

Appendix C. Variable Descriptions and Database References

C.1 Variable Descriptions

Number of Publications - Fractional Counts, Fixed Journal Set

Number of Publications - Fractional Counts, Expanding Journal Set

Status: Dependent variable

Description: This variable indicates the number of articles, using the fractional count method, in science and engineering articles, notes, and reviews published in a fixed or slowly expanding set of influential scientific and technical journals, respectively.

Source: Institute for Scientific Information, Science Citation Index and Social Sciences Citation index; ipIQ, Inc. (formerly CHI Research, Inc.)

Availability: Data are available for 1988–2001 by institution (FICE code) and standardized science and engineering academic disciplines as defined in WebCASPAR.

Number of Publications - Whole Counts, Fixed Journal Set

Number of Publications - Whole Counts, Expanding Journal Set

Status: Dependent variable

Description: This variable indicates the number of articles, using the whole count method, in science and engineering articles, notes, and reviews published in a fixed or slowly expanding set of influential scientific and technical journals, respectively.

Source: Institute for Scientific Information, Science Citation Index and Social Sciences Citation index; ipIQ, Inc. (formerly CHI Research, Inc.).

Availability: Data are available for 1988–2001 by institution (FICE code) and standardized science and engineering academic disciplines as defined in WebCASPAR.

Number of Citations - Fractional Counts, Fixed Journal Set

Number of Citations - Fractional Counts, Expanding Journal Set

Status: Dependent variable

Description: This variable indicates the number of article citations, using the fractional count method, in science and engineering articles, notes, and reviews published in a fixed or slowly expanding set of influential scientific and technical journals, respectively.

Source: Institute for Scientific Information, Science Citation Index and Social Sciences Citation index; ipIQ, Inc. (formerly CHI Research, Inc.).

Availability: Data are available for 1992–2001 by institution (FICE code) and standardized science and engineering academic disciplines as defined in WebCASPAR. The citation data are generated by a two year lag with a three year window (i.e., 1992 citation counts are 1992 articles citing articles published in 1988–1990). Since 1988 is the earliest year with publication data in the database, 1992 is the earliest possible year to have citation data using the two year lag with three year window rule.

Number of Citations - Whole Counts, Fixed Journal Set**Number of Citations - Whole Counts, Expanding Journal Set**

Status: Dependent variable

Description: This variable indicates the number of article citations, using the whole count method, in science and engineering articles, notes, and reviews published in a fixed, or slowly expanding set of influential scientific and technical journals, respectively.

Source: Institute for Scientific Information, Science Citation Index and Social Sciences Citation index; ipIQ, Inc. (formerly CHI Research, Inc.).

Availability: Data are available for 1992–2001 by institution (FICE code) and standardized science and engineering academic disciplines as defined in WebCASPAR. The citation data are generated by a two year lag with a three year window (i.e., 1992 citation counts are 1992 articles citing articles published in 1988–1990). Since 1988 is the earliest year in the database, 1992 is the earliest possible year to have citation data using the two year lag with three year window rule.

IPEDS Number of Degrees Awarded – S&E Baccalaureate

Status: Independent variable, not retained in final model

Description: This variable indicates the number of Baccalaureate degrees conferred from July 1 through June 30 of the following year. Theology (B.D. or Ordination) degrees are not included. Degrees earned but not yet conferred, conferred by branch institutions located in foreign countries, and of an honorary nature are not included.

Source: National Center for Education Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS) Completions Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 with the exception of 1999; 1999 data were not released by NCES. Data are available by institution (FICE code) and standardized science and engineering academic disciplines as defined in WebCASPAR.

IPEDS Number of Degrees Awarded – S&E Master's

Status: Independent variable, not retained in final model

Description: This variable indicates the number of Master's degrees conferred from July 1 through June 30 of the following year. Master's of Theology (M.Div., M.H.L., or Ordination) degrees are not included. Degrees earned but not yet conferred, conferred by branch institutions located in foreign countries, and of an honorary nature are not included.

Source: NCES IPEDS Completions Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 with the exception of 1999; 1999 data were not released by NCES. Data are available by institution (FICE code) and standardized science and engineering academic disciplines as defined in WebCASPAR.

IPEDS Number of Degrees Awarded – S&E Doctorate

Status: Independent variable, not retained in final model

Description: This variable indicates the number of Doctorate degrees conferred from July 1 through June 30 of the following year. Doctorate degrees such as Doctor of Education, Doctor of Juridical Science, Doctor of Public Health, and the Doctor of Philosophy are included.

The following professional doctorates are not included: Chiropractic (D.C., D.C.M.), Dentistry (D.D.S., D.M.D.), Medicine (M.D.), Optometry (O.D.), Osteopathic Medicine (D.O.), Pharmacy (Pharm.D.), Podiatry (D.P.M., D.P., Pod.D.), Veterinary Medicine (D.V.M.), and Law (L.L.B., J.D.)

Degrees earned but not yet conferred, conferred by branch institutions located in foreign countries, and of an honorary nature are not included.

Source: NCES IPEDS Completions Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc;

Availability: Data are available for 1988–2001 with the exception of 1999; 1999 data were not released by NCES. Data are available by institution (FICE code) and standardized science and engineering academic disciplines as defined in WebCASPAR.

IPEDS Number of Degrees Awarded – S&E Total

Status: Independent variable, not retained in final institution-level model. This variable was retained in the six variable model used at the field-group level, due to its modest contribution to estimating publications in the engineering-math-physics field group.

Description: This variable indicates the number of Baccalaureate, Master's, and Doctorate degrees conferred from July 1 through June 30 of the following year. . Degrees earned but not yet conferred, conferred by branch institutions located in foreign countries, and of an honorary nature are not included.

Source: NCES IPEDS Completions Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 with the exception of 1999; 1999 data were not released by NCES. Data are available by institution (FICE code) and standardized science and engineering academic disciplines as defined in WebCASPAR.

SED Number of S&E Doctorate Recipients

Status: Independent variable, retained in final model

Description: This variable indicates the number of earned doctorates awarded from July 1 through June 30 of the following year. Doctorates are defined as Ph.D., Sc.D., Ed.D., Doctor of Arts, etc.; professional doctorates such as M.D., D.D.S., and D.V.M. are not included.

Source: Survey of Earned Doctorates (SED)/Doctorate Records File (DRF); WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code) and standardized science and engineering academic disciplines as defined in WebCASPAR.

Current Funds Revenues-Tuition and fees

Status: Not used as an independent variable due to definitional inconsistencies across the time period 1988 to 2001

Description: This variable indicates all tuition and fees (including student activity fees) assessed against students for education purposes. Tuition and fee remissions or exemptions are included even though there is no intention of collecting these amounts from the student. Also included are tuitions and fees that are remitted to the state as an offset to the state appropriation. Charges for room, board, and other services rendered by auxiliary enterprises are not included.

Source: NCES IPEDS Finance Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–1996; the NCES IPEDS Finance Survey has undergone significant changes since 1996, therefore, 1997 and later data have not been loaded into WebCASPAR. Data are available by institution (FICE code).

Current Funds Revenues-Federal Government Appropriations

Status: Not used as an independent variable due to definitional inconsistencies across the time period 1988 to 2001

Description: This variable indicates all federal government appropriations, including all amounts received by the institution through acts of a legislative body, except grants and contracts. These funds are for meeting current operating expenses, not for specific projects or programs. An example is federal land-grant appropriations. Pell Grants are not reported here, as they are grants, not appropriations. Federal appropriations received through state channels are included.

Source: NCES IPEDS Finance Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–1996; the NCES IPEDS Finance Survey has undergone significant changes since 1996, therefore, 1997 and later data have not been loaded into WebCASPAR. Data are available by institution (FICE code).

Current Funds Revenues-State Government Appropriation

Status: Not used as an independent variable due to definitional inconsistencies across the time period 1988 to 2001

Description: This variable indicates all state government appropriations, including all amounts received by the institution through acts of a legislative body, except grants and contracts. These funds are for meeting current operating expenses, not for specific projects or programs.

Source: NCES IPEDS Finance Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–1996; the NCES IPEDS Finance Survey has undergone significant changes since 1996, therefore, 1997 and later data have not been loaded into WebCASPAR. Data are available by institution (FICE code).

Current Funds Revenues-Federal Government Grants and Contracts

Status: Not used as an independent variable due to definitional inconsistencies across the time period 1988 to 2001

Description: This variable indicates all federal government grants and contracts, including revenues from governmental agencies that are for specific research projects or other types of programs. Examples are research projects, training programs, and similar activities for which amounts are received or expenditures are reimbursable

under the terms of a government grant or contract. Pell Grants as well as federal grants and contracts received through state channels are included.

Source: NCES IPEDS Finance Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–1996; the NCES IPEDS Finance Survey has undergone significant changes since 1996, therefore, 1997 and later data have not been loaded into WebCASPAR. Data are available by institution (FICE code).

Current Funds Revenues-State Government Grants and Contracts

Status: Not used as an independent variable due to definitional inconsistencies across the time period 1988 to 2001

Description: This variable indicates all state government grants and contracts, including revenues from governmental agencies that are for specific research projects or other types of programs. Examples are research projects, training programs, and similar activities for which amounts are received or expenditures are reimbursable under the terms of a government grant or contract.

Source: NCES IPEDS Finance Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–1996; the NCES IPEDS Finance Survey has undergone significant changes since 1996, therefore, 1997 and later data have not been loaded into WebCASPAR. Data are available by institution (FICE code).

Current Funds Expenditures and Transfers-Instruction

Status: Not used as an independent variable due to definitional inconsistencies across the time period 1988 to 2001

Description: This variable indicates current funds expenditures and transfers for instruction, including expenditures of the colleges, schools, departments, and other instructional divisions of the institution and expenditures for departmental research and public service that are not separately budgeted. Expenditures for both credit and noncredit activities are included. Expenditures for academic administration where the primary function is administration (e.g., academic deans) are excluded. The instruction category includes general academic instruction, occupational and vocational instruction, special session instruction, community education, preparatory and adult basic education, and remedial and tutorial instruction conducted by the teaching faculty for the institution's students.

Source: NCES IPEDS Finance Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–1996; the NCES IPEDS Finance Survey has undergone significant changes since 1996, therefore, 1997 and later data have not been loaded into WebCASPAR. Data are available by institution (FICE code).

Current Funds Expenditures and Transfers-Research

Status: Not used as an independent variable due to definitional inconsistencies across the time period 1988 to 2001

Description: This variable indicates current funds expenditures and transfers for research, including all funds expended for activities specifically organized to produce research outcomes and commissioned by an agency either external to the institution

or separately budgeted by an organizational unit within the institution. Non-research sponsored programs (e.g., training programs) are not included.

Source: NCES IPEDS Finance Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–1996; the NCES IPEDS Finance Survey has undergone significant changes since 1996, therefore, 1997 and later data have not been loaded into WebCASPAR. Data are available by institution (FICE code).

Current Funds Expenditures and Transfers-Public Service

Status: Not used as an independent variable due to definitional inconsistencies across the time period 1988 to 2001

Description: This variable indicates current funds expenditures and transfers for public service, including all funds budgeted specifically for public service and expended for activities established primarily to provide non-instructional services beneficial to groups external to the institution. Examples are seminars and projects provided to particular sectors of the community. Expenditures for community services and cooperative extension services are included.

Source: NCES IPEDS Finance Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–1996; the NCES IPEDS Finance Survey has undergone significant changes since 1996, therefore, 1997 and later data have not been loaded into WebCASPAR. Data are available by institution (FICE code).

Current Funds Expenditures and Transfers-Academic support

Status: Not used as an independent variable due to definitional inconsistencies across the time period 1988 to 2001

Description: This variable indicates current funds expenditures and transfers for academic support, including all expenditures for the support services that are an integral part of the institution's primary mission of instruction, research, or public service. Expenditures for libraries, museums, galleries, audio/visual services, academic computing support, ancillary support, academic administration, personnel development, and course and curriculum development are included. Also included are expenditures for veterinary and dental clinics if their primary purpose is to support the institutional program.

Source: NCES IPEDS Finance Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–1996; the NCES IPEDS Finance Survey has undergone significant changes since 1996, therefore, 1997 and later data have not been loaded into WebCASPAR. Data are available by institution (FICE code).

Current Funds Expenditures and Transfers-Libraries

Status: Not used as an independent variable due to definitional inconsistencies across the time period 1988 to 2001

Description: This variable indicates current funds expenditures and transfers for library acquisitions including all print material, microfilm, microfiche, audio-visual materials such as records and films, and computer software; expenditures for hardware of any

kind (i.e., computer terminals, microfiche readers, record players, or projectors) are not included.

Source: NCES IPEDS Finance Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–1996; the NCES IPEDS Finance Survey has undergone significant changes since 1996, therefore, 1997 and later data have not been loaded into WebCASPAR. Data are available by institution (FICE code).

Current Funds Expenditures and Transfers-Student Services

Status: Not used as an independent variable due to definitional inconsistencies across the time period 1988 to 2001

Description: This variable indicates current funds expenditures and transfers for student services, including funds expended for admissions, registrar activities, and activities whose primary purpose is to contribute to students' emotional and physical well-being and to their intellectual, cultural, and social development outside the context of the formal instructional program. Examples are career guidance, counseling, financial aid administration, and student health services (except when operated as a self-supporting auxiliary enterprise). Also included is the administrative allowance for Pell Grants.

Source: NCES IPEDS Finance Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–1996; the NCES IPEDS Finance Survey has undergone significant changes since 1996, therefore, 1997 and later data have not been loaded into WebCASPAR. Data are available by institution (FICE code).

Current Funds Expenditures and Transfers-Institutional Support

Status: Not used as an independent variable due to definitional inconsistencies across the time period 1988 to 2001

Description: This variable indicates current funds expenditures and transfers for institutional support, including expenditures for the day-to-day operational support of the institution, excluding expenditures for physical plant operations. Expenditures for general administrative services, executive direction and planning, legal and fiscal operations, and public relations/development are included.

Source: NCES IPEDS Finance Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–1996; the NCES IPEDS Finance Survey has undergone significant changes since 1996, therefore, 1997 and later data have not been loaded into WebCASPAR. Data are available by institution (FICE code).

Current Funds Expenditures and Transfers-Operations and Maintenance of Plant

Status: Not used as an independent variable due to definitional inconsistencies across the time period 1988 to 2001

Description: This variable indicates current funds expenditures and transfers for operation and maintenance of plant, including all expenditures for operations established to provide service and maintenance related to grounds and facilities used for educational and general purposes. Expenditures for utilities, fire protection,

property insurance, and similar items are included. Expenditures made from the institutional plant funds account are not included.

Source: NCES IPEDS Finance Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–1996; the NCES IPEDS Finance Survey has undergone significant changes since 1996, therefore, 1997 and later data have not been loaded into WebCASPAR. Data are available by institution (FICE code).

Current Funds Expenditures and Transfers-Scholarships and Fellowships

Status: Not used as an independent variable due to definitional inconsistencies across the time period 1988 to 2001

Description: This variable indicates current funds expenditures and transfers for scholarships and fellowships, including all expenditures given in the form of outright grants and trainee stipends to individuals enrolled in formal course work, either for credit or noncredit. Pell Grants and aid to students in the form of tuition or fee remissions are included. Remissions that are granted because of faculty or staff status and College Work Study program expenses are not included.

Source: NCES IPEDS Finance Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–1996; the NCES IPEDS Finance Survey has undergone significant changes since 1996, therefore, 1997 and later data have not been loaded into WebCASPAR. Data are available by institution (FICE code).

Current Funds Expenditures and Transfers-Mandatory Transfers

Status: Not used as an independent variable due to definitional inconsistencies across the time period 1988 to 2001

Description: This variable indicates mandatory transfers from current funds that must be made in order to fulfill a binding legal obligation of the institution. Included are mandatory debt-service provisions relating to academic and administrative buildings, including (1) amounts set aside for debt retirement and interest; and (2) required provisions for renewal and replacements to the extent not financed from other sources. Also included are the institutional matching portion for Perkins Loans when the source of funds is current revenue. Transfers into the current fund (i.e., negative numbers) are not included.

Source: NCES IPEDS Finance Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–1996; the NCES IPEDS Finance Survey has undergone significant changes since 1996, therefore, 1997 and later data have not been loaded into WebCASPAR. Data are available by institution (FICE code).

Current Funds Expenditures and Transfers-Non-Mandatory Transfers

Status: Not used as an independent variable due to definitional inconsistencies across the time period 1988 to 2001

Description: This variable indicates nonmandatory transfers from current funds to other fund groups made at the discretion of the governing board to serve a variety of objectives, such as additions to loan funds, funds functioning as endowment, general

or specific plant additions, voluntary renewals and replacement of additions, voluntary renewals and replacement of plant, and prepayments on debt principal.

Source: NCES IPEDS Finance Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–1996; the NCES IPEDS Finance Survey has undergone significant changes since 1996, therefore, 1997 and later data have not been loaded into WebCASPAR. Data are available by institution (FICE code).

Academic Discipline

Status: Used to define field-groups and aggregate other variables to the field-group level so that field-group specific regressions could be conducted.

Description: This variable contains the standardized science and engineering academic disciplines as defined in WebCASPAR. The possible values are:

- 11=Aerospace Engineering
- 12=Chemical Engineering
- 13=Civil Engineering
- 14=Electrical Engineering
- 15=Mechanical Engineering
- 16=Materials Engineering
- 17=Industrial Engineering
- 19=Other Engineering
- 21=Astronomy
- 22=Chemistry
- 23=Physics
- 29=Other Physical Sciences
- 31=Atmospheric Sciences
- 32=Earth Sciences
- 33=Oceanography
- 39=Other Geosciences
- 41=Mathematics and Statistics
- 42=Computer Science
- 49=Operations Research
- 51=Agricultural Sciences
- 52=Biological Sciences
- 53=Medical Sciences
- 59=Other Life Sciences
- 60=Psychology
- 71=Economics
- 72=Political Science and Public Administration
- 73=Sociology
- 74=Anthropology
- 75=Linguistics
- 76=History of Science
- 77=Area and Ethnic Studies
- 79=Other Social Sciences
- 81=Science Technologies
- 82=Engineering Technologies

83=Health Technologies
89=Other Science and Engineering Technologies
99=Interdisciplinary or Other Sciences

Source: WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001; data by Academic Discipline are not available for all variables; see Availability section for each variable for more information.

Academic Discipline Group

Status: This variable defines the field-groups used to aggregate data to the field-group level for field-group specific regressions.

Description: This variable groups the academic disciplines, as follows:

- Computer sciences = 42
- Medical sciences = 53
- Bio-life-ag sciences = 51, 52 and 59
- Eng-math-phy-sciences = 11 to 41 (inclusive) and 49
- Soc-sciences = 60 to 79 (inclusive)

Source: WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc. and recoded by SRI International

Availability: Data are available for 1988–2001; data by Academic Discipline are not available for all variables; see Availability section for each variable for additional information.

Number of S&E Postdoctorates (Total)

Number of S&E Postdoctorates supported by Federal Fellowship

Number of S&E Postdoctorates supported by Federal Research Grants

Number of S&E Postdoctorates supported by Federal Traineeships

Number of S&E Postdoctorates supported by Non-Federal Sources

Number of S&E Postdoctorates with Medical Degrees (Total)

Number of S&E Postdoctorates with Medical Degrees supported by Federal Fellowships

Number of S&E Postdoctorates with Medical Degrees supported by Federal Research Grants

Number of S&E Postdoctorates with Medical Degrees supported by Federal Traineeships

Number of S&E Postdoctorates with Medical Degrees supported by Non-Federal Sources

Number of S&E Postdoctorates without Medical Degrees supported by Federal Fellowships

Number of S&E Postdoctorates without Medical Degrees supported by Federal Research Grants

Number of S&E Postdoctorates without Medical Degrees supported by Federal Traineeships

Number of S&E Postdoctorates without Medical Degrees supported by Non-Federal Sources

Status: The total number of S&E postdoctorates was retained. Several sub-totals of S&E postdoctorates at field group levels slightly improved the explanatory power of field-specific models. The number of S&E postdoctorates in computer sciences, engineering, math, and physical sciences, and social sciences was used in models for these three field groups. The number of S&E postdoctorates supported by federal research grants in the biology, life, and agricultural sciences field group was used in a model for this field group for fractional count publications. The number of S&E postdoctorates with an M.D. and without an M.D. in biology, life, and agricultural sciences was used in a model for this field group for whole count publications. The number of S&E postdoctorates with M.D. degrees supported by federal research grants in the medical sciences was used in a model for this field group. Other variations of these independent variables were not retained.

Description: This variable indicates the headcount of individuals with Ph.D., M.D., D.O., D.D.S., or D.V.M. degrees (including equivalent foreign degrees) who devote their primary effort to their own research training in science, engineering, or health fields through research activities or study under temporary appointments carrying no academic rank and who are supported by a federal fellowship, federal research grant, federal traineeship, or non-federal sources, respectively. These individuals may contribute to the academic program through seminars, lectures, or working with graduate students. Postdoctorates may have different titles at different institutions, e.g., “Postdoctoral Scholar,” “Research Associate,” “Postdoctoral Fellow,” or “Postgraduate Researcher.” Clinical fellows and those with appointments in residency training programs in medical and health professions are excluded, unless research training under the supervision of a senior mentor is the primary purpose of the appointment.

Source: NSF-NIH Survey of Graduate Student and Postdoctorates in Science and Engineering; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code) and standardized science and engineering academic disciplines as defined in WebCASPAR.

Number of S&E Graduate Students

Status: Independent variable that was not retained.

Description: This variable indicates the headcount (not full-time equivalent) of students enrolled in graduate S&E and health-related fields at U.S. academic institutions. M.D., D.O., D.V.M., or D.D.S. candidates, interns, and residents are counted if they are concurrently working for an S&E master’s or Ph.D. degree or are enrolled in a joint medical/Ph.D. program. Individuals who already hold graduate or medical degrees and are working on another master’s or Ph.D. degree are considered graduate students, not postdoctorates. S&E students performing thesis or dissertation research away from the campus (for example, at Government and contractor-owned facilities) in the United States are included as long as they are enrolled for credit in an advanced-degree program. Students enrolled in a foreign country (at a branch or extension center), and non-matriculated students are not included. Students enrolled in multiple departments/institutions are only included in one department/institution;

students enrolled in interdisciplinary/interinstitutional programs are counted only once, in their “home” department and institution.

Source: NSF-NIH Survey of Graduate Student and Postdoctorates in S&E; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code) and standardized science and engineering academic disciplines as defined in WebCASPAR.

Number of Non-Faculty Research Staff with Medical Degrees

Status: Independent variable that was not retained.

Description: This variable indicates the headcount of doctoral scientists and engineers with M.D., D.O., D.D.S., or D.V.M. degrees (including foreign degrees equivalent to U.S. doctorates) who are involved principally in research activities but are not considered either postdoctoral appointees or members of the regular faculty.

Source: NSF-NIH Survey of Graduate Student and Postdoctorates in Science and Engineering; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code) and standardized science and engineering academic disciplines as defined in WebCASPAR.

Number of Non-Faculty Research Staff

Status: Independent variable that was not retained.

Description: This variable indicates the headcount of doctoral scientists and engineers who are involved principally in research activities but are not considered either postdoctoral appointees or members of the regular faculty.

Source: NSF-NIH Survey of Graduate Student and Postdoctorates in Science and Engineering; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code) and standardized science and engineering academic disciplines as defined in WebCASPAR.

Academic Institution Attribute-1994 Carnegie Classification

Status: Independent variable that was not retained in the institution level model. This variable was retained in the six variable version of the model applicable at the field-group level due to its contribution to estimating publications in the medical sciences field group.

Description: This variable is the institution’s 1994 Carnegie Classification. The possible values are:

- D-1=Doctoral I
- D-2=Doctoral II
- ENG=Engineering and Technology
- MED=Medical
- M-1=Master's/Comprehensive I
- N/A=Not Classified

- OTH=Other Specialized
- R-1=Research I
- R-2=Research II
- HLT=Health

Source: WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: This variable is an institution attribute, and is not available by academic discipline or year.

Academic Institution Attribute-Type of Control

Status: Independent variable that was not retained.

Description: This variable indicates the form of control or affiliation under which the institution operates. The possible values are:

- Pri=Private
- Pub=Public
- Unk=Unknown

Source: WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: This variable is an institution attribute, and is not available by academic discipline or year.

IPEDS-Number of Full-time Faculty, Full Professors by Year

IPEDS Number of Full-time Faculty, Associate Professors by Year

IPEDS Number of Full-time Faculty, Assistant Professors by Year

IPEDS-Number of Full-time Faculty, Instructors by Year

IPEDS-Number of Full-time Faculty, Lecturers by Year

IPEDS-Number of Full-time Faculty, Other Ranks by Year

Status: Independent variables that were not retained.

Description: These variables indicate the headcount (not full-time equivalent) of those members of the instructional and research staff with academic rank designation of full professor, associate professor, assistant professor, instructor, lecturer or other rank, respectively, who are employed full-time (as defined by the institution) and whose major (more than 50%) regular assignment is instruction, including those with released time for research. Also included are: full-time instructional faculty on sabbatical leave, full-time replacements for instructional faculty on leave without pay, and Chairs of departments (if they have no other administrative title and hold a full-time faculty rank).

The following staff are not included:

- Replacements for instructional faculty on sabbatical leave.
- Instructional faculty on leave without pay.
- Instructional faculty for preclinical and clinical medicine (instructional faculty in all other fields, such as dentistry, veterinary medicine, nursing, dental hygiene, etc., are included.)
- Instructional faculty who are employed on a part-time basis.
- Instructional faculty (such as members of religious orders) whose services are valued by bookkeeping entries rather than by full cash transactions.

- Instructional faculty who, as members of military organizations, are paid on a different salary scale from civilian employees.
- Administrative officers with titles such as dean of instruction, academic dean, dean of faculty, dean of students, librarian, registrar, coach, etc., even though they may devote part of their time to classroom instruction.
- Undergraduate or graduate students who assist in the instruction of courses, but have titles such as graduate or teaching assistant, teaching associate, teaching fellow, etc.

Source: NCES IPEDS Salaries, Tenure, and Fringe Benefits of Full-time Instructional Faculty Survey WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–1999, except 1989. Data are available by institution (FICE code).

1993 NRC Scholarly Quality Rating by Field

Status: Independent variable that was not retained.

Description: This variable is the mean of the Scholarly Quality Rating (SQR) of the Program Faculty on a scale of 0 to 5, with 5 as the best possible value. Raters were asked to comment on two dimensions of quality for about 50 randomly selected programs in their fields: 1) “scholarly quality of program faculty,” and 2) “effectiveness in educating research scholars/scientists.” Ratings for “scholarly quality of program faculty” ranged from 0 to 5 with 0 signifying “not sufficient for doctoral education” and 5 signifying “distinguished.” Raters were asked to designate no more than five programs as “distinguished.” From these responses, the committee calculated a mean rating for each program appearing in the study. For some disciplines the program ratings are provided at a more detailed discipline level than WebCASPAR Academic Disciplines. Therefore, it was necessary to compute a weighted average of the program ratings for these disciplines; the institution's number of graduates in the program was used to weight the ranking data.

Source: Research Doctorate Programs in the United States: Continuity and Change; National Academy of Sciences, National Research Council; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: This variable is an institution attribute that is available by standardized science and engineering academic disciplines as defined in WebCASPAR.

1993 NRC Scholarly Quality Rating Distinguished Indicator by Field

Status: Independent variable that was not retained.

Description: This variable indicates if the mean of the Scholarly Quality Rating of the Program Faculty is greater than 4.00 (on a scale of 0 to 5, with 5 as the best possible value). For some disciplines the program ratings are provided at a more detailed discipline level than WebCASPAR Academic Disciplines. Therefore, it was necessary to derive this variable as follows for these disciplines:

- Institutions rated distinguished in mathematics are rated distinguished in mathematics/statistics, regardless of the rating in the smaller field;
- Institutions rated distinguished in statistics and that also have a weighted average above 4.00 in mathematics/statistics are counted as distinguished;

- Institutions rated distinguished in 3 or more of the 7 Biology subfields are counted as distinguished; and
- Institutions that have a weighted average in Biology above 4.00 are counted as distinguished.

Source: Research Doctorate Programs in the United States: Continuity and Change; National Academy of Sciences, National Research Council; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: This variable is an institution attribute that is available by standardized science and engineering academic disciplines as defined in WebCASPAR.

Number of Patents in 1988 to 2001

Status: Independent variable that was not retained.

Description: This variable indicates the sum of the number of patents granted in 1988 to 2001.

Source: US Colleges and Universities- Utility Patent Grants, 1969–2001, produced by the USPTO, Office of Electronic Information Products, Patent Technology Monitoring Division (PTMD). A more recent version of this report is available at http://www.uspto.gov/web/offices/ac/ido/oeip/taf/univ/univ_toc.htm

Availability: Data are available by institution (FICE code). Although patents data are available by year, due to the sparseness of the data, data for 1988 to 2001 were aggregated for each institution.

IPEDS Opening Fall Enrollment

Status: Independent variable that was not retained.

IPEDS Opening Fall Enrollment-Total

IPEDS Opening Fall Enrollment-Undergraduate Students

IPEDS Opening Fall Enrollment-Graduate Students

Description: These variables indicate the headcount of all students, undergraduate students (as defined by the institution), or graduate students (as defined by the institution), respectively, that are enrolled in courses creditable toward a diploma, certificate, degree, or other formal award. Students enrolled in courses that are part of a vocational or occupational program, including those enrolled in off-campus centers are included. Also included are high school students taking regular college courses for credit and students taking remedial courses if the student is considered degree-seeking for the purpose of student financial aid determination.

Source: NCES IPEDS Opening Fall Enrollment Survey; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 with the exception of 1999; 1999 data were not released by NCES. Data are available by institution (FICE code).

FICE Code

Status: Variable used to identify parent institutions

Description: This variable is the Federal Interagency Commission on Education (FICE) code for an institution corresponding to the FICE code under which NSF Survey of Research and Development Expenditures at Colleges and Universities are collected. Appendix A provides a listing of campuses and their FICE codes that are included with each parental FICE (pfice).

Source: NSF Survey of Research and Development Expenditures at Colleges and Universities; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001.

Rank among top 200 R&D performing universities for Sum of 1988–2001 Total R&D Expenditures

Status: Independent variable that was not retained.

Description: This variable is the rank of the institution based on average total R&D expenditures for 1988–2001. The possible values are 1–200. Appendix A provides a list of institutions with their corresponding ranks.

Source: NSF Survey of Research and Development Expenditures at Colleges and Universities; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code).

Federally Financed Academic Basic Research Expenditures

Status: Independent variable that was not retained.

Description: This variable indicates awards for basic research in S&E, including direct and reimbursed indirect costs, by all agencies of the federal government. Basic research is directed toward an increase of knowledge; it is research where the primary aim of the investigator is a fuller knowledge or understanding of the subject under study rather than a specific application thereof.

Source: NSF Survey of Research and Development Expenditures at Colleges and Universities; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code).

Federally Financed Academic Research Equipment Expenditures

Status: Independent variable that was not retained.

Description: This variable indicates federally financed current fund research equipment expenditures for separately budgeted R&D in S&E. It includes all research equipment purchased under sponsored research project awards from current fund accounts.

Source: NSF Survey of Research and Development Expenditures at Colleges and Universities; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code).

Federally Financed Academic R&D Expenditures

Status: Independent variable that appeared in some initial models, and was replaced with total academic R&D expenditures to maintain consistency in models across field-groups and dependent variables. Due to the high correlation between total academic R&D expenditures and federally financed academic R&D expenditures, this substitution resulted in minimal loss of explanatory ability.

Description: This variable indicates awards for R&D in S&E, including direct and reimbursed indirect costs, by all agencies of the federal government.

Source: NSF Survey of Research and Development Expenditures at Colleges and Universities; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code) and standardized science and engineering academic disciplines as defined in WebCASPAR.

Industry Financed Academic R&D Expenditures

Status: Independent variable that was not retained.

Description: This variable indicates all grants and contracts funds for R&D in S&E from profit-making organizations, whether engaged in production, distribution, research, service, or other activities. Grants and contracts from nonprofit foundations financed by industry are not included.

Source: NSF Survey of Research and Development Expenditures at Colleges and Universities; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code).

Other Funding Sources for Academic R&D Expenditures

Status: Independent variable that was not retained.

Description: This variable indicates awards for R&D in S&E, including direct and reimbursed indirect costs, from nonprofit foundations and voluntary health agencies. Also included are gifts from individuals that are restricted by the donor to research as well as all other sources not elsewhere classified.

Source: NSF Survey of Research and Development Expenditures at Colleges and Universities; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code).

Institutionally Financed Academic R&D Expenditures

Status: Independent variable that was not retained.

Description: This variable indicates funds, including related indirect costs, spent by the institution for R&D activities in S&E from the following unrestricted sources: 1) general-purpose state or local government appropriations; 2) general-purpose awards from industry, foundations, or other outside sources; 3) tuition and fees; 4) endowment income; 5) and other institutional funds. Also included are on-campus and off-campus unreimbursed indirect costs associated with externally funded R&D projects, including mandatory and voluntary cost sharing. Institutions are instructed to estimate unreimbursed indirect costs, preferably on a project-by-project basis, using the appropriate on-campus or off-campus negotiated research indirect cost rate(s) multiplied by the corresponding base(s) minus actual indirect cost recovery.

Source: NSF Survey of Research and Development Expenditures at Colleges and Universities; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code).

Institutionally Financed Organized Research Expenditures

Status: Independent variable that was not retained.

Description: This variable indicates funds, including related indirect costs, spent by the institution for R&D activities from the following unrestricted sources: general-purpose state or local government appropriations; general-purpose awards from industry, foundations, or other outside sources; tuition and fees; endowment income; gifts; and other institutional funds.

Source: NSF Survey of Research and Development Expenditures at Colleges and Universities; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code).

State/Local Government Financed Academic R&D Expenditures

Status: Independent variable that was not retained.

Description: This variable indicates funds for R&D in S&E from state, county, municipal, or other local governments and their agencies. State funds that support R&D at agricultural and other experiment stations are included.

Source: NSF Survey of Research and Development Expenditures at Colleges and Universities; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code).

Total Academic Basic Research Expenditures

Status: Independent variable that was retained in the six variable model used for field-specific estimates. This variable appeared only to be applicable to the computer science field, where it modestly improved the model fit.

Description: This variable indicates separately budgeted R&D expenditures in S&E for basic research. Basic research is directed toward an increase of knowledge; it is research where the primary aim of the investigator is a fuller knowledge or understanding of the subject under study rather than a specific application thereof.

Source: NSF Survey of Research and Development Expenditures at Colleges and Universities; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code).

Total Academic Research Equipment Expenditures

Status: Independent variable that was not retained.

Description: This variable indicates current fund research equipment expenditures from all sources for separately budgeted R&D in S&E. It includes all research equipment purchased under sponsored research project awards from current fund accounts.

Source: NSF Survey of Research and Development Expenditures at Colleges and Universities; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code).

Total Academic R&D Expenditures

Status: Independent variable that was retained.

Description: This variable indicates separately budgeted R&D expenditures in S&E. It includes: 1) all funds expended for activities specifically organized to produce research outcomes and commissioned by an agency either external to the institution or separately budgeted by an organizational unit within the institution; 2) research equipment purchased under research project awards from current fund accounts; and 3) research funds for which an outside organization, educational or other, is a subrecipient. Excluded are: training grants, public service grants, demonstration projects, clinical trials, and departmental research expenditures that are not separately budgeted.

Source: NSF Survey of Research and Development Expenditures at Colleges and Universities; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code) and standardized science and engineering academic disciplines as defined in WebCASPAR.

Unreimbursed Indirect Costs and Related Sponsored Research

Status: Independent variable that was not retained.

Description: This variable indicates estimated on-campus and off-campus unreimbursed indirect costs associated with externally funded R&D projects, including mandatory and voluntary cost sharing; survey respondents are instructed to estimate unreimbursed indirect costs, preferably on a project-by-project basis, using the appropriate on-campus or off-campus negotiated research indirect cost rate(s) multiplied by the corresponding base(s) minus actual indirect cost recovery.

Source: NSF Survey of Research and Development Expenditures at Colleges and Universities; WebCASPAR database system input SAS data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code).

SDR Number of S&E Doctorate Recipients Employed at Institution by Field

Status: This variable was not used in the analyses, due to concern about the appropriateness of institution-level estimates, uncertainty in what capacity these Ph.D.s were employed, and concern that the exclusion of individuals with foreign doctorates from the survey resulted in an undercount.

Description: This variable is the sum of the S&E doctorate recipients employed at an institution by field for 1988 to 2001. The Survey of Doctorate Recipients is a sample survey; sample data were weighted to obtain institution estimates.

Source: NSF Survey of Doctorate Recipients; WebCASPAR database system, ABC-SQL Query Tool input data sets prepared by ORC Macro, Inc.

Availability: Data are available for 1988–2001 by institution (FICE code). The Survey of Doctorate Recipients is a biennial survey; data were collected in odd-numbered years 1987 through 2001. Data for even-numbered years 1988 through 2000 were interpolated.

SDR Average Number of S&E Doctorate Recipients Employed at Institution in 1988–2001 by Field

Status: This variable was not used in the analyses, partially due to concern about the appropriateness of institution-level estimates and partially because it was uncertain in what capacity these Ph.D.s were employed.

Description: This variable is the average of the S&E doctorate recipients employed at an institution by field for 1988 to 2001. The Survey of Doctorate Recipients is a sample survey; sample data were weighted to obtain institution estimates. The Survey of Doctorate Recipients is a sample survey; sample data were weighted to obtain institution estimates.

Source: NSF Survey of Doctorate Recipients; WebCASPAR database system, ABC-SQL Query Tool input data sets prepared by ORC Macro, Inc.

Availability: Data are available by institution (FICE code). The Survey of Doctorate Recipients is a biennial survey; data were collected in odd-numbered years 1987 through 2001. Data for even-numbered years 1988 through 2000 were interpolated.

C.2 References For Data Sources

Thomson ISI, Science Citation Index (SCI) and Social Sciences Citation Index (SSCI); data provided by ipIQ, Inc. (formerly CHI Research, Inc.)

Additional information is available from:

<http://scientific.thomson.com/products/categories/citation/>

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NCES IPEDS Completions, Finance, Opening Fall Enrollment, and Salaries, Tenure, and Fringe Benefits of Full-time Instructional Faculty Surveys

Additional information is available from:

<http://nces.ed.gov/ipeds/>

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NSF Survey of Doctorate Recipients

Additional information is available from:

<http://www.nsf.gov/statistics/srvydoctoratework/>

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NSF Survey of Earned Doctorates (SED)/Doctorate Records File (DRF)

Additional information is available from:

<http://www.nsf.gov/statistics/srvydoctorates/>
<http://www.norc.uchicago.edu/issues/docdata.htm>

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NSF Survey of Research and Development Expenditures at Colleges and Universities

Additional information is available from:

<http://www.nsf.gov/statistics/srvyrdexpenditures/>

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NSF-NIH Survey of Graduate Student and Postdoctorates in Science and Engineering

Additional information is available from:

<http://www.nsf.gov/statistics/srvygradpostdoc/>

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**Research Doctorate Programs in the United States: Continuity and Change;
National Academy of Sciences, National Research Council**

Additional information is available from:

<http://www.nap.edu/readingroom/books/researchdoc/>
<http://books.nap.edu/catalog/4915.html>
<http://books.nap.edu/catalog/5305.html>
<http://www7.nationalacademies.org/resdoc/index.html>

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Electronic Information Products**

Additional information is available from:

<http://www.uspto.gov/web/offices/cio/cis/prodsvc.htm>

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