



Munich Personal RePEc Archive

Digital DNA of economy of scale and scope

Dimitri O. Ledenyov and Viktor O. Ledenyov

James Cook University, Townsville, Australia

20 January 2016

Online at <https://mpra.ub.uni-muenchen.de/68929/>

MPRA Paper No. 68929, posted 24 January 2016 11:37 UTC

Digital DNA of economy of scale and scope

Dimitri O. Ledenyov and Viktor O. Ledenyov

Abstract – The research article aims to create a general fundamental theory on the Digital DNA of the modern digital creative economy of the scale and scope. In the frames of our theory, we define the Digital DNA of the modern digital creative economy of the scale and scope, making the following theoretical assumptions: 1) Digital DNA exists in the modern digital creative economy of the scale and scope; 2) Digital DNA consists of a chain of the knowledge with all the information on the modern digital creative economy of the scale and scope; 3) the Digital DNA uniquely identifies and accurately characterizes the modern digital creative economy of the scale and scope in the time, scale, frequency domains; 4) the Digital DNA represents a genetic key, which may help us to better understand the generation of the discrete-time digital business cycles with the different amplitudes, frequencies, shapes and powers in the modern digital creative economy of the scale and scope in the time, scale, frequency domains. In this innovative advanced research, we investigate the following research problems: 1) the existing damaging mechanisms of the Digital DNA's complex knowledge base structure in the modern digital creative economies of the scales and scopes in the time, scale, frequency domains; 2) the possible repairing mechanisms of the Digital DNA's complex knowledge base structure in the modern digital creative economies of the scales and scopes in the time, scale, frequency domains; 3) the specific influences by the damaged/repaired Digital DNA on the discrete-time digital business cycles generation/propagation in the modern digital creative economies of the scales and scopes in the time, scale, frequency domains. In addition, the innovative advanced research aims: 1) to perform the computer modeling on the Digital DNA's complex knowledge base structure in the modern digital creative economy of the scale and scope; 2) to decode the Digital DNA's complex knowledge base structure in the modern digital creative economy of the scale and scope.

JEL: E32, E43, E44, E53, E58, E61, G18, G21, G28

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

Keywords: Digital DNA, chain of knowledge, Ledenyov discrete-time digital waves, spectrum analysis of discrete-time digital signals, amplitude / frequency / wavelength / period / phase of discrete-time digital signal, continuous time signals, *Juglar* fixed investment cycle, *Kitchin* inventory cycle, *Kondratieff* long wave cycle, *Kuznets* infrastructural investment cycle, modern digital creative economy, macroeconomics, econometrics, econophysics, macroeconomics.

Introduction

The *fundamental economics science*, including the *macro-, micro- and nano- economics sciences*, has been a *subject of great research interest* at the *universities/institutions* in the *World* in the *recent centuries*. The *fundamental economics science* has been studied, using both the *social sciences methodologies* in *Joseph Penso de la Vega (1668, 1996), Mortimer (1765), Smith (1776, 2008), Menger (1871), Bagehot (1873, 1897), von Böhm-Bawerk (1884, 1889, 1921), Hirsch (1896), Bachelier (1900), Schumpeter (1906, 1911, 1933, 1939, 1961, 1939, 1947), Slutsky (1910, 1915 1923), von Mises (1912), Hayek (1931, 1935, 2008; 1948, 1980), Keynes (1936, 1992), Ellis, Metzler (1949), Friedman (1953), Baumol (1957), Debreu (1959), Krugman, Wells (2005), Stiglitz (2005, 2015), Dodd (2014)* as well as the *natural sciences methodologies* in *Schumpeter (1906, 1933), Bowley (1924), Fogel (1964), Box, Jenkins (1970), Grangel, Newbold (1977), Van Horne (1984), Taylor S (1986), Tong (1986, 1990), Judge, Hill, Griffiths, Lee, Lutkepol (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), Cameron, Trivedi (2005), Iyetomi, Aoyama, Ikeda, Souma, Fujiwara (2008), Iyetomi, Aoyama, Fujiwara, Sato (editors) (2012), Vialar, Goergen (2009)*.

In the *fundamental economics science*, the application of the *empirical methods in the social sciences* in combination with the *mathematical methods in the natural sciences* resulted in the discovery of the *periodic oscillations* of the *economic variables* in the *nonlinear dynamic economic system* in *Juglar (1862), George (1881, 2009), Kondratieff (1922, 1925, 1926, 1928, 1935, 1984, 2002), Kitchin (1923), Schumpeter (1939), Burns, Mitchell (1946), Dupriez (1947), Samuelson (1947), Hicks (1950), Inada, Uzawa (1972), Kuznets (1973a, b), Bernanke (1979), Marchetti (1980), Kleinknecht (1981), Dickson (1983), Hodrick, Prescott (1997), Baxter, King (1999), Kim, Nelson (1999), McConnell, Pérez-Quirós (2000), Devezas, Corredine (2001, 2002), Devezas (editor) (2006), Arnord (2002), Stock, Watson (2002), Helfat, Peteraf (2003), Sussmuth (2003), Hirooka (2006), Kleinknecht, Van der Panne (2006), Jourdon (2008), Taniguchi, Bando, Nakayama (2008), Drehmann, Borio, Tsatsaronis (2011), Iyetomi, Nakayama, Yoshikawa, Aoyama, Fujiwara, Ikeda, Souma (2011), Ikeda, Aoyama, Fujiwara, Iyetomi, Ogimoto, Souma, Yoshikawa (2012), Swiss National Bank (2012, 2013), Uechi, Akutsu (2012), Central Banking Newsdesk (2013), Ledenyov D O, Ledenyov V O (2013c, 2015d), Union Bank of Switzerland (2013), Wikipedia (2015a, b, c)*. More specifically, in the *fundamental economics science*, the

evolutionary development of both the *empirical methods in the social sciences* and the *technical methods in the natural sciences*, led to both the better understanding of the *fundamental economics science principles* and the groundbreaking discovery of the *Ledenyov discrete time digital waves of $GIP(t)/GDP(t)/GNP(t)/PPP(t)$ (the discrete-time digital business cycles)* with the *different amplitudes, frequencies, shapes and powers* in the *modern digital creative economy of the scale and scope* in the *time, scale, frequency domains* in *Ledenyov D O, Ledenyov V O (2015e, f)*. Therefore, presently, we know that the *Ledenyov discrete-time digital waves* can be generated by and propagated in the *modern digital creative economy of the scale and scope* in the *time, scale, frequency domains* in *Ledenyov D O, Ledenyov V O (2015e, f)*.

In this connection, the *following empirical question* may arise: *Can we formulate the general fundamental theory on the Digital DNA of the modern digital creative economy of the scale and scope with the purpose to accurately characterize the modern digital creative economy of the scale and scope and predict the generation of the Ledenyov discrete-time digital waves in the modern digital creative economy of the scale and scope?*

Therefore, this *innovative research article* aims to create the *general fundamental theory on the Digital DNA of the modern digital creative economy of the scale and scope*, changing in the *time, scale, frequency domains*. In the *frames of our general fundamental theory*, we would like to define the *Digital DNA structure in the modern digital creative economy of the scale and scope*, making the *following theoretical assumptions*:

1. the *Digital DNA exists in the modern digital creative economy of the scale and scope*;
2. the *Digital DNA consists of a chain of knowledge on the modern digital creative economy of the scale and scope*;
3. the *Digital DNA uniquely identifies and accurately characterizes the modern digital creative economy of the scale and scope in the time, scale, frequency domains*;
4. the *Digital DNA represents a genetic key, which may help us to better understand the generation/propagation of the Ledenyov discrete time digital waves of $GIP(t)/GDP(t)/GNP(t)/PPP(t)$ (the discrete-time digital business cycles) with the different amplitudes, frequencies, shapes and powers in the modern digital creative economy of the scale and scope in the time, scale, frequency domains*.

Moreover, in this *innovative advanced research*, we aim to investigate the *following research problems*:

1. the *existing damaging mechanisms of the Digital DNA's complex knowledge base structure in the economies of the scales and scopes in the time, scale, frequency domains*;

2. the possible repairing mechanisms of the Digital DNA's complex knowledge base structure in the economies of the scales and scopes in the time, scale, frequency domains;

3. the specific influences by the damaged/repaired Digital DNA with the complex knowledge base structures on the generation/propagation of the Ledenyov discrete time digital waves of $GIP(t)/GDP(t)/GNP(t)/PPP(t)$ (the discrete-time digital business cycles) with the different amplitudes, frequencies, shapes and powers in the modern digital creative economy of the scale and scope in the time, scale, frequency domains.

In addition, the innovative advanced research aims to do the following things:

1. to perform the computer modeling the Digital DNA's complex knowledge base structure of the modern digital creative economy of the scale and scope in the time, scale, frequency domains;

2. to decode the Digital DNA's complex knowledge base structure of the modern digital creative economy of the scale and scope in the time, scale, frequency domains.

Following the above written introduction, let us begin a more detailed insightful scientific thinking and discussion on the general fundamental theory of the Digital DNA of the modern digital creative economy of the scale and scope, presenting our original research thoughts and ideas on the subject of our scientific interest in this research article.

Digital DNA of modern digital creative economy of scale and scope

We would like to start our empirical philosophical research toward the creation of the general fundamental theory on the Digital DNA of the modern digital creative economy of the scale and scope in the macroeconomics, using the following research plan:

1. Presentation on the overview of available research information on **Deoxyribonucleic acid (DNA)**;

2. Presentation on the original research proposal on the **Digital DNA of the modern digital creative economy of the scale and scope**,

3. Presentation on the concluding remarks on the **Digital DNA of the modern digital creative economy of the scale and scope**.

Beginning the discussion on the Deoxyribonucleic acid (DNA) in the biology science, let us explain that the **Deoxyribonucleic Acid (DNA) is a molecule, with the complex double helix structure made of the two biopolymer strands in the living cell nuclei, that contains all the biological information in the form of the genetic instructions on how it is possible to develop, function and reproduce the existing living organisms** in Miescher (1871), Kol'tsov (December

12, 1927), Watson, Crick (1953), Watson (2002, 2004), Gamow (July 2 1954a, b), DeVinne (editor) (1985), Dahm (2008), Library of Congress (2015), Wikipedia (2015i). *The Deoxyribonucleic Acid (DNA) in the form of the nuclein substance was discovered by Friedrich Miescher, Swiss physician, University of Tübingen in 1869 in Miescher (1871). The double helix structure of DNA was first discovered by Watson and Crick, University of Cambridge, UK in 1953 in Watson, Crick (1953). The coding scheme for the Deoxyribonucleic Acid (DNA) was proposed in Gamow (July 2 1954a, b, Library of Congress (2015).*

Going to the discussion on our *original research proposal on the Digital DNA of the modern digital creative economy of the scale and scope*, we would like to propose a *concise definition of the Digital DNA of the modern digital creative economy of the scale and scope* and formulate the *general fundamental theory on the Digital DNA of the modern digital creative economy of the scale and scope*.

Thus, performing a *comparative analogy* between the *Deoxyribonucleic Acid (DNA)* in the *biology science* and the *Digital DNA* in the *macroeconomics science*, let us define the **Digital DNA** in this *empirical philosophical research* for the *first time*: ***The Digital DNA of the modern digital creative economy of the scale and scope represents an accumulated chain of knowledge, which stores all the information in the form of the “genetic instructions” on how it is possible to develop, function and reproduce the modern digital creative economy of the scale and scope in the time, scale, frequency domains.***

Continuing the research on the *Digital DNA* in the *macroeconomics science*, let us clarify that, in our opinion, a ***chain of accumulated knowledge may include all the spectrum of information, which has been created, exchanged, transmitted and stored by the humans in the natural sciences databases, the social sciences databases, the numerous encyclopedia databases, the intellectual properties databases, the technological standards databases at the governments, universities, institutions, colleges, schools, firms, governmental organizations, non-governmental organizations, cultural organizations, religious organizations within the particular modern digital creative economy of the scale and scope in the time, scale, frequency domains.***

Let us consider the *possible damaging mechanisms* of the *Digital DNA's complex knowledge base structure* in the *modern digital creative economies of the scales and scopes* in the *time, scale, frequency domains*. In our research opinion, the ***Digital DNA's complex knowledge base structure can be severely damaged by the bad governance practices at the governments, universities, institutions, colleges, schools, firms, governmental organizations, non-governmental organizations, cultural organizations, religious organizations at the***

state/province/city/district/organization levels, resulting in a possible disappearance of the certain knowledge in various sectors of the modern digital creative economies of the scales and scopes in the time, scale, frequency domains. For example, the *bad governance practices* may include the *failing strategies creation and execution* by the *presidents/prime ministers/ministers/governors/chairmen/directors/managers* at the *governments, universities, institutions, colleges, schools, firms, governmental organizations, non-governmental organizations, cultural organizations, religious organizations* at the *state/province/city/district/organization levels, resulting in a possible disappearance of the certain knowledge in various sectors of the modern digital creative economies of the scales and scopes in the time, scale, frequency domains.*

Let us describe the *possible repairing mechanisms* of the *Digital DNA's complex knowledge base structure* in the *modern digital creative economies of the scales and scopes in the time, scale, frequency domains.* In our view, the ***Digital DNA's complex knowledge base structure can be partly/completely repaired by the good governance practices at the governments, universities, institutions, colleges, schools, firms, governmental organizations, non-governmental organizations, cultural organizations, religious organizations at the state/province/city/district/organization levels, resulting in a possible appearance of the certain knowledge in various sectors of the modern digital creative economies of the scales and scopes in the time, scale, frequency domains.*** For instance, the *good governance practices* may include the *winning virtuous strategies creation and execution* by the *presidents/prime ministers/ministers/governors/chairmen/directors/managers* at the *governments, universities, institutions, colleges, schools, firms, governmental organizations, non-governmental organizations, cultural organizations, religious organizations* at the *state/province/city/district/organization levels, resulting in a possible appearance of the certain knowledge in various sectors of the modern digital creative economies of the scales and scopes in the time, scale, frequency domains.*

Let us comment that a *number of insightful discussions* on the *existing distinctions* between the *failing strategies* and the *winning virtuous successful strategies*, which can be created and implemented in the *governance/management practices* can be found in *Chandler (1962, 1998; 1977, 1993; 1994; 2001; 2005), Chandler , Daems (1980), Andrews (1971a, b, 1980, 1981a, b, 1984), Rumelt (1974, 1982), Porter (1979, 1980, 1982a, b, 1983, 1985, 1987a, b, 1991, 1994a, b, 1996a, b, 1997, 2001a, b, 2008, December 2013), Porter, Harrigan (1981), Porter, Salter (1982), Montgomery, Porter (1991), Porter, Rivkin (2000), Porter, Sakakibara (2004), Anand, Bradley, Ghemawat, Khanna, Montgomery, Porter, Rivkin, Rukstad, Wells,*

Yoffie (2005), Porter, Kramer (2006), Porter, Heppelmann (November 2014), Schendel, Hofer (1979), Yelle (1979), Dess, Davis (1984), Schwenk (1984), Pitol-Belin (1984), Hambrick (1985), Palepu (1985), Barney (1986, 1991), Huff, Reger (1987), Hill, Snell (1988), Hill, Jones (1998, 2004), Baysinger, Hoskisson (1989), Rue, Holland (1989), Fombrum, Shanley (1990), Pearson (1990), Ansoff (1991), Goold (1991), Goold, Luchs (1993), Goold et al (1994), Goold, Campbell (September, October 1998), Alexander, Goold, Collis, Campbell, Lieberthal, Montgomery, Palepu, Prahalad, Stalk, Khanna, Hart, Shulman, Evans (1992, 1995, 1996, 1997, 1998, 1999), Yip (1992, 1998, 2000, 2007), Campbell et al (1995), Johnson, Scholes (1997), Johnson, Scholes, Whittington (1998), Johnson, Scholes, Whittington (2002, 2003), McKiernan (1997), Child, Faulkner (1998), Martin (1998-1999, 2004, 2005-2006, 2007a,b, 2008, 2009), Moldoveanu, Martin (2001), Lafley, Martin (2013), Shiryaev (1999), Laffont, Tirole (1999), Grant (2001), Welch (2001a, b), Choo, Bontis (2002), Drejer (2002), Sadler (2003), Gavetti, Levinthal (2004), Gavetti, Rivkin (2007), Roney (2004), Thietart, Xuereb (2005), Godard (2006), Ireland, Hoskisson, Hitt (2006), Hitt, Ireland, Hoskisson (2007), Lorino, Tarondeau (2006), Besanko, Shanley, Dranove (2007), Sull (2007a, b, c, d, 2008), Teece, Winter (2007), Samuels (2008), Chamberlain (2010), Holt, Cameron (2010), Ledenyov D O, Ledenyov V O (2015b, n, o).

Going to the *next problem*, let us identify the *specific influences* by the *damaged/repaired Digital DNA* on the *discrete-time digital business cycles generation/propagation* in the *modern digital creative economies of the scales and scopes* in the *time, scale, frequency domains*. The ***authors' strategic vision is that the damaged/repaired Digital DNA may have the specific influences on the generation/propagation of the Ledenyov discrete time digital waves of $GIP(t)/GDP(t)/GNP(t)/PPP(t)$ (the discrete-time digital business cycles of $GIP(t)/GDP(t)/GNP(t)/PPP(t)$) in the modern digital creative economies of the scales and scopes in the time, scale, frequency domains.*** For example, the *damaged/repaired Digital DNA* may result in the *generation and propagation* of the *Ledenyov discrete time digital waves of $GIP(t)/GDP(t)/GNP(t)/PPP(t)$ (the discrete-time digital business cycles of $GIP(t)/GDP(t)/GNP(t)/PPP(t)$)* with the *small/big amplitudes, low/high frequencies, different phases* in the *modern digital creative economies of the scales and scopes* in the *time, scale, frequency domains*. The main reason for the above mentioned facts existence is that the *damaged/repaired Digital DNA* can decrease/increase the *outputs* by the *real sector* and by the *speculative sectors* of the *modern digital creative economies of the scales and scopes* in the *time, scale, frequency domains*. The more comprehensive description of the *Ledenyov discrete time digital waves of $GIP(t)/GDP(t)/GNP(t)/PPP(t)$ (the discrete-time digital business cycles of $GIP(t)/GDP(t)/GNP(t)/PPP(t)$)* is presented in *Ledenyov D O, Ledenyov V O (2015e, f)*.

Presently, the *authors' research efforts* are mainly focused on the *following two research problems* in the *macroeconomics science*:

1. the *computer modeling the Digital DNA's complex knowledge base structure of the modern digital creative economy of the scale and scope in the time, scale, frequency domains*;
2. the *understanding of the coding/decoding schemes for the Digital DNA's complex knowledge base structure in the modern digital creative economy of the scale and scope in the time, scale, frequency domains*.

We report a successful development of the *complex software program, DNACode*, to model the existing *Digital DNAs* of the *G20 economies of the scales and scopes* for the *first time*. The *complex software program* can code/decode the *Digital DNA's complex knowledge base structure*, researching *any selected economy of the scale and scope* in the case of the *G20 nations*. It may worth to note that the *complex software program* can accurately forecast the *generation/propagation of the Ledenyov discrete time digital waves of $GIP(t)/GDP(t)/GNP(t)/PPP(t)$ (the discrete-time digital business cycles of $GIP(t)/GDP(t)/GNP(t)/PPP(t)$)* in the *G20 economies of the scales and scopes*.

Conclusion

The *research article* had a goal to create a *general fundamental theory* on the *Digital DNA* of the *modern digital creative economy of the scale and scope*. In the frames of our theory, we defined the *Digital DNA* of the *modern digital creative economy of the scale and scope*, making the *following theoretical assumptions*:

1. *Digital DNA exists in the modern digital creative economy of the scale and scope*;
2. *Digital DNA consists of a chain of knowledge with all the information on the modern digital creative economy of the scale and scope*;
3. *Digital DNA uniquely identifies and accurately characterizes the modern digital creative economy of the scale and scope in the time, scale, frequency domains*;
4. *Digital DNA represents a genetic key, which may help us to better understand the generation of the discrete-time digital business cycles with the different amplitudes, frequencies, shapes and powers in the modern digital creative economy of the scale and scope in the time, scale, frequency domains*.

In this innovative advanced research, we investigated the following research problems:

1. the existing damaging mechanisms of the Digital DNA's complex knowledge base structure in the modern digital creative economies of the scales and scopes in the time, scale, frequency domains;

2. the possible repairing mechanisms of the Digital DNA's complex knowledge base structure in the modern digital creative economies of the scales and scopes in the time, scale, frequency domains;

3. the specific influences by the damaged/repaired Digital DNA on the discrete-time digital business cycles generation/propagation in the modern digital creative economies of the scales and scopes in the time, scale, frequency domains.

In addition, the innovative advanced research aimed:

1. to perform the computer modeling on the Digital DNA's complex knowledge base structure in the modern digital creative economy of the scale and scope;

2. to decode the Digital DNA's complex knowledge base structure in the modern digital creative economy of the scale and scope

Finally, the present research article had an ultimate goal to continue our scientific exploration on the Ledenyov discrete time digital waves of $GIP(t)/GDP(t)/GNP(t)/PPP(t)$ (the discrete-time digital business cycles of $GIP(t)/GDP(t)/GNP(t)/PPP(t)$), which constitute a new class of the discrete-time digital waves in the economies of scale and scope in the macroeconomics science.

Particularly, the present research article aimed to continue to study the following early outlined research topics:

1. the re-thinking of the foundations of macroeconomic theory, introducing the scientific proposition about the digital nature of the business cycles, which can be originated by the discrete-time fluctuations such as the creative disruptive innovations in the economies of the scales and scopes;

2. the creation of the Ledenyov discrete time digital signals theory to precisely characterize the discrete time digital signals (the business cycles) in the macroeconomics;

3. the modeling of new types of the discrete-time digital signals generators for the business cycles origination in the macroeconomics;

4. the analysis the spectrum of discrete-time digital signals in the economies of scale and scope;

5. the demonstration of the technical differences between the new model of the discrete-time digital signals generator and the existing models of the continuous-time (continuous wave) signals generators in the macroeconomics; and

6. the development of the complex software program DNACode to forecast the business cycles, going from the spectral analysis of the discrete time digital signals and the continuous time signals in the nonlinear dynamic economic system over the selected time period.

Acknowledgement

The scientific thinking school in Bunyakovsky (1825a, b, c, 1846) influenced the authors' strategic scientific vision creation and helped to develop the authors' tactical approaches to the scientific problems solutions search. The authors acknowledge the multiple scientific discussions on the Digital DNA with Oleg P. Ledenyov in Kharkiv, Ukraine in 1988 – 2016. The first author appreciates many hours of the research discussions on the computing modeling techniques for the accurate characterization of the scientific phenomena with Janina E. Mazierska at James Cook University in Townsville, Australia in 2000 - 2016.

*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. Menger C 1871 *Principles of Economics (Grundsätze der Volkswirtschaftslehre)* Ludwig von Mises Institute Auburn Alabama USA
<http://www.mises.org/etexts/menger/Mengerprinciples.pdf> .
5. Bagehot W 1873, 1897 *Lombard Street: A description of the money market* *Charles Scribner's Sons* New York USA.
6. 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 .
7. Hirsch M 1896 *Economic principles: A manual of political economy* *The Russkin Press Pty Ltd* 123 Latrobe Street Melbourne Australia.
8. Bachelier L 1900 *Theorie de la speculation* *Annales de l'Ecole Normale Supérieure* Paris France vol **17** pp 21 – 86.
9. Schumpeter J A 1906 *Über die mathematische methode der theoretischen ökonomie* *ZfVSV* Austria.
10. Schumpeter J A 1933 *The common sense of econometrics* *Econometrica*.
11. 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.
12. Schumpeter J A 1939 *Business cycle* *McGraw-Hill* New York USA.
13. Schumpeter J A 1947 *The creative response in economic history* *Journal of Economic History* vol **7** pp 149 – 159.
14. Slutsky E E 1910 *Theory of marginal utility* *M Sc Thesis* Vernadsky National Library Kiev Ukraine.
15. Slutsky E E 1915 *Sulla teoria sel bilancio del consumatore* *Giornale degli economisti e rivista di statistica* **51** no 1 pp 1 – 26 Italy.

16. Slutsky E E 1923 On calculation of state revenue from emission of paper money *Local Economy* 2 pp 39 – 62 Kiev Ukraine.
17. 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 .
18. 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.
19. Hayek F A 1948, 1980 Individualism and economic order London School of Economics and Political Science London UK, University of Chicago Press Chicago USA.
20. Keynes J M 1936 The general theory of employment, interest and money *Macmillan Cambridge University Press* Cambridge UK.
21. Keynes J M 1998 The collected writings of John Maynard Keynes *Cambridge University Press* Cambridge UK ISBN 978-0-521-30766-6.
22. Ellis H, Metzler L (editors) 1949 Readings in the theory of international trade *Blakiston* Philadelphia USA.
23. Friedman M (editor) 1953 Essays in positive economics *Chicago University Press* Chicago USA.
24. Baumol W 1957 Speculation, profitability, and stability *Review of Economics and Statistics* 39 pp 263 – 271.
25. Debreu G 1959 Theory of value *Cowles Foundation Monograph* vol 17 *John Wiley & Sons Inc* New York USA.
26. Minsky H P 1974 The modeling of financial instability: An introduction *Modeling and Simulation* Proceedings of the Fifth Annual Pittsburgh Conference 5.
27. Minsky H P May 1992 The financial instability hypothesis *Working Paper no 74*: 6–8
<http://www.levy.org/pubs/wp74.pdf> .
28. 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/> .
29. Krugman P, Wells R 2005 Economics *Worth Publishers* 1st edition ISBN-10: 1572591501 ISBN-13: 978-1572591509 pp 1 – 1200.
30. Stiglitz J E 2005 Principles of macroeconomics *W W Norton* 4th edition ISBN-10: 0393926249 ISBN-13: 978-0393926248 pp 1 – 526.

31. 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 .

32. Dodd N 2014 The social life of money *Princeton University Press* NJ USA
ISBN: 9780691141428 pp 1 – 456.

Juglar Economic Cycle:

33. Juglar C 1862 Des crises commerciales et de leur retour périodique en France en Angleterre et aux États-Unis *Guillaumin* Paris France.

34. Schumpeter J A 1939 Business cycle *McGraw-Hill* New York USA.

35. 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:

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

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

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

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

40. 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.

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

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

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

44. 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.

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

46. Forrester J W 1978 Innovation and the economic long wave *MIT System Dynamics Group Working Paper* Massachusetts Institute of Technology Cambridge USA.
47. Forrester J W 1981 The Kondratieff cycle and changing economic conditions *MIT System Dynamics Group Working Paper* Massachusetts Institute of Technology Cambridge USA.
48. Forrester J W 1985 Economic conditions ahead: Understanding the Kondratieff wave *Futurist* **19** (3) pp 16 – 20.
49. 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.
50. 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.
51. Barr K 1979 Long waves: A selective annotated bibliography *Review* **2** (4) pp 675 – 718.
52. Van Duijn J J 1979 The long wave in economic life *De Economist* **125** (4) pp 544 – 576.
53. Van Duijn J J 1981 Fluctuations in innovations over time *Futures* **13**(4) pp 264 – 275.
54. Van Duijn J J 1983 The long wave in economic life *Allen and Unwin* Boston MA USA.
55. Eklund K 1980 Long waves in the development of capitalism? *Kyklos* **33** (3) pp 383 – 419.
56. Mandel E 1980 Long waves of capitalist development *Cambridge University Press* Cambridge UK.
57. 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.
58. Tinbergen J 1981 Kondratiev cycles and so-called long waves: The early research *Futures* **13** (4) pp 258 – 263.
59. Van Ewijk C 1982 A spectral analysis of the Kondratieff cycle *Kyklos* **35** (3) pp 468 – 499.
60. 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.
61. 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.

62. Bieshaar H, Kleinknecht A 1984 Kondratieff long waves in aggregate output? An econometric test *Konjunkturpolitik* **30** (5) pp 279 – 303.
63. Wallerstein I 1984 Economic cycles and socialist policies *Futures* **16** (6) pp 579 – 585.
64. 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.
65. Summers L H 1986 Some skeptical observations on real business cycle theory *Federal Reserve Bank of Minneapolis Quarterly Review* **10** pp 23 – 27.
66. 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.
67. Freeman C, Louçã F 2001 As time goes by: From the industrial revolutions to the information revolution *Oxford University Press* Oxford UK.
68. Goldstein J 1988 Long cycles: Prosperity and war in the modern age *Yale University Press* New Haven CT USA.
69. Solomou S 1989 Phases of economic growth, 1850–1973: Kondratieff waves and Kuznets swings *Cambridge University Press* Cambridge UK.
70. Berry B J L 1991 Long wave rhythms in economic development and political behavior *Johns Hopkins University Press* Baltimore MD USA.
71. 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.
72. 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.
73. 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.
74. Tylecote A 1992 The long wave in the world economy *Routledge* London UK.
75. Cooley Th (editor) 1995 Frontiers of business cycle research *Princeton University Press* USA ISBN 0-691-04323-X.
76. 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.
77. Modelski G 2001 What causes K-waves? *Technological Forecasting and Social Change* **68** pp 75 – 80.

78. 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.
79. Perez C 2002 Technological revolutions and financial capital – The dynamics of bubbles and golden ages *Edward Elgar* Cheltenham UK.
80. 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.
81. Rumyantseva S Yu 2003 Long waves in economics: Multifactor analysis *St. Petersburg University Publishing House* St. Petersburg Russian Federation.
82. 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.
83. 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.
84. 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>.
85. Papehausen Ch 2008 Causal mechanisms of long waves *Futures* **40** pp 788 – 794.
86. 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> .
87. Wikipedia 2015a Kondratieff *Wikipedia* USA www.wikipedia.org.

Kitchin Economic Cycle:

88. 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:

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

91. Kuznets S 1930 Secular movements in production and prices. Their nature and their bearing upon cyclical fluctuations *Houghton Mifflin* Boston USA.
92. Kuznets S 1937 National income and capital formation, 1919 – 1935.
93. Kuznets S 1941 National income and its composition, 1919 – 1938.
94. Kuznets S March 1955 Economic growth and income inequality *American Economic Review* **45** pp 1 – 28.
95. 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.
96. Kuznets S 1966 Modern economic growth: Rate, structure, and spread.
97. Kuznets S 1968 Toward a theory of economic growth, with reflections on the economic growth of modern nations.
98. Kuznets S 1971 Economic growth of nations: Total output and production structure.
99. Kuznets S 1973a Population, capital and growth.
100. Kuznets S 1973b Modern economic growth: Findings and reflections *American Economic Review* **63** pp 247 – 58.
101. Abramovitz M 1961 The nature and significance of Kuznets cycles *Economic Development and Cultural Change* **9** (3) pp 225 – 248.
102. Abramovitz M March 1986 Simon Kuznets 1901 – 1985) *The Journal of Economic History* vol **46** no 1 pp 241 – 246.
103. Lundberg E 1971 Simon Kuznets contributions to economics *The Swedish Journal of Economics* **73** (4) pp 444 – 459 DOI:10.2307/3439225, JSTOR 3439225.
104. Hozelitz B F January 1983 Bibliography of Simon Kuznets *Economic Development and Cultural Change* vol **31** no 2 pp 433 – 454.
105. Ben-Porath Y April 1988 Simon Kuznets in person and in writing *Economic Development and Cultural Change* vol **36** no 3 pp 435 – 447.
106. 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.
107. Kapuria-Foreman V, Perlman M November 1995 An economic historian's economist: Remembering Simon Kuznets *The Economic Journal* **105** pp 1524 – 1547.
108. Fogel R W 2000 Simon S. Kuznets: April 30, 1901 – July 9, 1985 *NBER Working Paper no W7787* NBER USA.
109. 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.

- 110.** 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.
- 111.** 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.
- 112.** Wikipedia 2015b Simon Kuznets Economist *Wikipedia* USA
www.wikipedia.org.
- Accurate Characterization of Properties of Economic Cycles:**
- 113.** George H 1881, 2009 Progress and poverty *Kegan Paul* USA; reissued by *Cambridge University Press* Cambridge UK ISBN 978-1-108-00361-2.
- 114.** Schumpeter J A 1939 Business cycle *McGraw-Hill* New York USA.
- 115.** Burns A F, Mitchell W C 1946 Measuring business cycles *National Bureau of Economic Research* New York USA.
- 116.** Dupriez L H 1947 Des mouvements économiques généraux vol **2** pt 3 *Institut de Recherches Economiques et Sociales de l'Université de Louvain* Belgium.
- 117.** Samuelson P A 1947 Foundations of economic analysis *Harvard University Press* Cambridge MA USA.
- 118.** Hicks J R 1950 A contribution to the theory of the trade cycle *Oxford University Press* Oxford UK.
- 119.** Goodwin R M 1951 The nonlinear accelerator and persistence of business cycles *Econometrica* **19** no 1 pp 1 – 17.
- 120.** Inada K, Uzawa H 1972 Economical development and fluctuations *Iwanami* Tokyo Japan.
- 121.** Bernanke B S 1979 Long-term commitments, dynamic optimization, and the business cycle *Ph. D. Thesis* Department of Economics Massachusetts Institute of Technology USA.
- 122.** Marchetti C 1980 Society as a learning system: Discovery, invention, and innovations cycles revisited *Technological Forecast and Social Change* **18** pp 257 – 282.
- 123.** Kleinknecht A 1981 Innovation, accumulation, and crisis: Waves in economic development? *Review* **4** (4) pp 683 – 711.
- 124.** Dickson D 1983 Technology and cycles of boom and bust *Science* **219** (4587) pp 933 – 936.
- 125.** 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.

- 126.** Anderson H M, Ramsey J B 1999 *Economic Research Reports PR # 99-01* New York University NY USA.
- 127.** 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.
- 128.** 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*.
- 129.** McConnell M, Pérez-Quirós G 2000 Output fluctuations in the United States: What has changed since the early 1980s? *American Economic Review*.
- 130.** 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.
- 131.** Devezas T C, Corredine J T 2002 The nonlinear dynamics of technoeconomic systems. An informational interpretation *Technological Forecasting & Social Change* **69** pp 317 – 357.
- 132.** Devezas T C (editor) 2006 *Kondratieff Waves, Warfare and World Security* IOS Press Amsterdam The Netherlands.
- 133.** Arnord L 2002 Business cycle theory *Oxford University Press* Oxford UK 2002.
- 134.** Stock J, Watson M 2002 Has the business cycle changed and why? *NBER Macroeconomics Annual* NBER USA.
- 135.** Helfat C E, Peteraf M A 2003 The dynamic resource-based view: Capability life cycles *Strategic Management Journal* **24** (10) pp 997 – 1010.
- 136.** Selover D D, Jensen R V, Kroll J 2003 *Studies in Nonlinear Dynamics & Econometrics* **7** p 1.
- 137.** Sussmuth B 2003 Business cycles in the contemporary World *Springer* Berlin Heidelberg Germany.
- 138.** Hirooka M 2006 Innovation dynamism and economic growth: A nonlinear perspective *Edward Elgar* Cheltenham UK Northampton MA USA.
- 139.** 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.
- 140.** Iyetomi H, Aoyama H, Ikeda Y, Souma W, Fujiwara Y 2008 *Econophysics* *Kyoritsu Shuppan* Tokyo Japan.

- 141.** 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.
- 142.** 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.
- 143.** Jourdon Ph 2008 La monnaie unique Europeenne et son lien au developpement economique et social coordonne: une analyse cliometrique *Thèse Universite Montpellier* France.
- 144.** 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.
- 145.** 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.
- 146.** 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 .
- 147.** 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/> .
- 148.** Ikeda Y, Aoyama H, Yoshikawa H 2013b Direct evidence for synchronization in international business cycles *Financial Networks and Systemic Risk*.
- 149.** Ikeda Y 2013 Direct evidence for synchronization in Japanese business cycles *Evolutionary and Institutional Economic Review* **10** (2) pp 1 – 13
arXiv:1305.2263v1 .
- 150.** 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 .
- 151.** 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 .

152. Uechi L, Akutsu T 2012 Conservation laws and symmetries in competitive systems
Progress of Theoretical Physics Supplement no 194 pp 210 – 222.
153. 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> .
154. Union Bank of Switzerland 2013 UBS outlook Switzerland
http://www.ubs.com/global/en/wealth_management/wealth_management_research/ubs_outlook_ch.html .
155. Da Costa (2015) Weak first-quarter growth due to seasonal issues after all, SF Fed says
The Wall Street Journal New York USA.
156. Federal Reserve Bank of St Louis 2015 US Federal Reserve Economic Data (FRED)
Federal Reserve Bank of St Louis
<http://research.stlouisfed.org/fred>
157. Wikipedia 2015c Business cycle *Wikipedia* California USA
www.wikipedia.org.
- Disruptive Innovation in Technology, Economics and Finances:**
158. 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.
159. Schumpeter J A 1939 Business cycle *McGraw-Hill* New York USA.
160. Schumpeter J A 1947 The creative response in economic history *Journal of Economic History* vol 7 pp 149 – 159.
161. Solow R H August 1957 Technical change and the aggregate production function *Review of Economics and Statistics* 39 pp 214 – 231.
162. Christensen C M June 16, 1977 Fatal attraction: The dangers of too much technology
Computerworld Leadership Series pp 3 – 11.
163. 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.
164. 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.
165. Bower J L, Christensen C M January February 1995 Disruptive technologies: Catching the wave *Harvard Business Review* 73 no 1 pp 43 – 53.

- 166.** 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.
- 167.** Christensen C M 1997 The innovator's dilemma: When new technologies cause great firms to fail *Harvard Business School Press* Boston MA USA.
- 168.** 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.
- 169.** Christensen C M 1998 The evolution of innovation *in Technology management handbook* Dorf R (editor) *CRC Press* Boca Raton FL USA.
- 170.** Christensen C M December 1998 Disruptive technologies: Catching the wave TN *Harvard Business School Teaching Note* 699 - 125.
- 171.** Christensen C M, Cape E G December 1998 Disruptive technology a heartbeat away: Ecton, Inc *Harvard Business School Case* 699 - 018.
- 172.** 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.
- 173.** 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.
- 174.** Christensen C M April 1999c Teradyne: The Aurora project & Teradyne: Corporate management of disruptive change, TN *Harvard Business School Teaching Note* 399 - 087.
- 175.** Christensen C M, Dann J June 1999 Processes of strategy definition and implementation, The *Harvard Business School Background Note* 399 - 179.
- 176.** 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.
- 177.** Christensen C M 1999a Innovation and the general manager *Irwin McGraw-Hill* Homewood IL USA.
- 178.** Christensen C M 1999b Impact of disruptive technologies in telecommunications in Bringing PC economies to the telecommunications industry *PulsePoint Communications*.
- 179.** Christensen C M, Tedlow R S January February 2000 Patterns of disruption in retailing *Harvard Business Review* **78** no 1 pp 42 – 45.

180. Christensen C M, Donovan T March 2000 Disruptive technology a heartbeat away: Ecton, Inc TN *Harvard Business School Teaching Note* 600 - 129.
181. Christensen C M, Overdorf M March April 2000 Meeting the challenge of disruptive change *Harvard Business Review* **78** no 2 pp 66 – 76.
182. 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.
183. Christensen C M, Craig Th, Hart S March April 2001 The great disruption *Foreign Affairs* **80** no 2.
184. Christensen C M Summer 2001 Assessing your organization's innovation capabilities *Leader to Leader* no 21 pp 27 – 37.
185. Christensen C M, Milunovich S March 2002 Technology strategy: The theory and application of the Christensen model *Merrill Lynch Report Series*.
186. Bass M J, Christensen C M April 2002 The future of the microprocessor business *IEEE Spectrum* **39** no 4.
187. 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.
188. Kenagy J, Christensen C M May 2002 Disruptive innovation: A new diagnosis for health care's 'Financial flu' *Healthcare Financial Management* pp 62 – 66.
189. 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.
190. 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.
191. Christensen C M June 2002 The rules of innovation *Technology Review*.
192. 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.
193. 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.
194. Christensen C M 2003 The opportunity and threat of disruptive technologies *Harvard Business School Publishing Class Lecture* HBSP Product Number 1482C Boston MA USA.
195. Shah Ch D, Brennan T A, Christensen C M April 2003 Interventional radiology: Disrupting invasive medicine.

196. Christensen C M March April 2003 Beyond the innovator's dilemma *Strategy & Innovation* **1** no 1.
197. Christensen C M, Raynor M E 2003 The innovator's solution: Creating and sustaining successful growth *Harvard Business School Press* Boston MA USA.
198. Burgelman R A, Christensen C M, Wheelwright S C 2003 Strategic management of technology and innovation 4th edition *McGraw-Hill Irwin* USA.
199. Christensen C M, Anthony S D January February 2004 Cheaper, faster, easier: Disruption in the service sector *Strategy & Innovation* **2** no 1.
200. 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.
201. Christensen C M January 2006 The ongoing process of building a theory of disruption *Journal of Product Innovation Management* **23** pp 39 – 55.
202. Christensen C M, Baumann H, Ruggles R, Sadtler Th M December 2006 Disruptive innovation for social change *Harvard Business Review* **84** no 12.
203. 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.
204. Christensen C M, Grossman J H, Hwang J 2009 The innovator's prescription: A disruptive solution for health care *McGraw-Hill* USA.
205. Dyer J H, Gregersen H B, Christensen C M December 2009 The innovator's DNA *Harvard Business Review* **87** no 12.
206. Christensen C M, Donovan T May 2010 Disruptive IPOs? WR Hambrecht & Co *Harvard Business School Case* 610-065.
207. 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.
208. Christensen C M, Talukdar Sh, Alton R, Horn M B Spring 2011 Picking green tech's winners and losers *Stanford Social Innovation Review* USA.
209. 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.
210. Christensen C M, Raynor M E, McDonald R December 2015 What is disruptive innovation? *Harvard Business Review* Cambridge MA USA pp 44 – 53
<https://hbr.org/2015/12/what-is-disruptive-innovation> .
211. Christensen C M, Denning St December 2015 Disruptive innovation *Forbes* New York USA

<http://www.forbes.com/sites#/sites/stevedenning/2015/12/02/fresh-insights-from-clayton-christensen-on-disruptive-innovation/> .

212. Bhattacharya S, Ritter J R 1983 Innovation and communication: Signaling with partial disclosure *Review of Economic Studies* **50** pp 331 – 346.
213. Scherer F M 1984 Innovation and growth: Schumpeterian perspectives *MIT Press* Cambridge MA USA.
214. Rodin J 2015 Managing disruption, avoiding disaster and growing stronger in an unpredictable World *Public Lecture on 19.01.2015* London School of Economics and Political Science London UK
http://media.rawvoice.com/lse_publiclecturesandevents/richmedia.lse.ac.uk/publiclecturesandevents/20150119_1830_managingDisruption.mp4 .
1243. Dobbs R, Woetzel J, Flanders St 2015 No ordinary disruption: The four global forces breaking all the trends *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 .
215. Barber L 2015 Making news for the new World *Public Lecture on 12.11.2015* London School of Economics and Political Science London UK
http://media.rawvoice.com/lse_publiclecturesandevents/richmedia.lse.ac.uk/publiclecturesandevents/20151112_1830_makingNewsForTheNewWorld.mp4 .

Strategy Science, Strategic Governance Science, Management Science:

216. 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.
217. 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.
218. Chandler A D Jr, Daems H 1980 Managerial hierarchies: Comparative perspectives on the rise of the modern industrial enterprise *Harvard University Press* ISBN 9780674547414 .
219. 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.
220. 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.

221. 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.
222. Andrews K R 1971a The concept of corporate strategy *Richard D Irwin* Homewood USA.
223. Andrews K R 1971b New horizons in corporate strategy *McKinsey Quarterly* vol 7 no 3 pp 34 – 43.
224. Andrews K R 1980 Directors' responsibility for corporate strategy *Harvard Business Review* vol 58 no 6 pp 30 – 42.
225. Andrews K R 1981a Corporate strategy as a vital function of the board *Harvard Business Review* vol 59 no 6 pp 174 – 180.
226. Andrews K R 1981b Replaying the board's role in formulating strategy *Harvard Business Review* vol 59 no 3 pp 18 – 23.
227. Andrews K R 1984 Corporate strategy: The essential intangibles *McKinsey Quarterly* no 4 pp 43 – 49.
228. Rumelt R P 1974 Strategy, structure and economic performance *Harvard Business School Press* Boston MA USA.
229. Rumelt R P 1982 Diversification strategy and profitability *Strategic Management Journal* 3 pp 359 – 369.
230. Porter M E March-April 1979 How competitive forces shape strategy *Harvard Business Review* 57 (2) pp 137 – 145.
231. Porter M E 1980, 1998 Competitive strategy: Techniques for analyzing industries and competitors *Free Press* New York USA.
232. 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.
233. Porter M E 1982a Cases in competitive strategy *Free Press* New York USA.
234. 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.
235. 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.

236. 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.
237. Porter M E 1985 Defensive strategy *Strategy* **7** (1).
238. Porter M E, Millar V July 1985 How information gives you competitive advantage *Harvard Business Review*
<http://hbr.org/1985/07/how-information-gives-you-competitive-advantage/ar/1> .
239. Porter M E 1985 Competitive advantage: Creating and sustaining superior performance *Free Press* New York USA
240. Porter M E May 1987a The state of strategic thinking *Economist* London UK.
241. Porter M E 1987b From competitive advantage to corporate strategy *Harvard Business Review* pp 43 – 59.
242. Porter M E April 1991 America's green strategy *Scientific American* **264** (4).
243. Porter M E 1991 Toward a dynamic theory of strategy *Strategic Management Journal* **12** pp 95 – 117.
244. Montgomery C A, Porter M E (editors) 1991 Strategy: Seeking and securing competitive advantage *Harvard Business School Press* Boston Massachusetts USA.
245. 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.
246. 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.
247. Porter M E, Van der Linde C 1995 Toward a new conception of the environment-competitiveness relationship *Journal of Economic Perspectives* **9** (4) pp 97 – 118.
248. Porter M E 1996a What is strategy? *Harvard Business Review* **74** (6) pp 61 – 78.
249. Porter M E December 1996b Tradeoffs, activity systems, and the theory of competitive strategy *Unpublished Work* Harvard University USA.
250. Porter M E March February 1997 New strategies for inner-city economic development *Economic Development Quarterly* **11** (1).
251. Schwab K, Connellius P, Porter M E 1999 The global competitiveness report *Oxford University Press* New York USA.
252. 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.

253. Porter M E March 2001a Strategy and the Internet *Harvard Business Review* **79** (3)
<http://hbr.org/2001/03/strategy-and-the-internet/ar/1> .
254. 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.
255. Porter M E, Kramer M R 2002 The competitive advantage of corporate philanthropy *Harvard Business Review* **80** (12) pp 56 – 68.
256. Porter M E, Sakakibara M 2004 Competition in Japan *Journal of Economic Perspectives* Winter Issue.
257. 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.
258. 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).
259. Porter M E January 2008 The five competitive forces that shape strategy *Special Issue on HBS Centennial Harvard Business Review* **86** (1)
<http://hbr.org/2008/01/the-five-competitive-forces-that-shape-strategy/ar/1> .
1244. 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> .
260. Porter M December 2013 Fundamental purpose *Value Investor Insight* pp 8 – 20
www.valueinvestorinsight.com .
261. Porter M E, Heppelmann J E November 2014 How smart, connected products are transforming competition *Harvard Business Review* November USA
<http://hbr.org/2014/11/how-smart-connected-products-are-transforming-competition/ar/1> .
262. Porter M E 2015 Strategy award *Thinkers50* London UK
www.thinkers50.org .
263. Schendel D E, Hofer Ch W 1979 Strategic management. A new view of business policy and planning *Little Brown* Boston USA p 9.
264. Yelle L E 1979 The learning curve: Historical review and comprehensive survey *Decision Sciences* **10** (2) pp 302 – 328.

265. Dess G G, Davis P S 1984 Porter's (1980) generic strategies as determinants of strategic group membership and organizational performance *Academy of Management Journal* **27** (3) pp 467 – 488.
266. Schwenk C R 1984 Cognitive simplification processes in strategic decision making *Strategic Management Journal* **5** pp 111 – 128.
267. Hambrick D C 1985 Turnaround strategies in *Handbook of strategic management* Guth W D (editor) *Warren, Gorham and Lamont* New York USA pp 10-1 to 10-32.
268. Palepu K G 1985 Diversification strategy, profit performance and the entropy measure *Strategic Management Journal* **6** pp 239 – 255.
269. Barney J B 1986 Strategic factor markets: Expectations, luck, and business strategy *Management Science* **32** (10) pp 1231 – 1241.
270. Barney J B 1991 Firm resources and sustained competitive advantage *Journal of Management* **17** (1) pp 99 – 120.
271. Miller D, Friesen P H 1986a Porter's (1980) generic strategies and performance: An empirical examination with American data, Part I: Testing Porter *Organization Studies* **7** pp 37 – 55.
272. Miller D, Friesen P H 1986b Porter's (1980) generic strategies and performance: An empirical examination with American data, Part II: Performance implications *Organization Studies* **7** pp 255 – 261.
273. Miller D 1988 Relating Porter's business strategies to environment and structure: Analysis and performance implications *Academy of Management Journal* **31** pp 280 – 308.
274. Huff A S, Reger R K 1987 A review of strategic process research *Journal of Management* vol **13** no 2 p 211.
275. Hill C W L, Snell S A 1988 External control, corporate strategy, and firm performance in research intensive industries *Strategic Management Journal* **9** pp 577 – 590.
276. Baysinger B D, Hoskisson R E 1989 Diversification strategy and R&D intensity in large multiproduct firms *Academy of Management Journal* **32** pp 310 – 332.
277. Rue L W, Holland P G 1989 *Strategic management: Concepts and experiences* 2nd edition *McGraw-Hill* Singapore; *Sage* Beverly Hills California USA.
278. Cohen W M, Levinthal D A 1990 Absorptive capacity: A new perspective on learning and innovation *Administrative Science Quarterly* **35** pp 128 – 152.
279. Goold M 1991 Strategic control in the decentralized firm *Sloan Management Review* **32** (2) pp 69 – 81.

280. Goold M, Luchs K 1993 Why diversify? Four decades of managed thinking *Academy of Management Executive* **7** (3) pp 7 – 25.
281. Goold M et al. 1994 Corporate level strategy: Creating value in the multi-business company *John Willey & Sons Inc* New York USA.
282. Goold M, Campbell A September, October 1998 Desperately seeking synergy *Harvard Business Review* pp 131 – 143.
283. Alexander M, Goold M, Collis D J, Campbell A, Lieberthal K, Montgomery C A, Palepu K, Prahalad C K, Stalk G, Khanna T, Hart S L, Shulman L F, Evans Ph 1992, 1995, 1996, 1997, 1998, 1999 Harvard Business Review on corporate strategy *Harvard University Press* Cambridge Massachusetts USA ISBN 1-57851-699-4.
284. Yip G 1992 Total global strategy: Managing for worldwide competitive advantage *Prentice Hall* NY USA.
285. Yip G 1998 Asian advantage: Key strategies for winning in the Asia-Pacific region *Addison Wesley/Perseus Books* USA.
286. Yip G 2000 Strategies for Central and Eastern Europe *Macmillan Business* USA.
287. Yip G 2007 Managing global customers *Oxford University Press* Oxford UK.
288. Campbell A et al 1995 Corporate strategy: The quest for parenting advantage *Harvard Business Review* **73** (2) pp 120 – 132.
289. Johnson G, Scholes K 1997 Exploring corporate strategy *Prentice- Hall* London UK.
290. Johnson G, Scholes K, Whittington R 1998 Exploring corporate strategy *Simon & Shuster* UK ISBN 0-2736-8734-4.
291. Johnson G, Scholes K, Whittington R 2002, 2003 Exploring corporate strategy 7th Edition *Prentice Hall* Pearson Education Limited UK ISBN 0-2736-8734-4.
292. McKiernan P 1997 Strategy past, strategy futures *Long range planning* vol **30** no 5 p 792.
293. Child J, Faulkner D 1998 Strategies of cooperation: Managing alliances, networks and joint ventures *Oxford University Press* Oxford UK.
294. Hill C, Jones G 1998 Strategic management 1st edition *Houghton Mifflin Co* Boston USA.
295. Hill C, Jones G 2004 Cases in strategic management 1st edition *Houghton Mifflin Co* Boston USA.
296. Martin R L (1998-1999, 2005-2006) Private communications on the theory of strategy *Rotman School of Management* University of Toronto Canada.

297. 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 Ontario Canada pp 1 – 57.
298. 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 .
299. Martin R L 2007 Becoming an integrative thinker *Rotman Magazine* Rotman School of Management University of Toronto Ontario Canada pp 4 – 9.
300. Martin R L 2007 Designing the thinker *Rotman Magazine* Rotman School of Management University of Toronto Ontario Canada pp 4 – 8.
301. Martin R L 2008 The opposable mind *Harvard Business Press* Cambridge Massachusetts USA.
302. Martin R L 2009 The design of business *Harvard Business School Press* ISBN 1422177807 pp 1 – 256.
303. Laffley 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.
304. Martin R L 2013 Strategy award *Thinkers50* London UK
www.thinkers50.org .
305. 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.
306. Laffont J-J, Tirole J 1999 Competition in telecommunications *MIT Press* USA.
307. Grant R 2001 Corporate strategy: Managing scope and strategy content in *Handbook of strategy and management* Pettigrew A, Thomas H, Whittington R (editors) *Sage* Newbury Park California USA pp 72 – 98.
308. Welch J 2001 Straight from the gut *Business Plus* ISBN-10: 0446528382 pp 1 – 496.
309. Welch J 2001 Winning *Warner Business Books* USA.
310. Choo C, Bontis N 2002 The strategic management of intellectual capital and organizational knowledge 1st edition *Oxford University Press* Oxford UK.
311. Drejer A 2002 Strategic management and core competencies 1st edition *Quorum Books* Westport Connecticut USA.
312. Sadler P 2003 Strategic management 1st edition *Kogan Page* Sterling VA USA.

313. Gavetti G, Levinthal D A 2004 The strategy field from the perspective of management science: Divergent strands and possible integration *Management Science* vol **50** no 10 pp 1309–1318 ISSN 0025-1909 EISSN 1526-5501.
314. 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 ISSN 1047-7039 EISSN 1526-5455.
315. Kim W C, Mauborgne R January–February 2004 Value innovation – The strategic logic of high growth *Harvard Business Review* **75** pp 103 – 112
<http://hbr.org/2004/07/value-innovation-the-strategic-logic-of-high-growth/ar/1> .
316. Kim W C, Mauborgne R 2005, 2015 Blue ocean strategy: How to create uncontested market space and make the competition irrelevant *Harvard Business School Press* Boston USA ISBN 978-1591396192, ISBN 978-1-62527-449-6 (expanded edition) pp 1 – 240, pp 1 – 287.
www.blueoceanstrategy.com ,
<https://smart.ly/blue-ocean-strategy/> .
317. Kim W C, Mauborgne R 2011 Strategy award *Thinkers50* London UK
www.thinkers50.org .
318. Roney C 2004 Strategic management methodology 1st edition *Praeger* Westport Connecticut USA.
319. Ireland R, Hoskisson R, Hitt M 2006 Understanding business strategy 1st edition *Thomson Higher Education* Mason OH USA.
320. Besanko D, Shanley M, Dranove D 2007 Economics of strategy *John Wiley & Sons Inc* USA.
321. Hitt M, Ireland R, Hoskisson R 2007 Management of strategy 1st edition *Thomson/South-Western* Australia.
322. Kirkbride P S 2007 Developing a leadership and talent architecture *MBS Leader-casts* Melbourne Business School Melbourne Australia.
323. Murphy T, Galunic Ch 2007 Leading in the age of talent wars *INSEAD Leader-casts* INSEAD France.
324. Sekhar G 2007 Management information systems 1st edition *Excel Books* New Delhi India.
325. Sull D 2007a Simple rules: Strategy as simple rules Part II *Public Lecture* London School of Economics and Political Science London UK.
326. Sull D 2007b Closing the gap between strategy and execution: Strategy and its discontents *Public Lecture* London School of Economics and Political Science London UK.

327. Sull D 2007c Closing the gap between strategy and execution: Making hard choices *Public Lecture* London School of Economics and Political Science London UK.
328. Sull D 2007d Closing the gap between strategy and execution: The strategy loop in action *Public Lecture* London School of Economics and Political Science London UK.
329. Sull D 2008 An iterative approach to the strategy *Public Lecture* London School of Economics and Political Science London UK.
330. Teece D J, Winter S 2007 Dynamic capabilities: Understanding strategic change in organizations *Blackwell* Oxford UK.
331. Samuels R 2008 Japan's grand strategy *Public Lecture on 13.10.2008* London School of Economics and Political Science London UK
<http://www.lse.ac.uk/collections/LSEPublicLecturesAndEvents/events/2008/20080819t1316z001.htm>
http://richmedia.lse.ac.uk/publicLecturesAndEvents/20081013_1830_japansGrandStrategy.mp3
332. Chamberlain G P 2010 Understanding strategy *Create Space* Charleston South Carolina USA.
333. Holt D, Cameron D 2010 Cultural strategy *Oxford University Press* Oxford UK ISBN 978-0-19-958740-7.
334. Heracleous 2013 Quantum strategy by Apple Inc *Organizational Dynamics* 42 pp 92 – 99 www.elsevier.com/locate/orgdyn .
335. Ive J, Foulkes N March 6 2015 The man behind the Apple watch *How to Spend It* *Financial Times* London UK
<http://howtospendit.ft.com/articles/77791> .
336. 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> .
337. Ledenyov D O, Ledenyov V O 2015n Quantum strategy creation by interlocking interconnecting directors in boards of directors in modern organizations at time of globalization *MPRA Paper no 68404* Munich University Munich Germany, *SSRN Paper no SSRN-id2704417* *Social Sciences Research Network* New York USA pp 1 – 104
<http://mpra.ub.uni-muenchen.de/68404/> ,

<http://ssrn.com/abstract=2704417> .

338. Ledenyov D O, Ledenyov V O 2015o Multivector strategy vs quantum strategy by Apple Inc *MPRA Paper no 68730* Munich University Munich Germany, *SSRN Paper no SSRN-id2707662* Social Sciences Research Network New York USA pp 1 – 109

<http://mpra.ub.uni-muenchen.de/68730/> ,

<http://ssrn.com/abstract=2707662> .

Probability Theory, Statistics Theory, Spectrum Analysis Theory, Brownian Movement Theory, Diffusion Theory, Chaos Theory, Information Communication Theory in Econometrics and Econophysics Sciences:

339. Huygens 1657 De ratiociniis in aleae ludo (On calculations in games of chance).

340. Bernoulli J 171 3 Ars conjectandi (The art of guessing).

341. Bernoulli D 1738, 1954 Specimen theoria 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.

342. De Moivre 1730 *Miscellanea analytica supplementum* (The analytic method).

343. 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.

344. 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](http://www.academie-sciences.fr/activite/archive/dossiers/Fourier/Fourier_pdf/Mem1827_p569_604.pdf) .

345. De Laplace 1812 *Théorie analytique des probabilités* *Paris* France.

346. Bunyakovsky V Ya 1825a 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.

347. Bunyakovsky V Ya 1825b 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.

348. Bunyakovsky V Ya 1825c Heat propagation in solids *Ph D Thesis no 3* under Prof. Augustin - Louis Cauchy supervision *École Polytechnique* Paris France.

349. Bunyakovsky V Ya 1846 *Foundations of the mathematical theory of probability* *St. Petersburg* Russian Federation.

350. 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> .
351. *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 Vinnytsia 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 .
352. Chebyshev P L 1846 An experience in the elementary analysis of the probability theory *Crelle's Journal fur die Reine und Angewandte Mathematik*.
353. Chebyshev P L 1867 Des valeurs moyennes *Journal de Math'ematics Pures et Appliqu'ees* vol **12** pp 177 – 184.
354. Chebyshev P L 1891 Sur deux theoremes relatifs aux probabilités *Acta Mathematica* vol **14**.
355. 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.
356. Markov A A 1890 On one problem by D I Mendeleev *Zapiski Imperatorskoi Akademii Nauk SPb* **62** pp 1 – 24.
357. Markov A A 1899 Application des fonctions continues au calcul des probabilités *Kazan Bulletin* **9** (2) pp 29 – 34 Russian Federation.
358. 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.
359. 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.
360. 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.
361. 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.
- 362.** 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.
- 363.** 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.
- 364.** 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.
- 365.** 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.
- 366.** Fisher I 1892 Mathematical investigations in the theory of value and prices *Transactions of the Connecticut Academy* **9** pp 1 – 124.
- 367.** 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.
- 368.** Einstein A 1956 Investigation on the theory of the Brownian motion Furth R (editor) *Dover* New York USA.
- 369.** Einstein A, Smolukhovsky M 1936 Brownian movement: Collection of research papers *ONTI* Moscow Russian Federation.
- 370.** Slutsky E E 1910 Theory of marginal utility *M Sc Thesis* Vernadsky National Library Kiev Ukraine.
- 371.** Slutsky E E 1912 Theory of correlation and elements of study about distribution curves *Kiev Commerce Institute Bulletin* **16** pp 1 – 208 Kiev Ukraine.
- 372.** 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.
- 373.** 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.

374. Slutsky E E 1915 Sulla teoria sel bilancio del consumatore *Giornale degli economisti e rivista di statistica* **51** no 1 pp 1 – 26 Italy.
375. Slutsky E E 1922a Statistics and mathematics. Review of Kaufman *Statistics Bulletin* **3 – 4** pp 104 – 120.
376. Slutsky E E 1922b To the question of logical foundations of probability calculation *Statistics Bulletin* **9 - 12** pp 13 – 21.
377. 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.
378. Slutsky E E 1923b On a new coefficient of mean density of population *Statistics Bulletin* **4 – 6** pp 5 – 19.
379. Slutsky E E 1923c On calculation of state revenue from emission of paper money *Local Economy* **2** pp 39 – 62 Kiev Ukraine.
380. Slutsky E E 1925a On the law of large numbers *Statistics Bulletin* **7 – 9** pp 1 – 55.
381. Slutsky E E 1925b Ueber stochastische Asymptoten und Grenzwerte *Metron* Padova Italy vol **5** no 3 pp 3 – 89.
382. Slutzhi 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.
383. 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.
384. Slutzhi E E 1927b Zur Kritik des Bohm-Bawerkschen Wertbegriffs und seiner Lehre von der Messbarkeit des Wertes *Schmollers Jb* **51** (4) pp 37 – 52.
385. 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.
386. Slutsky E E 1935 To the extrapolation problem in connection with forecast problem *Geophysics Journal* **5** (3) pp 263 – 277.
387. Slutsky E E 1937a Quelche propositione relative alla teoria delle funzioni aleatorie *Giornale dell Istituto Italiano degli Attuari* **8** no 2 pp 3 – 19.
388. Slutsky E E 1937b The summation of random causes as the source of cyclical processes *Econometrica* **5** pp 105 – 146.
389. Slutsky E E 1942, 1999 Autobiography of December 3, 1942 *Economics School* **5** pp 18 – 21.

390. Slutsky E E 1960 Selected research works (Izbrannye trudy) *Academy of Sciences of USSR* Moscow Russian Federation.
391. Bowley A L 1924 The mathematical groundwork of economic *Clarendon Press* Oxford UK.
392. Kolmogorov A N 1937 Markov chains with countable many states *Bulletin Moscow University* **1**.
393. 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.
394. Kolmogorov A N 1947 The contribution of Russian science to the development of probability theory *Uchenye Zapiski Moskovskogo Universiteta* no 91.
395. Kolmogorov A N 1956 Probability theory in Mathematics: Its contents, methods, and meaning *Academy of Sciences USSR* vol **2**.
396. Kolmogorov A N 1956 Foundations of the theory of probability *Chelsea* New York USA.
397. Kolmogorov A N 1985 Mathematics and mechanics Selected works vol **1** *Nauka Publishing House* Moscow Russian Federation.
398. Kolmogorov A N 1986 Probability theory and mathematical statistics Selected works vol **2** *Nauka Publishing House* Moscow Russian Federation.
399. Allen R G D 1938 Mathematical analysis for economists *Macmillan* London UK.
400. Cramer H 1940 On the theory of stationary random processes *Ann Math* vol **41** pp 215 – 230.
401. Cramer H 1946 Mathematical methods of statistics *Princeton University Press* USA.
402. Cramer H, Leadbetter M 1967 Stationary and related stochastic processes. Sample function properties and their applications *John Wiley and Sons Inc* NY USA.
403. Bemshtein S N 1946 Theory of probability 4th edition *Gostehizdat* Moscow Russian Federation.
404. Bogolyubov N N 1946 Dynamic problems in statistic physics.
405. Neyman J, Scott E L 1948 Consistent estimates based on partially consistent observations *Econometrica* **16** pp 1 – 32.
406. Shannon C E 1948 A mathematical theory of communication *Bell System Technical Journal* **27** pp 379 – 423 and pp 623 – 656.
407. Terletsky Ya P 1950 Dynamic and statistic laws of physics *Publishing House of Moscow State University* Russian Federation pp 1 – 96.
408. Hannan E J 1960 Time series analysis *Methuen* London.

- 409.** Hannan E J 1970 Multiple time series *John Wiley and Sons Inc* New York USA.
- 410.** Mandelbrot B B 1960 The Pareto-Levy law and the distribution of income *International Economic Review* no 1.
- 411.** Mandelbrot B B 1963a The stable Paretian income distribution when the apparent exponent is near two *International Economic Review* no 4.
- 412.** Mandelbrot B B 1963b The variation of certain speculative prices *Journal of Business* vol **36** pp 394 – 419.
- 413.** 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.
- 414.** Mandelbrot B B 1967a The variation of some other speculative prices *Journal of Business* vol **40** pp 393 – 413.
- 415.** 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.
- 416.** Mandelbrot B B, Taylor H M 1967 On the distribution of stock price difference *Operations Research* vol **15** no 6 pp 1057 – 1062.
- 417.** Mandelbrot B B, van Ness J W 1968 Fractional Brownian motions, fractional noises and applications *SIAM Review* vol **10** no 4 pp 422 – 437.
- 418.** 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.
- 419.** Mandelbrot B B, Wallis J R 1969 Computer experiments with fractional Gaussian noises I, II, III *Water Resources Research* vol **5** pp 228 – 267.
- 420.** 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.
- 421.** 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.
- 422.** Mandelbrot B B 1975a Les objets fractals *Flammarion* Paris France.
- 423.** 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.

424. Mandelbrot B B 1977 Fractals: Form, chance and dimension *W H Freeman* San Francisco USA.
425. Mandelbrot B B 1982 The fractal geometry of nature *W H Freeman* San Francisco USA.
426. Mandelbrot B B 1997 Fractals and scaling in finance *Springer* New York USA.
427. Gnedenko B V, Khinchin A Ya 1961 An elementary introduction to the theory of probability *Freeman* San Francisco USA.
428. Gnedenko B V 1988 The theory of probability *Mir* Moscow Russian Federation.
429. 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.
430. Shiryaev A N 1963 On optimal methods in quickest detection problems *Theory of Probability and its Applications* **8** (1) pp 22 – 46.
431. Shiryaev 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.
432. Shiryaev A N 1965 Some exact formulas in a 'disorder' problem *Theory of Probability and its Applications* **10** pp 348 – 354.
433. Grigelionis B I, Shiryaev A N 1966 On Stefan's problem and optimal stopping rules for Markov processes *Theory of Probability and its Applications* **11** pp 541 – 558.
434. Shiryaev A N 1967 Two problems of sequential analysis *Cybernetics* **3** pp 63 – 69.
435. Liptser R S, Shiryaev A N 1977 Statistics of random processes *Springer-Verlag* New York USA.
436. Shiryaev A N 1972 Random processes *Moscow State University Press* Russian Federation.
437. Shiryaev A N 1973, 1974 Probability, statistics, random processes *Moscow State University Press* vols **1, 2** Russian Federation.
438. 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.
439. Shiryaev A N 1988 Probability *Springer-Verlag* Berlin Heidelberg Germany.
440. Shiryaev A N 1995 Probability 2nd edition *Springer - Verlag* ISBN 0-387-94549-0 New York USA pp 1 – 621.
441. 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.

- 442.** 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.
- 443.** 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.
- 444.** 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.
- 445.** Graversen 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/mathscinet/getitem?mr=1810977> .
- 446.** 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> .
- 447.** 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/mathscinet/getitem?mr=1932378> .
- 448.** 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> .
- 449.** 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> .
- 450.** 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.
- 451.** 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.
- 452.** 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> .

- 453.** 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.
- 454.** Kabanov Yu, Lipster R, Stoyanov J 2006 The Shiryaev festschrift: From stochastic calculus to mathematical finance *Springer* Germany pp 1 – 668.
- 455.** 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>.
- 456.** 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.
- 457.** Eberlein E, Papapantoleon 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> .
- 458.** 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.
- 459.** 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> .
- 460.** 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.
- 461.** 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> .
- 462.** 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> .
- 463.** 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> .
- 464.** 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.

465. 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> .
466. Abramowitz M, Stegun I A (editors) 1964 Handbook of mathematical functions *National Bureau of Standards Applied Mathematics Series* vol **55** USA.
467. Kubilius J 1964 Probabilistic methods in the theory of numbers *American Mathematical Society Providence USA*.
468. Akhiezer N I, Glazman I M 1966 Theory of linear operators in Hilbert space *Nauka Moscow Russian Federation*.
469. Lamperti J 1966 Probability *Benjamin New York USA*.
470. Kai-Lai Chung 1967 Markov chains with stationary transition probabilities *Springer-Verlag New York USA*.
471. Skorohod A V 1967 Random processes with independent increments *Nauka Moscow Russian Federation*.
472. Gikhman I I, Skorohod A V 1968 Stochastic differential equations *Naukova Dumka Kiev Ukraine*.
473. Gikhman I I, Skorohod A V 1969 Introduction to the theory of random processes 1st edition *Saunders Philadelphia USA*.
474. Gikhman I I, Skorohod A V 1974-1979 Theory of stochastic processes vols **1, 2, 3** *Springer-Verlag New York-Berlin USA-Germany*.
475. Breiman L 1968 Probability *Addison-Wesley Reading MA USA*.
476. Feller W 1968 An introduction to probability theory and its applications vols **1, 2** 3rd edition *John Wiley and Sons Inc New York USA*.
477. 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*.
478. Glesjer H 1969 A new test for heteroskedasticity *Journal of the American Statistical Association* **64** pp 316 – 323.
479. Ash R B 1970 Basic probability theory *John Wiley and Sons Inc New York USA*.
480. Ash R B 1972 Real analysis and probability *Academic Press New York USA*.
481. Ash R B, Gardner M F 1975 Topics in stochastic processes *Academic Press New York USA*.
482. Box G E P, Jenkins G M 1970 Time series analysis: Forecasting and control *Holden Day San Francisco California USA*.

483. Renyi A 1970 Probability theory *North-Holland Publishing Company* Amsterdam The Netherlands.
484. Isihara A 1971 Statistical physics *Academic Press* New York USA.
485. Brent R P 1973 Algorithms for minimization without derivatives *Englewood Cliffs* USA.
486. Rubin D B 1974 Estimating causal effects of treatments in randomized and nonrandomized studies *Journal of Educational Psychology* **55** (5) pp 688 – 701.
487. Borovkov A A 1976 Wahrscheinlichkeitstheorie: Eine EinjUhrung 1st edition *Birkhiuser* Basel-Stuttgart Switzerland-Germany.
488. Grangel C W J, Newbold P 1977 Forecasting economic time series *Academic Press* New York USA.
489. Grangel C W J, Teräsvirta T 1993 Modeling nonlinear economic relationships *Oxford University Press* Oxford New York UK USA.
490. 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.
491. Ross S M 1980 Introduction to probability models *Academic Press* New York USA.
492. Karlin S, Taylor H M 1981 A second course in stochastic processes *Academic Press* New York USA.
493. Venttsel A D 1981 A course in the theory of stochastic processes *McGraw-Hill* New York USA.
494. Maddala G S 1983 Limited-dependent and qualitative variables in econometrics *Cambridge University Press* Cambridge UK.
495. Yaglom A M, Yaglom I M 1983 Probability and information *Reidel Dordrecht*.
496. 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.
497. Heckman J, Singer B 1984b Econometric duration analysis *Journal of Econometrics* **24** pp 63 – 132.
498. Pagan A 1984 Econometric issues in the analysis of regressions with generated regressors *International Economic Review* **25** pp 221 – 247.
499. Van Horne J C 1984 Financial market rates and flows *Prentice Hall* Englewood Cliffs NJ USA.
500. 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.

501. Neter J, Wasserman W, Kutner M H 1985 Applied linear statistical models 2nd edition Irwin Homewood USA.
502. Powell J L 1986 Censored regression quantiles *Journal of Econometrics* **32** (1) pp 143 – 155.
503. Taylor S 1986 Modeling financial time series *John Willey and Sons Inc* New York USA.
504. Tong H 1986 Nonlinear time series *Oxford University Press* Oxford UK.
505. Tornqvist L, Vartia P, Vartia Y February 1985 How should relative change be measured? *American Statistician* **39** pp 43 – 46.
506. Sharkovsky A N, Maistrenko Yu L, Romanenko E Yu 1986 Differential equations and their applications *Naukova Dumka* Kiev Ukraine pp 1 – 280.
507. Newey W, West K 1987 A simple positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix *Econometrica* **55** pp 703 – 708.
508. Luukkonen R, Saikkonen P, Terasvirta T 1988 Testing linearity against smooth transition autoregressive models *Biometrika* **75** pp 491 – 499.
509. 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.
510. Hardle W 1990 Applied nonparametric regression *Econometric Society Monograph* Cambridge University Press Cambridge UK.
511. Lancaster T 1990 The econometric analysis of transition data *Cambridge University Press* Cambridge UK.
512. Tong H 1990 Nonlinear time series: A dynamical system approach *Clarendon Press* Oxford UK.
513. Johansen S 1992 Cointegration in partial systems and the efficiency of single equation analysis *Journal of Econometrics* **52** pp 389 – 402.
514. 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.
515. Cleveland W S 1993 Visualizing data *Hobart Press* Summit New Jersey USA.
516. Pesaran M H, Potter S M (editors) 1993 Nonlinear dynamics, chaos and econometrics *John Willey and Sons Inc* New York USA.
517. Hamilton J D 1994 Time series analysis *Princeton University Press* Princeton, NJ USA.
518. Peters E E 1994 Fractal market analysis: Applying chaos theory to investment and economics *John Wiley and Sons Inc* New York USA.
519. Enders W 1995 Applied econometric time series *John Wiley and Sons Inc* New York USA.

520. Johansen S 1995 Likelihood based inference in co-integrated vector autoregressive models *Oxford University Press* Oxford UK.
521. Karatzas I, Shreve S 1995 Methods of mathematical finance *Columbia University Press* New York USA.
522. Moore G E 1995 Lithography and the future of Moore's law *Proceedings SPIE Symposium Optical Microlithography Conference VIII* **2440** 2.
523. Moore G E 2003 No exponential is forever – but we can delay forever *ISSCC*.
524. Campbell J Y, Lo A W, MacKinlay A C 1996 The econometrics of financial markets *Princeton University Press* Princeton USA.
525. Mosekilde E 1996 Topics in nonlinear dynamics: Applications to physics, biology and economic systems *World Scientific Publishing Pte Ltd* Singapore.
526. Rogers L C G, Talay D (editors) 1997 Numerical methods in finance *Cambridge University Press* Cambridge UK.
527. Campbell J, Lo A, MacKinlay C 1997 The econometrics of financial markets *Princeton University Press* Princeton NJ USA.
528. Greene W H 1997, 1999, 2003 Econometric analysis 1st edition, 4th edition, 5th edition *Prentice Hall* Upper Saddle River USA.
529. Hasem P M, Pesaran B 1997 Working with Microfit 4.0: Interactive econometric analysis *Oxford University Press* Oxford UK.
530. Lo A W, MacKinlay A C 1997 The econometrics of financial markets *Princeton University Press* Princeton New Jersey USA.
531. Anderson H M, Vahid F 1998 Testing multiple equation systems for common nonlinear factors *Journal of Econometrics* **84** pp 1 – 37.
532. Hubbard B B 1998 The world according to wavelets *A K Peters* Wellesley MA USA.
533. Mallat S A 1998 Wavelet tour of signal processing *Academic Press* San Diego CA USA.
534. Teolis A 1998 Computational signal processing with wavelets *Birkhauser* Switzerland.
535. Anishenko V S, Vadivasova T E, Astakhov V V 1999 Nonlinear dynamics of chaotic and stochastic systems *Saratov University Publishing House* Saratov Russian Federation.
536. 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.
537. 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 .

538. 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.
539. Potter S 1999 Non-linear time series modelling: An introduction *Typescript* Federal Reserve Bank of New York NY USA.
540. Rothman (editor) 1999 Nonlinear time series analysis of economic and financial data *Kluwer Academic Press* Amsterdam The Netherlands.
541. Hayashi F 2000 Econometrics *Princeton University Press* Princeton NJ USA.
542. 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.
543. Durbin J, Koopman S J 2002 A simple and efficient simulation smoother for state space time series analysis *Biometrika* **89** pp 603 – 615.
544. Durbin J, Koopman S J 2012 Time series analysis by state space methods 2nd edition *Oxford University Press* Oxford UK.
545. 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.
546. Kuznetsov S P 2001 Dynamic chaos *Izdatel'stvo Fiziko-Matematicheskoi Literatury* Moscow Russian Federation pp 1 – 296.
547. Tufte E R 2001 The visual display of quantitative information 2nd edition *Graphics Press* Cheshire CT USA.
548. 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.
549. 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.
550. Woolridge J M 2002 Econometric analysis of cross section and panel data *MIT Press* Cambridge MA USA.
551. Koop G 2003 Bayesian econometrics *John Wiley and Sons Inc* New York USA.
552. Selover D D, Jensen R V, J. Kroll J 2003 *Studies in Nonlinear Dynamics & Econometrics* **7** 1.

553. Davidson R, MacKinnon J 2004 *Econometric theory and methods Oxford University Press Oxford UK.*
554. Cameron A C, Trivedi P K 2005 *Microeconometrics: Methods and applications Cambridge University Press Cambridge UK.*
555. Protter P E 2005 *Stochastic integration and differential equations Springer Germany.*
556. Backhaus K et al 2006 *Multivariate analysemethoden. Eine anwendungsorientierte einföhrung Springer Berlin Heidelberg Germany.*
557. Damodaran A 2006 *Applied corporate finance. A user' manual 2nd edition John Wiley & Sons Inc New Jersey USA.*
558. Ernst D, Häcker J 2007 *Applied international corporate finance Vahlen München Germany.*
559. Angrist J D, Pischke J-S 2008 *Mostly harmless econometrics: An empiricist's companion Princeton University Press USA.*
560. Vialar Th, Goergen A 2009 *Complex and chaotic nonlinear dynamics Springer-Verlag Berlin Heidelberg Germany ISBN 978-3-540-85977-2 pp 1 – 752.*
561. Weatherall J O 2013 *Physics of Wall Street Houghton New York USA.*
- Selected Research Papers in Macroeconomics, Microeconomics & Nanoeconomics Sciences:**
562. 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 .
563. 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 .
564. 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 .
565. 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 .
566. 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 .
- 567.** 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 .
- 568.** 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 .
- 569.** 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 .
- 570.** 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/> .
- 571.** 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/> .
- 572.** 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> .
- 573.** 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> .

574. 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> .
575. 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> .
576. 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://mpra.ub.uni-muenchen.de/53780/> ,
<http://ssrn.com/abstract=2577767> .
577. 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://mpra.ub.uni-muenchen.de/61863/> ,
<http://ssrn.com/abstract=2560297> .
578. 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://mpra.ub.uni-muenchen.de/61805/> ,
<http://ssrn.com/abstract=2559168> .
579. 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.

- 580.** 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.
- 581.** 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 .
- 582.** 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> .
- 583.** 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> .
- 584.** 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> .

585. 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> .
586. 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> .
587. 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> .
588. 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> .
589. 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> .
590. 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> .
591. 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> .
- 592.** Ledenyov D O, Ledenyov V O 2015l Wave function method to forecast foreign currencies exchange rates at ultra high frequency electronic trading in foreign currencies exchange markets *MPRA Paper no 67470* Munich University Munich Germany, *SSRN Paper no SSRN-id2681183 Social Sciences Research Network* New York USA pp 1 – 156
<http://mpra.ub.uni-muenchen.de/67470/> ,
<http://ssrn.com/abstract=2681183> .
- 593.** Ledenyov D O, Ledenyov V O 2015m Quantum money *MPRA Paper no 67982* Munich University Munich Germany, *SSRN Paper no SSRN-id2693128 Social Sciences Research Network* New York USA pp 1 – 70
<http://mpra.ub.uni-muenchen.de/67982/> ,
<http://ssrn.com/abstract=2693128> .
- 594.** Ledenyov D O, Ledenyov V O 2015n Quantum strategy creation by interlocking interconnecting directors in boards of directors in modern organizations at time of globalization *MPRA Paper no 68404* Munich University Munich Germany, *SSRN Paper no SSRN-id2704417 Social Sciences Research Network* New York USA pp 1 – 104
<http://mpra.ub.uni-muenchen.de/68404/> ,
<http://ssrn.com/abstract=2704417> .
- 595.** Ledenyov D O, Ledenyov V O 2015o Multivector strategy vs quantum strategy by Apple Inc *MPRA Paper no 68730* Munich University Munich Germany, *SSRN Paper no SSRN-id2707662 Social Sciences Research Network* New York USA pp 1 – 109
<http://mpra.ub.uni-muenchen.de/68730/> ,
<http://ssrn.com/abstract=2707662> .
- 596.** Ledenyov D O, Ledenyov V O 2015p *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.
- 597.** Ledenyov D O, Ledenyov V O 2015r *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.*

598. Ledenyov D O, Ledenyov V O 2015s *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.*

599. Ledenyov D O, Ledenyov V O 2015t *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.*

600. Ledenyov D O, Ledenyov V O 2015i *DNACode* software program **1)** to model the Digital DNA's complex knowledge base structure for the selected economy of the scale and scope in the case of the G20 nations; **2)** to accurately forecast the generation/propagation of the Ledenyov discrete time digital waves of GIP(t)/GDP(t)/GNP(t)/PPP(t) (the discrete-time digital business cycles of GIP(t)/GDP(t)/GNP(t)/PPP(t)) in the G20 economies of the scales and scopes *ECE James Cook University Townsville Australia, Kharkov Ukraine.*

Deoxyribonucleic acid (DNA):

- 601.** Miescher Fr 1871 Ueber die chemische Zusammensetzung der Eiterzellen (On the chemical composition of pus cells) *Medicinish-chemische Untersuchungen* **4** pp 441 – 460.
- 602.** Kol'tsov N K December 12, 1927 The physical-chemical basis of morphology *3rd All-Union Meeting of Zoologist, Anatomists, and Histologists* Leningrad USSR.
- 603.** Watson J D, Crick F H 1953 A structure for deoxyribose nucleic acid *Nature* **171** (4356) pp 737 – 738 Bibcode:1953Natur.171..737W , doi:10.1038/171737a0 , PMID 13054692
<http://www.nature.com/nature/dna50/watsoncrick.pdf> ,
<http://adsabs.harvard.edu/abs/1953Natur.171..737W> ,
<https://dx.doi.org/10.1038%2F171737a0> ,
<https://www.ncbi.nlm.nih.gov/pubmed/13054692> .
- 604.** Watson J D 2002 Genes, girls, and Gamow: After the double helix *Random House* New York USA ISBN 0-375-41283-2 OCLC 47716375 .
- 605.** Watson J D 2004 DNA: The secret of life *Random House* New York USA ISBN 978-0-09-945184-6 .
- 606.** Gamow G July 2 1954a Letter to Martynas Ycas *Library of Congress* Washington USA www.loc.gov/exhibits/treasures/trr115.html .
- 607.** Gamow G 1954b Possible mathematical relation between deoxyribonucleic acid and proteins *Det Kongelige Danske Videnskabernes Selskab* Copenhagen Denmark pp 1 – 2.
- 608.** Library of Congress 2015 DNA: An “amateur” makes a real contribution *American Treasures of the Library of Congress* Library of Congress Washington USA www.loc.gov/exhibits/treasures/trr115.html .
- 609.** DeVinne (editor) (1985) DNA *American Heritage Dictionary* USA p 413 ISBN 0-395-32943-4 .
- 610.** Dahm R 2008 Discovering DNA: Friedrich Miescher and the early years of nucleic acid research *Hum Genet* **122** (6) pp 565 – 581 doi:10.1007/s00439-007-0433-0 PMID 17901982
<https://dx.doi.org/10.1007%2Fs00439-007-0433-0> ,
<https://www.ncbi.nlm.nih.gov/pubmed/17901982> .
- 611.** Wikipedia 2015i DNA Wikipedia California USA <https://en.wikipedia.org/wiki/DNA> .

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:

- 612.** 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.
- 613.** Walsh J L 1923a A closed set of normal orthogonal functions *American J Math* **45** pp 5 – 24.
- 614.** Walsh J L 1923b A property of Haar's system of orthogonal functions *Math Ann* **90** p 3845.
- 615.** Wikipedia 2015d Joseph L Walsh *Wikipedia* USA
www.wikipedia.org .
- 616.** Gabor D 1946 Theory of communication Part 1 The analysis of information *J Inst Elect Eng* **93** pp 429 – 441.
- 617.** 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> .
- 618.** 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> .
- 619.** Granger C W J, Hatanaka M 1964 Spectral analysis of economic time series *Princeton University Press* Princeton USA.
- 620.** 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> .
- 621.** Hwang K, Briggs F A 1984 Computer architecture and parallel processing *McGraw-Hill* New York USA.
- 622.** Orfanidis S J 1985 Optimum signal processing: An introduction 2nd edition *Macmillan* New York USA.
- 623.** Orfanidis S J 1995 Introduction to signal processing *Prentice-Hall* Englewood Cliffs NJ USA.
- 624.** Anceau F 1986 The architectures of microprocessors *Addison-Wesley* Wokingham England.
- 625.** Fountain T 1987 Processor arrays, architecture and applications *Academic Press* London UK.
- 626.** Chen C H (editor) 1988 Signal processing handbook *Marcel Dekker* New York USA.

627. Kay S M 1988 Modern spectral estimation: Theory and application *Prentice-Hall* Englewood Cliffs NJ USA.
628. Oppenheim A V, Schaffer R W 1989 Discrete-time signal processing *Prentice-Hall* Englewood Cliffs NJ USA.
629. Van de Goor A J 1989 Computer architecture and design *Addison-Wesley* Wokingham England.
630. Priemer R 1991 Introductory signal processing *World Scientific* Singapore ISBN 9971509199.
631. 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.
632. Hsu P H 1995 Schaum's theory and problems: Signals and systems *McGraw-Hill* ISBN 0-07-030641-9.
633. Proakis J G, Manolakis D G 1996 Digital signal processing 3rd edition *Prentice Hall* Upper Saddle River NJ USA.
634. Lathi B P 1998 Signal processing and linear systems *Berkeley-Cambridge Press* ISBN 0-941413-35-7.
635. Prisch P 1998 Architectures for digital signal processing *John Wiley and Sons Inc* Chichester UK.
636. Gershenfeld N A 1999 The nature of mathematical modeling *Cambridge University Press* UK ISBN 0-521-57095-6.
637. Wanhammar L 1999 DSP integrated circuits *Academic Press* San Diego California USA ISBN 0-12-734530-2 pp 1 – 561.
638. McMahon D 2007 Signals and systems demystified *McGraw Hill* New York USA ISBN 978-0-07-147578-5.
639. Rice M 2008 Digital communications - A discrete-time approach *Prentice Hall* Englewood Cliffs NJ USA.
640. Wikipedia 2015e Signal (electrical engineering) *Wikipedia Inc* USA www.wikipedia.org .
641. Wikipedia 2015f Continuous wave *Wikipedia Inc* USA www.wikipedia.org .
642. Wikipedia 2015g Discrete-time signal *Wikipedia Inc* USA www.wikipedia.org .
643. Wikipedia 2015h Hadamard code *Wikipedia* USA

www.wikipedia.org .

644. Ledenyov D O, Ledenyov V O 2015a Nonlinearities in microwave superconductivity
7th edition *Cornell University* NY USA pp 1 – 923

[www.arxiv.org 1206.4426v7.pdf](http://www.arxiv.org/1206.4426v7.pdf) .