



# Chris Freeman's contribution to innovation studies

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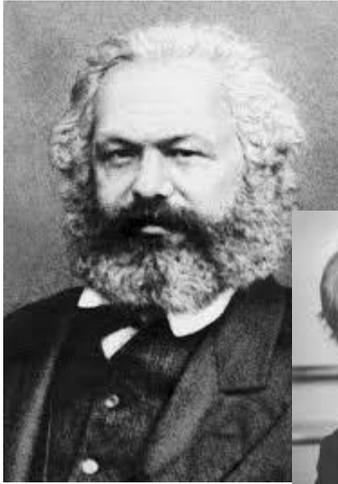
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# The shaping of an agenda



- **Marx** : Technological progress essential for social progress but requires appropriate institutions
- **Bernal**: The importance of science , science based industries & science policy
- **Schumpeter (&Marx)**: Innovation-based competition between **firms** drive capitalist evolution. **Innovation** requires more than **Invention**.
- **Galbraith**: Large firms, “technostructure”, system perspective?
- Combining Marx, Bernal, Schumpeter & others Freeman developed an original agenda with emphasis on **understanding innovation processes in firms & their interaction with the (social, institutional and economic) surroundings**

# An entrepreneur in the world of science



- Wrote the first Frascati manual that made **internationally comparable data on R&D** possible (1962)
- A pioneer in studying “**technology gaps**” (chemicals, electronics) in the global economy (1960s)
- First director of **SPRU**, University of Sussex, 1966-1982 (from three to around fifty academics in 15 years)
- First editor of **Research Policy** (1971)
- First “**textbook**” on innovation, *The Economics of Industrial Innovation* (1974)
- Promoter of **cross disciplinary & problem-focused** research on innovation worldwide

# SPRU, Freeman and the “system” approach

“The Unit’s central interest is in policy for the **professional research and development network** and the way in which this **social subsystem** interacts with **society as a whole**. This interest includes both **technological innovation arising from R&D**, and the narrower concept of “**science**” as fundamental research. It extends to the **diffusion** process of innovations in **social systems**.”

*(SPRU annual report 1971)*

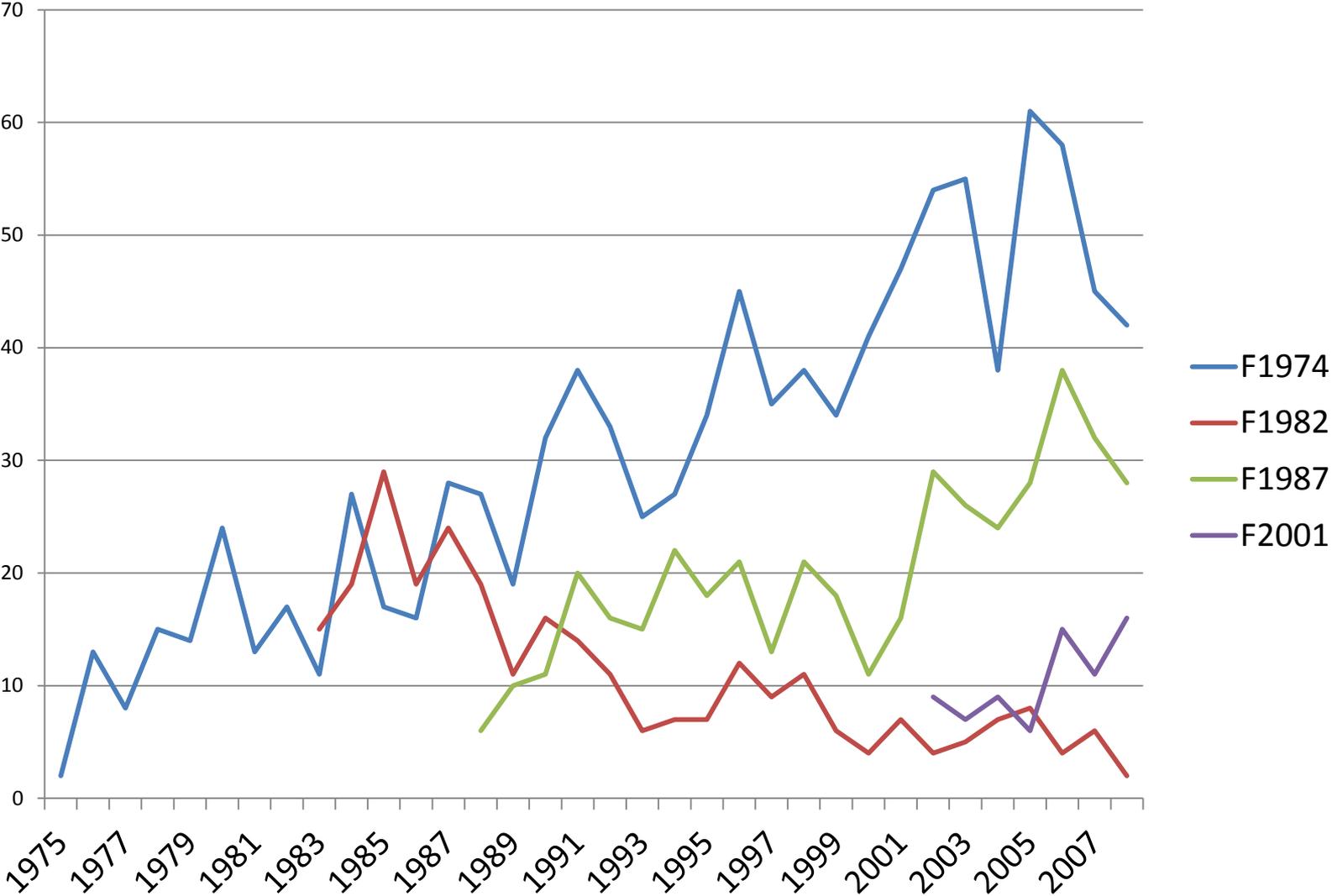
- **SPRU**: A broad, cross-disciplinary perspective (1966)
- **Projects & cross-disciplinary teams**: 40% of staff science background (1966-82), central projects for Freeman were in particular:
- **SAPPHO** (success and failure in innovation, 1967-1976),
- **STAFF** (Social and Technological Alternatives for the Future, 1971 - ?)
- **TEMPO** (Technical change and employment opportunities, 1979-1984)
- Freeman quits as SPRU director 1982 (formally retires 1986); IFIAS project, Japan/IKE/Merit & more ...

# Freeman's most influential works

(citations in handbook-chapters, J-score)

Rank	Title	Year	Type	J-Score	ISI
7	<b>The Economics of Industrial Innovation</b>	1974	Book	13	1033
12	<b>Technology Policy and Economic Performance: Lessons from Japan</b>	1987	Book	10	423
54	<b>As Time Goes By: From the Industrial Revolution to the Information Revolution (with F. Louca)</b>	2001	Book	5	74
57	SAPPHO Updated - Project SAPPHO Phase II (with Rothwell, R. C., Jervis, P., Robertson, A. and Townsend, J.)	1975	RP	5	299
89	Technical Change and Economic Theory ((with Dosi, G. , Nelson, R., Silverberg, G. and Soete, L.)	1988	Book	4	568
90	Structural Crises of Adjustment: Business Cycles and Investment Behaviour (with C. Perez)	1988	Chapter	4	145
99	The National Innovation Systems in Historical Perspective	1995	CJE	4	118
128	Networks of Innovators: A Synthesis of Research Issues	1991	RP	3	198
176	<b>Unemployment and Technical Innovation: A Study of Long Waves and Economic Development (with Clark &amp; Soete)</b>	1982	Book	3	283
471	The Economics of Technical Change	1994	CJE	2	127

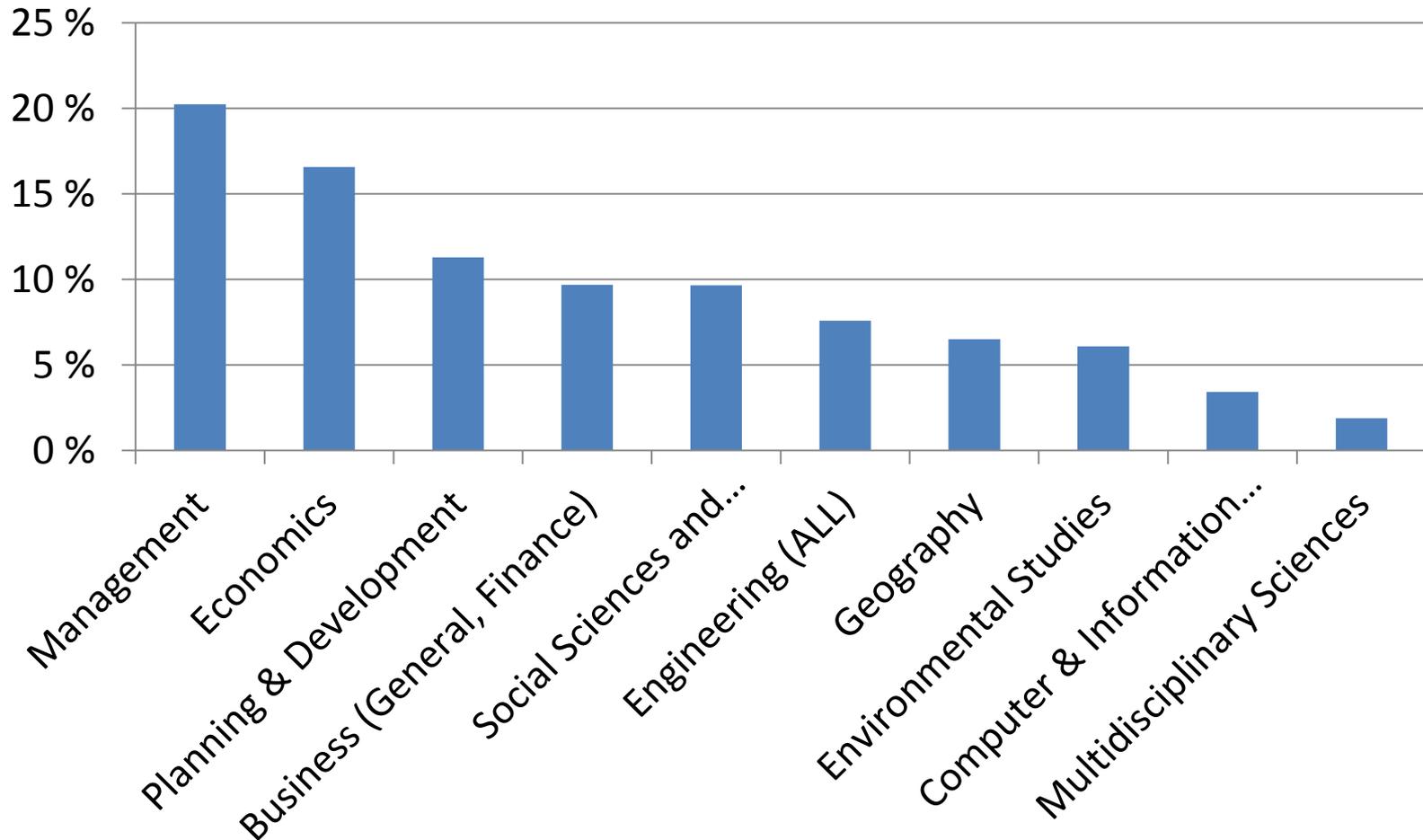
# Freeman-books: Citations per year (ISI)



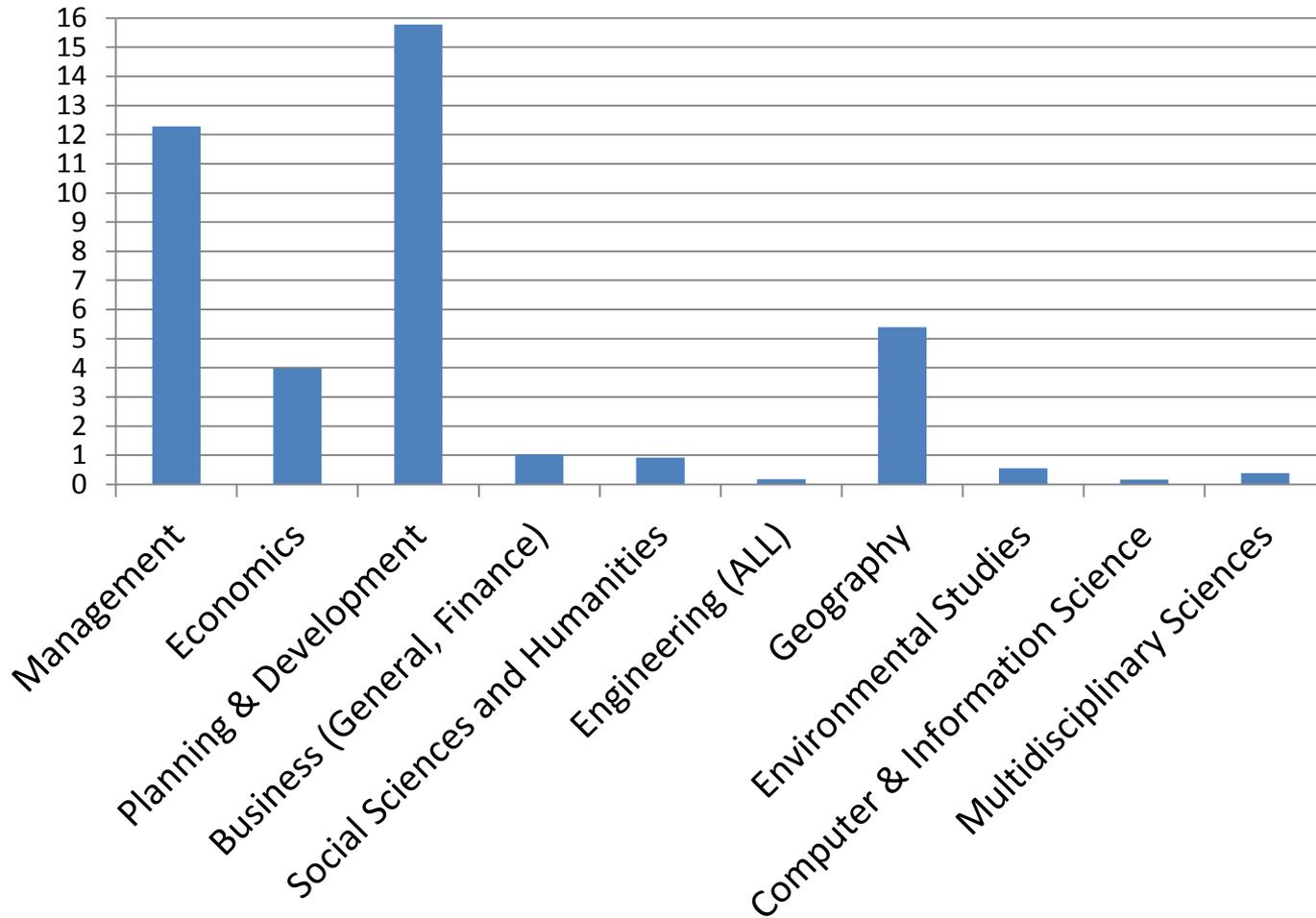
# Journals citing Freeman

Rank	Journal	ISI	Share	Subject area
1	RESEARCH POLICY	358	13 %	<b>Management; Planning &amp; Development</b>
2	TECHNOVATION	121	4 %	<b>Engineering</b> , Industrial; <b>management</b> , Operations Research & Management Science
3	INTERNATIONAL JOURNAL OF TECHNOLOGY MANAGEMENT	99	4 %	<b>Engineering</b> , Multidisciplinary; <b>Management</b> ; Operations Research & Management Science
4	R & D MANAGEMENT	84	3 %	Business; <b>Management</b>
5	TECHNOLOGY ANALYSIS & STRATEGIC MANAGEMENT	73	3 %	<b>Management</b> ; Multidisciplinary Sciences
6	REGIONAL STUDIES	72	3 %	Environmental Studies; Geography
7	TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE	70	3 %	Business; <b>Planning &amp; Development</b>
8	CAMBRIDGE JOURNAL OF ECONOMICS	62	2 %	<b>Economics</b>
9	JOURNAL OF PRODUCT INNOVATION MANAGEMENT	56	2 %	Business; <b>Engineering</b> , Industrial; <b>Management</b>
10	INDUSTRIAL AND CORPORATE CHANGE	48	2 %	Business; <b>Economics</b> ; <b>Management</b>

# Disciplinary profile (subject areas) of Freeman users



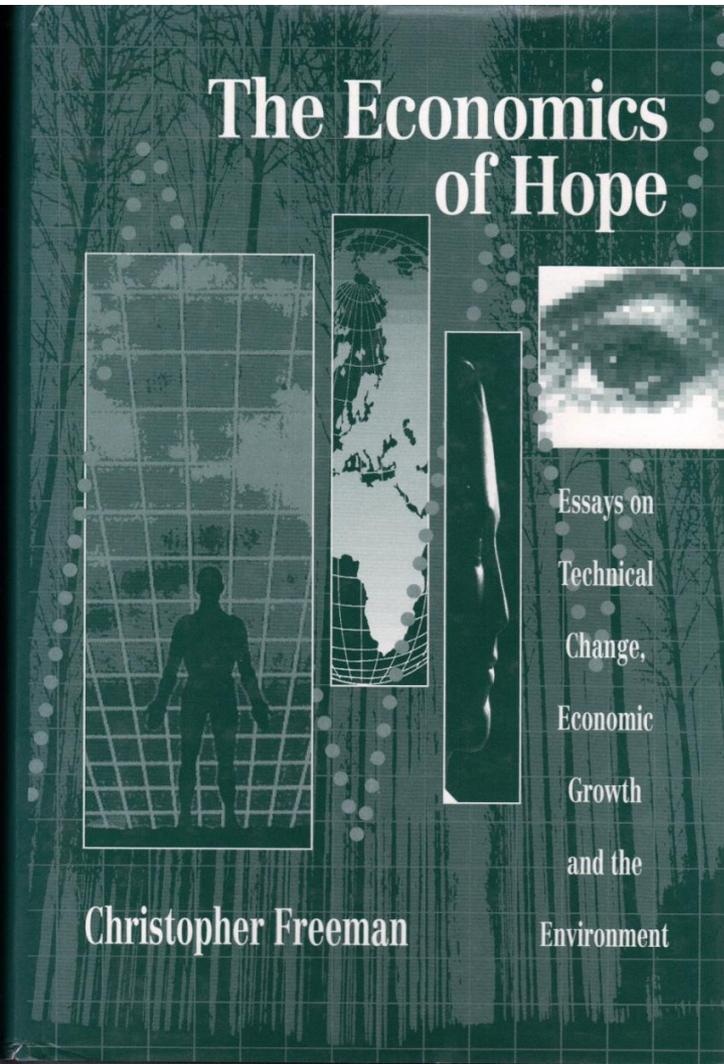
# Especially eager users (adjusted for the size of subject areas)





# Freeman's legacy

- Contributed more than any other scholar to the development of “**innovation studies**” as a separate field
- As academic **entrepreneur, writer, collaborator** and **tutor/ supporter** of the work of others
- Developed a **historically oriented, empirically focused & holistic (systemic) approach** that has influenced subsequent research (more than we realize?).
- Advocated a **problem-focused, policy-oriented, cross-disciplinary** (social/natural sciences) orientation : “**The Economics of Hope**”



# Challenging us!

(Chris Freeman in interview with Naubahar Sharif on 24 October 2003)



*“Sectoral systems, regional systems are all very constructive and helpful. (...) You can point to the success of Pakistan in medical instruments or Brazil in boots or shoes or whatever (...) and if you point out the role of innovation in all those micro level studies, that’s very useful. And if you point out certain regions of countries are more innovative, and the north of Italy has contributed more to the growth of the country than Sicily, that’s all very useful. But I don’t think you’ll change the main paradigm of neoclassical economics, I think you have to attack it head on in the centre (...) Most of the people working on innovation systems prefer to work at the micro-level. They are a bit frightened still of the strength of the neoclassical paradigm at the macroeconomic level. But I think that’s where they have to work. You have to have an attack on the central core of macroeconomic theory. It is happening but not happening enough.”*