



NORTHWESTERN INSTITUTE
ON COMPLEX SYSTEMS (NICO)

CHAMBERS HALL
600 FOSTER STREET
EVANSTON, IL 60208-4057
T . 847 491 2527
F . 847 556 1280



NORTHWESTERN
UNIVERSITY

**Northwestern Institute on Complex Systems
invites you to its
Weekly Seminar**

Speaker: Benjamin F. Jones, Kellogg School of Management, Northwestern University

Title: The Burden of Knowledge

When: Wednesday, April 25, 2007

Where: Chambers Hall, 600 Foster Street, Lower Classroom Level

Time: 12:00 – 1:00

NICO Coffee Hour will follow for questions, networking, and collaboration

Abstract

If knowledge accumulates as technology progresses, then successive generations of innovators may face an increasing educational burden. Innovators can compensate in their education by seeking narrower expertise, but narrowing expertise will reduce their individual capacities, with implications for the organization of innovative activity - a greater reliance on teamwork - and negative implications for growth. I develop a formal model of this "knowledge burden mechanism" and derive six testable predictions for innovators. Over time, educational attainment will rise while increased specialization and teamwork follow from a sufficiently rapid increase in the burden of knowledge. In cross-section, the model predicts that specialization and teamwork will be greater in deeper areas of knowledge while, surprisingly, educational attainment will not vary across fields. I test these six predictions using a micro-data set of individual inventors and find evidence consistent with each prediction. The model thus provides a parsimonious explanation for a range of empirical patterns of inventive activity. Upward trends in academic collaboration and lengthening doctorates, which have been noted in other research, can also be explained by the model, as can much-debated trends relating productivity growth and patent output to aggregate inventive effort. The knowledge burden mechanism suggests that the nature of innovation is changing, with negative implications for long-run economic growth.