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PROFESSIONAL EXPERIENCE

2006 – Co-Founder, (with Paul Milgrom) Auction Technologies, Inc.
2007 – Professor Associé/Invité and Associated Researcher Toulouse School of Economics
2008 – 2011 Senior Managing Director, FTI Consulting (now affiliate)
2017 – 2020
2013 – 2015 Managing Director Alvarez and Marsal
2003 – Senior Fellow and Adjunct Senior Research Scholar, Columbia Institute for Tele-Information, Columbia University
2004 – Research Professor, Center for Research in Wireless Communications, Clemson University
2006 – 2008 Senior Consultant, CRA International
2003 – 2004 Co-CEO and Founder, Optimal Markets, Inc.
2000 – 2003 Senior Vice President, NERA
2000 Special Consultant, NERA
1999 – 2002 President and Founder, Alkera Inc d/b/a Optimal Auctions.
1999– 2000 Managing Director, Navigant Consulting Incorporated/LECG, Incorporated
1998–1999 Principal, LECG, Incorporated
1996–1998 Director, LECG, Incorporated
1995–1996 Principal, Charles River Associates Incorporated
1993–1995 Principal Member Technical Staff, GTE Laboratories Incorporated
1991–1993 Research Associate, Department of Economics, Boston University

1987–1993 Senior Member Technical Staff, GTE Laboratories Incorporated
1983–1987 Assistant Professor, Department of Economics, VPI
1979–1983 Assistant Professor, Department of Economics, SUNY at Buffalo

EDUCATION

Ph.D., (Economics) University of Rochester, February, 1981.

M.A., (Economics) University of Rochester, May, 1978.

A.B., (Economics and Mathematics) Washington University, Magna Cum Laude, May, 1975.

PUBLICATIONS

Book

“A Primer on Auction Design, Management and Strategy,” MIT Press (2014).

Refereed Publications

“Sequential Auctions and Auction Revenue,” with Luis Cabral, *Economics Letters* *Economics Letters* 176 (March 2019): 1-4.

“Resale Price Maintenance Post Leegin: A Model of RPM Incentives,” (with William Comanor), *Review of Industrial Organization* Vol. 50, No. 2 (March 2017): 169-79.

“Evolving Technologies and Standards Regulation,” with Luis Cabral, *International Journal of Industrial Organization*, Vol. 36 (September, 2014):48-56.

“Abuse of Dominance and Licensing of Intellectual Property,” with Patrick Rey, *International Journal of Industrial Organization*, Vol. 30, No. 6 (November, 2012): 518-27.

Book review of “An Introduction to the Structural Econometrics of Auction Data,” by Harry J. Paarsch, Han Hong and with M. Ryan Haley.” *European Review of Agricultural Economics* Vol. 36, No. 3 (2009):462-465.

“Formulas for Fair, Reasonable, and Non-Discriminatory Royalty Determination.” *International Journal of IT Standards and Standardization Research*, Volume 7, No. 1, (2009).

“Auctions for Transmission Capacity Rights: The Empire Connection Experience.” *The Electricity Journal*, Vol. 18, No. 1 (January/February 2005).

“Default Service Auctions.” With Colin Loxley, *Journal of Regulatory Economics*, Vol. 27, No. 3 (2004).

“Standards in Wireless Telephone Networks.” With Neil Gandal and Leonard Waverman, *Telecommunications Policy*, Vol. 27 (2003): 325-332.

“Auctions and Regulation: Reengineering of Regulatory Mechanisms.” Introduction to special issue on Auctions and Regulation, *Journal of Regulatory Economics*, Vol. 17, No. 3, (May, 2000): 195 – 204.

“Third Generation Wireless Telecommunications Standard Setting.” With Peter Grindley and Leonard Waverman, *International Journal of Competition Law and Policy*, IJCLP Web-Doc 2-3-1999.

“Adoptions and Orphans in the Early Microcomputer Market.” With Neil Gandal and Shane Greenstein. *Journal of Industrial Economics*, Vol. 47, No. 1, (March, 1999):87-105.

“Monopoly Prices with Network Externalities.” With Luis Cabral and Glenn Woroch. *International Journal of Industrial Organization*, Vol. 17, No.2, (February, 1999): 199-214.

“Cost Allocation Principles for Pipeline Capacity and Usage.” With G. Campbell Watkins, *Energy Studies Review* Vol, 8, No.2 (May, 1999): 91-101.

"Toward the Best Bet." With Phillip McLeod, *Electric Perspectives*, Vol. 23, No. 5, (September-October 1998): 74-83.

“Up in the Air: GTE’s Experience in The MTA Auction for PCS Licenses.” *Journal of Economics and Management Strategy*, Vol. 6, No. 3 (Fall, 1997): 549-72.

“Behind the Revolving Door: A New View of Public Utility Regulation.” *RAND Journal of Economics* Vol. 26, No.3, (Autumn 1995): 362–77.

“Hollygopoly: Oligopolistic Competition for Hollywood Movies.” With Neil Gandal. *The Antitrust Bulletin* Vol XL, No. 3, (Fall 1995): 699–712.

“Preemptive Adoptions of an Emerging Technology.” With Michael Riordan. *Journal of Industrial Economics* Vol. 42, No. 3, (September 1994): 247-61.

“Trigger Price Regulation.” With Glenn Woroch. *RAND Journal of Economics* 23, No. 1 (Spring 1992): 29–51.

“A Repeated Game with Finitely Lived Overlapping Generations of Players.” *Games and Economic Behavior* 3 (May 1991): 244–59.

“Crossing Deputit’s Bridge Again: A Trigger Policy for Efficient Investment in Infrastructure.” With Glenn Woroch. *Contemporary Policy Issues* 9 (April 1991): 101–14.

“Time Consistency and Subgame Perfect Equilibria in a Monetary Policy Game.” With Douglas McTaggart. *Journal of Macroeconomics* 11, No. 4 (Fall 1989): 575–88.

“Equilibrium in a Spatial Model of Imperfect Competition with Sequential Choice of Locations and Quantities.” *Canadian Journal of Economics* 21, No. 4 (November 1986): 575–88.

“On the Consistency of Consistent Conjectures.” *Economics Letters* 16 (1984): 151–57.

“Existence of Vote Maximizing Equilibrium in One Dimension.” *Mathematical Social Sciences* 5 (August 1983): 73–87.

Other Publications

“Policy toward Standardization in Wireless Telecommunications.” with Luis Cabral, in *The Economics of Digital Markets*,” edited by Gary Madden and Russel Cooper, Edward Elgar Publishers, 2009.

“Multi-Lot Auctions: Applications to Regulatory Restructuring.” In *Obtaining the Best from Regulation and Competition*, edited by M.A. Crew and S. Spiegel. Boston, MA: Kluwer Academic Publishers (2004).

“Auctions of Last Resort in Telecommunications and Energy Regulatory Restructuring.” Chapter 7 in Michael Crew (ed.) in *Market Pricing and Deregulation of Utilities*, Kluwer Academic Publishers (2002).

“Promoting Capital Improvements by Public Utilities: A Supergame Approach.” With Glenn Woroch. Chapter 14 in W. Neufeind and R. Riezman (eds.), *Economic Theory and International Trade: Essays in Memoriam of John Trout Rader III*. Springer Verlag, 1992.

“A New Look at Public Utility Regulation Through a Revolving Door.” Chapter 9 in Michael Crew (ed.), *Economic Innovations in Public Utility Regulation*. Kluwer Academic Publishers, 1992.

“Price Setting in Professional Team Sports.” Chapter 5 in Paul M. Sommers (ed.), *Diamonds Are Forever: The Business of Baseball*. The Brookings Institution, 1992.

OTHER PAPERS

“Getting Auctions for Transportation Capacity to Roll,” with Frédéric Cherbonnier and Karine Van Der Straeten, TSE Working Paper 21-1254, September 2021.

“Auctions and Mobile Market Competition: Evidence from European 4G Auctions,” with Dan Ershov, January 2021.

“Auctions for Essential Inputs,” with Patrick Rey, 2017 (revised June 2019).

"A multi-regional model of electric resource adequacy," (with Claude Crampes) TSE Working Papers 18-877,

“The Effects of Standard Setting Organization Policy on Investment and Welfare,” with Paul Seabright, 2014.

“Auction Design for Capacity Markets,” with Robert Stoddard, June, 2008.

PATENTS

"Electronic withdrawal and/or exit price requests for computer-based auctioning of basic generation services." U.S. Patent 9,940,666, April 10, 2018.

"Electronic withdrawal and/or bid switch requests for computer-based auctioning of basic generation services." U.S. Patent No. 9,886,719. February 6, 2018.

"Electronic extension requests to extend electronic bidding for qualified bidders for computer-based auctioning of basic generation services." U.S. Patent 9,811,855, November 7, 2017.

"Electronic bid switch requests for computer-based auctioning of basic generation services." U.S. Patent 9,792,647, October 17, 2017.

“System and method for multi-product clock auctions” (with Paul Milgrom), US Patent No. 8577746 B1, November 5, 2013

“Method and System for Computer-Based Auctioning of Basic Generation Services,” US Patent No. 7,409,360, August 5, 2008.

“Method and System for Computer-Based Auctioning of Basic Generation Services,” US Patent No. 8,195,523, June 5, 2012.

“Method and System for Computer-Based Auctioning of Basic Generation Services,” US Patent No. 8,219,458 July 10, 2012.

“Method and System for Computer-Based Auctioning of Basic Generation Services,” US Patent No. 8,219,459 July 10, 2012.

“Method and System for Computer-Based Auctioning of Basic Generation Services,” US Patent No. 8,285,601 October 9, 2012.

EDITORIAL AND REFEREE ACTIVITY

Dr. Salant is the guest editor of two special issues of the *Journal of Regulatory Economics* on Auctions and Regulation. In addition, Dr. Salant has served as a referee for *American Economic Review*, *Canadian Journal of Economics*, *Contemporary Policy Issues*, *Econometrica*, *Economic Inquiry*, *The Economic Journal*, *Games and Economic Behavior*, *IEEE/ACM Transactions on Networking*, *International Economic Review*, *Journal of Political Economy*, *Journal of Economics and Management Strategy*, *Journal of Regulatory Economics*, *Journal of Macroeconomics*, National Science Foundation, and the *RAND Journal of Economics*

CONFERENCES AND INVITED SEMINARS

“Auctions and Mobile Market Competition: Evidence from European 4G Auctions,” European Association for Research in Industry Economics, August 2021.

“Auctions and Mobile Market Competition: Evidence from European 4G Auctions,” Competition and Regulation European Summer School and Conference (CRESSE) August 2021.

“Auctions in the Energy Sector: An Introduction and Survey.” Paris Bachelier Lecture, March – April, 2019.

Organized Conferences on

“Empirical Research on the Impact of Recent Spectrum Auctions on the Market Structure of Mobile Communications,” Columbia University, CITI, December 2020.

“Spectrum Auction Design, Experience and Post-Auction Market Structure,” Columbia University, CITI, June 2014.

“Smart Radio,” Center for Tele Information, Columbia University, joint with Clemson Center for Research in Wireless Communications and Virginia Tech’s College of Engineering,
<http://www4.gsb.columbia.edu/citi/events/eventsarchive/smartradio>.

“Wireless Communications and Universal Service,” Center for Tele Information, Columbia University, 2005, <http://www4.gsb.columbia.edu/citi/events/eventsarchive/wirelessuniversal200>.

“After the Closing of the Spectrum Frontier: What Spectrum Models Work Best and When,” Center for Tele Information, Columbia University, 2004, <http://www4.gsb.columbia.edu/citi/events/eventsarchive/spectrumfrontier>.

HONORS, SCHOLARSHIPS, AND FELLOWSHIPS

Phi Beta Kappa, 1975

Rush Rhees Fellowship, 1975–1978

University Fellowship, 1975–1979

COURSES TAUGHT

Auction Theory and Practice (graduate)

Microeconomics (graduate and undergraduate)

Industrial Organization (graduate and undergraduate)

Managerial Economics (graduate and undergraduate)

Regulatory Economics

Game Theory

Public Finance (graduate and undergraduate)

Economics of Sports

Principles of Economics

CONSULTING EXPERIENCE

EXPERT REPORTS and TESTIMONY

Report on CAF-2 auction design for NTCA (2018)

Report (with Gary Biglaiser) for Northstar and SNR Wireless on FCC Auction 97 (2018) v. Northstar Wireless, LLC, SNR Wireless LicenseCo, LLC, Applications for New Licenses in the 1695-1710 MHz, 1755-1780 MHz and 2155-2180 MHz Bands, Order on Remand, 33 FCC Rcd 231 (WTB 2018) (Order on Remand)

Report on auction design for Clear Caption (2018)

Report on auction design for Sunrise Communications (2018)

Report on auction design on behalf of Sprint, FCC GN Docket No. 12-268; May 2015

At Montana Public Service Commission on behalf of Northwestern Energy on default service procurement auction (2006).

At Illinois Commerce Commission on default service procurement auctions, Docket Numbers 05-0159, 05-0160, 05-0161 and 05-0162, (Spring and Summer 2005).

At Public Utility Commission of Texas, on capacity entitlements auctions, Project Number 24492 (2001).

At New Jersey Board of Public Utilities, on auction design for Basic Generation Services, Docket Number EX 01110754 (2000).

Hearing of the International Competition Policy Advisory Committee on 3G standard setting procedures and competition policy, June 1999.

On behalf of the FCC in Nextwave Personal Communications Inc v. Federal Communications Commission, May, 1999

On behalf of PanCanadian at Alberta Energy Utilities Board (January, 1996) on pipeline cost allocation principles.

TELECOMMUNICATIONS:

- Spectrum Auction Bidder Support (mostly lead adviser*)

| | |
|---------------|-------------------------|
| (2022) | South Africa 5G* |
| (2022) | Netherlands 5G* |
| (2022) | Canada 3800 MHz* |
| (2021) | Canada 3500 MHz |
| (2021) | Charter C-band |
| (2020) | Charter RDOF* |
| (2019 -20) | Charter CBRS* |
| (2018-20) | Sprint mmWave* |
| (2018) | CAF-2 US (confidential) |
| (2016 - 2020) | KPN (Netherlands)* |

- (2017 - 2018) Sunrise (Switzerland)*
- (2015 - 17) Comcast - US Incentive Auctions*
- (2015) Sprint – US Incentive Auction
- (2015) German multi-band (Vodafone), Canada AWS
- (2014) Canada 700 MHz, US AWS-3 #97 (SAAS-Tillman)*, Poland
- (2013) Austria multi-band (T-Mobile)*, Canada, Slovakia
- (2012) Netherlands (KPN)*, Belgium (BASE), Swiss 4G (Swisscom), France 4G auctions
- (2011) Spain 4G (Orange), Italy 4G (Three)*, Portugal 4G (Osiptel), Greece 4G (Cosmote)
- (2010) German 4G*(E-Plus), Mexican AWS/PCS*, Indian 3G* (Vodafone)
- (2008) US 700 #73 (Alltel), Canadian AWS, Italian WiMax
- (2006) US AWS-1 #66 (Leap) *
- (2005) US PCS #58 (Leap)*
- (2003) US 700 #49 (QUALCOMM)
- (2002) Taiwan 3G
- (2001) US PCS #35 (Leap)*, Australian 3G (Primus)*, Austrian 3G (T-Mobile), Danish 3G, Dutch 3G
- (2000) US 39 GHz #30, Australian PCS (QUALCOMM)*, UK 3G (Orange)*, German 3G (T-Mobile)*
- (1999) US PCS #22 (Leap)*, Canadian 24 and 38 GHz*
- (1998) Dutch 2G (KPN), Telebras privatization (QUALCOMM), Mexico PCS (QUALCOMM)
- (1997) Brazil B block cellular

(1996) US PCS #5, US MDS #6, US SMR #7

(1994-5) US PCS #4 (GTE)*

Regulation and Wireless Advisory

Development of wireless industry simulation modeling team at Math Science Research Center at Bell Labs (2000–2001).

Advised Leap Wireless on the ATT and T-Mobile proposed merger (2010).

Advised E-Plus on wholesale roaming regulation (2009 – 2010).

Advised QUALCOMM on European 3G standard setting, including numerous filings and testimony (1999 – 2001)

Advised QUALCOMM on competition policy issues related to European competition policy matters (2005 – 2007)

Led team in developing GTE's Universal Service auction proposal (1995–6)

Project leader for wireless cost simulation model for GTE Labs (1989 – 93)

Advised Leap Wireless on wholesale roaming, prepared testimony (2005)

Advised SouthernLinc Wireless on wholesale roaming (2005)

Advising Canadian operator on wholesale roaming (2009)

Advised Indian operator on spectrum requirements for 3G (2008)

Advised Peru's OSIPTEL on rural service procurement auctions (1995)

- Spectrum Allocation and Auction Design

Advised Pakistan PTA on 3G auction (2013–4)

Advised Hungarian NMHH on auction design options (2012)

Advised satellite television operator on design of auction for television ads (2011)

Ex Parte and advice on auction design, FCC Dockets AU Docket No 06-30; WT Docket No. 05-211, on behalf of Leap Wireless, 2006.

Ex Parte and advice on roaming, FCC Docket WT Docket No. 05-265 on behalf of SouthernLinc Wireless, 2006.

Advised Telecommunications Regulatory Authority of India (2004).

Advised Industry Canada on 2300 MHz/3500 MHz auction (2003–4)

Advised UK Radiocommunications Agency on spectrum trading (2002)

Advised Netherlands DGTP on design of auction for sale of AM and FM frequency rights (2001–2)

Advised Italian Ministry of Communication in design of 3G spectrum auction (2000)

Advised on design of auction for ads in telephone directories (1999)

Advised Industry Canada on spectrum auctions for LMCS frequencies (1996) and 24/38 GHz frequencies (1999)

Designed and implemented first spectrum auction for paging licenses for the Mexican Ministry of Communications (SCT), November 1996

Designed and implemented first spectrum auction for trunk radio frequencies for the Guatemalan Superintendent of Telecommunications, May 1997

FCC experimental testing of combinatorial auction mechanisms (2000)

Advised IDA Singapore on 3G auctions (2001)

Advised IDA Singapore on wireless local loop auctions (2001)

Advised Australian ACA on 3G auctions (2000)

Advised Australian SMA on design of 500 MHz license spectrum auction (1996)

Led team that developed auction software adopted by Industry Canada (1995), the Mexican Ministry of Communications and Transport (1995) and the Guatemalan Superintendent of Telecommunications (1996 – 7).

Advised Colombia (Ministry of Communications) in draft auction legislation for spectrum auctions (1999).

Ex Parte on FCC Docket CC 96-45 on behalf of GTE, February 1997, March 1997

Advised Peru (OSIPTTEL) on spectrum allocations for universal service (1995).

ENERGY AND CHEMICALS:

BOEM NY Bight auction (2022)

BOEM Carolina Long Bay auction (2022)

Advised on bid strategy for offshore wind leasing, round 4 Crown Estates (2021).

Carbon credits auction design – North America (2016)

Advised on Energy Procurement, Southern California Edison (2009 – 10)

Advised First Energy Solutions on Bidding Strategy (2009)

Advised California Forward Capacity Markets Association on California Capacity Markets (2007).

Served as Auction Manager for Northwestern Energy default service procurement auction (2006). Testified at Montana Public Service Commission.

Advised NYSERDA on auction design and bidding procedures for NYSERDA Renewable Electricity Credit Procurement (2006).

Served as Auction Monitor for Illinois Commerce Commission (2005 - 6). Testified at Illinois Commerce Commission (2006).

Developed design and implementation plan for Empire Connection transmission rights auction (2003)

Developed and managed auction for Williams for selling ethylene (2003)

Developed auction design adopted by OMV for natural gas release program (2003)

Advised Acquirente Unico (Italy) on default service options (2002–3)

Advised Texas Utilities on energy entitlement auctions, and testified at PUCT (2001–2)

Developed Standard Offer Service procurement auction design for New Jersey Utilities (2000–2).

Advised Netherlands DTe on transmission rights auctions (2000)

Advised EPCOR on bidding strategy in Alberta PPA auction (2000)

Advised EPCOR on bidding strategy in Alberta Balancing Pool auction (2000)

Advised on bidding 3rd round PEDEVESA auction of oil lease rights in Venezuela (1996)



A Primer on Auction Design, Management, and Strategy

David J. Salant 2014

A guide to modeling and analyzing auctions, with the applications of game theory and auction theory to real-world auction decision making.

Auctions are highly structured market transactions primarily used in thin markets (markets with few participants and infrequent transactions). In auctions, unlike most other markets, offers and counteroffers are typically made within a structure defined by a set of rigid and comprehensive rules. Because auctions are essentially complex negotiations that occur within a fully defined and rigid set of rules, they can be

analyzed by game theoretic models more accurately and completely than can most other types of market transactions.

This book offers a guide for modeling, analyzing, and predicting the outcomes of auctions, focusing on the application of game theory and auction theory to real-world auction design and decision making. After a brief introduction to fundamental concepts from game theory, the book explains some of the more significant results from the auction theory literature, including the revenue (or payoff) equivalence theorem, the winner's curse, and optimal auction design. Chapters on auction practice follow, addressing collusion, competition, information disclosure, and other basic principles of auction management, with some discussion of auction experiments and simulations. Finally, the book covers auction experience, with most of the discussion centered on energy and telecommunications auctions, which have become the proving ground for many new auction designs. A clear and concise introduction to auctions, auction design, and auction strategy, this Primer will be an essential resource for students, researchers, and practitioners.

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