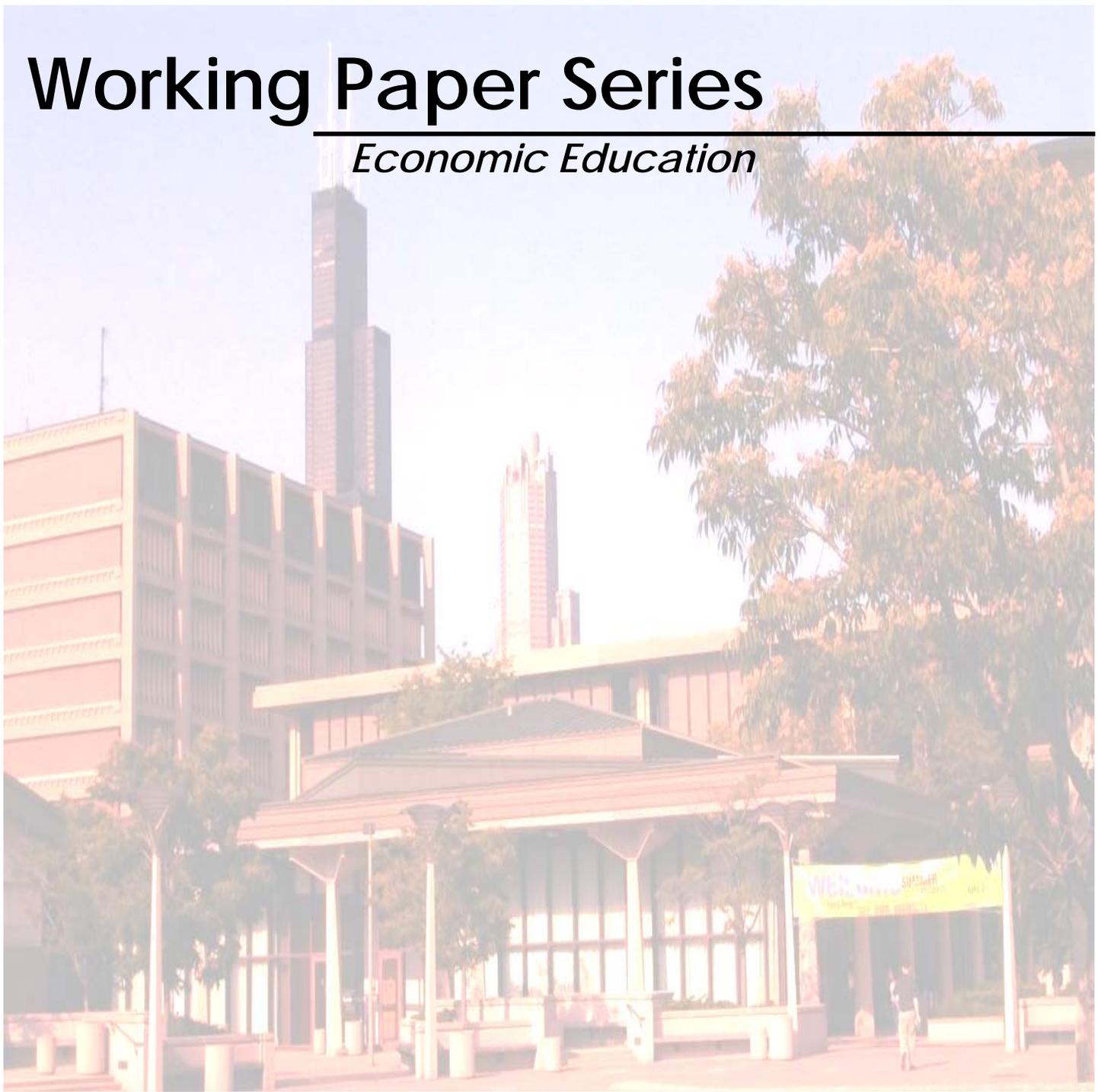


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## *The Economics Major: A Cross-Sectional View*

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# The Economics Major: A Cross-Sectional View

Rachel A. Willis and Paul J. Pieper

It is only natural that economists, who are familiar with both the principles of utility maximization and derived demand, should be interested in the number of students majoring in economics. A more altruistic reason for interest among economists in the number of economics majors is the belief that economics instruction has much to contribute to today's students and to tomorrow's policymakers. In either case, recent trends in the number of economics majors gives cause for concern. The number of economics majors apparently peaked in 1990, and according to a survey by Siegfried (1995) fell by 20% between 1992 and 1994.

This paper examines where the economics majors come from and the reasons for their disappearance. The first section of this paper examines the production of economics majors by school. Section two examines five possible explanations for the decline in economics majors, utilizing the cross-sectional evidence whenever possible. Section three summarizes our conclusions.

## I. The Production of Economics Majors by School

A total of 856 colleges and universities in the U.S. offered bachelor's degrees in economics in 1987. This represents approximately 60 percent of the 1,450 four-year colleges and universities in the U.S. As shown in Table 1, the schools offering an economics major accounted for 788,000 bachelor's degrees in all fields out of a nationwide total of 991,000 degrees. Hence an economics major was available to close to 80% of all college graduates.

Ninetyfive schools offered a joint major in economics and a second field in 1987. The second field was most commonly business, but joint majors were also offered in computer science, finance, management, mathematics, philosophy, political science and statistics. Most of the schools offering joint majors also offered a straight economics major but 39 schools offered only the joint degree. The latter schools tended to be small, totaling only 11,889 graduates in all fields, or about 300 per school.<sup>i</sup> Including joint majors, the number of schools offering an economics degree rises to 895, representing over 80% of all bachelor's degrees awarded.

An additional 48 schools offered bachelor's degrees in business economics, all but seven of which also offered straight economics majors. In terms of school-wide graduates, about 8 percent of economics bachelor's programs face competition from a business economics program. Business economics majors are classified separately from economics majors by the U.S. Department of Education.

While a large number of schools offer bachelor's degrees in economics, the bulk of economics majors are produced by a relatively small number of schools. For example, in 1987, the top 100 schools produced 61% of all economics majors. On the other hand, one-third of the schools offering economics majors produced 5 or fewer majors. This skewness is only partly due to skewness in school size.<sup>ii</sup>

Table 2 shows the composition of economics majors by the characteristics of the degree-granting school. Nearly half of all economics majors graduate from private institutions, versus only 28 percent of all graduates. There is also a strong relationship between institutional size and the proportion of economics majors. The rate of majoring in economics was over two times greater for students from small schools (less than 2,000 students) than for students from large schools (more than 10,000 students). An even more striking relationship is between the proportion of economics majors and the institution's admission selectivity. Graduates from schools in the two most selective categories of Barron's selectivity index comprised nearly one-third of all economics majors but only about twelve percent of all degrees. Schools whose admission is rated "very competitive" or greater comprise two-thirds of all economics majors but only 37 percent of all graduates.

Although economics majors come disproportionately from smaller than average, private and highly selective schools, liberal arts colleges are not the primary producers of economics majors. While liberal arts I college students are nearly four times more likely to major in economics than other students, they still comprise only about 18 percent of all economics majors. About half of all economics majors graduate from schools which also offer doctoral degrees in economics.

There are also regional differences in the rate of majoring in economics. The proportion of economics majors is highest for schools in the Northeast and the Middle Atlantic, slightly above average for the remainder of the Atlantic coast and the Pacific, and below average in the mid-section of the country.

Finally, economics majors are produced at far greater rates by schools which do not offer bachelor's degrees in business. Schools without an undergraduate business major account for 35 percent of all economics majors but just ten percent of all majors.

The breakdowns shown in Table 2 of course do not control for other factors. Table 3 regresses the log of the number of economics majors on a variety of institutional characteristics. Most of the results are in accord with the simple crosstabs shown in Table 2. The main exception is institutional control, which is insignificant in the cross-sectional regression. The coefficient on the log of the number of graduates is positive but significantly less than one, indicating a smaller proportion of economics majors for large schools. The admissions selectivity dummies are highly significant and increase monotonically with greater selectivity. Schools with doctoral programs in economics have significantly greater numbers of majors, all else equal. The signs of the regional dummy variables are in accordance with the raw crosstabs, although only the East South Central, West South Central and West North Central are significantly different from the Middle Atlantic, which forms the excluded category.

The strongest independent variable in terms of statistical significance is the presence of an undergraduate degree in business. Schools offering undergraduate degrees in business have only one-fourth (exp -1.40) as many economics majors as schools which do not face

competition from a business major. Competition from a degree in business economics reduces the number of economics majors by a further 55% while the presence of a joint economics program increases majors by approximately 25%.<sup>iii</sup> Both the business economics and joint economics variables are statistically significant at the 5 percent level.

## II. The Decline in the Number of Economics Majors

Information on the number of majors by field is collected by the National Center for Education Statistics (NCES) of the U.S. Department of Education.<sup>iv</sup> Figure 1 plots economics degrees as a percentage of all bachelor's degrees. The percentage of students majoring in economics has undergone two long cycles during the post-war period. The economics share fell sharply during the fifties, recovered modestly in the sixties, only to decline again in the early seventies, reaching a post-war low of 1.5% in 1974. The economics share trended upward from 1974 to 1989, but declined slightly from 1989 to 1992, the latest year for which NCES data is available. In 1992 2.1% of all bachelor's degrees were awarded in economics, which was equal to the average for the 1950-1992 period.

As of 1992, the latest year for which NCES data is available, the decline in the number of economics majors has been rather modest. The economics share in 1992 had fallen to 2.1% from its 1989 peak of 2.3%. The absolute number of economics majors peaked in 1990, and had fallen by 500, or just 2.0%, by 1992. However, a survey of 199 schools by Siegfried (1995) found that the number of economics majors fell by nearly 20% between 1992 and 1994. If the Siegfried survey is representative of all economics departments, and assuming that the total number of bachelor's degrees awarded has continued to grow at recent rates, the economics share of bachelor's degrees in 1994 would be only 1.5%, or close to its post-war low.<sup>v</sup> The remainder of this section discusses five possible explanations of the decline in economics majors.

### A. The Decline in Business Majors

Since economics is often been viewed as a close substitute for a business major, changes in the popularity of a business major can effect the number of economics majors. This is most evident at schools without business majors, which may experience an increase in economics majors as the popularity of business increases.<sup>vi</sup> The number of economics majors may also be sensitive to the popularity of business at schools with a business major if those schools put a limit on the number of business majors. In this case, any excess demand for business majors may spill over into economics (see Salemi and Eubanks, this issue, for a fuller explanation).

Past trends in the number of economics majors relative to social science majors are broadly consistent with the business substitution hypothesis. Figure 1 plots the share of bachelor's degrees awarded in economics, business and all social sciences except economics. Whereas the share of economics majors was about the same in 1986 as in 1970, the share of other social science majors fell by more than one-half. The absence of a fall in economics was arguably due to the tremendous increase in the number of business majors during this period, whose share nearly doubled.

Similarly, the share of economics majors grew less rapidly than the share of the other social sciences in the sixties, a period in which the share of business majors was roughly constant. Since the fall in the number of economics majors has coincided with a fall in the share of business majors, it is natural to suspect that the two trends are related. Business degrees peaked as a share of all bachelor's degree at 24.5% in 1988, at about the same time as the peak in economics majors. The share of business degrees fell by about two percentage points from 1988 to 1992. Unfortunately, as with economics, NCES data on the number of business majors is unavailable after 1992. However surveys of high school seniors show a precipitous drop in the percentage of students planning to major in business. Among high school seniors taking the SAT, planned business majors fell continuously from its peak of 23% of the total in 1987 to 14% in 1994.<sup>vii</sup> Most of the decline occurred between 1990 and 1993, when the business share fell by six percentage points. The ACT also shows a six percentage point drop in the share of planned business majors between 1987 and 1993. Since planned business majors were still falling as of 1994, and since actual majors lag planned majors by one to two years, actual business majors will not reach their trough until 1996 at the earliest. Thus if the demand for business hypothesis is correct, it predicts a very pessimistic short-run outlook for the number of economics majors.

However, the cross-sectional evidence is less supportive of the hypothesis that the decline in economics majors is due to a decline in the popularity of the business major. If economics is a substitute for a business major, then the number of economics majors should grow more rapidly at non-business schools when the popularity of business is increasing and less rapidly when the popularity of business is decreasing. Between 1979 and 1987, when the business share of all majors increased by six percentage points, the number of economics majors at schools without a business major increased by 20%. This is actually less than the 34% increase which occurred at economics departments at schools with a business major. Siegfried (1995) reports similar findings for a sample of schools for the 1992-94 period, using the administrative location of the department as a proxy for whether the department faces competition from a business major. He finds that the drop in economics majors was nearly the same for departments located inside business schools as for those located outside business schools, contrary to what would be expected if the decline in the number of business majors had direct substitution effects.

#### B. The Rate of Return to Majoring in Economics

Standard economic theory suggests that the choice of a major is based on relative rates of return. Since economics majors face many of the same opportunities as business majors, the rate of return hypothesis is not mutually exclusive with the demand for business hypothesis. While no comprehensive series exists on the starting salaries of economics majors, much less expected lifetime earnings, indirect evidence strongly suggests that the rate of return to majoring in economics has fallen recently.

One reason for a decline in the rate of return to majoring in economics is a slowdown in employment in the financial service industries.

Finance, insurance and real estate (FIRE) is the largest employer of economics majors, employing 38 percent of all majors immediately after graduation according to a survey by Siegfried and Raymond (1984).<sup>viii</sup> This understates the importance of the financial services industry because it does not include students who work in the industry after attending graduate or professional school. In addition, if prospective majors are not familiar with all of the options available to economics majors, they may use the financial services industry as a measure of employment opportunities in economics, thus giving the industry an importance out of proportion to its actual numbers.

Figure one plots total employment in FIRE between 1970 and 1995. FIRE employment grew by 3.5% per year between 1975 and 1988, or well above the 2.4% growth rate for all industries. During this time the share of economics majors was rising. Employment growth in FIRE weakened beginning in 1988, or just before the peak in economics majors. Between 1988 and 1994 employment in FIRE grew by a total of only 1.0%. Supervisory employment, which is probably more relevant for college graduates, grew by even less, remaining virtually constant between 1989 and 1994. If there are any accelerator effects present, then a slowdown in total employment could be associated with a decline in the number of new hires.

The cross sectional evidence also suggests the importance of the financial services industry. Regional differences in the rate of majoring in economics may be proxies for regional differences in FIRE employment. If students have geographic preferences, both during and after college, and if the return to majoring in economics depends on employment opportunities in FIRE, then regional variations in FIRE employment should be associated with variations in the rate of majoring in economics. Replacing the regional dummies in the cross sectional regression in section I with the region's FIRE employment as a percentage of total employment yields a significant positive coefficient.<sup>ix</sup>

Besides the financial services industry, a large fraction of economics majors pursue graduate degrees in business and law. In the Siegfried and Raymond survey, a remarkable 64 percent of the economics majors planned to enter professional school, with about two-thirds planning to enter a business program and most of the rest law. In actual practice, two years after graduation, 36 percent of the economics majors had entered professional within two years of their undergraduate degree, divided equally between business and law. After years of spectacular growth, enrollment in both business and law schools has recently slowed. Anecdotal evidence suggests that the salaries of professional graduates has weakened, possibly because of a surfeit of graduates.<sup>x</sup> This would further lower the rate of return to majoring in economics.

### C. Competing Degrees

The largest single factor explaining the number of economics majors in a cross section is the presence of a competing degree in business. Only four schools offering an economics major in 1987 added a business major in the ensuing eight years. However these schools were larger than average, producing a total of 774 majors in 1987. According to the cross-sectional

regression, a competing undergraduate degree in business reduces the number of economics majors by 75%. Thus, the addition of a business major in these four schools alone can explain a decline of 580 majors.

Economics programs also face increased competition from business economics degrees. A total of 32 schools added degrees in business economics during the 1987-95 period, while 6 schools dropped the degree. These schools produced a net total of 655 majors in 1987. Since the presence of a business economics major is estimated to reduce the number of economics majors by about 40 percent, the addition of the business economics degrees can explain a decline of 262 majors.<sup>xi</sup>

The increase in the number of business economics programs suggests that substitution effects between business and economics may be larger in the short run than the long run. In the short run, increased student demand for business is likely to have a positive effect on economics, as economics substitutes for business in non-business schools and absorbs any excess demand for business in business schools. However, in the long run, increased student demand for business may lead to the creation of competing degrees, such as business economics, or a business major in schools without such a degree. New degrees in business and business economics during the 1987-95 period can explain a drop of 842 economics majors, or about 3.6% of all economics majors in 1989. This is significant but still far less than the projected 20 percent fall in the number of economics majors.

The decline in the number of economics majors is too small in the aggregate to have any noticeable impact on the number of majors in other fields. However, results from a sample of 21 liberal arts colleges are at least suggestive of where the "lost" economics majors have gone. From 1983 to 1992 the share of economics majors at these schools fell by more than three percentage points, from 10.8% of all bachelor's degrees to 7.6%.<sup>xii</sup> However the share of social science degrees, including economics, remained nearly the same, falling by only 0.5%. Hence the fall in economics majors at these schools was almost totally offset by an increase in the number of majors in other social sciences.

#### D. Student Academic Skills

Since economics majors are produced disproportionately by academically selective schools, the decline in economics majors may simply reflect a decline in the pool of top students, particularly those with mathematical aptitude. However, this hypothesis is not supported by the trend in average scores on either the SAT or ACT. Average math scores of high school seniors on the SAT and the ACT have remained stable since the mid eighties. The percentage of students scoring above 600 on the SAT math section has actually increased slightly. In addition, the steepest descent in SAT math scores of high school seniors occurred between 1970 and 1984, falling from an average of 488 to 471, when the share of economics majors four years later increased from 1.5% to 2.3%.

There has also been no discernible shift in enrollment away from schools which have traditionally produced economics majors. Total full-time enrollment at the top one hundred producing schools of economics majors increased by 0.8% between 1987 and 1995.<sup>xiii</sup> Nationwide enrollment

figures for 1995 are not yet available so it is possible that this is a smaller than average increase. However since school enrollment at traditional economics schools increased rather than decreased, enrollment shifts can not explain a decline in the absolute number of economics majors.

#### E. Faculty Teaching Skills

It may also be argued that students are voting with their feet and reacting to a decline in the teaching skills of economics faculty. For example, it has been argued that recent economics Ph.D.'s are increasingly trained in abstract theory and are less able to teach the applied topics that appeal to the bulk of undergraduate majors. However this cannot explain a sudden drop in the number of majors because the stock of faculty changes very slowly over time. For example, 82% of the economics faculty teaching at schools with Ph.D. programs in economics in 1994 were also teaching at a Ph.D. granting school in 1990.<sup>xiv</sup> The faculty retention rate for the entire academic sector is of course even higher since some faculty may have moved from Ph.D. granting schools to non-Ph.D. granting schools. Thus the drop in economics majors was not associated with a significant turnover of economics faculty. Even if new economics faculty are worse teachers than the faculty that they replaced, the average teaching level in economics would not decline significantly unless the teaching skills of existing faculty deteriorated.

#### IV. Conclusion

Of the five explanations for the decline in economics majors that we have examined, the academic skills hypotheses is not consistent with the facts while the teaching and competing majors hypothesis are at best of second order importance. This leaves two hypotheses, the demand for the business major and the rate of return hypotheses. Our preferred explanation is that the number of economics majors has fallen because of a decline in the rate of return to majoring in economics, due largely to a slowdown in the financial services industry. While we have no hard evidence on the prospective rate of return to majoring in economics, it is known that the financial services industry employs a large fraction of economics majors, and that the number of economics majors per school responds to regional FIRE employment. The timing of this hypothesis is also consistent with the facts, with financial employment peaking just before the peak in economics majors. Looking ahead, FIRE employment as a percentage of total employment has apparently reached its trough, having increased slightly since 1994. Thus if this explanation is correct, the number of economics majors is at or near its trough.

Table 1. Number and Size of U.S. Schools Offering Bachelor's Degrees in Economics, Joint Economics and Business Economics in 1987

<u>Major</u>	<u>Number of Schools</u>	<u>Number of Graduates, All Fields</u>
Economics	857	789,001
Economics only	769	699,450
Economics and Joint Economics	45	37,976
Economics and Business Economics	46	55,416
Economics, Joint Economics and Business Economics	3	3,841
Joint Economics <sup>1</sup>	82	49,625
Joint Economics only	37	11,649
Economics and Joint Economics	45	37,976
Business Economics	54	61,454
Business Economics only	8	6,038
Economics and Business Economics	46	55,416
Economics or Joint Economics	894	800,650
Economics, Joint Economics or Business Economics	902	806,688
Total, U.S. Four-year Colleges <sup>2</sup>	1,465	991,339

<sup>1</sup>Consists of schools offering combined degrees in economics and a second subject, such as economics and business or economics and mathematics.

<sup>2</sup>Total number of four year colleges and universities in the U.S. in 1984 as reported in Barrons (1984). The total number of graduates is from the U.S. Department of Education, Digest of Education Statistics.

Source: The College Blue Book. Degrees Offered by College and Subject, 1987.

Table 2. Institutional Characteristics of Economics Majors, 1986-87

	Percent of		Econ. Majors as Percent of <u>All Majors<sup>1</sup></u>
	<u>All Econ. Majors</u>	<u>All Majors<sup>1</sup></u>	
1. Institutional Control			
Public	54.7	76.3	2.0
Private	45.3	23.7	5.2
2. Full-time Enrollment			
< 2,000	16.4	7.6	5.9
2,000 - 4,999	21.2	16.9	3.4
5,000 - 9,999	23.0	25.4	2.7
≥ 10,000	39.4	50.1	2.2
3. Selectivity			
Most Competitive	13.6	4.6	8.0
Highly Competitive	17.6	6.2	7.8
Very Competitive	34.6	23.2	4.1
Competitive	28.6	44.5	1.7
Less Competitive	4.0	16.4	0.7
Noncompetitive	1.6	5.1	0.9
4. Carnegie Classification			
Research I	37.3	27.4	3.7
Research II	9.0	10.3	2.4
Doctorate	13.0	18.0	2.0
Comprehensive	19.2	36.8	1.4
Liberal Arts I	17.8	4.5	10.8
Liberal Arts II	2.3	1.7	3.7
Other	1.2	1.3	2.5

<sup>1</sup>Includes only schools offering bachelor's degrees in economics.

Sources: Economics majors and total bachelor's degrees are from Cass and Birnbaum (1989). Both the selectivity measure and full-time enrollment are from Barron's (1984). The enrollment figures are based on the 1983-1984 academic year. The Carnegie classification scheme is given by the Carnegie Foundation for the Advancement of Teaching (1994).

Table 3. Determinants of the Number of Economics Major by School

<u>Independent Variable</u>	<u>Coefficient</u>	<u>T-Statistic</u>
Constant	-1.22	-2.87
<u>School Size</u>		
Log(Graduates)	0.66	10.64
<u>Institutional Control</u>		
Private	0.07	0.71
<u>Admission Selectivity</u>		
Most or Highly Competitive	0.89	5.45
Very Competitive	0.73	5.73
Competitive	0.33	3.26
<u>Census Region</u>		
Northeast	0.29	2.06
South Atlantic	-0.07	-0.57
East South Central	-0.43	-2.14
East North Central	-0.11	-0.92
West North Central	-0.32	-2.33
West South Central	-0.67	-4.14
Mountain	-0.27	-1.33
Pacific	-0.02	-0.17
<u>Graduate Program in Economics</u>		
Ph.D.	0.76	5.84
Master's	0.12	0.91
<u>Competing Degrees</u>		
Business	-1.34	-11.53
Business Economics	-0.53	-3.64
Joint Economics	0.36	2.64
N	652	

R.62

Notes: Dependent variable is the log of the number of economics majors in 1987. Regression was estimated by ordinary least squares and includes all schools with at least one major. The excluded variables are public control, less or non-competitive admission, middle atlantic location and bachelor's granting only. See Table 2 for sources.

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i. The U.S. Department of Education's count of majors by field is based on tabulations by university registrars. It is therefore not known how many graduates from joint economics programs are classified under economics.

ii. For example, the largest 100 institutions offering economics degrees produced 48% of all bachelor's degrees whereas the largest 100 economics programs produced 61% of all economics majors.

iii. This result of course does not necessarily imply that a joint major will increase total enrollment in economics since joint majors will normally take a larger fraction of their classes outside of economics.

iv. The NCES counts double majors only once and thus misses some economics majors. Siegfried and Wilkinson (1982) argue that the NCES counts only 82% of all economics majors. The data reported in this paper also do not include degrees in business economics.

v. Siegfried's sample was not random. He divided schools into six categories according to institutional control and the highest degree offered. We compared the NCES estimate of the share of economics majors produced by these six categories of schools in 1987 with the shares in the Siegfried sample. The Siegfried sample overweighted Ph.D. granting schools by about 12 percentage points and underweighted bachelor's granting schools by a similar amount. However, reweighting the Siegfried sample to reflect NCES proportions makes only a minor difference in the predicted number of economics majors, with an estimated fall of 18.4% between 1992 and 1994 in the weighted sample versus a 19.8% fall in the Siegfried sample. It should be noted that previous surveys (Siegfried and Scott, 1994) sometimes did a poor job in estimating the actual change in economics majors, overestimating the increase in majors between 1978 and 1983 and underestimating the increase between 1983 and 1988. Thus, while it is likely that the share of economics majors has fallen since 1992 given the large reported drops in the Siegfried survey, the amount of the fall is still open to question.

vi. This substitution effect would not occur if students chose their majors before entering college and chose their college solely on the basis of majors offered. In this case, any changes in the popularity of business would be reflected in increased enrollment at schools with business majors and not in the number of economics majors at non-business schools. However, since college choices are based on numerous factors other than majors offered (e.g. academic reputation, cost, location), then some students may select schools without a business major even though business is their first choice for a major. These students may then choose economics as a substitute. In addition, students may decide on a major after entering college. Students who desire a business degree but are at a non-business college may find it too costly to transfer and may instead choose economics as a substitute.

vii. If all high school senior's plans for a major were realized, then planned majors should lead actual majors by about four years. In practice, the SAT series on planned business majors peaked only one year before actual business majors. Formal statistical tests also found that a one year lead fit best, performing slightly better than a two year lead and considerably better than longer leads. However since planned majors are available only since 1973 and actual majors are available until 1992, the number of observations is small and hence the power of these tests are low. However, the optimal lag length between planned and actual majors was also short, two years, in both engineering and the social sciences. It should also be noted that the planned

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series fluctuates more than the actual series. Hence a six percentage point drop in planned majors would likely correspond with a smaller drop in actual majors.

<sup>viii.</sup> The Siegfried and Raymond survey covered 48 schools. They note that the sample is weighted more heavily to academically selective schools. This may lead to an overestimate of the number of students pursuing advanced degrees.

<sup>ix.</sup> The coefficient was .106 with a T-statistic of 2.22 and a p-value of .027.

<sup>x.</sup> Martinson (pa. 9) reports that the "job market for recent law school graduates took a pronounced downward turn" in the early nineties. Krasna (pa. 9) also reports some evidence of a weakening in the market for MBAs, including a 13 percent decline in the number of students taking the GMAT between 1991 and 1994.

<sup>xi.</sup> There was virtually no change in the number of joint economics programs, with a net decline of two programs, accounting for a net total of 110 economics majors in 1987.

<sup>xii.</sup> The sample was based on the 21 Liberal Arts I schools in Siegfried and Scott's (1994) survey of economics majors. Degrees granted in economics and social science in 1982 and social science in 1992 are from Cass and Birnbaum (1985) and Cass and Cass-Liepman (1994) respectively. Economics degrees in 1992 are based on the Siegfried and Scott survey.

<sup>xiii.</sup> Enrollment figures are from Cass and Birnbaum (1989) and Cass and Cass-Liepmann (1994).

<sup>xiv.</sup> This figure refers to tenure or tenure track faculty at 88 Ph.D. granting schools in economics. The source for the faculty information are college catalogs and program descriptions.