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MIT'S RISE TO PROMINENCE:
OUTLINE OF A COLLECTIVE BIOGRAPHY

BY ANDREJ SVORENCIK

CHOPE Working Paper No. 2013-19

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CENTER FOR THE
HISTORY OF POLITICAL ECONOMY
AT DUKE UNIVERSITY

MIT's Rise to Prominence: Outline of a Collective Biography

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Revised Version: January 2014¹

Forthcoming: Special issue of History of Political Economy “MIT and the Transformation of American Economics” (2014)

The core question of MIT Economics Department’s history – why has MIT economics risen to prominence so quickly – requires an approach to history of economics that focuses on the role of the networks within which economists operate, their ideas diffuse, and gain scientific credit. By reconstructing the network of MIT economics Ph.Ds. and their advisors, this paper furnishes not just evidence of how MIT rose to prominence as documented by the numerous ties of Nobel Laureates, Clark Medalists, elected officials of the AEA or the Council of Economic Advisors to the MIT network. The MIT Economics Department is also revealed as a community of self-replicating economists who are to a large extent trained by a few key advisers who were mostly trained at MIT as well. MIT exhibits a large share of graduates who remain in American academia that is disproportionate to the number of graduates it has produced. It is hypothesized that this has been an important factor in MIT’s rise to prominence. On a methodological level this paper introduces prosopography or collective biography, a well-established historiographic method, to the field of history of economics.

Keywords: MIT, networks of economists, advisor-advisee relations, prosopography, collective biography

JEL codes: B20, B30, J44, J62

Previous version’s title was *Towards a Prosopography of the MIT Economics Department*

The Economics Department at the Massachusetts Institute of Technology has been for over half a century one of the most influential economics departments in the world. Not only thirteen Economics Nobel Laureates but also “many of world’s leading central bankers and policy makers have roots that trace back” to MIT. To support its claim the Wall Street Journal listed fifteen doctorate holders or former MIT faculty, who were either classmates or even in student-advisor relationship. (Hilsenrath, 2012)² However, MIT started training academic economists only in the 1940s, later than its rivals such as Harvard, Chicago, Columbia or Cambridge. True, MIT’s rapid ascent might be explained by resorting to the traditional view of history of economic thought as a succession of great minds and their seminal ideas. MIT economists undisputedly provide ample opportunity for this approach. Yet, it disregards the role of the networks within which economists operate, their ideas diffuse, and gain scientific credit. Therefore in this paper I advocate an alternative view that the history of economics is largely the history of groups of economists and the emphasis should be placed on their networks such as departments. To this end, inspired by *collective biography*, or *prosopography*, a method successfully employed by historians, this paper intends to furnish a first step towards a collective biography of the MIT Economics Department.

Among historians of economics, “Chicago Economics” has become an industry on its own. (Van Horn et al., 2011, Emmett, 2010) Yet, they have largely ignored MIT, which equals – and very likely exceeds – Chicago’s influence among academic economists. Moreover, MIT’s influence in the current world of central banking exceeds any other economics department. According to WSJ’s assertion, it is the “MIT engineers” who have been wielding power in central banks around the world during the recent worldwide

I would like to thank *Beatrice Cherrier*, *Roger Backhouse*, *Marek Hlavac*, and *Jim Poterba* for their comments on a preliminary draft, and *Will Thomas* for our discussion about his prosopographic research on American Postwar Physics Elite. The idea for this paper appeared when I had the opportunity to discuss Beatrice’s early version of her paper ([this volume](#)) presented at the HISRECO conference in 2010 in Paris. I would also like to thank *Paul Pier* for sharing MIT relevant part of the source data of his 1999 paper. *Jan Zilinsky* provided invaluable help in obtaining some records from the MIT Archives. The usual disclaimers apply.

² The article mistakenly claims that Mario Draghi, the ECB chief, was supervised by Stanley Fischer. However, my data and a check of his dissertation suggest that it his only supervisor was Franco Modigliani.

economic crisis. While the present volume³ attempts to mitigate this acute historiographic lacuna, this paper promises a rigorous empirical basis for a new understanding of MIT's transformative influence on American and world economics. Furthermore, prosopographic research allows turning received knowledge about MIT for which there is no reference except for, say, anecdotes into reliably demonstrated evidence.

Collective biography (prosopography) is an established historiographic method that identifies and draws relationships between various people within a specific, well-defined historical or social context by collecting and analyzing statistically relevant biographical data.⁴ (Keats-Rohan, 2007) It is particularly well suited for identification of hidden hierarchies or relationships that remain elusive when the focus is on the most prominent members of a group. The prosopographic method provides an interpretative framework for understanding academic communities that is novel to the history of economics.⁵ It

3 Special issue of History of Political Economy on the history of MIT Economics titled "MIT and the Transformation of American Economics" (2014)

4 The literal meaning of prosopography is the "description of external/material individual characteristics." However, prosopography as a historiographic method goes beyond a mere collection of such characteristics as its goal is to identify often unrecognized relations. It is the study of biographical details of individuals in aggregate, *not a biography of groups*. Therefore the alternative term collective biography is somewhat misleading. The classic treatment of prosopography was delivered by Stone STONE, L. 1971. Prosopography. *Daedalus*, 100, 46-79, STONE, L. 1987. *The past and the present revisited*, London; New York, Routledge & Kegan Paul. Shapin and Thackray advocated that prosopographic research could reform the notions of "the scientist" and "the scientific community." SHAPIN, S. & THACKRAY, A. 1974. Prosopography as a research tool in history of science : the British scientific community 1700-1900. *History of science*, 12, 1-28. Some of the many applications of prosopography to history of science include: SÖDERQVIST, T. & SILVERSTEIN, A. M. 1994. Participation in scientific meetings: A new prosopographical approach to the disciplinary history of science: The case of immunology, 1951-72. *Social Studies of Science*, 24, 513-548, BELLHOUSE, D. R., RENOUF, E. M., RAUT, R. & BAUER, M. A. 2009. De Moivre's Knowledge Community: An Analysis of The Subscription List to the Miscellanea Analytica. *Notes and Records of the Royal Society of London*, 63, 137-162.

5 The literature on quantitative analysis of economists and the economics profession typically includes bibliometric analysis; content analysis of publications; and rankings of individuals, departments, etc. For a survey covering this field until the late 1990s see BACKHOUSE, R. E., MIDDLETON, R. & TRIBE, K. 1997. 'Economics is what economists do', but what do the numbers tell us? *Annual History of Economic Thought Conference*. University of Bristol, 3-5 September 1997. However, only two history of economics papers come close to prosopographic research. Both investigated whether the decline of institutional economics can be explained through lower rates of graduates staying in academia. Malcolm Rutherford chose to follow the career paths of students of John R. Commons, a key inter-war institutionalist. RUTHERFORD, M. 2006. Wisconsin Institutionalism: John R. Commons and His Students. *LABOR HISTORY*, 47, 161-188. Jeff Biddle on the other hand investigated the decline of institutionalism through a comparison of careers paths of University of Wisconsin and several other departments Ph.Ds. who graduated in the interwar period. BIDDLE, J. 1998. Institutional Economics: A Case of Reproductive Failure? *History of Political Economy History of Political Economy*, 30, 108-133.

might be particularly useful given the dramatic expansion of economists in the postwar era.

Typically, collective biography is applied to deal with the issue of scarcity of historical data. In contrast, in an MIT collective biography one deals with a period that is much richer on relevant biographical data.⁶ This allows going beyond the investigation of socio-cultural background and academic peregrination of students and faculty that is typical of prosopographies of early academic institutions like medieval universities. It shifts the focus to networks of patronage and academic genealogies.⁷

Both are closely connected and their analysis requires the reconstruction of a target population of students and faculty and also of the advisor-advisee relationship. The implicit assumption in this paper is that the advisor-advisee relationship is the most important in defining the network of patronage. True, there might be faculty who do not supervise a particular student, but influence her in class or research. However, in the post-WWII period each step of the academic career cycle such as the job market, promotion reviews, and to lesser extent attribution of scientific credit heavily relies on the advisers' letters of recommendation.⁸ On an individual level, being supervised by a particular advisor informs in no small part others' prior beliefs about the nature, quality, and context of the student's research. On a collective level, such beliefs are also formed by the student's affiliation to a particular department. Together, they form the student's academic identity through shared training, experiences, practice of economics, and personal networks that extend beyond graduate school and have led to notions of MIT or Chicago economists. This can be visualized through academic family trees that I construct in this paper for the case of MIT. These identities, especially of influential

6 For a discussion of data intensive research, databases, and implication for history of science including further references see STRASSER, B. J. 2012. Collecting Nature: Practices, Styles, and Narratives. *Osiris*, 27, 303-340.

7 Interest in academic genealogies is not new. The online *Mathematics Genealogy Project* inspired similar endeavors in artificial intelligence, chemistry, linguistics, and philosophy. Randal Collins in his 1998 book *The sociology of philosophies* successfully utilized them to uncover "patterns of intellectual networks and their inner divisions and conflicts." COLLINS, R. 1998. *The sociology of philosophies : a global theory of intellectual change*, Cambridge, Mass., Belknap Press of Harvard University Press.

8 This is not to say that academic career cycle is not evolving. However, the nature of its change is not investigated in this paper.

departments, have become subject of considerable attention by historians of economics including in this volume who use the rubrics of MIT style, MIT economics, or MIT economists. These issues are well known in the sociology of science literature (Collins, 1998), STS studies (e.g. Knorr-Cetina, 1999, Latour and Woolgar, 1986), but also sociology in general. (Wetherell, 1998)

The body of this paper analyzes available data and lays out the evidence about MIT. First two subsections address two parts of the MIT population – its graduate students and faculty respectively. The third subsection zooms onto the advisor-advisee relationship and constructs a partial academic family tree. Once these basic prosopographic characteristics are established, subsection four adds various relational structures to demonstrate the growing importance of MIT over time. In the second section I introduce the high retention conjecture as a possible explanation of MIT's rapid rise to prominence. The concluding section synthesizes the structure and the ways of operation of the MIT network and outlines future research avenues.

1 Evidence

1.1 MIT Students

The first step towards an MIT collective biography is to precisely establish the size of the MIT population. It consists of both Ph.D. students and faculty from the beginning of the MIT doctoral program in 1941. I limit my investigation with the year 2011. This paper is based on a complete dataset of MIT graduates that includes the year of graduation, names of advisor(s), and title of dissertation – all laboriously obtained directly from MIT's library records.⁹ These records are unique in their scope, as I was unable to retrieve such data from library records for any other major US economics department.

⁹ I do not include Ph.D. degrees awarded by the MIT Sloan School of Management. Since the establishment of its doctoral program in 1964, 671 doctorates were conferred until 2011 but only a small fraction of them were in economics or were (co-)supervised by faculty from the economics department.

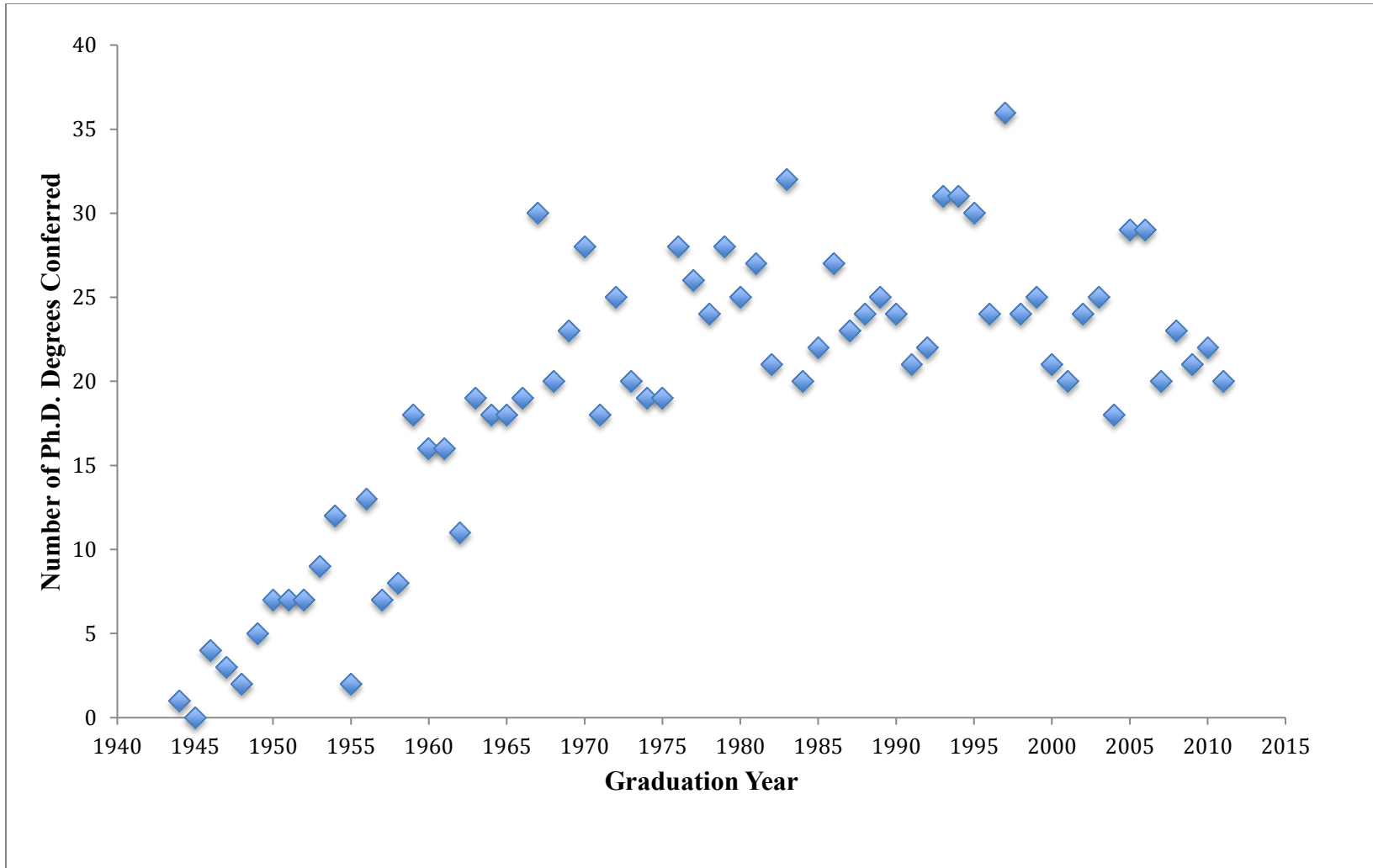


Figure 1

MIT annual graduation rates for the period 1944-2011

Observation 1: For the period 1944-2011, 1316 MIT economics Ph.Ds. are recorded. The first Ph.D. degree was conferred to Lawrence Klein in 1944, who was supervised by Paul Samuelson. The Figure 1 depicts the evolution of the number of degrees awarded.

Observation 2: Two distinct periods can be observed in this figure. First, until about 1970 the number of graduation rose steadily. Second, from 1970 onwards the number of graduates has oscillated around 24 per year; the fluctuations around this number likely reflect external economic conditions influencing student enrollment. Until the 1990s the modal duration of graduate studies was four years, the MIT program reached a saturation point by mid/late 1960s.¹⁰

In the first twenty years, 1944-1964, 185 doctorates were completed. This many students finish now during an eight-year period. Put differently, by 1972 the number of economists with a degree from MIT doubled. In comparison, in the 1950s Harvard was churning 34 doctorates, Wisconsin over 25, and Berkeley and Columbia around 19 doctorates annually. Only in the 1970s MIT joined these departments as one of the largest programs in the USA. (Scott Jr and Anstine, 1997, p. 313)

There is only one case of a joint thesis and for each author it is counted individually.¹¹ Another peculiarity is a thesis with a co-author and the co-author defended a separate thesis.¹² According to library records, 945 students had one supervisor, 333 two supervisors and 38 three supervisors. All theses are counted individually. However, shared supervision is divided in equal parts. For instance, Susan Athey, the 2007 Clark Medalist and MIT faculty from 1995-2001, was involved in supervision of four graduate students, and her total supervision share was 1.83 students – the result of three half

¹⁰ The four year modal duration was suggested by a referee.

¹¹ This happened in 1967 when D. Carter and G. Nicholas were jointly supervised by Karl Shell. Their dissertation was titled *On the Use of a Non-Linear Criterion Function in Development Programming Models*.

¹² The dissertation titled *Informational aspects of securities markets* was written by Robert Ward Vishny and supervised by Eric Maskin and Franklin Fisher. (1985) Two out of three essays were co-authored with Andrei Shleifer who defended a separate thesis.

supervisions and an one third supervision. In my interpretation, Athey influenced four MIT doctorates, but the actual strength of her influence was 1.83 students. I will refer to these measures as **extensive** and **intensive supervision measure**. I give preference to intensive supervision measure as I implicitly assume that the each co-supervisor has an equal impact on a student. The available data do not allow establishing who had the decisive influence on a student.¹³

Observation 3: Theses with two supervisors became common in the second half of the 1980s; there were just seven cases prior to 1985. Theses with three supervisors became popular only in the 2000s; there were just four cases prior to 2000. In consequence, unlike in the early years supervisors in the past two decades have a much lower intensive supervision than extensive one.¹⁴

1.2 MIT Faculty

Observation 4: 165 distinct advisors supervised 1316 MIT Ph.Ds.¹⁵ There are 33 supervisors who advised at least 1% of all students.¹⁶ The following table orders them according to their intensive supervision - a measure that modifies extensive supervision by accounting for co-supervisors. It is important to note that the third and fourth column indicate only a period from the first recorded graduation of a student by the particular

¹³ I checked several theses that are available online. In cases of several supervisors, the primary supervisor is not indicated.

¹⁴ Jim Poterba became an assistant professor at the MIT in 1982 and served as it the Associate Department head between 1994-2006 (except 2000-2001). He recalls that “for most of the period over which I've been at MIT, the primary function of the third advisor was to read the completed dissertation, to determine whether it met the standards for acceptance, and to provide some advice to the student on where the various parts of the dissertation might be submitted for publication. I believe that there would be three faculty names on the dissertation in this case, but the third reader, as I suggested, would have had a relatively minor role in the advising process. More recently, however, we have seen a number of students with three actively involved advisers. I can't hazard a guess of how common that is, and I don't think there is any way to determine this based only on department records -- the dissertation would still have three faculty signatures.” Personal communication with the author May 27, 2013.

¹⁵ Names of advisors of 13 students were missing from the library records. They were obtained through direct inquiry with the department and the MIT Archives.

¹⁶ As the graduation rate is not constant in time, faculty in earlier period did not have that many supervision opportunities. I will later show that this was compensated by the smaller (supervising) faculty size.

advisor – even though he joined the depart a few years earlier and still might be a faculty member though not supervising students anymore.

First Name	Surname	Supervising from	Supervising until	Intensive supervision	Extensive supervision
Robert	<i>Solow</i>	1954	1997	72.5	76
Rüdiger	Dornbusch	1977	2002	69.33	86
Olivier	Blanchard	1985	1999	52.66	76
James	Poterba	1985	2010	51.5	66
Franklin	Fisher	1962	2003	49.83	55
Charles	Kindleberger	1951	1980	47.5	48
Stanley	Fischer	1975	1994	47	50
Jerry	Hausman	1976	2010	39.33	54
Daron	Acemoglu	1995	2011	39.33	73
Charles	Myers	1946	1980	35.5	37
Morris	Adelman	1952	1982	33.33	34
Peter	<i>Diamond</i>	1973	2010	28	38
Michael	Piore	1969	2000	26.33	29
Paul	<i>Samuelson</i>	1944	1978	25.5	26
Richard	Eckaus	1965	1997	24	25
Lance	Taylor	1976	1989	24	24
Paul	<i>Krugman</i>	1981	2000	23.5	28
Abhijit	Banerjee	1995	2011	22.5	46
Paul	Joskow	1976	2005	21.5	28
Glenn	Ellison	1994	2007	20.33	36
Ricardo	Caballero	1995	2011	19.33	35
Franco	<i>Modigliani</i>	1967	1985	19	19
Peter	Temin	1972	2005	17.83	21
Jonathan	Gruber	1994	2011	17.66	30
Esther	Duflo	2000	2011	16.66	34
Henry	Farber	1980	1993	16	16
Joshua	Angrist	1998	2011	15.83	34
Douglas	Brown	1947	1966	16.5	18
Edwin	Kuh	1962	1973	15	15
Evsey	Domar	1960	1984	15	15
Jerome	Rothenberg	1968	1979	14	14
Jagdish	Bhagwati	1970	1981	13	13
David	Autor	2003	2011	13	27

Table 1

Most active MIT supervisors according to intensive measure of supervision

Surnames in italics indicate Nobel Laureates and in bold a Ph.D. degree from MIT.

Observation 5: There are only nine supervisors who supervised more than 3% of students (intensive count). In total, they have supervised 468.98 students, or 36% of all doctorates. As the length of supervision tenure differs among supervisors, one could normalize their performance. However, this does not change the results in Table 1 significantly.

Observation 6: Zooming onto the nine most active supervisors. From mid-1950s until mid 1970s, Solow is the dominant figure, with Kindleberger and somewhat later Franklin Fisher being important. Dornbusch dominated the second half of the 1970s and the 1980s. His influence extended well through out the 1990s until his premature death in 2002. The turn of the 1990s raised Poterba and Blanchard to prominence. Acemoglu dominates the 2000s.

Conclusions whether it is justified to label a particular period according to one or two leading supervisors require the consideration of the total number of students produced. For instance, Charles Kindleberger and Charles Meyers dominated the 1950s with 13 and 14 supervisions respectively. Douglas Brown, Morris Adelman, Paul Samuelson and Robert Solow supervised from 8 to 10.5 theses in that period.

Observation 7: Table 2 depicts advisors who supervised at least six theses in the period 1944-1969 (i.e. at least two 2% of theses written in that period). At the very beginning Brown, Meyers, and Samuelson were leading these efforts. Kindleberger and Adelman joining in the early 1950s and Solow in mid 1950s. In the 1960s, both Solow and Kindleberger clearly lead the supervision efforts. The second half of the 1960s saw the increase of the number of active supervisors.

Year	Adelman	Ando	Bishop	Brown	Domar	Eckaus	Fisher	Kindleberger	Kuh	Millikan	Myers	Samuelson	Shepard	Solow	Sum per Year
1944												1			1

1946				1							1	2			4
1947				1.5							0.5	1			3
1948				1											1
1949				1							1				2
1950				3.5							1.5				5
1951				1.5				2			2.5	1			7
1952	1		1								3		1		6
1953	1			2								1	2		6
1954	1			1			1		1	1	3	2	1		11
1955	1			1											2
1956				1				3			1	2.5		3	10.5
1957	1							1			1	2	1	1	7
1958	1		2					2		1					6
1959	2		1	1				4			4			2	14
1960	1	1	1	1	1			3			2			4	14
1961	2	1.5			2			0.5		1	1	1		1	10
1962	2	1			1		1		1						6
1963		3	1					3				1		6	14
1964	1	3					1	3		1	4	1		1	15
1965		1				1	2	4	1	1	1	1		2	14
1966	2			2		2	2	1	1	2	2			4	18
1967	1			2	1	3	1	4	3		3			7	25
1968	2					2	1	4	4					3	16
1969	4		1	2	1	1	5	1	2		1				18
Total	23	10.5	7	22.5	6	9	13	36.5	12	7	30.5	17.5	6	35	235.5

Table 2

The first twenty-five years of MIT's graduate program and distributions of graduates according to supervisors who supervised at least six students.

Observation 8: In the 1970s, Kindleberger decreased his supervision activity and the decade was dominated by Robert Solow and Franklin Fisher with 24.50 and 23.83 supervisions respectively. The 1980s witnessed a transition towards Rüdiger Dornbusch and Stanley Fischer with 27 and 29.5 supervisions respectively. In both decades the two leading supervisors mentored twice as many Ph.Ds. than the other faculty members. In the 1990s, Poterba, Blanchard, and Dornbusch with 33.50, 28.83, and 27.83 supervisions respectively led these efforts, but the gap between the other supervisors tripled. The 2000s have only one leading faculty member, Daron Acemoglu with 32.33

supervisions. However, in this period a large group of nine faculty members with around 13 supervisions each emerged.

Observation 9: 32 out of 165 supervisors received their doctorates from MIT. These faculty members, I refer to them as **second-generation advisors**, were involved in supervising 479 students (37% of all MIT students), and their intensive share was 346.1 students. Together with their advisers they form a group of 49 faculty, or **30% of faculty**, and they effectively supervised together 851.91 students, or **65% of all graduates**. The extensive supervision measure is 1140 students, or 87% of all.

Observation 10: The complete MIT population thus consists of 1316 Ph.D. holders (including 32 who returned to MIT as supervisors), and 133 advisors, i.e. 1449 individuals in total.

True, there might be MIT faculty who have not supervised any students – most likely because of a short period of activity at MIT or visiting status. That is for instance the case of Mervyn King, the current governor of Bank of England, who was a visiting professor at MIT in 1983-4 and shared an office with Ben Bernanke. However, the proposed way of counting faculty adds many supervisors who supervised one or less students, likely indicating external status. That is for instance the case of David Laibson. He is a professor at Harvard who co-supervised one student at MIT.

Observation 11: There are 26 advisors with an intensive supervision measure of less than one student and 36 advisors who supervised just one student. They include three advisors who were MIT students themselves. (David Laibson, Dimitrios Vayanos, and David Cutler). If we exclude these 62 advisors, then there would be just 103 advisors responsible for the supervision of MIT students or 74 advisors if second-generation advisors are excluded as well. Once details on the job history of all 165 supervisors are established a better decision whom to count as MIT faculty can be made.

Observation 12: A rapid intake of new supervising faculty took place in the first half of the 1950s – Charles Kindleberge’s first student graduated in 1951, Morris Adelman’s and Robert Bishop’s in 1952, Walt Rostow’s in 1953, and Robert Solow’s in 1954. There was a lot of fluctuation in 1960s, even though lasting figures such as Franklin Fisher, *Richard Eckaus* and Franco Modigliani. In the 1970s faculty who joined stayed much longer and remained the dominant force until the early 1990s (e.g. Michael Piore with a first graduate in 1969; *Jagdish Bhagwati* in 1970; *Peter Diamond* and *Peter Temin* in 1972; Stanley Fischer in 1975; Jerry Hausman, Paul Joskow, and Lance Taylor in 1976; Rüdiger Dornbusch in 1977; and *Paul Krugman* in 1981). The 1980s resemble the 1960s – the new leading supervisors *Oliver Blanchard* and Jim Poterba with first students in 1985. Both 1990s and 2000s experienced a growth in new faculty and half of them is still active at MIT (i.e. they supervised a thesis in 2010 or 2011).¹⁷

1.3 Advisor-Advisee relationship

Observation 9 stated that there are 32 second-generation advisers. Table 3 lists them and highlights three groups – two small ones started by Solow and Dornbusch respectively, and a large one that originated from Kindleberger, Maskin, and Fisher and now is connected through students.

Observation 13: While there is no discernible patters in terms of graduation year among these 32 faculty, in terms of the start of their supervision work there are two five year periods marked by their concentrated arrival at MIT. The first period took place during 1972-1976 and the other 1991-1995. In each, six former graduates were hired. The first period also suggests Solow’s strong position in the department in 1960s as three second-generation advisers that were hired were supervised by him. The same holds for Fisher and the 1970s.

First Name	Surname	MIT Ph.D.	Advisors	Active at MIT from	Until
Herbert	Shepard	1950	Bavelas	1952	1957

¹⁷ Names in italics in this paragraph denote 2nd generation MIT supervisors,

Paul	Cootner	1953	Rostow	1963	1965
Richard	Eckaus	1954	Samuelson	1965	1997
Peter	Diamond	1963	Solow	1973	2010
Ann	Friedlaender	1964	Ando	1975	1989
Peter	Temin	1964	Kindleberger	1972	2005
Martin	Weitzman	1967	Solow	1976	1987
Robert	Hall	1967	Solow	1975	1981
Jagdish	Bhagwati	1967	Kindleberger	1970	1981
Stanley	Fischer	1969	Fisher	1975	1994
Richard	Schmalensee	1970	Fisher	1980	1998
Paul	Krugman	1977	Dornbusch	1981	2000
Olivier	Blanchard	1977	Fischer	1985	1999
Francesco	Giavazzi	1978	Dornbusch	2008	2011
Drew	Fudenberg	1981	Maskin	1989	1994
Jean	Tirole	1981	Maskin	1986	1995
Whitney	Newey	1983	Hausman	1993	2010
Nancy	Rose	1985	Joskow, Fisher	1994	2011
Jeremy	Stein	1986	Hart	1994	1997
Roland	Benabou	1986	Tirole, Blanchard	1991	1994
David	Scharfstein	1986	Maskin, Hart	1993	1995
Ricardo	Caballero	1988	Temin, Blanchard	1995	2011
Simon	Johnson	1989	Dornbusch	2002	2006
David	Cutler	1991	Poterba	1997	1997
Glenn	Ellison	1992	Fudenberg	1994	2007
Dimitrios	Vayanos	1993	Tirole	2001	2001
David	Laibson	1994	Blanchard	2010	2010
Esther	Duflo	1999	Banerjee, Angrist	2000	2011
Amy	Finkelstein	2001	Poterba, Gruber	2008	2010
Guido	Lorenzoni	2001	Caballero	2008	2011
Pol	Antràs	2003	Ventura, Acemoglu	2005	2010

Table 3

List of MIT advisers who themselves graduated from MIT. The names in bold belong to the largest group for which a joint family tree can be drawn.

Observation 14: There are three distinct groups of second-generations advisers – two originating by Solow and Dornbusch with three students respectively. The third comprises of fifteen second-generation advisers. For them it is possible to draw a joint

family tree of their academic progeny depicted in Figure 2.¹⁸ Academic family trees allow visualizing the advisor-advisee network and the variety of meanings that one can attach to it. It presents formal connections between immediate advisors and her advisees. It also presents often intellectual connections (academic lineage) that can run through several generation, but are the closest the closer are the.¹⁹ The academic family tree also depicts professional relations. Other students such as those who gained prominent positions in central banks can be added to the tree in order to demonstrate the close ties between MIT and particular non-academic institutions.²⁰

Observation 15: Currently the longest line of direct MIT descent ends with Guido Lorenzoni who can claim up to three generations of MIT educated advisers and four complete generations of advisers working at MIT. Further similar growth of the tree can soon expected from academic descendants of Glenn Ellison who has been a prolific MIT supervisors and has two generations of MIT affiliated advisers.²¹

18 Unlike in familial genealogy, academic genealogy allows for multiple academic ‘parents’ and therefore the form of the family tree is a lattice rather than a tree.

19 E.g. The thesis research topic of Fisher and Blanchard is more closely related than Lorenzoni’s and Temin’s. To investigate the intellectual connection one would however need to add the research topics that the researchers were involved (theses, joint articles).

20 For instance, Fischer’s students Ben Bernanke (Ph.D. 1979), Daniel Wilcox (Ph.D. 1986, FED Economic Research) and William English (Ph.D. 1987, FED Monetary Affairs); Blanchard’s student Michael Gibson (Ph.D. 1993, FED Bank Supervision); or Hart’s student Jeremy Stein (Ph.D. 1986, FED)

21 I do not address the issue of the meaning or impact of having a 2-3 generations of ancestors from the same department.

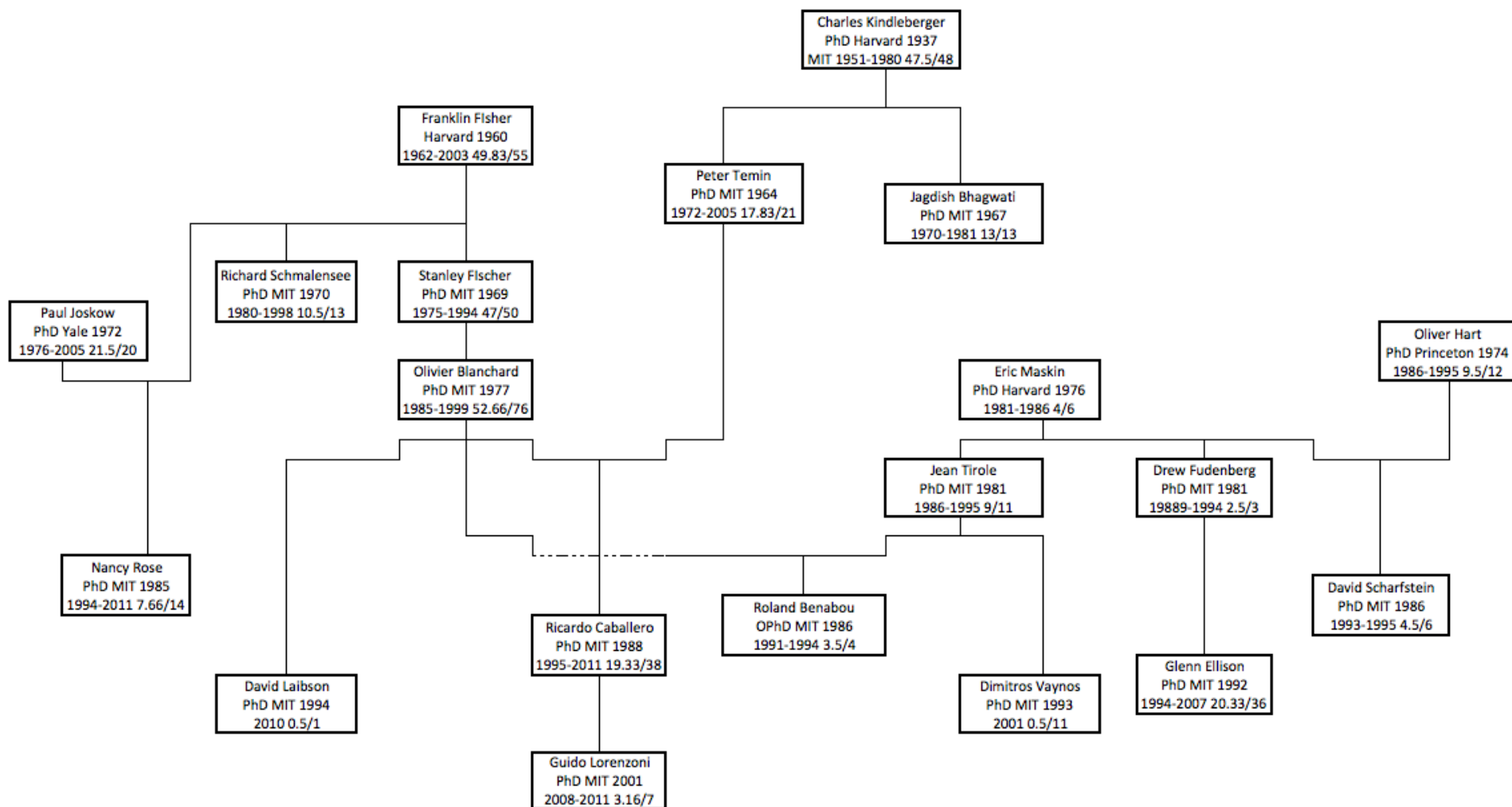


Figure 2
 Family Tree of MIT Advisers who graduated from MIT (2nd generation advisers). Each box contains full name, place and year of doctorate, and active years of supervision at MIT with the intensive and extensive measure of supervision. The dotted line is used in the case of two lines crossing each other – i.e. Tirole and Blanchard jointly supervised only Benabou, not Caballero.

The Family Tree in Figure 2 excludes the separate branches that originate with Solow and Dornbusch respectively. Three students of Solow joined MIT – Peter Diamond (Ph.D. 1963 28/38 supervisions during 1973-2010), Robert Hall (Ph.D. 1967, 7/7 supervisions during 1975-81); and Martin Weitzman (Ph.D. 1967, 4. 5/5 supervisions during 1976-87). Solow also trained central bankers such as Charles Bean, the deputy director of Bank of England (Ph.D. 1981).

Rüdiger Dornbusch supervised Paul Krugman (Ph.D. 1977, 23.5/28 supervision during 1981-2000); Francesco Giavazzi (Ph.D. 1978, 1.66/4 supervision during 2008-11); and Simon Johnson (Ph.D. 1989, 1.5/3 supervision during 2002-06). He also supervised the former governor of Chile and Cyprus – Jose de Gregorio and Athanasios Orphanides both completing their degrees in 1990.

1.4 Markers of MIT's Preeminence

Now that the MIT population and the advisor-advisee relationships are reconstructed, a variety of relational structures can be superimposed on them. I use the Clark Medal and Economics Nobel Memorial Prize awards, positions in the Executive Committee of the AEA, and the membership in the Council of Economic Advisors as such topologies. They will shed more light on the rise of MIT to the top economics department in the world.

Observation 16: Out of 12 MIT affiliated Nobel Laureates, eight served as supervisors at MIT. Five of these supervisors appear in Table 1 of the most active supervisors. The other three Laureates are Eric Maskin, Daniel McFadden, and Robert Engle with intensive supervision measures of 4, 9.5, and 1 respectively.

Observation 17: Out of 35 Clark medalists until 2012 17 (almost 49%) have some affiliation with MIT. The Table 4 breaks them down according to whether they graduated from MIT or were faculty at MIT at the time of the award. Only two Clark medalists – Lawrence Summers and Susan Athey – can be excluded from the count as they both

		MIT Faculty at the time of award of the Clark Medal		Sum
		Yes	No	
PhD from MIT	Yes	4 Fisher 1973, Krugman 1991, Duflo 2010, Finkelstein 2012	7 Klein 1959, Stieglitz 1979, Shleifer 1999, Rabin 2001, Levitt 2003, Saez 2009, Levin 2011	11
	No	4 Samuelson 1947, Solow 1961, Hausman 1985, Acemoglu 2005	2 Summers 1993, Athey 2007	6
Sum		8	8	17

Table 4

MIT affiliated Clark Medalists

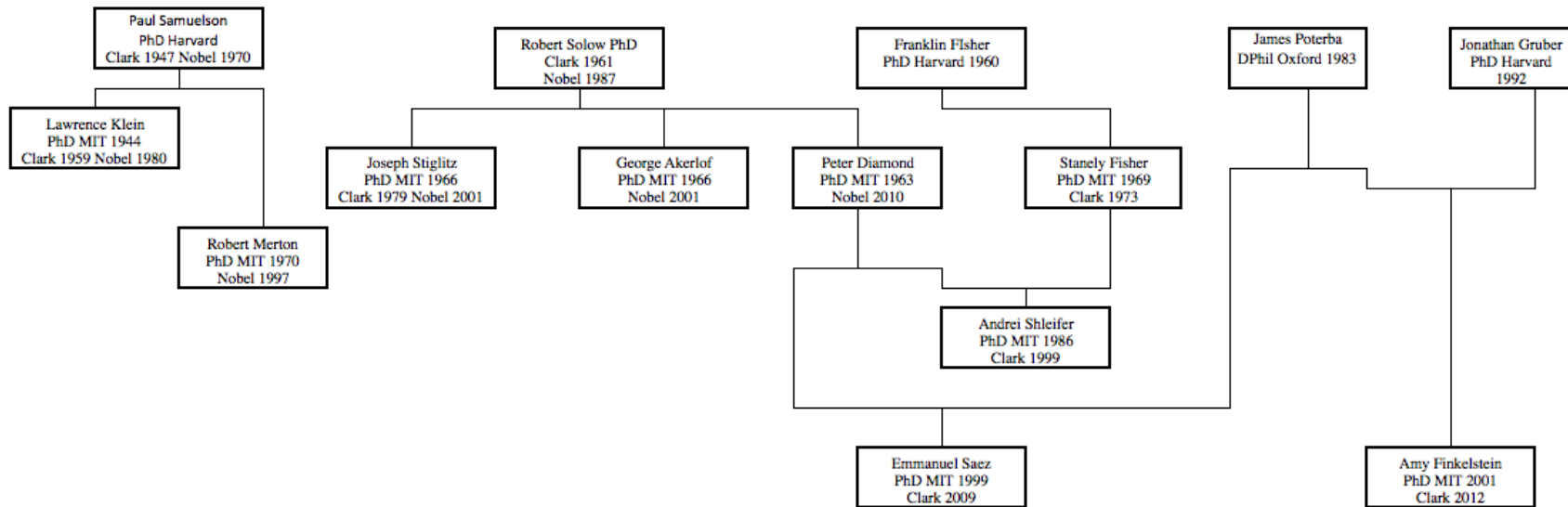


Figure 3

Academic Family Tree of MIT Clark Medalists and Nobel Laureates. Each box contains information on the person’s Ph.D. and, if received, information on Clark and Nobel awards. Emmanuel Saez was jointly supervised by Diamond and Poterba while Shleifer by Diamond and Fisher.

neither graduated from MIT nor were faculty at the time of the award. MIT's dominance in the Clark Medal category is particularly conspicuous in the period 1999- 2012, when every of the nine awardees had a connection with MIT. Only the latest winner, Raj Chetty (2013), has not had any MIT connection.

Observation 18: For 11 MIT economists with either of these two awards it possible to draw a joint academic family tree. (Figure 3)

My joint work with Kevin Hoover on the leadership hierarchy of the American Economic Association adds further insights into MIT's rise to preeminence. We analyzed the educational background and job history of all members of the Executive Committee of the AEA – Presidents, Vice-Presidents, and Elected Members – 216 distinct officers since 1950 until 2013. One of our main conclusions is that this data reveals a rapid growth of MIT's standing. In the period 1950-2013, only five AEA Presidents graduated from MIT with a Ph.D., compared to ten for Harvard, eight for both Columbia and Chicago, and seven for Wisconsin. In terms of employment at the time of election only four Presidents worked at MIT. However most importantly, four out of the five MIT educated Presidents were in office only after 1980.

Observation 19: MIT's representation among AEA Vice-Presidents is even more revealing. Until 1980 only one MIT educated economist was elected as an AEA VP. In contrast, 18 were elected since 1980. That is a 27% share of all VPs in that period. (Table 5) On average it took 26.5 years after graduation from MIT to being elected.

1950-2013		1980-2013	
Ph.D received from	Number	Ph.D received from	Number
Harvard	24	MIT	18
MIT	19	Harvard	15
Chicago	12	Chicago	8
Yale	8	Yale	7
Columbia	8	Princeton	5
Princeton	6		

Table 5

AEA Vice-Presidents' educational background (Ph.D.) ordered according to the most frequent origin of their Ph.D. degrees.

MIT educated economists also lead in the counts of elected members of the AEA Executive Committee (six members elected with a three year tenure). For the period 1950-2013, MIT graduates were second behind Harvard and their share of all elected members was 20%. In the shorter period 1980-2013, their share rose to 34% and outperformed Harvard. In terms of current employment at the time of election, MIT leads in both periods.

While these markers suggest an early rise of MIT academic preeminence, it is not clear whether it was accompanied by coeval success in gaining high positions in the government. Membership in the *Council of Economic Advisers* is one of such positions. Since its establishment in 1946 until 2011 only 76 economists served on its executive board. A number of other MIT members were also senior economists at the Council such as Robert Solow.

Observation 20: 16 MIT Ph.D. graduates served on the *Council of Economic Advisers* – a share of 21%. The first to join was William Nordhaus in 1977. In the period 1977-2011, MIT economists comprised 34% of the Council. Robert Solow supervised one third of them.²² The following Table 6 lists their tenures.

Surname	Name	Position	Oath Of Office Date	Separation Date	Advisors	Graduation Year
Nordhaus	William D	Member	18-Mar-77	4-Feb-79	Solow	1967
Goldfeld	Stephen M	Member	20-Aug-80	20-Jan-81	Ando	1963
Schmalensee	Richard L	Member	3-Oct-89	21-Jun-91	Fisher	1970
Blinder	Alan S	Member	27-Jul-93	26-Jun-94	Solow	1971
D'Andrea Tyson	Laura	Chair	5-Feb-93	20-Apr-95	Domar	1974
Stiglitz	Joseph E	Member	27-Jul-94		Solow	1966
Stiglitz	Joseph E	Chairman	28-Jun-95	10-Feb-97	Solow	1966
Frankel	Jeffrey A	Member	23-Apr-97	2-Mar-99	Dornbusch	1978

²² The fact that Solow served at the Council as a senior economist suggests an obvious reason why so many of the Councils appointed members with MIT background have been his students.

Blank	Rebecca M	Member	22-Oct-98	9-Jul-99	Farber	1983
Bailey	Martin N	Chairman	12-Aug-99	19-Jan-01	Fisher/Solow	1972
McClellan	Mark B	Member	25-Jul-01	13-Nov-02	Poterba	1993
Mankiw	N Gregory	Chairman	29-May-03	18-Feb-05	Fischer	1984
Forbes	Kristin J	Member	21-Nov-03	3-Jun-05	Ventura Dornbusch	1998
Bernanke	Ben S	Chairman	21-Jun-05	31-Jan-06	Fischer	1979
Slaughter	Matthew J	Member	18-Nov-05	1-Mar-07	Krugman Brainard	1994
Marron	Donald B	Member	17-Jul-08	20-Jan-09	Joskow	1994
Romer	Christina	Chair	29-Jan-09	3-Sept-10	Temin Dornbusch	1985

Table 6

MIT graduates as members of the Council of Economic Advisers. NB: Joseph Stiglitz is mentioned twice. Source of data: <http://www.whitehouse.gov/administration/eop/cea/about/Former-Members> [Accessed January 13, 2013]

2 High Retention Conjecture

All the effort in this paper so far has only indirectly tackled the core question of MIT's history – why has MIT risen to preeminence so quickly? And all my observations so far address a related question – how has MIT risen to preeminence so quickly. Analyzing the career paths of MIT students, particularly those who stayed in academia, might provide a possible explanation.

A study by Pieper and Willis from 1999 provides a tantalizing piece of evidence that in conjunction with my previous results suggest a high retention of MIT graduates in academia compared to other leading departments. They surveyed 3291 faculty members of 121 economics Ph.D. granting institutions in the US in the academic year 1991/92. MIT, they found out, was the second most frequent doctoral origin of these economists after Harvard. 213 faculty positions were held by MIT graduates. Analyzing their unpublished data, 204 can be identified as graduates of the MIT economics department.²³

²³ The remaining nine faculty received their PhDs from other departments such as Mathematics (e.g. Robert Aumann), Political Science, Urban Studies and Planning, etc. I did not have access to individual data of other PhD granting institutions.

They further reported that Harvard had 233, Chicago 184, Berkeley 174, Stanford 150, Yale 132, Wisconsin 130, Minnesota 115, Princeton 112, and Columbia 100 graduates active in American academia.²⁴ (Pieper and Willis, 1999, p. 82) All these institutions had begun conferring doctorates in economics earlier than MIT and, as noted in Observation 2, MIT joined other largest programs only in the 1970s. By 1992, there were 820 MIT minted economists and almost a fourth was active in American academia in 1992.²⁵

Observation 21: One can conjecture that MIT has had the highest ratio of graduates among American graduate programs who stay in academia.²⁶ Over time this would lead to higher share of MIT students in American academia than their share on all Ph.Ds. produced in the US.

Observation 22: The 204 MIT graduates were located at 70 different departments with 83 (41%) located at just ten departments. (See Table 7) Almost a fifth, 37 in total, of MIT graduates worked on UC campuses (or 40 when Stanford is included in a California contingent). Another large group is the Boston area with 33 MIT graduates active there in 1992. Although the clement California weather or ties to the Boston area might play a role in the high concentration in those areas, examining the temporal distribution of graduation years of the MIT graduates at these ten departments unravels another aspect. Of these 83 MIT graduates 80 graduated after 1960, 60 after 1970, and 38 after 1980.

It would be premature to conclude that the 1980s mark a period when MIT definitely reached to all top departments – its students were sought after everywhere. More data would be needed to determine whether the surge in the 1980s is a result of taking 1992 as a reference point (i.e. these departments might have been hiring MIT students in earlier decades but they might have moved to different departments) or whether it is just an artifact of the stabilization of number of annual PhD output in the 1970s. However the

24 All other programs had fewer than 100 graduates active as faculty. It is safe to conclude that the numbers for other departments include some graduates of other departments than just economics.

25 The issue of graduates leaving US for academic positions abroad and regular faculty positions at American non-PhD granting institutions is not addressed in the Pieper and Willis paper. The term “American academia” needs to be understood in this limited sense.

26 Possibly small graduate programs that produce few doctorates might have a higher academic retention, but among equally large programs, I contest, MIT has the highest rate.

last column of Table 7 suggests relative stability of the number of graduates placed at the top destinations in 1992 in comparison with 2012.

Department	MIT graduates 1991/2		MIT graduates 2012/3 and (all faculty)
	All	Those who graduated after 1980	
Berkeley	17	9	14 (66)
MIT	13	5	11 (45)
Princeton	9	4	10 (58)
Harvard	7	6	13 (66)
Columbia	7	3	7 (58)
Yale	6	1	10 (48)
UCLA	6	3	3 (43)
UCSD	6	2	6 (58)
BU	6	3	5 (48)
BC	6	1	6 (36)

Table 7

Top ten locations of MIT graduates in the academic year 1991/2 and comparison of these departments with 2012/3. Data for the first three columns was obtained from unpublished source data of (Pieper and Willis, 1999) and the last column from the faculty lists on departmental websites and my database of MIT graduates. The numbers in brackets in the last column denote the total size of faculty in 2012/3. NB – not all departments list their emeritus faculty separately.

3 Conclusions

The results of prosopographic research do not have the same narrative quality of archive-oozing research affording rich histories such as Beatrice Cherrier’s *A Preliminary History of Economics at MIT, 1940-1972*. (Cherrier, 2014) Nevertheless, even utilizing only a fragment of the plethora of the dispersed, yet available, biographical data allows drawing a number of preliminary conclusions about social and intellectual relationships that rich histories cannot avoid dealing with. Let me highlight and combine some of the most salient observations about the MIT Economics Department:

- **Large community:** Conclusions about MIT should be based on the total number of MIT economists rather than the small number of well-known figures. By 2011, 1449 economists can claim the membership in the group – 1316 MIT Ph.D.

- holders and 133 supervising faculty without a Ph.D. from MIT (Observations #1,4, and 10)
- **Concentration and Self-replication:** Within the department, a small circle of advisors has emerged who have supervised a disproportionately large portion of students, and from the late 1960s onwards such supervisors very likely graduated from MIT itself. Hence economists like Solow, Kindleberger, Fisher, Fischer, Dornbusch, Poterba, Blanchard, and Acemoglu have left an indelible mark on MIT graduates and created subgroups in the MIT network. (Observations #9, 11, and 13-15)
 - **High retention:** Compared with other leading economics departments, a higher proportion of MIT graduates has stayed in academia, strengthening and extending the influence of MIT economists. (Observations #21-22)
 - **Lagged recognition:** Beginning with the late 1970s, MIT *students* started receiving the highest honors of the profession. Their representation among Clark Medalists (50%), Nobel Laureates, AEA Executive Committee members (27% of AEA VPs since 1980), and Council of Economic Advisers (a third since 1977) grew rapidly since then. However, the MIT *faculty* were whispering into the ears of princes a decade or two earlier (e.g. Samuelson adviser to Kennedy and Johnson) (Observations #16-20)

Hence, the emerging picture of MIT reveals a fairly large community of economists who are to a large extent trained by a few key advisers who were mostly trained at MIT as well. Apart from this self-replication, MIT exhibits a large share of graduates who remain in academia, thus leaving MIT with an overproportionate share of American faculty. Since the 1970s MIT dominance is ubiquitous.

Unsurprisingly, these conclusions raise further questions. For instance, Paul Samuelson is not revealed as a central figure.²⁷ He is not among the most active supervisors, not even in the early days of MIT. His students (with one short exception) do not return back to MIT like the students of Solow and Fisher. To answer a question why is it so and how did he extend his influence one might need to turn archives and other sources (e.g. courses

²⁷ A similar case is Franco Modigliani.

taught, informal advising, etc.). However, there are other questions that can be dealt by the collective biography method. Collecting data on supervisors of the faculty who did not receive their doctorate at MIT is likely to reveal additional second generation links among MIT advisors and likely connect the Solow and Dornbusch branches with the tree in Figure 2, but also the links to leading figures such as Samuelson and Modigliani. Hence a more precise identification subgroups within MIT clustered around various key faculty members could be established. Such analysis will demonstrate the interaction with other top departments such as Harvard, MIT's closest neighbor. A number of key faculty got their doctorates at Harvard – such as Samuelson, Kindleberger, and Fisher – and many graduates found their first jobs there suggesting deep ties between the two departments. Collecting data on job histories of MIT graduates will reveal typical career trajectories of MIT economists in academia, business, or government. Analyzing how MIT graduates have dispersed in time could highlight 1) how its graduate program's standing rose and also the dynamics of the economics academic job market; 2) investigate the crowding out conjecture; 3) the level of successful penetration of leading governmental and international economic policy agencies and central banks. Apart from the well known figures such as Ben Bernanke, Mario Draghi, Stanley Fisher (Bank of Israel Governor), Jeremy Stein (FED Governor), and Olivier Blanchard, (IMF chief economists), one can expect to find many MIT graduates at lower level positions. It remains an open question how soon they started obtaining these jobs. In short, answers to all these and related questions are certain to provide a prosopography, an empirical collective biography, of MIT.²⁸

28 Data on close to 100 unique members of the MIT population have been already gathered for this purpose. The design of an MIT specific database is under way. It should allow importing data from web-based or pdf-based forms that are going to be distributed among the living MIT members utilizing variety of social and alumni networks. Thus self-reporting will eliminate a large part of transcription of data related to living members of MIT. Furthermore it will speed up the project and allow future scaling up.

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