for 1986 to 1990 were provided. Intrinsic to the study was a comprehensive analysis of actual and projected enrollment trends; a close review of teacher availability; an exploration of the demand and supply relationships and related issues influencing current and future conditions in teacher education. Surpluses and shortages were identified for elementary education, special areas, and secondary education by teaching areas. Contingency plans for a possible teacher shortage are also discussed. Thirteen appendices include data on enrollments and on student teacher ratios for special subject areas; data on demand and new hires and supply versus demand by field and region; new teachers analysis; age distribution of Kentucky teachers by totals; and average teacher salaries in elementary, secondary and combined Kentucky schools.

Neugart, M., & Tuinstra, J. (2003). Endogenous fluctuations in the demand for education. *Journal of Evolutionary Economics*, 13(1), 29.

New York State Education Dept., Albany. Bureau of Postsecondary Research and Information Systems. (1991). *A Report on Student Financial Aid at Degree-Granting Postsecondary Institutions in New York State: 1987-88 to 1989-90*. U.S.; New York: This report provides a complete accounting of financial aid available to students at New York's degree-granting postsecondary institutions. It shows trends in financial aid from state, federal, institutional, and private sources for academic years 1987-88, 1988-99, and 1989-90. The report presents trends in total funds available to all students; examines trends in aid per student, using full-time equivalent students as a measure of enrollment; and compares aid trends to changes in undergraduate expenses, other economic indicators, and enrollment trends. The first section provides an overview of all student aid

funds. The following sections contain detailed tables showing funds and recipients for specific aid programs, with separate tables for pre- and post-baccalaureate students in each sector, at each type of institution in each sector, and at each type of institution within sectors. The appendices contain a glossary of terms; a description of student aid data sources and data adjustments; and a list of institutions included in each sector and type category used in the report.

Nova Southeastern Univ., Fort Lauderdale, FL. (2001). *Enrollments in the Academic Majors: Trends between Fall 1996 and Fall 2000. Volume One* No. RP0107). U.S.; Florida.

This study examined enrollment trends at the level of individual majors for Nova Southeastern University, Florida. The results should provide support for the evaluation of the major, enrollment planning at the program and center levels, and more detailed context for program review and university strategic planning. The study includes an analysis of fall 2000 enrollments by major and data on enrollment trends between fall 1996 and fall 2000. The data also provide for analysis of enrollment trends in each major by racial/ethnic category or gender to provide a context for program evaluation. Majors were ranked university-wide and within academic centers by size and ethnic/racial enrollment. The master's degree in education and the doctorate in educational leadership were found to comprise 17% of the total university enrollment in degree programs. Analysis of minority enrollments by major indicated that specific majors are particularly attractive to specific groups. For example, Hispanic students dominate enrollments in the Master's in International Business program, while Black students gravitate to majors in education and public administration. Analysis of this type of data may provide valuable information for enrollment management, marketing, and strategic planning. Six appendixes contain specific details about rankings of majors.

O'Connor, K., & Aasheim, L. J. (1985). *Working with Non-Traditional Students: Women in Transition*. U.S.; Washington.

Trends and issues concerning college attendance by adult students are reviewed. Trends seem to suggest that the rising educational attainment of the general population will result in increased demand for learning activities by older students. Data are provided on: estimated college enrollments for 1990 and projected population and enrollments in 1990 for ages 14-17 through 55-64; and 5-year enrollment trends among male and female students aged 25-34 by class standing and part- or full-time status. The increased enrollments of females and the social and personal factors accounting for their enrollment are addressed. Attention is also directed to the changing racial and ethnic demography of higher education, minority public school enrollment in fall 1980, the process of actively recruiting adult learners, the socioeconomic status of adult learners, the responses of colleges to adults on campus, and characteristics of younger and older students. Three stages of adaptation of the college to adult students are identified: the laissez-faire stage, the separatist stage, and the equity stage. Carole Kaswon's typology of students and eight suggestions by Edmund Ackell on reentry education are included.

O'Heron, H. (1997). *Undergraduate Enrolment Forecasts: A Tricky Science*. Retrieved 12/01, 2005 from http://www.aucc.ca/_pdf/english/publications/researchfile/1997-98/vol2n1_e.pdf

For 17 years, undergraduate enrolment at Canadian universities charted a steady climb. Then suddenly in 1993, full-time enrolment levelled off at around the 500,000 mark, and has remained relatively stable ever since. Is current enrolment simply a lull in a cyclical growth pattern? Does it provide an indication of future stability? Or is it perhaps the harbinger of a downward shift? This analysis begins by exploring the factors that influence demand for a university education, focusing on full-time undergraduates 18 to 21- years-old, the prime age when students are starting university or are in the early stages of a degree program. The second part of the paper examines the institutional situation, and looks at whether students are instead flocking to other parts of the postsecondary system.

Olson, S. J. (1990). *Home Economics Education: A Review of the Literature on the Impact of a Decade of Change*. U.S.; Ohio.

This paper examines how the field of home economics education adapted to changes in the fields of education and home economics in the last 10 years. National trends and issues related to the employment and education of teachers are discussed with emphasis on influential factors and events such as enrollment declines and changes in the demand for public school teachers. Factors and events influencing changes in home economics and home economics education, including enrollment trends, the labor market for home economics graduates, and overall changes in the field, are examined. The relationship between home economics and home economics education is discussed. The paper concludes that the field of home economics education is in a state of transition, even more so than the broader field of education, and that changes in opportunities for women have affected both of these fields.

Ottinger, C. A. E. (1989). *Higher Education Today: Facts in Brief*. U.S.; District of Columbia: Division of Policy Analysis and Research.

Fifty-four charts and statistical profiles depict changes affecting American colleges and college students, based on information drawn from government publications and other technical reports. Charts and graphs are accompanied by some narrative. They cover: changes in the higher education and consumer price indexes; family income and savings; trends in the college-age and high school graduate population; increases in the number of college-educated adults; employment patterns among the college-educated; relationships between family income and college attendance; population trends, including minority groups; the status of women and minorities in degree attainment and academic employment; enrollment trends; faculty trends; college costs; institutional finance; acceptance of credit for non-collegiate learning; trends and patterns in student characteristics; trends in choice of major; college preparation and application; college choice; and student financial aid and indebtedness. (MSE)

Ottinger, C. A. E. (1989). *Higher Education Today: Facts in Brief*. U.S.; District of Columbia: Division of Policy Analysis and Research.

Fifty-four charts and statistical profiles depict changes affecting American colleges

and college students, based on information drawn from government publications and other technical reports. Charts and graphs are accompanied by some narrative. They cover: changes in the higher education and consumer price indexes; family income and savings; trends in the college-age and high school graduate population; increases in the number of college-educated adults; employment patterns among the college-educated; relationships between family income and college attendance; population trends, including minority groups; the status of women and minorities in degree attainment and academic employment; enrollment trends; faculty trends; college costs; institutional finance; acceptance of credit for non-collegiate learning; trends and patterns in student characteristics; trends in choice of major; college preparation and application; college choice; and student financial aid and indebtedness.

Parker, J., & Summers, J. (1993). Tuition and Enrollment Yield at Selective Liberal Arts Colleges. *Economics of Education Review*, 12(4), 311-24.

This paper investigates the effect of changes in tuition and fees on the matriculation rate of applicants admitted to a group of selective liberal arts colleges. Our sample is drawn from a detailed data base for 82 liberal arts colleges over the 1988 to 1990 period, compiled by the Higher Education Data Sharing (HEDS) Consortium. We find that an increase in the level of tuition and fees charged by a college causes a significant reduction in the share of admitted applicants who choose to enroll. The elasticity of this relationship is in the neighborhood of one-third, and is somewhat larger for financial aid recipients than for students who did not apply for or did not qualify for aid.

Paulsen, M. B., & Pogue, T. F. (1988). Higher Education Enrollment: The Interaction of Labor Market Conditions, Curriculum, and Selectivity. *Economics of Education Review*, 7(3), 275-298.

To determine how a college's curriculum and selectivity may influence enrollment fluctuations, this study analyzed data on 64 private colleges in Iowa and Illinois. Colleges emphasizing arts and sciences had greater enrollment growth during improving market conditions for college graduates; those stressing occupational growth had greater enrollment growth during deteriorating conditions.

Pennington, K. L., McGinty, D., & Williams, M. R. (2002). Community college enrollment as a function of economic indicators. *Community College Journal of Research and Practice*, 26(5), 431-437.

A study examined the ability of national economic trends to predict community college enrollment. Data were collected from source books and from government documents. The findings suggested that the economic variables of Personal Consumption Expenditure, Unemployment Rate, Dollars Disposable Income, and Gross Domestic Product were significantly related to community college enrollment but that the economic variables of Consumer Price Index and Average Hourly Earnings of Production Workers were not significantly related to community college enrollment. The results are discussed, and implications for practice are provided.

Plank, S. B., & Jordan, W. J. (2001). Effects of information, guidance, and actions on postsecondary destinations: a study of talent loss. *American Educational Research Journal*, 38(4), 947-979.

This study uses National Educational Longitudinal Study data to show that information about higher education, guidance, and essential preparatory actions taken by secondary students influence whether they will attend postsecondary educational institutions (PEIs) within 2 years of high school graduation, and, if so, what types of institutions. The conceptual framework is embedded in research on college choice and talent loss. Talent loss is described as the occurrence of promising students not reaching their full educational potential. Choice theory attempts to explain the myriad factors contributing to individuals' postsecondary destinations. We find that increased levels of information, guidance, and critical actions taken are positively and significantly associated with initial enrollment in a 4-year PEI, as opposed to enrollment in a 2-year PEI (full or part time) or no enrollment. These factors explain a large part of the effect of socioeconomic status on postsecondary destination, controlling for high school achievement.

Robinson, N. (2003). *Undergraduate Access to the University of California after the Elimination of Race-Conscious Policies*. U.S.; California: University of California. This report describes the University of California's (UC's) experience developing and implementing race-neutral undergraduate admissions and outreach policies and programs from 1995-2002. UC's experience indicates that in highly selective institutions, implementing race neutral policies leads to substantial declines in the proportion of entering minority students. These declines have been partially mitigated by programs designed to increase enrollments of students from low-income families, those with little family experience in higher education, and those who attend schools that traditionally do not send many students to four-year institutions. Increases in numbers of underrepresented minorities graduating from California high schools, combined with substantial expansion of enrollment capacity at several UC campuses, have led to overall increases for some groups, though underrepresented students remain a substantially smaller proportion of those admitted to and enrolled at UC's most selective campuses than they were before race conscious policies were eliminated. The gap between the percentage of underrepresented minority students graduating from California high schools and the percentage enrolling at UC has widened. In the 5 years since elimination of race conscious policies, UC has adopted strategies to enhance UC students' academic preparation and maintain access for disadvantaged students (e.g., expanding outreach to and partnerships with K-12 schools, expanding the criteria used to define academic achievement, and implementing the comprehensive review admission policy).

Rubin, K. D., Rosenbaum, B. D., & McManamy, Rob. (1991). For Construction Educators, the Future Is Now; Higher Education: Magnets for Scarce Students. *ENR (Engineering News-Record)*, 227(19), 26.

Engineering and construction education in the US is a product of evolution that eventually catches up with the changing needs of the nation and industry. Some

claim that the process is too slow to produce the kind of well-rounded talent that is needed to lead the industry into the 21st century. There is also the fear that traditional educational approaches are failing to attract and retain those who will help stave off the industry's looming labor shortage and provide a critically needed balance to its all-male, all-white image. Some say engineering training must be better linked to the real world and introduced to students earlier in their academic life. The non-engineering, management-oriented training approach of construction schools has gained wide industry and educational support. With enrollments down and operating costs up, colleges and universities across the US are betting on construction dollars to reverse the trend. They hope that new and renovated facilities that emphasize technology and aesthetics will attract both students and faculty.

Sakellaris, P., & Spilimbergo, A. (2000). Business Cycles and Investment in Human Capital: International Evidence on Higher Education. *Carnegie-Rochester Conference Series on Public Policy*, 52(0), 221-56.

We study the effect of economic fluctuations on investment in higher education for a wide range of countries. Our main focus is on foreign students who come to the United States to attend universities. There is a strong relation between enrollment and the business cycle in the sending country. The cyclical pattern of enrollment is sharply different for two groups of countries. For OECD countries enrollment is countercyclical, whereas for non-OECD countries it is pro-cyclical. At business cycle frequencies, opportunity cost plays a dominant role in explaining enrollment from OECD countries, whereas ability to pay and credit constraints seem more prevalent at non-OECD countries. The results are confirmed using data on domestic enrollment from national sources.

Scannell, J. J. (1992). *The Effect of Financial Aid Policies on Admission and Enrollment. Admission Practices Series*. U.S.; New York: College Board Publications.

This study looks at the evolution of the financial aid process as a function of higher education administration and its impact on the recruitment and retention of college students. It illustrates the effects on enrollment of differing financial aid strategies and recommends possible directions for meeting the challenges of the 21st century. Discussions focus on the following topics: (1) the institutional need for financial aid; (2) the relationship of aid and costs; (3) programs that work in reverse; and (4) targeting of financial aid to enrollment goals. The following financial aid packages are also examined: uniform self-help; self-help varied by ability to borrow; self-help varied by desirability; self-help varied by ability to borrow and desirability; admit/deny; aid-conscious admission; merit awards; renewals; equity packaging; and differential and preferential packaging.

Somers, P., & St. John Edward, P. (1997). Interpreting Price Response in Enrollment Decisions: A Comparative Institutional Study. *Journal of Student Financial Aid*, 27(3), 15-36.

Analyzes the influence of student aid on enrollment decisions of all accepted applicants at four institutions. Student aid was negatively associated with first-time enrollment, indicating that, in most cases, the amount of aid available was

insufficient relative to the cost of college attendance. This suggests that institutions need to study their aid policies and adjust them to assure access.

Spencer, B. G. (2001). *Student Enrolment and Faculty Recruitment in Ontario: the Double Cohort, the Baby Boom Echo, and the Aging of University Faculty*.

Retrieved 12/01, 2005 from http://www.ocufa.on.ca/research_studies/stuenrol.pdf

Two demographic events will have significant effects on the Ontario university system this decade. The first is the growth in the population of student age, which will increase the demand on the system. That increase is associated with the baby boom echo, but it will be exacerbated by the so called "double cohort" and by trends towards higher enrolment. The second event will reduce the supply of services that the university can provide. It is the retirement of the large fraction of the faculty that was hired in the late 1960s and the 1970s to meet the demands associated with the baby boom itself. The purpose of this paper is to attach some numbers to these two effects, and, in particular, to anticipate the need to recruit new faculty.

Teichler, U. (2000). New Perspectives of the Relationships between Higher Education and Employment. *Tertiary Education and Management*, 6(2), 79.

The relationships between higher education and the world of work revived in 1990 as a major issue of debate. Growing enrollment as well as labour market problems in many industrialized countries fuelled the debate. A close look reveals that the systematic information provided on graduate employment is often insufficient or biased. In spite of controversial assessments of graduate employment and work, most experts, however, tend to agree that a growing diversification is an appropriate response. Also, common views are widely held as regards the desirable curricular approaches: emphasis ought to be placed on general knowledge and flexibility, problem-solving abilities, a confrontation of theory and practice, interdisciplinarity and international competencies. These views are advocated irrespective of whether higher education is expected to follow closely the presumed demands of the employment system or whether higher education is called on to counteract instrumentalist pressures and to prepare students for a proactive role in society.

Thomas, R. S. (1998). *Black and Latino College Enrollment: Effects of Background, High School Preparation, Family and Peer Influence, and Financial Aid*. U.S.; New York:

This study examined the college enrollment decisions of Black and Latino students, focusing on factors that influenced their decision to attend college. Data from the National Education Longitudinal Study of 1988-1994 were used, namely a sample of 11,879 seniors who completed high school in 1992, including 1,181 Blacks and 1,505 Latinos. The study found that Black students who enrolled in a four-year college were more likely to: be female (62 percent), have come from upper-middle-class backgrounds (36 percent), have parents with some college education (52 percent), have been placed in a college prep program in high school (62 percent), and fall in the third quartile of standardized tests (33 percent), than their peers. Unlike Blacks, Latinos who enrolled in a four-year college were slightly more likely to be male (53 percent) and to be from low-income backgrounds (30 percent), and

were about equally as likely to have parents with educational levels no higher than high school or some college (38 percent and 37 percent) and to fall into the two highest test quartiles (34 percent and 33 percent respectively). High school preparation and the availability of financial aid also had a significant influence on the college enrollment decisions of both groups. An appendix describes the operationalization of the variables.

Thompson, F., & Zumeta, W. (2001). Effects of Key State Policies on Private Colleges and Universities: Sustaining Private-Sector Capacity in the Face of the Higher Education Access Challenge. *Economics of Education Review*, 20(6), 517-31. The relationship between key state policy variables--(1) relative (private-public) tuition prices, (2) state student-aid funding, and (3) public institution density--and the competitive position of private colleges and universities is examined. Elite private schools are found to be nearly impervious to state policy. Large and moderately selective private institutions are adversely affected by public institution density and low public prices. Such prices divert students who would otherwise prefer these private institutions to similar public schools. State student aid funding most affects the enrollment market shares of the small, low-selectivity private colleges enrolling the greatest proportions of minority and modest-income students. The findings suggest state policies in this era of strong demand for higher education and constrained public sector capacity should use price signals (student aid and public institution pricing) to encourage students to consider seriously whether private higher education might serve their needs as well as or better than public institutions.

Thompson, P. R., Capps, Jr, O., & Massey, G. J. (1994). Demand for an undergraduate education in the agricultural sciences. *American Journal of Agricultural Economics*, 76(2), 303.

Undergraduate enrollments in the agricultural and natural resource sciences (AGNR) declined during the 1980s. A study to analyze factors affecting the drop in demand for an AGNR education is presented.

Vasigh, B., & Hamzaee, R. G. (2004). Testing Sensitivity of Student Enrollment with Respect to Tuition at an Institution of Higher Education. *International Advances in Economic Research*, 10(2), 133-49.

This study was conducted to measure the impact of H-University's (HU's) tuition increases on enrollment. Based on an internal survey, this study attempts to explain the sensitivity of student enrollment to tuition variations. In addition, this paper develops an aggregate enrollment model and uses the common economic variables such as tuition, income, wage rates, financial aids, and unemployment rates to explain the sensitivity of demand. The most significant finding of this study is that tuition consideration seems to have a relatively small effect on students' decisions. Actually, enrollment at HU (a private institution) have increased despite higher tuition rate. Possible justifications could be proposed, such as the necessity of higher education and the fact that higher education is a continued investment in human

capital, in which the more relevant decision factor is the corresponding expected rate of return and not just the cost of investment.

Walsh, M. M., & Ishida, H. (1990). Trends in Dental Hygiene Applicant Pool Size and Characteristics of Students upon Entry over Three Decades. *Journal of Dental Education*, 54(10), 602-608.

A survey of dental hygiene program directors (n=107) revealed that in associate degree/certificate and bachelor's programs, applicants, class size, and student achievement have declined since 1957 but student age and experience have increased. In addition, students tend to be female Caucasians. Recruitment and labor market implications are discussed.

Walters, P. B. (1986). Sex and institutional differences in labor market effects on the expansion of higher education, 1952 to 1980. *Sociology of Education*, 59, 199-211.

Watson, S., & Others. (1987). Factors Affecting Applications to Professional Schools of Six Professions (Medicine, Dentistry, Nursing, Law, Social Work, and Public Health). *Journal of Dental Education*, 51(3), 130-136.

Future demand for professional education is examined through demographic trends, enrollment trends, professional manpower demands, the role of values and attitudes, and the current responses of the professional schools to change.

Woodard, D. B. J. (1995). Restructuring and Policy Implications for Students. *Journal for Higher Education Management*, 10(2), 45-49.

Implications of the restructuring of higher education are considered in light of the likely evolution of the college student population. Enrollment trends, social and economic trends, and trends in student values concerning academic preparation are examined as they are likely to affect the learning environment in the year 2010.

References – Other Geographic Areas

Aamodt, P. O., & Arnesen, C. A. (1995). The relationship between expansion in higher education and the labour market in Norway. *European Journal of Education*, 30, 65-76.

Part of a special issue on higher education and employment in Europe. The writers discuss the relationship between educational expansion and the labor market in Norway. They describe quantitative growth in higher education and certain overall trends in the economy. They argue that the policy of expanding the capacity of higher education is being used as a buffer against youth unemployment and that, even if this policy succeeds in its aim of checking unemployment, it is unclear if it will benefit the economy in the long-term. Survey data on the transition from higher education to work are presented in order to illuminate changes in the labor market for graduates. The writers conclude by discussing whether a worsening labor market

for graduates is the result of changes in the demand structure for educated manpower or whether it is due to the expansion of higher education.

Braunstein, A., McGrath, M., & Pescatrice, D. (1999). Measuring the Impact of Income and Financial Aid Offers on College Enrollment Decisions. *Research in Higher Education*, 40(3), 247-259.

A study analyzed demographic, socioeconomic, and financial factors in enrollment behavior of accepted applicants to Iona College (New York). Financial aid had a positive impact on enrollment decisions (excepting upper-income applicants): for every \$1,000 increase offered, probability of enrollment increased 1.1 to 2.5%. Work-study was not influential unless packaged with other aid forms.

Brown, N., & Clark, T. (2003). *Impact on Student Demand of Tuition Fees and Changes in Higher Education Student Support. A Literature Review*. United Kingdom; England: Higher Education Funding Council for England.

The Higher Education Funding Council for England (HEFCE) commissioned a review of the available literature on the impact of the introduction of means-tested contributions to tuition fees for full-time undergraduates from 1998-1999. The overall objective was to provide evidence to assist the HEFCE's ongoing assessment of future levels of student demand for higher education and the scope for increasing demand through widening access. Evidence was sought about: (1) the propensity of young people to enter higher education and the factors affecting that propensity; (2) evidence about student hardship; and (3) evidence about nonpayment of fees and dropout. The literature about the impact of new financial support arrangements for students in higher education, including the introduction of the means-tested contribution to tuition fees, remains limited. It is only 3 years since the new arrangements were introduced, and the first full cohort of graduates with income contingent loans at the new substantially higher level will only start repayments next April. In spite of the shortcomings in the literature available, findings generally suggest that costs and potential benefits are two among several factors affecting decisions by those in the lowest socioeconomic groups on whether to enter higher education. Given the evidence that there is reluctance on the part of some young people to meet some of their costs by taking out substantial loans, it would seem that part of the solution should be to replace some of the loans by grants. For institutions, the task is to provide ways of ensuring that potential students are aware of what the institution can offer.

Conference of Education System Chief Executive Officers (Australia), & Ministerial Council on Education, Employment, Training and Youth Affairs, Carlton South (Australia). (1998). *School Teacher Demand and Supply. Primary and Secondary. Draft*. Australia; Victoria:

This paper examines trends in the supply and demand for elementary and secondary teachers in Australia, concluding that, overall, a sufficient supply of qualified teachers should be available to meet the expected slight increase in demand for teachers from 1998-2001. Data come from a mandated monitoring of and annual report on the supply and demand of teachers. Section 1, "Demand for Teachers,"

includes information on "School Aged Population," "School Retention Rates," "Student Enrollment Trends," "Student /Teacher Ratios," "Employment Trends and Prospects: Government Sector," and "Impact of Overseas Demand." Section 2, "Supply of Teachers," discusses "Employment," "Training," "Unemployment," "Pool of Available Teachers," "Graduate Employment Outcomes," "Immigration to Australia," "Interstate Mobility," "Wastage," "Graduate Destinations," "Job Mobility," and "Earnings." Section 3, "Age Profile of Teachers," discusses "Age Structure: All Teachers," "Age Related Issues," and "Age Structure: Government Sector by State/Territory." Section 4, "Labour Market Outlook for Teachers," discusses "Balance of Demand and Supply," "Sensitivity Analysis," "Teacher Recruitment: Government," "Specializations Experiencing Recruiting Difficulties," and "Prospects for Teachers." Section 5, "State/Territory Teacher Labour Markets," discusses "New South Wales," "Victoria," "Queensland," "Western Australia," "South Australia," "Tasmania," "Northern Territory," and "Australian Capital Territory." The four appendixes present data on school students by age, school students by state, consolidated tables from state and territory survey returns, and teaching students: commencements and completions.

Eckstein, Z., & Others. (1988). University Policies under Varying Market Conditions: The Training of Electrical Engineers. *Economics of Education Review*, 7(4), 393-403.

Analyzes an Israeli university's problem in optimizing the quality and quantity of electrical engineers in response to fluctuating enrollment. An equilibrium model considers the effect of students' occupation choice and the university's decision on the current and future demand and supply of engineers, in order to predict the equilibrium number of electrical engineers toward the end of the century.

Esnault, Eric. (1992). From Higher Education to Employment. *Organisation for Economic Cooperation and Development. the OECD Observer*, (176), 35.

There was an appreciable rise in the volume of employment in OECD countries in the 1980s. Yet at the same time, unemployment rates were often high, sometimes rising, especially among school-leavers. The same paradox was apparent among graduates from higher education. The growth in the number of high-level jobs, particularly for managers and engineers, was attributable both to structural change and to more diffuse developments in the evolution of the organization of work, its ever-increasing complexity, and the demand for quality. All these factors furthered the recruitment of young graduates considerably. Some of the changes that took place in the 1980s were less advantageous. In several countries, the unemployment rates rose still further for some categories of graduates, largely those whose studies would traditionally have led to teaching or some other public sector job. The probability for the 1990s is that, except in particular instances, the absorption of graduate flows, for the first time in recent history, will not be eased by shortages of personnel.

Evetts, J. (1989). Primary Teachers' Careers: The Contexts of Expansion and Contraction. *Cambridge Journal of Education*, 19(3), 287-297.

Analyzes the effects of changes in teachers' career structure, enrollment trends, and labor markets on the primary teaching profession in England and Wales (1950-85). Primary teachers benefited less than secondary teachers from altered teaching career structure, and women benefited less than men in career opportunities from expansion of the profession.

Fredriksson, Peter. (1997). Economic incentives and the demand for higher education. *The Scandinavian Journal of Economics*, 99(1), 129.

The question is examined: to what extent do economic incentives affect the demand for higher education? This question is addressed by means of a time-series analysis of the demand for university education in Sweden. The bulk of the variation in the fraction of qualified individuals at universities is attributed to fluctuations in the university wage premium. Furthermore, relative employment prospects for university graduates and variations in the generosity of the study allowance scheme appear to be of importance for the enrollment decision.

Goddard, A. (2000). Rising debt hits access efforts. *The Times Higher Education Supplement*, (1462), 1.

Recent figures in Great Britain reveal that spiralling student debt is deterring the poor and disadvantaged from attending higher education. These figures inflict a blow to government plans to widen participation in higher education.

Harrington, P. E. (1987). The enrollment crisis that never happened: how the job market overcame demographics. *The Chronicle of Higher Education*, 33, 44-45.

Kaneko, M. (1987). *Enrollment Expansion in Postwar Japan. International Publication Series No. 1*. Japan: Publication Sales.

After World War II, enrollment in the Japanese educational system underwent an unprecedented expansion, largely on account of postwar economic growth. Although such expansion was common throughout the world, Japan's experience was unique because of the magnitude of changes in the enrollment rates and the degree to which these changes directly reflect popular demand rather than government intervention. Accordingly, this study is a systematic quantitative analysis relating the increased demand for education in Japan to economic variables. The study addresses three questions: (1) What caused the educational expansion? (2) How did it keep momentum for such a long period? and (3) Why did it finally lose momentum in the mid-1970s? After an introduction establishing the framework and issues of analysis, the first chapter sets forth a theoretical framework by creating a model of individual choice from which the aggregate demand function of education can be derived. Chapter II examines internal rates of return of senior high school and college education from 1954 to 1980, and analyzes changes in the benefit-cost ratio over this period. Then alternative indicators of anticipated educational benefits are constructed, based on hypothetical models of rational expectation. Based on this analysis, chapter III presents the methods and results of a time-series regression

analysis that discloses determining factors of the actual changes in enrollment rates. The original sources and methods of estimation of the data used in the text are appended: (1) the estimation of cohort enrollment rates; (2) the wage-profile by education; (3) the direct costs of senior high school and college education; and (4) the time-series economic indicators. The last two appendices examine the difference between the United States and Japan and the gender differentials in economic returns to education.

Mangan, K. S. (2002). Professional-school enrollments boom as many parts of the economy tank. *The Chronicle of Higher Education*, 48(23), A45-6.

A lot of graduate programs that, just a few years ago, were struggling to attract students, are enjoying a boom in enrollments. Graduate programs in law, business, nursing, pharmacy, and engineering are experiencing a boom as many people are heading to professional schools to make themselves more marketable in a sputtering economy.

Maslen, G. (1997). Applications to Australian universities drop. *The Chronicle of Higher Education*, 43, A47.

Major tuition increases for degree programs in engineering, the sciences, and technology have been blamed for a notable drop in university applications in Australia for the 1997 academic year. Furthermore, evidence from universities in several states suggests that many science and engineering faculties have been forced to lower their admission standards to meet federal enrollment numbers.

Mora, J. (1997). Equity in Spanish higher education. *Higher Education*, 33, 233-249.

The most outstanding event in the recent evolution of higher education in developed countries has been the continuously increasing proportion of students entering higher education and, therefore, its extension to more and more inclusive groups. It seems reasonable to assume that the expansion of higher education must have facilitated access of less privileged social classes, but it is important to analyze to what extent this significant increase in higher education participation has reached all social, economic, and cultural groups. This analysis could be useful in designing a policy to help those students who have more difficulty accessing higher education. The goal in this paper is to analyze this subject thoroughly focusing especially on the level of participation of young adults in Spanish higher education controlling for economic level, parental education and occupation, and other environmental characteristics. We present a logistic model which jointly values the influence of different family and social characteristics of the individual on his/her decision to enroll in higher education. The main conclusions of the study are these: (a) There has been improvement in the equity of access to higher education. In spite of this overall improvement, about 30 per cent of the less privileged population is still underrepresented in higher education, (b) Family educational level is the most important factor in the decision to enter higher education. The weight of these educational characteristics exceeds by far the influence of family income level.

National Centre for Vocational Education Research, Leabrook (Australia). (2000). *Australian Vocational Education and Training--Statistics 1999: An Overview*. Australia; South Australia: National Centre for Vocational Education Research. Data pertaining to Australia's publicly funded vocational education and training (VET) sector in 1999 were reviewed. Both national-level and state/territory-level data on the following topics were reviewed: VET providers and delivery systems; student characteristics; enrollment trends; program costs and financing mechanisms; and apprentices and trainees involved in work-based VET. The following were among the review's key findings: (1) in 1999, publicly funded VET providers delivered courses, subjects, and training packages to nearly 1.65 million students, which represented a 7.3% increase over 1998 VET enrollment levels; (2) students residing in capital cities and other metropolitan areas averaged 217 hours of VET each, which was 50 hours more than students from rural and remote locations; (3) the most popular VET subject areas were business/administration/economics, engineering and surveying, and services/hospitality/transportation; (4) more than two-thirds of training activity resulted in successful completions; (5) most training (86.4% of annual hours) was funded from recurrent state and territory allocations for VET and commonwealth funds disbursed by the Australian National Training Authority; (6) 1999 operating expenditures on publicly funded VET remained essentially at the 1998 level (just under \$4 billion); and (7) an estimated 259,900 Australians were undertaking apprenticeships or traineeships in 1999.

Ohlsson, R. (1985). The Expansion of the Education Sector in Sweden During the 20th Century. *Swedish Research on Higher Education*, (4)

Three investigations on quantitative changes in higher education in Sweden are described. In Anders Nilsson's dissertation, "Study Financing and Social Recruitment to Higher Education (1920-1976)," attention was focused on changes in college recruitment from 1920 until reforms in 1977; the effect of various college financing conditions on recruitment; and enrollment trends. Variations in enrollment of different social groups were considered, as measured by enrollment ratio from upper-secondary school (gymnasium) to higher education (universities). Lars Pettersson's dissertation, "Engineering Education and Capital Formation (1933-1973)," provides an historical explanation for the expansion in engineering education in Sweden against the background of the growth and transformation of the economy. Consideration was given to changes in the labor market for engineers that affected salaries and, thereby, the demand for engineering education. Rulf Ohlsson's study, "Higher Education and Demographic Change," analyzed the short- and long-term changes in the annual flow to higher education during 1923-1975. Enrollment ratios were constructed for different student groups (e.g., male students, female students, engineering students, foreign students). The variations in the flow to college were assessed using a human capital model.

Oosterbeek, Hessel, & Webbink, Dinand. (1995). Enrolment in higher education in The Netherlands. *De Economist*, 143(3), 367.

The determinants of higher education enrollment in The Netherlands are investigated. Three different economic models are estimated, referring to: 1.

investment motives, 2. consumption motives, and 3. a combination of these two. By estimating these models for different years (1982 and 1991), changes over time are identified. The importance of financial variables appears to be vanishing. Moreover, enrollment is no longer related to ability variables.

Organisation for Economic Cooperation and Development, Paris (France). (1992). *From Higher Education To Employment. Volume II: Canada, Denmark, Spain, United States = De l'enseignement superieur a l'emploi. Volume II: Canada, Danemark, Espagne, Etats-Unis*. France: OECD Publications and Information Centre.

This volume presents reports on the flows of graduates from higher education and on their entry into working life in Canada, Denmark, Spain and the United States. Each paper is written according to detailed guidelines designed to assemble information from many sources, to reflect the state of the art, and to illustrate a variety of approaches, methodologies and philosophies. The emphasis is on flows rather than on particular institutions. The paper on Canada by Ramona McDowell and Gilles Jasmin treats social and educational changes since the Second World War, different types of graduates, market conditions, transition to the labor force, and issues of post-secondary education. The study on Denmark by Hanne Traberg and Poul Bache describes higher education, recent changes, structure of outflow from higher education, women in the outflow, changes in transition to working life, and the labor market. The study of Spain by Antonio Casanueva de Luis looks at the Spanish system and its outflow, enrollment trends, developments in graduate employment, and policy development. The section on the United States by E. Stephen Hunt explores trends in the flow of post-secondary students and trends in the educational major and its relation to work. The first two papers include extensive references.

Oulton, Nicholas. (1995). Supply side reform and UK economic growth: What happened to the miracle? *National Institute Economic Review*, (154), 53.

Two institutions have retarded UK productivity growth in the post-war period: industrial relations and education. The failings of both were largely addressed in the 1980s. The productivity improvement of the 1980s was genuine and was largely due to the reduction in union power brought about by the trade union legislation of the 1980s. The 1980s and 1990s have also seen large falls in the proportion of the labor force that is unqualified and rises in enrollment rates in further and higher education, changes which tend to increase long-run growth. However, 2 factors have obscured the extent of the improvement. First, the whole climate for economic growth is less favorable than it was in the so-called Golden Age prior to the first oil shock in 1973. Second, UK macroeconomic policy compares poorly with other OECD countries: booms have been shorter and recessions longer, so that microeconomic success has been masked by macroeconomic failure.

Reuterberg, S., & Svensson, A. (1986). *Student Financial Aid and Participation in Higher Education. Changes between 1965 and 1985 in Sweden*. Sweden:

The relationship between student financial aid and college attendance in Sweden during 1965-1985 was assessed. Objectives were to determine: the extent to which student aid has increased the overall rates of transition to higher education; the effect

of financial aid on the recruitment of different socioeconomic groups; the effect of financial aid on recruitment of students of differing achievement levels; and any sex differences in recruitment resulting from aid. For three nationally representative samples born in 1948, 1953, and 1963, consideration was given to college attendance in the late 1960s, early 1970s, and early 1980s, respectively. During this period, the rate of transition from upper-secondary to higher education decreased from nearly 70% to less than 30%. However, the evidence suggests that student aid did not explain the decreasing enrollments. In each cohort, the transition rate of students from higher social groups exceeded that of students from lower groups. Yet, in the late 1960s student aid had a substantial socially-equalizing effect on educational opportunities. However, this positive effect vanished and in the early 1970s student aid had practically no bearing on social differentiation, and this trend was greatly reinforced in the 1980s. Additional findings are covered.

Reuterberg, S., & Svensson, A. (1986). *Student Financial Aid and Participation in Higher Education. Changes between 1965 and 1985 in Sweden*. Sweden: The relationship between student financial aid and college attendance in Sweden during 1965-1985 was assessed. Objectives were to determine: the extent to which student aid has increased the overall rates of transition to higher education; the effect of financial aid on the recruitment of different socioeconomic groups; the effect of financial aid on recruitment of students of differing achievement levels; and any sex differences in recruitment resulting from aid. For three nationally representative samples born in 1948, 1953, and 1963, consideration was given to college attendance in the late 1960s, early 1970s, and early 1980s, respectively. During this period, the rate of transition from upper-secondary to higher education decreased from nearly 70% to less than 30%. However, the evidence suggests that student aid did not explain the decreasing enrollments. In each cohort, the transition rate of students from higher social groups exceeded that of students from lower groups. Yet, in the late 1960s student aid had a substantial socially-equalizing effect on educational opportunities. However, this positive effect vanished and in the early 1970s student aid had practically no bearing on social differentiation, and this trend was greatly reinforced in the 1980s. Additional findings are covered.

Shiqi, H. (1985). On Some Vital Issues in the Development and Reform of Higher Education in the People's Republic of China. *Higher Education in Europe*, 10(3), 63-75.

Undergraduate and graduate enrollment trends in higher education institutions in mainland China since 1949 are reviewed, and training needs and imbalances by discipline are discussed.

Williams, B. (1996). Some Predicted and Unpredicted Changes in Higher Education. *Journal of Higher Education Policy and Management*, 18(2), 139-148. Predictions made in 1978 about Australian higher education are re-examined. Very inaccurate enrollment predictions are attributed to unforeseen demand and supply influences. The end to the binary system of higher education, a major change in 1989, was not predicted. However, early analyses of relationships between

education, employment, and growth; manpower forecasts and educational planning; and credentialism were predicted with relative accuracy.

Williams, G. J., & Willson, S. J. (1997). *What Are Universities For?* St. Catharines/Glaxo Wellcome Conference (Windsor, England, United Kingdom, November 1997). Conference Report No. 61. 18.

The report summarizes a conference on the state of British higher education which took place closely following publication of the Dearing Report (Summer 1997) on the role of colleges and universities in labor force and economic development. An introductory section gives an overview of enrollment trends, the funding system, public policy concerning the purposes of higher education, demands facing the universities, meeting industry needs, research in universities, and policy needs. The second section examines the role of scholarship in the universities, including the distinction between scholarship and research, and academic freedom and freedom of speech. The third section addresses the role of British higher education in the global education market, and section four its role as a national training agency. Research funding and policy are discussed in the fifth and sixth sections, and the universities' role in British competitiveness in the global commercial market in the seventh. The concluding section summarizes current challenges to the universities. A list of conference participants is included.

Appendix B: Excluded References

- Applicants dry up in face of fees.(1996). *The Times Higher Education Supplement*, (1250), 10.
- Adeyemi, J. K. (2000). Academic Manpower Needs of Nigerian Universities. *Assessment & Evaluation in Higher Education*, 25(2), 36-44.
- Ambler, J. S., & Neathery, J. (1999). Education Policy and Equality: Some Evidence from Europe. *Social Science Quarterly*, 80(3), 437-56.
- Anisef, P. (1989). Studying Part-Time in Canada's Universities: A Social Change Perspective. *Canadian Journal of Higher Education*, 19(1), 11-28.
- Association of Universities and Colleges of Canada, Ottawa (Ontario). (1986). *Compendium of University Statistics, 1986 Edition = Compendium de statistique concernant les universités, édition 1986*. Canada; Ontario: Association of Universities and Colleges of Canada.
- Barnes, C. (1987). *Older Students in College Programs: A Survey of the Characteristics of Participants in the College Centers for Older Learners*. U.S.; Vermont.
- Beach, C. M., Boadway, R. W., & McInnis, R. M. (2005). *Higher Education in Canada* from <http://search.epnet.com/login.aspx?direct=true&db=ecn&an=0790136>
- Beattie, I. R. (2002). Are all "adolescent econometricians" created equal? Racial, class, and gender differences in college enrollment. *Sociology of Education*, 75(1), 19-43.
- Buron, L., Orr, L., & Patrabansh, S. (1999). *The Lifelong Learning Demonstration: Final Evaluation Report on the Experimental Site. Research and Evaluation Report Series No. DOLETARERS99C*. U.S.; Maryland.
- Chaikind, S. (1987). *College Enrollment Patterns of Black and White Students*. U.S.; District of Columbia.
- Clotfelter, C. T., & Others. (1991). *Economic Challenges in Higher Education U.S.; Illinois*.
- Conley, D. (2001). Capital for college: parental assets and postsecondary schooling. *Sociology of Education*, 74(1), 59-72.
- Cornett, L. (2001). *Teacher Supply and Demand in Tennessee*. U.S.; Georgia: Southern Regional Education Board.

- Davila, E. M. (1985). In Ford Foundation, New York, N.Y. (Ed.), *Today's Urban University Students: Part 1. Profile of a New Generation. Final Report on the Urban University Study U.S.*; New York: College Board Publications.
- Dresch, S. P. (1987). *The Economics of Foreign Students. IIE Research Report Number 11.* U.S.; New York: Institute of International Education.
- El-Khawas, E. (1990). *Campus Trends, 1990. Higher Education Panel Report Number 80* U.S.; District of Columbia: Division of Policy Analysis and Research.
- Gayle, V., Berridge, D., & Davies, R. (2002). Young people's entry into higher education: quantifying influential factors. *Oxford Review of Education*, 28(1), 5-20.
- Giugale, M. M., Lafourcade, O., & Luff, C. (2003). *Columbia: The Economic Foundation of Peace. Chapters 21-28* U.S.; District of Columbia: Book available from World Bank Publications.
- Gregory, R. G. (1995). Higher Education Expansion and Economic Change. *Australian Bulletin of Labour*, 21(4), 295-322.
- Haddad, W. D. (1990). *Education and development: Evidence for new priorities* Washington, D.C.: World Bank. from <http://search.epnet.com/login.aspx?direct=true&db=ecn&an=0244172>
- Honnold, J. A., & Keeter, S. (1989). *Survey of Enrollment Decisions of Virginia Community College Students.* U.S.; Virginia.
- Hoxby, C. M. (2004). *College choices: The economics of where to go, when to go, and how to pay for it* Chicago and London: University of Chicago Press. from <http://search.epnet.com/login.aspx?direct=true&db=ecn&an=0767189>
- Lamb, S., Long, M., & Malley, J. (1998). *Access and Equity in Vocational Education and Training: Results from Longitudinal Surveys of Australian Youth. ACER Research Monograph No. 55* Australia; Victoria.
- Lambert, L. M., & Ruiz, M. L. D. (1988). College Courses in High School--Implications for Enrollment Management. *College and University*, 63(2), 140-147.
- Lauritzen, P. (1997). *Supply and Demand of Educational Personnel for Wisconsin Public Schools. An Examination of Data Trends, 1997.* U.S.; Wisconsin.
- Leppel, K. (1993). Logit Estimation of a Gravity Model of the College Enrollment Decision. *Research in Higher Education*, 34(3), 387-398.
- Lick, D. W. (1985). *Rural School Partnerships with Higher Education and the Private Sector* U.S.; Georgia.

- Lloyd-Ellis, H. (2000). Public Education, Occupational Choice, and the Growth-Inequality Relationship. *International Economic Review*, 41(1), 171-201.
- McMillan, J., & Western, J. (2000). Measurement of the socio-economic status of Australian higher education students. *Higher Education*, 39(2), 223-248.
- McPherson, M., & Schapiro, M. O. (2000). Financing Lifelong Learning, Trends and Patterns of Participation and Financing in US Higher Education. *Higher Education Management*, 12(2), 131-156.
- Metcalf, H. (2005). Paying for University: The Impact of Increasing Costs on Student Employment, Debt and Satisfaction. *National Institute Economic Review*, 0(191), 106-17.
- Mortenson, T. G. E. (1995). Postsecondary Education Opportunity. The Mortenson Report on Public Policy Analysis of Opportunity for Postsecondary Education, 1995. *Postsecondary Education Opportunity*, (31-42).
- Nathanson, J. H., & Ludwig, M. J. (1990). *Student Charges at Public Institutions. Annual Survey 1989-90*. U.S.; District of Columbia: NASULGC Office of Public Affairs.
- Nicholson, D. (2004, Oct 21). Time to refocus on education: 'It is critical to the success of society'. *Sudbury Star*, pp. A.10.
- Nunez, A., & Cuccaro-Alamin, S. (1998). *First-Generation Students: Undergraduates Whose Parents Never Enrolled in Postsecondary Education. Statistical Analysis Report. Postsecondary Education Descriptive Analysis Reports No. NCES98082*. U.S.; District of Columbia.
- Parrado, E. A. (1998). Expansion of schooling, economic growth, and regional inequalities in Argentina. *Comparative Education Review*, 42(3), 338-364.
- Paulsen, M. B., & St. John, E. P. (2002). Social class and college costs: examining the financial nexus between college choice and persistence. *The Journal of Higher Education (Columbus, Ohio)*, 73(2), 189-236.
- Perna, L. W. (2000). *Racial/Ethnic Group Differences in the Realization of Educational Plans*. U.S.; Maryland.
- Perna, L. W. (1998). *Differences in the Decision To Attend College among Blacks, Hispanics, and Whites*. U.S.; Virginia.

- Rosas, M., & Hamrick, F. A. (2002). Postsecondary Enrollment and Academic Decision Making: Family Influences on Women College Students of Mexican Descent. *Equity & Excellence in Education, 35*(1), 59-69.
- Russell, J. (2003). New England Leaders Eyeing Education, Job Training. *Knight Ridder Tribune Business News, 1*.
- Sanders, N. F., & Poynter, D. J. (1989). The local economy and the adult learner enrollment behavior: does a relationship exist? *College and University, 64*, 356-366.
- Seftor, N. S., & Turner, S. E. (2002). Back to School: Federal Student Aid Policy and Adult College Enrollment. *Journal of Human Resources, 37*(2), 336-352.
- Stage, F. K., & Hossler, D. (1988). *Differences in Family Influences on College Attendance Plans for Male and Female Ninth Graders. ASHE 1988 Annual Meeting Paper*. U.S.; Indiana.
- Stater, M. (2004). Strategic Tuition and Financial Aid Policies: Implications for Enrollment and Graduation.
- Thomas, R. S. (1998). *Black and Latino College Enrollment: Effects of Background, High School Preparation, Family and Peer Influence, and Financial Aid*. U.S.; New York.
- Williams, B. (1994). Higher education and unemployment. *Higher Education Quarterly, 48*, 277-293.
- Wise, L. R. (1999). Taking Stock: Evidence about the Standing of Public Administration in Academia. *Journal of Public Affairs Education, 5*(2), 145-155.
- Zick, C. D., & Widdows, R. (1992). Turning the Ebbing Tide of Consumer Studies Enrollments. *Advancing the Consumer Interest, 4*(2), 19-23.