



Munich Personal RePEc Archive

Wave function method to forecast foreign currencies exchange rates at ultra high frequency electronic trading in foreign currencies exchange markets

Ledenyov, Dimitri O. and Ledenyov, Viktor O.

James Cook University, Townsville, Australia

27 October 2015

Online at <https://mpra.ub.uni-muenchen.de/67470/>

MPRA Paper No. 67470, posted 28 Oct 2015 03:27 UTC

Wave function method to forecast foreign currencies exchange rates at ultra high frequency electronic trading in foreign currencies exchange markets

Dimitri O. Ledenyov and Viktor O. Ledenyov

Abstract – The accurate forecast of the foreign currencies exchange rates at the ultra high frequency electronic trading in the foreign currencies exchange markets is a main topic of our research: **1)** the present state of the foreign currencies exchange markets in Asia, Europe and North America; **2)** the research review on the classic forecast techniques of the foreign currencies exchange rates dynamics in the foreign currencies exchange markets in the classic finances theory; **3)** the description on the quantum forecast techniques of the foreign currencies exchange rates dynamics in the foreign currencies exchange markets with the application of both the wave function and the time dependent / time independent wave equation in the quantum finances theory; **4)** the derivation of the time dependent / time independent wave equation in the quantum finances theory; **5)** the creation of the quantum system state prediction algorithm, based on both the wave function and the time dependent / time independent wave equation in the quantum finances theory; **6)** the discussion on the developed software program with the embedded quantum system state prediction algorithm, using both the wave function and the time dependent / time independent wave equation in the quantum finances theory; **7)** the final words on the perspectives of the quantum forecast techniques of the foreign currencies exchange rates dynamics in the foreign currencies exchange markets, applying both the wave function and the time dependent / time independent wave equation in the quantum finances theory.

JEL: G1, G10, G12, G14, G15, G20, C40, C42, C82, D0, D82, E42, F3, F4, F31

PACS numbers: 89.65.Gh, 89.65.-s, 89.75.Fb

Keywords: ultra high frequency electronic trading, foreign currencies exchange rates, foreign currencies exchange markets, vehicle currency, interest rate, retail aggregator, liquidity aggregator, interdealer trade orders flow direction, stop-loss order, bid - ask spreads, price discovery process, capital inflow, capital outflow, carry trade strategy, financial liquidity, FX market micro structure, FX rate dynamics, absorption/diffusion/transmission of information, information theory, asymmetric information, autoregressive conditional heteroskedasticity, Wiener filtering theory, Stratanovich-Kalman-Bucy filtering algorithm / filter, particle filter, quantum system state prediction algorithm with wave function, time dependent / time independent wave equation, nonlinearities, artificial intelligence, Ledenyov strategy search algorithm, econophysics, econometrics, global foreign exchange market, global capital market, wealth management.

Introduction

*The ultra high frequency electronic trading is a trading process between the participating traders to trade the foreign currencies in the foreign currencies exchange markets at the time period of 10^{-9} sec. The ultra high frequency electronic trading takes an advantage of the fact that the foreign currencies exchange rates change at the ultra high frequencies due to the high performance computing application, resulting in the new opportunities for the traders to make the profitable trade deals completion at the foreign currencies exchange markets. The scientific term such as the **ultra high frequency electronic trading** has been recently introduced in Ledenyov D O, Ledenyov V O (2014c) and the scientific term such as the **high frequency electronic trading** has been introduced some time ago in Goodhart, Hall, Henry, Pesaran (1993), Goodhart, O'Hara (1995), Goodhart, O'Hara (1997).*

Discussing the *technical realization aspects* of the *ultra high frequency electronic trading process*, it makes sense to explain that the *ultra high frequency electronic trading* is usually realized with the use of the *complex algorithms*, which are implemented in the *object oriented and sequential software*, compiled by the *compilers* into the *executable file*, and executed by the *operating system* at the *high performance computing hardware*.

There are *many various economic/financial/technical factors*, which may have certain impacts on the *change dynamics* of the *foreign currencies exchange rates* at the *ultra high frequency electronic trading* in the *foreign currencies exchange markets*. For instance, it is a well known fact that the *foreign currencies exchange rates* in the *foreign currencies exchange markets* fluctuate at the *ultra high frequencies* in the *frequency domain*, depending on:

1. The *foreign currencies supply and demand* in the *process of the foreign currencies trading* at the *in the foreign currencies exchange markets* at the *given time moment*.
2. The *propagation properties of the discrete-time digital waves* (the *business cycles*) in the *economies of the scales and scopes* in the *time domain* at the *Schumpeterian creative disruption age*;
3. The *technical parameters of the algorithms*, used by the *traders* in the *process of the foreign currencies trading* at the *in the foreign currencies exchange markets*;
4. The *technical specifications of the computers*, used by the *traders* in the *process of the foreign currencies trading* at the *in the foreign currencies exchange markets*;
5. The *volumes of the foreign currencies*, traded at the *ultra high frequency electronic trading* in the *foreign currencies exchange markets*;

6. *The frequencies of the trade deals completion at the ultra high frequency electronic trading in the foreign currencies exchange markets;*
7. *The characteristics of the traders' discrete-time information absorption processes in the diffusion - type financial systems with the induced nonlinearities;*
8. *Some other parameters.*

From the *wealth management point of view*, the *investment of the money, professional efforts and working time* in the *ultra high frequency electronic trading* in the *foreign currencies exchange markets* is a *best way to increase and accumulate* the *enormous private/institutional wealth* by the *experienced investors* on a *global scale* at the *present time of the disruptive changes*. In addition, the *authors' scientific opinion* reflects their view on the subject that an *increasing application* of the *electronic computing technologies* in the *finances* opens a big number of *unbounded lucrative business opportunities* towards the *high profitable trading deals completion* in an era of the *ultra high frequency electronic trading* in the *foreign currencies exchange markets* at the *time of globalization*.

Having said that, we would like to emphasize that the *following research topics* are comprehensively discussed in this *research article*:

1. *The present state of the foreign currencies exchange markets in Asia, Europe and North America;*
2. *The research review on the classic forecast techniques of the foreign currencies exchange rates dynamics in the foreign currencies exchange markets in the classic finances theory;*
3. *The description on the quantum forecast techniques of the foreign currencies exchange rates dynamics in the foreign currencies exchange markets with the application of both the wave function and the time dependent / time independent wave equation in the quantum finances theory;*
4. *The derivation of the time dependent / time independent wave equation in the quantum finances theory;*
5. *The creation of the quantum system state prediction algorithm, based on both the wave function and the time dependent / time independent wave equation in the quantum finances theory;*
6. *The discussion on the developed software program with the embedded quantum system state prediction algorithm, using both the wave function and the time dependent / time independent wave equation in the quantum finances theory;*

7. The final words on the perspectives of the quantum forecast techniques of the foreign currencies exchange rates dynamics in the foreign currencies exchange markets, applying the time dependent / time independent wave equation with wave function in the quantum finances theory.

Literature review on high frequency electronic trading in foreign currencies exchange markets

Researching the *subject of interest* on the *high frequency electronic trading* in the *foreign currencies exchange markets* in *Ledenyov D O, Ledenyov V O (2014c)*, the authors analyzed a wide range of existing scientific problems, identified a number of significant scientific contributions and made a *comprehensive literature review*. Let us list the *research works* by the brilliant scientists, who contributed to the field of research on the *foreign currencies exchange rates dynamics in the foreign currencies exchange markets* in *Ellis, Metzler (editors) (1949)*, *Machlup (1949)*, *Robinson (1949)*, *Friedman (1953)*, *Baumol (1957)*, *Debreu (1959)*, *Fama (1965, 1970, 1984, 1998)*, *Fama, Blume (1966)*, *Fama, French (1988, 1996)*, *Fama, Hansen, Shiller (2013)*, *Demsetz (1968)*, *Radner (1968)*, *Bates, Granger (1969)*, *Akerlof (1970)*, *Arrow (1970)*, *Black (1971, 1986)*, *Black, Scholes (1973)*, *Merton (1973)*, *Newbold, Granger(1974)*, *Fleming (1975)*, *Shapiro (1975)*, *Dooley, Shafer (1976)*, *Dornbusch (1976, 1987)*, *Frankel (1976, 1979, 1982a, b, 1983, 1992, (editor) 1993)*, *Frankel, Froot (1987, 1990a, b, c)*, *Frankel, Goldstein, Mason (1991)*, *Frankel, Rose (1994, 1995)*, *Frankel, Galli, Giovannini (editors) (1996)*, *Frankel, Poonawala (2004)*, *Garman (1976)*, *Grossman (1976)*, *Grossman, Stiglitz (1980)*, *Grossman, Miller (1988)*, *Kouri (1976)*, *McKinnon (1976)*, *Mussa (1976, 1979, 1981, 1984)*, *Williamson (1976)*, *Branson (1977)*, *Branson, Halttunen, Masson (1977)*, *Branson, Henderson (1985)*, *Clark, Logue, Sweeney (editors) (1977)*, *Girton, Henderson (1977)*, *Cornell, Dietrich (1978)*, *Cornell (1982)*, *Stoll (1978, 1985, 1989, 1995, 1998, 2006)*, *Huang, Stoll (1996, 1997)*, *Stoll, Schenzler (2005)*, *Blanchard (1979)*, *Brunner, Meltzer (editors) (1979)*, *Deardorff (1979)*, *Goodman (1979)*, *Aliber (1980, 2002)*, *Allen, Kenen (1980)*, *Amihud, Mendelson (1980)*, *Amihud, Ho, Schwartz (editors) (1985)*, *Amihud (1994a, b, c)* *Amihud, Levich (editors) (1994)*, *Hansen, Hodrick (1980)*, *Hellwig (1980, 1982)*, *Krugman (1980, 1984, 1991, 1999)*, *Krugman, Miller (1993)*, *Callier (1981)*, *Cohen, Maier, Schwartz, Whitcomb (1981)*, *Cox, Ingersoll, Ross (1981)*, *Diamond, Verrecchia (1981)*, *Diamond (1982)*, *Fieleke (1981)*, *Ho, Stoll (1981, 1983)*, *Loosignian (1981)*, *Stigum (1981, 1990)*, *Dooley, Isard (1982)*, *Hansen (1982)*, *Hodder (1982)*, *Milgrom, Stokey (1982)*, *Taylor D (1982)*, *Bigman, Taya (editors) (1983)*, *Copeland, Galai*

(1983), Dooley, Shafer (1983), Edwards (1983), French (1983), Garman, Kohlhagen (1983), Meese, Rogoff (1983a, b, 1988) Rogoff (1984, 1985, 1996), Meese (1986, 1990), Obstfeld, Rogoff (1995, 1998), Robinson (1983), Adler, Dumas (1984), Backus (1984), Bilson, Marston (editors) (1984), Booth (1984), Engel, Frankel (1984a, b), Engel, Hamilton (1990), Engel (1992, 1995, 1996, 1999), Devereux, Engel (1999, 2002), Devereux, Shi (2005), Engel, West (2004a, b, 2005, 2006), Engel, Mark, West (2007), Garner, Shapiro (1984), Loopesko (1984), Roll (1984), French, Roll (1986), Roll (1988), White, Domowitz (1984), Bahmani-Oskooee, Das (1985), Cohen, Conroy, Maier (1985), Glosten, Milgrom (1985), Glosten, Harris (1988), Glosten (1989, 1994), Hakkio, Pearce (1985), Hardouvelis (1985), Jones, Kenen (editors) (1985), Kearney, Macdonald (1985), Kyle (1985, 1989), Kyle, Xiong (2001), Levich (1985), McNish, Wood (1985), Dominguez (1986, 1990, 1992, 1993, 1998, 2003a, b), Dominguez, Frankel (1993a, b, c), Bollerslev (1986, 1990), Baillie, Bollerslev (1989, 1990, 1991), Bollerslev, Chou, Jayaraman, Kroner (1990), Bollerslev, Domowitz (1991, 1993), Bollerslev, Melvin (1994), Andersen, Bollerslev (1994, 1998), Bollerslev, Engle, Nelson (1995), Bollerslev, Cai, Song (2000), Andersen, Bollerslev, Diebold, Labys (2000, 2001, 2003), Andersen, Bollerslev, Diebold, Vega (2001, 2003), Andersen, Bollerslev, Diebold (2007), Engle (1982) Engle, Bollerslev (1986), Engle, Granger (1987), Engle, Rodriguez (1989), Engle, Ito, Lin Wen-Ling (1990), Engle, Russell (1995), Engle, Gallo (2006), Evans (1986), Flood, Lessard (1986), Grammatikos, Saunders, Swary (1986), Harris (1986, 1990), Hart, Kreps (1986), Lyons (1986, 1988, 1990, 1991, 1992, 1993a, b, c, 1994, 1995, 1996a, b, 1997a, b, c, 1998a, b, 2001, 2002a, b, 2003, 2006), Baldwin, Lyons (1994), Lyons, Rose (1995), Fan, Lyons (2001, 2003), Killeen, Lyons, Moore (2001), Killeen, Hau, Moore (2001), Killeen, Lyons, Moore (2006), O'Hara, Oldfield (1986), Burdett, O'Hara (1987), O'Hara (1995, 1998), Shleifer (1986), Shleifer, Summers (1990), Sweeney (1986), DeLong, Shleifer, Summers, Waldmann (1990), Bilson, Hsieh (1987), Glassman (1987), Gerlach (1987), Hasbrouck, Ho (1987), Hasbrouck (1988, 1991), Hasbrouck, Sofianos (1993), Hasbrouck, Seppi (2001), Hodrick (1987), Ito, Roley (1987, 1990), Canova, Ito (1991), Ito, Engle, Lin (1992), Ito, Lin (1992), Ito, Isard, Symansky, Bayoumi (1996), Ito, Lyons, Melvin (1998), Ito (2002, 2005a, b), Ito, Hashimoto (2006), Mendelson (1987), Newey, West (1987), Rubinstein, Wolinsky (1987), Taylor (1987, 1989, 1995, 2005), Allen, Taylor (1989), Taylor, Allen (1992), Sarno, Taylor (2000, 2001a, b), Sager, Taylor (2005, 2006, 2008), Reitz, Taylor (2006), Schulmeister (1987), Melvin, Taylor (2009), Newey, West (1987), Wolff (1987), Admati, Pfleiderer (1988, 1989), Boothe (1988), Choi, Salandro, Shastri, Clinton (1988), Goodhart (1988, 1989, 1992), Goodhart, Demos (1990, 1991a, b), Goodhart, Curcio (1991), Goodhart, Figliuoli (1991), Goodhart, Hall, Henry, Pesaran (1993), Goodhart, Hesse (1993),

Goodhart, Ito, Payne (1995, 1996), Goodhart, O'Hara (1995), Goodhart, O'Hara (1997), Goodhart, Love, Payne, Rime (2002), Hardouvelis (1988), Lewis (1988, 1995), Baldwin, Krugman (1989), Baxter, Stockman (1989), Dooley, Lizondo, Mathieson (1989), Giovannini (1989), Golub (1989), Humpage (1989), Leach, Madhavan (1989), Leahy (1989), Miller, Eichengreen, Portes (editors) (1989), Van Hagen (1989), Allen, Taylor (1990), Allen, Karjalainen (1999), Courakis, Taylor (1990), Diebold, Nason (1990), Flood, Hodrick (1990), Flood, Rose (1995), Flood, Taylor (1996), Flood, Marion (2001), Foster, Viswanathan (1990), Foster, Viswanathan (1993), Holthausen, Leftwich, Mayers (1990), De Long, Shleifer, Summers, Waldmann (1990), Domowitz (1990, 1993), Domowitz, Steil (1999), Johansen, Juselius (1990), Johansen (1991, 1992), Jorion (1990, 1991, 1996), Lo, MacKinley (1990), Melino, Turnbull (1990, 1995), Mishkin (1990), Müller, Dacorogna, Olsen, Pictet, Schwarz, Morgenegg (1990), Müller, Dacorogna, Dave, Pictet, Olsen, Ward (1993), Müller, Dacorogna, Dave, Olsen, Pictet, von Weizsäcker (1995), Roell (1990), Seppi (1990), Bali (1991), Bhattacharya, Spiegel (1991), Black (1991), Bossaerts, Hillion (1991), Burnham (1991), Campbell, LaMaster, Smith, Van Boening (1991), Campbell, Lo, MacKinlay (1997), Chinn (1991), Chinn, Meese (1995), Chowdhry, Nanda (1991), Edwards (1991), Froot, Obstfeld (1991), Froot, Rogoff (1995), Froot, Ramadorai (2002), Froot, Donohue (2004), Froot, Ramadorai (2005), Georg, Kaul, Nimalendran (1991), Grabbe (1991), Harvey, Huang (1991), Khonry (editor) (1991), Kim, Verrecchia (1991, 1994, 1997), Klein (1991), Klein, Rosengren (1991), Lease, Masulis, Page (1991), LeBaron (1991), Lee, Ready (1991), Messe, Rose (1991), Subrahmanyam (1991), Spiegel, Subrahmanyam (1992, 1995), Williamson (1991), Bekaert, Hodrick (1992), Choi, Elyasiani, Kopecky (1992), Choi, Elyasiani (1997), Curcio, Goodhart (1992), Curcio, Goodhart, Guillaume, Payne (1997), De Grauwe, Decupere (1992), De Grauwe, Grimaldi (2006a, b), Edison (1992, 1993, 2003), Edison, Liang (1999), Flood (1992, 1994), Flood, Rose (1995), Flood, Huisman, Koedijk, Mahieu (1996, 1998), Gosh (1992), Guillaume, Dacorogna, Dave, Muller, Olsen, Hamon, Jacquillat (1992), Guillaume, Pictet, Dacorogna (1995), Guillaume, Dacorogna, Dave, Muller, Olsen, Pictet (1997), Hansen (1992), Holden, Subrahmanyam (1992), Neal (1992), Pesaran, Samiei (1992), Rhee, Chang, Svensson (1992, 1993), Bertola, Svensson (1993), Rose, Svensson (1994), Taylor S J (1992), Zhou (1992a, b, 1997), Bank for International Settlements (1993, 1999a, b, 2001, 2002, 2004 2005, 2007, 2010), Bertola, Svensson (1993), Biais (1993), Chan, Weinstein (1993), Cheung (1993), Cheung, Ng (1996), Cheung, Chinn (1998, 2001), Cheung, Wong (1999, 2000), Cheung, Chinn, Marsh (2004), Cheung, Chinn, Pascual (2004, 2005), Dacorogna, Muller, Nagrel, Olsen, Pictet (1993), Dacorogna, Muller, Pictet, de Vries (1995), Dominguez, Frankel (1993), Dominguez (1998, 2006), Dominguez,

Panthaki (2006), Ederington, Lee (1993), Edin, Vredin (1993), Goldstein, Folkerts-Landau, Garber, Rojas-Suarez, Spencer (1993), Griffiths, White (1993), Grimes (1993), Harris, Raviv (1993), Klein (1993), Levich, Thomas (1993), Matsuyama, Kiyotaki, Matsui (1993), Romer (1993), Schmidt, Iversen, Treske (1993), Schmidt, Iversen (1993), Schmidt, Oesterhelweg, Treske (1996), Wolinsky (1990), Ammer, Brunner (1994), Andrew, Broadbent (1994), Bakker, Boot, Sleijpen, Vanthoor (editors) (1994), Bartov, Bodnar (1994, 1995), Berry, Howe (1994), Bessembinder (1994), Ball, Roma (1994), Brousseau, Czarnecki (1994), De Jong (1994), De Jong, Nijman, Röell (1995), De Jong, Nijman, Röell (1996), De Jong, Mahieu, Schotman (1998), De Jong, Ligterink, Macrae (2006), De Jong, Verschoor, Zwinkels (2010), Degryse, de Jong, van Kervel (2011), Dini (1994), Fialkowski, Petersen (1994), Glass (1994), Grünbichler, Longstaff, Schwartz (1994), Hansch, Naik, Viswanathan (1994), Hirschleifer, Subrahmanyam, Titman (1994), Hogan, Melvin (1994), Jones, Kaul, Lipson (1994), Jones, Lipson (1999), Kraus, Smith (1994), Massib, Phelps (1994), Mendelson, Peake (1994), Naidu, Rozeff (1994), Nieuwland, Verschoor, Wolff (1994), Pictet, Dacorogna, Muller, De Vries (1994), Sharpe (1994), Silber (1994), Slezak (1994), Szpiro (1994), Yadav, Pope, Paudyal (1994), Walsh (1994), Wei (1994), Watanabe (1992), Watanabe, Harada (2004), Watanabe, Yabu (2007), Almekinders (1995), Chiang, Jiang (1995), Dumas, Solnik (1995), Ederington, Lee (1995), Evertsz (1995), Faruquee (1995), Frino, McCorry (1995), Frino, McInish, Toner (1998), Ghysels, Jasiak (1995), Grossman, Rogoff (1995), Havrilesky (1995), Hong, Wang (1995), Isard (1995), Kandel, Pearson (1995), Lewis (1995), Lin, Sanger, Booth (1995), Mantegna, Stanley (1995), Mark (1995, 2001, 2009), Mark, Wu (1998), Obstfeld, Rogoff (1995, 1998), Osler (1995, 1998, 2000, 2003, 2005, 2006, 2008, 2009, 2012), Carlson, Osler (1999, 2005), Kevin, Osler (1999), Osler, Vandroych (2009), Osler, Yusim (2009), Osler, Mende, Menkhoff (2011), Osler, Savaser (2011), Dahl, Carlson, Osler (2011), Peiers (1995), Prasad, Rajan (1995), Schnidrig, Würtz (1995), Schwartz (editor) (1995), Shyy, Lee (1995), Shyy, Vijayraghavan, Scott-Quinn (1996), Vivex (1995), Zaheer, Zaheer (1995), Bonser – Neal, Tanner (1996), Claassen (1996), Danker, Haas, Henderson, Symanski, Tryon (1996), Dukas, Fatemi, Tavakkol (1996), Dwyer, Locke, Yu (1996), Easley, Kiefer, O'Hara, Paperman (1996, 1997a, b), Easley, O'Hara, Srinivas (1998), Flemming, Ostdiek, Whaley (1996), Gagnon (1996), Ghashghaie, Breymann, Peinke, Talkner, Dodge (1996), Hsieh, Kleidon (1996), Ingersoll (1996), Kaminsky, Lewis (1996), LeBaron (1996), MacDonald, Marsh (1996), Madrigal (1996), Mosekilde (1996), Pirrong (1996), Rosenberg (1996), Tsang (1996, 1998, 1999a, b), Tsang, Sin, Cheng (1999), Tsang, Yue (2002), Vermeiren, Ková (1996), Balke, Fomby (1997), Balke, Wohar (1998), Bhattacharya, Weller (1997), Campbell, Lo, MacKinlay (1997), Campbell, Viceira (2002), Chamberlain, Howe,

Popper (1997), Clarida, Taylor (1997), Clarida, Sarno, Taylor, Valente (2003), Copejans, Domowitz (1997), DeGennaro, Shrieves (1997), Dewachter (1997, 2001), Dewachter, Lyrio (2005), Embrechts, Klueppelberg, Mikosch (1997), Evans (1997, 2001, 2002, 2005, 2009, 2010, 2011), Evans, Lyons (1999, 2001a, b, c, 2002a, b, c, d, 2003, 2004a, b, 2005a, b, c, d, 2006, 2007, 2008, 2009), Cao, Evans, Lyons (2003), Evans, Hnatkovska (2005), Fleming, Remolona (1997, 1999), Fleming (2002, 2003), Franke, Hess (1997), Goldberg, Tenorio (1997), Gosh, Ostry, Gulde, Wolf (1997), Harris, Schultz (1997), Hartmann (1997, 1998a, b, 1999), Hung (1997), Kirilenko (1997), Lamoureux, Schnitzlein (1997), Madhavan, Smidt (1991, 1993), Leach, Madhavan (1993), Keim, Madhavan (1996), Madhavan, Cheng (1997), Madhavan, Richardson, Roomans (1997), Madhavan, Sofianos (1997), Madhavan (2000a, b, c), Martens (1997), Montiel (1997), Pagano, Roell (1997), Peiers (1997), Reiss, Werner (1997), Sweeney (1997, 2000), Szakmary, Mathur (1997), Vogler (1997), Wei, Kim (1997), Werner (1997), Wren-Lewis (1997), Abhyankar (1998), Abrams, Beato (1998), Anthony, MacDonald (1998, 1999), Bjønnes, Rime (1998, 2001, 2005), Bjønnes, Rime, Solheim (2005), Bjønnes, Osler, Rime (2011), Blennerhasset, Bowman (1998), Bodnar, Hayt, Marston (1998), Caramazza, Aziz (1998), Chang, Taylor (1998), Choi, Hiraki, Takezawa (1998), Chow, Chen (1998), Clark, Macdonald (1998), Covrig, Melvin (1998), Eddelbuttel, McCurdy (1998), Edison (1998), Fleming, Kirby, Ost diek (1998), Garfinkel, Nimalendran (1998), George (1998), Hansch, Naik, Viswanathan (1998), Hau (1998), Hau, Killeen, Moore (2000, 2002a, b), Hau, Rey (2002, 2003), He, Ng (1998), Helpman, Sadka (1998), Hong Kong Monetary Authority (1998), Isard, Faruqee (1998), Isard, Faruqee, Kincaid, Fetherston (2001), Kanas (1998), Lee (1998), Litterman, Winkelmann (1998), Lui, Mole (1998), Menkhoff (1998, 2010), Gehrig, Menkhoff (2000, 2004), Mende, Menkhoff (2003, 2006), Menkhoff, Taylor (2007), Frömmel, Mende, Menkhoff (2008), Menkhoff, Schmeling (2008, 2010), Miller, Reuer (1998), Miville, DiMillo (1998), Nagayasu (1998), Neely (1998, 2000a, b, 2004, 2005), Pesaran, Hasem, Smith (1998), Portes, Rey (1998), Rey (2001), Reiss, Werner (1998), Sarkar, Tozzi (1998), Viswanathan, Wang (1998, 2000), Vitale (1998, 1999, 2000, 2003, 2004, 2006) Yao (1998), Alberola, Cervero, Lopez, Ubide (1999), Bos, Fetherstone (1999), Carrera (1999), Chaboud, LeBaron (1999, 2001), Chaboud, Humpage (2005), Chaboud, Chernenko, Wright (2008), Chaboud, Chiquoine, Hjalmarsson, Vega (2009), Chaboud, Chiquoine, Hjalmarsson, Loretan (2009), Fiess, MacDonald (1999, 2002), Fleming, Lopez (1999), Freihube, Kehr, Krahen, Theissen (1999), Grammig, Schiereck, Theissen (1999), Isard, Razin, Rose (1999), Jeanne, Rose (1999), Kandel, Marx (1999), LeBaron (1999), Marks (1999), Macey, O'Hara (1999), Naik, Neuberger, Viswanathan (1999), Naik, Yadav (1999), Payne (1999, 2003), Payne, Vitale (2003), Moore, Payne (2011), Love, Payne (2004, 2008), Rigobon

(1999), Saar (1999), Scalia, Vacca (1999), Scalia (2004, 2008), Shapiro, Varian (1999), Theissen (1999), Vayanos (1999, 2001), Wang (1999), Aliber, Chowdhry, Yan (2000), Ausloos (2000), Baillie, Humpage, Osterberg (2000), Carlson, Osler (2000), Carlson (2002), Ebrahim (2000), Eichengreen, Mathieson (2000), Greenspan (2000), Hüfner (2000), Franke, Hess (2000), Fujiwara (2000), Kanas (2000), Kaul, Mehrotra, Morck (2000), Kim, Kortian, Sheen (2000), Kim, Sheen (2002), Kim (2003), Lane, Milesi-Ferretti (2000), Lo (2000), Lee, Swaminathan (2000), Ma, Kanas (2000), Ma, Tsang, Yiu, Wai-Yip Alex Ho (2010), Martin (2000), Martin, Mauer (2003, 2005), McCallum (2000), Melvin M, Yin (2000), Melvin M, Melvin B P (2003), Melvin M, Taylor (2009), Naranjo, Nimalendran (2000), Ng (2000), Ramaswamy, Samiei (2000), Rime (2000, 2001, 2003), Akram, Rime, Sarno (2005), Rime, Sarno, Sojli (2006, 2007, 2010), Schwartz (2000), US General Accounting Office (2000), Allayannis, Ofek (2001), Anderson, Vahid (2001), Brandt, Edelen, Kavajecz (2001), Brown (2001), Cai, Cheung, Lee, Melvin (2001), Claessens, Forbes (2001), Clark, McCracken (2001), Collins, Rodrik (2001), Corsetti, Pesenti, Roubini (2001), Coval, Shumway (2001), Croushore, Stark (2001), Dacorogna, Gencay, Mueller, Olsen, Pictet (2001), D'Souza (2001), Duarte, Stockman (2001), Fischer (2001), Galati (2001), Griffin, Stulz (2001), Guembel, Sussman (2001), Hong (2001), Lane (2001), Montgomery, Popper (2001), Moore, Roche (2001, 2002), Rey (2001), Sato, Hawkins (2001), Sinn, Westermann (2001), Tse, Zobotina (2001), Williamson (2001), Yamaguchi (2001), Aguiar (2002), Beine (2002), Cavallo, Perri, Roubini, Kisselev (2002), Chari, Kehoe, McGrattan (2002), Chari (2006), Chordia, Roll, Subrahmanyam (2002), Covrig, Melvin (2002), Danielsson, Payne (2002, 2011), Danielsson, Payne, Luo (2002), Danielsson, Love (2006), Deutsche Bundesbank (2002), Doyme, Joshi (2002), Fatum, Hutchison (2002), Fatum, King (2005), King, Sarno, Sojli (2010), King, Rime (2010), King, Mallo (2010), King, Osler, Rime (2011a, b, 2012), Kantelhardt, Zschiegner, Koscielny-Bunde, Havlin, Bunde, Stanley (2002), Galati (2002), Girardin, Horsewood (2002), Huang, Cai, Jeanne, Rose (2002), Kaul, Mehrotra (2002), Obadan (2002), Ryan, Worthington (2002), Abreu, Brunnermeier (2003), Aliber, Chowdry, Yan (2003), Bacchetta, van Wincoop (2003), Bergsten, Williamson (2003), Bodnar, Wong (2003), Burstein, Neves, Rebelo (2003), Carpenter, Wang (2003), Derviz (2003), Dominguez (2003), Dominguez, Panthaki (2006), Doukas, Hall, Lang (2003), Fatum, Hutchison (2003), Fatum, Hutchison (2006), Faust, Rogers, Wright (2003), Gordon (2003), Humpage (2003), Koutmos, Martin (2003), Laurenceson, Chai (2003), Mathisen (2003), Okunev, White (2003), Peng, Shu, Chow (2003), Rogers, Siklos (2003), Spiegel (2003), Westerhoff (2003), Wright (2003), Aitken, Frino, Hill, Jarnecic (2004), Anwar (2004), Bacchetta, van Wincoop (2004, 2006), Bartram (2004), Bartram, Bodnar (2004), Bartram,

Brown, Minton (2005), Bartram, Karolyi (2006), Bhanumurthy (2004), Brandt, Kavajecz (2004), Breedon, Vitale (2004), Cashin, Cespedes, Sahay (2004), Choi, Baek (2004), De Wet, Gebreselasie (2004), Dunne, Hau, Moore (2004), Fratzscher (2004), Hahm (2004), Hui, Neely, Higbee (2004, 2007), Hui, Yeung, Fung, Lo (2007), Hui, Fong (2007), Hui, Genberg, Chung (2009), Kim, Yoon (2004), Nagayasu (2004), National Bank of Poland (2004, 2007), Reinhart, Rogoff (2004), Rigobon, Sack (2004), Simatele (2004), Akram, Rime, Sarno (2005), Ates, Wang (2005), Bauwens, Omrane, Giot (2005), Campa, Goldberg (2005, 2006a, b), Chui, Gerlach, Yu (2005), DeGrauwe (editor) (2005), Dueker, Neely (2005), Eichengreen (2005), El-Shagi, Rübel (editors) (2005), Fung, Lien, Tse, Tse (2005), Hau, Rey (2005), Inoue, Kilian (2005), Marsh, O'Rourke (2005), Newsome (2006), Vaubel (2005), Yu, Fung, Hongyi (2005), Alexander, Barbosa (2006), Bacchetta, van Wincoop (2006), Bayoumi, Lee, Jayanthi (2006), Boyen, Van Norden (2006), Cai, Howorka, Wongswan (2006), Cai, Howorka, Wongswan (2008), Cao, Evans, Lyons (2006), Carlson, Lo (2006), Charlebois, Sapp (2006), Chu, Mo, Wong, Lim (2006), Gilbert, Rijken (2006), Jeon, Oh, Yang (2006), Escribano, Pascual (2006), Kaul, Sapp (2006), Killeen, Lyons, Moore (2006), Kim, Lee, Shin (2006), Kočenda, Valachy (2006), Kočenda, Kután, Yigit (2008), Kočenda, Poghosyan (2009), LeBaron (2006), Mende (2006), Mende, Menkhoff (2006), Muller, Verschoor (2006), Norouzzadeh, Rahmani (2006), Pelham (2006), Rodrik (2006), Sager, Taylor M P (2006), Starks, Wei (2006), Tabak, Cajueiro (2006), Taylor A, Farstrup (2006) Taylor J B (2006), Tesfatsion, Judd (editors) (2006), Wong (2006), Adebisi (2007), Barker (2007), Bhansali (2007), Broz, Frieden, Weymouth (2007), Burnside, Eichenbaum, Rebelo (2007, 2009), Burnside (2012), Canto, Kräussl (2007), Chi, Tripe, Young (2007), Christodoulou, O'Connor (2007), Dreher, Vaubel (2007), DuCharme (2007), Egstrup, Fischer (2007), Fleming, Mizrach (2007), Fung, Yu (2007), Genberg, He, Leung (2007a, b), Genberg, Hui (2009), Hong Kong Monetary Authority (2007), Jiang, Ma, Cai (2007), Leung, Ng (2007, 2008), Mitchell, Pedersen, Pulvino (2007), Pasquariello (2007), Sahminan (2007), Scarlat, Stan, Cristescu (2007), Van Wincoop, Tille (2007), Wong J, Wong E, Fong, Choi (2007), Wong E, Wong J, Leung (2008), Yu, Fung, Tam (2007), Acemoglu, Rogoff, Woodford (editors) (2008), Baglioni, Monticini (2008), Barndorff-Nielsen, Hansen, Lunde, Shephard (2008), Bartram (2008), Beaupain, Durré (2008), Berger, Chaboud, Chernenko, Howorka, Wright (2008), Brunnermeier, Nagel, Pedersen (2008), Burnside (2008), Burnside, Eichenbaum, Kleshchelski, Rebelo, Hall L, Hall H (2008), Chinn, Moore (2008, 2011), Gagnon, Chaboud (2008), Lam, Fung, Yu (2008), Lien (2008), Lindley (2008), Liu, Tsang (2008), Liu, Fung, Tse (2008), Lo, Sapp (2008, 2010), Ramadorai (2008), Sebastião (2008), Terada, Higashio, Iwasaki (2008), Adrian, Etula, Shin (2009), Bacchetta, Mertens, Van Wincoop (2009), Baba, Packer

(2009), Brunnermeier, Nagel, Pedersen (2009), Brunnermeier, Crockett, Goodhart, Persaud, Shin (2009), Bubák, Zikes (2009), Bubák, Kočenda, Žikeš (2010), De Zwart, Markwat, Swinkels, van Dijk (2009), Ding (2009), Gallardo, Heath (2009), Gençay, Gradojevic (2009), Jiang, Zhou (2009), Hattori, Shin (2009), He, Zhang, Wang (2009), Heath, Whitelaw (2011), McGuire, von Peter (2009), Meyers (2009), Muller, Verschoor (2009), Nolte I, Nolte S (2009, 2011), Serban (2009), Simwaka, Mkandawire (2009), Breedon, Vitale (2010), Breedon, Rime, Vitale (2011), Dunne, Hau, Moore (2010), Fukuda, Kon (2010), Liu, Qian, Lu (2010), Maurer, Schäfer (2010), Nightingale, Ossolinski, Zurawski (2010), Pasquariello (2010), Yiu, Ho, Ma, Tsang (2010), Diamond (2011), Durčáková (2011), Heimer, Simon (2011), Marzo, Zagaglia (2011), Moore, Payne (2011), Plantin, Shin (2011), Rafferty (2011), Wang, Wu, Pan (2011), Banti, Phylaktis, Sarno (2012), James, Marsh, Sarno (editors) (2012), Mancini, Ranaldo, Wrampelmeyer (2012), Sheng (2012a, b, 2014), Trenca, Plesoianu, Căpușan (2012), Wang, Yu, Suo (2012), Lassmann (2013).”

Wave function to forecast foreign currencies exchange rates at ultra high frequency electronic trading in foreign currencies exchange markets

During the process of the *foreign currencies exchange rates forecast at the ultra high frequency electronic trading in the foreign currencies exchange markets*, the **computing modeling result accuracy** depends on such factors as:

1. The *mathematical model meaningfulness and validity*;
2. The *quality of the random number generator*; and
3. The *technical parameters of the high performance computing system*.

Therefore, a *considerable research attention* is paid to the development of the **meaningful mathematical model**, which must account for all the *financial variables changes in the time, frequency and space domains* as well as have to apply all the theories on the *ultra high frequency electronic trading in the foreign currencies exchange markets*.

Going to the thoughtful discussion on the technical issues, let us remind that the *foreign currencies forward exchange rate* is a sum of the two components: a *foreign currencies future spot rate* and a *time-varying risk premium* in Yu, Fung, Hongyi (2005), Ledenyov D O, Ledenyov V O (2014c):

$$\text{Foreign Currencies Forward Exchange Rate} = \text{Foreign Currencies Spot Exchange Rate} + \text{Time Varying Risk Premium}$$

Discussing the *mathematical models*, we would like to say that the *existing research approaches* to forecast the *foreign currencies exchange rates* at the *ultra high frequency electronic trading* in the *foreign currencies exchange markets* include, but not limited to, the following well known *financial analysis methods and models* in the *classic finances science* in Ledenyov D O, Ledenyov V O (2014c):

1. Macroeconomic analysis methods, based on:

- 1) The *Purchasing Power Parity* model;
- 2) The *Uncovered Interest Rate Parity* model;
- 3) The *Sticky Price Monetary* model;
- 4) The *Bayesian Averaging Technique* model;
- 5) The *Combined Forecast* model.

2. Microeconomic analysis methods, based on:

- 1) The *market microstructure model*;
- 2) The *transactions order flow model*;
- 3) The *generalized autoregressive conditional heteroskedasticity model*;
- 4) The *Stratanovich-Kalman-Bucy filtering algorithm model*;
- 5) The *particle filtering algorithm model*.

However, the *national/global financial systems of scale and scope* can be described as the *discrete-time quantum systems* rather than the *continuous-time systems*, because of their *discrete-time quantum nature* in view of the *disruptive events influences* in Ledenyov D O, Ledenyov V O (2015h, i, j, k). Therefore, the **quantum finances science** instead of the *classic finances science* has to be used with the aim to accurately characterize the *foreign currencies exchange rates dynamics* at the *ultra high frequency electronic trading* in the *foreign currencies exchange markets*. In other words, all the above listed research approaches, aiming to predict the *foreign currencies exchange rates* at the *ultra high frequency electronic trading* in the *foreign currencies exchange markets*, have a *limited accuracy*, because they can characterize the *relatively slow changing continuous-time signals* only, but not the *discrete-time digital signals*.

Applying the *quantum macroeconomic theory* in Ledenyov D O, Ledenyov V O (2015h) and the *quantum microeconomic theory* in Ledenyov D O, Ledenyov V O (2015j), the authors propose a *new research methodology* to forecast the *foreign currencies exchange rates* at the *ultra high frequency electronic trading* in the *foreign currencies exchange markets*, which include the following newly invented innovative *financial analysis methods and models* in the *quantum finances science*:

1. Macroeconomic analysis method, based on:

1) The *Ledenyov wave function* in the *time dependent Ledenyov quantum econophysical wave equation model*;

2) The *Ledenyov wave function* in the *time independent Ledenyov quantum econophysical wave equation model*.

2. **Microeconomic analysis methods**, based on:

1) The *Ledenyov wave function* in the *time dependent Ledenyov quantum econophysical wave equation model*;

2) The *Ledenyov wave function* in the *time independent Ledenyov quantum econophysical wave equation model*.

The **time dependent Ledenyov quantum econophysical wave equation** in the *wave function method to forecast the foreign currencies exchange rates at the ultra high frequency electronic trading in the foreign currencies exchange markets* can be written as

$$i\chi_{FX} \frac{\partial}{\partial t} w_{FX} = \hat{L}_{FX} w_{FX}, \quad (1)$$

where: i – the *imaginary unit*,

w_{FX} – the *wave function of a quantum financial system, which is a mathematical function in the quantum mechanics to accurately characterize a specified state of a quantum financial system. The square of the amplitude of the wave function at a given point being representative of the probability of the system being found in that state at that point.*

χ_{FX} – the *Ledenyov constant*,

t – the *time*,

$\frac{\partial}{\partial t}$ – the *partial derivative with respect to the time*,

\hat{L}_{FX} – the *Ledenyov operator to characterize the total energy of the wave function*.

The **time independent Ledenyov quantum econophysical wave equation** in the *wave function method to forecast the foreign currencies exchange rates at the ultra high frequency electronic trading in the foreign currencies exchange markets* can be written as

$$E_{FX} w_{FX} = \hat{L}_{FX} w_{FX}, \quad (2)$$

where: w_{FX} – the *wave function of a quantum financial system, which is a mathematical function in the quantum mechanics to accurately characterize a specified state of a quantum financial system. The square of the amplitude of the wave function at a given point being representative of the probability of the system being found in that state at that point*,

\hat{L}_{FX} – the *Ledenyov operator to characterize the total energy of the wave function*,

E_{FX} – the energy of the state w_{FX} .

It is necessary to add that we developed a *software program*, which uses the *quantum system state prediction algorithm*, based on the *time dependent / time independent wave equation* with the *wave function* in the *quantum finances theory*, to forecast the *foreign currencies exchange rates* at the *ultra high frequency electronic trading* in the *foreign currencies exchange markets*.

In addition, we successfully applied the *software program*, which uses the *quantum system state prediction algorithm*, based on the *time dependent / time independent wave equation* with the *wave function* in the *quantum finances theory*, with the aim to forecast the *foreign currencies exchange rates* at the *ultra high frequency electronic trading* in the *global foreign currencies exchange markets*.

This *innovative research* on the *foreign currencies exchange rates* at the *ultra high frequency electronic trading* in the *foreign currencies exchange markets* is done, using the *following scientific literature*:

1. The ***econophysics science*** in Schumpeter (1906, 1933), Bowley (1924), Box, Jenkins (1970), Grangel, Newbold (1977), Van Horne (1984), Taylor S (1986), Tong (1986, 1990), Judge, Hill, Griffiths, Lee, Lutkepohl (1988), Hardle (1990), Grangel, Teräsvirta (1993), Pesaran, Potter (1993), Banerjee, Dolado, Galbraith, Hendry (1993), Hamilton (1994), Karatzas, Shreve (1995), Campbell, Lo, MacKinlay (1997), Rogers, Talay (1997), Hayashi (2000), Durbin, Koopman (2000, 2002, 2012), Ilinski (2001), Greene (2003), Koop (2003), Davidson, MacKinnon (2004), Campbell, Lo, MacKinlay (1996).

2. The ***quantum mechanics science*** in Planck (1900a, b, c, d, 1901, 1903, 1906, 1914, 1915, 1943), Einstein (1905, 1917, 1924, 1935), Einstein, Podolsky, Rosen (1935), Bohr (1922, 1924), de Broglie L (1924, 1925, 1926, 1927, 1928), Compton (1926), Compton A, Allison S K (1935), Schrödinger (1926), Schiff (1949), Akhiezer, Berestetsky (1953, 1964, 1980), Berestetsky, Lifshits, Pitaevsky (1980), Dirac (1958), Merzbacher (1961), Feynman, Leighton, Sands (1965), Atkins (1974, 1977, 1978), Landau, Lifshits (1977), Bransden, Joachain (1983), Resnick, Eisberg (1985), Galindo, Pascual (1990, 1991), Shankar (1994), Ballentine (1998), Bransden, Joachain (2000), Liboff (2002), Abers, Pearson (2004), Blokhintsev (2004), Griffiths (2004), Vakarchuk (2004), McMahan (2006), Halliday (2007), Hand, Finch (2008), Teschl (2009), Zettili (2009), Laloe (2012), Rylov (2015);

3. The ***probability science*** in De Laplace (1812), Bunyakovsky (1846), Chebyshev (1846, 1867, 1891), Markov (1890, 1899, 1900, 1906, 1907, 1908, 1910, 1911, 1912, 1913), Kolmogorov (1938, 1985, 1986), Wiener (1949), Brush (1968, 1977), Shiryaev (1995).

Conclusion

This research article presents an original research on the following scientific topics:

- 1) the present state of the foreign currencies exchange markets in Asia, Europe and North America;
- 2) the research review on the classic forecast techniques of the foreign currencies exchange rates dynamics in the foreign currencies exchange markets in the classic finances theory;
- 3) the description on the quantum forecast techniques of the foreign currencies exchange rates dynamics in the foreign currencies exchange markets with the application of the time dependent / time independent wave equation with the wave function in the quantum finances theory;
- 4) the derivation of the time dependent / time independent wave equation in the quantum finances theory;
- 5) the creation of the quantum system state prediction algorithm, based on both the wave function and the time dependent / time independent wave equation in the quantum finances theory;
- 6) the discussion on the developed software program with the embedded quantum system state prediction algorithm, using both the wave function and the time dependent / time independent wave equation in the quantum finances theory;
- 7) the final words on the perspectives of the quantum forecast techniques of the foreign currencies exchange rates dynamics in the foreign currencies exchange markets, applying the time dependent / time independent wave equation with the wave function in the quantum finances theory.

Acknowledgement

The first author started his scientific work on the information processing in Kharkiv, Ukraine, researching the microwave filters, making the discovery that the quantum knot of the magnetic vortex is in an extreme quantum limit, focusing on the research and development toward the ultra dense memory on the quantum knots of the magnetic vortices, and presenting his innovative research results at the international conferences, including the Marconi seminar at Birmingham University in the UK in 1999.

The *advanced innovative research on the analog and digital signals processing at ultra high frequencies in the electronics engineering and physics sciences* has been conducted by the *first author* under *Prof. Janina E. Mazierska* at *James Cook University* in *Townsville* in *Australia* in *2000 – 2015*.

The *first author* would like to tell an interesting story that he decided to fly from *James Cook University* in the *City of Townsville* in the *State of Australia* to *University of Czernowitz* in the *City of Czernowitz* in the *State of Ukraine* to pay his respect to *Prof. Joseph Alois Schumpeter's scientific achievements* in *March, 2015*, because *Prof. Joseph Alois Schumpeter* started to think on the *business cycles and economic development* in the *economics science* at *University of Czernowitz* in the *City of Czernowitz* in the *State of Ukraine* in *1909 – 1911*, completing the writing of his well known book on the *business cycles* in *Schumpeter (1939)*.

It may be interesting to note that the *first* and *second authors* were graduated from *V. N. Karazin Kharkiv National University* in the *City of Kharkiv* in the *State of Ukraine* in *1999* and *1993*. The *V. N. Karazin Kharkiv National University*, was founded in *1805* in *Kharkiv, Ukraine*, becoming a leading high educational institution in *Europe in IXX-XXI centuries*. Let us remind that *Prof. Tugan-Baranovsky*, who originated the *business cycle research*, was graduated with his *first technical degree* from *V. N Karazin Kharkiv National University* in *Kharkiv, Ukraine* at the end of *IXX century*. *Prof. Nikolai D. Kondratiev*, who is well known for his groundbreaking *research on the business cycles*, considered *Prof. Tugan-Baranovsky* as his most respected *Teacher*. At later date, *Prof. Simon Kuznets*, obtained his *high degree* and conducted his *scientific work* on the *cyclical fluctuations in the economic systems* in the *City of Kharkiv* in the *State of Ukraine* in *1915 - 1922*, being influenced by *Prof. Joseph Alois Schumpeter and Prof. Nikolai D. Kondratiev* research ideas/papers and coming up with the remarkable research results, published at *Harvard University* in the *USA*, in *Kuznets (1930, 1973)*.

It is a *notable historical fact* that the *first and second authors* were strongly influenced by the *remarkable scientific papers and books* by *Lev Davydovich Landau*, who had a considerable interest in the *physics* and, at the later stage of his life, in the *econophysics*, working at *National Scientific Centre Kharkiv Institute of Physics and Technology / V. N. Karazin Kharkiv National University* in the *City of Kharkiv* in the *State of Ukraine* in *1930s*.

The *second author* began his research work on the *information processing*, specifically focusing on the *information processing and coding* by various *electronic computing devices* in *Ukraine* in the *later 1980s* and *early 1990s*. The *second author* made his *significant research contributions* to establish the *scientific field* on the *information processing* by the *quantum computing devices*, researching and developing the *1024 Quantum Random Number Generator*

on the Magnetic Flux Qubits, based on the Superconducting Quantum Interference Device (SQUID) arrays, for the space applications at a number of leading research institutions and elite universities in Europe and in North America since the beginning of 1990s. The second author is frequently regarded and commonly recognized as a founder of the research field on the information processing by the superconducting quantum computing devices, which was established in Europe almost 30 years ago.

In the quantum computing, the second author's scientific views were mainly influenced 1) by Prof. Lev Landau research papers on the quantum physics, which have been absorbed during his research work in the City of Kharkiv in the State of Ukraine in 1990s; and 2) by Prof. Niels Bohr research articles on the quantum physics, which have been studied during his scientific work at Technical University of Denmark in the City of Lyngby near the City of Copenhagen in the State of Denmark in Scandinavia in 1995, 1997-1998; and 3) by Prof. Heike Kamerlingh Onnes research discoveries, which have been researched during his scientific visit to Leiden University in the State of The Netherlands in 1998.

Discussing the scientific problems on the signal generation, it is necessary to comment that the second author completed his research on the Gunn diode microwave generators in 1991-1992 at V. N. Karazin Kharkiv National University in Kharkiv, Ukraine, and then continued his innovative scientific work on the various scientific programs towards the continuous-time waves generators such as the Yttrium Iron Garnet (YIG) microwave generators, tuned by the magnetic field, as well as the discrete-time digital signal generators such as the 1024 Quantum Random Number Generator on the Magnetic Flux Qubits, based on the Superconducting Quantum Interference Device (SQUID) arrays, the superconducting microwave resonators, among other research programs during the last three decades. In addition, the second author has developed a plenty of experience in the discrete-time digital signal generators, using the digital modulation techniques such as the Pulse Amplitude Modulation (PAM), Quadrature Amplitude Modulation (QAM), Phase Shift Keying (BPSK, QPSK, MPSK), Frequency Shift Keying (FSK), Gaussian Minimum Shift Keying (GMSK), etc.

The second author has been greatly influenced by the Henry George's scientific ideas, articles and books in the economics since the beginning of 1990s. The second author has had the numerous opportunities to discuss a wide range of research problems in the economics during his frequent visits to the international conferences and his intensive research work at leading universities in Europe and North America during last four decades.

Let us repeat that this innovative research uses the knowledge on the analogue and digital signals processing in the physics and the electronics engineering, which is described in

our scientific book on the nonlinearities in the microwave superconductivity in Ledenyov D O, Ledenyov V O (2015a).

The final writing, editing and reading of our research article have been made by the authors during our travel to the Prof. Viktor Yakovlevich Bunyakovsky motherland in the Town of Bar in Vinnytsia Region in the State of Ukraine in the beginning of May, 2015 and August, 2015.

The additional research changes have been added by the authors during the visits to the City of Kharkiv in the State of Ukraine in June / July / September, 2015. The obtained research results have been extensively discussed with a number of prominent scientists at the VII International Economic Forum: Innovations, Investments, Kharkiv initiatives at Kharkiv Palace hotel in Kharkiv, Ukraine on September 4, 2015; and at the International Economic Conference: Tugan-Baranovsky's Scientific Heritage and Modern Economics Science at V.N. Karazin Kharkiv National University in Kharkiv, Ukraine on October 15-16, 2015.

The authors' vision is that the leading universities continue to educate the students to and make the research in the old meaningless theories in the classic economics science and the classic finance science, which can not explain the functional principles of the real national economies of scale and scope, because of the imposed scientific limitations. We think that the modern theories in the quantum economics science and the quantum finance science can only explain the functional principles of the real national economies of scale and scope meaningfully.

Let us make a final comment by saying that, in the time of the unlimited presence of and access to the information, knowledge and creative integrative thinking around the Globe, we do believe that the new innovative discoveries in the science and technology could be generated by the talented scientists and inventors at any place in our global increasingly multi-polar World at any time.

*E-mails: dimitri.ledenyov@my.jcu.edu.au,
 ledenyov@univer.kharkov.ua .

References:

Economics Science, Finance Science, Economic History Science:

1. Joseph Penso de la Vega 1668, 1996 *Confusión de Confusiones* re-published by *John Wiley and Sons Inc* USA.
2. Mortimer Th 1765 *Every man his own broker 4th edition* London UK.
3. Smith A 1776, 2008 *An inquiry into the nature and causes of the wealth of nations* *W Strahan and T Cadell* London UK, A Selected Edition edited by Kathryn Sutherland Oxford Paperbacks Oxford UK.
4. Marx K 1867 *Capital, Volume 1*.
5. Marx K July, 1893 *Capital, Volume 2: The process of circulation of capital* *Engels publisher*.
6. Marx K October, 1994 *Capital, Volume 3: The process of capitalist production as a whole* *Engels publisher*.
7. Menger C 1871 *Principles of Economics (Grundsätze der Volkswirtschaftslehre)* Ludwig von Mises Institute Auburn Alabama USA
<http://www.mises.org/etexts/menger/Mengerprinciples.pdf> .
8. Bagehot W 1873, 1897 *Lombard Street: A description of the money market* *Charles Scribner's Sons* New York USA.
9. George H 1879, 1881, 2009 *Progress and poverty: An inquiry into the cause of industrial depressions and of increase of want with increase of wealth; The remedy* *Kegan Paul* USA, *Cambridge University Press* UK ISBN 978-1-108-00361-2.
10. von Böhm-Bawerk E 1884, 1889, 1921 *Capital and interest: History and critique of interest theories, positive theory of capital, further essays on capital and interest* Austria; 1890 *Macmillan and Co* Smart W A (translator) London UK
http://files.libertyfund.org/files/284/0188_Bk.pdf .
11. Hirsch M 1896 *Economic principles: A manual of political economy* *The Russkin Press Pty Ltd* 123 Latrobe Street Melbourne Australia.
12. Bachelier L 1900 *Theorie de la speculation* *Annales de l'Ecole Normale Supérieure* Paris France vol 17 pp 21 – 86.
13. Schumpeter J A 1906 *Über die mathematische methode der theoretischen ökonomie* *ZfVSV* Austria.
14. Schumpeter J A 1933 *The common sense of econometrics* *Econometrica*.
15. Schumpeter J A 1911; 1939, 1961 *Theorie der wirtschaftlichen entwicklung; The theory of economic development: An inquiry into profits, capital, credit, interest and the business cycle* Redvers Opie (translator) *OUP* New York USA.

16. Schumpeter J A 1939 Business cycle *McGraw-Hill* New York USA.
17. Schumpeter J A 1947 The creative response in economic history *Journal of Economic History* vol 7 pp 149 – 159.
18. Slutsky E E 1910 Theory of marginal utility *M Sc Thesis* Vernadsky National Library Kiev Ukraine.
19. Slutsky E E 1915 Sulla teoria sel bilancio del consumatore *Giornale degli economisti e rivista di statistica* 51 no 1 pp 1 – 26 Italy.
20. Slutsky E E 1923 On calculation of state revenue from emission of paper money *Local Economy* 2 pp 39 – 62 Kiev Ukraine.
21. von Mises L 1912 The theory of money and credit *Ludwig von Mises Institute* Auburn Alabama USA
http://mises.org/books/Theory_Money_Credit/Contents.aspx .
22. Hayek F A 1931, 1935, 2008 Prices and production 1st edition Routledge and Sons London UK, 2nd edition Routledge and Kegan Paul London UK, 2008 edition Ludwig von Mises Institute Auburn Alabama USA.
23. Hayek F A 1948, 1980 Individualism and economic order London School of Economics and Political Science London UK, University of Chicago Press Chicago USA.
24. Keynes J M 1936 The general theory of employment, interest and money *Macmillan Cambridge University Press* Cambridge UK.
25. Keynes J M 1998 The collected writings of John Maynard Keynes *Cambridge University Press* Cambridge UK ISBN 978-0-521-30766-6.
26. Ellis H, Metzler L (editors) 1949 Readings in the theory of international trade *Blakiston* Philadelphia USA.
27. Friedman M (editor) 1953 Essays in positive economics *Chicago University Press* Chicago USA.
28. Friedman 1976 Nobel Prize in Economics Stockholm Sweden.
29. Baumol W 1957 Speculation, profitability, and stability *Review of Economics and Statistics* 39 pp 263 – 271.
30. Debreu G 1959 Theory of value *Cowles Foundation Monograph* vol 17 *John Wiley & Sons Inc* New York USA.
31. Minsky H P 1974 The modeling of financial instability: An introduction *Modeling and Simulation* Proceedings of the Fifth Annual Pittsburgh Conference 5.
32. Minsky H P May 1992 The financial instability hypothesis *Working Paper no 74*: 6–8
<http://www.levy.org/pubs/wp74.pdf> .

33. Minsky H P 2015 Minsky archive *The Levy Economics Institute of Bard College* Blithewood Bard College Annandale-on-Hudson New York USA
<http://www.bard.edu/library/archive/minsky/> .
 34. Stigler G J 1982 Nobel Prize in Economics Stockholm Sweden.
 35. Stigler G J 1988 Chicago studies in political economy *University of Chicago Press* Chicago USA ISBN 0-226-77437-6.
 36. Coase 1991 Nobel Prize in Economics Stockholm Sweden.
 37. Becker 1992 Nobel Prize in Economics Stockholm Sweden.
 38. Fogel 1993 Nobel Prize in Economics Stockholm Sweden.
 39. Lucas 1995 Nobel Prize in Economics Stockholm Sweden.
 40. Scornick-Gerstein F May, 1996 Private communications on land value taxation theory by Henry George *Royal Automobile Club* London UK.
 41. Scornick-Gerstein F 1999 The future of taxation: The failure of the poll tax in the UK ISBN: 9781902250007.
 42. Landes D 1998, 1998, 1999 The wealth and poverty of nations W W Norton & Company Inc; Little , Brown and Company; Abacus ISBN 0 34911166 9 pp 1 – 650.
 43. Krugman P, Wells R 2005 Economics *Worth Publishers* 1st edition ISBN-10: 1572591501 ISBN-13: 978-1572591509 pp 1 – 1200.
 44. Stiglitz J E 2005 Principles of macroeconomics *W W Norton* 4th edition ISBN-10: 0393926249 ISBN-13: 978-0393926248 pp 1 – 526.
 45. Stiglitz J E 2015 The great divide *Public Lecture on 19.05.2015* London School of Economics and Political Science London UK
http://media.rawvoice.com/lse_publiclecturesandevents/richmedia.lse.ac.uk/publiclecturesandevents/20150519_1830_greatDivide.mp4 .
 46. Fama 2013 Nobel Prize in Economics Stockholm Sweden.
 47. Hansen 2013 Nobel Prize in Economics Stockholm Sweden.
 48. Dodd N 2014 The social life of money *Princeton University Press* NJ USA ISBN: 9780691141428 pp 1 – 456.
- Juglar Economic Cycle in Macroeconomics:**
49. Juglar C 1862 Des crises commerciales et de leur retour périodique en France en Angleterre et aux États-Unis *Guillaumin* Paris France.
 50. Schumpeter J A 1939 Business cycle *McGraw-Hill* New York USA.

51. Grinin L E, Korotayev A V, Malkov S Y 2010 A mathematical model of Juglar cycles and the current global crisis in *History & Mathematics* Grinin L, Korotayev A, Tausch A (editors) URSS Moscow Russian Federation.

Kondratiev Economic Cycle in Macroeconomics:

52. Tugan-Baranovsky M 1894 Industrial crises in contemporary England: Their causes and influences on the life of the people *St Petersburg/Moscow* Russian Federation.

53. Kondratieff N D 1922 The world economy and its trends during and after war *Regional branch of state publishing house* Vologda Russian Federation.

54. Kondratiev N D 1923 Mikhail Tugan-Baranovsky *St Petersburg* Russian Federation pp 1 – 115.

55. Kondratieff N D 1925 The big cycles of conjuncture *The problems of conjuncture* **1** (1) pp 28 – 79.

56. Kondratieff N D 1926 Die langen wellen der konjunktur *Archiv fuer Sozialwissenschaft und Sozialpolitik* **56** (3) pp 573 – 609.

57. Kondratieff N D 1928 The big cycles of conjuncture *Institute of Economics RANION* Moscow Russian Federation.

58. Kondratieff N D, Stolper W F 1935 The long waves in economic life *Review of Economics and Statistics The MIT Press* **17** (6) pp 105 – 115 doi:10.2307/1928486 JSTOR 1928486.

59. Kondratieff N D 1984 The Long wave cycle *Richardson & Snyder* New York USA.

60. Kondratieff N D 2002 The big cycles of conjuncture and theory of forecast *Economics* Moscow Russian Federation.

61. Garvy G 1943 Kondratieff's theory of long cycles *Review of Economic Statistics* **25** (4) pp 203 – 220.

62. Silberling N J 1943 The dynamics of business: An analysis of trends, cycles, and time relationships in American economic activity since 1700 and their bearing upon governmental and business policy *McGraw-Hill* New York USA.

63. Kowal L 1973 The market and business cycle theories of M I Tugan-Baranovsky *Revista Internazionale di Scienze Economiche e Commercial* vol **20** part 4 Padova Italy.

64. Rostow W W 1975 Kondratieff, Schumpeter and Kuznets: Trend periods revisited *Journal of Economic History* **25** (4) pp 719 – 753.

65. Forrester J W 1978 Innovation and the economic long wave *MIT System Dynamics Group Working Paper* Massachusetts Institute of Technology Cambridge USA.

66. Forrester J W 1981 The Kondratieff cycle and changing economic conditions *MIT System Dynamics Group Working Paper* Massachusetts Institute of Technology Cambridge USA.

67. Forrester J W 1985 Economic conditions ahead: Understanding the Kondratieff wave *Futurist* **19** (3) pp 16 – 20.
68. Kuczynski Th 1978 Spectral analysis and cluster analysis as mathematical methods for the periodization of historical processes: Kondratieff cycles – Appearance or reality? *Proceedings of the Seventh International Economic History Congress* vol **2** International Economic History Congress Edinburgh UK pp 79–86.
69. Kuczynski Th 1982 Leads and lags in an escalation model of capitalist development: Kondratieff cycles reconsidered *Proceedings of the Eighth International Economic History Congress* vol **B3** International Economic History Congress Budapest Hungary pp 27.
70. Barr K 1979 Long waves: A selective annotated bibliography *Review* **2** (4) pp 675 – 718.
71. Van Duijn J J 1979 The long wave in economic life *De Economist* **125** (4) pp 544 – 576.
72. Van Duijn J J 1981 Fluctuations in innovations over time *Futures* **13**(4) pp 264 – 275.
73. Van Duijn J J 1983 The long wave in economic life *Allen and Unwin* Boston MA USA.
74. Eklund K 1980 Long waves in the development of capitalism? *Kyklos* **33** (3) pp 383 – 419.
75. Mandel E 1980 Long waves of capitalist development *Cambridge University Press* Cambridge UK.
76. Van der Zwan A 1980 On the assessment of the Kondratieff cycle and related issues in *Prospects of Economic Growth* Kuipers S K, Lanjouw G J (editors) North-Holland Oxford UK pp 183 – 222.
77. Tinbergen J 1981 Kondratiev cycles and so-called long waves: The early research *Futures* **13** (4) pp 258 – 263.
78. Van Ewijk C 1982 A spectral analysis of the Kondratieff cycle *Kyklos* **35** (3) pp 468 – 499.
79. Cleary M N, Hobbs G D 1983 The fifty year cycle: A look at the empirical evidence in *Long Waves in the World Economy* Freeman Chr (editor) *Butterworth* London UK pp 164 – 182.
80. Glismann H H, Rodemer H, Wolter W 1983 Long waves in economic development: Causes and empirical evidence in *Long Waves in the World Economy* Freeman Chr (editor) *Butterworth* London UK pp 135 – 163.
81. Bieshaar H, Kleinknecht A 1984 Kondratieff long waves in aggregate output? An econometric test *Konjunkturpolitik* **30** (5) pp 279 – 303.
82. Wallerstein I 1984 Economic cycles and socialist policies *Futures* **16** (6) pp 579 – 585.

83. Zarnowitz V 1985 Recent work on business cycles in historical perspective: Review of theories and evidence *Journal of Economic Literature* **23** (2) pp 523 – 580.
84. Summers L H 1986 Some skeptical observations on real business cycle theory *Federal Reserve Bank of Minneapolis Quarterly Review* **10** pp 23 – 27.
85. Freeman C 1987 Technical innovation, diffusion, and long cycles of economic development in *The long-wave debate* Vasko T (editor) *Springer* Berlin Germany pp 295–309.
86. Freeman C, Louçã F 2001 As time goes by: From the industrial revolutions to the information revolution *Oxford University Press* Oxford UK.
87. Goldstein J 1988 Long cycles: Prosperity and war in the modern age *Yale University Press* New Haven CT USA.
88. Solomou S 1989 Phases of economic growth, 1850–1973: Kondratieff waves and Kuznets swings *Cambridge University Press* Cambridge UK.
89. Berry B J L 1991 Long wave rhythms in economic development and political behavior *Johns Hopkins University Press* Baltimore MD USA.
90. Metz R 1992 Re-examination of long waves in aggregate production series *New Findings in Long Wave Research* Kleinknecht A, Mandel E, Wallerstein I (editors) *St. Martin's* New York USA pp 80 – 119.
91. Metz R 1998 Langfristige wachstumsschwankungen – Trends, zyklen, strukturbrüche oder zufall Kondratieffs *Zyklen der Wirtschaft. An der Schwelle neuer Vollbeschäftigung?* Thomas H, Nefiodow L A, Herford (editors) pp 283 – 307.
92. Metz R 2006 Empirical evidence and causation of Kondratieff cycles *Kondratieff Waves, Warfare and World Security* Devezas T C (editor) *IOS Press* Amsterdam The Netherlands pp 91 – 99.
93. Tylecote A 1992 The long wave in the world economy *Routledge* London UK.
94. Cooley Th (editor) 1995 Frontiers of business cycle research *Princeton University Press* USA ISBN 0-691-04323-X.
95. Modelski G, Thompson W R 1996 Leading sectors and world politics: The co-evolution of global politics and economics *University of South Carolina Press* Columbia SC USA.
96. Modelski G 2001 What causes K-waves? *Technological Forecasting and Social Change* **68** pp 75 – 80.
97. Modelski G 2006 Global political evolution, long cycles, and K-waves *Kondratieff Waves, Warfare and World Security* Devezas T C (editor) *IOS Press* Amsterdam The Netherlands pp 293 – 302.

98. Barnett V December 2001 Tugan-Baranovsky as a pioneer of trade cycle analysis *Journal of the History of Economic Thought* vol **23** no 4 pp 443 – 466.
99. Perez C 2002 Technological revolutions and financial capital – The dynamics of bubbles and golden ages *Edward Elgar* Cheltenham UK.
100. Rennstich J K 2002 The new economy, the leadership long cycle and the nineteenth K-wave *Review of International Political Economy* **9** pp 150 – 182.
101. Rummyantseva S Yu 2003 Long waves in economics: Multifactor analysis *St. Petersburg University Publishing House* St. Petersburg Russian Federation.
102. Diebolt C, Doliger C 2006 Economic cycles under test: A spectral analysis in *Kondratieff Waves, Warfare and World Security* Devezas T C (editor) *IOS Press* Amsterdam The Netherlands pp 39 – 47.
103. Linstone H A 2006 The information and molecular ages: Will K-waves persist? *Kondratieff Waves, Warfare and World Security* edited by Devezas T C *IOS Press* Amsterdam The Netherlands pp 260 – 269.
104. Thompson W 2007 The Kondratieff wave as global social process in *World System History, Encyclopedia of Life Support Systems* Modelski G (editor) *EOLSS Publishers* Oxford UK
<http://www.eolss.net>.
105. Papenhausen Ch 2008 Causal mechanisms of long waves *Futures* **40** pp 788 – 794.
106. Korotayev A V, Tsirel S V 2010 A spectral analysis of world GDP dynamics: Kondratieff waves, Kuznets swings, Juglar and Kitchin cycles in global economic development, and the 2008–2009 economic crisis *Structure and Dynamics* vol **4** issue 1 pp 1 – 55
<http://www.escholarship.org/uc/item/9jv108xp> .
107. Wikipedia 2015a Kondratieff *Wikipedia* USA
www.wikipedia.org.

Kitchin Economic Cycle in Macroeconomics:

108. Kitchin J 1923 Cycles and trends in economic factors *Review of Economics and Statistics* *The MIT Press* **5** (1) pp 10 – 16 doi:10.2307/1927031 JSTOR 1927031.

Kuznets Economic Cycle in Macroeconomics:

109. Kuznets S 1924 Economic system of Dr. Schumpeter *M. Sc. Thesis under Prof. Wesley Clair Mitchell* Columbia University NY USA.
110. Kuznets S 1930 Secular movements in production and prices *Ph. D. Thesis under Prof. Wesley Clair Mitchell* Columbia University NY USA.

- 111.** Kuznets S 1930 Secular movements in production and prices. Their nature and their bearing upon cyclical fluctuations *Houghton Mifflin* Boston USA.
- 112.** Kuznets S 1937 National income and capital formation, 1919 – 1935.
- 113.** Kuznets S 1941 National income and its composition, 1919 – 1938.
- 114.** Kuznets S March 1955 Economic growth and income inequality *American Economic Review* **45** pp 1 – 28.
- 115.** Kuznets S 1963 Quantitative aspects of the economic growth of nations, VIII: The distribution of income by size *Economic Development and Cultural Change* **11** pp 1 – 92.
- 116.** Kuznets S 1966 Modern economic growth: Rate, structure, and spread.
- 117.** Kuznets S 1968 Toward a theory of economic growth, with reflections on the economic growth of modern nations.
- 118.** Kuznets S 1971 Economic growth of nations: Total output and production structure.
- 119.** Kuznets S 1973a Population, capital and growth.
- 120.** Kuznets S 1973b Modern economic growth: Findings and reflections *American Economic Review* **63** pp 247 – 58.
- 121.** Abramovitz M 1961 The nature and significance of Kuznets cycles *Economic Development and Cultural Change* **9** (3) pp 225 – 248.
- 122.** Abramovitz M March 1986 Simon Kuznets (1901 – 1985) *The Journal of Economic History* vol **46** no 1 pp 241 – 246.
- 123.** Lundberg E 1971 Simon Kuznets contributions to economics *The Swedish Journal of Economics* **73** (4) pp 444 – 459 DOI:10.2307/3439225, JSTOR 3439225.
- 124.** Hozelitz B F January 1983 Bibliography of Simon Kuznets *Economic Development and Cultural Change* vol **31** no 2 pp 433 – 454.
- 125.** Ben-Porath Y April 1988 Simon Kuznets in person and in writing *Economic Development and Cultural Change* vol **36** no 3 pp 435 – 447.
- 126.** Street J H June 1988 The contribution of Simon S. Kuznets to institutionalist development theory *Journal Economic Issues* vol **22** no 2 pp 499 – 509.
- 127.** Kapuria-Foreman V, Perlman M November 1995 An economic historian's economist: Remembering Simon Kuznets *The Economic Journal* **105** pp 1524 – 1547.
- 128.** Fogel R W 2000 Simon S. Kuznets: April 30, 1901 – July 9, 1985 *NBER Working Paper no W7787* NBER USA.
- 129.** Fogel R W, Fogel E M, Guglielmo M, Grotte N 2013 Political arithmetic: Simon Kuznets and the empirical tradition in economics *University of Chicago Press* Chicago USA ISBN 0-226-25661-8.

- 130.** Syed M K, Mohammad M J 2004 Revisiting Kuznets hypothesis: An analysis with time series and panel data *Bangladesh Development Studies* **30** (3-4) pp 89 – 112.
- 131.** Diebolt C, Doliger C 2008 New international evidence on the cyclical behaviour of output: Kuznets swings reconsidered. Quality & quantity. *International Journal of Methodology* **42** (6) pp 719 – 737.
- 132.** Wikipedia 2015b Simon Kuznets Economist *Wikipedia* USA
www.wikipedia.org.

Accurate Characterization of Properties of Economic Cycles in Macroeconomics:

- 133.** George H 1881, 2009 Progress and poverty *Kegan Paul* USA; reissued by *Cambridge University Press* Cambridge UK ISBN 978-1-108-00361-2.
- 134.** Schumpeter J A 1939 Business cycle *McGraw-Hill* New York USA.
- 135.** Burns A F, Mitchell W C 1946 Measuring business cycles *National Bureau of Economic Research* New York USA.
- 136.** Dupriez L H 1947 Des mouvements économiques généraux vol **2** pt 3 *Institut de Recherches Economiques et Sociales de l'Université de Louvain* Belgium.
- 137.** Samuelson P A 1947 Foundations of economic analysis *Harvard University Press* Cambridge MA USA.
- 138.** Hicks J R 1950 A contribution to the theory of the trade cycle *Oxford University Press* Oxford UK.
- 139.** Goodwin R M 1951 The nonlinear accelerator and persistence of business cycles *Econometrica* **19** no 1 pp 1 – 17.
- 140.** Inada K, Uzawa H 1972 Economical development and fluctuations *Iwanami* Tokyo Japan.
- 141.** Bernanke B S 1979 Long-term commitments, dynamic optimization, and the business cycle *Ph. D. Thesis* Department of Economics Massachusetts Institute of Technology USA.
- 142.** Marchetti C 1980 Society as a learning system: Discovery, invention, and innovations cycles revisited *Technological Forecast and Social Change* **18** pp 257 – 282.
- 143.** Kleinknecht A 1981 Innovation, accumulation, and crisis: Waves in economic development? *Review* **4** (4) pp 683 – 711.
- 144.** Dickson D 1983 Technology and cycles of boom and bust *Science* **219** (4587) pp 933 – 936.
- 145.** Hodrick R J, Prescott E C 1997 Postwar U.S. business cycles: An empirical investigation *Journal of Money, Credit, and Banking* vol **29** no 1 pp 1 – 16.

- 146.** Anderson H M, Ramsey J B 1999 *Economic Research Reports PR # 99-01* New York University NY USA.
- 147.** Baxter M, King R G 1999 Measuring business cycles: Approximate band-pass filters for economic time series *Review of Economics and Statistics* **81** (4) pp 575 – 593.
- 148.** Kim Ch-J, Nelson Ch 1999 Has the U.S. economy become more stable? A Bayesian approach based on a Markov-switching model of the business cycle *Review of Economics and Statistics*.
- 149.** McConnell M, Pérez-Quirós G 2000 Output fluctuations in the United States: What has changed since the early 1980s? *American Economic Review*.
- 150.** Devezas T C, Corredine J T 2001 The biological determinants of long-wave behavior in socioeconomic growth and development *Technological Forecasting & Social Change* **68** pp 1 – 57.
- 151.** Devezas T C, Corredine J T 2002 The nonlinear dynamics of technoeconomic systems. An informational interpretation *Technological Forecasting & Social Change* **69** pp 317 – 357.
- 152.** Devezas T C (editor) 2006 *Kondratieff Waves, Warfare and World Security* IOS Press Amsterdam The Netherlands.
- 153.** Arnord L 2002 Business cycle theory *Oxford University Press* Oxford UK 2002.
- 154.** Stock J, Watson M 2002 Has the business cycle changed and why? *NBER Macroeconomics Annual* NBER USA.
- 155.** Helfat C E, Peteraf M A 2003 The dynamic resource-based view: Capability life cycles *Strategic Management Journal* **24** (10) pp 997 – 1010.
- 156.** Selover D D, Jensen R V, Kroll J 2003 *Studies in Nonlinear Dynamics & Econometrics* **7** p 1.
- 157.** Sussmuth B 2003 Business cycles in the contemporary World *Springer* Berlin Heidelberg Germany.
- 158.** Hirooka M 2006 Innovation dynamism and economic growth: A nonlinear perspective *Edward Elgar* Cheltenham UK Northampton MA USA.
- 159.** Kleinknecht A, Van der Panne G 2006 Who was right? Kuznets in 1930 or Schumpeter in 1939? in *Kondratieff Waves, Warfare and World Security* Devezas T C (editor) *IOS Press* Amsterdam The Netherlands pp 118 – 127.
- 160.** Iyetomi H, Aoyama H, Ikeda Y, Souma W, Fujiwara Y 2008 *Econophysics* *Kyoritsu Shuppan* Tokyo Japan.

- 161.** Iyetomi H, Nakayama Y, Yoshikawa H, Aoyama H, Fujiwara Y, Ikeda Y, Souma W 2011 What causes business cycles? Analysis of the Japanese industrial production data *Journal of the Japanese and International Economies* **25** (3) pp 246 – 272.
- 162.** Iyetomi H, Aoyama H, Fujiwara Y, Sato A-H (editors) 2012 Econophysics 2011 - The Hitchhiker's guide to the economy *Proceedings of the YITP Workshop on Econophysics Japan Progress of Theoretical Physics Supplement* no 194.
- 163.** Jourdon Ph 2008 La monnaie unique Europeenne et son lien au developpement economique et social coordonne: une analyse cliometrique *Thèse Universite Montpellier* France.
- 164.** Taniguchi M, Bando M, Nakayama A 2008 Business cycle and conserved quantity in economics *Journal of the Physical Society of Japan* vol **77** no 11.
- 165.** Drehmann M, Borio C, Tsatsaronis K 2011 Anchoring countercyclical capital buffers: The role of credit aggregates *International Journal of Central Banking* vol **7** no 4 pp 189 – 240.
- 166.** Ikeda Y, Aoyama H, Fujiwara Y, Iyetomi H, Ogimoto K, Souma W, Yoshikawa H 2012 Coupled oscillator model of the business cycle with fluctuating goods markets *Proceedings of the YITP Workshop on Econophysics Japan Progress of Theoretical Physics Supplement* no 194 pp 111 – 121.
arXiv:1110.6679v1 .
- 167.** Ikeda Y, Aoyama H, Yoshikawa H 2013a Synchronization and the coupled oscillator model in international business cycles *RIETI Discussion Paper October 13-E-089* The Research Institute of Economy, Trade and Industry Japan
<http://www.rieti.go.jp/en/> .
- 168.** Ikeda Y, Aoyama H, Yoshikawa H 2013b Direct evidence for synchronization in international business cycles *Financial Networks and Systemic Risk*.
- 169.** Ikeda Y 2013 Direct evidence for synchronization in Japanese business cycles *Evolutionary and Institutional Economic Review* **10** (2) pp 1 – 13
arXiv:1305.2263v1 .
- 170.** Swiss National Bank 2012 Swiss National Bank financial stability report 2012
http://www.snb.ch/en/mmr/reference/stabrep_2012/source/stabrep_2012.en.pdf .
- 171.** Swiss National Bank 2013 Countercyclical capital buffer: Proposal of the Swiss National Bank and decision of the Federal Council
http://www.snb.ch/en/mmr/reference/pre_20130213/source/pre_20130213.en.pdf .

172. Uechi L, Akutsu T 2012 Conservation laws and symmetries in competitive systems
Progress of Theoretical Physics Supplement no 194 pp 210 – 222.
173. Central Banking Newsdesk 2013 Swiss board member supports counter-cyclical capital buffer
<http://www.centralbanking.com/central-banking/speech/2203857/swiss-board-member-supportscountercyclical-capital-buffer> .
174. Union Bank of Switzerland 2013 UBS outlook Switzerland
http://www.ubs.com/global/en/wealth_management/wealth_management_research/ubs_outlook_ch.html .
175. Da Costa 2015 Weak first-quarter growth due to seasonal issues after all, SF Fed says
The Wall Street Journal New York USA.
176. Federal Reserve Bank of St Louis 2015 US Federal Reserve Economic Data (FRED)
Federal Reserve Bank of St Louis
<http://research.stlouisfed.org/fred>
177. Desai M, King St, Goodhart Ch 2015 Hubris: why economists failed to predict the crisis and how to avoid the next one *Public Lecture on 27.05.2015* London School of Economics and Political Science London UK
http://media.rawvoice.com/lse_publiclecturesandevents/richmedia.lse.ac.uk/publiclecturesandevents/20150527_1830_hubris.mp4 .
178. Desai M 2015 Do we need a new macroeconomics? *Public Lecture on 09.07.2015* London School of Economics and Political Science London UK (the presentation was made after the publication of an initial version of our research article at the MPRA and SSRN)
http://media.rawvoice.com/lse_publiclecturesandevents/richmedia.lse.ac.uk/publiclecturesandevents/20150709_1830_needNewMacroeconomics.mp3 .
179. Wall Street Journal 2015a Economic forecasting survey US GDP (quarterly) for 5 years (28.06.2015) Wall Street Journal New York USA
<http://projects.wsj.com/econforecast/#ind=gdp&r=20>
180. Wall Street Journal 2015b Economic forecasting survey US GDP (quarterly) for 7 years (28.06.2015) Wall Street Journal New York USA
<http://projects.wsj.com/econforecast/#ind=gdp&r=28>
181. Wikipedia (English) 2015c Business cycle *Wikipedia* California USA
www.wikipedia.org .

Ultra High Frequency Electronic Trading, Foreign Currencies Exchange Rates, Foreign Currencies Exchange Markets Sciences:

- 182.** Ellis H, Metzler L (editors) 1949 Readings in the theory of international trade *Blakiston Philadelphia USA*.
- 183.** Machlup F 1949 The theory of foreign exchanges *in* Readings in the theory of international trade Ellis H, Metzler L (editors) *Blakiston Philadelphia USA*.
- 184.** Robinson J 1949 The foreign exchanges *in* Readings in the theory of international trade Ellis H, Metzler L (editors) *Blakiston Philadelphia USA*.
- 185.** Friedman M 1953 The case for flexible exchange rates *in* Essay in positive economics *University of Chicago Press Chicago USA*.
- 186.** Friedman M (editor) 1953 Essays in positive economics *Chicago University Press Chicago USA*.
- 187.** Baumol W 1957 Speculation, profitability, and stability *Review of Economics and Statistics* **39** pp 263 – 271.
- 188.** Debreu G 1959 Theory of value *Cowles Foundation Monograph vol 17 John Wiley & Sons Inc New York USA*.
- 189.** Shiryaev A N 1961 The problem of the most rapid detection of a disturbance in a stationary process *Soviet Mathematical Doklady* **2** pp 795 – 799.
- 190.** Shiryaev A N 1998a Foundations of stochastic financial mathematics vol **1** *Fazis Scientific and Publishing House Moscow Russian Federation ISBN 5-7036-0044-8* pp 1 – 492.
- 191.** Shiryaev A N 1998b Foundations of stochastic financial mathematics vol **2** *Fazis Scientific and Publishing House Moscow Russian Federation ISBN 5-7036-0044-8* pp 493 – 1017.
- 192.** Shiryaev A N 1999 Essentials of stochastic finance: Facts, models, theory *Advanced Series on Statistical Science & Applied Probability vol 3 World Scientific Publishing Co Pte Ltd Kruzhilin N (translator) ISBN 981-02-3605-0 Singapore* pp 1 – 834.
- 193.** Shiryaev A N, Grossinho M R, Oliveira P E, Esquível M L (editors) 2006 Stochastic finance *Springer Germany ISBN-10:0-387-28262-9* pp 1 – 364.
- 194.** Kabanov Yu, Lipster R, Stoyanov J 2006 The Shiryaev festschrift: From stochastic calculus to mathematical finance *Springer Germany* pp 1 – 668.
- 195.** Fama E F 1965 The behavior of stock market prices *Journal of Business* **38** pp 34 – 105.
- 196.** Fama E F, Blume M 1966 Filter rules and stock market trading profits *Journal of Business* **39** pp 226 – 241.
- 197.** Fama E F 1970 Efficient capital markets: A review of theory and empirical work *Journal of Finance* **25** (2) pp 383 – 417.

198. Fama E 1984 Forward and spot exchange rates *Journal of Monetary Economics* **14** pp 319 – 338.
199. Fama E, French K 1988 Permanent and temporary components of stock prices *Journal of Political Economy* **96** pp 246 – 273.
200. Fama E F, French K R 1996 Multifactor explanations of asset pricing anomalies *Journal of Finance* **51** (1) pp 55 – 84.
201. Fama E F 1998 Market efficiency, long-term returns, and behavioral finance *Journal of Financial Economics* **49** pp 283 – 306.
202. Fama E, Hansen L P, Shiller R 2013 Lectures: 2013 Nobel prize in economic sciences <http://www.youtube.com/watch?v=WzxZGvrpFu4> , www.nobelprize.org .
203. Demsetz H 1968 The cost of transacting *Quarterly Journal of Economics* **82** pp 33 – 53.
204. Radner R 1968 Competitive equilibrium under uncertainty *Econometrica* **36** pp 31 – 58.
205. Bates J M, Granger C W J 1969 The combination of forecasts *Operations Research Quarterly* **20** pp 451 – 468.
206. Akerlof G A 1970 The market for lemons: Qualitative uncertainty and the market mechanism *Quarterly Journal of Economics* **84** (3) pp 488 – 500.
207. Akerlof G A (29 August) 2014 Writing the "The Market for 'Lemons'": A Personal Interpretive Essay". Nobelprize.org. Nobel Media AB 2014. Web. 29 Aug 2014. http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2001/akerlof-article.html?utm_source=facebook&utm_medium=social&utm_campaign=facebook_page
208. Arrow K 1970 Essays in the theory of risk bearing *Markham* Chicago USA.
209. Black F 1971 Toward a fully automated exchange *Financial Analysts Journal* **27** pp 29 – 35 and pp 86 – 87.
210. Black F, Scholes M 1973 The pricing of options and corporate liability *Journal of Political Economics* **81** pp 637 – 654.
211. Black F 1986 Noise *Journal of Finance* **41** (3) pp 529 – 543.
212. Merton R C 1973 Theory of rational option pricing *Bell Journal of Economics and Management Science* **4** pp 141 – 183.
213. Newbold P, Granger C W J 1974 Experience with forecasting univariate time series and the combination of forecasts *Journal of the Royal Statistical Society* **137** pp 131 – 165.
214. Fleming J M 1975 Floating exchange rates, asymmetrical intervention and the management of international liquidity *IMF* Washington USA <http://www.imf.org> .
215. Shapiro A C 1975 Exchange rate changes, inflation, and the value of the multinational corporation

216. Dooley M P, Shafer J R 1976 Analysis of short-run exchange rate behaviour: March 1973 to September 1975 *Federal Reserve Board International Finance Discussion Paper no 123* Federal Reserve Board USA.
217. Dornbusch R 1976 Expectations and exchange rate dynamics *Journal of Political Economy* **84** (6) pp 1161 – 1176.
218. Dornbusch R 1987 Exchange rates and prices *American Economic Review* **77** (1) pp 93 – 106.
219. Frankel J A 1976 A monetary approach to the exchange rate: Doctrinal aspects and empirical evidence *Scandinavian Journal of Economics* **78** pp 200 – 224.
220. Frankel J A 1979 On the mark: A theory of floating exchange rates based on real interest differentials *American Economic Review* **69** pp 610 – 622.
221. Frankel J A 1982a In search of the exchange risk premium: A six currency test assuming mean-variance optimization *Journal of International Money and Finance* **1** pp 255 – 274.
222. Frankel J A 1982b A test of perfect substitutability in the foreign exchange market *Southern Economic Journal* **49** pp 406 – 416.
223. Frankel J A (editor) 1983 Exchange rate and international macroeconomics *University of Chicago Press* Chicago USA.
224. Frankel J A, Froot K 1987 Using survey data to test standard propositions regarding exchange rate expectations *American Economic Review* **77** (1) pp 133 – 153.
225. Frankel J A, Froot K 1990a Chartists, fundamentalists, and trading in the foreign exchange market *American Economic Review* **80** pp 181 – 185.
226. Frankel J A, Froot K 1990b Chartists, fundamentalists, and the demand for dollars in Private behavior and government policy in interdependent economies Courakis A, Taylor M P *Clarendon* Oxford UK.
227. Frankel J A, Froot K 1990c Exchange rate forecasting techniques, survey data, and implications for the foreign exchange market *Working Paper no 3470* National Bureau of Economic Research Cambridge Massachusetts USA.
228. Frankel J A, Goldstein M, Mason P 1991 Characteristics of a successful exchange rate system *IMF* Washington USA <http://www.imf.org> .
229. Frankel J A 1992 In search of the exchange rate premium: A six-currency test assuming mean-variance optimization *Journal of International Money and Finance* **1**.
230. Frankel J A (editor) 1993 On exchange rates *MIT Press* Cambridge MA USA.
231. Frankel J A, Rose A K 1994 A survey of empirical research on nominal exchange rates *NBER Working Paper no 4865* NBER USA.

232. Frankel J A, Rose A 1995 Empirical research on nominal exchange rates *in Handbook of international economics* Grossman G, Rogoff K (editors) *Elsevier Science* vol **3** pp 1689 – 1729.
233. Frankel J A, Galli G, Giovannini A (editors) 1996 Introduction *in The microstructure of foreign exchange markets* *University of Chicago Press* Chicago USA ISBN: 0-226-26000-3 pp 1 – 15
<http://www.nber.org/books/fran96-1> ,
<http://www.nber.org/chapters/c11360> .
234. Frankel J A, Galli G, Giovannini A (editors) 1996 The microstructure of foreign exchange markets *University of Chicago Press* Chicago USA.
235. Frankel J A, Poonawala J 2004 The forward market in emerging currencies: Less biased than in major currencies *Working Paper* Harvard University USA.
236. Garman M 1976 Market microstructure *Journal of Financial Economics* **3** pp 257 – 275.
237. Grossman S 1976 On the efficiency of competitive stock markets when agents have diverse information *Journal of Finance* **31** pp 573 – 585.
238. Grossman S, Stiglitz J 1980 On the impossibility of informationally efficient markets *American Economic Review* **70** pp 393 – 408.
239. Grossman S, Miller M 1988 Liquidity and market structure *Journal of Finance* **43** pp 617 – 633.
240. Kouri P J K 1976 The exchange rate and the balance of payments in the short run and in the long run: A monetary approach *The Scandinavian Journal of Economics* **78** (2) pp 280 – 304.
241. McKinnon R 1976 Floating exchange rates, 1973-74: The emperor's new clothes *Carnegie-Rochester Conference Series on Public Policy* **3** pp 79 – 114.
242. Mussa M 1976 The exchange rate, the balance of payments, and monetary and fiscal policy under a regime of controlled floating *Scandinavian Journal of Economics* **78** pp 229 – 248.
243. Mussa M 1979 Empirical regularities in the behaviour of exchange rates and theories of the foreign exchange market *in* Brunner K, Meltzer A H (editors) *Policies for employment, prices and exchange rates* *Carnegie-Rochester Conference Series on Public Policy II* *North-Holland Publishing Company Elsevier* Amsterdam The Netherlands pp 9 – 57.
244. Mussa M 1981 The role of official intervention *Group of Thirty* New York NY USA.
245. Mussa M 1984 The theory of exchange rate determination *in* Exchange rates in theory and practice Bilson J, Marston R (editors) *University of Chicago Press* Chicago USA.

246. Williamson J 1976 Exchange rate flexibility and reserve use *Scandinavian Journal of Economics* **78** (2) pp 327 – 339.
247. Branson W 1977 Asset markets and relative prices in exchange rate determination *Sozialwissenschaftliche Annalen* **1** pp 69 – 89.
248. Branson W, Halttunen H, Masson P 1977 Exchange rates in the short run: The Deutschemark rate *European Economic Review* **10** pp 303 – 324.
249. Branson W, Henderson D 1985 The specification and influence of asset markets in Handbook of international economics vol **2** Jones R, Kenen P (editors) *North-Holland Publishing Company* Amsterdam The Netherlands.
250. Clark, Logue, Sweeney (editors) 1977 The effects of exchange rate adjustment *Department of the Treasury* Washington DC USA.
251. Girton L, Henderson D 1977 Central bank operations in foreign and domestic assets under fixed and flexible exchange rates in The effects of exchange rate adjustment Clark P, Logue D, Sweeney R (editors) *Department of the Treasury* Washington DC pp 151 – 179.
252. Cornell W B, Dietrich J K 1978 The efficiency of the market for foreign exchange under floating exchange rates *Review of Economics and Statistics* **60** (1) pp 111 – 120.
253. Cornell W B 1982 Money supply announcements, interest rates, and foreign exchange *Journal of International Money and Finance* **1** pp 201 – 208.
254. Stoll H R 1978 The supply of dealer services in securities markets *Journal of Finance* **33** pp 1133 – 1151.
255. Stoll H R 1985 The stock exchange specialist system: An economic analysis *Monograph Series in Finance and Economics: Monograph 1985-2* New York University NY USA.
256. Stoll H 1989 Inferring the components of the bid-ask spread: Theory and empirical tests *Journal of Finance* **44** pp 115 – 134.
257. Stoll H R 1995 The importance of equity trading costs: Evidence from securities firms' revenues in Global equity markets: Technological, competitive, and regulatory challenges Schwartz R (editor) *Irwin* Homewood Illinois USA pp 98 – 120.
258. Huang R, Stoll H 1996 Dealer versus auction markets: A paired comparison of execution costs on NASDAQ and the NYSE *Journal of Financial Economics* **41** pp 313 – 357.
259. Huang R, Stoll H 1997 The components of the bid-ask spread: A general approach *Review of Financial Studies* **10** pp 995 – 1034.
260. Stoll H R 1998 Reconsidering the affirmative obligation of market-makers *Financial Analysts Journal* **54** (5) pp 72 – 82.

261. Stoll H R, Schenzler Ch 2005 Trades outside the quotes: Reporting delay, trading option, or trade size? *Journal of Financial Economics*.
262. Stoll H R 2006 Electronic trading in stock markets *Journal of Economic Perspectives* **20** (1) pp 153 – 174.
263. Blanchard O 1979 Speculative bubbles, crashes, and rational expectations *Economics Letters* **14** pp 387 – 389.
264. Brunner K, Meltzer A H (editors) 1979 Policies for employment, prices and exchange rates *Carnegie-Rochester Conference Series on Public Policy* **11** North-Holland Publishing Company Elsevier Amsterdam The Netherlands.
265. Deardorff A 1979 One way arbitrage and its implications for the foreign exchange markets *Journal of Political Economy* **87** pp 351 - 364.
266. Goodman S 1979 Foreign exchange rate forecasting techniques: Implications for business and policy *The Journal of Finance* **34** pp 415 – 424.
267. Aliber R (October) 1980 The integration of the offshore and domestic banking system *Journal of Monetary Economics* vol **6** issue 4 pp 509 – 526.
268. Aliber R 2002 The new international money game 6th edition *University of Chicago Press* Chicago USA.
269. Allen P, Kenen P 1980 Asset markets, exchange rates, and economic integration *Cambridge University Press* New York USA.
270. Amihud Y, Mendelson H 1980 Dealership markets: Market making with inventory *Journal of Financial Economics* **8** pp 31 – 53.
271. Amihud Y, Ho T, Schwartz R (editors) 1985 Market making and the changing structure of the securities industry *Lexington* Massachusetts USA.
272. Amihud Y 1994a Evidence on exchange rates and valuation of equity shares in Exchange rates and corporate finance Amihud Y, Levich R M (editors) *Business One Irwin* Homewood IL USA.
273. Amihud Y 1994b Exchange rates and the valuation of equity shares in Exchange rates and corporate performance Amihud Y, Levich R M (editors) *Irwin* New York USA pp 49 – 59.
274. Amihud Y, Levich R M (editors) 1994 Exchange rates and corporate finance *Business One Irwin* Homewood IL USA.
275. Hansen L P, Hodrick R J 1980 Forward exchange rates as optimal predictors of future spot rates: An econometric analysis *Journal of Political Economy* **88** (5) pp 829 – 853.

276. Hellwig M 1980 On the aggregation of information in complete markets *Journal of Economic Theory* 26 pp 279 – 312.
277. Hellwig M 1982 Rational expectations equilibrium with conditioning on past prices: A mean-variance example *Journal of Economic Theory* 26 pp 279 – 312.
278. Krugman P 1980 Vehicle currencies and the structure of international exchange *Journal of Money, Credit, and Banking* 12 pp 503 – 526.
279. Krugman P 1984 The international role of the dollar: Theory and prospect in Exchange rate theory and practice Bilson J, Marston R (editors) *University of Chicago Press* Chicago USA pp 261 – 278.
280. Krugman P 1991 Target zones and exchange rate dynamics *Quarterly Journal of Economics* 106 (3) pp 669 – 682.
281. Krugman P, Miller M 1993 Why have a target zone? *Carnegie-Rochester Conference Series on Public Policy* 38 pp 279 – 314.
282. Krugman P 1999 The return of depression economics *W W Norton & Company* New York USA.
283. Callier P 1981 One way arbitrage, foreign exchange and securities markets: A note *Journal of Finance* 36 pp 1177 – 1186.
284. Cohen K, Maier S, Schwartz R, Whitcomb D 1981 Transaction costs, order placement strategy , and existence of the bid - ask spread *Journal of Political Economy* 89 (2) pp 287 – 305.
285. Cox J C, Ingersoll Jr J E, Ross S A 1981 The relation between forward and futures prices *Journal of Financial Economics* 9 pp 321 – 346.
286. Diamond D, Verrecchia R 1981 Information aggregation in a noisy rational expectations economy *Journal of Financial Economics* 9 pp 221 – 235.
287. Diamond D 1982 Aggregate demand management in search equilibrium *Journal of Political Economy* 90 pp 881 – 894.
288. Fieleke N (February) 1981 Foreign-currency positioning by US firms: Some new evidence *Review of Economics and Statistics* 63 no 1 pp 35 – 43.
289. Ho Th, Stoll H 1981 Optimal dealer pricing under transaction and return uncertainty *Journal of Financial Economics* 9 (1) pp 47 – 73.
290. Ho Th, Stoll H 1983 The dynamics of dealer markets under competition *Journal of Finance* 38 pp 1053 – 1074.
291. Loosignian A M 1981 Foreign exchange futures *Dow Jones - Irwin* Homewood IL USA.
292. Mussa M 1981 The role of official intervention *Group of Thirty* New York NY USA.

293. Stigum M 1981 Money market calculations: Yields, break - evens, and arbitrage *Dow Jones - Irwin* Homewood IL USA.
294. Stigum M 1990 The money market *Dow Jones - Irwin* Homewood IL USA.
295. Dooley M, Isard P 1982 A portfolio balance rational expectations model of the Dollar-Mark exchange rate *Journal of International Economics* **12** pp 257 – 276.
296. Hansen L 1982 Large sample properties of generalized method of moments estimators *Econometrica* **50** pp 1029 – 1054.
297. Hodder J E 1982 Exposure to foreign exchange-rate movements *Journal of International Economics* **13** (11) pp 375 – 386.
298. Milgrom P, Stokey N 1982 Information, trade and common knowledge *Journal of Economic Theory* **26** pp 17 – 27.
299. Taylor D 1982 Official intervention in the foreign exchange market, or, bet against the central bank *Journal of Political Economy* **90** (2) pp 356 – 368.
300. Bigman D, Taya T (editors) 1983 Exchange rate and trade instability *Ballinger* Cambridge Massachusetts USA.
301. Copeland T E, Galai D 1983 Information effects on the bid-ask spread *The Journal of Finance* **38** pp 1457 – 1469.
302. Dooley M P, Shafer J R 1983 Analysis of short-run exchange rate behaviour: March 1973 to November 1981 in Exchange rate and trade instability Bigman D, Taya T (editors) *Ballinger* Cambridge Massachusetts USA pp 43 - 69.
303. Edwards S 1983 The demand for international reserves and exchange rate adjustments: The case of LDCs, 1964–1972 *Economica* **50** pp 269 – 280.
304. French K R 1983 A comparison of futures and forward prices *Journal of Financial Economics* **12** pp 311 – 342.
305. Garman M B, Kohlhagen S W 1983 Foreign currency option values *Journal of International Money and Finance* **2** pp 231 – 237.
306. Meese R A, Rogoff K 1983a Empirical exchange rate models of the seventies: Do they fit out of sample? *Journal of International Economics* **14** pp 3 – 24.
307. Meese R A, Rogoff K 1983b The out-of-sample failure of empirical exchange rate models in Exchange rate and international macroeconomics Frankel J (editor) *University of Chicago Press* Chicago USA.
308. Rogoff K 1984 On the effects of sterilized intervention: An analysis of weekly data *Journal of Monetary Economics* **14** pp 133 – 150.

309. Rogoff K 1985 Can exchange rate predictability be achieved without monetary convergence? Evidence from the EMS *European Economic Review* **28** pp 93 – 115.
310. Meese R A 1986 Testing for bubbles in exchange markets *Journal of Political Economy* **94** pp 345 – 373.
311. Meese R A, Rogoff K 1988 Was it real? The exchange rate-interest differential relation of the modern floating-rate period *Journal of Finance* **43** pp 933 - 948.
312. Meese R A 1990 Currency fluctuations in the post-Bretton Woods era *Journal of Economic Perspectives* **4** pp 117 – 134.
313. Obstfeld M, Rogoff K 1995 Exchange rate dynamics redux *Journal of Political Economy* **103** pp 624 – 660.
314. Rogoff K 1996 The purchasing power parity puzzle *Journal of Economic Literature* **34** pp 647 – 668.
315. Obstfeld M, Rogoff K (August) 1998 Risk and exchange rates *NBER Working Paper 6694 NBER USA* in Helpman E, Sadka E (editors) *Contemporary economic policy: Essays in honor of Assaf Razin Cambridge University Press Cambridge U.K.*
316. Robinson P 1983 Nonparametric estimators for time series *Journal of Time Series Analysis* **4** pp 185 – 207.
317. Adler M, Dumas B 1984 Exposure to currency risk: Definition and measurement *Financial Management* **13** pp 41 – 50.
318. Backus D 1984 Empirical models of the exchange rate: Separating the wheat from the chaff *Canadian Journal of Economics* **17** pp 826 – 846.
319. Bilson J, Marston R (editors) 1984 Exchange rate theory and practice *University of Chicago Press Chicago USA.*
320. Booth L D 1984 Bid-ask spreads in the market for forward exchange *Journal of International Money and Finance* **3** (2) pp 209 – 222.
321. Engel Ch M, Frankel J A 1984a Why interest rates react to money announcements: An answer from the foreign exchange market *Journal of Monetary Economics* **13** pp 31 – 39.
322. Engel Ch M, Frankel J A 1984b Do asset demand functions optimize over the mean and variance of the real returns? A six-currency test *Journal of International Economics* **17**.
323. Engel Ch M, Hamilton J D 1990 Long swings in the dollar: Are they in the data and do markets know it? *American Economic Review* **80** pp 689 – 713.
324. Engel Ch M 1992 Can the Markov switching model forecast exchange rates? *NBER Working Paper no 4210 NBER USA.*

325. Engel Ch M 1995 The forward discount anomaly and the risk premium: A survey of recent evidence *Technical Report 5312* National Bureau of Economic Research USA.
326. Engel Ch M 1996 The forward discount anomaly and the risk premium: A survey of recent evidence *Journal of Empirical Finance* **3** (2) pp 123 – 191.
327. Engel Ch M 1999 On the foreign exchange risk premium in sticky-price general equilibrium models *in* International finance and financial crises: Essays in honor of Robert P. Flood Isard P, Razin A, Rose A (editors) *IMF and Kluwer* The Netherlands.
328. Devereux M, Engel Ch M 1999 The optimal choice of exchange-rate regime: Price setting rules and internationalized production *NBER Working Paper 6992* NBER USA.
329. Devereux M B, Engel Ch M 2002 Exchange rate pass-through, exchange rate volatility, and exchange rate disconnect *Journal of Monetary Economics* **49** pp 913 – 940.
330. Devereux M B, Shi S 2005 Vehicle currency *Working Paper* University of British Columbia Vancouver Canada
<http://www.econ.ubc.ca/devereux/vc2.pdf> .
331. Engel Ch M, West K (May) 2004a Accounting for exchange rate variability in present value models when the discount factor is near one *American Economic Review* **94** pp 118 – 125.
332. Engel Ch M, West K (August) 2004b, 2005 Exchange rates and fundamentals *Working Paper 10723* NBER USA, *Journal of Political Economy* **113** pp 485 – 517.
333. Engel Ch M, West K D 2006 Taylor rules and the Deutschmark - Dollar real exchange rate *Journal of Money, Credit, and Banking* **38** (5) pp 1175 – 1194.
334. Engel Ch M, Mark N, West K D 2007 Exchange rate models are not as bad as you think *NBER Working Paper* NBER USA.
335. Garner C K, Shapiro A C 1984 A practical method of assessing foreign exchange risk *Midland Corporate Finance Journal* pp 6 – 17.
336. Loopesko B 1984 Relationships among exchange rates, intervention, and interest rates: An empirical investigation *Journal of International Money and Finance* **3** pp 257 – 277.
337. Roll R 1984 A simple implicit measure of the effective bid - ask spread in an efficient market *The Journal of Finance* **39** pp 1127 – 1139.
338. French K, Roll R 1986 Stock return variances: The arrival of information and the reaction of traders *Journal of Financial Economics* **17** pp 5 – 26.
339. Roll R 1988 R^2 *Journal of Finance* **43** pp 541 – 566.
340. Urich T, Watchel P 1984 The effects of inflation and money supply announcements on interest rates *Journal of Finance* **39** pp 1177 – 1188.

341. White H, Domowitz I 1984 Nonlinear regression with dependent observations *Econometrica* **52** (1) pp 143 – 161.
342. Bahmani-Oskooee M, Das S 1985 Transaction costs and the interest parity theorem *Journal of Political Economy* **93** pp 793 – 799.
343. Cohen K, Conroy R, Maier S 1985 Order flow and the quality of the market in Market making and the changing structure of the securities industry Amihud Y, Ho T, Schwartz R (editors) *Lexington Massachusetts USA*.
344. Glosten L R, Milgrom P (March) 1985 Bid, ask, and transaction prices in a specialist market with heterogeneously informed agents *Journal of Financial Economics* **14** pp 71 – 100.
345. Glosten L R, Harris L 1988 Estimating the components of the bid - ask spread *Journal of Financial Economics* **21** pp 123 – 142.
346. Glosten L R 1989 Insider trading, liquidity, and the role of the monopolist specialist *Journal of Business* **62** (2) pp 211 – 235.
347. Glosten L R 1994 Is the electronic open limit order book inevitable? *Journal of Finance* **49** pp 1127 – 1162.
348. Hakkio C, Pearce D 1985 The reaction of exchange rates to economic news *Economic Inquiry* **23** pp 621 – 635.
349. Hardouvelis G A 1985 Exchange rates, interest rates, and money-stock announcements: A Theoretical exposition *Journal of International Money and Finance* **4** pp 443 – 454.
350. Jones R, Kenen P (editors) 1985 Handbook of international economics *North-Holland Publishing Company Amsterdam The Netherlands*.
351. Kearney C, Macdonald R 1985 Intervention and sterilization under floating exchange rates: The UK 1973-1983 *European Economic Review* **30**.
352. Kyle A 1985 Continuous auctions and insider trading *Econometrica* **53** pp 1315 – 1335.
353. Kyle A 1989 Informed speculation with imperfect competition *Review of Economic Studies* **56** pp 317 – 356.
354. Kyle A, Xiong W 2001 Contagion as a wealth effect *Typescript Duke University North Carolina USA*.
355. Levich R M 1985 Empirical studies of exchange rates: Price behaviour, rate determination and market efficiency in Handbook of international economics Jones R W, Kenen P B (editors) vol **2** *North-Holland Publishing Company Amsterdam The Netherlands*.
356. McInish T H, Wood R A 1985 An analysis of transactions data for the Toronto Stock Exchange *The Journal of Banking and Finance* **14** pp 441 – 458.

357. Dominguez K M 1986 Are foreign exchange forecasts rational? New evidence from survey data *Economic Letters* **21** pp 277 – 281.
358. Dominguez K M 1990 Market responses to coordinated central bank intervention *Carnegie-Rochester Series on Public Policy* **32** pp 121 – 163.
359. Dominguez K M 1992 Exchange rate efficiency and the behavior of international asset markets *Garland* New York USA.
360. Dominguez K M 1993 Does central bank intervention increase the volatility of foreign exchange rates? *Technical Report 4532* National Bureau of Economic Research Cambridge MA USA.
361. Dominguez K M, Frankel J 1993a Does foreign-exchange intervention matter? The portfolio effect *American Economic Review* **83** (5) pp 1356 – 1369.
362. Dominguez K M, Frankel J 1993b Does foreign-exchange intervention work? *Institute for International Economics* Washington DC USA.
363. Dominguez K M, Frankel J A 1993c Foreign exchange intervention: An empirical assessment in *On exchange rates* Frankel J A (editor) *MIT Press* Cambridge MA USA.
364. Dominguez K M 1998 Central bank intervention and exchange rate volatility *Journal of International Money and Finance* **18** pp 161 – 190.
365. Dominguez K M 2003a The market microstructure of central bank intervention *Journal of International Economics* **59** pp 25 – 45.
366. Dominguez K M 2003b Foreign exchange intervention: Did it work in the 1990s? in *Dollar overvaluation and the World economy* Bergsten C F, Williamson J (editors) *Institute for International Economics* Washington DC USA.
367. Bollerslev T 1986 Generalized autoregressive conditional heteroskedasticity *Journal of Econometrics* **21** pp 307 – 328.
368. Baillie R, Bollerslev T 1989 The daily message in exchange rates: A conditional variance tale *Journal of Business and Economic Statistics* **7** pp 297 – 305.
369. Baillie R, Bollerslev T 1990 Intra-day and inter market volatility in foreign exchange rates *Review of Economic Studies* **58** pp 565 – 585.
370. Bollerslev T 1990 Modeling the coherence in short-run nominal exchange rates: A multivariate generalized ARCH model *Review of Economics and Statistics* **72** pp 498 – 595.
371. Bollerslev T, Chou R Y, Jayaraman N, Kroner K F 1990 ARCH modeling in finance: A review of the theory and empirical evidence *Journal of Econometrics* **52** (1) pp 5 – 60.
372. Bollerslev T, Domowitz I 1991 Price volatility, spread variability and the role of alternative market mechanisms *Review of Futures Markets* **10** pp 78 – 102.

373. Baillie R T, Bollerslev T 1991 Intra - day and inter - market volatility in foreign exchange rates *Review of Economic Studies* **58** pp 565 – 585.
374. Bollerslev T, Domowitz I (September) 1993 Trading patterns and prices in the interbank foreign exchange market *Journal of Finance* **48** (4) pp 1421 – 1443.
375. Bollerslev T, Melvin M 1994 Bid - ask spreads and volatility in the foreign exchange market: An empirical analysis *Journal of International Economics* **36** pp 355 – 372.
376. Andersen T, Bollerslev T 1994 Intraday seasonality and volatility persistence in foreign exchange and equity markets *Working Paper no 186* Department of Finance Northwestern University USA.
377. Bollerslev T, Engle R F, Nelson D B 1995 ARCH models *in Handbook of econometrics* vol **4** North-Holland Publishing Company New York USA.
378. Andersen T, Bollerslev T 1998 Deutsche mark-dollar volatility: Intraday activity patterns, macroeconomic announcements, and longer run dependencies *Journal of Finance* **53** pp 219 – 266.
379. Bollerslev T, Cai J, Song F 2000 Intraday periodicity, long-memory volatility, and macroeconomic announcement effects in the US treasury bond market *Journal of Empirical Finance* **7** pp 37 – 55.
380. Andersen T G, Bollerslev T, Diebold F X, Labys P 2000 Exchange rate returns standardized by realized volatility are (nearly) Gaussian *Multinational Finance Journal* **4** pp 159 – 179.
381. Andersen T, Bollerslev T, Diebold F, Vega C (September) 2001, 2003 Micro effects of macro announcements: Real-time price discovery in foreign exchange *Typescript* Northwestern University USA; *American Economic Review* **93** pp 38 – 62.
382. Andersen T, Bollerslev T, Diebold F X, Labys P 2001 The distribution of realized exchange rate volatility *Journal of the American Statistical Association* **96** (453) pp 42 – 55.
383. Andersen T G, Bollerslev T, Diebold F X, Labys P 2003 Modeling and forecasting realized volatility *Econometrica* **71** pp 579 - 625.
384. Andersen T G, Bollerslev T, Diebold F X 2007 Roughing it up: Including jump components *in The measurement, modeling and forecasting of return volatility* *Review of Economics and Statistics* **89** pp 701 – 720.
385. Engle R F 1982 Autoregressive conditional heteroskedasticity with estimates of the variance of United Kingdom inflation *Econometrica* **50** pp 987 – 1007.
386. Engle R F, Bollerslev T 1986 Modeling the persistence of conditional variance *Econometrics Reviews* **5** pp 1 – 50.

387. Engle R F, Granger C 1987 Cointegration and error correction: Representation, estimation and testing *Econometrica* **55** pp 251 – 276.
388. Engle R F, Rodriguez A P 1989 Tests of international CAPM with time varying covariances *Journal Of Applied Econometrics* **4**.
389. Engle R F, Ito T, Lin Wen-Ling 1990 Meteor showers or heat waves? Heteroskedastic intra-daily volatility in the foreign exchange market *Econometrica* **58** pp 525 – 542.
390. Engle R F, Russell J R 1995 Forecasting transaction rates: The autoregressive conditional duration model *Proceedings of the First International Conference on High Frequency Data in Finance (HFDF-1)* vol **4** Research Institute for Applied Economics Olsen & Associates Zürich Switzerland.
391. Engle R F, Gallo G M 2006 A multiple indicators model for volatility using intra-daily data *Journal of Econometrics* **131** pp 3 – 27.
392. Evans G 1986 A test for speculative bubbles in the sterling-dollar exchange rate *American Economic Review* **76** pp 621 – 636.
393. Flood E Jr, Lessard D R 1986 On the measurement of operating exposure to exchange rates: A conceptual approach *Financial Management* **15** pp 25 – 37.
394. Grammatikos T, Saunders A, Swary I 1986 Returns and risks of US Bank foreign currency activities *Journal of Finance* **41** (3) pp 671 – 682.
395. Harris L 1986 A transaction data survey of weekly and intraday patterns in stock returns *Journal of Financial Economics* **16** pp 99 – 117.
396. Harris L 1990 Statistical properties of the roll serial covariance bid/ask spread estimator *Journal of Finance* **45** pp 579 – 590.
397. Hart O D, Kreps D M 1986 Price destabilizing speculation *Journal of Political Economy* **94** pp 927 – 952.
398. Lyons R K 1986 Tests of the foreign exchange risk premium using the expected second moments implied by option pricing *International Finance Discussion Papers 290* Board of Governors of the Federal Reserve System USA.
399. Lyons R K (March) 1988 Tests of the foreign exchange risk premium using the expected second moments implied by option pricing *Journal of International Money and Finance Elsevier* **7** (1) pp 91 – 108.
400. Lyons R K (November) 1990 Whence exchange rate overshooting: Money stock or flow? *Journal of International Economics Elsevier* **29** (3 - 4) pp 369 – 384.
401. Lyons R K 1991 Private beliefs and information externalities in the foreign exchange market *NBER Working Papers 3889* National Bureau of Economic Research Inc.

402. Lyons R K (January) 1992 Floating exchange rates in Peru, 1950-1954 *Journal of Development Economics Elsevier* **38** (1) pp 99 – 118.
403. Lyons R 1993a Information intermediation in the microstructure of the foreign exchange market *NBER Working Paper #3889* Berkeley Business School USA.
404. Lyons R 1993b Tests of microstructural hypothesis in the foreign exchange market *NBER Working Paper #4471* Berkeley Business School USA.
405. Lyons R K 1993c Optimal transparency in a dealership market with an application to foreign exchange *NBER Working Papers 4467* National Bureau of Economic Research Inc.
406. Baldwin R E, Lyons R K (January) 1994 Exchange rate hysteresis? Large versus small policy misalignments *European Economic Review Elsevier* **38** (1) pp 1 – 22.
407. Lyons R 1994 Foreign exchange volume: Sound and fury signifying nothing? *Berkeley Business School USA*.
408. Lyons R K 1995 Tests of microstructural hypotheses in the foreign exchange market *Journal of Financial Economics Elsevier* **39** (2 - 3) pp 321 – 351.
409. Lyons R K, Rose A K (September) 1995 Explaining forward exchange bias . . . intraday *Journal of Finance American Finance Association* **50** (4) pp 1321 – 1329.
410. Lyons R K 1996a Foreign exchange volume: Sound and fury signifying nothing? in *The microstructure of foreign exchange markets National Bureau of Economic Research Inc* pp 183 – 208.
411. Lyons R K (July) 1996b Optimal transparency in a dealer market with an application to foreign exchange *Journal of Financial Intermediation Elsevier* **5** (3) pp 225 – 254.
412. Lyons R K 1997a Explaining trading volume in foreign exchange: Lessons from Tokyo *FRBSF Economic Letter* Federal Reserve Bank of San Francisco issue December 26.
413. Lyons R K (May) 1997b A simultaneous trade model of the foreign exchange hot potato *Journal of International Economics Elsevier* **42** (3 - 4) pp 275 – 298.
414. Lyons R K 1997c Profits and position control: A week of FX dealing *Research Program in Finance Working Papers RPF-273* University of California at Berkeley.
415. Lyons R K (February) 1998a Profits and position control: A week of FX dealing *Journal of International Money and Finance Elsevier* **17** (1) pp 97 – 115.
416. Lyons R K (December) 1998b Introduction to the international market microstructure issue *Journal of International Financial Markets, Institutions and Money Elsevier* **8** (3 - 4) pp 219 – 223.
417. Lyons R K (Summer) 2001 New perspective on FX markets: Order-flow analysis *International Finance Wiley Blackwell* **4** (2) pp 303 – 320.

418. Fan M, Lyons R (July) 2001 Customer-dealer trading in the foreign exchange market *Typescript* UC Berkeley USA.
419. Killeen W, Lyons R, Moore M (September) 2001 Fixed versus flexible: Lessons from EMS order flow *NBER Working Paper 8491* NBER USA.
420. Killeen W, Hau H, Moore M 2001 The euro as an international currency: Explaining puzzling first evidence from the foreign exchange markets *Journal of International Money and Finance*.
421. Lyons R K (October) 2002 Theoretical perspective on euro liquidity *Economic Policy* CEPR & CES & MSH **17** (35) pp 571 – 597.
422. Lyons R K 2002 Foreign exchange: Macro puzzles, micro tools *Economic Review* Federal Reserve Bank of San Francisco pp 51 – 69.
423. Lyons R K 2003 Explaining and forecasting exchange rates with order flows *Economie Internationale* CEPII research center issue 96 pp 107 – 127.
424. Fan M, Lyons R K, 2003, Customer trades and extreme events in foreign exchange in Central banking, monetary theory and practice: Essays in honor of Charles Goodhart Mizen P (editor) vol **2** pp 160 – 179 *Edward Elgar* Cheltenham UK.
425. Killeen W P, Lyons R K, Moore M J (June) 2006 Fixed versus flexible: Lessons from EMS order flow *Journal of International Money and Finance Elsevier* **25** (4) pp 551 – 579.
426. Lyons R K (January) 2006 The microstructure approach to exchange rates *MIT Press* edition 1 vol **1** ISBN 026262205x Cambridge MA USA.
427. O'Hara M, Oldfield G 1986 The microeconomics of market making *Journal of Financial and Quantitative Analysis* **21** pp 361 - 376.
428. Burdett K, O'Hara M 1987 Building blocks: An introduction to block trading *Journal of Banking and Finance* **13** pp 397 – 419.
429. O'Hara M 1995, 1998 Market microstructure theory *Blackwell Business* Cambridge MA USA, *John Wiley and Sons Inc* USA.
430. Shleifer A 1986 Do demand for stock slope down? *Journal of Finance* **41** (3) pp 579 – 590.
431. Shleifer A, Summers L 1990 The noise trader approach to finance *Journal of Economic Perspectives* **4** (2) pp 19 – 33.
432. Sweeney R 1986 Beating the foreign exchange market *The Journal of Finance* **41** pp 163 – 182.
433. DeLong B, Shleifer A, Summers L, Waldmann R 1990 Positive feedback investment strategies, and destabilizing rational speculation *Journal of Finance* **45** pp 379 – 396.

434. Bilson J F, Hsieh D 1987 The profitability of currency speculation *International Journal of Forecasting* **3** pp 115 – 130.
435. Glassman D 1987 Exchange rate risk and transactions costs: Evidence from bid-ask spreads *Journal of International Money and Finance* **6** (4) pp 479 – 490.
436. Gerlach S 1987 Exchange rates: A review essay *Journal of Monetary Economics* **19** pp 137 –142.
437. Hasbrouck J, Ho T S H 1987 Order arrival, quote behaviour and the return - generating process *The Journal of Finance* **42** (4) pp 1035 – 1048.
438. Hasbrouck J 1988 Trades, quotes, inventories, and information *Journal of Financial Economics* **22** pp 229 – 252.
439. Hasbrouck J 1991 Measuring the information content of stock trades *Journal of Finance* **46** pp 179 – 207.
440. Hasbrouck J, Sofianos G 1993 The trades of market makers: An empirical analysis of NYSE specialists *Journal of Finance* **48** pp 1565 – 1593.
441. Hasbrouck J, Seppi D 2001 Common factors in prices, order flows, and liquidity *Journal of Financial Economics* **59** pp 383 – 411.
442. Hodrick R 1987 The empirical evidence on the efficiency of forward and futures foreign exchange markets in *Fundamentals of pure and applied economics* vol **24** Harwood Academic Publishers New York USA.
443. Ito T, Roley V 1987 News from the US and Japan: Which moves the Yen/Dollar exchange rate? *Journal of Monetary Economics* **19** pp 255 – 277.
444. Ito T, Roley V V 1990 Intraday Yen/Dollar exchange rate movements: News or noise? *Journal of International Financial Markets, Institutions and Money* vol **1** no 1.
445. Canova F, Ito T 1991 The time series properties of the risk premium in the Yen/Dollar exchange market *Journal of Applied Econometrics* **6** pp 125 – 142.
446. Ito T, Engle R F, Lin W-L 1992 Where does the meteor shower come from? The role of stochastic policy coordination *Journal of International Economics* **32** pp 221 – 240.
447. Ito T, Lin W 1992 Lunch break and intraday volatility of stock returns: An hourly data analysis of Tokyo and New York stock markets *Economics Letters* **39** pp 85 - 90.
448. Ito T, Isard P, Symansky St, Bayoumi T 1996 Exchange rate movements and their impact on trade and investment in the APEC region *IMF Occasional Paper no 145* International Monetary Fund.
449. Ito T, Lyons R K, Melvin M T 1998 Is there private information in the FX market? The Tokyo experiment *Journal of Finance American Finance Association* **53** (3) pp 1111 – 1130.

- 450.** Ito T (April) 2002 Is foreign exchange intervention effective? The Japanese experience in the 1990s *NBER Working Paper no 8914* NBER MA USA.
- 451.** Ito T 2005a The exchange rate in the Japanese economy: The past, puzzles, and prospects *Japanese Economic Review* **56** no 1 pp 1 – 38.
- 452.** Ito T 2005b The Yen and the Japanese economy: 2004 in Dollar adjustment: How far? Against what? Bergsten F, Williamson J (editors) *Institute of International Economics* Washington DC pp 171 – 196.
- 453.** Ito T, Hashimoto Y 2006 Intraday seasonality in activities of the foreign exchange markets: Evidence from the electronic broking system *Journal of Japanese and International Economics* **20** pp 637 – 664.
- 454.** Mendelson H 1987 Consolidation, fragmentation, and market performance *Journal of Financial and Quantitative Analysis* **22** pp 189 – 208.
- 455.** Newey W, West K 1987 A simple positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix *Econometrica* **55** pp 703 – 708.
- 456.** Rubinstein A, Wolinsky A 1987 Middlemen *Quarterly Journal of Economics* **102** pp 581 – 593.
- 457.** Taylor M P 1987 Covered interest parity: A high-frequency, high-quality data study *Economica* **54** (216) pp 429 – 438.
- 458.** Taylor M P 1989 Covered interest arbitrage and market turbulence *Economic Journal* **99** pp 376 – 391.
- 459.** Allen H, Taylor M P 1989 Chartists, noise and fundamentals: A study of the London foreign exchange market *Working Paper no 341* Centre for Economic Policy Research London UK.
- 460.** Taylor M P, Allen H 1992 The use of technical analysis in the foreign exchange market *Journal of International Money and Finance* **11** (3) pp 304 – 314.
- 461.** Taylor M P 1995 The economics of exchange rates *Journal of Economic Literature* **33** pp 13 – 47.
- 462.** Sarno L, Taylor M P 2000 Official intervention in the foreign exchange market *University of Oxford* UK.
- 463.** Sarno L, Taylor M P 2001a Official intervention in the foreign exchange market: Is it effective and if so how does it work? *Journal of Economic Literature* **39** pp 839 – 868.
- 464.** Sarno L, Taylor M P 2001b The microstructure of the foreign exchange market. A selective survey of the literature *Princeton Studies in International Economics Series no 89* Princeton University Press Princeton NJ USA.

465. Taylor M P 2005 Official foreign exchange intervention as a coordinating signal to the Dollar-Yen market *Pacific Economic Review* **10** pp 73 – 82.
466. Sager M, Taylor M P 2005 Order flow and exchange rate movements *Typescript* University of Warwick UK.
467. Reitz S, Taylor M P 2006 The coordination channel of foreign exchange intervention: A non-linear microstructural analysis *Deutsche Bundesbank Discussion Paper no 08/2006* Germany.
468. Sager M, Taylor M P 2006 Under the microscope: The structure of the foreign exchange market *International Journal of Finance and Economics* **11** pp 81 – 95.
469. Sager M J, Taylor M P 2008 Commercially available order flow data and exchange rate movements: Caveat emptor *Journal of Money, Credit and Banking* **40** (4) pp 583 – 625.
470. Schulmeister St 1987 An essay on exchange rate dynamics *Research Unit Labor Market and Employment Discussion Paper no 87-8* Wissenschaftszentrum Berlin für Sozialforschung Berlin Germany.
471. Melvin M, Taylor M P 2009 The crisis in the foreign exchange market *Journal of International Money and Finance* **28** (8) pp 1317 – 1330.
472. Newey W, West K A 1987 Simple, positive semidefinite, heteroskedasticity and autocorrelation consistent covariance matrix *Econometrica* **55** pp 703 – 708.
473. Wolff Ch C P 1987 Forward foreign exchange rates, expected spot rates, and premia: A signal-extraction approach *Journal of Finance* **42** (2) pp 395 – 406.
474. Admati A, Pfleiderer P 1988 A theory of intraday patterns: Volume and price variability *The Review of Financial Studies* **1** pp 3 – 40.
475. Admati A, Pfleiderer P 1989 Divide and conquer: A theory of intraday and day - of - the - week mean effects *The Review of Financial Studies* **2** (2) pp 189 – 223.
476. Boothe P 1988 Exchange rate risk and the bid-ask spread *Economic Inquiry* **XXVI** pp 485 – 492.
477. Choi J Y, Salandro D, Shastri K 1988 On the estimation of bid - ask spreads: Theory and evidence *Journal of Financial Analysis* **23** pp 219 – 230.
478. Clinton K 1988 Transactions costs and covered interest arbitrage: Theory and evidence *Journal of Political Economy* **96** pp 358 - 370.
479. Goodhart Ch A E 1988 The foreign exchange market: A random walk with a dragging anchor *Economica* **55** (220) pp 437 – 460.
480. Goodhart Ch A E (October) 1989 “News” and the foreign exchange market *Proceedings of Manchester Statistical Society* Manchester UK pp 1 – 79.

481. Goodhart Ch A E, Demos A (Winter) 1990 Reuters screen images of the foreign exchange market: The Deutschmark / Dollar spot rate *Journal of International Securities Markets* **4** pp 333 – 348.
482. Goodhart Ch A E, Curcio R (January) 1991 The clustering of bid / ask prices and spreads in the foreign exchange market *Discussion Paper 110* Financial Markets Group London School of Economics and Political Science London UK.
483. Goodhart Ch A E, Demos A 1991a Reuters screen images of the foreign exchange market: The Yen / Dollar and Sterling / Dollar spot market *Journal of International Securities Markets* **5** Spring pp 35 – 64.
484. Goodhart Ch A E, Demos A (September 2nd) 1991b The Asian surprise in the forex markets *Financial Times* p 13.
485. Goodhart Ch A E, Figliuoli L 1991 Every minute counts in financial markets *Journal of International Money and Finance* **10** (1) pp 23 – 52.
486. Goodhart Ch A E 1992 News effects in a high-frequency model of the Sterling-Dollar exchange rate *Journal of Applied Econometrics* **7**.
487. Goodhart Ch A E, Hall S, Henry S, Pesaran B 1993 News effects in a high frequency model of the Sterling-Dollar exchange rate *Journal of Applied Econometrics* **8** pp 1 – 13.
488. Goodhart Ch A E, Hesse T 1993 Central bank forex intervention assessed in continuous time *Journal of International Money and Finance* **12** pp 368 – 389.
489. Goodhart Ch A E, Ito T, Payne R 1995, 1996 One day in June, 1993: A study of the working of Reuters 2000-2 electronic foreign exchange trading system *National Bureau of Economic Research* Cambridge MA USA pp 1 – 133, in *The microstructure of foreign exchange markets* Frankel J, Galli G, Giovannini A (editors) *University of Chicago Press* Chicago IL USA pp 107 – 179.
490. Goodhart Ch A E, O'Hara M 1995 High frequency data in financial markets: Issues and applications *Introductory Lecture Proceedings of the First International Conference on High Frequency Data in Finance (HFDF-1)* *Research Institute for Applied Economics Olsen & Associates* Zürich Switzerland.
491. Goodhart Ch A E, Payne R G 1996 Microstructural dynamics in a foreign exchange electronic broking system *Journal of International Money and Finance* **15** (6) pp 829 – 852.
492. Goodhart Ch A E, O'Hara M 1997 High frequency data in financial markets: Issues and applications' *Journal of Empirical Finance* **4** pp 73 – 114.
493. Goodhart Ch A E, Love R, Payne R, Rime D 2002 Analysis of spreads in the Dollar/Euro and Deutschmark/Dollar foreign exchange markets *Economic Policy* **17** (35) pp 537 – 552.

494. Hardouvelis G 1988 Economic news, exchange rates, and interest rates *Journal of International Money and Finance* **7** pp 23 – 25.
495. Lewis K 1988 Testing the portfolio balance model: A multilateral approach *Journal of International Economics* **7** pp 273 – 288.
496. Lewis K 1995 Puzzles in international financial markets in *Handbook of international economics* Grossman G, Rogoff K (editors) vol **3** North Holland Publishing Company Amsterdam The Netherlands.
497. Baldwin R, Krugman P 1989 Persistent trade effects of large exchange rate shocks *The Quarterly Journal of Economics* **104** (4) pp 635 – 654.
498. Baxter M, Stockman A 1989 Business cycles and the exchange rate regime: Some international evidence *Journal of Monetary Economics* **23** pp 377 – 400.
499. Dooley M, Lizondo S, Mathieson D 1989 The currency composition of foreign exchange reserves *IMF Staff Papers* **36** no 2 pp 385 – 434.
500. Giovannini A 1989 How do fixed exchange rate regimes work? Evidence from the gold standard, Bretton Woods and the EMS in *Blueprints for exchange rate management* Miller M, Eichengreen B, Portes R (editors) Academic New York USA.
501. Golub S 1989 Foreign currency government debt, asset markets, and the balance of payments *Journal of International Money and Finance* **8** pp 285 – 294.
502. Humpage O 1989 On the effectiveness of exchange market intervention *Federal Reserve Bank of Cleveland* USA.
503. Leach C, Madhavan 1989 Price experimentation and market structure *Working Paper* Wharton School University of Pennsylvania USA.
504. Leahy M 1989 The profitability of US intervention *Technical Report 343* Board of Governors Federal Reserve Bank Washington DC USA.
505. Miller M, Eichengreen B, Portes R (editors) 1989 *Blueprints for exchange rate management* Academic New York USA.
506. Van Hagen J 1989 Monetary targeting with exchange rate constraints: The Bundesbank in the 1980s *Federal Reserve Bank of St Louis* USA.
507. Allen H L, Taylor M P 1990 Charts, noise and fundamentals in the London foreign exchange market *Economic Journal* **100** (Supplement) pp 49 – 59.
508. Allen H L, Karjalainen R 1999 Using genetic algorithms to find technical trading rules *Journal of Financial Economics* **51** pp 245 – 271.
509. Courakis A, Taylor M P (editors) 1990 Private behavior and government policy in interdependent economies *Clarendon* Oxford UK.

510. Diebold F X, Nason J 1990 Nonparametric exchange rate prediction? *Journal of International Economics* **28** pp 315 – 332.
511. Flood R, Hodrick R 1990 On testing for speculative bubbles *Journal of Economic Perspectives* **4** pp 85 – 101.
512. Flood R, Rose A 1995 Fixing exchange rates: A virtual quest for fundamentals *Journal of Monetary Economics* **36** pp 3 – 37.
513. Flood R, Taylor M 1996 Exchange rate economics: What's wrong with the conventional macro approach? in *The microstructure of foreign exchange markets* Frankel J, Galli G, Giovannini A (editors) *The University of Chicago Press* Chicago USA pp 261 – 294.
514. Flood R, Marion N 2001 Holding international reserves in an era of high capital mobility in *Brookings Trade Forum 2001* Collins S, Rodrik D (editors) *Brookings Institution Press* Washington DC USA.
515. Foster D, Viswanathan S 1990 A theory of inter-day variations in volumes variances, and trading costs in securities markets *Review of Financial Studies* **3** pp 593 – 624.
516. Foster D, Viswanathan S 1993 Variations in trading volume, return volatility, and trading costs: Evidence on recent price formation models *Journal of Finance* **48** 187 – 211.
517. Holthausen R W, Leftwich R W, Mayers D 1990 Large-block transactions, the speed of response, and temporary and permanent stock-price effects *Journal of Financial Economics* **26** (1) pp 71 – 95.
518. De Long J B, Shleifer A, Summers L H, Waldmann R J 1990 Noise trader risk in financial markets *Journal of Political Economy* **98** (4) pp 703 – 738.
519. Domowitz I (June) 1990 The mechanics of automated trade execution systems *Journal of Financial Intermediation* **1** pp 167 – 194.
520. Domowitz I 1993 A taxonomy of automated trade execution systems *Journal of International Money and Finance* **12** (6) pp 607 – 631.
521. Domowitz I, Steil B (September) 1999 Automation, trading costs and the structure of the securities trading industry *Brookings-Wharton Papers on Financial Services* pp 33 – 92.
522. Johansen S, Juselius K 1990 Maximum likelihood estimation and inference on cointegration with applications to the demand for money *Oxford Bulletin of Economics and Statistics* **52** (2) pp 169 – 210.
523. Johansen S 1991 Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models *Econometrica* **59** (6) pp 1551 – 1580.
524. Johansen S 1992 Cointegration in partial systems and the efficiency of single equation analysis *Journal of Econometrics* **52** pp 389 – 402.

525. Jorion P 1990 The exchange-rate exposure of United-States multinationals *Journal of Business* **63** pp 331 – 345.
526. Jorion P 1991 The pricing of exchange rate risk in the stock market *Journal of Financial and Quantitative Analysis* **26** (3) pp 363 – 376.
527. Jorion P 1996 Risk and turnover in the foreign exchange market in *The microstructure of foreign exchange markets* Frankel J A, Galli G, Giovannini A (editors) *University of Chicago Press* Chicago USA pp 19 – 37.
528. Lo A W, MacKinley A C 1990 An econometric analysis of nonsynchronous trading *Journal of Econometrics* **45** pp 181 – 211.
529. Melino A, Turnbull S M 1990 Pricing foreign currency options with stochastic volatility *Journal of Econometrics* **45** pp 239 – 265.
530. Melino A, Turnbull S M 1995 Misspecification and the pricing and hedging of long-term foreign currency options *Journal of International Money and Finance* **14** pp 373 – 393.
531. Mishkin F 1990 What does the term structure tell us about future inflation? *Journal of Monetary Economics* **25** (1) pp 77 – 95.
532. Müller U A, Dacorogna M M, Olsen R B, Pictet O, Schwarz M, Morgeneegg C 1990 Statistical study of foreign exchange rates, empirical evidence of a price scaling law, and intraday analysis *Journal of Banking and Finance* **14** pp 1189 – 1208.
533. Müller U A, Dacorogna M M, Dave R D, Pictet O V, Olsen R B, Ward J R 1993 Fractals and intrinsic time - A challenge to econometricians *Technical Report UAM 1993-08-16 Research Institute for Applied Economics Olsen & Associates* Zurich Switzerland.
534. Müller U A, Dacorogna M M, Dave R D, Olsen R B, Pictet O V, von Weizsäcker J E 1995 Volatilities of different time resolutions - Analyzing the dynamics of market components *Preprint UAM 1995-01-12 Research institute for Applied economics Olsen & Associates* Zurich Switzerland.
535. Roell A 1990 Dual capacity trading and the quality of the market *Journal of Financial Intermediation* **1** pp 105 – 124.
536. Seppi D 1990 Equilibrium block trading and asymmetric information *Journal of Finance* **45** pp 73 – 94.
537. Bali T 1991 An empirical comparison of continuous time models of the short term interest rate *Journal of Futures Markets* **19** (7) pp 777 – 797.
538. Bhattacharya U, Spiegel M 1991 Insiders, outsiders, and market breakdowns *Review of Financial Studies* **4** pp 255 – 282.

539. Black S 1991 Transaction costs and vehicle currencies *Journal of International Money and Finance* **10** pp 512 - 527.
540. Bossaerts P, Hillion P 1991 Market microstructure effects of government intervention in the foreign exchange market *Review of Financial Studies* **4** pp 513 – 541.
541. Burnham J B 1991 Current structure and recent developments in foreign exchange markets in *Recent developments in international banking and finance* Khonry S J (editor) *Elsevier Science Publishing North Holland Publishing Company* pp 123 – 163.
542. Campbell J, LaMaster S, Smith V, Van Boening M 1991 Off-floor trading, disintegration, and the bid-ask spread in experimental markets *Journal of Business* **64** pp 495 – 522.
543. Campbell J, Lo A, MacKinlay A 1997 *The econometrics of financial markets* *Princeton University Press* USA.
544. Chinn M D 1991 Some linear and non-linear thoughts on exchange rates *Journal of International Money and Finance* **10** pp 214 – 230.
545. Chinn M D, Meese R A 1995 Banking on currency forecasts: How predictable is change in money *Journal of International Economics* **38** pp 161 – 178.
546. Chowdhry B, Nanda V 1991 Multimarket trading and market liquidity *Review of Financial Studies* **4** pp 483 – 511.
547. Edwards S 1991 *Real exchange rates, devaluation, and adjustment – Exchange rate policy in developing countries* *MIT Press* USA.
548. Froot K A, Obstfeld M 1991 Exchange rate dynamics under stochastic regime shifts: A unified approach *Journal of International Economics* **31** pp 203 – 229.
549. Froot K A, Rogoff K 1995 Perspectives on PPP and long-run real exchange rates in *Handbook of international economics* Grossman G, Rogoff K (editors) *Elsevier Science Amsterdam* pp 1647 – 1688.
550. Froot K A, Ramadorai T (August) 2002 Currency returns, institutional investor flows, and exchange rate fundamentals *NBER Working Paper 9101* NBER USA.
551. Froot K A, Donohue 2004 Decomposing the persistence of international equity flows *Finance Research Letters* pp 154 – 170.
552. Froot K A, Ramadorai T 2005 Currency returns, intrinsic value, and institutional-investor flows *Journal of Finance* **60** pp 1535 – 1566.
553. Georg Th, Kaul G, Nimalendran M 1991 Estimation of the bid-ask spread and its components: A new approach *Review of Financial Studies* **4** pp 623 – 656.
554. Grabbe J O 1991 *International financial markets* 2nd edition *Elsevier Science Publishing Co Inc* New York USA.

555. Harvey C R, Huang R D Volatility in the foreign currency futures market *Review of Financial Studies* **4** pp 543 – 569.
556. Khonry S J (editor) 1991 Recent developments in international banking and finance *Elsevier Science Publishing North Holland Publishing Company* The Netherlands.
557. Kim O, Verrecchia R 1991 Trading volume and price reactions to public announcements *Journal of Accounting Research* **29** pp 302 – 321.
558. Kim O, Verrecchia R 1994 Market liquidity and volume around earnings announcements *Journal of Accounting and Economics* **17** pp 41 – 67.
559. Kim O, Verrecchia R 1997 Pre-announcement and event-period information *Journal of Accounting and Economics* **24** pp 395 – 419.
560. Klein M 1991 Managing the dollar: Has the Plaza agreement mattered? *Journal of Money, Credit, and Banking* **23** pp 742 – 751.
561. Klein M, Rosengren E 1991 Foreign exchange intervention as a signal of monetary policy *New England Economic Review* pp 39 – 50.
562. Lease R, Masulis R, Page J 1991 An investigation of market microstructure impacts on event study returns *The Journal of Finance* **46** pp 1523 – 1536.
563. LeBaron B 1991 Technical trading rules and regime shifts in foreign exchange *Technical Report* University of Wisconsin - Madison WI USA.
564. Lee Ch M C, Ready M J 1991 Inferring trade direction from intraday data *Journal of Finance* **46** pp 733 – 746.
565. Messe R A, Rose A K 1991 An empirical assessment of nonlinearities in models of exchange rate determination *Review of Economic Studies* **58** 603-2-19.
566. Subrahmanyam A 1991 Risk aversion, market liquidity, and price efficiency *Review of Financial Studies* **4** pp 417 – 442.
567. Spiegel M, Subrahmanyam A 1992 Informed speculation and hedging in a non-competitive securities market *Review of Financial Studies* **5** (2).
568. Spiegel M, Subrahmanyam A 1995 On intraday risk premia *Journal of Finance* **50** pp 319 - 339.
569. Williamson J (May) 1991 Advice on the choice of an exchange rate policy *Working Paper no 3* ICEG.
570. Bekaert G, Hodrick R J 1992 Characterizing predictable components in excess returns on equity and foreign exchange markets *The Journal of Finance* **47** pp 467 – 511.
571. Choi J J, Elyasiani E, Kopecky K J 1992 The sensitivity of bank stock returns to market, interest and exchange rate risk *Journal of Banking and Finance* **16** (5) pp 983 – 1005.

572. Choi J J, Elyasiani E 1997 Derivatives exposure and the interest rate and exchange rate risks of US banks *Journal of Financial Services Research* **12** (2/3) pp 267 – 286.
573. Curcio R, Goodhart Ch 1992 When support / resistance levels are broken, can profits be made? Evidence from the foreign exchange market *Discussion Paper no 142* Financial Markets Group London School of Economics London UK.
574. Curcio R, Goodhart Ch, Guillaume D, Payne R 1997 Do technical trading rules generate profits? Conclusions from the intra-day foreign exchange market *International Journal of Finance and Economics* **2** (4) pp 267 – 280.
575. De Grauwe P, Decupere D 1992 Psychological barriers in the foreign exchange market *Journal of International and Comparative Economics* **1** (2) pp 87 – 101.
576. De Grauwe P, Grimaldi M 2006a The exchange rate in a behavioural framework *Princeton University Press* Princeton USA.
577. De Grauwe P, Grimaldi G 2006b Exchange rate puzzles: A tale of switching attractors *European Economic Review* **50** pp 1 – 33.
578. Edison H J 1992, 1993 The effectiveness of central bank intervention: A survey of the post - 1982 literature *Working Paper* Federal Reserve Board of Governors Washington DC USA, *Princeton Studies in International Economics* **18** Princeton University Princeton NJ USA.
579. Edison H J, Liang H 1999 Foreign exchange intervention and the Australian dollar: Has it mattered? *IMF Working Paper WP/03/99*.
580. Edison H J (September) 2003 Are foreign exchange reserves in Asia too high? in World economics outlook (September 2003) *International Monetary Fund* Washington DC USA.
581. Flood M D 1994 Market structure and inefficiency in the foreign exchange market *Journal of International Money and Finance* **13** (2) pp 131 – 158.
582. Flood M D, Rose A K 1995 Fixing exchange rates: A virtual quest for fundamentals *Journal of Monetary Economics* **36** pp 3 – 37.
583. Flood M D, Huisman R, Koedijk K, Mahieu R (December) 1996 Price discovery in multiple-dealer financial markets: The effect of pre-trade transparency *Typescript* Concordia University.
584. Flood M D, Huisman R, Koedijk K, Mahieu R 1998 Quote disclosure and price discovery in multiple dealer financial markets *Review of Financial Studies*.
585. Gosh A 1992 Is it signaling? Exchange intervention and the Dollar Deutsche-mark rate *Journal Of International Economics* **32**.

586. Guillaume D M, Dacorogna M M, Dave R R, Müller U A, Olsen R B, Hamon O V, Jacquillat B 1992 Le marche Francais des actions *Presses Universitaires de France* Paris France.
587. Guillaume D M, Pictet O V, Dacorogna M M 1995 On the intra-day performance of GARCH processes *Proceedings of the First International Conference on High Frequency Data in Finance (HFDF-1)* vol 3 *Research Institute for Applied Economics Olsen & Associates* Zürich Switzerland.
588. Guillaume D M, Dacorogna M M, Dave R R, Müller U A, Olsen R B, Pictet O V 1997 From the bird's eye to the microscope: A survey of new stylized facts of the intra - daily foreign exchange markets *Finance and Stochastics* 1 (2) pp 95 – 129.
589. Hansen B 1992 Tests for parameter instability in regressions with I (1) processes *Journal of Business and Economic Statistics* 10 pp 321 – 335.
590. Holden C, Subrahmanyam A 1992 Long-lived private information and imperfect competition *Journal of Finance* 47 pp 247 – 270.
591. Neal R 1992 A comparison of transaction costs between competitive market maker and specialist market structures *Journal of Business* 65 pp 317 – 334.
592. Pesaran M H, Samiei H 1992 Estimating limited - dependent rational expectations models with an application to exchange rate determination in a target zone *Journal of Econometrics* 53 pp 141 – 163.
593. Rhee S G, Chang R P 1992 Intra-day arbitrage opportunities in foreign exchange and Euro-currency markets *Journal of Finance* 47 pp 363 – 379.
594. Svensson L E O 1992 An interpretation of recent research on exchange rate target zones *Journal of Economic Perspectives* 6 (1) pp 19 – 44.
595. Svensson L E O 1993 Assessing target zone credibility *European Economic Review* 37 pp 763 – 802.
596. Bertola G, Svensson L E O 1993 Stochastic devaluation risk and the empirical fit of target zone models *Review of Economic Studies* 60 pp 689 – 712.
597. Rose A K, Svensson L E O 1994 European exchange rate credibility before the fall *European Economics Review* 38 pp 1185 – 1216.
598. Taylor S J 1992 Rewards available to currency futures speculators: Compensation for risk or evidence of inefficient pricing? *Economic Record* 68 pp 105 – 116.
599. Zhou B 1992a High frequency data and volatility in foreign exchange rates *Manuscript* Department of Finance Sloan School of Management MIT Cambridge MA USA.

- 600.** Zhou B 1992b Forecasting foreign exchange rates subject to de-volatilization *Working Paper no 3510* Sloan School of Management Massachusetts Institute of Technology Cambridge MA USA.
- 601.** Zhou B 1997 Currency exchange in a random search model *Review of Economic Studies* **64** pp 289 – 310.
- 602.** Bank for International Settlements 1993 Survey of foreign exchange market activity *Monetary and Economic Department Bank for International Settlements* Basel Switzerland www.bis.org .
- 603.** Bank for International Settlements (May) 1999 Central bank survey of foreign exchange market activity in April 1998 *Monetary and Economics Department Bank for International Settlements* Basel Switzerland www.bis.org .
- 604.** Bank for International Settlements (October) 1999 A review of financial market events in autumn 1998 *Committee on the Global Financial System Bank for International Settlements* Basel Switzerland www.bis.org .
- 605.** Bank for International Settlements (June) 2001 70th annual report *Bank for International Settlements* Basel Switzerland www.bis.org .
- 606.** Bank for International Settlements 2002 Central bank survey of foreign exchange market activity in April 2001 *Monetary and Economics Department Bank for International Settlements* Basel Switzerland www.bis.org .
- 607.** Bank for International Settlements 2004 Triennial central bank survey: Foreign exchange and derivatives market activity in 2004 *Monetary and Economics Department Bank for International Settlements* Basel Switzerland www.bis.org .
- 608.** Bank for International Settlements (March) 2005 Triennial central bank survey of foreign exchange and derivatives market activity in 2004 *Bank for International Settlements* Basel Switzerland ISSN 1814-7356 www.bis.org .
- 609.** Bank for International Settlements (May) 2005 Foreign exchange market intervention in emerging markets: motives, techniques and implications *BIS Paper no 24* ISSN 1609-0381 pp 1 – 307 Monetary and Economic Department *Bank for International Settlements* Basel Switzerland www.bis.org .
- 610.** Bank for International Settlements (December) 2007 Triennial central bank survey of foreign exchange and derivatives market activity in 2007 *Bank for International Settlements* Basel Switzerland ISSN 1814-7356 <http://www.bis.org/publ/rpfx07t.pdf?noframes=1> .

- 611.** Bank for International Settlements 2010 Triennial central bank survey. Foreign exchange and derivatives market activity in 2010 *Bank for International Settlements* Basel Switzerland ISSN 1814-7356 www.bis.org .
- 612.** Bertola G, Svensson L E O 1993 Stochastic devaluation risk and the empirical fit of target zone models *Review of Economic Studies* **60** pp 689 – 712.
- 613.** Biais B 1993 Price formation and equilibrium liquidity in fragmented and centralized markets *Journal of Finance* **48** pp 157 – 184.
- 614.** Chan Y-S, Weinstein M 1993 Reputation, bid-ask spread and market structure *Financial Analysts Journal* July/August pp 57 – 62.
- 615.** Cheung Y - W 1993 Exchange rate risk premiums *Journal of International Money and Finance* **12** pp 182 – 194.
- 616.** Cheung Y-W, Ng L 1996 A causality-in-variance test and its application to financial market prices *Journal of Econometrics* **72** pp 33 – 48.
- 617.** Cheung Y - W, Chinn M 1998 Integration, cointegration, and the forecast consistency of structural exchange rate models *Journal of International Money and Finance* **17** pp 813 – 830.
- 618.** Cheung Y-W, Wong C Y-P 1999 Foreign exchange traders in Hong Kong, Tokyo, and Singapore *in Advances in pacific basin financial markets* vol **5** Bos Th, Fetherstone Th A (editors) *JAI Press* Greenwich Connecticut pp 111 – 134.
- 619.** Cheung Y - W, Wong C 2000 A survey of market practitioners' views on exchange rate dynamics *Journal of International Economics* **51** pp 401 – 423.
- 620.** Cheung Y - W, Chinn M D 2001 Currency traders and exchange rate dynamics: A survey of the US market *Journal of International Money and Finance* **20** (4) pp 439 – 471.
- 621.** Cheung Y-W, Chinn M D, Marsh I W 2004 How do UK-based foreign exchange dealers think their market operates? *International Journal of Finance and Economics* **9** pp 289 – 306.
- 622.** Cheung Y - W, Chinn M, Pascual A G 2004, 2005 Empirical exchange rate models of the nineties: Are any fit to survive? *IMF Working Paper WP/04/73* IMF Washington USA, *Journal of International Money and Finance* **24** pp 1150 – 1175.
- 623.** Dacorogna M M, Müller U A, Nagrel R J, Olsen R B, Pictet O V 1993 A geographical model for the daily and weekly seasonal volatility in the FX market *Journal of International Money and Finance* **12** (4) pp 413 – 438.

- 624.** Dacorogna M M, Müller U A, Pictet O V, de Vries C G (March 17) 1995 The distribution of external foreign exchange rate returns in extremely large data sets *Preprint UAM 1992-10-22* Research Institute for Applied Economics *Olsen and Associates* Zurich Switzerland.
- 625.** Dominguez K M E, Frankel J A 1993 Does foreign exchange intervention work? Institute for International Economics Washington DC USA.
- 626.** Dominguez K M E 1998 Central bank intervention and exchange rate volatility *Journal of International Money and Finance* **17** pp 161 – 190.
- 627.** Dominguez K M E 2006 When do central bank interventions influence intra-daily and longer-term exchange rate movements? *Journal of International Money and Finance* **25** (7) pp 1051 – 1071.
- 628.** Dominguez K M E, Panthaki F 2006 What defines ‘news’ in foreign exchange markets? *Journal of International Money and Finance* **25** (1) pp 168 – 198.
- 629.** Ederington L, Lee J 1993 How markets process information: News releases and volatility *Journal of Finance* **48** pp 1161 – 1191.
- 630.** Edin P A, Vredin A 1993 Devaluation risk in target zones: Evidence from the Nordic countries *Economic Journal* **103** pp 161 – 175.
- 631.** Goldstein M, Folkerts-Landau D, Garber P, Rojas-Suarez L, Spencer M 1993 International capital markets Parts I and II *The International Monetary Fund* Washington DC USA.
- 632.** Griffiths M D, White R W (June) 1993 Tax - induced trading and the turn - of - the - year anomaly: An intraday study *The Journal of Finance* **48** (2) pp 575 – 598.
- 633.** Grimes A 1993 International reserves under floating exchange rates: Two paradoxes explained *The Economic Record* **69** pp 411 – 415.
- 634.** Harris M, Raviv A 1993 Differences of opinion make a horse race *Review of Financial Studies* **6** pp 473 – 506.
- 635.** Klein M W 1993 The accuracy of reports of foreign exchange intervention *The Journal of International Money and Finance* **12** (6) pp 644 – 653.
- 636.** Levich R M, Thomas L R 1993 The significance of technical trading-rule profits in the foreign exchange market: A bootstrap approach *Journal of International Money and Finance* **12** pp 451 – 474.
- 637.** Matsuyama K, Kiyotaki N, Matsui A 1993 Toward a theory of international currency *Review of Economic Studies* **60** pp 283 – 320.
- 638.** Romer D 1993 Rational asset-price movements without news *American Economic Review* **83** pp 1112 – 1130.

639. Schmidt H, Iversen P, Treske K 1993 Parkett oder computer? *Zeitschrift für Bankrecht und Bankwirtschaft* **5** pp 209 – 221.
640. Schmidt H, Iversen P 1993 Automating German equity trading: Bid-ask spreads on competing systems *Journal of Financial Services Research* **6** pp 373 – 397.
641. Schmidt H, Oesterhelweg O, Treske K 1996 Deutsche Börsen im Leistungsvergleich: IBIS und BOSS-CUBE *Kredit und Kapital* **29** pp 90 – 122.
642. Wolinsky A 1990 Information revelation in a market with pair wise meetings *Econometrica* **58** pp 1 – 23.
643. Ammer J, Brunner A 1994 Are banks market timers or market makers? Explaining foreign exchange trading profits *International Finance Discussion Paper #484* Board of Governors of the Federal Reserve System USA.
644. Andrew R, Broadbent J 1994 Reserve bank operations in the foreign exchange market: Effectiveness and profitability *Research Discussion Paper 9406* Reserve Bank of Australia Sydney Australia.
645. Backus D, Kehoe P, Kydland F 1994 Dynamics of the trade balance and the terms of trade: The J-curve? *American Economic Review* **84** pp 84 – 103.
646. Bakker A, Boot H, Sleijpen O, Vanthoor W (editors) 1994 Monetary stability through international cooperation *Kluwer Academic Publishers* Dordrecht The Netherlands.
647. Bartov E, Bodnar G M 1994 Firm valuation, earnings expectations, and the exchange rate exposure effect *Journal of Finance* **44** (5) pp 1755 – 1785.
648. Bartov E, Bodnar G M 1995 Foreign currency translation reporting and the exchange-rate exposure effect *Journal of International Financial Management & Accounting* **6** (2) pp 93 – 115.
649. Berry T, Howe K 1994 Public information arrival *Journal of Finance* **49** pp 1331 – 1346.
650. Bessembinder H (June) 1994 Bid - ask spreads in the inter-bank foreign exchange markets *Journal of Financial Economics* **35** (3) pp 317 – 348.
651. Ball C, Roma A 1994 Target zone modelling and estimation for European monetary system exchange rates *Journal of Empirical Finance* **1** pp 385 – 420.
652. Brousseau V, Czarnecki M O (August 16) 1994 Modelling exchange rates: The stable model *Preprint Ecole Polytechnique* Paris France.
653. De Jong F 1994 A univariate analysis of EMS exchange rates using a target zone model *Journal of Applied Econometrics* **9** pp 35 – 45.

654. De Jong F, Nijman Th, Röell A 1995 A comparison of the cost of trading French shares on the Paris bourse and on SEAQ *International European Economic Review* **39** pp 1277 – 1301.
655. De Jong F, Nijman Th, Röell A 1996 Price effects of trading and components of the bid-ask spread on the Paris bourse *Journal of Empirical Finance* **3** pp 193 – 213.
656. De Jong F, Mahieu R, Schotman P 1998 Price discovery in the foreign exchange market: An empirical analysis of the Yen / Dmark rate *Journal of International Money and Finance* **17** pp 5 – 27.
657. De Jong F, Ligterink J, Macrae V 2006 A firm specific analysis of the exchange rate exposure of Dutch firms *Journal of International Financial Management and Accounting* **17** (1) pp 1 – 28.
658. De Jong F, Verschoor W F C, Zwinkels R C J 2010 Heterogeneity of agents and exchange rate dynamics: Evidence from the EMS *Journal of International Money and Finance* **29** (8) pp 1652 – 1669.
659. Degryse H, de Jong F, van Kervel V 2011 The impact of dark trading and visible fragmentation on market quality *Discussion Paper 8630 CEPR*.
660. Dini L 1994 Turbulence in the foreign exchange markets: Old and new lessons in Monetary stability through international cooperation Bakker A, Boot H, Sleijpen O, Vanthoor W (editors) *Kluwer Academic Publishers* Dordrecht The Netherlands.
661. Fialkowski D, Petersen 1994 Posted versus effective spreads: Good prices or bad quotes? *Journal of Financial Economics* **35** pp 269 – 292.
662. Glass G R 1994 Multinet *Panel Discussion: Clearing house arrangements in the foreign exchange markets Federal Reserve Board's International Symposium: Banking and payment services* Washington DC USA.
663. Grünbichler A, Longstaff F, Schwartz E 1994 Electronic screen trading and the transmission of information: An empirical examination *Journal of Financial Intermediation* **3** pp 166 – 187.
664. Hansch O, Naik N, Viswanathan S (November) 1994 Trading profits, inventory control and market share in a competitive dealer market *Typescript* Duke University USA.
665. Hirschleifer D, Subrahmanyam A, Titman S 1994 Security analysis and trading patterns when some investors receive information before others *Journal of Finance* **49** pp 1665 – 1698.
666. Hogan K C Jr, Melvin M 1994 Sources of meteor showers and heat waves in the foreign exchange market *Journal of International Economics* **37** pp 239 – 247.

667. Jones C, Kaul G, Lipson M 1994 Transactions, volume, and volatility *Review of Financial Studies* **7** pp 631 – 651.
668. Jones C, Lipson M 1999 Execution costs of institutional equity orders *Journal of Financial Intermediation* **8** pp 123 – 140.
669. Kraus A, Smith M (September) 1994 Beliefs about beliefs *Working Paper* University of British Columbia Vancouver Canada.
670. Massib M, Phelps B 1994 Electronic trading, market structure and liquidity *Financial Analysts Journal* pp 39 – 50.
671. Mendelson M, Peake J (September) 1994 Equity markets in economies in transition *Journal of Banking and Finance* **15** (5) pp 913 – 929.
672. Naidu G N, Rozeff M 1994 Volume, volatility, liquidity and efficiency of the Singapore stock exchange before and after automation *Pacific-Basin Finance Journal* **2** pp 23 – 42.
673. Nieuwland F G M C, Verschoor W F C, Wolff C C P 1994 Stochastic jumps in EMS exchange rates *Journal of International Money and Finance* **13** pp 699 – 727.
674. Pictet O V, Dacorogna M M, Muller U A, De Vries C G 1994 The distribution of external foreign exchange rate returns and extremely large data sets *Olsen and Associates Research Group* Zurich Switzerland.
675. Sharpe W A (Fall) 1994 The Sharpe ratio *Journal of Portfolio Management* pp 49 – 58.
676. Silber W L 1994 Technical trading: When it works and when it doesn't *The Journal of Derivatives* **1** (3).
677. Slezak S 1994 A theory of the dynamics of security returns around market closures *Journal of Finance* **49** pp 1163 – 1211.
678. Szpiro G G 1994 Exchange rate speculation and chaos inducing intervention *Journal of Economic Behavior and Organization* **24** pp 363 – 368.
679. Yadav P, Pope P, Paudyal K 1994 Threshold autoregressive modeling in finance: The rice differences of equivalent assets *Mathematical Finance* **4** (2) pp 205 – 221.
680. Walsh E J 1994 Operating income, exchange rate changes, and the value of the firm: An empirical analysis *Journal of Accounting, Auditing and Finance* **9** (4) pp 703 – 724.
681. Wei, Sh-J (May) 1994 Anticipations of foreign exchange volatility and bid-ask spreads *Working Paper no 4737* National Bureau of Economic Research Cambridge Massachusetts USA.
682. Watanabe T 1992 The signaling effect of foreign exchange intervention: The case of Japan *Bank of Japan* Tokyo Japan.

683. Watanabe T, Harada K 2004 Effects of the Bank of Japan's intervention on yen/dollar exchange rate volatility *Journal of the Japanese and International Economies*.
684. Watanabe T, Yabu T (June) 2007 The great intervention and massive money injection: The Japanese experience 2003-2004 *Working Paper* Institute of Economic Research Hitotsubashi University Japan.
685. Almekinders G J 1995 Foreign exchange intervention: Theory and evidence *E Elgar* Brookfield VT USA.
686. Chiang T, Jiang C 1995 Foreign exchange returns over short and long horizons *International Review of Economics & Finance* **4** pp 267 – 282.
687. Dumas B, Solnik B 1995 The world price of foreign exchange risk *Journal of Finance* **50** pp 445 – 479.
688. Ederington L, Lee J 1995 The short-run dynamics of price adjustment to new information *Journal of Financial and Quantitative Analysis* **30** pp 117 – 134.
689. Evertsz C J G 1995 Self - similarity of high - frequency USD/DEM exchange rates *Proceedings of the First International Conference on High Frequency Data in Finance (HFDF-1)* vol **3** *Research Institute for Applied Economics Olsen & Associates Zürich* Switzerland.
690. Faruquee H 1995 Long-run determinants of the real exchange rate: A stock-flow perspective *IMF Staff Papers* **42** (1) pp 80 – 107.
691. Frino A, McCorry M 1995 Why are spreads tighter on the Australian Stock Exchange than the NYSE? An electronic open limit order book versus the specialist structure *Working Paper* University of Sydney Australia.
692. Frino A, McInish Th, Toner M 1998 The liquidity of automated exchanges: New evidence from German bund futures *Journal of International Financial Markets, Institutions and Money* **8** pp 225 – 241.
693. Ghysels E, Jasiak J 1995 Trading patterns: Time deformation and stochastic volatility in foreign exchange markets *Proceedings of the First International Conference on High Frequency Data in Finance (HFDF-1)* vol **1** *Research Institute for Applied Economics Olsen & Associates Zürich* Switzerland.
694. Grossman G, Rogoff K (editors) 1995 Handbook of international economics *Elsevier Science* The Netherlands.
695. Havrilesky T 1995 The pressures on American monetary policy 2nd edition *Kluwer Academic Publishing* Boston USA.

696. Hong H, Wang J (July) 1995 Trading and returns under periodic market closures *Working Paper* Massachusetts Institute of Technology USA.
697. Isard P 1995 Exchange rate economics *Cambridge University Press* Cambridge UK.
698. Kandel E, Pearson N 1995 Differential interpretation of public signals and trade in speculative markets *Journal of Political Economy* **103** pp 831 – 872.
699. Lewis K K 1995 Are foreign exchange intervention and monetary policy related and does it really matter? *Journal of Business* **68** pp 185 – 214.
700. Lin J-C, Sanger G, Booth G 1995 Trade size and components of the bid-ask spread *Review of Financial Studies* **8** pp 1153 – 1183.
701. Mantegna R N, Stanley H E 1995 Scaling behaviour in economic index *Nature* vol **376** pp 46 – 49.
702. Mark N 1995 Exchange rates and fundamentals: Evidence on long-horizon predictability *American Economic Review* **85** pp 201 – 218.
703. Mark N, Wu Y 1998 Rethinking deviations from uncovered interest parity: The role of covariance risk and noise *Economic Journal* **108** pp 1686 – 1706.
704. Mark N 2001 International macroeconomics and finance *Blackwell Publishers* Oxford UK.
705. Mark N 2009 Changing monetary policy rules, learning, and real exchange rate dynamics *Journal of Money, Credit and Banking*.
706. Obstfeld M, Rogoff K 1995 Exchange rate dynamics redux *Journal of Political Economy* **103** pp 624-660.
707. Obstfeld M, Rogoff K (August) 1998 Risk and exchange rates *NBER Working Paper 6694* in Contemporary economic policy: Essays in honor of Assaf Razin; Helpman E, Sadka E (editors) *Cambridge University Press* Cambridge UK.
708. Osler C L 1995 Exchange rate dynamics and speculator horizon *Journal of International Money and Finance* **14** (5) pp 695 – 720.
709. Osler C L 1998 Short-term speculators and the puzzling behavior of exchange rates *Journal of International Economics* **45** pp 37 – 57.
710. Carlson J A, Osler C L (March) 1999 Determinants of currency risk premiums *Federal Reserve Bank of New York Staff Reports Series* no 70.
711. Kevin C P H, Osler C L 1999 Methodical madness: Technical analysis and the irrationality of exchange-rate forecasts *Economic Journal* **109** (458) pp 636 – 661.
712. Osler C L 2000 Support for resistance: Technical analysis and intraday exchange rates *Federal Reserve Bank of New York Economic Policy Review* **6** (2) pp 53 – 68.

713. Osler C L 2003 Currency orders and exchange-rate dynamics: Explaining the success of technical analysis *Journal of Finance* **58** (5) pp 1791 – 1819.
714. Osler C L 2005 Stop-loss orders and price cascades in currency markets *Journal of International Money and Finance* **24** (2) pp 219 – 241.
715. Carlson A J, Osler C L 2005 Short-run exchange rate dynamics: Theory and evidence.
716. Osler C L 2006 Macro lessons from microstructure *International Journal of Finance and Economics* **11** (1) pp 55 – 80.
717. Osler C L 2008 Foreign exchange microstructure: A survey in Springer encyclopedia of complexity and system science *Springer* Germany.
718. Osler C L 2009 Market microstructure, foreign exchange in Encyclopedia of complexity and system science Meyers R A (ed.) *Springer* pp 5404 – 5438.
719. Osler C L, Vandrovych V 2009 Hedge funds and the origins of private information in currency markets *Typescript* Brandeis University.
720. Osler C L, Yusim R 2009 Intraday dynamics of foreign-exchange spreads *Typescript* Brandeis University.
721. Osler C L, Mende A, Menkhoff L 2011 Price discovery in currency markets *Journal of International Money and Finance* **30** (8) pp 1696 – 1718.
722. Osler C L, Savaser T 2011 Extreme returns: The case of currencies *Journal of Banking and Finance* **35** (11) pp 2868 – 2880.
723. Dahl Ch, Carlson J A, Osler C L 2011 Short-run exchange-rate dynamics: Theory and evidence *Research Paper* Brandeis University.
724. Osler C L 2012 Currency market microstructure, the carry trade, and technical trading *Annual Review of Financial Economics* **4** (1).
725. Peiers B (October) 1995 Informed traders, intervention, and price leadership: A deeper view of the microstructure of the foreign exchange market *University California Los Angeles* California USA.
726. Prasad A M, Rajan M 1995 The role of exchange and interest risk in equity valuation: A comparative study of international stock markets *Journal of Economics and Business* **47** (5) pp 457 – 472.
727. Schnidrig R, Würtz D (March) 1995 Investigation of the volatility and autocorrelation function of the USD/DEM exchange rate on operational time scales *Proceedings of the First International Conference on High Frequency Data in Finance* (HFDF-1) vol **3** *Research Institute for Applied Economics Olsen & Associates* Zürich Switzerland.

728. Schwartz R (editor) 1995 Global equity markets: Technological, competitive, and regulatory challenges *Irwin* Homewood Illinois USA.
729. Shyy G, Lee J 1995 Price transmission and information asymmetry in bund futures markets: LIFFE vs DTB *Journal of Futures Markets* **15** pp 87 – 99.
730. Shyy G, Vijayraghavan V, Scott-Quinn B 1996 A further investigation of the lead-lag relationship between the cash market and stock index futures market with the use of bid/ask quotes: The case of France *Journal of Futures Markets* **16** pp 405 – 420.
731. Vivex X 1995 The speed of information revelation in a financial market mechanism *Journal of Economic Theory* **67** pp 178 – 204.
732. Zaheer A, Zaheer S (December) 1995 Catching the wave: Alertness, responsiveness, and market influence in global electronic networks *Typescript* University of Minnesota USA.
733. Bonser – Neal C, Tanner G 1996 Central bank intervention and volatility of foreign exchange rates: Evidence from options market *Journal of International Money and Finance* vol **15** pp 853 – 878.
734. Claassen E M 1996 Global monetary economics *Oxford University Press* Oxford UK.
735. Danker D, Haas R A, Henderson D W, Symanski S, Tryon R W 1996 Small empirical models of exchange market intervention: Applications to Germany, Japan, and Canada *Journal of Policy Modeling* **9**.
736. Dukas S P, Fatemi A M, Tavakkol A 1996 Foreign exchange rate exposure and the pricing of exchange rate risk *Global Finance Journal* **7** (2) pp 169 – 189.
737. Dwyer G, Locke P, Yu W 1996 Index arbitrage and nonlinear dynamics between the S&P 500 futures and cash *Review of Financial Studies* **9** (1) pp 301 – 332.
738. Easley D, Kiefer N, O'Hara M, Paperman J 1996 Liquidity, information and infrequently traded stocks *Journal of Finance* **51** pp 1405 – 1436.
739. Easley D, Kiefer N, O'Hara M 1997a The information content of the trading process *Journal of Empirical Finance* **4** pp 159 – 185.
740. Easley D, Kiefer N, O'Hara M 1997b One day in the life of a very common stock *Review of Financial Studies*.
741. Easley D, O'Hara M, Srinivas P S 1998 Option volume and stock prices: Evidence on where informed traders trade *Journal of Finance* **53** pp 431 – 465.
742. Flemming J, Ostdiek B, Whaley R 1996 Trading costs and the relative rates of price discovery in stocks, futures and options markets *Journal of Futures Markets* **16** pp 353 – 387.

743. Gagnon J E 1996 Net foreign assets and equilibrium exchange rates: Panel evidence *Board of Governors of the Federal Reserve System International Finance Discussion Papers* 574 USA.
744. Ghashghaie S, Breymann W, Peinke J, Talkner P, Dodge Y (June) 1996 Turbulent cascades in foreign exchange markets *Nature* **381** (27) pp 767 – 770.
745. Hsieh D, Kleidon A 1996 Bid-ask spreads in foreign exchange markets: Implications for models of asymmetric information in *The Microstructure of foreign exchange markets* Frankel J A, Galli G, Giovannini A (editors) *University of Chicago Press* Chicago pp 41 – 65.
746. Ingersoll J E Jr 1996 Valuing foreign exchange rate derivatives with a bounded exchange process *Review of Derivatives Research* **1** pp 159 – 181.
747. Kaminsky G, Lewis K 1996 Does foreign exchange intervention signal future monetary policy? *Journal Of Monetary Economics* **37** pp 285 – 312.
748. LeBaron B (March) 1996 Technical trading rule, profitability and foreign exchange intervention *Working Paper 5505* NBER USA pp 1 – 18.
749. MacDonald R, Marsh I W 1996 Currency forecasters are heterogeneous: Confirmation and consequences *Journal of International Money and Finance* **15** (5) pp 665 – 685.
750. Madrigal V 1996 Non-fundamental speculation *Journal of Finance* **51** pp 553 – 578.
751. Pirrong C 1996 Market liquidity and depth on computerized and open outcry trading systems: A comparison of DTB and LIFFE bund contracts *Journal of Futures Markets* **16** pp 519 – 543.
752. Rosenberg M 1996 Currency forecasting: A guide to fundamental and technical models of exchange rate determination *Irwin Professional Publishing* Chicago USA.
753. Tsang Sh-K 1996 A study of the linked exchange rate system and policy options for Hong Kong *Hong Kong Policy Research Institute* Hong Kong P R China.
754. Tsang Sh-K 1998 The case for adopting the convertible reserves system in Hong Kong *Pacific Economic Review* **3** pp 265 – 275.
755. Tsang Sh-K, Sin Ch-Y, Cheng Y-Sh 1999 The robustness of Hong Kong's linked exchange rate system as a currency board arrangement *The 54th European Meeting of the Econometric Society* Hong Kong P R China.
756. Tsang Sh-K 1999a A study of the linked exchange rate system and policy options for Hong Kong *Hong Kong Policy Research Institute Ltd* Hong Kong P R China.
757. Tsang Sh-K 1999b Fixing the exchange rate through a currency board arrangement: Efficiency risk, systemic risk and exit cost *Asian Economic Journal* **13** pp 239 – 266.

758. Tsang Sh-K, Yue Ma 2002 Currency substitution and speculative attacks on a currency board system *Journal of International Money and Finance* **21** (1) pp 53 – 78.
759. Vermeiren D, Ková T Z 1996 Foreign exchange risk management and auditing *Basic Documentation Version 1.0a* Prague CNB – Banking Supervision 1996.
760. Balke N, Fomby T 1997 Threshold cointegration *International Economic Review* **38** pp 627 – 646.
761. Balke N, Wohar M 1998 Nonlinear dynamics and covered interest rate parity *Empirical Economics* **23** pp 535 – 559.
762. Bhattacharya U, Weller P 1997 The advantage to hiding one's hand: Speculation and central bank intervention in the foreign exchange market *Journal of Monetary Economics* **39** pp 251 – 277.
763. Campbell J Y, Lo A W, MacKinlay A C 1997 The econometrics of financial markets *Princeton University Press* Princeton New Jersey USA.
764. Campbell J Y, Viceira L 2002 Strategic asset allocation: Portfolio choice for long term investors *Clarendon Lectures in Economics Oxford University Press* Oxford UK.
765. Chamberlain S, Howe J S, Popper H 1997 The exchange rate exposure of US and Japanese banking institution *Journal of Banking and Finance* **21** (6) pp 871 – 892.
766. Clarida R H, Taylor M P 1997 The term structure of forward exchange premiums and the forecastability of spot exchange rates: Correcting the errors *Review of Economics and Statistics* **79** pp 353 – 361.
767. Clarida R H, Sarno L, Taylor M P, Valente G 2003 The out-of-sample success of term structure models as exchange rate predictors: A step beyond *Journal of International Economics* **60** pp 61 – 83.
768. Copejans M, Domowitz I 1997 The performance of an automated trading market in an illiquid environment *Working Paper* Duke University, Northwestern University USA.
769. DeGennaro R, Shrieves R 1997 Public information releases, private information arrival, and volatility in the foreign exchange market *Journal of Empirical Finance* **4** pp 295 – 315.
770. Dewachter H 1997 Sign predictions of exchange rate changes: Charts as proxies for Bayesian inferences *Review of World Economics* **133** (1) pp 39 – 55.
771. Dewachter H 2001 Can Markov switching models replicate chartist profits in the foreign exchange market? *Journal of International Money and Finance* **20** pp 25 – 41.
772. Dewachter H, Lyrio M 2005 The economic value of technical trading rules: A nonparametric utility-based approach *International Journal of Finance and Economics* **10** pp 41 – 62.

773. Embrechts P, Klueppelberg C, Mikosch T 1997 Modeling external events for insurance and finance *Springer - Verlag* Berlin Germany.
774. Evans M D D (November) 1997 The microstructure of foreign exchange dynamics *Typescript* Georgetown University USA.
775. Evans M D D, Lyons R K 1999, (February) 2002a Order flow and exchange rate dynamics *Typescript* UC Berkeley, *Journal of Political Economy* **110** (1) pp 170 – 180.
776. Evans M D D, Lyons R K 2001a Why order flow explains exchange rates *Unpublished Manuscript* University California Berkeley USA.
777. Evans M D D, Lyons R K (July) 2001b Portfolio balance, price impact, and secret intervention *NBER Working Paper 8356* NBER USA.
778. Evans M D D (February) 2001c, 2002b FX trading and exchange rate dynamics *NBER Working Paper 8116*; *Journal of Finance* **57** (6) pp 2405 – 2447.
779. Evans M D D, Lyons R K (July) 2002c Time-varying liquidity in foreign exchange *Journal of Monetary Economics Elsevier* **49** (5) pp 1025 – 1051.
780. Evans M D D, Lyons R K (November) 2002d Informational integration and FX Trading *Journal of International Money and Finance* **21** (6) pp 807 – 831.
781. Evans M D D, Lyons R K (January) 2003 How is macro news transmitted to exchange rates? *NBER Working Paper 9433* National Bureau of Economic Research Inc USA.
782. Cao H, Evans M, Lyons R (August) 2003 Inventory information *NBER Working Paper 9893* NBER USA <http://www.nber.org/papers/w9893>, *Journal of Business*, USA.
783. Evans M D D, Lyons R K (March) 2004a A new micro model of exchange rate dynamics *NBER Working Papers 10379* National Bureau of Economic Research Inc USA <http://www.nber.org/papers/w10379> .
784. Evans M D D, Lyons R K 2004b, 2007 Exchange rate fundamentals and order flow *Working Papers gueconwpa~05-05-03* Department of Economics Georgetown University; *Working Paper 13151* National Bureau of Economic Research Cambridge MA USA <http://www.nber.org/papers/w13151> .
785. Evans M D D, Lyons R K 2005a Meese-Rogoff redux: Micro-based exchange-rate forecasting *NBER Working Paper 11042* National Bureau of Economic Research <http://www.nber.org/papers/w11042>, *American Economic Review Papers and Proceedings* **95** (2) pp 405 – 414.
786. Evans M D D, Lyons R K 2005b Do currency markets absorb news quickly? *Working Paper 11041* NBE USA pp 1 – 25, *Journal of International Money and Finance* **24** (2) pp 197 – 217.

787. Evans M D D, Lyons R 2005c Are different-currency assets imperfect substitutes? *in* Exchange rate economics: Where do we stand? DeGrauwe P (editor) *MIT Press* Cambridge USA.
788. Evans M D D, Lyon R K 2005d, 2006 Understanding order flow NBER Working Paper 11748 NBER USA <http://www.nber.org/papers/w11748>, *International Journal of Finance & Economics John Wiley & Sons Inc* **11** (1) pp 3 – 23.
789. Evans M D D 2005 Where are we know? Real-time estimates of the macroeconomy *International Journal of Central Banking* **1** (6) pp 127 – 175.
790. Evans M D D, Hnatkovska V 2005 International capital flows, returns and world financial integration *NBER Working Paper* NBER USA.
791. Evans M D D, Lyons R K 2008 How is macro news transmitted to exchange rates? *Journal of Financial Economics* **88** (1) pp 26 – 50.
792. Evans M D D, Lyons R K 2009 Forecasting exchange rate fundamentals with order flow *Working Paper* Georgetown University USA.
793. Evans M D D 2010 Order flows and the exchange rate disconnect puzzle *Journal of International Economics* **80** (1) pp 58 – 71.
794. Evans M D D 2011 Exchange-rate dynamics *Princeton University Press* USA.
795. Fleming M, Remolona E 1997 What moves the bond market? *Federal Reserve Bank of New York Economic Policy Review* **3** pp 31 – 50.
796. Fleming M, Remolona E 1999 Price formation and liquidity in the US treasury market *Journal of Finance* **54** pp 1901 – 1915.
797. Fleming M (September) 2002 Price discovery in the US treasury market: The impact of order flow and liquidity on the yield curve *Typescript* New York Federal Reserve Bank New York USA.
798. Fleming M 2003 Measuring treasury market liquidity *Federal Reserve Bank of New York Economic Policy Review* **9** pp 83 – 108.
799. Franke G, Hess D 1997, 2000 Information diffusion in electronic and floor trading *Working Paper* Universität Konstanz Germany, *Journal of Empirical Finance* **7** (5) pp 455 – 478.
800. Goldberg L, Tenorio R 1997 Strategic trading in a two-sided foreign exchange auction *Journal of International Economics* **42** pp 299 – 326.
801. Gosh A R, Ostry J D, Gulde A M, Wolf H C 1997 Does the exchange rate regime matter for inflation and growth? *IMF* Washington USA <http://www.imf.org> .

802. Harris J, Schultz P 1997 The importance of firm quotes and rapid executions: Evidence from the January 1994 SOES rule change *Journal of Financial Economics* **45** pp 135 – 166.
803. Hartmann P 1997 The currency denomination of international trade after European Monetary Union *Typescript* European Central Bank.
804. Hartmann Ph 1998 Do Reuters spreads reflect currencies' differences in global trading activity? *Journal of International Money and Finance* **17** (5) pp 757 – 784.
805. Hartmann P 1998 Currency competition and foreign exchange markets: The dollar, the yen, and the euro *Cambridge University Press* Cambridge UK.
806. Hartmann P 1999 Trading volumes and transaction costs in the foreign exchange market: Evidence from daily dollar-yen spot data *Journal of Banking and Finance* **23** pp 801 – 824.
807. Hung J 1997 Intervention strategies and exchange rate volatility: A noise trading perspective *Journal of International Money and Finance* **16** (5) pp 779 – 793.
808. Kirilenko A 1997 Endogenous trading arrangements in emerging foreign exchange markets *Typescript* International Monetary Fund USA.
809. Lamoureux C, Schnitzlein C 1997 When it's not the only game in town: The effect of bilateral search on the quality of a dealer market *Journal of Finance* **52** pp 683 – 712.
810. Madhavan A, Smidt S 1991 A Bayesian model of intraday specialist pricing *Journal of Financial Economics* **30** pp 99 – 134.
811. Madhavan A, Smidt S 1993 An analysis of changes in specialist inventories and quotations *Journal of Finance* **48** (5) pp 1595 – 1628.
812. Leach J, Madhavan A 1993 Price experimentation and security market structure *Review of Financial Studies* **6** pp 375 – 404.
813. Keim D, Madhavan A 1996 The upstairs market for large-block transactions: Analysis and measurement of price effects *Review of Financial Studies* **9** pp 1 – 36.
814. Madhavan A, Cheng M 1997 In search of liquidity: Block trades in the upstairs and downstairs market *Review of Financial Studies* **10** pp 175 – 203.
815. Madhavan A, Richardson M, Roomans M 1997 Why do security prices change? A transaction-level analysis of NYSE stocks *Review of Financial Studies* **10** pp 1035 – 1064.
816. Madhavan A, Sofianos G 1997 An empirical analysis of NYSE specialist trading *Journal of Financial Economics* **48** pp 189 – 210.
817. Madhavan A (March) 2000 Market microstructure: A survey *University of Southern California* USA.
818. Madhavan A 2000 Market microstructure: A survey *Journal of Financial Markets* **3** pp 205 – 258.

819. Madhavan A (October) 2000 In search of liquidity in the internet era *9th Annual Financial Markets Conference of the Federal Reserve Bank of Atlanta USA*.
820. Martens M 1997 Interaction between financial markets *Tinbergen Institute Research Series no 139* Rotterdam The Netherlands.
821. Montiel P J 1997 Exchange rate policy and macroeconomic management tin ASEAN countries in macroeconomic issues facing ASEAN countries *International Monetary Fund* Washington USA.
822. Pagano M, Roell A 1997 Front running: Market professionals as quasi-insiders *Typescript* Tilburg University.
823. Peiers B 1997 Informed traders, intervention, and price leadership: A deeper view of the microstructure of the foreign exchange market *Journal of Finance* **52** pp 1589 – 1614.
824. Reiss P, Werner I (February) 1997 Interdealer trading: Evidence from London *Stanford Graduate School of Business Research Paper no 1430* University of Stanford California USA.
825. Sweeney R J 1997 Do central banks lose on foreign exchange intervention? A review article *Journal of Banking & Finance* **21** pp 1667 – 1684.
826. Sweeney R J 2000 Does the Fed beat the foreign exchange market? *Journal of Banking & Finance* **24** pp 665 – 694.
827. Szakmary A, Mathur I 1997 Central bank intervention and trading rule profits in foreign exchange markets *Journal of International Money and Finance* **16** pp 513 – 535.
828. Vogler K 1997 Risk allocation and interdealer trading *European Economic Review* **41** pp 417 – 441.
829. Wei S, Kim J (November) 1997 The big players in the foreign exchange market: Do they trade on information or noise? *NBER Working Paper 6256* NBER USA.
830. Werner I (September) 1997 A double auction model of interdealer trading *Research Paper no 1454* Stanford University California USA.
831. Wren-Lewis S (July) 1997 The choice of exchange rate regime *Economic Journal*.
832. Abhyankar A H 1998 Linear and nonlinear Granger causality: Evidence from the UK stock index futures market *Journal of Futures Markets* **18** (5) pp 519 – 540.
833. Abrams R K, Beato P 1998 The prudential regulation and management of foreign exchange risk *International Monetary Fund* Washington DC USA.
834. Anthony M, MacDonald R 1998 On the mean reverting properties of target zone exchange rates: Some evidence from the ERM *European Economic Review* **42** pp 1493 – 1523.

835. Anthony M, MacDonald R 1999 The width of the band and exchange rate mean reversion: Some further ERM-Based Results *Journal of International Money and Finance* **18** pp 411 – 428.
836. Bjønnes G H, Rime D (December) 1998 FX trading ... live: Impact of new trading environments *Typescript* Norwegian School of Management University of Oslo Norway.
837. Bjønnes G H, Rime D (March) 2001 FX trading live! Dealer behavior and trading systems in foreign exchange markets *Typescript* Norwegian School of Management University of Oslo Norway www.uio.no/~dagfinri .
838. Bjønnes G H, Rime D 2005 Dealer behavior and trading systems in foreign exchange markets *Journal of Financial Economics* **75** (3) pp 571 – 605.
839. Bjønnes G H, Rime D, Solheim H O A 2005 Liquidity provision in the overnight foreign exchange market *Journal of International Money and Finance* **24** (2) pp 177 – 198.
840. Bjønnes G H, Osler C, Rime D (September 15) 2007 Asymmetric information in the interbank foreign exchange market *3rd Annual Conference on Market Microstructure* Budapest Hungary.
841. Bjønnes G H, Osler C L, Rime D 2011 Sources of information advantage in the foreign exchange market *Working Paper* Norges Bank Norway.
842. Blennerhasset M, Bowman R G 1998 A change in market microstructure: The switch to electronic screen trading on the New Zealand stock exchange *Journal of International Financial Markets, Institutions and Money* **8** pp 261 – 276.
843. Bodnar G, Hayt G, Marston R 1998 Wharton survey of financial risk management by US non-financial firms *Financial Management* **27** (4) pp 70 – 91.
844. Caramazza F, Aziz J 1998 Fixed or flexible? Getting the exchange rate right in the 1990s *IMF* Washington USA <http://www.imf.org> .
845. Chang Y, Taylor S 1998 Intraday effects of foreign exchange intervention by the Bank of Japan *Journal of International Money and Finance* **18** pp 191 – 210.
846. Choi J J, Hiraki T, Takezawa N 1998 Is foreign exchange risk priced in the Japanese stock market *Journal of Financial and Quantitative Analysis* **33** pp 361 – 382.
847. Chow E H, Chen H L 1998 The determinants of foreign exchange rate exposure: Evidence on Japanese firms *Pacific-Basin Finance Journal* **6** (1/2) pp 153 – 174.
848. Clark P B, Macdonald R 1998 Exchange rates and economic fundamentals: A methodological comparison of BEERS and FEERS *IMF Working Paper WP/98/67* IMF USA.

849. Covrig V, Melvin M 1998, 2002 Asymmetric information and price discovery in the FX market: Does Tokyo know more about the yen? *Typescript* Arizona State University, *Journal of Empirical Finance* **9** pp 271 – 285.
850. Eddelbuttel D, McCurdy T 1998 The impact of news on foreign exchange rates: Evidence from high frequency data *Typescript* University of Toronto Canada.
851. Edison H (February) 1998 On foreign exchange intervention: An assessment of the US experience *Typescript* Board of Governors of the Federal Reserve System USA.
852. Fleming J, Kirby C, Ostdiek B 1998 Information and volatility linkages in the stock, bond, and money markets *Journal of Financial Economics* **49** pp 111 – 137.
853. Garfinkel J, Nimalendran M 1998 Market structure and trader anonymity: An analysis of insider trading *Working Paper* Loyola University of Chicago University of Florida USA.
854. George E 1998 Exchange rates: An intractable aspect of monetary policy *Bank of England Quarterly Bulletin* (May 1998) **38** no 2.
855. Hansch O, Naik N, Viswanathan S 1998 Do inventories matter in dealership markets? Evidence from the London stock exchange *Journal of Finance* **53** pp 1623 – 1656.
856. Hau H 1998 Competitive entry and endogenous risk in the foreign exchange market *Review of Financial Studies* **11** pp 757 – 788.
857. Hau H, Killeen W, Moore M (July) 2000, 2002a The Euro as an international currency: Explaining puzzling first evidence from the foreign exchange markets *CEPR Discussion Paper no 2510* CEPR, *Journal of International Money and Finance* **21** (3) pp 351 – 383.
858. Hau H, Killeen W, Moore M (April) 2002b Euro's forex role: How has the Euro changed the foreign exchange market? *Economic Policy* pp 151 – 191.
859. Hau H, Rey H (December) 2002 Exchange rates, equity prices, and capital flows *NBER Working Paper 9398* NBER USA.
860. Hau H, Rey H 2003 Can portfolio rebalancing explain the dynamics of equity returns, equity flows, and exchange rates? *American Economic Review*.
861. He J, Ng L K 1998 The foreign exchange exposure of Japanese multinational corporations *Journal of Finance* **53** (2) pp 733 – 753.
862. Helpman E, Sadka E (editors) 1998 Contemporary economic policy: Essays in honor of Assaf Razin *Cambridge University Press* Cambridge U.K.
863. Hong Kong Monetary Authority 1998 Strengthening of currency board arrangements in Hong Kong *Quarterly Bulletin November* pp 1 – 5.
864. Isard P, Faruqee H 1998 Exchange rate assessment: Extensions of the macroeconomic balance approach *IMF Occasional Paper no 167* IMF Washington USA.

- 865.** Isard P, Faruquee H, Kincaid G R, Fetherston M 2001 Methodology for current account and exchange rate assessments *IMF Occasional Paper no 209* International Monetary Fund Washington USA.
- 866.** Kanas A 1998 Testing for a unit root in ERM exchange rates in the presence of structural breaks: Evidence from the boot-strap *Applied Economics Letters* **5** pp 407 – 410.
- 867.** Lee R 1998 What is an exchange? The automation, management and regulation of financial markets *Oxford University Press* Oxford UK.
- 868.** Litterman R, Winkelmann K (January) 1998 Estimating covariance matrices *Goldman Sachs Risk Management Series*.
- 869.** Lui Y - H, Mole D 1998 The use of fundamental and technical analyses by foreign exchange dealers: Hong Kong evidence *Journal of International Money and Finance* **17** pp 535 – 545.
- 870.** Menkhoff L 1998 The noise trading approach — Questionnaire evidence from foreign exchange *Journal of International Money and Finance* **17** pp 547 – 564.
- 871.** Gehrig Th, Menkhoff L 2000, 2004 The use of flow analysis in foreign exchange: Exploratory evidence *Typescript* Department of Economics University of Freiburg Germany, *Journal of International Money and Finance* **23** (4) pp 573 – 594.
- 872.** Mende A, Menkhoff L (March) 2003 Different counterparties, different foreign exchange trading? The perspective of a median bank.
- 873.** Mende A, Menkhoff L 2006 Profits and speculation in intra-day foreign exchange trading *Journal of Financial Markets* **9** (3) pp 223 – 245.
- 874.** Menkhoff L, Taylor M P 2007 The obstinate passion of foreign exchange professionals: Technical analysis, *Warwick Economic Research Papers no 769* Department Of Economics The University of Warwick UK pp 1 – 61, *Journal of Economic Literature* **45** (4) pp 936 – 972.
- 875.** Frömmel M, Mende A, Menkhoff L 2008 Order flows, news, and exchange rate volatility *Journal of International Money and Finance* **27** (6) pp 994 – 1012.
- 876.** Menkhoff L, Schmeling M 2008 Local information in foreign exchange markets *Journal of International Money and Finance* **27** (8) pp 1383 – 1406.
- 877.** Menkhoff L, Osler C L, Schmeling M (May 11) 2010 Limit-order submission strategies under asymmetric information *CESIFO Working Paper no 3054* Category 7: Monetary Policy and International Finance Department of Economics Leibniz University Hannover Germany pp 1 – 42.

878. Menkhoff L 2010 High-frequency analysis of foreign exchange interventions: What do we learn? *Journal of Economic Surveys* **24** (1) pp 85 – 112.
879. Menkhoff L, Schmeling M 2010 Trader see, trader do: How do (small) FX traders react to large counterparties' trades? *Journal of International Money and Finance*.
880. Miller K D, Reuer J J 1998 Asymmetric corporate exposures to foreign exchange rate changes *Strategic Management Journal* **19** (12) pp 1183 – 1191.
881. Miville M, DiMillo J 1998 Survey of the Canadian foreign exchange and derivatives markets *Bank of Canada Review Winter 1995-1996* Financial Markets Department Bank of Canada Ottawa Canada.
882. Nagayasu J 1998 Japanese effective exchange rates and determinants: Prices, real interest rates, and actual and optimal current accounts *IMF Working Paper WP/98/86* IMF USA.
883. Neely Ch 1998 Technical analysis and the profitability of US foreign exchange intervention *Federal Reserve Bank of St Louis Review* **80** pp 3 – 17.
884. Neely Ch J 2000a The practice of central bank intervention: Looking under the hood *Central Banking* **XI** pp 24 – 37.
885. Neely Ch J 2000b Are changes in foreign exchange reserves well correlated with official intervention? *Economic Review of the Federal Reserve Bank of St Louis September/October* pp 17 – 30.
886. Neely C J 2004 Forecasting foreign exchange volatility: Why is implied volatility biased and inefficient? And does it matter? *Working Paper 2002-017D* Federal Reserve Bank of St Louis MO USA.
887. Neely Ch J 2005 An analysis of recent studies of the effect of foreign exchange intervention *Federal Reserve Bank of St Louis Review November/December* **87** (6) pp 685 – 717.
888. Pesaran M, Hasem P M, Smith R P 1998 Structural analysis of co-integrating VARs *Journal of Economic Survey* **12** (5) pp 471 – 505.
889. Portes R, Rey H 1998 The emergence of the Euro as an international currency *Economic Policy* **26** pp 307 – 332.
890. Rey H 2001 International trade and currency exchange *Review of Economic Studies* **68** pp 443 – 464.
891. Reiss P, Werner I 1998 Does risk sharing motivate interdealer trading? *Journal of Finance* **53** pp 1657 – 1704.
892. Sarkar A, Tozzi M (January) 1998 Electronic trading on futures exchanges *Current Issues in Economics and Finance* Federal Reserve Bank of New York **4** (1).

- 893.** Viswanathan S, Wang J 1998 Why is interdealer trade so pervasive in financial markets? *Working Paper* Duke University North Carolina USA.
- 894.** Viswanathan S, Wang J D 2000 Inter-dealer trading in financial markets *Working Paper* Duke University Durham North Carolina USA.
- 895.** Vitale P 1998 Two months in the life of several gilt-edged market makers on the London Stock Exchange *Journal of International Financial Markets, Institutions, & Money* **8** pp 301 – 326.
- 896.** Vitale P 1999 Sterilized central bank intervention in the foreign exchange market *Journal of International Economics* **49** pp 245 – 267.
- 897.** Vitale P 2000 Speculative noise trading and manipulation in the foreign exchange market *Journal of International Money and Finance* **19** pp 689 – 712.
- 898.** Vitale P 2003 Foreign exchange intervention: How to signal policy objectives and stabilize the economy *Journal of Monetary Economics* **50** pp 841 – 870.
- 899.** Vitale P 2004 A guided tour of the market microstructure approach to exchange rate determination *CEPR Working Paper 4530*.
- 900.** Vitale P 2006 A market microstructure analysis of foreign exchange intervention *Working Paper series no 629 / MAY 2006* European Central Bank Frankfurt am Main Germany ISSN 1561-0810 (print) ISSN 1725-2806 (online) pp 1 - 59 http://ssrn.com/abstract_id=902528 <http://www.ecb.int> .
- 901.** Yao J 1998 Market making in the interbank foreign exchange market *Salomon Center Working Paper #S-98-4* New York University NY USA.
- 902.** Alberola E, Cervero S G, Lopez H, Ubide A 1999 Global equilibrium exchange rates: Euro, Dollar, “ins”, “outs”, and other major currencies in a panel cointegration framework *IMF Working Paper WP/99/175* IMF USA.
- 903.** Bos Th, Fetherstone Th A (editors) 1999 Advances in pacific basin financial markets *JAI Press* Greenwich Connecticut USA.
- 904.** Carrera J 1999 Speculative attacks to currency target zones: A market microstructure approach *Journal of Empirical Finance* **6** pp 555 – 582.
- 905.** Chaboud A P, LeBaron B (July)1999 Foreign exchange market trading volume and Federal Reserve intervention *Typescript* Brandeis University, *Journal of Banking and Finance*.
- 906.** Chaboud A P, LeBaron B 2001 Foreign exchange market trading volume and Federal Reserve intervention *Journal of Futures Markets* **21** pp 851 – 860.

- 907.** Chaboud A P, Humpage O (January) 2005 An assessment of the impact of Japanese foreign exchange intervention: 1991-2004 *International Finance Discussion Paper 824* Board of Governors of the Federal Reserve System USA.
- 908.** Chaboud A P, Chernenko S, Wright J 2008 Trading activity and macroeconomic announcements in high-frequency exchange rate data *Journal of the European Economic Association* **6** pp 589 – 596.
- 909.** Chaboud A P, Chiquoine B, Hjalmarsson E, Vega C 2009 Rise of the machines: Algorithmic trading in the foreign exchange market *International Finance Discussion Papers* 980 Federal Reserve Board of Governors USA.
- 910.** Chaboud A P, Chiquoine B, Hjalmarsson E, Loretan M 2009 Frequency of observation and the estimation of integrated volatility in deep and liquid financial markets *Federal Reserve Board of Governors USA*.
- 911.** Fiess N, MacDonald R 1999 Technical analysis in the foreign exchange market: A cointegration-based approach *Multinational Finance Journal* **3** (3) pp 147 – 172.
- 912.** Fiess N, MacDonald R 2002 Towards the fundamentals of technical analysis: Analyzing the information content of high, low and close prices *Economic Modelling* **19** (3) pp 353 – 374.
- 913.** Fleming M, Lopez J 1999 Heat waves, meteor showers, and trading volume: An analysis of volatility spillovers in the US Treasury market *Federal Reserve Bank of New York Staff Reports #82* NY USA.
- 914.** Freihube Th, Kehr C-H, J. Krahen J, Theissen E 1999 Was leisten die kursmakler? Eine empirische untersuchung am beispiel der Frankfurter wertpapierbörse *Kredit und Kapital* **32** pp 426 – 460.
- 915.** Grammig J, Schiereck D, Theissen E 1999 Informationsbasierter aktienhandel über *IBIS Working Paper* Johann Wolfgang Goethe-Universität Frankfurt *Zeitschrift für betriebswirtschaftliche Forschung* Germany.
- 916.** Isard P, Razin A, Rose A (editors) 1999 *IMF and Kluwer* The Netherlands.
- 917.** Jeanne O, Rose A (April) 1999 Noise trading and exchange rate regimes *NBER Working Paper #7104* NBER USA, *Quarterly Journal of Economics*.
- 918.** Kandel E, Marx L 1999 Payments for order flow on Nasdaq *Journal of Finance* **54** pp 35 – 66.
- 919.** LeBaron B 1999 Technical trading rule profitability and foreign exchange intervention *Journal of International Economics* **49** pp 125 – 214.

- 920.** Marks J 1999 The impact of the internet on users and suppliers of financial services *Brookings-Wharton Papers on Financial Services* pp 147 – 185.
- 921.** Macey J, O’Hara M 1999 Globalization, exchange governance and the future of exchanges *Brookings-Wharton Papers on Financial Services* pp 1 – 32.
- 922.** Naik N Y, Neuberger A, Viswanathan S 1999 Trade disclosure regulation in markets with negotiated trades *Review of Financial Studies* **12** (4) pp 873 – 900.
- 923.** Naik N Y, Yadav P 1999 The effects of market reform on trading costs of public investors: Evidence from the London stock exchange *Working Paper* London Business School and University of Strathclyde UK.
- 924.** Payne R (January) 1999, 2003 Informed trade in spot foreign exchange markets: An empirical investigation *Typescript* London School of Economics and Political Science London UK, *Journal of International Economics* **61** (2) pp 307 – 329.
- 925.** Payne R, Vitale P 2003, A transaction level study of the effects of central bank intervention on exchange rates *Journal of International Economics* **61** pp 331 – 352.
- 926.** Moore M J, Payne R 2011 On the sources of private information in FX markets *Journal of Banking and Finance* **35** (5) pp 1250 – 1262.
- 927.** Love R, Payne R 2004, 2008 Macroeconomic news, order flows, and exchange rates *Typescript* London School of Economics and Political Science London UK, *Journal of Financial and Quantitative Analysis* **43** pp 467 – 488.
- 928.** Rigobon R (September) 1999 On the measurement of the international propagation of shocks *NBER Working Paper 7354* NBER USA.
- 929.** Saar G (July) 1999 Demand uncertainty and the information content of order flow *Typescript Johnson School* Cornell University NY USA.
- 930.** Scalia A, Vacca V (October) 1999 Does market transparency matter? A case study *Banca d’Italia Discussion Paper 359* Bank of Italy Rome Italy.
- 931.** Scalia A (August) 2004 Is foreign exchange intervention effective? Some micro-analytical evidence from Central Europe *Typescript* Bank of Italy Rome Italy.
- 932.** Scalia A 2008 Is foreign exchange intervention effective? Some micro-analytical evidence from the Czech Republic *Journal of International Money and Finance* **27** (4) pp 529 – 546.
- 933.** Shapiro C, Varian H 1999 Information rules *Harvard Business School Press* Harvard University USA.

- 934.** Theissen E 1999 Floor versus screen trading: Evidence from the German stock market *Département Finance et Economie Groupe HEC France, Johann Wolfgang Goethe-Universität Frankfurt/Main Frankfurt Germany* pp 1 – 37.
- 935.** Vayanos D 1999 Strategic trading and welfare in a dynamic market *Review of Economic Studies* **66** pp 219 – 234.
- 936.** Vayanos D 2001 Strategic trading in a dynamic noisy market *Journal of Finance* **56** pp 131 – 171.
- 937.** Wang J 1999 Asymmetric information and the bid-ask spread: An empirical comparison between automated order execution and open outcry auction *Journal of International Financial Markets, Institutions and Money* **9** pp 115 – 128.
- 938.** Aliber R Z, Chowdhry Bh, Yan Sh 2000 Transactions costs in the foreign exchange market *University Of Chicago, The Anderson Graduate School of Management UCLA, University of Arizona USA* <http://www.escholarship.org/uc/item/4qw3p6rp> .
- 939.** Ausloos M 2000 Statistical physics in foreign exchange currency and stock markets *Physica A* **285** pp 48 – 65.
- 940.** Baillie R, Humpage O, Osterberg W 2000 Intervention from an information perspective *Journal of International Financial Markets, Institutions and Money* **10** pp 407 – 421.
- 941.** Carlson J, Osler C 2000 Rational speculators and exchange rate volatility *European Economic Review* **44** pp 231 – 253.
- 942.** Carlson J (August) 2002 One minute in the life of the DM/\$: Public information in an electronic market *Typescript Purdue University USA*.
- 943.** Ebrahim S K 2000 Volatility transmission between foreign exchange and money markets *Working Paper 2000-16 Bank of Canada Ottawa Canada*.
- 944.** Eichengreen B, Mathieson D J 2000 The currency composition of foreign exchange reserves: Retrospect and prospect *IMF Working Paper 00/131 International Monetary Fund Washington DC USA*.
- 945.** Greenspan A (October) 2000 Remarks [on e-finance] *9th Annual Financial Markets Conference of the Federal Reserve Bank of Atlanta USA*.
- 946.** Hüfner F P 2000 The British foreign exchange reserves puzzle *ZEW Discussion Papers no 00-55 ZEW - Zentrum für Europäische Wirtschaftsforschung / Center for European Economic Research* <http://hdl.handle.net/10419/24403> .
- 947.** Fujiwara I (June) 2000 Liquidity and leverage risk in the Dollar/Yen market *Typescript Nuffield College Oxford UK*.

- 948.** Kanas A 2000 Volatility spillovers between stock returns and exchange rate changes: International evidence *Journal of Business Finance and Accounting* **27** pp 447 – 467.
- 949.** Kaul A, Mehrotra V, Morck R 2000 Demand curves for stock do slope down: New evidence from an index weights adjustment *Journal of Finance* **55** pp 893 – 912.
- 950.** Kim S-J, Kortian T, Sheen J 2000 Identifying central bank intervention and exchange rate volatility – Australian evidence *Journal of International Financial Markets Institutions and Money* vol **10** pp 381 – 405.
- 951.** Kim S-J, Sheen J 2002 The determinants of foreign exchange intervention by central banks: Evidence from Australia *Journal of International Money and Finance* vol **21** pp 619 – 649.
- 952.** Kim S-J 2003 Monetary policy, foreign exchange intervention, and the exchange rate in a unifying framework *Journal of International Economics* **60** pp 355 – 386.
- 953.** Lane Ph R, and Milesi-Ferretti G M 2000 The transfer problem revisited: Net foreign assets and real exchange rates *Hong Kong Institute for Monetary Research Working Paper 6/2000*.
- 954.** Lo Ch-K (editor) 2000 Financial markets in Hong Kong *Springer* Singapore.
- 955.** Lee C, Swaminathan B 2000 Price momentum and trading volume *The Journal of Finance* **55** pp 2017 – 2069.
- 956.** Ma Y, Kanas A 2000 Testing nonlinear relationship among fundamentals and exchange rates in the ERM *Journal of International Money and Finance* **19** (1) pp 135 – 152.
- 957.** Ma Y, Tsang Sh-K, Yiu M S, Wai-Yip Alex Ho 2010 A target-zone model with two types of assets *Working Paper* Hong Kong Institute for Monetary Research Hong Kong P R China.
- 958.** Martin A D 2000 Exchange rate exposure of the key financial institutions in the foreign exchange market *International Review of Economics and Finance* **9** (3) pp 267 – 286.
- 959.** Martin A D, Mauer L J 2003 Exchange rate exposures of US banks: A cash flow-based methodology *Journal of Banking and Finance* **27** (5) pp 851 – 865.
- 960.** Martin A D, Mauer L J 2005 A note on common methods used to estimate foreign exchange exposure *Journal of International Financial Markets, Institutions & Money* **15** (2) pp 125 – 140.
- 961.** McCallum B (April) 2000 Theoretical analysis regarding a zero lower bound on nominal interest rates *NBER Working Paper no 7677* NBER USA.
- 962.** Melvin M, Yin X 2000 Public information arrival, exchange rate volatility, and quote frequency *Economic Journal* **110** pp 644 – 661.

963. Melvin M, Melvin B P 2003 The global transmission of volatility in the foreign exchange market *The Review of Economics and Statistics* **85** pp 670 – 679.
964. Melvin M, Taylor M P 2009 The crisis in the foreign exchange market *Journal of International Money and Finance* **28** (8) pp 1317 – 1330.
965. Naranjo A, Nimalendran M 2000 Government intervention and adverse selection costs in foreign exchange markets *Review of Financial Studies* **13** pp 453 – 477.
966. Ng A 2000 Volatility spillover effects from Japan and the US to the Pacific-Basin *Journal of International Money and Finance* **19** pp 207 – 233.
967. Ramaswamy R, Samiei H (June) 2000 The Yen-Dollar rate: Have interventions mattered? *IMF Working Paper no 00/95* IMF USA.
968. Rime D (March) 2000 Private or public information in foreign exchange markets? An empirical analysis *Typescript* University of Oslo Norway www.uio.no/~dagfinri .
969. Rime D 2001 Private or public information in foreign exchange markets? An empirical analysis *Typescript Central Bank of Norway* Oslo Norway.
970. Rime D 2003 New electronic trading systems in the foreign exchange markets *in* New economy handbook Jones D C (editor) chap 21 *Academic Press* San Diego USA pp 471 – 504.
971. Akram Q, Rime D, Sarno L (February) 2005 Arbitrage in the foreign exchange market: Turning on the microscope *Working Paper no 2005/12* Norges Bank Norway.
972. Rime D, Sarno L, Sojli E 2006 Exchange rate dynamics and order flow: A step beyond *Typescript* Warwick University UK.
973. Rime D, Sarno L, Sojli E 2007 Exchange rate forecasting, order flow and macroeconomic information *Working Paper no 2* Norges Bank Norway.
974. Rime D, Sarno L, Sojli E 2010 Exchange rate forecasting, order flow and macroeconomic information *Journal of International Economics* **80** (1) pp 72 – 88.
975. Schwartz A J 2000 The rise and fall of foreign exchange market intervention *NBER Working Paper W7751* National Bureau of Economic Research Cambridge MA USA.
976. US General Accounting Office (May) 2000 On-line trading: Better investor protection information needed on brokers' web sites *US General Accounting Office* USA.
977. Allayannis G, Ofek E 2001 Exchange rate exposure, hedging, and the use of foreign currency derivatives *Journal of International Money and Finance* **20** pp 273 – 296.
978. Anderson H, Vahid F 2001 Market architecture and nonlinear dynamics of Australian stock and futures indices *Australian Economic Papers* **40** (4) pp 541 – 566.

- 979.** Brandt M W, Edelen R, Kavajecz K A 2001 Liquidity in the US treasury market: Asymmetric information and inventory effects *Manuscript* Department of Finance The Wharton School University of Pennsylvania USA.
- 980.** Brown G W 2001 Managing foreign exchange risk with derivatives *Journal of Financial Economics* **60** pp 401 – 448.
- 981.** Cai J, Cheung Y - L, Lee R S K, Melvin M 2001 Once-in-a-generation Yen volatility in 1998: Fundamentals, intervention, and order flow *Journal of International Money and Finance* **20** (3) pp 327 – 347.
- 982.** Claessens S, Forbes K 2001 International and financial contagion *Springer*.
- 983.** Clark T, McCracken M 2001 Evaluating long-horizon forecasts *Working Paper no 01-14* Federal Reserve Bank of Kansas City USA.
- 984.** Collins S, Rodrik D (editors) 2001 Brookings Trade Forum 2001 *Brookings Institution Press* Washington DC USA.
- 985.** Corsetti G, Pesenti P, Roubini N (May) 2001 Does one Soros make a difference? The role of a large trader in currency crises *NBER Working Paper 8303* NBER USA, *Review of Economic Studies*.
- 986.** Coval J D, Shumway T 2001 Is sound just noise? *The Journal of Finance* **56** pp 1887 – 1910.
- 987.** Croushore D, Stark T 2001 A real-time data set for macroeconomists *Journal of Econometrics* **105** pp 111 – 130.
- 988.** Dacorogna M M, Gencay R, Mueller U A, Olsen R B, Pictet O V 2001 An introduction to high-frequency finance *Academic Press* San Diego CA USA.
- 989.** D'Souza C (March) 2001 A market-microstructure analysis of FX intervention in Canada *Working Paper* Financial Markets Division Bank of Canada Ottawa Canada.
- 990.** Duarte M, Stockman A (July) 2001 Rational speculation and exchange rates *NBER Working Paper 8362* NBER USA.
- 991.** Fischer S 2001 Exchange rate regimes: Is the bipolar view correct? *Finance and Development* 2/2001 *IMF* Washington USA <http://www.imf.org>.
- 992.** Galati G 2001 Why has global FX turnover declined? Explaining the 2001 triennial survey *BIS Quarterly Review* (December) pp 39 – 47.
- 993.** Griffin J M, Stulz R M 2001 International competition and exchange rate shocks: A cross-country industry analysis of stock returns *Review of Financial Studies* **14** pp 215 – 241.
- 994.** Guembel A, Sussman O 2001 Optimal exchange rates: A market-microstructure approach *Typescript* Said Business School Oxford University Oxford UK.

- 995.** Hong Y 2001 A test for volatility spillover with application to exchange rates *Journal of Econometrics* **103** pp 183 – 224.
- 996.** Lane P 2001 The new open-economy macroeconomics: A survey *Journal of International Economics* **54** pp 235 – 266.
- 997.** Montgomery J D, Popper H A 2001 Information sharing and central bank intervention in the foreign exchange market *Journal of International Economics* **55** pp 295 – 316.
- 998.** Moore M, Roche M (May) 2001 Liquidity in the forward exchange market *Journal of Empirical Finance* **8** pp 157 – 170.
- 999.** Moore M, Roche M 2002 Less of a puzzle: A new look at the forward forex market *Journal of International Economics* **58** pp 387 – 411.
- 1000.** Rey H 2001 International trade and currency exchange *Review of Economic Studies* **68** pp 443 – 464.
- 1001.** Sato S, Hawkins J 2001 Electronic finance: An overview of the issues *BIS Paper no 7* Switzerland.
- 1002.** Sinn H, Westermann F (July) 2001 Why has the euro been falling? An investigation into the determinants of the exchange rate *NBER Working Paper 8352* NBER USA.
- 1003.** Tse Y, Zobotina T 2001 Transaction costs and market quality: Open outcry versus electronic trading *Journal of Futures Markets* **21** (8) pp 713 – 735.
- 1004.** Williamson R 2001 Exchange rate exposure and competition: Evidence from the automotive industry *Journal of Financial Economics* **59** pp 441 – 475.
- 1005.** Yamaguchi Y 2001 The implications of electronic trading in financial markets *Committee on the Global Financial System* Bank for International Settlements ISBN 92-9131-613-X pp 1 – 37.
- 1006.** Aguiar M (March) 2002 Informed speculation and the choice of exchange rate regime *Typescript* University of Chicago USA.
- 1007.** Beine M et al 2002 Central bank intervention and foreign exchange rates: New evidence from FIGARCH estimations *Journal of International Money and Finance* **21**.
- 1008.** Cavallo M, Perri F, Roubini N, Kisselev K (March) 2002 Exchange rate overshooting and the costs of floating *Typescript* New York University.
- 1009.** Chari V, Kehoe P, McGrattan E 2002 Can sticky price models generate volatile and persistent real exchange rates? *Review of Economic Studies* **69** pp 533 – 564.
- 1010.** Chari A 2006 Heterogeneous market making in foreign exchange markets: Evidence from individual bank responses to central bank interventions *Journal of Money, Credit, and Banking*.

- 1011.** Chordia T, Roll R, Subrahmanyam A 2002 Order imbalance, liquidity, and market returns *Journal of Financial Economics* **65** (1) pp 111 – 130.
- 1012.** Danielsson J, Payne R 2002 Real trading patterns and prices in spot foreign exchange markets *Journal of International Money and Finance* **21** (2) pp 203 – 222.
- 1013.** Danielsson J, Payne R, Luo J (July) 2002 Exchange rate determination and inter-market order flow effects *Typescript* Financial Markets Group London School of Economics and Political Science London UK.
- 1014.** Danielsson J, Love R 2006 Feedback trading *International Journal of Finance and Economics* **11** (1) pp 35 – 53.
- 1015.** Danielsson J, Payne R 2011 Liquidity determination in an order-driven market *European Journal of Finance*.
- 1016.** Deutsche Bundesbank (January) 2002 Capital flows and the exchange rate *Deutsche Bundesbank Monthly Report* pp 15 – 26.
- 1017.** Doyne F J, Joshi Sh 2002 The price dynamics of common trading strategies *Journal of Economic Behavior and Organization* **49** pp 149 – 171.
- 1018.** Fatum R, Hutchison M 2002 Is foreign exchange intervention an alternative to monetary policy? Evidence from Japan *Working Paper 02-11* Department of Economics University of Copenhagen Denmark.
- 1019.** Fatum R, King M R 2005 Rules versus discretion in foreign exchange intervention: Evidence from official Bank of Canada high-frequency data *Working Paper 05-06* Department of Economics University of Copenhagen Denmark.
- 1020.** King M R, Sarno L, Sojli E 2010 Timing exchange rates using order flow: The case of the Loonie *Journal of Banking and Finance* **34** (12) pp 2917 – 2928.
- 1021.** King M R, Rime D 2010 The \$4 trillion question: What explains FX growth since the 2007 survey? *BIS Quarterly Review* **4** pp 27 – 42.
- 1022.** King M R, Mallo C 2010 A user's guide to the Triennial Central Bank Survey of foreign exchange market activity *BIS Quarterly Review* **4** pp 71 – 83.
- 1023.** King M R, Osler C, Rime D 2011 Instruments, players and the foreign exchange trading environment' in *The handbook of exchange rates* James J, Marsh I W, Sarno L (editors) *John Wiley & Sons Inc* USA.
- 1024.** King M R, Osler C, Rime D 2011 Foreign exchange market structure, players and evolution *Working Paper no 2011 / 10* Norges Bank Oslo Norway ISSN 1502-8143 ISBN 978-82-7553-616-5 pp 1 – 47.

- 1025.** King M R, Osler C, Rime D 2012 The market microstructure approach to foreign exchange: Looking back and looking forward *Working Paper 2012 / 54* Ivey Business School University of Western Ontario, Brandeis International Business School Brandeis University, Norges Bank Oslo Norway pp 1 – 40.
- 1026.** Kantelhardt J, Zschiegner St, Koscielny-Bunde E, Havlin Sh, Bunde A, Stanley E 2002 Multifractal de-trended fluctuation analysis of nonstationary time series *Physica A* **316** pp 87 – 114.
- 1027.** Galati G 2002 Settlement risk in foreign exchange markets and CLS Bank *BIS Quarterly Review* **4** pp 55 – 65.
- 1028.** Girardin E, Horsewood N 2002 New transmission mechanisms and instruments of monetary policy at near zero interest rates: The case of Japan in the 1990s *in* Essays in honour of Maxwell J. Fry Dickinson D, Mullineux A (editors) *Edward Elgar* UK.
- 1029.** Huang R, Cai J, Wang X 2002 Information-based trading in the interdealer market *Journal of Financial Intermediation* **11** pp 269 – 296.
- 1030.** Jeanne O, Rose A 2002 Noise trading and exchange rate regimes *Quarterly Journal of Economics* **117** pp 537 – 569.
- 1031.** Kaul A, Mehrotra V (June) 2002 Ticker or trade? How prices adjust in international markets *Typescript* University of Alberta Edmonton Alberta Canada.
- 1032.** Obadan M I 2002 Towards exchange rate stability in Nigeria *The Year 2002 One-Day Seminar of the Nigerian Economic Society (NES)* Federal Palace Hotel Lagos Nigeria.
- 1033.** Ryan S, Worthington A C 2002 Time-varying market, interest rate and exchange rate risk in Australian Bank portfolio stock returns: A GARCH-M approach *Discussion Papers and Working Paper Series no 112* School of Economics and Finance Queensland University of Technology Brisbane Queensland Australia.
- 1034.** Abreu D, Brunnermeier M K 2003 Bubbles and crashes *Econometrica* **71** (1) pp 173 – 204.
- 1035.** Aliber R Z, Chowdry B, Yan S 2003 Some evidence that a Tobin tax on foreign exchange transactions may increase volatility *European Finance Review* **7** pp 481 – 510.
- 1036.** Bacchetta P, van Wincoop E (February) 2003 Can information dispersion explain the exchange rate disconnect puzzle? *NBER Working Paper 9498* NBER USA.
- 1037.** Bergsten C F, Williamson J (editors) 2003 Dollar overvaluation and the World economy *Institute for International Economics* Washington DC USA.
- 1038.** Bergsten C F, Williamson J (editors) 2005 Dollar adjustment: How far? Against what? *Institute of International Economics* Washington DC USA.

- 1039.** Bodnar G M, Wong M H F 2003 Estimating exchange rate exposures: Issues in model structure *Financial Management* **32** pp 35 – 67.
- 1040.** Burstein A T, Neves J, Rebelo S (September) 2003 Distribution costs and real exchange rate dynamics during exchange rate-based stabilizations *Journal of Monetary Economics* vol **50** (6) pp 1189 – 1214.
- 1041.** Carpenter A, Wang J (January) 2003 Sources of private information in FX trading *Typescript* University of New South Wales Sydney Australia.
- 1042.** Choi C, Baek S-G 2004 Exchange rate regimes and international reserves *Working Paper*.
- 1043.** Derviz A 2003 Asset return dynamics and the FX risk premium in a decentralized dealer market *Typescript* Czech National Bank, *European Economic Review*.
- 1044.** Dominguez K M E 2003 The market microstructure of central bank intervention *Journal of International Economics* **59** pp 25 – 45.
- 1045.** Dominguez K M E, Panthaki F 2006 What defines “News” in foreign exchange markets? *Journal of International Money and Finance* **25** pp 168 – 198.
- 1046.** Doukas J A, Hall P H, Lang L H P 2003 Exchange rate exposure at the firm and industry level *Financial Markets, Institutions & Instruments* **12** (5) pp 291 – 347.
- 1047.** Fatum R, Hutchison M M 2003 Is sterilized foreign exchange intervention effective after all? An event study approach *Economic Journal* **113** pp 390 – 411.
- 1048.** Fatum R, Hutchison M M 2006 Effectiveness of official daily foreign exchange market operations in Japan *Journal of International Money and Finance* **25** pp 199 – 219.
- 1049.** Faust J, Rogers J H, Wright J H 2003 Exchange rate forecasting: The errors we’ve really made *Journal of International Economics* **60** (1) pp 35 – 59.
- 1050.** Gordon M 2003 Estimates of time-varying term premia for New Zealand and Australia *Discussion Paper Series DP2003/06* Reserve Bank of New Zealand New Zealand.
- 1051.** Humpage O F 2003 Government intervention in the foreign exchange market *Federal Reserve Bank of Cleveland Working Paper 0315* USA.
- 1052.** Koutmos G, Martin A D 2003 Asymmetric exchange rate exposure: theory and evidence *Journal of International Money and Finance* **22** (3) pp 365 – 384.
- 1053.** Laurenceson J, Chai J C H 2003 Financial reform and economic development in China *Edward Elgar* Cheltenham UK.
- 1054.** Mathisen J 2003 Estimation of the equilibrium real exchange rate for Malawi *IMF Working papers 03/104* IMF USA.

- 1055.** Okunev J, White D 2003 Do momentum-based strategies still work in foreign currency markets? *Journal of Financial and Quantitative Analysis* **38** pp 425 – 447.
- 1056.** Peng W, Shu Ch, Chow K (May) 2003 The Yen exchange rate and net foreign assets *Research Department Economic Research Division Hong Kong Monetary Authority* pp 1 – 19.
- 1057.** Rogers J M, Siklos P L 2003 Foreign exchange market intervention in two small open economies: The Canadian and Australian experience *Journal of International Money and Finance*.
- 1058.** Spiegel M 2003 Japanese foreign exchange intervention *Federal Reserve Bank of San Francisco Newsletter* 2003-36 San Francisco USA.
- 1059.** Westerhoff F H 2003 Market-maker, inventory control and foreign exchange dynamics *Quantitative Finance* **83** (3) pp 363 – 369.
- 1060.** Wright J H 2003 Bayesian model averaging and exchange rate forecasts *International Finance Discussion Papers no 779* Board of Governors of the Federal Reserve System USA.
- 1061.** Aitken M, Frino A, Hill A, Jarnecic E 2004 The impact of electronic trading on bid - ask spreads: Evidence from futures markets in Hong Kong, London, and Sydney *Journal of Futures Markets* **24** (7) pp 675 – 696.
- 1062.** Anwar T 2004 Recent macroeconomic developments and implications for poverty and employment in Pakistan: The cost of foreign exchange reserve holdings in South Asia Australia South Asia *ASARC Working Paper 2004-14 2* Research Centre The Research School of Pacific & Asian Studies The National Institute of Economics and Business Australian National University Canberra Australia pp 1 – 23.
- 1063.** Bacchetta P, van Wincoop E (January) 2004 A scapegoat model of exchange rate fluctuation *NBER Working Paper 10245* NBER USA.
- 1064.** Bacchetta P, van Wincoop E 2006 Can information dispersion explain the exchange rate disconnect puzzle? *American Economic Review* **93** pp 552 – 576.
- 1065.** Bartram S M 2004 Linear and nonlinear foreign exchange rate exposures of German nonfinancial corporations *Journal of International Money and Finance* **23** (4) pp 673 – 699.
- 1066.** Bartram S M, Bodnar G M 2004 The foreign exchange exposure puzzle *Johns Hopkins University Working Paper* USA.
- 1067.** Bartram S M, Brown G, Minton B 2005 Resolving the exposure puzzle: The many facets of exchange rate exposure *Working Paper* Lancaster University UK, University of North Carolina at Chapel Hill, Ohio State University USA.

- 1068.** Bartram S M, Karolyi G A 2006 The impact of the introduction of the Euro on foreign exchange rate risk exposures *Journal of Empirical Finance* **13** (4-5) pp 519 – 549.
- 1069.** Bhanumurthy N R 2004 Microstructures in the Indian foreign exchange market *Working Paper* Delhi University India.
- 1070.** Brandt M W, Kavajecz K A 2004 Price discovery in the US treasury market: The impact of order flow and liquidity on the yield curve *Journal of Finance* **59** (6) pp 2623 – 2654.
- 1071.** Breedon F, Vitale P 2004 An empirical study of information and liquidity effects of order flow on exchange rates *CEPR Working Paper* 4586.
- 1072.** Cashin P, Cespedes L, Sahay R 2004 Commodity currencies and the real exchange rate *Journal of Development Economics* vol **75** pp 239 – 268.
- 1073.** De Wet W A, Gebreselasie T G 2004 The exchange rate exposure of major commercial banks in South Africa *The African Finance Journal* **6** (2) pp 21 – 35.
- 1074.** Dunne P, Hau H, Moore M (November) 2004 Macroeconomic order flows: Explaining equity and exchange rate returns *Typescript*.
- 1075.** Fratzscher M 2004 Exchange rate policy strategies and foreign exchange interventions in the group of three economies in Dollar adjustment: How far? Against what? Bergsten C F, Williamson J (editors) *Institute for International Economics* Washington DC USA.
- 1076.** Hahn J H 2004 Interest rate and exchange rate exposures of banking institutions in pre-crisis Korea *Applied Economics* **36** (13) pp 1409 – 1419.
- 1077.** Hui Ch-H, Neely Ch J, Higbee J (November) 2004, (June) 2007 Foreign exchange volatility is priced in equities *Working Paper 2004-029F* Research Division Federal Reserve Bank of St Louis MO USA <http://research.stlouisfed.org/wp/2004/2004-029.pdf> pp 1 – 39.
- 1078.** Hui Ch-H, Yeung V, Fung L, Lo Ch-F 2007 Valuing foreign currency options with a mean-reverting process: a study of Hong Kong dollar *Working Paper 08/2007* Research Department Market Research Division Hong Kong Monetary Authority Hong Kong P R China, Physics Department The Chinese University of Hong Kong P R China pp 1 – 28.
- 1079.** Hui Ch-H, Fong T 2007 Is the Hong Kong dollar exchange rate “bounded” in the convertibility zone? *Working Paper 13/2007* Research Department Market Research Division Hong Kong Monetary Authority Hong Kong P R China pp 1 - 14.
- 1080.** Hui Ch-H, Genberg H, Chung T-K 2009 Liquidity, risk appetite and exchange rate movements during the financial crisis of 2007-2009 *Working Paper 11/2009* Research Department Market Research Division Hong Kong Monetary Authority Hong Kong P R China pp 1 – 23.

- 1081.** Kim K, Yoon S-M 2004 Multifractal features of financial markets *Physica A* **344** pp 272 – 278.
- 1082.** Nagayasu J 2004 The effectiveness of Japanese foreign exchange interventions during 1991-2001 *Economics Letters* **84** pp 377 – 381.
- 1083.** National Bank of Poland 2004 Turnover in the Polish foreign exchange and OTC derivatives markets in April 2004 Result Summary *National Bank of Poland* Warsaw Poland.
- 1084.** National Bank of Poland 2007 Turnover in the Polish foreign exchange and OTC derivatives markets in April 2007 Result Summary *National Bank of Poland* Warsaw Poland.
- 1085.** Reinhart C M, Rogoff K S 2004 The modern history of exchange rate arrangements: A reinterpretation *Quarterly Journal of Economics* **119** (1) pp 1 – 48.
- 1086.** Rigobon R, Sack B 2004 The impact of monetary policy on asset prices *Journal of Monetary Economics* **51** pp 1553 – 1575.
- 1087.** Simatele M 2004 Foreign exchange intervention and the exchange rate in Zambia *Economics Studies Goteborg University* Sweden.
- 1088.** Akram Q F, Rime D, Sarno L 2005 Arbitrage in the foreign exchange market: Turning on the microscope *Working Paper ANO 2005/12* ISSN 0801-2504 (printed) 1502-8143 (online) Norges Bank Oslo Norway.
- 1089.** Ates A, Wang G H 2005 Information transmission in electronic versus open-outcry systems: An analysis of US equity index futures markets *Journal of Futures Markets* **25** (7) pp 679 – 715.
- 1090.** Bauwens L, Omrane W B, Giot P 2005 News announcements, market activity and volatility in the euro/dollar foreign exchange market *Journal of International Money and Finance* **24** (7) pp 1108 – 1125.
- 1091.** Campa J M, Goldberg L S 2005 Exchange rate pass through into import prices *Review of Economics and Statistics November* **87** (4) pp 679 – 690.
- 1092.** Campa J M, Goldberg L S 2006a Distribution margins, imported inputs, and the sensitivity of the CPI to exchange rates *NBER Working Paper no 12121* NBER USA.
- 1093.** Campa J M, Goldberg L S 2006b Pass-through of exchange rates to consumption prices: What has changed and why? *Working Paper* Federal Reserve Bank of New York USA.
- 1094.** Chui M, Gerlach S, Yu I W 2005 The recent appreciation of the Hong Kong dollar *BIS Papers* **23** pp 150 – 155.
- 1095.** DeGrauwe P (editor) 2005 Exchange rate economics: Where do we stand? *MIT Press* Cambridge USA.

- 1096.** Dueker M, Neely Ch J 2005 Can Markov switching models predict excess foreign exchange returns? *Journal of Banking and Finance*.
- 1097.** Eichengreen B 2005 Sterling's past, Dollar's future: Historical perspectives on reserve currency competition *NBER Working Paper no 11336* National Bureau of Economic Research Cambridge MA USA.
- 1098.** Fung J K W, Lien D, Tse Y M, Tse Y K 2005 Effects of electronic trading on the Hang Seng index futures market international *Review of Economics and Finance* **14** (4) pp 415 – 425.
- 1099.** Hau H, Rey H 2005 Exchange rates, equity prices and capital flows *Review of Financial Studies*.
- 1100.** Hull J C (2005-2006) Private communications on the electronic trading strategies in the foreign currencies exchange markets *Electronic Trade Laboratory Rotman School of Management* University of Toronto Canada.
- 1101.** Hull J C 2012a Options, futures, and other derivatives *Prentice Hall* 8th edition ISBN: 0-13-216484-9 USA pp 1 – 816.
- 1102.** Hull J C 2012b Risk management and financial institutions *John Wiley and Sons Inc* 3rd edition ISBN: 978-1-1182-6903-9 USA pp 1 – 672.
- 1103.** Hull J C 2010 Fundamentals of futures and options markets *Prentice Hall* 7th edition ISBN-10: 0136103227 ISBN-13: 978-0136103226 USA pp 1 – 624.
- 1104.** Inoue A, Kilian L 2005 In-sample or out-of-sample tests of predictability: Which one should we use? *Econometric Reviews* **23** (4) pp 371 – 402.
- 1105.** Marsh I W, O'Rourke C 2005 Customer order flow and exchange rate movements: Is there really information content? *Working Paper* Cass Business School UK.
- 1106.** Newsome J 2006 La criée ou le tout électronique: Le marché décide *Revue D'économie Financière* pp 1 – 5.
- 1107.** Vaubel R 2005 Foreign exchange accumulation by emerging and transition economies: An explanation and critique *in* Aspekte der internationalen ökonomie El-Shagi M, Rübél G (editors) *Wiesbaden Gabler* Germany pp 77 – 84.
- 1108.** Yu I-W, Fung L, Hongyi Ch (November) 2005 Exchange rate risk premiums in Hong Kong dollar: A signal-extraction approach *Research Department Economic Research Division* Hong Kong Monetary Authority pp 1 – 16.
- 1109.** Alexander K, Barbosa A 2006 The impact of electronic trading and exchange traded funds on the effectiveness of minimum variance hedging *ICMA Centre Discussion Paper in Finance DP2006-04* University of Reading UK pp 1 – 23.

- 1110.** Bacchetta P, van Wincoop E 2006 Can information heterogeneity explain the exchange rate determination puzzle? *American Economic Review* **96** (3) pp 552 – 576.
- 1111.** Bayoumi T, Lee J, Jayanthi S 2006 New rates from new weights IMF Staff Papers vol **53** no 2 *IMF* Washington USA.
- 1112.** Boyen M M, Van Norden S 2006 Exchange rates and order flow in the long run *Finance Research Letters* **3** (4).
- 1113.** Cai F, Howorka E, Wongswan J 2006 Transmission of volatility and trading activity in the global interdealer foreign exchange market: Evidence from electronic broking services (EBS) data *International Finance Discussion Papers* Board of Governors of the Federal Reserve System USA.
- 1114.** Cai F, Howorka E, Wongswan J 2008 Informational linkages across trading regions: Evidence from foreign exchange markets *Journal of International Money and Finance* **27** (8) pp 1215 – 1243.
- 1115.** Cao H H, Evans M D D, Lyons R K 2006 Inventory information *Journal of Business* **79** (1) pp 325 – 364.
- 1116.** Carlson J A, Lo M 2006 One minute in the life of the DM/US\$: Public news in an electronic market *Journal of International Money and Finance* **25** (7) pp 1090 – 1102.
- 1117.** Charlebois M, Sapp St 2006 Temporal patterns in foreign exchange returns and options *Richard Ivey School of Business* University of Western Ontario Canada.
- 1118.** Chu C, Mo Y K, Wong G, Lim P 2006 Financial integration in Asia *Hong Kong Monetary Authority Quarterly Bulletin* **49**.
- 1119.** Gilbert C, Rijken H 2006 How is futures trading affected by the move to a computerized trading system? Lessons from the LIFFE FTSE 100 contract *Journal of Business Finance and Accounting* pp 1 – 31.
- 1120.** Jeon J, Oh Y, Yang D Y 2006 Financial market integration in East Asia: Regional or global *Asian Economic Papers* **5** (1) pp 73 – 89.
- 1121.** Escribano A, Pascual R 2006 Asymmetries in bid and ask responses to innovations in the trading process *Empirical Economics* **30** pp 913 – 946.
- 1122.** Kaul A, Sapp S 2006 Y2K fears and safe haven trading of the US dollar *Journal of International Money and Finance* **25** (5) pp 760 – 779.
- 1123.** Killeen W P, Lyons R K, Moore M J 2006 Fixed versus flexible: Lessons from EMS order flow *Journal of International Money and Finance* **25** (4) pp 551 – 579.
- 1124.** Kim S, Lee J W, Shin K 2006 Regional and global financial integration in East Asia *Working Paper Series 0602* Institute of Economic Research Korea University South Korea.

- 1125.** Kočenda E, Valachy J 2006 Exchange rate volatility and regime change: Visegrad comparison *Journal of Comparative Economics* **34** (4) pp 727 – 753.
- 1126.** Kočenda E, Kutan A M, Yigit T 2008 Fiscal convergence in the European Union *North-American Journal of Economics and Finance* **19** (3) pp 319 – 330.
- 1127.** Kočenda E, Poghosyan T 2009 Macroeconomic sources of foreign exchange risk in new EU members *Journal of Banking and Finance* **33** (11) pp 2164 – 2173.
- 1128.** LeBaron B 2006 Agent-based computational finance vol **2** Tesfatsion L, Judd K L (editors) *North-Holland Publishing Company / Elsevier* Amsterdam The Netherlands.
- 1129.** Mende A 2006 09/11 on the USD/EUR foreign exchange market *Applied Financial Economics* **16** (3) pp 213 – 222.
- 1130.** Mende A, Menkhoff L 2006 Profits and speculation in intra-day foreign exchange trading *Journal of Financial Markets* **9** (3) pp 223 – 245.
- 1131.** Muller A, Verschoor W F C 2006 Foreign exchange risk exposure: Survey and suggestions *Journal of Multinational Financial Management* **16** (4) pp 385 – 410.
- 1132.** Norouzzadeh P, Rahmani B A 2006 Multifractal de-trended fluctuation description of Iranian-US dollar exchange rate *Physica A* **367** pp 328 – 336.
- 1133.** Pelham M 2006 Automation creates level playing field for FX traders *The Banker* (August) pp 30 – 33.
- 1134.** Rodrik D 2006 The social cost of foreign exchange reserves *NBER Working Paper no 11952* National Bureau of Economic Research Cambridge MA USA.
- 1135.** Sager M J, Taylor M P 2006 Under the microscope: The structure of the foreign exchange market *International Journal of Finance and Economics* **11** (1) pp 81 – 95.
- 1136.** Starks L T, Wei K D 2006 Foreign exchange rate exposure and short-term cash flow sensitivity *Working Paper* University of Texas TX USA.
- 1137.** Tabak B, Cajueiro D 2006 Assessing inefficiency in euro bilateral exchange rates *Physica A* **367** pp 319 – 327.
- 1138.** Taylor A, Farstrup A 2006 Active currency management: Arguments, considerations, and performance for institutional investors *CRA Rogers Casey International Equity Research* Darien Connecticut USA.
- 1139.** Taylor J B (September 14) 2006 Lessons from the recovery from the ‘lost decade’ in Japan: The case of the great intervention and money injection *ESRI international Conference* Cabinet Office Government of Japan Tokyo Japan.
- 1140.** Tesfatsion L, Judd K L (editors) 2006 *North-Holland Publishing Company / Elsevier* Amsterdam The Netherlands.

- 1141.** Wong A 2006 Analyzing foreign exchange reserve diversification *Institute for International Economics Working Paper* Institute for International Economics Washington DC USA.
- 1142.** Adebisi M A (July) 2007 An evaluation of foreign exchange intervention and monetary aggregates in Nigeria (1986 - 2003) *Department of Economics* University of Lagos Nigeria *MPRA Paper no 3817* pp 1 – 21 <http://mpa.ub.uni-muenchen.de/3817/> .
- 1143.** Barker W 2007 The global foreign exchange market: Growth and transformation *Bank of Canada Review* (Autumn) pp 3 – 12.
- 1144.** Bhansali V 2007 Volatility and the carry trade *Journal of Fixed Income* **17** (3) pp 72 - 84.
- 1145.** Broz J L, Frieden J, Weymouth S 2007 Exchange rate policy attitude: Direct evidence from survey data *IMF* Washington USA <http://www.imf.org> .
- 1146.** Burnside C, Eichenbaum M S, Rebelo S 2007 The returns to currency speculation in emerging markets *American Economic Review Papers and Proceedings* **97** (2) pp 333 – 338.
- 1147.** Burnside C, Eichenbaum M S, Rebelo S 2009 Understanding the forward premium puzzle: A microstructure approach *American Economic Journal: Macroeconomics* **1** (2) pp 127 – 154.
- 1148.** Burnside C 2012 Carry trades and risk *in* The handbook of exchange rates James J, Marsh I W, Sarno L (editors) *John Wiley & Sons Inc.* USA.
- 1149.** Canto B, Kräussl R 2007 Electronic trading systems and intraday non-linear dynamics: An examination of the FTSE 100 cash and futures returns *CFS Working Paper no 2007/20* Center for Financial Studies an der Johann Wolfgang Goethe-Universität Frankfurt am Main Leibniz Information Centre for Economics Germany pp 1 – 45 <http://hdl.handle.net/10419/25521> www.ifk-cfs.de www.econstor.eu .
- 1150.** Chi J, Tripe D, Young M (24-25 September) 2007 Do exchange rate affect the stock performance of Australian Banks? 12th Finsia-Melbourne Centre for Financial Studies Banking and Finance Conference Melbourne Australia.
- 1151.** Christodoulou G, O'Connor P 2007 The foreign exchange and over-the-counter derivatives markets in the United Kingdom *Bank of England Quarterly Bulletin* (Q4) pp 548 – 563.
- 1152.** Dreher A, Vaubel R 2007 Foreign exchange intervention and the political business cycle: A panel data analysis *KOF Working Paper 159* KOF Swiss Economic Institute Swiss Federal Institute of Technology Zurich Switzerland pp 1 – 28 www.kof.ethz.ch .
- 1153.** DuCharme M 2007 First steps in foreign exchange transaction cost analysis *Journal of Performance Measurement* pp 19 – 27.

- 1154.** Egstrup R, Fischer B D (4th Quarter) 2007 Foreign exchange and derivatives markets in 2007 Monetary review *Danmarks Nationalbank* Copenhagen Denmark
[http:// www. natioanlbanken.dk/DNUK/Publications.nsf](http://www.natioanlbanken.dk/DNUK/Publications.nsf) .
- 1155.** Fleming M J, Mizrach B 2007 The microstructure of a US treasury ECN: The BrokerTec platform pp 1 – 40 <http://ssrn.com/abstract=1433488> .
- 1156.** Fung L, Yu I W 2007 Assessing the credibility of the convertibility zone of the Hong Kong dollar *Working Paper 19/2007* Hong Kong Monetary Authority Hong Kong P R China.
- 1157.** Genberg H, He D, Leung F 2007 Recent performance of the Hong Kong dollar linked exchange rate system *Research Note 02/2007* Hong Kong Monetary Authority Hong Kong P R China.
- 1158.** Genberg H, He D, Leung F 2007 The ‘Three refinements’ of the Hong Kong dollar linked exchange rate system two years on *Hong Kong Monetary Authority Quarterly Bulletin 51* pp 5 – 11.
- 1159.** Genberg H, Hui C H 2009 The credibility of the LINK from the perspective of modern financial theory *Working Paper 02/2009* Hong Kong Monetary Authority Hong Kong P R China.
- 1160.** Hong Kong Monetary Authority (December) 2007 The foreign exchange and derivatives markets in Hong Kong *Hong Kong Monetary Authority Quarterly Bulletin* Hong Kong P R China.
- 1161.** Jiang J, Ma K, Cai X 2007 Scaling and correlations in foreign exchange market *Physica A 375* pp 274 – 280.
- 1162.** Leung F, Ng P 2007 Is the Hong Kong dollar real exchange rate misaligned? *Working Paper 21/2007* Research Department Market Research Division Hong Kong Monetary Authority Hong Kong P R China pp 1 – 31.
- 1163.** Leung F, Ng P 2008 Impact of IPO activities on the Hong Kong dollar interbank market *Working Paper 2008-11* Hong Kong Monetary Authority Hong Kong P R China.
- 1164.** Mitchell M, Pedersen L H, Pulvino T 2007 Slow moving capital *American Economic Review 97* (2) pp 215 – 220.
- 1165.** Pasquariello P 2007 Informative trading or just costly noise? An analysis of central bank interventions *Journal of Financial Markets 10* pp 107 – 143.
- 1166.** Sahminan S 2007 Effects of exchange rate depreciation on commercial bank failures in Indonesia *Journal of Financial Stability 3* (2) pp 175 – 193.

- 1167.** Scarlat E, Stan Cr, Cristescu C 2007 Self-similar characteristics of the currency exchange rate in an economy in transition *Physica A* **370** pp 188 – 198.
- 1168.** Van Wincoop E, Tille C 2007 International capital flows *NBER Working Paper 33* NBER USA.
- 1169.** Wong J, Wong E, Fong T, Choi K-F 2007 Testing for collusion in the Hong Kong banking sector *Working Paper 01/2007* Research Department Market Research Division Hong Kong Monetary Authority Hong Kong P R China pp 1 – 20.
- 1170.** Wong E, Wong J, Leung Ph 2008 The foreign exchange exposure of Chinese banks *Working Paper 07/2008* Research Department Market Research Division Hong Kong Monetary Authority Hong Kong P R China pp 1 – 25.
- 1171.** Yu I-W, Fung L, Tam Ch-S 2007 Assessing financial market integration in Asia equity markets *Working Paper 04/2007* Research Department Market Research Division Hong Kong Monetary Authority Hong Kong P R China pp 1 – 37.
- 1172.** Acemoglu D, Rogoff K, Woodford M (editors) 2008 NBER macroeconomics annual 2008 *University of Chicago Press* Cambridge MA USA.
- 1173.** Baglioni A, Monticini A 2008 The intraday price of money: Evidence from the e-MID market *Journal of Money, Credit and Banking* **40** (7).
- 1174.** Barndorff-Nielsen O E, Hansen P R, Lunde A, Shephard N 2008 Realized kernels in practice: Trades and quotes *Econometrics Journal* **4** pp 1 – 33.
- 1175.** Bartram S M (January) 2008 What lies beneath: Foreign exchange rate exposure, hedging and cash flows *Department of Accounting and Finance Management School Lancaster University UK MPRA Paper no 6661* pp 1 – 31 <http://mpa.ub.uni-muenchen.de/6661/> .
- 1176.** Beaupain R, Durré A 2008 The inter-day and intra-day patterns of the overnight market: Evidence from an electronic platform *ECB Working Paper no 988*.
- 1177.** Berger D W, Chaboud A P, Chernenko S V, Howorka E, Wright J H 2008 Order flow and exchange rate dynamics in electronic brokerage system data *Journal of International Economics* **75** (1) pp 93 – 109.
- 1178.** Brunnermeier M K, Nagel S, Pedersen L H 2008 Carry trades and currency crashes *NBER Macroeconomics Annual 2008* NBER USA.
- 1179.** Burnside A C 2008 Comment on "Carry trades and currency crashes" in NBER chapters *NBER Macroeconomics Annual 2008* Acemoglu D, Rogoff K, Woodford M (editors) National Bureau of Economic Research Inc USA.
- 1180.** Burnside A, Eichenbaum M, Kleshchelski I, Rebelo S, Hall L, Hall H 2008 Do Peso problems explain the returns to the carry trade? *NBER Working Papers 14054* NBER USA.

- 1181.** Chinn M D, Moore M J 2008 Private information and the monetary model of exchange rates: Evidence from a novel data set <http://www.imf.org/External/NP/seminars/eng/2007/macrofin/index.htm> .
- 1182.** Chinn M D, Moore M J 2011 Order flow and the monetary model of exchange rates: Evidence from a novel data set *Journal of Money, Credit and Banking* **43** (8) pp 1599 – 1624.
- 1183.** Gagnon J E, Chaboud A 2008 What Can the Data Tell Us About Carry Trades in Japanese Yen? *FRB International Finance Discussion Paper 899*.
- 1184.** Lam L, Fung L, Yu I-W 2008 Comparing forecast performance of exchange rate models *Working Paper 08/2008* Research Department Market Research Division Hong Kong Monetary Authority Hong Kong P R China pp 1 – 23.
- 1185.** Lien K 2008 Day trading and swing trading the currency market: Technical and fundamental strategies to profit from market moves *John Wiley and Sons* New York USA.
- 1186.** Lindley R 2008 Reducing foreign exchange settlement risk *BIS Quarterly Review* **3** pp 53 – 65.
- 1187.** Liu L-G, Tsang A 2008 Exchange rate pass-through to domestic inflation in Hong Kong *Working Paper 02/2008* Research Department Market Research Division Hong Kong Monetary Authority Hong Kong P R China pp 1 – 23.
- 1188.** Liu Q, Fung H-G, Tse Y 2008 An analysis of price linkages among DJIA index, futures, and exchange-traded fund markets *Review of Futures Markets*.
- 1189.** Lo I, Sapp S G 2008 The submission of limit orders or market orders: The role of timing and information in the Reuters D2000-2 system *Journal of International Money and Finance* **27** (7) pp 1056 – 1073.
- 1190.** Lo I, Sapp S G 2010 Order aggressiveness and quantity: How are they determined in a limit order market? *Journal of International Financial Markets, Institutions and Money* **20** (3) pp 213 – 237.
- 1191.** Ramadorai T 2008 What determines transaction costs in foreign exchange markets? *International Journal of Finance and Economics* **13** (1) pp 14 – 25.
- 1192.** Sebastião H M C V 2008 The partial adjustment factors of FTSE 100 stock index and stock index futures: The informational impact of electronic trading systems *Working Paper no 7* Faculdade de Economia da Universidade de Coimbra Portugal pp 1 – 48.
- 1193.** Terada T, Higashio N, Iwasaki J 2008 Recent trends in Japanese foreign-exchange margin trading *Bank of Japan Review no 2008-E-3* Tokyo Japan.

- 1194.** Adrian T, Etula E, Shin H S 2009 Risk appetite and exchange rates *Staff Report no 361* Reserve Bank of New York NY USA.
- 1195.** Bacchetta Ph, Mertens E, Van Wincoop E 2009 Predictability in financial markets: What do survey expectations tell us? *Journal of International Money and Finance* **28** (3) pp 406 – 426.
- 1196.** Baba N, Packer F 2009 From turmoil to crisis: Dislocations in the FX swap market before and after the failure of Lehman Brothers *BIS Working Papers* 285 Bank for International Settlements Basel Switzerland.
- 1197.** Brunnermeier M K, Nagel S, Pedersen L H 2009 Carry trades and currency crashes in NBER macroeconomics annual 2008 vol **23** Acemoglu D, Rogoff K, Woodford M (editors) *University of Chicago Press* Cambridge MA USA pp 313 – 347.
- 1198.** Brunnermeier M, Crockett A, Goodhart C, Persaud A D, Shin H 2009 The fundamental principles of financial regulation *Geneva Reports on the World Economy 11* Preliminary Conference Draft www.voxeu.org/reports/Geneva11.pdf .
- 1199.** Bubák V, Zikes F 2009 Distribution and dynamics of Central-European exchange rates: Evidence from intraday data *Czech Journal of Economics and Finance* **4** pp 334 – 359.
- 1200.** Bubák V, Kočenda E, Žikeš F 2010 Volatility transmission in emerging European foreign exchange markets *CESIFO Working Paper no 3063* pp 1 – 36.
- 1201.** De Zwart G, Markwat T, Swinkels L, van Dijk D 2009 The economic value of fundamental and technical information in emerging currency markets *Journal of International Money and Finance* **28** (4) pp 581 – 604.
- 1202.** Ding L 2009 Bid-ask spread and order size in the foreign exchange market: An empirical investigation *International Journal of Finance and Economics* **14** (1) pp 98 – 105.
- 1203.** Gallardo P, Heath A (March) 2009 Execution methods in foreign exchange markets *BIS Quarterly Review* pp 83 – 91.
- 1204.** Gençay R, Gradojevic N 2009 Informed trading in an electronic foreign exchange market *The Rimini Centre for Economic Analysis* Bologna University Italy pp 1 – 12.
- 1205.** Jiang Zh-Q, Zhou W-X 2009 De-trended fluctuation analysis of inter-trade durations *Physica A* **388** pp 433 – 440.
- 1206.** Hattori M, Shin H S 2009 Yen carry trade and the subprime crisis *IMF Staff Papers* IMF USA.
- 1207.** He D, Zhang Z, Wang H 2009 Hong Kong's financial market interactions with the US and mainland China in crisis and tranquil times *Working Paper 10/2009* Research

- Department Market Research Division Hong Kong Monetary Authority Hong Kong P R China pp 1 – 27.
- 1208.** Heath A, Whitelaw J June 2011 Electronic trading and the Australian foreign exchange market *Bulletin Reserve Bank of Australia* Canberra Australia pp 41 – 48.
- 1209.** McGuire P, von Peter G 2009 The US dollar shortage in global banking *BIS Quarterly Review (March 2009)* pp 47 – 63.
- 1210.** Meyers R A (editor) 2009 Encyclopedia of complexity and system science *Springer*.
- 1211.** Muller A, Verschoor W F 2009 The effect of exchange rate variability on US shareholder wealth *Journal of Banking & Finance* pp 1963 – 1972.
- 1212.** Nolte I, Nolte S 2009 Customer trading in the foreign exchange market. Empirical evidence from an Internet trading platform *Working Paper 09-01* FERC.
- 1213.** Nolte I, Nolte S 2011 How do individual investors trade? *European Journal of Finance* pp 1 – 27.
- 1214.** Serban A F (November) 2009 Combining mean reversion and momentum trading strategies in foreign exchange markets *Department of Economics* West Virginia University USA pp 1 – 30.
- 1215.** Simwaka K, Mkandawire L 2009 The efficacy of foreign exchange market intervention in Malawi *Reserve Bank of Malawi MPRA Paper no 15946* pp 1 – 39
<http://mpra.ub.uni-muenchen.de/15946/> .
- 1216.** Breedon F, Vitale P 2010 An empirical study of portfolio-balance and information effects of order flow on exchange rates *Journal of International Money and Finance* **29** (3) pp 504 – 524.
- 1217.** Breedon F, Rime D, Vitale P 2011 Carry trades, order flow and the forward bias puzzle *Working Paper* Norges Bank Oslo Norway.
- 1218.** Dunne P, Hau H, Moore M 2010 International order flows: Explaining equity and exchange rate returns *Journal of International Money and Finance* **29** (2) pp 358 – 386.
- 1219.** Fukuda Sh-I, Kon Y (February) 2010 Macroeconomic impacts of foreign exchange reserve accumulation: Theory and international evidence *ADBI Working Paper Series no 197* Asian Development Bank Institute Tokyo Japan
<http://www.adbi.org/working-paper/2010/02/19/3515.macroecomic.impact.forex.reserve.accumulation/> .
- 1220.** Liu L-Zh, Qian X-Y, Lu H-Y 2010 Cross-sample entropy of foreign exchange time series *Physica A* **389** pp 4785 – 4792.

- 1221.** Maurer K-O, Schäfer C 2010 Analysis of binary trading patterns in Xetra *CFS Working Paper no 2010/12* Center for Financial Studies an der Johann Wolfgang Goethe-Universität Frankfurt am Main Leibniz Information Centre for Economics Germany pp 1 – 22.
- 1222.** Nightingale S, Ossolinski C, Zurawski A December 2010 Activity in global foreign exchange markets *RBA Bulletin* pp 45 – 51.
- 1223.** Pasquariello P 2010 Central bank intervention and the intraday process of price formation in the currency markets *Journal of International Money and Finance* **29** (6) pp 1045 – 1061.
- 1224.** Yiu M S, Ho W-Y A, Ma Y, Tsang Sh-K 2010 An analytical framework for the Hong Kong dollar exchange rate dynamics under strong capital inflows *Working Paper 05/2010* Hong Kong Monetary Authority Hong Kong P R China.
- 1225.** Diamond R (April 4) 2011 Banks' profits could take hit in fight over forex fees *Pensions and Investments*.
- 1226.** Durčáková J 2011 Foreign exchange rate regimes and foreign exchange markets in transitive economies *Prague Economic Papers* **4** pp Prague Check Republic pp 309 – 328.
- 1227.** Heimer R Z, Simon D 2011 Facebook finance: How social interaction propagates active investing *Working Paper* Brandeis University.
- 1228.** Marzo M, Zagaglia P P 2011 Trading directions and the pricing of euro interbank deposits in the long run *Working Paper 11-20* The Rimini Centre for Economic Analysis University of Bologna Italy.
- 1229.** Moore M J, Payne R 2011 On the sources of private information in FX markets *Journal of Banking and Finance* **35** (5) pp 1250 – 1262.
- 1230.** Plantin G, Shin H H 2011 Carry trades, monetary policy and speculative dynamics *Princeton University* USA.
- 1231.** Rafferty B 2011 Currency returns, skewness and crash risk *Working Paper* Duke University North Carolina Durham USA.
- 1232.** Wang Y, Wu Ch, Pan Zh 2011 Multifractal de-trending moving average analysis on the US dollar exchange rates *Physica A* **390** pp 3512 – 3523.
- 1233.** Banti Ch, Phylaktis K, Sarno L 2012 Global liquidity risk in the foreign exchange market *Journal of International Money and Finance* **31** (2) pp 267 – 291.
- 1234.** James J, Marsh I W, Sarno L (editors) 2012 The handbook of exchange rates *John Wiley & Sons Inc* USA.
- 1235.** Mancini L, Ranaldo A, Wrampelmeyer J 2012 Liquidity in the foreign exchange market: Measurement, commonality, and risk premiums *Journal of Finance*.

- 1236.** Sheng A (February) 2012a Hong Kong's global challenge - How to build on success pp 1 – 3
<http://www.fungglobalinstitute.org/en/hong-kong's-global-challenge-how-build-success> ,
<http://www.fungglobalinstitute.org/en/experts/andrew-sheng> .
- 1237.** Sheng A (August) 2012b The future of central banking *Fung Global Institute Hong Kong P R China, Central Banking Publications London UK*
<http://riskbooks.com/the-future-of-central-banking> ,
<http://www.fungglobalinstitute.org/en/future-central-banking> ,
<http://www.fungglobalinstitute.org/en/experts/andrew-sheng> .
- 1238.** Sheng A (April) 2014 Invited speech *6th London School of Economics Asia Forum 2014 Kuala Lumpur Malaysia*
http://media.rawvoice.com/lse_publiclecturesandevents/richmedia.lse.ac.uk/publiclecturesandevents/20140403_1540_plenary4.mp4 .
- 1239.** Trenca I, Plesoianu A, Căpusan R 2012 Multifractal structure of Central and Eastern European foreign exchange markets *Faculty of Economics and Business Administration Babes-Bolyai University, Faculty of Finance, Insurance, Banking and Stock Exchange Academy of Economic Studies* pp 784 – 790.
- 1240.** Wang D-H, Yu X-W, Suo Y-Y 2012 Statistical properties of the Yuan exchange rate index *Physica A* **391** pp 3503 – 3512.
- 1241.** Lassmann A 2013 Exchange rate transmission and export activity at the firm level *Working Paper 331 KOF Swiss Economic Institute Swiss Federal Institute of Technology Zurich Switzerland* pp 1 – 39
www.kof.ethz.ch .
- 1242.** Ingves St, Danielsson J, Goodhart Ch (July 7) 2014 Towards a safer and more stable financial system: Stefan Ingves *London School of Economics and Political Science London UK*
http://media.rawvoice.com/lse_publiclecturesandevents/richmedia.lse.ac.uk/publiclecturesandevents/20140707_1830_saferStableFinancial.mp4 .
- Disruptive Innovation in Terms of Economics Science in Macroeconomics and Microeconomics:**
- 1243.** Schumpeter J A 1911; 1939, 1961 *Theorie der wirtschaftlichen entwicklung; The theory of economic development: An inquiry into profits, capital, credit, interest and the business cycle* Redvers Opie (translator) *OUP New York USA*.
- 1244.** Schumpeter J A 1939 *Business cycle McGraw-Hill New York USA*.

- 1245.** Schumpeter J A 1947 The creative response in economic history *Journal of Economic History* vol 7 pp 149 – 159.
- 1246.** Solow R H August 1957 Technical change and the aggregate production function *Review of Economics and Statistics* **39** pp 214 – 231.
- 1247.** Christensen C M June 16, 1977 Fatal attraction: The dangers of too much technology *Computerworld Leadership Series* pp 3 – 11.
- 1248.** Christensen C M Fall 1992a Exploring the limits of the technology S-curve, Part 1: Component Technologies *Production and Operations Management* **1** pp 334 – 357.
- 1249.** Christensen C M Fall 1992b Exploring the limits of the technology S-curve, Part 2: Architectural technologies *Production and Operations Management* **1** pp 358 – 366.
- 1250.** Bower J L, Christensen C M January February 1995 Disruptive technologies: Catching the wave *Harvard Business Review* **73** no 1 pp 43 – 53.
- 1251.** Bower J L, Christensen C M 1997 Disruptive technologies: Catching the wave in *Seeing differently: Insights on innovation* Brown J S (editor) *Harvard Business School Press* Boston MA USA.
- 1252.** Christensen C M 1997 The innovator's dilemma: When new technologies cause great firms to fail *Harvard Business School Press* Boston MA USA.
- 1253.** Christensen C M, Armstrong E G Spring 1998 Disruptive technologies: A credible threat to leading programs in continuing medical education? *Journal of Continuing Education in the Health Professions* **69** no 80 pp 69 – 80.
- 1254.** Christensen C M 1998 The evolution of innovation in *Technology management handbook* Dorf R (editor) *CRC Press* Boca Raton FL USA.
- 1255.** Christensen C M December 1998 Disruptive technologies: Catching the wave TN *Harvard Business School Teaching Note* 699 - 125.
- 1256.** Christensen C M, Cape E G December 1998 Disruptive technology a heartbeat away: Ecton, Inc *Harvard Business School Case* 699 - 018.
- 1257.** Christensen C M April 1999a Value networks and the impetus to change: Managing innovation: Overview teaching note for module 1 *Harvard Business School Teaching Note* 699 - 163.
- 1258.** Christensen C M April 1999b Finding new markets for new and disruptive technologies: Managing innovation, overview teaching note for module 2 *Harvard Business School Teaching Note* 699 - 164.
- 1259.** Christensen C M April 1999c Teradyne: The Aurora project & Teradyne: Corporate management of disruptive change, TN *Harvard Business School Teaching Note* 399 - 087.

- 1260.** Christensen C M, Dann J June 1999 Processes of strategy definition and implementation, The *Harvard Business School Background Note* 399 - 179.
- 1261.** Bower J L, Christensen C M 1999 Disruptive technologies: Catching the wave Ch 29 in The entrepreneurial venture 2nd edition Sahlman W A, Stevenson H H, Roberts M J, Bhide A V pp 506 – 520 *Harvard Business School Press* Boston MA USA.
- 1262.** Christensen C M 1999a Innovation and the general manager *Irwin McGraw-Hill* Homewood IL USA.
- 1263.** Christensen C M 1999b Impact of disruptive technologies in telecommunications in Bringing PC economies to the telecommunications industry *PulsePoint Communications*.
- 1264.** Christensen C M, Tedlow R S January February 2000 Patterns of disruption in retailing *Harvard Business Review* **78** no 1 pp 42 – 45.
- 1265.** Christensen C M, Donovan T March 2000 Disruptive technology a heartbeat away: Ecton, Inc TN *Harvard Business School Teaching Note* 600 - 129.
- 1266.** Christensen C M, Overdorf M March April 2000 Meeting the challenge of disruptive change *Harvard Business Review* **78** no 2 pp 66 – 76.
- 1267.** Christensen C M, Bohmer R M J, Kenagy J September October 2000 Will disruptive innovations cure health care? *Harvard Business Review* **78** no 5 pp 102 – 117.
- 1268.** Christensen C M, Craig Th, Hart S March April 2001 The great disruption *Foreign Affairs* **80** no 2.
- 1269.** Christensen C M Summer 2001 Assessing your organization's innovation capabilities *Leader to Leader* no 21 pp 27 – 37.
- 1270.** Christensen C M, Milunovich S March 2002 Technology strategy: The theory and application of the Christensen model *Merrill Lynch Report Series*.
- 1271.** Bass M J, Christensen C M April 2002 The future of the microprocessor business *IEEE Spectrum* **39** no 4.
- 1272.** Anthony S D, Roth E A, Christensen C M April 2002 The policymaker's dilemma: The impact of government intervention on innovation in the telecommunications industry *Harvard Business School Working Paper* no 02 - 075.
- 1273.** Kenagy J, Christensen C M May 2002 Disruptive innovation: A new diagnosis for health care's 'Financial flu' *Healthcare Financial Management* pp 62 – 66.
- 1274.** Christensen C M, Johnson M W, Rigby D K Spring 2002 Foundations for growth: How to identify and build disruptive new businesses *MIT Sloan Management Review* **43** no 3.

- 1275.** Kenagy J W, Christensen C M 2002 Disruptive innovation - New diagnosis and treatment for the systemic maladies of healthcare *World Markets Series Business Briefing Global Healthcare 2002* pp 14 – 17.
- 1276.** Christensen C M June 2002 The rules of innovation *Technology Review*.
- 1277.** Hart S L, Christensen C M Fall 2002 The great leap: Driving innovation from the base of the global pyramid *MIT Sloan Management Review* **44** no 1 pp 51 – 56.
- 1278.** Christensen C M, Verlinden M, Westerman G November 2002 Disruption, disintegration, and the dissipation of differentiability *Industrial and Corporate Change* **11** no 5 pp 955 – 993.
- 1279.** Christensen C M 2003 The opportunity and threat of disruptive technologies *Harvard Business School Publishing Class Lecture HBSP Product Number 1482C Boston MA USA*.
- 1280.** Shah Ch D, Brennan T A, Christensen C M April 2003 Interventional radiology: Disrupting invasive medicine.
- 1281.** Christensen C M March April 2003 Beyond the innovator's dilemma *Strategy & Innovation* **1** no 1.
- 1282.** Christensen C M, Raynor M E 2003 The innovator's solution: Creating and sustaining successful growth *Harvard Business School Press Boston MA USA*.
- 1283.** Burgelman R A, Christensen C M, Wheelwright S C 2003 Strategic management of technology and innovation 4th edition *McGraw-Hill Irwin USA*.
- 1284.** Christensen C M, Anthony S D January February 2004 Cheaper, faster, easier: Disruption in the service sector *Strategy & Innovation* **2** no 1.
- 1285.** Christensen C M, Anthony S D, Roth E A 2004 Seeing what's next: Using the theories of innovation to predict industry change *Harvard Business School Press Boston MA USA*.
- 1286.** Christensen C M January 2006 The ongoing process of building a theory of disruption *Journal of Product Innovation Management* **23** pp 39 – 55.
- 1287.** Christensen C M, Baumann H, Ruggles R, Sadtler Th M December 2006 Disruptive innovation for social change *Harvard Business Review* **84** no 12.
- 1288.** Christensen C M, Horn M B, Johnson C W 2008 Disrupting class: How disruptive innovation will change the way the World learns *McGraw-Hill USA*.
- 1289.** Christensen C M, Grossman J H, Hwang J 2009 The innovator's prescription: A disruptive solution for health care *McGraw-Hill USA*.
- 1290.** Dyer J H, Gregersen H B, Christensen C M December 2009 The innovator's DNA *Harvard Business Review* **87** no 12.

- 1291.** Christensen C M, Donovan T May 2010 Disruptive IPOs? WR Hambrecht & Co *Harvard Business School Case 610-065*.
- 1292.** Dyer J H, Gregersen H B, Christensen C M 2011 The innovator's DNA: Mastering the five skills of disruptive innovators *Harvard Business Press Boston MA USA*.
- 1293.** Christensen C M, Talukdar Sh, Alton R, Horn M B Spring 2011 Picking green tech's winners and losers *Stanford Social Innovation Review USA*.
- 1294.** Christensen C M, Wang D, van Bever D October 2013 Consulting on the cusp of disruption *Harvard Business Review* **91** no 10 pp 106 – 114.
- 1295.** Bhattacharya S, Ritter J R 1983 Innovation and communication: Signaling with partial disclosure *Review of Economic Studies* **50** pp 331 – 346.
- 1296.** Scherer F M 1984 Innovation and growth: Schumpeterian perspectives *MIT Press Cambridge MA USA*.
- 1297.** Porter M E, Kramer M R December 2006 Strategy and society: The link between competitive advantage and corporate social responsibility *Harvard Business Review* Harvard Business School USA.
- 1298.** Porter M E, Kramer M R January-February 2011 Creating shared value *Harvard Business Review* Harvard Business School USA
<https://hbr.org/2011/01/the-big-idea-creating-shared-value> .
- 1299.** Dobbs R, Woetzel J, Flanders St 2015 *Public Lecture on 08.06.2015* London School of Economics and Political Science London UK
http://media.rawvoice.com/lse_publiclecturesandevents/richmedia.lse.ac.uk/publiclecturesandevents/20150608_1830_noOrdinaryDisruption.mp4 .
- Probability Theory, Statistics Theory, Spectrum Analysis Theory, Brownian Movement Theory, Diffusion Theory, Chaos Theory, Information Communication Theory in Econometrics and Econophysics Sciences:**
- 1300.** Huygens 1657 De ratiociniis in aleae ludo (On calculations in games of chance).
- 1301.** Bernoulli J 1713 Ars conjectandi (The art of guessing).
- 1302.** Bernoulli D 1738, 1954 Specimen theoriae novae de mensura sortis *Commentarii Academiae Scientiarum Imperialis Petropolitanae* Petropoli vol **5** pp 175 – 192; Exposition of a new theory on the measurements of risk Sommer L (translator) *Econometrica* vol **22** pp 23 – 36.
- 1303.** De Moivre 1730 *Miscellanea analytica supplementum* (The analytic method).
- 1304.** Fourier J-B J 1807-1822, 1878, 2009 *Théorie Analytique de la Chaleur* *Firmin Didot, Cambridge University Press* ISBN 978-1-108-00178-6, ISBN 978-1-108-00180-9.

- 1305.** Fourier J-B J 1824 Mémoires de l'Académie Royale des Sciences de l'Institut de France
VII pp 570 – 604
http://www.academie-sciences.fr/activite/archive/dossiers/Fourier/Fourier_pdf/Mem1827_p569_604.pdf .
- 1306.** De Laplace 1812 Théorie analytique des probabilités *Paris* France.
- 1307.** Bunyakovsky V Ya 1825 Rotary motion in a resistant medium of a set of plates of constant thickness and defined contour around an axis inclined with respect to the horizon
Ph D Thesis no 1 under Prof. Augustin - Louis Cauchy supervision *École Polytechnique* Paris France.
- 1308.** Bunyakovsky V Ya 1825 Determination of the radius-vector in elliptical motion of planets
Ph D Thesis no 2 under Prof. Augustin - Louis Cauchy supervision *École Polytechnique* Paris France.
- 1309.** Bunyakovsky V Ya 1825 Heat propagation in solids
Ph D Thesis no 3 under Prof. Augustin - Louis Cauchy supervision *École Polytechnique* Paris France.
- 1310.** Bunyakovsky V Ya 1846 Foundations of the mathematical theory of probability
St. Petersburg Russian Federation.
- 1311.** Connor J J, Robertson E F (July) 2000 Viktor Yakovlevich Bunyakovsky (December 16, 1804 - December 12, 1889)
School of Mathematics and Statistics University of St Andrews Scotland UK
<http://www-history.mcs.st-andrews.ac.uk/Biographies/Bunyakovsky.html> .
- 1312.** V Ya Bunyakovsky *International Conference* (August 20 - 21) 2004 Private communications with conference participants on V Ya Bunyakovsky's mathematical theory of probability and its applications in econophysics and econometrics during a tour to Town of Bar Vinnitsia Region Ukraine
V Ya Bunyakovsky International Conference Institute of Mathematics of National Academy of Sciences of Ukraine (NASU) Kyiv Ukraine
www.imath.kiev.ua/~syta/bunyak .
- 1313.** Chebyshev P L 1846 An experience in the elementary analysis of the probability theory
Crelle's Journal fur die Reine und Angewandte Mathematik.
- 1314.** Chebyshev P L 1867 Des valeurs moyennes
Journal de Mathématiques Pures et Appliquées vol 12 pp 177 – 184.
- 1315.** Chebyshev P L 1891 Sur deux théorèmes relatifs aux probabilités
Acta Mathematica vol 14.

- 1316.** Chebyshev P L 1936 Theory of probability: Lectures given in 1879 and 1880 Lyapunov A N (lecture notes writer) Krylov A N (editor) *Moscow - St Petersburg* Russian Federation.
- 1317.** Markov A A 1890 On one problem by D I Mendeleev *Zapiski Imperatorskoi Akademii Nauk SPb* **62** pp 1 – 24.
- 1318.** Markov A A 1899 Application des fonctions continues au calcul des probabilités *Kazan Bulletin* **9** (2) pp 29 – 34 Russian Federation.
- 1319.** Markov A A 1900, 1912, 1913 Calculation of probabilities *St Petersburg* Russian Federation; Wahrscheinlichkeits-Rechnung *Teubner* Leipzig-Berlin Germany; 3rd edition *St Petersburg* Russian Federation.
- 1320.** Markov A A 1906 Extension of law of big numbers on variables, depending from each other *Izvestiya Fiziko-Matematicheskogo Obschestva pri Kazanskom Universitete* 2nd series vol **15** (94) pp 135 – 156 Russian Federation.
- 1321.** Markov A A 1907, 1910 Research on fine case of depending trials *Izvestiya Akademii Nauk SPb* 6th series vol **1** (93) pp 61 – 80; Recherches sur un cas remarquable d'épreuves dependantes *Acta Mathematica* **33** pp 87 – 104 Stockholm Sweden.
- 1322.** Markov A A 1908, 1912, 1971 Extension of limit theorems of calculation of probabilities to sum of variables, connected in chain *Zapiski Akademii Nauk po Fiziko-Matematicheskomu Otdeleniyu* 8th series vol **25** (3); Ausdehnung der Satze uber die Grenzwerte in der Wahrscheinlichkeitsrechnung auf eine Summe verketteter Grossen Liebmann H (translator) in *Wahrscheinlichkeitsrechnung* Markov A A (author) pp 272 – 298 *Teubner B G* Leipzig Germany; Extension of the limit theorems of probability theory to a sum of variables connected in a chain Petelin S (translator) in *Dynamic probabilities systems* Howard R A (editor) vol **1** pp 552 – 576 *John Wiley and Sons Inc* New York USA.
- 1323.** Markov A A 1910 Research on common case of trials, connected in chain *Zapiski Akademii Nauk po Fiziko-Matematicheskomu Otdeleniyu* 8th series vol **25** (93) Russian Federation.
- 1324.** Markov A A 1911 On one case of trials, connected in complex chain *Izvestiya Akademii Nauk SPb* 6th series vol **5** (93) pp 171 – 186 Russian Federation.
- 1325.** Markov A A 1912 On trials of connected in chain unobserved events *Izvestiya Akademii Nauk SPb* 6th series vol **6** (98) pp 551 – 572 Russian Federation.
- 1326.** Markov A A 1913 Example of statistical research on text of “Eugene Onegin”, illustrating interconnection of trials in chain *Izvestiya Akademii Nauk SPb* 6th series vol **7** (93) pp 153 – 162 Russian Federation.

- 1327.** Fisher I 1892 Mathematical investigations in the theory of value and prices *Transactions of the Connecticut Academy* **9** pp 1 – 124.
- 1328.** Einstein A 1905 On the movement of small particles suspended in a stationary liquid demanded by the molecular-kinetic theory of heat *Annalen der Physik* **17** pp 549 – 560.
- 1329.** Einstein A 1956 Investigation on the theory of the Brownian motion Furth R (editor) *Dover* New York USA.
- 1330.** Einstein A, Smolukhovskiy M 1936 Brownian movement: Collection of research papers *ONTI* Moscow Russian Federation.
- 1331.** Slutsky E E 1910 Theory of marginal utility *M Sc Thesis* Vernadsky National Library Kiev Ukraine.
- 1332.** Slutsky E E 1912 Theory of correlation and elements of study about distribution curves *Kiev Commerce Institute Bulletin* **16** pp 1 – 208 Kiev Ukraine.
- 1333.** Slutsky E E 1913 On the criterion of goodness of fit of the regression lines and the best method of fitting them to the data *Journal Royal Statistics Society* vol **77** part I pp 8 – 84.
- 1334.** Slutsky E E 1914 Sir William Petty: Short overview of his economic visions with attachment of his several important research works *Kiev Commerce Institute Bulletin* **18** pp 5 – 48 Kiev Ukraine.
- 1335.** Slutsky E E 1915 Sulla teoria del bilancio del consumatore *Giornale degli economisti e rivista di statistica* **51** no 1 pp 1 – 26 Italy.
- 1336.** Slutsky E E 1922a Statistics and mathematics. Review of Kaufman *Statistics Bulletin* **3 – 4** pp 104 – 120.
- 1337.** Slutsky E E 1922b To the question of logical foundations of probability calculation *Statistics Bulletin* **9 - 12** pp 13 – 21.
- 1338.** Slutsky E E 1923a On the some patterns of correlation connection and the systematic error of correlation coefficient *Statistics Bulletin* **1 – 3** pp 31 – 50.
- 1339.** Slutsky E E 1923b On a new coefficient of mean density of population *Statistics Bulletin* **4 – 6** pp 5 – 19.
- 1340.** Slutsky E E 1923c On calculation of state revenue from emission of paper money *Local Economy* **2** pp 39 – 62 Kiev Ukraine.
- 1341.** Slutsky E E 1925a On the law of large numbers *Statistics Bulletin* **7 – 9** pp 1 – 55.
- 1342.** Slutsky E E 1925b Ueber stochastische Asymptoten und Grenzwerte *Metron* Padova Italy vol **5** no 3 pp 3 – 89.

- 1343.** Slutski E E 1926 Ein Beitrag zur Formal-praxeologischen Grundlegung der Oekonomik
Ann de la classe des sci soc-econ Akad Oukrainienne des Sciences Kiev Ukraine vol **4**
pp 3 – 12.
- 1344.** Slutsky E E 1927a The summation of random causes as sources of cyclic processes
Problems of Conjuncture (Voprosy Kon'yunktury) vol **3** issue 1 pp 34 – 64 Moscow Russian
Federation.
- 1345.** Slutski E E 1927b Zur Kritik des Bohm-Bawerkschen Wertbegriffs und seiner Lehre von
der Messbarkeit des Wertes *Schmollers Jb* **51** (4) pp 37 – 52.
- 1346.** Slutsky E E 1929 Sur l'erreur quadratique mogenne du coefficient de correlation dans le
cas des suites des epreuves non independantes *Comptes rendus* **189** pp 612 – 614.
- 1347.** Slutsky E E 1935 To the extrapolation problem in connection with forecast problem
Geophysics Journal **5** (3) pp 263 – 277.
- 1348.** Slutsky E E 1937a Quelche propositione relative alla teoria delle funzioni aleatorie
Giornale dell Istituto Italiano degli Attuari **8** no 2 pp 3 – 19.
- 1349.** Slutsky E E 1937b The summation of random causes as the source of cyclical processes
Econometrica **5** pp 105 – 146.
- 1350.** Slutsky E E 1942, 1999 Autobiography of December 3, 1942 *Economics School* **5**
pp 18 – 21.
- 1351.** Slutsky E E 1960 Selected research works (Izbrannye trudy) *Academy of Sciences of
USSR* Moscow Russian Federation.
- 1352.** Bowley A L 1924 The mathematical groundwork of economic *Clarendon Press* Oxford
UK.
- 1353.** Kolmogorov A N 1937 Markov chains with countable many states *Bulletin Moscow
University* **1**.
- 1354.** Kolmogorov A N 1938 On analytic methods in probability theory *in* Selected works of
Kolmogorov A N vol **2** Probability theory and mathematical statistics Shiryaev A N (editor)
Springer Germany.
- 1355.** Kolmogorov A N 1947 The contribution of Russian science to the development of
probability theory *Uchenye Zapiski Moskovskogo Universiteta* no 91.
- 1356.** Kolmogorov A N 1956 Probability theory in Mathematics: Its contents, methods, and
meaning *Academy of Sciences USSR* vol **2**.
- 1357.** Kolmogorov A N 1956 Foundations of the theory of probability *Chelsea* New York USA.
- 1358.** Kolmogorov A N 1985 Mathematics and mechanics Selected works vol **1** *Nauka
Publishing House* Moscow Russian Federation.

- 1359.** Kolmogorov A N 1986 Probability theory and mathematical statistics Selected works vol **2** *Nauka Publishing House* Moscow Russian Federation.
- 1360.** Allen R G D 1938 Mathematical analysis for economists *Macmillan* London UK.
- 1361.** Cramer H 1940 On the theory of stationary random processes *Ann Math* vol **41** pp 215 – 230.
- 1362.** Cramer H 1946 Mathematical methods of statistics *Princeton University Press* USA.
- 1363.** Cramer H, Leadbetter M 1967 Stationary and related stochastic processes. Sample function properties and their applications *John Wiley and Sons Inc* NY USA.
- 1364.** Bemshtein S N 1946 Theory of probability 4th edition *Gostehizdat* Moscow Russian Federation.
- 1365.** Bogolyubov N N 1946 Dynamic problems in statistic physics.
- 1366.** Neyman J, Scott E L 1948 Consistent estimates based on partially consistent observations *Econometrica* **16** pp 1 – 32.
- 1367.** Shannon C E 1948 A mathematical theory of communication *Bell System Technical Journal* **27** pp 379 – 423 and pp 623 – 656.
- 1368.** Terletsky Ya P 1950 Dynamic and statistic laws of physics *Publishing House of Moscow State University* Russian Federation pp 1 – 96.
- 1369.** Hannan E J 1960 Time series analysis *Methuen* London.
- 1370.** Hannan E J 1970 Multiple time series *John Wiley and Sons Inc* New York USA.
- 1371.** Mandelbrot B B 1960 The Pareto-Levy law and the distribution of income *International Economic Review* no 1.
- 1372.** Mandelbrot B B 1963a The stable Paretian income distribution when the apparent exponent is near two *International Economic Review* no 4.
- 1373.** Mandelbrot B B 1963b The variation of certain speculative prices *Journal of Business* vol **36** pp 394 – 419.
- 1374.** Mandelbrot B B 1965 Une classe de processus stochastiques homothetiques a soi: Application a la loi climatologique de H. E. Hurst *Comptes Rendus de l'Academie des Sciences* vol **240** pp 3274 – 3277 Paris France.
- 1375.** Mandelbrot B B 1967a The variation of some other speculative prices *Joural of Business* vol **40** pp 393 – 413.
- 1376.** Mandelbrot B B (April) 1967b Some noises with 1/f spectrum: A bridge between direct current and white noise *IEEE Transactions on Information Theory* USA.
- 1377.** Mandelbrot B B, Taylor H M 1967 On the distribution of stock price difference *Operations Research* vol **15** no 6 pp 1057 – 1062.

- 1378.** Mandelbrot B B, van Ness J W 1968 Fractional Brownian motions, fractional noises and applications *SIAM Review* vol **10** no 4 pp 422 – 437.
- 1379.** Mandelbrot B B 1969 Robustness of the rescaled range R/S in the measurement of non-cyclic long-run statistical dependence *Water Resources Research* vol **5** no 5 pp 967 – 988.
- 1380.** Mandelbrot B B, Wallis J R 1969 Computer experiments with fractional Gaussian noises I, II, III *Water Resources Research* vol **5** pp 228 – 267.
- 1381.** Mandelbrot B B 1971 When can price be arbitrated efficiently? A limit of the validity of the random walk and martingale models *Review of Economics and Statistics* vol **53** pp 225 – 236.
- 1382.** Mandelbrot B B 1972 Statistical methodology for non-periodic cycles: From the covariance to R/S analysis *Annals of Economic and Social Measurement* vol **1** no 3 pp 259 – 290.
- 1383.** Mandelbrot B B 1975a Les objets fractals *Flammarion* Paris France.
- 1384.** Mandelbrot B B 1975b Limit theorems on the self-normalized range for weakly and strongly dependent process *Zeitschrift Wahrscheinlichkeitstheorie und Verwandte Gebiete* vol **31** pp 271 – 285.
- 1385.** Mandelbrot B B 1977 Fractals: Form, chance and dimension *W H Freeman* San Francisco USA.
- 1386.** Mandelbrot B B 1982 The fractal geometry of nature *W H Freeman* San Francisco USA.
- 1387.** Mandelbrot B B 1997 Fractals and scaling in finance *Springer* New York USA.
- 1388.** Gnedenko B V, Khinchin A Ya 1961 An elementary introduction to the theory of probability *Freeman* San Francisco USA.
- 1389.** Gnedenko B V 1988 The theory of probability *Mir* Moscow Russian Federation.
- 1390.** Shiryayev A N 1961 The problem of the most rapid detection of a disturbance in a stationary process *Soviet Mathematical Doklady* **2** pp 795 – 799.
- 1391.** Shiryayev A N 1963 On optimal methods in quickest detection problems *Theory of Probability and its Applications* **8** (1) pp 22 – 46.
- 1392.** Shiryayev A N 1964 On Markov sufficient statistics in non-additive Bayes problems of sequential analysis *Theory of Probability and its Applications* **9** (4) pp 670 – 686.
- 1393.** Shiryayev A N 1965 Some exact formulas in a 'disorder' problem *Theory of Probability and its Applications* **10** pp 348 – 354.
- 1394.** Grigelionis B I, Shiryayev A N 1966 On Stefan's problem and optimal stopping rules for Markov processes *Theory of Probability and its Applications* **11** pp 541 – 558.

- 1395.** Shiryaev A N 1967 Two problems of sequential analysis *Cybernetics* **3** pp 63 – 69.
- 1396.** Liptser R S, Shiryaev A N 1977 Statistics of random processes *Springer-Verlag* New York USA.
- 1397.** Shiryaev A N 1972 Random processes *Moscow State University Press* Russian Federation.
- 1398.** Shiryaev A N 1973, 1974 Probability, statistics, random processes *Moscow State University Press* vols **1, 2** Russian Federation.
- 1399.** Shiryaev A N 1978, 2008b Optimal stopping rules 1st edition, 3rd edition *Springer* ISSN 0172-4568 *Library of Congress Control Number: 2007934268* Berlin Germany pp 1 – 217.
- 1400.** Shiryaev A N 1988 Probability *Springer-Verlag* Berlin Heidelberg Germany.
- 1401.** Shiryaev A N 1995 Probability 2nd edition *Springer - Verlag* ISBN 0-387-94549-0 New York USA pp 1 – 621.
- 1402.** Shiryaev A N 1998a Foundations of stochastic financial mathematics vol **1** *Fazis Scientific and Publishing House* Moscow Russian Federation ISBN 5-7036-0044-8 pp 1 – 492.
- 1403.** Shiryaev A N 1998b Foundations of stochastic financial mathematics vol **2** *Fazis Scientific and Publishing House* Moscow Russian Federation ISBN 5-7036-0044-8 pp 493 – 1017.
- 1404.** Shiryaev A N 1999 Essentials of stochastic finance: Facts, models, theory *Advanced Series on Statistical Science & Applied Probability* vol **3** *World Scientific Publishing Co Pte Ltd* Kruzhilin N (translator) ISBN 981-02-3605-0 Singapore pp 1 – 834.
- 1405.** Shiryaev A N, Spokoiny V G 2000 Statistical experiments and decisions: Asymptotic theory *World Scientific Publishing Co Pte Ltd* ISBN 9810241011 Singapore pp 1 – 283.
- 1406.** Gravarsen S E, Peskir G, Shiryaev A N 2001 Stopping Brownian motion without anticipation as close as possible to its ultimate maximum *Theory of Probability and its Applications* **45** pp 125 – 136 MR1810977
<http://www.ams.org/mathscinetgetitem?mr=1810977> .
- 1407.** Kallsen J, Shiryaev A N 2001 Time change representation of stochastic integrals *Theory of Probability and its Applications* **46** pp 579 – 585 MR1978671
<http://www.ams.org/mathscinet-getitem?mr=1978671> .
- 1408.** Kallsen J, Shiryaev A N 2002 The cumulant process and Esscher's change of measure *Finance Stoch* **6** pp 397 – 428 MR1932378
<http://www.ams.org/mathscinetgetitem?mr=1932378> .

- 1409.** Shiryaev A N 2002 Quickest detection problems in the technical analysis of the financial data *Proceedings Mathematical Finance Bachelier Congress Paris France (2000)* Springer Germany pp 487 – 521 MR1960576
<http://www.ams.org/mathscinet-getitem?mr=1960576> .
- 1410.** Jacod J, Shiryaev A N 2003 Limit theorems for stochastic processes *2nd edition* Grundlehren der Mathematischen Wissenschaften [Fundamental Principles of Mathematical Sciences] **288** Springer Berlin Germany MR1943877
<http://www.ams.org/mathscinet-getitem?mr=1943877> .
- 1411.** Shiryaev A N 2004 Kolmogorov and modern mathematics *International Conference at Mathematical Institute named after V A Steklov June 16-21, 2003* Russian Academy of Sciences Moscow Russian Federation ISBN 5-98419-003-6 pp 1 – 195.
- 1412.** Shiryaev A N, Grossinho M R, Oliveira P E, Esquivel M L (editors) 2006 Stochastic finance Springer Germany ISBN-10:0-387-28262-9 pp 1 – 364.
- 1413.** Peskir G, Shiryaev A N 2006 Optimal stopping and free-boundary problems *Lectures in Mathematics* ETH Zürich Birkhäuser Switzerland MR2256030
<http://www.ams.org/mathscinet-getitem?mr=2256030> .
- 1414.** Feinberg E A, Shiryaev A N 2006 Quickest detection of drift change for Brownian motion in generalized Bayesian and mini-max settings *Statistics & Decisions* **24** (4) pp 445 – 470.
- 1415.** Kabanov Yu, Lipster R, Stoyanov J 2006 The Shiryaev festschrift: From stochastic calculus to mathematical finance Springer Germany pp 1 – 668.
- 1416.** du Toit J, Peskir G, Shiryaev A N 2007 Predicting the last zero of Brownian motion with drift *Cornell University* NY USA pp 1 – 17
<http://arxiv.org/abs/0712.3415v1>.
- 1417.** Shiryaev A N 2008a Generalized Bayesian nonlinear quickest detection problems: on Markov family of sufficient statistics *Mathematical Control Theory and Finance Proceedings of the Workshop of April 10–14 2007* Lisbon Portugal Sarychev A et al (editors) Springer Berlin Germany pp 377 – 386.
- 1418.** Eberlein E, Papantoleon A, Shiryaev A N 2008 On the duality principle in option pricing: Semimartingale setting *Finance Stoch* **12** pp 265 – 292
<http://www.ams.org/mathscinet-getitem?mr=2390191> .
- 1419.** Shiryaev A N, Novikov A A 2009 On a stochastic version of the trading rule "Buy and hold" *Statistics & Decisions* **26** (4) pp 289 – 302.

- 1420.** Eberlein E, Papapantoleon A, Shiryaev A N 2009 Esscher transform and the duality principle for multidimensional semimartingales *The Annals of Applied Probability* vol **19** no 5 pp 1944 – 1971 <http://dx.doi.org/10.1214/09-AAP600> <http://arxiv.org/abs/0809.0301v5> .
- 1421.** Shiryaev A N, Zryumov P Y 2009 On the linear and nonlinear generalized Bayesian disorder problem (discrete time case) optimality and risk – modern trends in mathematical finance *The Kabanov Festschrift* Delbaen F et al (editors) *Springer* Berlin Germany pp 227 – 235.
- 1422.** Gapeev P V, Shiryaev A N 2010 Bayesian quickest detection problems for some diffusion processes *Cornell University NY USA* pp 1 – 25 <http://arxiv.org/abs/1010.3430v2> .
- 1423.** Karatzas I, Shiryaev A N, Shkolnikov M 2011 The one-sided Tanaka equation with drift *Cornell University NY USA* <http://arxiv.org/abs/1108.4069v1> .
- 1424.** Shiryaev A N, Zhitlukhin M V 2012 Optimal stopping problems for a Brownian motion with a disorder on a finite interval *Cornell University NY USA* pp 1 – 10 <http://arxiv.org/abs/1212.3709v1> .
- 1425.** Zhitlukhin M V, Shiryaev A N 2012 Bayesian disorder detection problems on filtered probability spaces *Theory of Probability and Its Applications* **57** (3) pp 453 – 470.
- 1426.** Feinberg E A, Mandava M, Shiryaev A N 2013 On solutions of Kolmogorov's equations for nonhomogeneous jump Markov processes *Cornell University NY USA* pp 1 – 15 <http://arxiv.org/abs/1301.6998v3> .
- 1427.** Abramowitz M, Stegun I A (editors) 1964 Handbook of mathematical functions *National Bureau of Standards Applied Mathematics Series* vol **55** USA.
- 1428.** Kubilius J 1964 Probabilistic methods in the theory of numbers American Mathematical Society Providence USA.
- 1429.** Akhiezer N I, Glazman I M 1966 Theory of linear operators in Hilbert space *Nauka* Moscow Russian Federation.
- 1430.** Lamperti J 1966 Probability *Benjamin* New York USA.
- 1431.** Kai-Lai Chung 1967 Markov chains with stationary transition probabilities *Springer-Verlag* New York USA.
- 1432.** Skorohod A V 1967 Random processes with independent increments *Nauka* Moscow Russian Federation.
- 1433.** Gikhman I I, Skorohod A V 1968 Stochastic differential equations *Naukova Dumka* Kiev Ukraine.

- 1434.** Gikhman I I, Skorohod A V 1969 Introduction to the theory of random processes 1st edition *Saunders* Philadelphia USA.
- 1435.** Gikhman I I, Skorohod A V 1974-1979 Theory of stochastic processes vols **1, 2, 3** *Springer-Verlag* New York-Berlin USA-Germany.
- 1436.** Breiman L 1968 Probability *Addison-Wesley* Reading MA USA.
- 1437.** Feller W 1968 An introduction to probability theory and its applications vols **1, 2** 3rd edition *John Wiley and Sons Inc* New York USA.
- 1438.** Brush S G 1968, 1977 A history of random processes: 1. Brownian movement *in* Study history statistics and probability Kendall M G, Plackett R L (editors) **2** pp 347 – 382 London UK.
- 1439.** Glesjer H 1969 A new test for heteroskedasticity *Journal of the American Statistical Association* **64** pp 316 – 323.
- 1440.** Ash R B 1970 Basic probability theory *John Wiley and Sons Inc* New York USA.
- 1441.** Ash R B 1972 Real analysis and probability *Academic Press* New York USA.
- 1442.** Ash R B, Gardner M F 1975 Topics in stochastic processes *Academic Press* New York USA.
- 1443.** Box G E P, Jenkins G M 1970 Time series analysis: Forecasting and control *Holden Day* San Francisco California USA.
- 1444.** Renyi A 1970 Probability theory *North-Holland Publishing Company* Amsterdam The Netherlands.
- 1445.** Isihara A 1971 Statistical physics *Academic Press* New York USA.
- 1446.** Brent R P 1973 Algorithms for minimization without derivatives *Englewood Cliffs* USA.
- 1447.** Rubin D B 1974 Estimating causal effects of treatments in randomized and nonrandomized studies *Journal of Educational Psychology* **55** (5) pp 688 – 701.
- 1448.** Borovkov A A 1976 Wahrscheinlichkeitstheorie: Eine EinjUhrung 1st edition *Birkhiuser* Basel-Stuttgart Switzerland-Germany.
- 1449.** Grangel C W J, Newbold P 1977 Forecasting economic time series *Academic Press* New York USA.
- 1450.** Grangel C W J, Teräsvirta T 1993 Modeling nonlinear economic relationships *Oxford University Press* Oxford New York UK USA.
- 1451.** Pugachev V S 1979 Theory of probability and mathematical statistics 1st edition *Nauka* Moscow Russian Federation, 2nd edition *Fizmatlit* Moscow Russian Federation ISBN 5–92210254–0 pp 1 – 496.
- 1452.** Ross S M 1980 Introduction to probability models *Academic Press* New York USA.

- 1453.** Karlin S, Taylor H M 1981 A second course in stochastic processes *Academic Press* New York USA.
- 1454.** Venttsel A D 1981 A course in the theory of stochastic processes *McGraw-Hill* New York USA.
- 1455.** Maddala G S 1983 Limited-dependent and qualitative variables in econometrics *Cambridge University Press* Cambridge UK.
- 1456.** Yaglom A M, Yaglom I M 1983 Probability and information *Reidel Dordrecht*.
- 1457.** Heckman J, Singer B 1984a A method for minimizing the impact of distributional assumptions in econometric models for duration data *Econometrica* **52** pp 271 – 320.
- 1458.** Heckman J, Singer B 1984b Econometric duration analysis *Journal of Econometrics* **24** pp 63 – 132.
- 1459.** Pagan A 1984 Econometric issues in the analysis of regressions with generated regressors *International Economic Review* **25** pp 221 – 247.
- 1460.** Van Horne J C 1984 Financial market rates and flows *Prentice Hall* Englewood Cliffs NJ USA.
- 1461.** Murphy K M, Topel R H October 1985 Estimation and inference in two-step econometric models *Journal of Business and Economic Statistics* **3** pp 370 – 379.
- 1462.** Neter J, Wasserman W, Kutner M H 1985 Applied linear statistical models 2nd edition *Irwin* Homewood USA.
- 1463.** Powell J L 1986 Censored regression quantiles *Journal of Econometrics* **32** (1) pp 143 – 155.
- 1464.** Taylor S 1986 Modeling financial time series *John Willey and Sons Inc* New York USA.
- 1465.** Tong H 1986 Nonlinear time series *Oxford University Press* Oxford UK.
- 1466.** Tornqvist L, Vartia P, Vartia Y February 1985 How should relative change be measured? *American Statistician* **39** pp 43 – 46.
- 1467.** Sharkovsky A N, Maistrenko Yu L, Romanenko E Yu 1986 Differential equations and their applications *Naukova Dumka* Kiev Ukraine pp 1 – 280.
- 1468.** Newey W, West K 1987 A simple positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix *Econometrica* **55** pp 703 – 708.
- 1469.** Luukkonen R, Saikkonen P, Terasvirta T 1988 Testing linearity against smooth transition autoregressive models *Biometrika* **75** pp 491 – 499.
- 1470.** Judge G, Hill C, Griffiths W, Lee T, Lutkepohl H 1988 An introduction to the theory and practice of econometrics 2nd edition *John Wiley and Sons Inc* New York USA.

- 1471.** Hardle W 1990 Applied nonparametric regression *Econometric Society Monograph Cambridge University Press* Cambridge UK.
- 1472.** Lancaster T 1990 The econometric analysis of transition data *Cambridge University Press* Cambridge UK.
- 1473.** Tong H 1990 Nonlinear time series: A dynamical system approach *Clarendon Press* Oxford UK.
- 1474.** Johansen S 1992 Cointegration in partial systems and the efficiency of single equation analysis *Journal of Econometrics* **52** pp 389 – 402.
- 1475.** Banerjee A, Dolado J J, Galbraith J W, Hendry D F 1993 Cointegration, error correction, and the econometric analysis of nonstationary data *Oxford University Press* Oxford UK.
- 1476.** Cleveland W S 1993 Visualizing data *Hobart Press* Summit New Jersey USA.
- 1477.** Pesaran M H, Potter S M (editors) 1993 Nonlinear dynamics, chaos and econometrics *John Wiley and Sons Inc* New York USA.
- 1478.** Hamilton J D 1994 Time series analysis *Princeton University Press* Princeton, NJ USA.
- 1479.** Peters E E 1994 Fractal market analysis: Applying chaos theory to investment and economics *John Wiley and Sons Inc* New York USA.
- 1480.** Enders W 1995 Applied econometric time series *John Wiley and Sons Inc* New York USA.
- 1481.** Johansen S 1995 Likelihood based inference in co-integrated vector autoregressive models *Oxford University Press* Oxford UK.
- 1482.** Karatzas I, Shreve S 1995 Methods of mathematical finance *Columbia University Press* New York USA.
- 1483.** Moore G E 1995 Lithography and the future of Moore's law *Proceedings SPIE Symposium Optical Microlithography Conference VIII* **2440** 2.
- 1484.** Moore G E 2003 No exponential is forever – but we can delay forever *ISSCC*.
- 1485.** Campbell J Y, Lo A W, MacKinlay A C 1996 The econometrics of financial markets *Princeton University Press* Princeton USA.
- 1486.** Mosekilde E 1996 Topics in nonlinear dynamics: Applications to physics, biology and economic systems *World Scientific Publishing Pte Ltd* Singapore.
- 1487.** Rogers L C G, Talay D (editors) 1997 Numerical methods in finance *Cambridge University Press* Cambridge UK.
- 1488.** Campbell J, Lo A, MacKinlay C 1997 The econometrics of financial markets *Princeton University Press* Princeton NJ USA.

- 1489.** Greene W H 1997, 1999, 2003 *Econometric analysis* 1st edition, 4th edition, 5th edition *Prentice Hall* Upper Saddle River USA.
- 1490.** Hasem P M, Pesaran B 1997 *Working with Microfit 4.0: Interactive econometric analysis* *Oxford University Press* Oxford UK.
- 1491.** Lo A W, MacKinlay A C 1997 *The econometrics of financial markets* *Princeton University Press* Princeton New Jersey USA.
- 1492.** Anderson H M, Vahid F 1998 Testing multiple equation systems for common nonlinear factors *Journal of Econometrics* **84** pp 1 – 37.
- 1493.** Hubbard B B 1998 *The world according to wavelets* *A K Peters* Wellesley MA USA.
- 1494.** Mallat S A 1998 *Wavelet tour of signal processing* *Academic Press* San Diego CA USA.
- 1495.** Teolis A 1998 *Computational signal processing with wavelets* *Birkhauser* Switzerland.
- 1496.** Anishenko V S, Vadivasova T E, Astakhov V V 1999 *Nonlinear dynamics of chaotic and stochastic systems* *Saratov University Publishing House* Saratov Russian Federation.
- 1497.** Escribano, Jorda 1999 Improved testing and specification of smooth transition regression models in *Nonlinear time series analysis of economic and financial data* Rothman (editor) *Kluwer Academic Press* Amsterdam The Netherlands.
- 1498.** Hasem P M, Shin Y 1999 An autoregressive distributed lag modelling approach to cointegration analysis in *Econometrics and economic theory in the 20th century: The Ranger Frisch centennial symposium* Strom S, Holly A, Diamond P (editors) *Cambridge University Press* Cambridge UK
www.econ.cam.ac.uk/faculty/pesaran/ADL.pdf .
- 1499.** Hasem P M, Shin Y, Smith R J 2001 Bounds testing approaches to the analysis of level relationships *Journal of Applied Econometrics* **16** (3) pp 289 – 326.
- 1500.** Potter S 1999 *Non-linear time series modelling: An introduction* *Typescript* Federal Reserve Bank of New York NY USA.
- 1501.** Rothman (editor) 1999 *Nonlinear time series analysis of economic and financial data* *Kluwer Academic Press* Amsterdam The Netherlands.
- 1502.** Hayashi F 2000 *Econometrics* *Princeton University Press* Princeton NJ USA.
- 1503.** Durbin J, Koopman S J 2000 Time series analysis of non-Gaussian observations based on state-space models from both classical and Bayesian perspectives *Journal of Royal Statistical Society Series B* **62** pp 3 – 56.
- 1504.** Durbin J, Koopman S J 2002 A simple and efficient simulation smoother for state space time series analysis *Biometrika* **89** pp 603 – 615.

- 1505.** Durbin J, Koopman S J 2012 Time series analysis by state space methods 2nd edition *Oxford University Press* Oxford UK.
- 1506.** Ilinski K 2001 Physics of finance: Gauge modelling in non-equilibrium pricing *John Wiley and Sons Inc* New York USA ISBN-10: 0471877387 pp 1 – 300.
- 1507.** Kuznetsov S P 2001 Dynamic chaos *Izdatel'stvo Fiziko-Matematicheskoi Literatury* Moscow Russian Federation pp 1 – 296.
- 1508.** Tufte E R 2001 The visual display of quantitative information 2nd edition *Graphics Press* Cheshire CT USA.
- 1509.** Nicolau J 2002 Stationary processes that look like random walks – The bounded random walk process in discrete and continuous time *Econometric Theory* **18** pp 99 – 118.
- 1510.** Ledenyov V O, Ledenyov O P, Ledenyov D O 2002 A quantum random number generator on magnetic flux qubits *Proceedings of the 2nd Institute of Electrical and Electronics Engineers Conference IEEE-NANO 2002* Chicago Washington DC USA IEEE Catalog no 02TH86302002 Library of Congress number: 2002106799 ISBN: 0-7803-7538-6.
- 1511.** Woolridge J M 2002 Econometric analysis of cross section and panel data *MIT Press* Cambridge MA USA.
- 1512.** Koop G 2003 Bayesian econometrics *John Wiley and Sons Inc* New York USA.
- 1513.** Selover D D, Jensen R V, J. Kroll J 2003 *Studies in Nonlinear Dynamics & Econometrics* 7 1.
- 1514.** Davidson R, MacKinnon J 2004 Econometric theory and methods *Oxford University Press* Oxford UK.
- 1515.** Cameron A C, Trivedi P K 2005 Microeconometrics: Methods and applications *Cambridge University Press* Cambridge UK.
- 1516.** Protter P E 2005 Stochastic integration and differential equations *Springer* Germany.
- 1517.** Backhaus K et al 2006 Multivariate analysemethoden. Eine anwendungsorientierte einföhrung *Springer* Berlin Heidelberg Germany.
- 1518.** Damodaran A 2006 Applied corporate finance. A user' manual 2nd edition *John Wiley & Sons Inc* New Jersey USA.
- 1519.** Ernst D, Häcker J 2007 Applied international corporate finance *Vahlen* München Germany.
- 1520.** Angrist J D, Pischke J-S 2008 Mostly harmless econometrics: An empiricist's companion *Princeton University Press* USA.
- 1521.** Vialar Th, Goergen A 2009 Complex and chaotic nonlinear dynamics *Springer-Verlag* Berlin Heidelberg Germany ISBN 978-3-540-85977-2 pp 1 – 752.

1522. Weatherall J O 2013 *Physics of Wall Street Houfton* New York USA.

Wiener Filtering Theory, Pugachev Filtering Theory, Stratanovich Optimal Nonlinear Filtering Theory, Stratanovich-Kalman-Bucy Filtering Algorithm, Stratanovich-Kalman-Bucy Filter, Particle Filter in Econometrics, Econophysics, Electrical and Computer Engineering:

1523. Edgeworth F I 1905 The law of error *Proceedings Cambridge Philosophic Society* vol **20** pp 36 – 65.

1524. Wiener N 1923 Differential space *Journal of Mathematical Physics Math Inst Tech* vol **2** pp 131 – 174.

1525. Wiener N 1930 Generalized harmonic analysis *Acta Math* vol **55** no 2 - 3 pp 117 – 258.

1526. Wiener N 1949 The extrapolation, interpolation and smoothing of stationary time series *John Wiley & Sons Inc* New York NY USA.

1527. Andronov A A, Vitt A A, Pontryagin L S 1933 On statistical consideration of dynamic systems *Soviet Journal of Experimental and Theoretical Physics* vol **3** no 3 pp 165 – 180.

1528. Ito K 1944 Stochastic integral *Proceedings Imperial Academy Tokyo* vol **20** pp 519 – 524.

1529. Ito K 1951a On a formula concerning stochastic differentials *Nagoya Mathematics Journal* vol **3** pp 55 – 65.

1530. Ito K 1951b On stochastic differential equations *Mem American Mathematical Society* vol **4** pp 1 – 51.

1531. Ito K, Xiong K 2000 Gaussian filters for nonlinear filtering problems *IEEE Transactions on Automatic Control* vol **45** no 5.

1532. Pugachev V S 1944 Random functions, defined by common differential equations *Works by Air Forces Military Academy named after Zhukovsky N E* vol **118** pp 3 – 36.

1533. Pugachev V S 1956a The use of canonical expansions of random functions in determining an optimum linear system *Automatics and Remote Control (USSR)* vol **17** pp 489 – 499.

1534. Pugachev V S 1956b On a possible general solution of the problem of determining optimum dynamic systems *Automatics and Remote Control (USSR)* vol **17** pp 585 – 589.

1535. Pugachev V S 1960 Theory of random functions and its application in problems of automatic control *State Publishing House of Physical Mathematical Literature (Fizmatlit)* Moscow Russian Federation pp 1 – 883.

- 1536.** Pugachev V S 1961 Application of theory of Markov processes in analysis of accuracy of automatic systems *News Academy of Sciences USSR Energetics and Automatics* no 3 pp 46 – 57.
- 1537.** Pugachev V S 1962 Theory of random functions and its application to problems of automatic control *Fizmatgiz* Moscow Russian Federation.
- 1538.** Pugachev V S 1971 On distribution of computing number of random process *Works of 1st All Union Symposium on Statistics Problems in Technical Cybernetics* Moscow USSR February 14 - 18, 1967 in *Nonlinear and optimal systems Nauka* Moscow Russian Federation pp 374 – 381.
- 1539.** Pugachev V S 1973, 1974, 1975 Stochastic systems *Nauka* Moscow Russian Federation issues 7-9, 11-12, 10.
- 1540.** Pugachev V S (editor) 1974 Foundations of automatic control *Nauka* Moscow Russian Federation.
- 1541.** Pugachev V S 1978 Estimation of variables and parameters in stochastic systems, described by differential equations *DAN USSR* vol **241** no 5 pp 1031 – 1034.
- 1542.** Pugachev V S 1979a Estimation of state and parameters of continuous nonlinear systems *Automatics and Tele-mechanics* no 6 pp 63 – 79.
- 1543.** Pugachev V S 1979b Theory of probability and mathematical statistics 1st edition *Nauka* Moscow Russian Federation, 2nd edition *Fizmatlit* Moscow Russian Federation ISBN 5–92210254–0 pp 1 – 496.
- 1544.** Pugachev V S 1980a Estimation of Markov processes. Time series *Proceedings International Conference Nottingham March, 1979; North Holland Publishing House* Amsterdam New York London pp 389 – 400.
- 1545.** Pugachev V S 1980b Finite distributions of processes, defined by stochastic differential equations, and extrapolation of these processes *DAN USSR* vol **251** no 1 pp 40 – 43.
- 1546.** Pugachev V S 1981 The finite-dimensional distributions of a random process determined by a stochastic differential equation and their application to control problems *Problems of Control and Theory of Information* vol **10** no 2 pp 95 – 114.
- 1547.** Pugachev V S 1982a Generalization of theory of conditional estimation and extrapolation *DAN USSR* vol **262** no 3 pp 535 - 538.
- 1548.** Pugachev V S 1982b Conditionally optimal estimation in stochastic differential systems *Automatics* vol **118** no 6 pp 685 – 696.
- 1549.** Pugachev V S 1984 Conditionally optimal filtering and extrapolation of continuous processes *Automatics and Tele-mechanics* no 2 pp 82 – 89.

- 1550.** Pugachev V S 1985 Conditionally optimal estimation in systems with randomly varying structure *Proceedings of the 9th World Congress of IFAC Budapest Hungary July 2-6, 1984* vol 2 pp 773 – 777 Pergamon Press Oxford UK.
- 1551.** Pugachev V S 1986 Approximate methods for findings finite-dimensional distributions of random sequences determined by difference equations *Problems of Control and Theory of Information* vol 15 no 2 pp 101 – 109.
- 1552.** Pugachev V S, Sinitsyn I N 1986 Directions of development of mathematical support for stochastic systems research in Modern informatics techniques *Nauka* Moscow Russian Federation pp 166 – 174.
- 1553.** Pugachev V S, Sinitsyn I N, Shin V I 1986a Conditionally optimal discrete filtering of processes in continuous - discrete systems *DAN USSR* vol 289 no 2 pp 297 - 301.
- 1554.** Pugachev V S, Sinitsyn I N, Shin V I 1986b Problems of analysis and on-line conditionally optimal filtering of processes in nonlinear stochastic systems *Preprints of the 2nd IFAC Symposium on Stochastic Control Vilnius USSR* May 19-23, 1986 no 1 pp 4 – 18.
- 1555.** Pugachev V S, Sinitsyn I N, Shin V I 1987a On one program realization of method of normal approximation in problems of analysis of nonlinear stochastic differential systems in Computers for numerous applications *Nauka* Moscow Russian Federation pp 55 - 60.
- 1556.** Pugachev V S, Sinitsyn I N, Shin V I 1987b Program realization of method of normal approximation in problems of analysis of nonlinear stochastic systems *Automatics and Tele-mechanics* no 2 pp 62 – 68.
- 1557.** Pugachev V S, Sinitsyn I N, Shin V I 1987c Problems of analysis and conditionally optimal filtering in real time scale processes in nonlinear stochastic systems (review) *Automatics and Tele-mechanics* no 12 pp 3 – 24.
- 1558.** Pugachev V S, Sinitsyn I N (editors) 1989 Principles of development of dialogue packets of applied programs for research of linear and nonlinear stochastic differential systems. Software pack “StS Analysis” version 1 *Pre-print Institute of Informatics Problems Academy of Sciences USSR* Moscow Russian Federation.
- 1559.** Pugachev V S, Sinitsyn I N 1990, 2004 Stochastic differential systems: Analysis and filtering *Nauka* Moscow Russian Federation pp 1 – 642, *Logos* Moscow Russian Federation ISBN 5-94010-199-2 pp 1 – 1000.
- 1560.** Pugachev V S, Sinitsyn I N 1999 Lectures on functional analysis and applications *World Scientific* Singapore ISBN 9810237227 ISBN 9810237235 pp 1 – 730.
- 1561.** Shannon C E 1948 A mathematical theory of communication *Bell System Technical Journal* 27 pp 379 – 423 and pp 623 – 656.

- 1562.** Bode H W, Shannon C E 1950 A simplified derivation of linear least-squares smoothing and prediction theory *Proceedings IRE* vol **38** pp 417 – 425.
- 1563.** Zadeh L A, Ragazzini J R 1950 An extension of Wiener's theory of prediction *Journal of Applied Physics* vol **21** pp 645 – 655.
- 1564.** Booton R C 1952 An optimization theory for time-varying linear systems with nonstationary statistical inputs *Proceedings IRE* vol **40** pp 977 – 981.
- 1565.** Davis R C 1952 On the theory of prediction of nonstationary stochastic processes *Journal of Applied Physics* vol **23** pp 1047 – 1053.
- 1566.** Bartlett M S 1954 Problemes de l'analyse spectral des series temporelles stationnaires *Publ Inst Statist University Paris III-3* pp 119 – 134.
- 1567.** Doob J L 1955 Stochastic processes *John Wiley & Sons Inc* New York N Y USA.
- 1568.** Franklin G 1955 The optimum synthesis of sampled-data systems *Ph D Thesis* Department of Electrical Engineering Columbia University New York USA.
- 1569.** Laning J H, Battin R H 1956 Random processes in automatic control *McGraw-Hill Book Company Inc* New York NY, USA.
- 1570.** Lees A B 1956 Interpolation and extrapolation of sampled data *Trans IRE Prof Group on Information Theory IT-2* 1956 pp 173 – 175.
- 1571.** Solodovnikov V V, Batkov A M 1956 On the theory of self-optimizing systems *Proc Heidelberg Conference on Automatic Control* pp 308 – 323.
- 1572.** Newton G C Jr, Gould L A, Kaiser J F 1957 Analytical design of linear feedback controls *John Wiley & Sons Inc* New York USA.
- 1573.** Tukey J W 1957 On the comparative anatomy of transformations *Annals of Mathematical Statistics* **28** pp 602 – 632.
- 1574.** Rytov S M 1957 Development of theory of nonlinear oscillations in the USSR *Radio-Technique and Electronics* no 11 pp 1435 – 1450.
- 1575.** Cramer H 1957 Mathematical methods of statistics *Princeton University Press* Princeton NJ USA.
- 1576.** Bellman R E, Glicksberg I, Gross O A 1958 Some aspects of the mathematical theory of control processes *RAND Report R-313* pp 1 – 244.
- 1577.** Blum M 1958 Recursion formulas for growing memory digital filters *Trans IRE Prof Group on Information Theory IT-4* pp 24 – 30.
- 1578.** Darlington S 1958 Linear least-squares smoothing and prediction with applications *Bell System Tech Journal* vol **37** pp 1221 – 1294.

- 1579.** Davenport W B Jr, Root W L 1958 An introduction to the theory of random signals and noise *McGraw-Hill Book Company Inc* New York NY USA.
- 1580.** Sherman S 1958 Non-mean-square error criteria *Trans IRE Prof Group on Information Theory* **IT-4** pp 125 – 126.
- 1581.** Shinbrot M 1958 Optimization of time-varying linear systems with nonstationary inputs *Trans ASME* vol **80** pp 457 – 462.
- 1582.** Smith O J M 1958 Feedback control systems *McGraw-Hill Book Company Inc* New York USA.
- 1583.** Kalman R E, Koepcke R W 1958 Optimal synthesis of linear sampling control systems using generalized performance indexes *Transactions of the ASME* vol **80** pp 1820 – 1826.
- 1584.** Kalman R E, Koepcke R W 1959 The role of digital computers in the dynamic optimization of chemical reactors *Proceedings of the Western Joint Computer Conference* pp 107 – 116.
- 1585.** Kalman R E, Bertram J E 1958 General synthesis procedure for computer control of single and multi-loop linear systems *Transactions of the AIEE* vol **77** II pp 602 – 609.
- 1586.** Kalman R E, Bertram J E 1959 A unified approach to the theory of sampling systems *Journal of the Franklin Institute* vol **267** pp 405 – 436.
- 1587.** Kalman R E 1960a On the general theory of control systems *Proceedings of the First International Conference on Automatic Control* Moscow USSR.
- 1588.** Kalman R E 1960b A new approach to linear filtering and prediction problems *Journal of Basic Engineering Transactions ASME Series D* **82** pp 35 – 45; **59** pp 1551 – 1580.
- 1589.** Kalman R E, Bucy R S 1961 New results in linear filtering and prediction theory *Journal of Basic Engineering Transactions ASME Series D* **83** pp 95 – 108.
- 1590.** Kalman R E 1963 New methods in Wiener filtering theory *in* Proceedings of the First Symposium of Engineering Applications of Random Function Theory and Probability Bogdanoff J L, Kozin F (editors) *John Wiley and Sons Inc* New York USA pp 270 – 388.
- 1591.** Merriam C W III 1959 A class of optimum control systems *Journal of the Franklin Institute* vol **267** pp 267 – 281.
- 1592.** Stratonovich R L 1959a Optimum nonlinear systems which bring about a separation of a signal with constant parameters from noise *Radiofizika* **2** (6) pp 892 – 901.
- 1593.** Stratonovich R L 1959b On the theory of optimal non-linear filtering of random functions *Theory of Probability and its Applications* **4** pp 223 – 225.
- 1594.** Stratonovich R L 1960a Application of the Markov processes theory to optimal filtering *Radio Engineering and Electronic Physics* **5** (11) pp 1 – 19.

- 1595.** Stratanovich R L 1960b Conditional Markov processes *Theory of Probability and its Applications* **5** pp 156 – 178.
- 1596.** Stratanovich R L 1961 Selected problems in theory of oscillations in radio-technique *Soviet Radio* Moscow Russian Federation.
- 1597.** Stratanovich R L 1964 New form of formulation of stochastic integrals and equations *Moscow State University Bulletin Series 1 Mathematics and Mechanics* Moscow Russian Federation.
- 1598.** Stratanovich R L 1966 Conditional Markov processes and their application in theory of optimal control *Moscow State University Publishing House* Moscow Russian Federation.
- 1599.** Volterra V 1959 Theory of functionals and integral and integro-differential equations *Dover Publications Inc* New York USA.
- 1600.** Middleton D 1960 An introduction to statistical communication theory *McGraw - Hill* New York USA.
- 1601.** US Air Forces Office of Scientific Research 1960 – 2014 Full extended complemented digital collection of technical research reports completed under US AFOSR contracts in 1960 – 2014 *US Air Forces Office of Scientific Research (US AFOSR)* Arlington DC USA.
- 1602.** Friedman M 1962 The interpolation of time series by related series *Journal of the American Statistical Association* **57** pp 729 – 757.
- 1603.** Kushner H J 1964a On the differential equations satisfied by the conditional densities of Markov processes with applications *Journal SIAM Control Ser A* vol **2** pp 106 – 119.
- 1604.** Kushner H J 1964b On the dynamical equations of conditional probability density functions with applications to optimal stochastic control theory *Journal Math Anal Appl* vol **8** pp 332 – 334.
- 1605.** Kushner H J 1967a Dynamical equations for optimal nonlinear filtering *Journal Differential Equations* vol **3** pp 179 – 190.
- 1606.** Kushner H J 1967b Approximations to optimal nonlinear filters *IEEE Transactions on Automatic Control* vol **12**.
- 1607.** Kushner H J, Budhiraja A S 2000 A nonlinear filtering algorithm based on an approximation of the conditional distribution *IEEE Transactions on Automatic Control* vol **45** no 3.
- 1608.** Busy R S 1967 Optimal filtering for correlated noise *Journal of Mathematical Analysis and Applications* vol **20** no 1 pp 1 – 8.

- 1609.** Fisher I R 1967 Optimal nonlinear filtering *in* Advances in control systems. Theory and application Leondes C T (editor) vol **5** pp 199 – 300 *Academic Press* New York London USA UK.
- 1610.** Liptser R Sh, Shiryaev A N 1968 Nonlinear filtering of diffusive Markov processes *Steklov Institute Research Works Academy of Sciences USSR* vol **104** pp 135 – 180.
- 1611.** Liptser R Sh, Shiryaev A N 1974 Statistics of random processes *Nauka* Moscow Russian Federation.
- 1612.** Bryson A E, Ho Y C 1969 Applied optimal control: Optimization, estimation, and control *Blaisdell Publishing* Waltham Massachusetts USA.
- 1613.** Jazwinski A H 1970 Stochastic processes and filtering theory *Academic Press* New York USA.
- 1614.** Sorenson H W 1970 Least-squares estimation: from Gauss to Kalman *IEEE Spectrum* vol **7** pp 63 – 68.
- 1615.** Bucy R S, Joseph P D 1970 Filtering for stochastic processes with applications to guidance *John Wiley & Sons Inc* New York USA.
- 1616.** Wright-Patterson Air Forces Base (AFB) 1970 – 2014 Full extended complemented digital collection of technical research reports and research seminars minutes *Wright-Patterson Air Forces Base (AFB)* Ohio USA.
- 1617.** Chow G C, Lin A 1971 Best linear unbiased interpolation, distribution, and extrapolation of time series by related series *Review of Economics and Statistics* **53** pp 372 – 375.
- 1618.** Chow G C, Lin A 1976 Best linear unbiased estimation of missing observations in an economic time series *Journal of the American Statistical Association* **71** pp 719 – 721.
- 1619.** Chow Y S, Teicher H 1978 Probability theory: Independence, interchangeability, Martingales *Springer-Verlag* New York USA.
- 1620.** Maybeck P S 1972 The Kalman filter—An introduction for potential users **TM-72-3** *Air Force Flight Dynamics Laboratory* Wright-Patterson Air Forces Base (AFB) Ohio USA.
- 1621.** Maybeck P S 1974 Applied optimal estimation—Kalman filter design and implementation *Air Force Institute of Technology* Wright-Patterson Air Forces Base (AFB) Ohio USA.
- 1622.** Maybeck P S 1990 The Kalman filter: An introduction to concepts *Autonomous Robot Vehicles* editors I J Cox and G T Wilfong *Springer-Verlag* New York USA pp 194 – 204.
- 1623.** Willner D 1973 Observation and control of partially unknown systems *Ph D Thesis Department of Electrical Engineering Massachusetts Institute of Technology* USA.

- 1624.** Leondes C T, Pearson J O 1973 Kalman filtering of systems with parameter uncertainties: A survey *International Journal of Control* vol **17** no 4 pp 785 – 801.
- 1625.** Akaike H 1974 A New look at the statistical model identification *IEEE Transactions on Automatic Control* **AC-19** pp 716 – 723.
- 1626.** Athans M 1974 The importance of Kalman filtering methods for economics *Annals of Economic and Social Measurement* vol **3** no 1 pp 49 – 64.
- 1627.** Dempster A P, Laird N M, Rubin D B 1977 Maximum likelihood estimation from incomplete data *Journal of the Royal Statistical Society* **14** pp 1 – 38.
- 1628.** Griffiths L J 1977 A continuously adaptive filter implemented as a lattice structure *Proceedings of IEEE International Conference on Acoustics, Speech, and Signal Processing* Hartford CT USA pp 683 – 686.
- 1629.** Schwarz G 1978 Estimating the dimension of a model *Annals of Statistics* **6** pp 147 – 164.
- 1630.** Falconer D D, Ljung L 1978 Application of fast Kalman estimation to adaptive equalization *IEEE Transactions Comm* vol **COM-26** pp 1439 – 1446.
- 1631.** Anderson B D O, Moore J B 1979 Optimal filtering *Prentice-Hall* Englewood Cliffs NJ USA.
- 1632.** Bozic S M 1979 Digital and Kalman filtering *Edward Arnold* London USA.
- 1633.** Julier S J, Uhlmann J K 1997 A new extension of the Kalman filter to nonlinear systems *Proceedings of Aero-Sense: The 11th International Symposium on Aerospace/Defense Sensing, Simulation and Controls*.
- 1634.** Priestley M B 1981 Spectral Analysis and Time Series *John Wiley and Sons Inc* USA.
- 1635.** Geweke J F, Singleton K J 1981 Maximum likelihood confirmatory factor analysis of economic time series *International Economic Review* **22** p 1980.
- 1636.** Fernandez R B 1981 A methodological note on the estimation of time series *Review of Economics and Statistics* **63** pp 471 – 476.
- 1637.** Litterman R B 1983 A random walk, Markov model for the distribution of time series *Journal of Business and Economic Statistics* **1** pp 169 – 173.
- 1638.** Meinhold R J, Singpurwalla N D 1983 Understanding the Kalman filter *The American Statistician* **37** (2) pp 123 – 127.
- 1639.** Ahlbehrendt N, Kempe V 1984 Analyse stochastischer systeme *Academie-Verlag* Berlin Germany.
- 1640.** Harvey A C, Pierse R G 1984 Estimating missing observations in economic time series *Journal of the American Statistical Association* **79** pp 125 – 131.

- 1641.** Harvey A C 1987 Applications of the Kalman filter in econometrics *in* Advances in econometrics: Fifth World congress Bewley T F (editor) vol **1** *Econometric Society Monograph no 13* Cambridge University Press Cambridge UK.
- 1642.** Harvey A C 1989 Forecasting, structural time series models and the Kalman filter *Cambridge University Press* Cambridge UK.
- 1643.** Lewis F 1986 Optimal estimation *John Wiley & Sons Inc* USA.
- 1644.** Watson M W 1986 Univariate de-trending methods with stochastic trends *Journal of Monetary Economics* **18** pp 49 – 75.
- 1645.** Lanning S G 1986 Missing observations: A simultaneous approach versus interpolation by related series *Journal of Economic and Social Measurement* **14** pp 155 – 163.
- 1646.** Burrige P, Wallis K F 1988 Prediction theory for autoregressive-moving average processes *Econometric Reviews* **7** pp 65 – 69.
- 1647.** Proakis J G, Manolakis D G 1988 Introduction to digital signal processing *Macmillan* New York USA.
- 1648.** Caines P E 1988 Linear stochastic systems *Wiley Series in Probability and Mathematical Statistics* *John Wiley & Sons* New York USA.
- 1649.** de Jong P 1988 The likelihood for a state space model *Biometrika* **75** pp 165 – 169.
- 1650.** de Jong P 1989 Smoothing and interpolation with the state space model *Journal of the American Statistical Association* **84** pp 1085 – 1088.
- 1651.** de Jong P 1991 The diffuse Kalman filter *Annals of Statistics* **19** pp 1073 – 1083.
- 1652.** de Jong P, Chu-Chun-Lin S 1994 Fast likelihood evaluation and prediction for nonstationary state space models *Biometrika* **81** pp 133 – 142.
- 1653.** de Jong P, Penzer J 2004 The ARMA model in state space form *Statistics and Probability Letters* **70** pp 119 – 125.
- 1654.** Franklin G F, Powell J D, Workman M L 1990 Digital control of dynamic systems *2nd edition* *Addison-Wesley* USA.
- 1655.** Brockwell P J, Davis R A 1991 Time series: Theory and methods *Springer* Germany.
- 1656.** Jang J-S R 1991 Fuzzy modeling using generalized neural networks and Kalman filter algorithm *Proceedings of the 9th National Conference on Artificial Intelligence (AAAI-91)* pp 762 – 767.
- 1657.** Doran E 1992 Constraining Kalman filter and smoothing estimates to satisfy time varying restrictions *Review of Economics and Statistics* **74** pp 568 – 572.
- 1658.** Brown R G, Hwang P Y C 1992, 1997 Introduction to random signals and applied Kalman filtering *3rd edition* *John Wiley and Sons Inc* New York USA.

- 1659.** Gordon N J, Salmond D J, Smith A F M 1993 A novel approach to non-linear and non-Gaussian Bayesian state estimation *IEE-Proceedings* **F 140** pp 107 – 113.
- 1660.** Tanizaki H 1993 Non-linear filters: Estimation and applications *Lecture Notes in economics and mathematical systems Springer Verlag* Germany.
- 1661.** Pinheiro M, Coimbra C 1993 Distribution and extrapolation of a time series by related series using logarithms and smoothing penalties *Economica* **12** pp 359 – 374.
- 1662.** Bar-Shalom, Xiao-Rong Li 1993 Estimation and tracking: Principles, techniques and software *Artech House* Boston USA.
- 1663.** Farhmeir L, Tutz G 1994 Multivariate statistical modeling based generalized linear models *Springer-Verlag* New-York USA.
- 1664.** Grimble M J 1994 Robust industrial control: Optimal design approach for polynomial systems *Prentice Hall* USA.
- 1665.** Bomhoff E 1994 Financial forecasting for business and economics *Dryden* London UK.
- 1666.** Lee J H, Ricker N L 1994 Extended Kalman filter based nonlinear model predictive control *Ind Eng Chem Res* vol **33** no 6 pp 1530 – 1541.
- 1667.** Ricker N L, Lee J H 1995 Nonlinear model predictive control of the Tennessee Eastman challenge process *Computers & Chemical Engineering* vol **19** no 9 pp 961 – 981.
- 1668.** Kleeman L 1995 Understanding and applying Kalman filtering *Department of Electrical and Computer Systems Engineering Monash University* Clayton Australia pp 1 – 37.
- 1669.** Venegas F, de Alba E, Ordorica M 1995 An economist's guide to the Kalman filter *Estudios Economicos* **10** (2) pp 123 – 145.
- 1670.** Golub G H, van Loan C F 1996 Matrix computations *3rd edition The John Hopkins University Press* USA.
- 1671.** Hayes M H 1996 Statistical digital signal processing and modeling *John Wiley and Sons Inc* USA.
- 1672.** Haykin S 1996 Adaptive filter theory *3rd edition Prentice-Hall Inc* Upper Saddle River New Jersey USA.
- 1673.** Haykin S (editor) 2001 Kalman filtering and neural networks *Wiley Inter-Science* USA.
- 1674.** Fuller W A 1996 Introduction to statistical time series *John Wiley & Sons Inc* USA.
- 1675.** Roncalli Th 1996 TSM - Time series and wavelets for finance *Global Design* Paris France.
- 1676.** Wells C 1996 The Kalman filter in finance *Advanced Studies in Theoretical and Applied Econometrics Kluwer Academic Publishers* vol **32** The Netherlands.

- 1677.** Hodrick R, Prescott E C 1997 Postwar U.S. business cycle: An empirical investigation, *Journal of Money, Credit and Banking* **29** (1) pp 1 – 16.
- 1678.** Krelle W 1997 How to deal with unobservable variables in economics *Discussion Paper no B 414 Bonn University Germany*.
- 1679.** Babbs S H, Nowman K B 1999 Kalman filtering of generalized Vasicek term structure models *Journal of Financial and Quantitative Analysis* vol **34** no 1.
- 1680.** Kim C J, Nelson C 1999 State-space models with regime-switching *MIT Press Cambridge MA USA*.
- 1681.** Pitt M K, Shephard N 1999 Filtering via simulation: Auxiliary particle filters *Journal of the American Statistical Association* **94** (446) pp 590 – 599.
- 1682.** Shiryaev A N 1999 Essentials of stochastic finance: Facts, models, theory *Advanced Series on Statistical Science & Applied Probability* vol **3** *World Scientific Publishing Co Pte Ltd Kruzhilin N (translator) ISBN 981-02-3605-0 Singapore* pp 1 – 834.
- 1683.** Wanhammar L 1999 DSP integrated circuits *Academic Press San Diego USA ISBN: 0-12-734530-2* p 85.
- 1684.** Durbin J, Koopman, S J 2000 Time series analysis of non-Gaussian observations based on state-space models from both classical and Bayesian perspectives *Journal of Royal Statistical Society Series B* **62** pp 3 – 56.
- 1685.** Durbin J, Koopman S J 2002 A simple and efficient simulation smoother for state space time series analysis *Biometrika* **89** pp 603 – 615.
- 1686.** Durbin J, Koopman S J 2012 Time series analysis by state space methods *2nd edition Oxford University Press Oxford UK*.
- 1687.** Cuche N A, Hess M K 2000 Estimating monthly GDP in a general Kalman filter framework: Evidence from Switzerland *Economic & Financial Modelling Winter 2000* pp 153 – 193.
- 1688.** Doucet A, de Freitas J F G, Gordon N J 2001 Sequential Monte Carlo methods in practice *Springer-Verlag New York USA*.
- 1689.** Welch G, Bishop G 2001 An introduction to the Kalman filter *Department of Computer Science University of North Carolina at Chapel Hill Chapel Hill USA*.
- 1690.** Arulampalam S, Maskell S, Gordon N J, Clapp T 2002 A tutorial on particle filters for online nonlinear/non-Gaussian Bayesian tracking *IEEE Transaction on Signal Processing* **50** (2) pp 174 – 188.

- 1691.** Javaheri A, Lautier D, Galli A 2002 Filtering in finance *RBC Capital Markets Universit'e Paris IX Ecole Nationale Sup'erieure des Mines de Paris Ecole Nationale Sup'erieure des Mines de Paris* France Filteringinfinance.pdf pp 1 – 26.
- 1692.** Doucet A, Tadic V B 2003 Parameter estimation in general state-space models using particle methods *Annals of the Institute of Statistical Mathematics* **55** (2) pp 409 – 422.
- 1693.** Bahmani O, Brown F 2004 Kalman filter approach to estimate the demand for international reserves *Applied Economics* **36** (15) pp 1655 – 1668.
- 1694.** Broto C, Ruiz E 2004 Estimation methods for stochastic volatility models: A survey, *Journal of Economic Surveys* **18** (5) pp 613 – 637.
- 1695.** Ristic B, Arulampalam S, Gordon N J 2004 Beyond the Kalman Filter: Particle filters for tracking applications *1st edition Artech House Boston USA*.
- 1696.** Capp'e O, Moulines E 2005 On the use of particle filtering for maximum likelihood parameter estimation in *European Signal Processing Conference Antalya Turkey*.
- 1697.** Ozbek L, Ozale U 2005 Employing the extended Kalman filter in measuring the output gap *Journal of Economic Dynamics and Control* **29** pp 1611 – 1622.
- 1698.** Poyiadjis G, Doucet A, Singh S S 2005a Particle methods for optimal filter derivative: application to parameter estimation in *Proceedings IEEE International Conference on Acoustics, Speech, and Signal Processing*.
- 1699.** Poyiadjis G, Doucet A, Singh S S 2005b Maximum likelihood parameter estimation in general state-space models using particle methods in *Proceedings of the American Statistical Association JSM 05*.
- 1700.** Proietti T 2006 Trend–cycle decompositions with correlated components *Econometric Reviews* **25** pp 61 – 84.
- 1701.** Litvin A, Konrad J Karl W C 2003 Probabilistic video stabilization using Kalman filtering and mosaicking *IS&T/SPIE Symposium on Electronic Imaging, Image and Video Communications and Proc*.
- 1702.** van Willigenburg L G, De Koning W L 2004 UDU factored discrete-time Lyapunov recursions solve optimal reduced-order LQG problems *European Journal of Control* **10** pp 588 – 601.
- 1703.** Voss H U, Timmer J, Kurths J 2004 Nonlinear dynamical system identification from uncertain and indirect measurements *International Journal Bifurcation and Chaos* **14** pp 1905 – 1933.
- 1704.** Capp'e O, Moulines E, Ryd'en T 2005 Inference in hidden Markov models *Springer Series in Statistics Springer New York USA*.

- 1705.** Fernández-Villaverde J, Rubio-Ramírez J F 2005 Estimating dynamic equilibrium economies: Linear versus non-linear likelihood *Journal of Applied Econometrics* 20 891910.
- 1706.** Fernández-Villaverde J, Rubio-Ramírez J F 2007 Estimating macroeconomic models: A likelihood approach *Review of Economic Studies* 74 pp 1059 – 1087.
- 1707.** Fernández-Villaverde J 2010 The econometrics of DSGE models *Journal of the Spanish Economic Association* 1 pp 3 – 49.
- 1708.** Frühwirth-Schnatter S 2006 Finite mixture and Markov switching models *Springer Series in Statistics Springer* New York USA.
- 1709.** Pasricha G K 2006 Kalman filter and its economic applications *MPRA Paper no 22734 Munich University Munich Germany* pp 1 – 14 <http://mpra.ub.uni-muenchen.de/22734/> .
- 1710.** Misra P, Enge P 2006 Global Positioning System signals, measurements, and performance *2nd edition* USA.
- 1711.** Gamerman D, Lopes H F 2006 Markov chain Monte Carlo. Stochastic simulation for Bayesian inference *2nd edition Chapman & Hall* London UK.
- 1712.** Pasricha G K 2006 Kalman filter and its economic applications *MPRA Paper no 22734 Munich University Munich Germany* pp 1 - 14 <http://mpra.ub.uni-muenchen.de/22734/> .
- 1713.** Rajamani M R 2007 Data-based techniques to improve state estimation in model predictive control *PhD Thesis* University of Wisconsin-Madison USA.
- 1714.** Bignasca F, Rossi E 2007 Applying the Hirose-Kamada filter to Swiss data: Output gap and exchange rate pass-through estimates *Swiss National Bank working Papers 2007 – 10* Swiss National Bank Switzerland ISSN 1660-7716 pp 1 – 27.
- 1715.** Andreasen M M 2008 Non-linear DSGE models, the central difference Kalman filter, and the mean shifted particle filter *CREATES Research Paper 2008-33* School of Economics and Management University of Aarhus Denmark pp 1 – 46.
- 1716.** Olsson J, Cappé O, Douc R, Moulines E 2008 Sequential Monte Carlo smoothing with application to parameter estimation in nonlinear state space models *Bernoulli* 14 (1) pp 155 – 179.
- 1717.** Roncalli T, Weisang G 2008 Tracking problems, hedge fund replication and alternative beta *MPRA Paper no 37358 Munich University Munich Germany* <http://mpra.ub.unimuenchen.de/37358/> .
- 1718.** Rajamani M R, Rawlings J B 2009 Estimation of the disturbance structure from data using semidefinite programming and optimal weighting *Automatica* 45 pp 142 – 148.

- 1719.** Bationo R, Hounkpodote H 2009 Estimated changes in prices of coffee and cocoa: Kalman filter, Hodrick-Prescott filter and modeling from Markov switching *MPRA Paper no 26980 Munich University Munich Germany* pp 1 – 22
<http://mpra.ub.unimuenchen.de/26980/> .
- 1720.** Chang Y, Miller J I, Park J Y 2009 Extracting a common stochastic trend: Theory with some applications *Journal of Econometrics* **15** pp 231 – 247.
- 1721.** Mapa D S, Sandoval M F B, Yap J E B 2009 Investigating the presence of regional economic growth convergence in the Philippines using Kalman filter *MPRA Paper no 20681 Munich University Munich Germany* <http://mpra.ub.uni-muenchen.de/20681/> .
- 1722.** Winschel W, Kratzig M 2010 Solving, estimating, and selecting nonlinear dynamic models without the curse of dimensionality *Econometrica* **39** (1) pp 3 – 33.
- 1723.** Francke M K , Koopman S J, de Vos A 2010 Likelihood functions for state space models with diffuse initial conditions *Journal of Time Series Analysis* **31** pp 407 – 414.
- 1724.** Luati A, Proietti T 2010 Hyper-spherical and elliptical stochastic cycles *Journal of Time Series Analysis* **31** pp 169 – 181.
- 1725.** Theoret R, and Racicot F - E 2010 Forecasting stochastic volatility using the Kalman filter: an application to Canadian interest rates and price-earnings ratio *MPRA Paper no 35911 Munich University Munich Germany* <http://mpra.ub.uni-muenchen.de/35911/> .
- 1726.** Xia Y, Tong H 2011 Feature matching in time series modeling *Statistical Science* **26** (1) pp 21 – 46.
- 1727.** Jungbacker B, Koopman S J, van der Wel M 2011 Maximum likelihood estimation for dynamic factor models with missing data *Journal of Economic Dynamics and Control* **35** (8) pp 1358 – 1368.
- 1728.** Moghaddam B A, Haleh H, Ebrahimijam S 2011 Forecasting trend and stock price with adaptive extended Kalman filter data *2011 International Conference on Economics and Finance Research IPEDR vol 4 IACSIT Press Singapore*.
- 1729.** Darvas Z, Varga B 2012 Uncovering time-varying parameters with the Kalman-filter and the flexible least squares: A Monte Carlo study *Working Paper 2012 / 4 Department of Mathematical Economics and Economic Analysis Corvinus University of Budapest Hungary* pp 1 – 19.
- 1730.** Hang Qian 2012 A flexible state space model and its applications *MPRA Paper No 38455 Munich University Munich Germany* pp 1 - 27 <http://mpra.ub.uni-muenchen.de/38455/> .

- 1731.** Proietti T, Luati A 2012a A maximum likelihood estimation of time series models: the Kalman filter and beyond *MPRA Paper no 41981 Munich University Munich Germany* pp 1 – 30 <http://mpra.ub.uni-muenchen.de/41981/> .
- 1732.** Proietti T, Luati A 2012b The generalised autocovariance function *MPRA Paper no 43711 Munich University Munich Germany* pp 1 – 30 <http://mpra.ub.unimuenchen.de/43711/>.
- 1733.** Creal D 2012 A survey of sequential Monte Carlo methods for economics and finance *Econometric Reviews* vol **31** 3 pp 245 – 296.
- 1734.** Matisko P, Havlena V 2012 Optimality tests and adaptive Kalman filter *Proceedings of 16th IFAC System Identification Symposium* Brussels Belgium.
- 1735.** Wikipedia 2014 Kalman filter *Wikipedia Foundation, Inc.*
- 1736.** Wolff Ch C P 1987 Forward foreign exchange rates, expected spot rates, and premia: A signal-extraction approach *Journal of Finance* **42** (2) pp 395 – 406.
- Business Administration Science, Management Science, Strategy Science:**
- 1737.** Chandler A D Jr 1962, 1998 Strategy and structure: Chapters in the history of the American industrial enterprise *Beard Books* USA ISBN-10: 158798198X ISBN-13: 978-1587981982 pp 1 – 480.
- 1738.** Chandler A D Jr 1977, 1993 The visible hand: The managerial revolution in American business *Belknap Press* ISBN-10 0674940520 ISBN-13 978-0674940529 pp 1 – 624.
- 1739.** Chandler A D Jr, Daems H 1980 Managerial hierarchies: Comparative perspectives on the rise of the modern industrial enterprise *Harvard University Press* ISBN 9780674547414 .
- 1740.** Chandler A D Jr 1994 Scale and scope: The dynamics of industrial capitalism *Belknap Press* USA ISBN-10: 0674789954 ISBN-13: 978-0674789951 pp 1 – 780.
- 1741.** Chandler A D Jr 2001 Inventing the electronic century: The epic story of the consumer electronics and computer industries *Free Press* USA ISBN-10: 0743215672 ISBN-13: 978-0743215671 pp 1 – 336.
- 1742.** Chandler A D Jr 2005 Shaping the industrial century: The remarkable story of chemical and pharmaceutical industries *Harvard University Press* Cambridge Massachusetts USA ISBN 0-674-01720-X pp 1 – 366.
- 1743.** Andrews K R 1971a The concept of corporate strategy *Richard D Irwin* Homewood USA.
- 1744.** Andrews K R 1971b New horizons in corporate strategy *McKinsey Quarterly* vol **7** no 3 pp 34 – 43.

- 1745.** Andrews K R 1980 Directors' responsibility for corporate strategy *Harvard Business Review* vol **58** no 6 pp 30 – 42.
- 1746.** Andrews K R 1981a Corporate strategy as a vital function of the board *Harvard Business Review* vol **59** no 6 pp 174 – 180.
- 1747.** Andrews K R 1981b Replaying the board's role in formulating strategy *Harvard Business Review* vol **59** no 3 pp 18 – 23.
- 1748.** Andrews K R 1984 Corporate strategy: The essential intangibles *McKinsey Quarterly* no 4 pp 43 – 49.
- 1749.** Rumelt R P 1974 Strategy, structure and economic performance *Harvard Business School Press* Boston MA USA.
- 1750.** Rumelt R P 1982 Diversification strategy and profitability *Strategic Management Journal* **3** pp 359 – 369.
- 1751.** Porter M E March-April 1979 How competitive forces shape strategy *Harvard Business Review* **57** (2) pp 137 – 145.
- 1752.** Porter M E 1980, 1998 Competitive strategy: Techniques for analyzing industries and competitors *Free Press* New York USA.
- 1753.** Porter M E, Harrigan K R 1981 A framework for looking at endgame strategies in Strategic management and business policy Glueck B (editor) *McGraw-Hill* USA.
- 1754.** Porter M E 1982a Cases in competitive strategy *Free Press* New York USA.
- 1755.** Porter M E 1982b Industrial organization and the evolution of concepts for strategic planning: The new learning in Corporate strategy: The integration of corporation planning models and economics Taylor T H (editor) *North-Holland Publishing Company* Amsterdam The Netherlands.
- 1756.** Porter M E, Salter M S March 1982, June 1986 Note on diversification as a strategy *Harvard Business School Background Note* Harvard University pp 382 – 129.
- 1757.** Porter M E 1983 Analyzing competitors: Predicting competitor behavior and formulating offensive and defensive strategy in Policy, strategy, and implementation Leontiades M (editor) *Random House* USA.
- 1758.** Porter M E 1985 Defensive strategy *Strategy* **7** (1).
- 1759.** Porter M E May 1987a The state of strategic thinking *Economist* London UK.
- 1760.** Porter M E 1987b From competitive advantage to corporate strategy *Harvard Business Review* pp 43 – 59.
- 1761.** Porter M E April 1991 America's green strategy *Scientific American* **264** (4).

- 1762.** Montgomery C A, Porter M E (editors) 1991 Strategy: Seeking and securing competitive advantage *Harvard Business School Press* Boston Massachusetts USA.
- 1763.** Porter M E 1994a Global strategy: Winning in the World-wide marketplace in *The portable MBA in strategy* Fahey L, Randall R M (editors) *John Willey & Sons* NY USA.
- 1764.** Porter M E 1994b Competitive strategy revisited: A view from the 1990s in *The relevance of a decade: Essays to mark the first ten years of the Harvard Business School Press* Duffy P B (editor) *Harvard Business School Press* Boston Massachusetts USA.
- 1765.** Porter M E 1996a What is strategy? *Harvard Business Review* **74** (6) pp 61 – 78.
- 1766.** Porter M E December 1996b Tradeoffs, activity systems, and the theory of competitive strategy *Unpublished Work* Harvard University USA.
- 1767.** Porter M E March February 1997 New strategies for inner-city economic development *Economic Development Quarterly* **11** (1).
- 1768.** Schwab K, Connellius P, Porter M E 1999 The global competitiveness report *Oxford University Press* New York USA.
- 1769.** Porter M E, Rivkin J W January 2000, March 2001 Competition & strategy: Course structure TN *Harvard Business School Teaching Note* Harvard University pp 700 – 091.
- 1770.** Porter M E March 2001a Strategy and the Internet *Harvard Business Review* **79** (3).
- 1771.** Porter M E 2001b The technological dimension of competitive strategy in *Research on technological innovation, management and policy* vol **7** Burgelman R A, Chesbrough H (editors) *JAI Press* Greenwich CT USA.
- 1772.** Porter M E, Sakakibara M 2004 Competition in Japan *Journal of Economic Perspectives* Winter Issue.
- 1773.** Anand B N, Bradley S P, Ghemawat P, Khanna T, Montgomery C A, Porter M E, Rivkin J W, Rukstad M G, Wells J R, Yoffie D B June 2005, September 2008 Strategy: Building and sustaining competitive advantage *Harvard Business School Class Lecture* Harvard University USA pp 705 – 509.
- 1774.** Porter M E, Kramer M R December 2006 Strategy and society: The link between competitive advantage and corporate social responsibility *Harvard Business Review* **84** (12).
- 1775.** Porter M E January 2008 The five competitive forces that shape strategy *Special Issue on HBS Centennial Harvard Business Review* **86** (1).
- 1776.** Porter M December 2013 Fundamental purpose *Value Investor Insight* pp 8 – 20 www.valueinvestorinsight.com .
- 1777.** Schendel D E, Hofer Ch W 1979 Strategic management. A new view of business policy and planning *Little Brown* Boston USA p 9.

- 1778.** Huff A S, Reger R K 1987 A review of strategic process research *Journal of Management* vol **13** no 2 p 211.
- 1779.** Cohen W, Levinthal D 1990 Absorptive capacity: A new perspective on learning and innovation *Administrative Science Quarterly* **35** pp 128 – 152.
- 1780.** McKiernan P 1997 Strategy past, strategy futures *Long range planning* vol **30** no 5 p 792.
- 1781.** Martin R L (1998-1999, 2005-2006) Private communications on the electronic trading strategies in the foreign currencies exchange markets *Electronic Trade Laboratory Rotman School of Management* University of Toronto Canada.
- 1782.** Moldoveanu M, Martin R L 2001 Agency theory and the design of efficient governance mechanisms *Joint Committee on Corporate Governance Meeting* Rotman School of Management University of Toronto Canada pp 1 – 57.
- 1783.** Martin R L 2004 Strategic choice structuring: A set of good choices positions a firm for competitive advantage *Rotman School of Management* University of Toronto Canada pp 1 – 14 www.rotman.utoronto.ca/strategicChoiceStructuring.pdf .
- 1784.** Martin R L 2007 Becoming an integrative thinker *Rotman Magazine* Rotman School of Management University of Toronto Ontario Canada pp 4 – 9.
- 1785.** Martin R L 2007 Designing the thinker *Rotman Magazine* Rotman School of Management University of Toronto Ontario Canada pp 4 – 8.
- 1786.** Martin R L 2008 The Opposable mind *Harvard Business Press* Cambridge Massachusetts USA.
- 1787.** Martin R L 2009 The design of business *Harvard Business School Press* ISBN 1422177807 pp 1 – 256.
- 1788.** Lafley A G, Martin R L 2013 Playing to win: How strategy really works *Harvard Business Review Press* ISBN-10: 142218739X ISBN-13: 978-1422187395 pp 1 – 272.
- 1789.** Shiryaev A N 1999 Essentials of stochastic finance: Facts, models, theory *Advanced Series on Statistical Science & Applied Probability* vol **3** *World Scientific Publishing Co Pte Ltd* Kruzhilin N (translator) ISBN 981-02-3605-0 Singapore pp 383 – 395, 633 – 646.
- 1790.** Grant R 2001 Corporate strategy: Managing scope and strategy content in Pettigrew A, Thomas H, Whittington R (editors) *Handbook of strategy and management* *Sage* Newbury Park California USA pp 72 – 98.
- 1791.** Besanko D, Shanley M, Dranove D 2007 Economics of strategy *John Wiley & Sons Inc* USA.
- 1792.** Gavetti G, Rivkin J W 2007 On the origin of strategy: Action and cognition over time *Organization Science* vol **18** no 3 pp 420 – 439.

- 1793.** Teece D J, Winter S 2007 Dynamic capabilities: Understanding strategic change in organizations *Blackwell* Oxford UK.
- 1794.** Chamberlain G P 2010 Understanding strategy *Create Space* Charleston SC USA.
- Selected Research Papers in Macroeconomics, Microeconomics & Nanoeconomics Sciences:**
- 1795.** Ledenyov V O, Ledenyov D O 2012a Shaping the international financial system in century of globalization *Cornell University* NY USA pp 1 – 20
www.arxiv.org/1206.2022.pdf .
- 1796.** Ledenyov V O, Ledenyov D O 2012b Designing the new architecture of international financial system in era of great changes by globalization *Cornell University* NY USA pp 1 – 18
www.arxiv.org/1206.2778.pdf .
- 1797.** Ledenyov D O, Ledenyov V O 2012a On the new central bank strategy toward monetary and financial instabilities management in finances: econophysical analysis of nonlinear dynamical financial systems *Cornell University* NY USA pp 1 – 8
www.arxiv.org/1211.1897.pdf .
- 1798.** Ledenyov D O, Ledenyov V O 2012b On the risk management with application of econophysics analysis in central banks and financial institutions *Cornell University* NY USA pp 1 – 10
www.arxiv.org/1211.4108.pdf .
- 1799.** Ledenyov D O, Ledenyov V O 2013a On the optimal allocation of assets in investment portfolio with application of modern portfolio management and nonlinear dynamic chaos theories in investment, commercial and central banks *Cornell University* NY USA pp 1 – 34
www.arxiv.org/1301.4881.pdf .
- 1800.** Ledenyov D O, Ledenyov V O 2013b On the theory of firm in nonlinear dynamic financial and economic systems *Cornell University* NY USA pp 1 – 27
www.arxiv.org/1206.4426v2.pdf .
- 1801.** Ledenyov D O, Ledenyov V O 2013c On the accurate characterization of business cycles in nonlinear dynamic financial and economic systems *Cornell University* NY USA pp 1 – 26
www.arxiv.org/1304.4807.pdf .
- 1802.** Ledenyov D O, Ledenyov V O 2013d To the problem of turbulence in quantitative easing transmission channels and transactions network channels at quantitative easing policy implementation by central banks *Cornell University* NY USA pp 1 – 40
www.arxiv.org/1305.5656.pdf .

- 1803.** Ledenyov D O, Ledenyov V O 2013e To the problem of evaluation of market risk of global equity index portfolio in global capital markets *MPRA Paper no 47708* Munich University Munich Germany pp 1 – 25
<http://mpra.ub.uni-muenchen.de/47708/> .
- 1804.** Ledenyov D O, Ledenyov V O 2013f Some thoughts on accurate characterization of stock market indexes trends in conditions of nonlinear capital flows during electronic trading at stock exchanges in global capital markets *MPRA Paper no 49964* Munich University Munich Germany pp 1 – 52
<http://mpra.ub.uni-muenchen.de/49964/> .
- 1805.** Ledenyov D O, Ledenyov V O 2013g On the Stratonovich - Kalman - Bucy filtering algorithm application for accurate characterization of financial time series with use of state-space model by central banks *MPRA Paper no 50235* Munich University Munich Germany pp 1 – 52, *SSRN Paper no SSRN-id2594333* Social Sciences Research Network New York USA
<http://mpra.ub.uni-muenchen.de/50235/> ,
<http://ssrn.com/abstract=2594333> .
- 1806.** Ledenyov D O, Ledenyov V O 2013h Tracking and replication of hedge fund optimal investment portfolio strategies in global capital markets in presence of nonlinearities *MPRA Paper no 51176* Munich University Munich Germany pp 1 – 92, *SSRN Paper no SSRN-id2588380* Social Sciences Research Network New York USA
<http://mpra.ub.uni-muenchen.de/51176/> ,
<http://ssrn.com/abstract=2588380> .
- 1807.** Ledenyov D O, Ledenyov V O 2013i Venture capital optimal investment portfolio strategies selection in diffusion - type financial systems in global capital markets with nonlinearities *MPRA Paper no 51903* Munich University Munich Germany pp 1 – 81, , *SSRN Paper no SSRN-id2592989* Social Sciences Research Network New York USA
<http://mpra.ub.uni-muenchen.de/51903/> ,
<http://ssrn.com/abstract=2592989> .
- 1808.** Ledenyov D O, Ledenyov V O 2014a Mergers and acquisitions transactions strategies in diffusion - type financial systems in highly volatile global capital markets with nonlinearities *MPRA Paper no 61946* Munich University Munich Germany, *SSRN Paper no SSRN-id2561300* Social Sciences Research Network New York USA pp 1 – 160
<http://mpra.ub.uni-muenchen.de/61946/> ,
<http://ssrn.com/abstract=2561300> .

- 1809.** Ledenyov D O, Ledenyov V O 2014b Strategies on initial public offering of company equity at stock exchanges in imperfect highly volatile global capital markets with induced nonlinearities *MPRA Paper no 53780* Munich University Munich Germany, *SSRN Paper no SSRN-id2577767 Social Sciences Research Network* New York USA pp 1 – 138
<http://mpa.ub.uni-muenchen.de/53780/> ,
<http://ssrn.com/abstract=2577767> .
- 1810.** Ledenyov D O, Ledenyov V O 2014c On the winning virtuous strategies for ultra high frequency electronic trading in foreign currencies exchange markets *MPRA Paper no 61863* Munich University Munich Germany, *SSRN Paper no SSRN-id2560297 Social Sciences Research Network* New York USA pp 1 – 175
<http://mpa.ub.uni-muenchen.de/61863/> ,
<http://ssrn.com/abstract=2560297> .
- 1811.** Ledenyov D O, Ledenyov V O 2014d On the fundamentals of winning virtuous strategies creation toward leveraged buyout transactions implementation during private equity investment in conditions of resonant absorption of discrete information in diffusion - type financial system with induced nonlinearities *MPRA Paper no 61805* Munich University Munich Germany pp 1 – 161, *SSRN Paper no SSRN-id2559168 Social Sciences Research Network* New York USA
<http://mpa.ub.uni-muenchen.de/61805/> ,
<http://ssrn.com/abstract=2559168> .
- 1812.** Ledenyov D O, Ledenyov V O 2014e *MicroFX* foreign currencies ultra high frequencies trading software platform with embedded optimized Stratonovich – Kalman - Bucy filtering algorithm, particle filtering algorithm, macroeconomic analysis algorithm, market microstructure analysis algorithm, order flow analysis algorithm, comparative analysis algorithm, and artificial intelligence algorithm for near-real-time decision making / instant switching on / between optimal trading strategies *ECE James Cook University* Townsville Australia, Kharkov Ukraine.
- 1813.** Ledenyov D O, Ledenyov V O 2014f *MicroLBO* software program with the embedded optimized near-real-time artificial intelligence algorithm to create winning virtuous strategies toward leveraged buyout transactions implementation and to compute direct/reverse leverage buyout transaction default probability number for selected public/private companies during private equity investment in conditions of resonant absorption of discrete information in diffusion - type financial system with induced nonlinearities *ECE James Cook University* Townsville Australia, Kharkov Ukraine.

- 1814.** Ledenyov D O, Ledenyov V O 2015a Nonlinearities in microwave superconductivity 8th edition *Cornell University* NY USA pp 1 – 923
www.arxiv.org/1206.4426v7.pdf .
- 1815.** Ledenyov D O, Ledenyov V O 2015b Winning virtuous strategy creation by interlocking interconnecting directors in boards of directors in firms in information century *MPRA Paper no 61681* Munich University Munich Germany, *SSRN Paper no SSRN-id2553938* *Social Sciences Research Network* New York USA pp 1 – 108
<http://mpra.ub.uni-muenchen.de/61681/> ,
<http://ssrn.com/abstract=2553938> .
- 1816.** Ledenyov D O, Ledenyov V O 2015c Information theory of firm *MPRA Paper no 63380* Munich University Munich Germany, *SSRN Paper no SSRN-id2587716* *Social Sciences Research Network* New York USA pp 1 – 185
<http://mpra.ub.uni-muenchen.de/63380/> ,
<http://ssrn.com/abstract=2587716> .
- 1817.** Ledenyov D O, Ledenyov V O 2015d Information money fields of cyclic oscillations in nonlinear dynamic economic system *MPRA Paper no 63565* Munich University Munich Germany, *SSRN Paper no SSRN-id2592975* *Social Sciences Research Network* New York USA pp 1 – 40
<http://mpra.ub.uni-muenchen.de/63565/> ,
<http://ssrn.com/abstract=2592975> .
- 1818.** Ledenyov D O, Ledenyov V O 2015e On the spectrum of oscillations in economics *MPRA Paper no 64368* Munich University Munich Germany, *SSRN Paper no SSRN-id2606209* *Social Sciences Research Network* New York USA pp 1 – 48
<http://mpra.ub.uni-muenchen.de/64368/> ,
<http://ssrn.com/abstract=2606209> .
- 1819.** Ledenyov D O, Ledenyov V O 2015f Digital waves in economics *MPRA Paper no 64755* Munich University Munich Germany, *SSRN Paper no SSRN-id2613434* *Social Sciences Research Network* New York USA pp 1 – 55
<http://mpra.ub.uni-muenchen.de/64755/> ,
<http://ssrn.com/abstract=2613434> .
- 1820.** Ledenyov D O, Ledenyov V O 2015g General information product theory in economics science *MPRA Paper no 64991* Munich University Munich Germany, *SSRN Paper no SSRN-id2617310* *Social Sciences Research Network* New York USA pp 1 – 54
<http://mpra.ub.uni-muenchen.de/64991/> ,

<http://ssrn.com/abstract=2617310> .

1821. Ledenyov D O, Ledenyov V O 2015h Quantum macroeconomics theory *MPRA Paper no 65566* Munich University Munich Germany, *SSRN Paper no SSRN-id2627086 Social Sciences Research Network* New York USA pp 1 – 55

<http://mpra.ub.uni-muenchen.de/65566/> ,

<http://ssrn.com/abstract=2627086> .

1822. Ledenyov D O, Ledenyov V O 2015i Wave function in economics *MPRA Paper no 66577* Munich University Munich Germany, *SSRN Paper no SSRN-id2659054 Social Sciences Research Network* New York USA pp 1 – 71

<http://mpra.ub.uni-muenchen.de/66577/> ,

<http://ssrn.com/abstract=2659054> .

1823. Ledenyov D O, Ledenyov V O 2015j Quantum microeconomics theory *MPRA Paper no 67010* Munich University Munich Germany, *SSRN Paper no SSRN-id2667016 Social Sciences Research Network* New York USA pp 1 – 71

<http://mpra.ub.uni-muenchen.de/67010/> ,

<http://ssrn.com/abstract=2667016> .

1824. Ledenyov D O, Ledenyov V O 2015k Quantum theory of firm *MPRA Paper no 67162* Munich University Munich Germany, *SSRN Paper no SSRN-id2672288 Social Sciences Research Network* New York USA pp 1 – 73

<http://mpra.ub.uni-muenchen.de/67162/> ,

<http://ssrn.com/abstract=2672288> .

1825. Ledenyov D O, Ledenyov V O 2015l *MicroID* software program with the embedded optimized near-real-time artificial intelligence algorithm to create the winning virtuous business strategies and to predict the director's election / appointment in the boards of directors in the firms, taking to the consideration both the director's technical characteristics and the interconnecting interlocking director's network parameters in conditions of the resonant absorption of discrete information in diffusion - type financial economic system with induced nonlinearities *ECE James Cook University* Townsville Australia, Kharkov Ukraine.

1826. Ledenyov D O, Ledenyov V O 2015m *MicroITF* operation system and software programs: **1)** the operation system to control the firm operation by means of the information resources near-real-time processing in the modern firms in the case of the diffusion - type financial economic system with the induced nonlinearities; **2)** the software program to accurately characterize the director's performance by means of a) the filtering of the

generated/transmitted/received information by the director into the separate virtual channels, depending on the information content, and b) the measurement of the levels of signals in every virtual channel with the generated/transmitted/received information by the director, in the overlapping interconnecting interlocking directors networks in the boards of directors in the firms during the Quality of Service (QoS) measurements process; and **3**) the software program to create the winning virtuous business strategies by the interlocking interconnecting directors in the boards of directors in the modern firms in the case of the diffusion - type financial economic system with the induced nonlinearities, using the patented recursive artificial intelligence algorithm *ECE James Cook University Townsville Australia, Kharkov Ukraine*.

1827. Ledenyov D O, Ledenyov V O 2015n *MicroIMF* software program: the *MicroIMF* software program to make the computer modeling of 1) the interactions between the information money fields of one cyclic oscillation and the information money fields of other cyclic oscillation(s) in the nonlinear dynamic economic system, 2) the interactions between the information money fields of cyclic oscillation and the nonlinear dynamic economic system itself, and 3) the density distributions of the information money fields by different cyclic oscillations (the economic continuous waves) in the nonlinear dynamic economic system *ECE James Cook University Townsville Australia, Kharkov Ukraine*.

1828. Ledenyov D O, Ledenyov V O 2015o *MicroSA* software program 1) to perform the spectrum analysis of the cyclic oscillations of the economic variables in the nonlinear dynamic economic system, including the discrete-time signals and the continuous-time signals; 2) to make the computer modeling and to forecast the business cycles for a) the central banks with the purpose to make the strategic decisions on the monetary policies, financial stability policies, and b) the commercial/investment banks with the aim to make the business decisions on the minimum capital allocation, countercyclical capital buffer creation, and capital investments *ECE James Cook University Townsville Australia, Kharkov Ukraine*.

Quantum Physics, Quantum Electronics, Quantum Computing, Quantum Mechanics:

1829. Planck M 1900a Über eine Verbesserung der Wienschen Spektralgleichung On an improvement of Wien's equation for the spectrum *Verhandlungen der Deutschen Physikalischen Gesellschaft* **2** pp 202 – 204

<http://archive.org/stream/verhandlungende01goog#page/n212/mode/2up> .

1830. Planck M 1900b Zur Theorie des Gesetzes der Energieverteilung im Normalspektrum *Verhandlungen der Deutschen Physikalischen Gesellschaft* **2** p 237

<http://archive.org/stream/verhandlungende01goog#page/n246/mode/2up> .

- 1831.** Planck M 1900c Entropie und Temperatur strahlender Wärme Entropy and temperature of radiant heat *Annalen der Physik* **306** (4) pp 719 – 737
<http://adsabs.harvard.edu/abs/1900AnP...306..719P> ,
<https://dx.doi.org/10.1002%2Fandp.19003060410> .
- 1832.** Planck M 1900d Über irreversible Strahlungsvorgänge On irreversible radiation processes *Annalen der Physik* **306** (1) pp 69 – 122
<http://adsabs.harvard.edu/abs/1900AnP...306...69P> ,
<https://dx.doi.org/10.1002%2Fandp.19003060105> .
- 1833.** Planck M 1901 Über das Gesetz der Energieverteilung im Normalspektrum On the law of distribution of energy in the normal spectrum *Annalen der Physik* **309** (3) pp 553 – 563.
<http://adsabs.harvard.edu/abs/1901AnP...309..553P> ,
<https://dx.doi.org/10.1002%2Fandp.19013090310> ,
<http://theochem.kuchem.kyoto-u.ac.jp/Ando/planck1901.pdf> .
- 1834.** Planck M 1903 Treatise on thermodynamics *Longmans, Green & Co* London UK
<http://archive.org/stream/treatiseonthermo00planuoft#page/n7/mode/2up> ,
<http://openlibrary.org/books/OL7246691M> .
- 1835.** Planck M 1906 Vorlesungen über die Theorie der Wärmestrahlung *JA Barth* Leipzig Germany
<http://lccn.loc.gov/07004527> .
- 1836.** Planck M 1914 The theory of heat radiation 2nd edition *P Blakiston's Son & Co*
<http://openlibrary.org/books/OL7154661M> .
- 1837.** Planck M 1915 Eight lectures on theoretical physics *Dover Publications* ISBN 0-486-69730-4.
- 1838.** Planck M 1943 Zur Geschichte der Auffindung des physikalischen Wirkungsquantums *Naturwissenschaften* **31** (14–15) pp 153 – 159
<http://adsabs.harvard.edu/abs/1943NW.....31..153P> ,
<https://dx.doi.org/10.1007%2F01475738> .
- 1839.** Einstein A 1905 Zur Elektrodynamik bewegter Körper On the electrodynamics of moving bodies *Annalen der Physik* Berlin Germany (in German) **322** (10) pp 891 – 921
<http://onlinelibrary.wiley.com/doi/10.1002/andp.19053221004/pdf> ,
<http://adsabs.harvard.edu/abs/1905AnP...322..891E>) ,
<http://dx.doi.org/10.1002%2Fandp.19053221004> .
- 1840.** Einstein A 1917 Zur Quantentheorie der Strahlung On the quantum mechanics of radiation *Physikalische Zeitschrift* (in German) **18** pp 121 – 128

- <http://adsabs.harvard.edu/abs/1917PhyZ...18..121E> .
- 1841.** Einstein A 1924 Quantentheorie des einatomigen idealen gases Quantum theory of monatomic ideal gases *Sitzungsberichte der Preussischen Akademie der Wissenschaften Physikalisch-Mathematische Klasse* (in German) pp 261 – 267
<http://echo.mpiwg-berlin.mpg.de/MPIWG:DRQK5WYB> .
- 1842.** Einstein A, Podolsky B, Rosen N 1935 Can quantum-mechanical description of physical reality be considered complete? *Physical Review* American Physical Society **47** (10) pp 777 – 780
<http://journals.aps.org/pr/pdf/10.1103/PhysRev.47.777> ,
<http://adsabs.harvard.edu/abs/1935PhRv...47..777E> ,
<https://dx.doi.org/10.1103%2FPhysRev.47.777> .
- 1843.** Bohr N 1922 The structure of the atom Nobel prize lecture in Niels Bohr A centenary volume French A P, Kennedy P J (editors) *Harvard University Press* Cambridge Massachusetts pp 91 – 97 ISBN 978-0-674-62415-3.
- 1844.** Bohr N, Kramers H A, Slater J C 1924 The quantum theory of radiation *Philosophical Magazine* **6 76** (287) pp 785 – 802
http://www.cond-mat.physik.uni-mainz.de/~oettel/ws10/bks_PhilMag_47_785_1924.pdf,
<https://dx.doi.org/10.1080%2F14786442408565262> .
- 1845.** de Broglie L 1924, 1925 Recherches sur la théorie des quanta Researches on the quantum theory *Ph D Thesis* Sorbonne Paris France, *Annales de Physique* **10** (3) pp 22 – 128.
- 1846.** de Broglie L 1926 Ondes et mouvements Waves and motions *Gauthier-Villars* Paris France.
- 1847.** de Broglie L 1927 Rapport au 5e Conseil de Physique Solvay Brussels Belgium.
- 1848.** de Broglie L 1928 La mécanique ondulatoire Wave mechanics *Gauthier-Villars* Paris France.
- 1849.** Compton A 1926 X-Rays and electrons: An outline of recent X-Ray theory *D Van Nostrand Company Inc* New York USA
<https://www.worldcat.org/oclc/1871779> .
- 1850.** Compton A; Allison S K 1935 X-Rays in theory and experiment *D Van Nostrand Company Inc* New York USA
<https://www.worldcat.org/oclc/853654> .
- 1851.** Schrödinger E 1926 Quantisierung als Eigenwertproblem *Annalen der Phys* **384** (4) pp 273 – 376
<http://onlinelibrary.wiley.com/doi/10.1002/andp.19263840404/pdf> ,

- <http://adsabs.harvard.edu/abs/1926AnP...384..361S> ,
<https://dx.doi.org/10.1002%2Fandp.19263840404> .
- 1852.** Fermi E 1934 Radioattività indotta da bombardamento di neutroni *La Ricerca scientifica* **1** (5) p 283 (in Italian)
<http://www.phys.uniroma1.it/DipWeb/museo/collezione%20Fermi/documento2.htm> .
- 1853.** Fermi E, Amaldi E, d'Agostino O, Rasetti F, Segre E 1934 Artificial radioactivity produced by neutron bombardment *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences* **146** (857) p 483
<http://adsabs.harvard.edu/abs/1934RSPSA.146..483F> ,
<https://dx.doi.org/10.1098%2Frspa.1934.0168> .
- 1854.** Townes Ch 1939 Concentration of the heavy isotope of carbon and measurement of its nuclear spin *PhD thesis* Caltech California USA
<http://thesis.library.caltech.edu/4202/> .
- 1855.** Townes Ch, Schawlow A 1955 Microwave spectroscopy *McGraw-Hill* USA ISBN 978-0-07-065095-4.
- 1856.** Gordon J, Zeiger H, Townes Ch 1955 The maser — new type of microwave amplifier, frequency standard, and spectrometer *Physical Review* **99** (4) p 1264
<http://adsabs.harvard.edu/abs/1955PhRv...99.1264G> ,
<https://dx.doi.org/10.1103%2FPhysRev.99.1264> .
- 1857.** Shimoda K, Wang T, Townes Ch 1956 Further aspects of the theory of the maser *Physical Review* **102** (5) p 1308
<http://adsabs.harvard.edu/abs/1956PhRv..102.1308S> ,
<https://dx.doi.org/10.1103%2FPhysRev.102.1308> .
- 1858.** Townes Ch H 1964 Nobel Prize in Physics Stockholm Sweden
http://nobelprize.org/nobel_prizes/physics/laureates/1964/townes-bio.html .
- 1859.** Townes Ch H 1966 Obtaining of coherent radiation with help of atoms and molecules *Uspekhi Fizicheskikh Nauk (UFN)* vol **88** no 3.
- 1860.** Townes Ch H 1969 Quantum electronics and technical progress *Uspekhi Fizicheskikh Nauk (UFN)* vol **98** no 5.
- 1861.** Townes Ch 1995 Making waves *American Institute of Physics Press* New York USA ISBN 978-1-56396-381-0.
- 1862.** Townes Ch 1999 How the laser happened: Adventures of a scientist *Oxford University Press* ISBN 978-0-19-512268-8.

- 1863.** Schiff L I 1949 Quantum mechanics *McGraw - Hill Book Company Inc* New York USA pp 1 – 404.
- 1864.** Blokhintsev D I 1954 Development of first nuclear reactor for nuclear power plant Moscow Russian Federation.
- 1865.** Blokhintsev D I 2004 Foundations of quantum mechanics 7th edition *Lan' Publishing House* St Petersburg Russian Federation ISBN 5-8114-0554-5 pp 1 – 664.
- 1866.** Prokhorov A M, Basov N G 1955 Molecular generator and amplifier *Uspekhi Fizicheskikh Nauk (UFN)* vol **57** no 3 pp 485 – 501.
- 1867.** Prokhorov A M, Fedorov V B 1963 *Soviet Journal of Experimental and Theoretical Physics JETP* **16** 1489.
- 1868.** Prokhorov A M 1964 Nobel Prize in Physics Stockholm Sweden
http://nobelprize.org/nobel_prizes/physics/laureates/1964/prokhorov-bio.html .
- 1869.** Prokhorov A M Quantum electronics 1965 *Uspekhi Fizicheskikh Nauk (UFN)* vol **85** no 4 pp 599 – 604.
- 1870.** Karlov N V, Prokhorov A M 1976 Laser's separation of isotopes *Uspekhi Fizicheskikh Nauk (UFN)* vol **118** no 4 pp 583 – 609.
- 1871.** Prokhorov A M 1979 To 25th anniversary of laser *Uspekhi Fizicheskikh Nauk (UFN)* vol **128** no 3.
- 1872.** Prokhorov A M (Editor in Chief), Buzzi J M, Sprangle P, Wille K 1992 Coherent radiation generation and particle acceleration *Research Trends in Physics Series American Institute of Physics Press* New York USA (Springer, Germany) ISBN 0-88318-926-7
<http://www.springer-sbm.de/index.php?id=121&L=0> .
- 1873.** Bardeen J 1956 Nobel Prize in Physics Stockholm Sweden
http://nobelprize.org/nobel_prizes/physics/laureates/1956/bardeen-bio.html .
- 1874.** Bardeen J 1972 Nobel Prize in Physics Stockholm Sweden
http://nobelprize.org/nobel_prizes/physics/laureates/1972/bardeen-bio.html .
- 1875.** Bardeen J 1990 Superconductivity and other macroscopic quantum phenomena *Physics Today* **43** (12) pp 25 – 31 doi: 10.1063/1.881218.
- 1876.** Schawlow A, Townes Ch 1958 Infrared and optical masers *Physical Review* **112** (6) p 1940
<http://dx.doi.org/10.1103/PhysRev.112.1940> ,
<http://adsabs.harvard.edu/abs/1958PhRv..112.1940S> .
- 1877.** Schawlow A 1963 Modern optical quantum generators *Uspekhi Fizicheskikh Nauk (UFN)* vol **81** no 12.

- 1878.** Schawlow A 1964 Nobel Prize in Physics Stockholm Sweden
http://nobelprize.org/nobel_prizes/physics/laureates/1964/schawlow-bio.html .
- 1879.** Gould R G 1959 The LASER, Light Amplification by Stimulated Emission of Radiation
in Franken PA, Sands RH (editors) *The Ann Arbor Conference on Optical Pumping* The
University of Michigan 15 June - 18 June 1959 p 128
<https://www.worldcat.org/oclc/02460155> .
- 1880.** Merzbacher E 1961 Quantum mechanics *John Willey and Sons Inc* New York USA
pp 1 – 621.
- 1881.** Josephson B D 1962 Possible new effects in superconductive tunneling *Physical Letters*
vol 1 p 251.
- 1882.** Josephson B D 1964 Coupled superconductors *Review Modern Physics* vol 36 p 216.
- 1883.** Josephson B D 1965 Super currents through barriers *Advances in Physics* vol 14 p 419.
- 1884.** Basov N G 1964 Nobel Prize in Physics Stockholm Sweden
http://nobelprize.org/nobel_prizes/physics/laureates/1964/basov-bio.html .
- 1885.** Basov N G 1965 Semiconductor quantum generators *Uspekhi Fizicheskikh Nauk (UFN)*
vol 85 no 4.
- 1886.** Landau L D, Lifshits E M 1977 Quantum mechanics 3rd edition *Pergamon Press* Oxford
UK.
- 1887.** Tesche C D, Clarke J 1977 DC SQUID: Noise and optimization *Journal of Low
Temperature Physics* 29 pp 301 – 331.
- 1888.** Clarke J 1989 Principles and applications of SQUIDS *Proc IEEE* 77 pp 1208 – 1223.
- 1889.** Fulton T A, Dolan G J 1987 Observation of single-electron charging effects in small
tunnel junctions *Phys Review Letters* 59 pp 109 – 112.
- 1890.** Galindo A, Pascual P 1990, 1991 Quantum mechanics vols 1, 2 *Springer-Verlag* Berlin
Germany pp 1 – 417, 1 – 415.
- 1891.** Grabert H, Devoret M H (editors) 1992 Single charge tunneling: Coulomb blockade
phenomena in nanostructures *Plenum Press* New York USA.
- 1892.** Yokoyama H, Ujihara K 1995 Spontaneous emission and laser oscillation in micro-
cavities *CRC Press* Boca Raton USA ISBN 0-8493-3786-0.
- 1893.** Alferov Zh I 1996 The history and future of semiconductor heterostructures in
Proceedings 99th Nobel Symposium Arild June 4-8 1996 *Physica Scripta* T68 32.
- 1894.** Mygind J 1997 Private communications on the new sources of noise in the single electron
transistors *Department of Physics* Technical University of Denmark Lyngby Denmark.

- 1895.** Milonni P W, Eberly J H 1998 Lasers *John Wiley and Sons Inc* USA ISBN 0-471-62731-3.
- 1896.** Muck M 1998 Radio frequency superconducting quantum interference devices *Institute of Applied Physics* University of Giessen Germany.
- 1897.** Bimberg D, Grundmann M, Ledentsov N N 1999 Quantum dot heterostructures *John Wiley and Sons Inc* New York USA.
- 1898.** Loudon R 2001 The quantum theory of light 3rd edition *Oxford University Press* New York USA.
- 1899.** Ledenyov V O, Ledenyov O P, Ledenyov D O 2002 A quantum random number generator on magnetic flux qubits *Proceedings of the 2nd Institute of Electrical and Electronics Engineers Conference IEEE-NANO 2002* Chicago Washington DC USA IEEE Catalog no 02TH86302002 Library of Congress number: 2002106799 ISBN: 0-7803-7538-6.

Wave Function in Schrödinger Quantum Mechanical Wave Equation in Quantum Mechanics:

- 1900.** de Broglie L 1924, 1925 Recherches sur la théorie des quanta Researches on the quantum theory *Ph D Thesis* Sorbonne Paris France, *Annales de Physique* **10** (3) pp 22 – 128.
- 1901.** Schrödinger E 1926a Quantisierung als Eigenwertproblem *Annalen der Phys* **384** (4) pp 273 – 376 doi:10.1002/andp.19263840404 Bibcode:1926AnP...384..361S
<https://dx.doi.org/10.1002%2Fandp.19263840404> ,
<http://adsabs.harvard.edu/abs/1926AnP...384..361S> .
- 1902.** Schrödinger E 1926b An undulatory theory of the mechanics of atoms and molecules *Physical Review* **28** (6) pp 1049 – 1070 doi:10.1103/PhysRev.28.1049
Bibcode:1926PhRv...28.1049S
<https://dx.doi.org/10.1103%2FPhysRev.28.1049> ,
<http://adsabs.harvard.edu/abs/1926PhRv...28.1049S> .
- 1903.** Schrödinger E 1982 Collected papers on wave mechanics 3rd edition *American Mathematical Society* ISBN 978-0-8218-3524-1.
- 1904.** Schrödinger E 1984 Collected papers *Friedrich Vieweg und Sohn* ISBN 3-7001-0573-8.
- 1905.** Einstein A 1917 Zur Quantentheorie der Strahlung On the quantum mechanics of radiation *Physikalische Zeitschrift* (in German) **18** pp 121 – 128
<http://adsabs.harvard.edu/abs/1917PhyZ...18..121E> .
- 1906.** Einstein A, Podolsky B, Rosen N 1935 Can quantum-mechanical description of physical reality be considered complete? *Physical Review* American Physical Society **47** (10) pp 777 – 780

<http://journals.aps.org/pr/pdf/10.1103/PhysRev.47.777> ,

<http://adsabs.harvard.edu/abs/1935PhRv...47..777E> ,

<https://dx.doi.org/10.1103%2FPhysRev.47.777> .

- 1907.** Akhiezer A I, Berestetsky V B 1953 Quantum electrodynamics *Gostekhtheorizdat* Moscow Russian Federation pp 1 – 428.
- 1908.** Akhiezer A I, Berestetsky V B 1964 Quantum electrodynamics 3rd edition *Nauka* Moscow Russian Federation pp 1 – 624.
- 1909.** Akhiezer A I, Berestetsky V B 1980 Quantum electrodynamics 4th edition *Nauka* Moscow Russian Federation pp 1 – 432.
- 1910.** Berestetsky V B, Lifshits E M, Pitaevsky L P 1980 Quantum electrodynamics *Nauka* Moscow Russian Federation pp 1 – 704.
- 1911.** Dirac P A M 1958 The principles of quantum mechanics 4th edition *Oxford University Press* UK.
- 1912.** Merzbacher E 1961 Quantum mechanics *John Willey and Sons Inc* New York USA pp 1 – 621.
- 1913.** Feynman R, Leighton R B, Sands M 1965 Feynman lectures on physics vol **3** *Addison-Wesley* USA ISBN 0-201-02118-8.
- 1914.** Atkins P W 1974 Quanta: A handbook of concepts *Oxford University Press* UK ISBN 0-19-855493-1.
- 1915.** Atkins P W 1977 Molecular quantum mechanics parts I and II: An introduction to quantum chemistry vol **1** *Oxford University Press* UK ISBN 0-19-855129-0.
- 1916.** Atkins P W 1978 Physical chemistry *Oxford University Press* UK ISBN 0-19-855148-7.
- 1917.** Landau L D, Lifshits E M 1977 Quantum mechanics 3rd edition *Pergamon Press* Oxford UK.
- 1918.** Bransden B H, Joachain C J 1983 Physics of atoms and molecules *Longman* ISBN 0-582-44401-2.
- 1919.** Resnick R, Eisberg R 1985 Quantum physics of atoms, molecules, solids, nuclei and particles 2nd edition *John Wiley & Sons Inc* USA ISBN 978-0-471-87373-0.
- 1920.** Galindo A, Pascual P 1990, 1991 Quantum mechanics vols **1, 2** *Springer-Verlag* Berlin Germany pp 1 – 417, 1 – 415.
- 1921.** Shankar R 1994 Principles of quantum mechanics 2nd edition *Kluwer Academic/Plenum Publishers* ISBN 978-0-306-44790-7.
- 1922.** Ballentine L 1998 Quantum mechanics: A modern development *World Scientific Publishing Co* Singapore ISBN 9810241054.

- 1923.** Bransden B H, Joachain C J 2000 Quantum mechanics 2nd edition *Prentice Hall PTR* ISBN 0-582-35691-1.
- 1924.** Liboff R 2002 Introductory quantum mechanics 4th edition *Addison Wesley* ISBN 0-8053-8714-5.
- 1925.** Abers E, Pearson Ed 2004 Quantum mechanics *Addison Wesley Prentice Hall Inc* ISBN 978-0-13-146100-0.
- 1926.** Blokhintsev D I 2004 Foundations of quantum mechanics 7th edition *Lan' Publishing House* St Petersburg Russian Federation ISBN 5-8114-0554-5 pp 1 – 664.
- 1927.** Griffiths D J 2004 Introduction to quantum mechanics 2nd edition *Prentice Hall* NJ USA ISBN 0-13-111892-7.
- 1928.** Vakarchuk I O 2004 Quantum mechanics *L'viv National University Publishing House* L'viv Ukraine.
- 1929.** McMahon D 2006 Quantum mechanics demystified *McGraw Hill* USA ISBN (10) 0 07 145546 9.
- 1930.** Halliday D 2007 Fundamentals of physics 8th edition *John Wiley & Sons Inc* NY USA ISBN 0-471-15950-6.
- 1931.** Hand L N, Finch J D 2008 Analytical mechanics *Cambridge University Press* UK ISBN 978-0-521-57572-0.
- 1932.** Teschl G 2009 Mathematical methods in quantum mechanics with applications to Schrödinger operators *American Mathematical Society* Providence USA ISBN 978-0-8218-4660-5.
- 1933.** Zettili N 2009 Quantum mechanics: Concepts and applications *John Wiley & Sons Inc* NY USA ISBN 978-0-470-02678-6.
- 1934.** Laloe F 2012 Do we really understand quantum mechanics *Cambridge University Press* UK ISBN 978-1-107-02501-1.
- 1935.** Rylov Y A 2015 What is the wave function and why is it used in quantum mechanics? pp 1 – 18
<http://gasdyn-ipm.ipmnet.ru/~rylov/rylov.htm> .
- 1936.** Wikipedia 2015i Erwin Schrödinger *Wikipedia* USA
www.wikipedia.org .
- 1937.** Wikipedia 2015j Schrödinger equation *Wikipedia* USA
www.wikipedia.org .

Artificial Intelligence Science, Computer Science:

- 1938.** Turing A October 1950 Computing machinery and intelligence *Mind* **LIX** 236 pp 433 – 460 doi:10.1093/mind/LIX.236.433 ISSN 0026-4423.
- 1939.** Rich E 1983 Artificial intelligence *McGraw-Hill* USA ISBN 0-07-052261-8.
- 1940.** Winston P H 1984 Artificial intelligence *Addison-Wesley* Reading Massachusetts USA ISBN 0-201-08259-4.
- 1941.** Haugeland J 1985 Artificial intelligence: The very idea *MIT Press* Cambridge MA USA ISBN 0-262-08153-9.
- 1942.** Edelson E 1991 The nervous system *Chelsea House* New York USA ISBN 978-0-7910-0464-7.
- 1943.** Jang J-S R July 1991 Fuzzy modeling using generalized neural networks and Kalman filter algorithm *Proceedings of the 9th National Conference on Artificial Intelligence AAAI-91* pp 762 – 767.
- 1944.** Sun R, Bookman L (editors) 1994 Computational architectures: Integrating neural and symbolic processes *Kluwer Academic Publishers* Needham MA USA.
- 1945.** John G H, Langley P 1995 Estimating continuous distributions in Bayesian classifiers *The 11th Conference on Uncertainty in Artificial Intelligence*.
- 1946.** Dowe D L, Hajek A R 1997 A computational extension to the Turing test *Proceedings of the 4th Conference of the Australasian Cognitive Science Society*.
- 1947.** Kohavi G J R 1997 Wrappers for feature subset selection *Artificial Intelligence* vol **97** no 1-2 pp 272 – 324.
- 1948.** Mitchell T 1997 Machine learning *McGraw Hill* USA.
- 1949.** Nilsson N 1998 Artificial intelligence: A new synthesis *Morgan Kaufmann Publishers* ISBN 978-1-55860-467-4.
- 1950.** Nilsson N 2010 The quest for artificial intelligence: A history of ideas and achievements *Cambridge University Press* New York USA ISBN 978-0-521-12293-1.
- 1951.** Poole D, Mackworth A, Goebel R 1998 Computational intelligence: A logical approach *Oxford University Press* New York USA ISBN 0-19-510270-3.
- 1952.** Calmet J, Benhamou B, Caprotti O, Henocque L, Sorge V (editors) 2002 Artificial intelligence, automated reasoning, and symbolic computation *Springer-Verlag* Berlin Germany.
- 1953.** Russell S J, Norvig P 2003 Artificial intelligence: A modern approach 2nd edition *Prentice Hall* Upper Saddle River New Jersey USA ISBN 0-13-790395-2.

- 1954.** Luger G, Stubblefield W 2004 Artificial intelligence: Structures and strategies for complex problem solving 5th edition *The Benjamin Cummings Publishing Company Inc* ISBN 0-8053-4780-1.
- 1955.** Bach J 2008 Seven principles of synthetic intelligence in Artificial general intelligence 2008 Proceedings of the First AGI Conference Wang P, Goertzel B, Franklin S (editors) *IOS Press* pp 63 – 74 ISBN 978-1-58603-833-5.
- 1956.** Neapolitan R, Jiang X 2012 Contemporary artificial intelligence *Chapman & Hall CRC* ISBN 978-1-4398-4469-4.
- Continuous Time Signal, Analog Signals, Discrete Time Signal, Digital Signals, Spectrum of Signals, Electromagnetic Field, Gravitation Field, Calibrating Field, Information Field Theories in Physics and Engineering Sciences:**
- 1957.** Maxwell J C 1890 Introductory lecture on experimental physics in Scientific papers of J C Maxwell Niven W D (editor) vols **1, 2** Cambridge UK.
- 1958.** Walsh J L 1923a A closed set of normal orthogonal functions *American J Math* **45** pp 5 – 24.
- 1959.** Walsh J L 1923b A property of Haar’s system of orthogonal functions *Math Ann* **90** p 3845.
- 1960.** Wikipedia 2015d Joseph L Walsh *Wikipedia USA* www.wikipedia.org .
- 1961.** Gabor D 1946 Theory of communication Part 1 The analysis of information *J Inst Elect Eng* **93** pp 429 – 441.
- 1962.** Shannon C E 1948 A mathematical theory of communication *Bell System Technical Journal* vol **27** pp 379 – 423, 623 – 656 <http://cm.bell-labs.com/cm/ms/what/shannonday/paper.html> .
- 1963.** Bose R C, Shrikhande S S 1959 A note on a result in the theory of code construction *Information and Control* **2** (2) pp 183 – 194 doi:10.1016/S0019-9958(59)90376-6 CiteSeerX: 10.1.1.154.2879 <http://dx.doi.org/10.1016%2FS0019-9958%2859%2990376-6> <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.154.2879> .
- 1964.** Granger C W J, Hatanaka M 1964 Spectral analysis of economic time series *Princeton University Press* Princeton USA.
- 1965.** Yuen C-K 1972 Remarks on the ordering of Walsh functions *IEEE Transactions on Computers* **21** (12) p 1452 doi:10.1109/T-C.1972.223524 <http://dx.doi.org/10.1109%2FT-C.1972.223524> .

- 1966.** Hwang K, Briggs F A 1984 Computer architecture and parallel processing *McGraw-Hill* New York USA.
- 1967.** Orfanidis S J 1985 Optimum signal processing: An introduction 2nd edition *Macmillan* New York USA.
- 1968.** Orfanidis S J 1995 Introduction to signal processing *Prentice-Hall* Englewood Cliffs NJ USA.
- 1969.** Anceau F 1986 The architectures of microprocessors *Addison-Wesley* Wokingham England.
- 1970.** Fountain T 1987 Processor arrays, architecture and applications *Academic Press* London UK.
- 1971.** Chen C H (editor) 1988 Signal processing handbook *Marcel Dekker* New York USA.
- 1972.** Kay S M 1988 Modern spectral estimation: Theory and application *Prentice-Hall* Englewood Cliffs NJ USA.
- 1973.** Oppenheim A V, Schafer R W 1989 Discrete-time signal processing *Prentice-Hall* Englewood Cliffs NJ USA.
- 1974.** Van de Goor A J 1989 Computer architecture and design *Addison-Wesley* Wokingham England.
- 1975.** Priemer R 1991 Introductory signal processing *World Scientific* Singapore ISBN 9971509199.
- 1976.** Jeruchim M C, Balaban Ph, Shanmugan K S 1992 Simulation of communication systems *Plenum Press* New York USA.
- 1977.** Witte R A 1993, 2001 Spectrum and network measurements 1st edition *Prentice Hall Inc* Upper Saddle River NJ USA, 2nd edition *Noble Pub Corp* Atlanta GA USA ISBN 10 1884932169 LC TK7879.4.W58 2001 pp 1 – 297.
- 1978.** Hsu P H 1995 Schaum's theory and problems: Signals and systems *McGraw-Hill* ISBN 0-07-030641-9.
- 1979.** Simon M K, Hinedi S M, Lindsey W C 1995 Digital communication techniques – Signal design and detection *Prentice-Hall* Englewood Cliffs NJ USA.
- 1980.** Simon M K, Alouini M S 2000 Digital communication over fading channels – A unified approach to performance analysis 1st edition *John Wiley and Sons Inc* USA.
- 1981.** Proakis J G, Manolakis D G 1996 Digital signal processing 3rd edition *Prentice Hall* Upper Saddle River NJ USA.
- 1982.** Lathi B P 1998 Signal processing and linear systems *Berkeley-Cambridge Press* ISBN 0-941413-35-7.

- 1983.** Prisch P 1998 Architectures for digital signal processing *John Wiley and Sons Inc* Chichester UK.
- 1984.** Gershenfeld N A 1999 The nature of mathematical modeling *Cambridge University Press* UK ISBN 0-521-57095-6.
- 1985.** Parhami B 1999 Computer arithmetic: Algorithms and hardware design *Oxford University Press* Oxford UK.
- 1986.** Wanhammar L 1999 DSP integrated circuits *Academic Press* San Diego California USA ISBN 0-12-734530-2 pp 1 – 561.
- 1987.** Koren I 2001 Computer arithmetic algorithms *A K Peters Ltd* Natick MA USA.
- 1988.** Sklar B 2001 Digital communications 2nd edition *Prentice-Hall* Englewood Cliffs NJ USA.
- 1989.** McMahon D 2007 Signals and systems demystified *McGraw Hill* New York USA ISBN 978-0-07-147578-5.
- 1990.** Rice M 2008 Digital communications - A discrete-time approach *Prentice Hall* Englewood Cliffs NJ USA.
- 1991.** Wikipedia 2015e Signal (electrical engineering) *Wikipedia Inc* USA
www.wikipedia.org .
- 1992.** Wikipedia 2015f Continuous wave *Wikipedia Inc* USA
www.wikipedia.org .
- 1993.** Wikipedia 2015g Discrete-time signal *Wikipedia Inc* USA
www.wikipedia.org .
- 1994.** Wikipedia 2015h Hadamard code *Wikipedia* USA
www.wikipedia.org .
- 1995.** Ledenyov D O, Ledenyov V O 2015a Nonlinearities in microwave superconductivity 8th edition *Cornell University* NY USA pp 1 – 923
www.arxiv.org/abs/1206.4426v8.pdf .