Map of literature

Prof. Sidney Winter
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Key themes

- **A** Heterogeneity: why do firms differ and how?
- **B** How firms learn?
- **C** Knowledge transfer
- **D** Evolution of knowledge
- **E** Innovation process
- **F** Impact of environment on innovation
- **G** Small entrepreneurs vs. big firms
- **H** Theory of the firm
- **I** Industry evolution
- **J** Decision process - biases

Timeline

Employment History

- RAND (59 -61) - Research Economist
- Council of Econ. Advisers (61 -62) - Staff
- US Office Sec. of Def. (62) - Consultant
- UC, Berkeley (63-66) – Acting Assistant Professor of Economics
- RAND (66-68) Research Economist and Co-leader of OB project
- University of Michigan, Institute of Public Policy Studies (68-76) – Professor of Economics and Research Associate
- Yale University (76-89) – Professor of Economics and Professor, School of Organization and Management
- US General Accounting Office (89-93) – Chief Economist
- Wharton School, University of Pennsylvania (93-08) – Deloitte and Touche Professor of Management
- Wharton School, University of Pennsylvania (08-) – Deloitte and Touche Professor of Management (Emeritus)

Meeting R. R. Nelson at RAND (1959)
Finishing M.A. in Economics at Yale (1957)
Finishing Ph.D in Economics at Yale (1964)
Founder of Journal of Economic Behavior and Organization (1980)
SMS Conference (2011)

30s and 40s | 1950 | 1960 | 1970 | 1980 | 1990 | 2000 | 2010

Finishing B.A. in Economics at Swarthmore College (1957)
Visiting Professor at INSEAD (Spring, 2007)

1934 | 42 | 12,466 | CIT 13
Schumpeter – The theory of economic development
- *Entrepreneur is the engine of growth*
- *Firms are vehicles for entrepreneurs*
- *Entrepreneurs see new combination of resources*

1937 | 43 | 17,789 | CIT 6
Coase – The nature of the firm
- *Transaction costs – two modes of organizing – market and inside the firm*

1950 | 44 | 3,320 | CIT 4
Alchian – Uncertainty, Evolution and Economic Theory
- *When foresight is uncertain profit maximization is meaningless*
- *Adaptive, imitative, trial & error behaviour is used instead – (mechanism of inheritance)*

1950 | 45 | 14,093 | CIT 11
Schumpeter – Capitalism, Socialism and Democracy
- *Costs of innovation can't be recovered in the presence of tight competition*
- *Oligopoly is the way to go*

1953 | 46 | 3,237 | CIT 3
Friedman – The methodology of positive economics
- *Selection may fool empirical models to believing that profit maximization drives firms' behavior*
- *Some other processes may be responsible for data that indicates that firms maximize (as if)*

1955 | 47 | 6,048 | CIT 12
Simon – A behavioral model of rational choice
- *In the face of complexity individuals use heuristics*
- *Satisficing instead of maximizing*

1958 | 48 | 6,317 | CIT 10
Polanyi – Personal Knowledge
- *Tacit knowledge "we know more than we can tell"*

1959 | 49 | 13,397 | CIT 1
Popper – The logic of scientific discovery
- *All repetitions are only approximate repetitions*

1959 | 50 | 12,449 | CIT 6
Penrose – The theory of the growth of the firm
- *Firms as bundle of resources, fungibility of resources and indivisibility leads to growth*

1962 | 51 | 5,725 | CIT 1
Arrow – Economic welfare and the allocation of resources for invention
- *When transacting information how one knows the value – must know the info – a paradox one must posses some kind of protection appropriability*

1963 | 52 | 12,375 | CIT 17
Cyert, March – Behavioural theory of the firm
- *Firm's behavior guided by simple rules*
- *Problemistic, local search*

1964 | 53 | 1,305 | CIT 2
Williamson – The economics of discretionary behavior
- *Hold ups and opportunistic behavior*

1966 | 54 | 11,779 | CIT 4
Polanyi –Tacit Dimension
- *Tacit knowledge "we know more than we can tell"*

1972 | 55 | 113 | CIT 1
Williamson – Dominant firms and the monopoly problem
- *Transaction costs*
- *Hold ups and opportunistic behavior*

1974 | 56 | 2,645 | CIT 1
Rumelt – Strategy, Structure and economic performance
- *Strong performance for firms that combine diversification strategy into related areas with a structure of divisional organization on a product-line rather than a functional basis*
- *Firms that diversify but restrict range of activities to central skill or competence perform better*
- *Critical resource to the diversified firm is general management skill*

1974 | 57 | 11,621 | CIT 2
Kahneman, Tversky – Judgment under uncertainty: heuristics and biases
- *Biases and departures from rationality*

1975 | 58 | 15,475 | CIT 10
Williamson – Markets and hierarchies
- *Transaction costs*
- *Hold ups and opportunistic behavior*

1975 | 5 | 147 | CIT 2
Optimization and Evolution in the Theory of the Firm (in Adaptive Economic Models)

1976 | 6 | 121 | CIT 0
Technical Change in an Evolutionary Model (QJE)
NOT CODED

1977 | 7 | 1,511 | CIT 2
In Search of Useful Theory of Innovation (RP)
- *Prevailing theory is fragmented, with knowledge and research falling into different disjoint intellectual traditions*
- *Economic literature on innovation (production functions and shifts in production functions) fails innovation involves uncertainty in an essential way and institutional environment supporting innovation varies greatly from one sector to the other*

1977 | 8 | 0 | CIT 0
Dynamic Competition and Technical Progress (in Economic Progress, Private Values and Public Policy)
NOT CODED

1978 | 9 | 175 | CIT 2
With R. R. Nelson
Forces Generating and Limiting Concentration under Schumpeterian Competition (TBRE)
- *Simulation model developed establishes that the development of concentration is affected by the rate of growth of potential productivity, effectiveness of technological imitation, and the extent to which firms restrict investment in response to perceived market power*
- *Paradox: "The actual exercise of market power by the larger firms in an industry may be an important factor tending to limit the growth of concentration in the industry"*

1980 | 10 | 206 | CIT 1
With R. Nelson
The Schumpeterian Tradeoff Revisited
- *Focus on contrast between innovators and imitators and how various technological and institutional conditions determine the nature of the contest*
- *Industries with rapid technological progress ought to have high average R&D intensity and more concentrated industry structure as industry matures*

1980 | 11 | 43 | CIT 0
With R. R. Nelson
Firm and Industry Response to Changed Market Conditions: An Evolutionary Approach (in Economic Inquiry)
NOT CODED

1980 | 59 | 80 | CIT 2
Nelson – Production sets, technological knowledge and R&D
- *Codification of knowledge, production sets*

1980 | 60 | 1,279 | CIT 3
Teece – Economies of scope and the scope of the enterprise
- *Size of the firms and appropriability of innovation*

1981 | 61 | 522 | CIT 3
Levinthal, March – A model of adaptive organizational search
- *Search strategy under ambiguity and environmental instability*

1982 | 62 | 1,407 | CIT 3
Teece – Towards an economic theory of the multiproduct firm
- *Excess capacity, tacit and fungible knowledge*
- *Diversification of firms*

1982 | 63 | 1,936 | CIT 8
Lippman, Rumelt – Uncertain imitability
- *Causal ambiguity*

1982 | 12 | 20,069 | CIT 30
With R. Nelson
An Evolutionary Theory of Economic Change (Book)
- *The Bible of Evolutionary Economics*

1982 | 13 | 128 | CIT 1
An Essay on Theory of Production (in Economics and the World Around It)
NOT CODED

1984 | 14 | 856 | CIT 1
Schumpeterian Competition in Alternative Technological Regimes (JEBO)
- *Extension of Schumpeterian competition model focusing on the relative importance of incumbents vs. entrants as sources of innovation – Routinized vs. Entrepreneurial innovation regime*

1985 | 64 | 22,113 | CIT 3
Williamson – The economic institutions of capitalism
- *Transaction costs should be the unit of analysis for understanding economic issues such as market structures, firm boundaries and regulation*
- *Draws from Economics, Organization Theory and Contracting Law*
- *Consideration of asset specificity, alongside bounded rationality and opportunism as foundations of TCE*

1986 | 15 | 112 | CIT 1
The Research Program of the Behavioral Theory of the Firm: Orthodox Critique and Evolutionary Perspective (in Handbook of Behavioral Economics)

1986 | 65 | 4,355 | CIT 4
Teece – Profiting from technological innovation
- *Need complementary assets in guarding an innovation – allows for profiting from innovative idea –big company vs. small entrepreneur*
- *The adoption of dominant designs by the industry*

1987 | 16 | 2,060 | CIT 0
With R. C. Levin, A. K. Klevorick, R. R. Nelson, R. Gilbert, and Z. Griliches
Appropriating the Returns from Industrial Research and Development
- *Patents do not work in practice as well as in theory*
- *Inquiry into appropriability conditions in more than 100 manufacturing industries with survey*
- *Social cost-benefit analysis of more intellectual property protection is not straightforward*
- *Trade issues*

1987 | 17 | 2,070 | CIT 9
Knowledge and Competence as Strategic Assets
- *Heuristic frame as collection of possible approaches to a strategic problem*
- *Notions of state variables and control variables from optimal control theory to explain strategic choice over knowledge assets*
- *State variables as dimensions on which knowledge transferability depends: tacitness, observability, teachability, articulability, complexity, independence*
- *Control variables: patents, complexity and interdependence for products, secrecy, lead time and learning curve for processes*
- *Opposition between voluntary and involuntary transfer*

1988 | 18 | 530 | CIT 2
On Coase, Competence, and the Corporation (JLEO)
- *Critiques to the orthodox theory of the firm: (i) conflict with methodological individualism – issues with unit of analysis, (ii) failure to explain economic organization, (iii) lack of realism in assumptions, (iv) simplistic treatment of firms' role as repositories of productive knowledge*

1990 | 19 | 224 | CIT 1
Survival, Selection, and Inheritance in Evolutionary Theories of Organization (in Organizational Evolution: New Directions)
NOT CODED

1990 | 66 | 4,013 | CIT 3
Henderson, Clark – Architectural Innovation
Architectural innovation – changing the product's architecture without changing its components

1990 | 67 | 13,028 | CIT 8
Cohen, Levinthal – Absorptive capacity
- *Capability to find, evaluate and implement new knowledge*

1991 | 68 | 243 | CIT 1
Levinthal – Organizational adaptation and environmental selection
- *Adaptation and selection not as mutually exclusive, but complementary and interdependent*
- *Organizational learning contributes in part to organizational inertia, but inertial forces are a prerequisite for intelligent adaptation*
- *Relationship between organizational age and organizational inertia and mortality; relationship between organizational change and mortality*

1991 | 69 | 7,149 | CIT 4
March – Exploration and exploitation in organizational learning
- *A key competence of a firm is ability to turn a small initial achievement into a big one (exploit)*

1992 | 70 | 5,878 | CIT 8
Kogut, Zander – Knowledge of the firm, combinative capabilities and the replication of technology
- *Combinative capabilities*
- *During knowledge transfer new tacit knowledge is created at the recipient's site*

1993 | 71 | 2,535 | CIT 2
Levinthal, March – The myopia of learning
- *a tendency to overlook distant times, places and failures*

1994 | 20 | 123 | CIT 0
Organizing for Continuous Improvement: Evolutionary Theory meets the Quality Revolution (in Evolutionary Dynamics of Organizations)
NOT CODED

1994 | 21 | 880 | CIT 1
With D. J. Teece, R. Rumelt, and G. Dosi
Understanding Corporate Coherence: Theory and Evidence (JEBO)
- *The role of coherence between neighbouring activities*
- *Coherence in terms of market and technological proximity*
- *Learning, path dependencies, and nature of selection environment explaining ubiquity of coherent diversifiers*

1994 | 72 | 745 | CIT 1
Cohen, Bacdayan – Organizational routines are stored as procedural memory
- *Organizational routines are stored in procedural memory / experiment with card game*
- *Misapplication of routine a cost of knowledge codification*

1994 | 73 | 578 | CIT 1
Collis – research note: how valuable are organizational capabilities
- *Many levels of capabilities (second- third-level capabilities)*
- *There is always a higher order capability*

1994 | 74 | 1,790 | CIT 3
Teece, Pisano, Shuen – Dynamic capabilities of firms: an introduction
- *First introduction of dynamic capabilities*

1995 | 75 | 1,907 | CIT 6
Zander, Kogut - Knowledge and the speed of the transfer and imitation of organizational capabilitie
- *Knowledge diffusion*

1996 | 76 | 3,709 | CIT 5
Szulanski - Exploring internal stickiness: impediments to the transfer of best practice within the firm
- *Knowledge transfer is sticky*

1995 | 23 | 361 | CIT 4
Four Rs of profitability: rents, resources, routines and replication (in Resource-Based and Evolutionary Theories of the Firm)
- *Re-invention more costly than replication*
- *Difficult imitation means difficult replication*
- *Classification of different types of rents: scarcity, monopoly and Schumpeterian rents*

1996 | 24 | 438 | CIT 0
With M. D. Cohen, R. Burkhart, G. Dosi et al.
Routines and Other Recurring Action Patterns of Organizations: Contemporary Research Issues (ICC)
- *The definition of routine: "A routine is an executable capability for repeated performance in some context that been learned by an organization in response to selective pressures"*

1996 | 76 | 3,709 | CIT 5
Szulanski - Exploring internal stickiness: impediments to the transfer of best practice within the firm
- *Knowledge transfer is sticky*

1997 | 77 | 999 | CIT 4
Levinthal – Rugged Landscapes
- *NK models of complexity*
- *Diversity of forms is related to K, interactions between dimensions*

1998 | 79 | 52 | CIT 0
McDonald – The evolution of Intel's Copy Exactly
- *Copy exactly from Intel*

2000 | 80 | 709 | CIT 0
Gavetti, Levinthal – Looking forward and looking backward: Cognitive and experiential search
- *Codification of knowledge important*

2000 | 81 | 3,911 | CIT 4
Eisenhardt, Martin – Dynamic capability: What are they?
- *Routines in high-velocity markets are simple rules of thumb*

2000 | 26 | 101 | CIT 0
With Y. M. Kaniovski, and G. Dosi
Modeling industrial dynamics with innovative entrants (SCED)
- *Analysis of generic features of industrial dynamics whereby change is undertaken by new entrants*

2000 | 27 | 527 | CIT 1
Satisficing Principle in Capability Learning (SMJ)
- *Ownership of a capability by an organization is a matter of degree*
- *Aspiration levels drive the learning efforts regarding a capability*
- *Organizational crises can redefine aspiration levels*
- *Cost-benefit analysis alone does not work to explain the level of capability learning – measurement issues*

1999 | 25 | 262 | CIT 0
With F. Malerba, L. Orsenigo, and R. R. Nelson
History-friendly Models of Industry Evolution: The Computer Industry (ICC)
- *Development of a "history-friendly" formal model that simulates mechanisms affecting industry evolution, technological advance, and institutional change in the context of the computer industry*

2001 | 28 | 471 | CIT 2
With G. Szulanski
Replication as Strategy (OS)
- *Replication strategy as a process involving a regime of exploration (creation and refinement of business model), followed by exploitation (stabilization and leveraging of business model through replication)*
- *Importance of templates*

2002 | 29 | 45 | CIT 0
With G. Szulanski
Replication of Organizational Routines: Conceptualizing the Exploitation of Knowledge Assets (in The Strategic Management of Intellectual Capital and Org. Knowledge)
- *Intended vs. Unintended replication*
- *Spatial vs. Temporal replication*
- *Broad vs. Narrow scope*
- *True vs. False replication*

2002 | 30 | 1,823 | CIT 3
With M. Zollo
Deliberate Learning and the Evolution of Dynamic Capabilities (OS)
- *Role of experience accumulation (semioutomatic), knowledge articulation (deliberate)), and knowledge codification (deliberate) processes in evolution of dynamic as well as operational routines*
- *Frequency, homogeneity and causal ambiguity of the tasks to be learned determine effectiveness of above processes*

2002 | 31 | 424 | CIT 0
With R. R. Nelson
Evolutionary Theorizing in Economics (JEP)
- *Opposition to Friedman's logic of maximization of returns as "apparent determinants of business behavior"*
- *Schumpeter viewed economic growth as a process involving disequilibrium in a fundamental way*
- *Evolutionary Economics offers great advantages in areas where interdisciplinary dialogue is needed for progress*

2002 | 32 | 9 | CIT 1
With G. Szulanski, R. Cappetta, C. vd Buhs
Opening the Black Box of Knowledge Transfer: The Role of Replication Accuracy (Working paper)
- *Replication accuracy mediates the effect of knowledge transfer barriers on knowledge stickiness*
- *Interventions to increase accuracy particularly beneficial during the implementation phases of the transfer*

2003 | 33 | 13 | CIT 0
Mistaken Perceptions: Cases and Consequences (BJM)
- *Managers can be mistaken in their perceptions*
- *Assessment of perception mistakes on managers' role as (i) informants for research, (ii) performers of their formal work, (iii) problem-solvers in novel situations, and (iv) strategic thinkers*

2003 | 34 | 1,138 | CIT 0
Understanding Dynamic Capabilities (SMJ)
- *Ordinary or zero-level capabilities as the ones allowing a firm to make a living*
- *Dynamic capabilities as those operating to extend, modify or create ordinary capabilities*
- *Firms can accomplish change without reliance on dynamic capability, by means here termed 'ad hoc problem solving.'*
- *Investing in dynamic capabilities can be a partial hedge against the obsolescence of an existing capability*

2005 | 35 | 67 | CIT 0
Toward a neo-Schumpeterian Theory of the Firm (ICC)
- *Schumpeterian analysis requires the conceptualization of distinction between routine and innovative behavior*
- *Mainstream Economics does not fulfil task because it makes the overly sharp distinction between "technically possible" and "technically impossible"*
- *"If the replicator's key advantage over the imitator is access to the template [...] then the advantage may be weak where the templates approach to replication is itself weak relative to principles."*

2005 | 36 | 286 | CIT 0
With M. Jacobides
The co-evolution of capabilities and transaction costs explaining the institutional structure of production (SMJ)
- *Capability differences are necessary for vertical specialization*
- *Transaction cost differences only lead to specialization when capabilities along the value chain are heterogeneous*
- *If evolutionary mechanisms shape vertical scope over time*

2005 | 37 | 29 | CIT 0
Developing Evolutionary Theory for Economics and Management (in Great Minds in Management)
- *Like mainstream economics, evolutionary theory illuminates the workings of competition in the marketplace, through which firms influence each others' profitability as well as their prospects for growth and survival. Unlike mainstream economics, its illumination of those "workings" falls directly on the dynamic processes of competition, rather than on equilibrium outcomes or tendencies."*
- *Emphasizing firm routines capabilities heterogeneity*
- *With Organization Learning literature it is within reach to produce a comprehensive model of the creation and evolution of an industry strategic thinkers*

2006 | 38 | 38 | CIT 0
The Logic of Appropriability: from Schumpeter to Arrow to Teece (RP)
- *Teece's analysis of innovator's access to complementary assets fills a significant gap that the other authors left open when talking about appropriability*

2007 | 39 | 12 | CIT 1
With C. Baden-Fuller
Replicating Organizational Knowledge: Principles or Templates (Working paper)
- *"In certain circumstances replication by principles can be as speedy and cost effective as replication with templates"*
- *"If the replicator's key advantage over the imitator is access to the template [...] then the advantage may be weak where the templates approach to replication is itself weak relative to principles."*

2007 | 40 | 359 | CIT 0
With C. E. Helfat, S. Finkelstein, W. Mitchell, M. A. Peteraf, H. Singh, and D. J. Teece
Dynamic Capabilities: Understanding Change in Organizations (Book)
- *Provision of clear definitional foundations of capabilities*
- *Winter's chapter (together with C. E. Helfat) is on firm growth and dynamic capabilities*

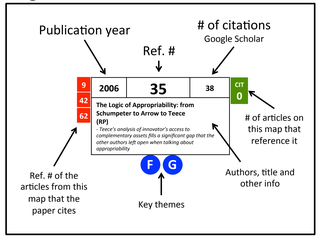
2007 | 84 | 45 | CIT 0
Jensen, Szulanski, Casaburi – Template use and the effectiveness of knowledge transfer
- *Making Principles and Templates leads to errors in replication process*

2010 | 41 | 3 | CIT 0
The Replication Perspective on Productive Knowledge (OSCS)
- *"The transfer of knowledge to the new units is a fundamental part of the replication process"*
- *"The study of replication is valuable not merely because replication processes greatly magnify the effects of some innovations, but also because the issues brought to light in the replication context are broadly relevant to understanding the basic phenomenon of productive knowledge itself"*

2001 | 82 | 194 | CIT 2
Rivkin – Reproducing knowledge
- *In intermediate levels of knowledge complexity there is a possibility of competitive advantage between a replicator and imitator*

2003 | 83 | 97 | CIT 1
Mezias, Starbuck – Studying the accuracy of managers' perceptions
- *Managers are an unreliable source of information*

Legend



Literature by Sidney Winter

Literature by other authors