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Global Economic and Financial Crises Best Fitted Fat – Tailed Effects Probability Distributions

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Abstract:
Black Swan Risks, Knightian Uncertainty, Dark Risks, Extreme Risks or Low – Probability, High – Impact events has significantly influenced the late 2007 – 2008 crises, 2011 – 2012 U.S. Debt Ceiling crises and by extension systemically the European crises (ongoing Greek and Sypurus Crises).
Supervisors, Regulators, Practitioners and Academia associate it with the over-reliance on Stock Returns (Asset Returns) NORMALITY assumption.
The So – called claim that stock returns (asset returns) follows Normal probability distribution is indeed the major FAILURE, hence the re-occurrences of the Economic and Financial Crises more often.
The major aim of this paper is to consider Eleven (11) out of Fifty (50) World's Biggest Public Companies by FORBES as of 2015 Ranking regardless of the platform in which they are listed and run the test of Goodness of fit on their stock returns vis – a – vis time series from 2014 – 2009 with the aim of finding the Global Economic and Financial crises best fitted fat – tailed effects probability distributions.
Finally, based on the test runs, in terms of hierarchy, the Best Fitted Fat – Tailed Effects probability distributions that can be used to address the potential crises vis – a – vis completeness of the Economic and Financial Stochastic Models are: Log – Logistic (3P), Cauchy, Pearson 5 (3P), Burr (4P), Fatique Life (3P), Inv. Gaussian (3P), Dagum (4P) and Lognormal (3P) Probability Distributions respectively.
Keywords: Log – Logistic (3P), Chauchy,Pearson 5 (3P), Burr (4P), Jameel.

INTRODUCTION:

FAT – TAILED EFFECTS Stock Return Probability Distributions are the most qualified crises barometer to quantify the gravity of the potential Economic and Financial crises in this innovative, exponentially growth and rapidly changing technologically oriented World.
Normality assumption has being a basic axiom or a subject matter by Quants when modeling an aspect in the financial market, though it has received serious criticisms from the angles of Academia, Regulators, Supervisors and Practitioners, nevertheless, it plays central role because, we always take reference to the Normal market condition.
However, we cannot keep condemning or criticizing the good work that has been done by Nobel Laureates Black, Scholes, Merton and others because of their normality assumptions, we have to seriously devote our time, energy and money in brainstorming on how to **IMPROVE** on the good work done by these Nobel Laureates and others by incorporating what is not being captured by their existing models, precisely the incorporation of the **fat – tailed effects components**.
Jamilu A. A. (2015) has attempted to include the fat – tailed effects components in most of the existing economic and financial stochastic models that assumed Normality in his paper entitled: Banking and Economic Advanced Stressed Probability of Default Models.
He considered Five (5) U.S. based Companies listed in the platform of New York Stock Exchange (NYSE), he runs the Test of Goodness of Fit on those Companies monthly stock returns from 2014 – 1991 using EasyFit software and obtained they all follows **LOG – LOGISTIC (3P)** probability distribution using his simple criteria.
From the past researchers, people like Smith (1981), was first to suggested stock returns follows Logistic Distribution and subsequently tested by Gray and French (1990) and Peiró (1994). Praetz (1972), Blattberg and Gonedes (1974), Gray and French (1990), and Peiró (1994) have reported that Scaled-*t* Distribution specification fits stock returns better than many competing alternatives.
Hsu (1982) and Gray and French (1990) have argued that Exponential Power Distribution specification, which displays fat tails that shrink at an exponential rate and a high peak, provides a reasonably-good fit to stock return data. Press (1967) argued that stock returns may be generated by the interaction of a continuous diffusion

(Brownian motion) process and a discontinuous jump (Poison) process, where the former captures continuous changes in stock prices and the second models large informational shocks. Kon (1984) also argues in favor of (and finds empirical support for) Mixtures of Two Normal Distributions specification.

However, the major aim of this paper is to consider Eleven (11) out of fifty (50) **WORLD'S BIGGEST PUBLIC** Companies by **FORBES** as of 2015 Ranking regardless of the platform in which they are listed and run the test of Goodness of fit on them vis – a – vis time series from 2014 – 2009. Two (2) (namely, **GOOGLE** and **FACEBOOK**) out of Eleven (11) Companies are of different time series. These include:

(1) **China Construction Bank Corporation (CICHY) from 2014 – 2009**
(2) **Bank of China Limited (3988.K) from 2014 – 2009**
(3) **Berkshire Hathaway Inc. (BRK – A) from 2014 – 2009**
(4) **Toyota Motor Corporation (TM) from 2014 – 2009**
(5) **Volkswagen Group AG (VLKAY) from 2014 – 2009**
(6) **Bank of America Corporation (BAC) from 2014 – 2009**
(7) **Nestle India Limited (NESTLEIND.NS) from 2014 – 2009**
(8) **International Business Machines Corporation (IBM) from 2014 – 2009**
(9) **Goldman Sachs Group Securities (GJS) from 2014 – 2009**
(10) **Google Inc. (GOOG) from 7/2/2015 to 5/18/2012**
(11) **Facebook Inc. (FB) from 7/2/2015 to 5/18/2012**

Recall that Jamilu A. A. (2015) used Five (5) U.S. based companies listed on the platform of New York Stock Exchange (NYSE) and time series of (2014 – 1991), **25 years monthly basis**.

WHAT would happen to the Stock Returns probability distributions **IF** we consider:

(a) Daily, Weekly, Quarterly or Annually Stock Returns (Asset Returns)
(b) Companies that are more than Five (5)
(c) Companies that are listed on different stock exchanges not only NYSE platform
(d) Simultaneously Long – term and Short – term time series of the Stock Returns (Asset Returns)
(e) Recently past public companies like **FACEBOOK** with initial public offering on the 18th May, 2012 and began selling stock to the public and trading on the NASDAQ the same date and the **GOOGLE** on the March 9 2006.

Are they going to all follows **LOG – LOGISTIC (3P)**? or there are other **BEST FITTED FAT – TAILED EFFECTS** probability distributions that can be used to capture potential Economic and Financial Crises.

Therefore, for the Nine (9) Companies, I consider the following time series patterns:

(i) 2014 – 2009, Daily and Weekly Stock Returns
(ii) 2014 – 2012, Daily and Weekly Stock Returns
(iii) 2011 – 2009, Daily and Weekly Stock Returns
(iv) Other different time series in the case of (GOOG) and (FB), Daily and Weekly Stock Returns

All Data are extracted from **YAHOO FINANCE.**

MATERIAL AND METHODS

The methodology adopted in this research work is to consider Eleven (11) out of Fifty (50) **WORLD'S BIGGEST PUBLIC** Companies by **FORBES** as of 2015 Ranking **REGARDLESS** of the platform in which they are listed, Number of the Research Companies, Time Series (Short or Long Terms), Old or Recently listed Companies; and to run the test of Goodness of fit on them vis – a – vis time series from 2014 – 2009 with the aim of finding the Best Fitted Fat – Tailed Effects Probability Distributions so as to address the potential Global Economic and Financial crises vis – a – vis completeness of the Economic and Financial Stochastic Models by the use of EASYFIT software.

TEST OF GOODNESS OF FIT OF THE ELEVEN (11) COMPANIES' STOCKS RETURNS

In this test of Goodness of fit, I consider Five (5) criteria:

(i) We accept if the Average of the ranks of Kolmogorov Smirnor, Anderson Darling and Chi-squared is less than or equal to Three (3)
(ii) We must choose the Probability Distribution follows by the data **ITSELF** regardless of its Rankings
(iii) If there is tie, we include both Probability Distributions in the selection
(iv) At least Two (2) probability distributions must be included in the selection
(v) We select the most occur probability distribution as the qualify candidate in each case of test of goodness of fit of the stock returns as follows

Bank of China Limited (3988.Hk)

Daily, Weekly and Monthly Stock Return Probability Distribution (2014 – 2009)

Bank of China Limited (3988.Hk) Best Fitted Fat – Tailed Effects Probability Distributions by their order of **HIERARCHY:**

Name of the Fat – Tailed Effects Probability Distribution	Frequency regardless of the Time Series
Log – Logistic (3P)	3
Cauchy	4
Pearson 5 (3P)	2
Burr (4P)	2
Fatique Life (3P)	1
Inv. Gaussian (3P)	1
Dagum (4P)	0
Lognormal (3P)	4
Normal, Pearson 6 (4P), Gen. Gamma (4P), Error, Laplace, Hypersecant, Gamma, Johnson SU, Beta, and Uniform	Frequency less than or equal to 2

China Construction Bank Corporation (CICHY)

Daily, Weekly and Monthly Stock Return Probability Distribution (2014 – 2009

China Construction Bank Corporation (CICHY) Best Fitted Fat – Tailed Effects Probability Distributions by their order of **HIERARCHY:**

Name of the Fat – Tailed Effects Probability Distribution	Frequency regardless of the Time Series
Log – Logistic (3P)	5
Cauchy	3
Pearson 5 (3P)	1
Burr (4P)	4
Fatique Life (3P)	1
Inv. Gaussian (3P)	1
Dagum (4P)	2
Lognormal (3P)	1
Normal, Pearson 6 (4P), Gen. Gamma (4P), Error, Laplace, Hypersecant, Gamma, Johnson SU, Beta, and Uniform	Frequency less than or equal to 2

Berkshire Hathaway (BRK – A)

Daily, Weekly and Monthly Stock Return Probability Distribution (2014 – 2009)

Berkshire Hathaway (BRK – A) Best Fitted Fat – Tailed Effects Probability Distributions by their order of **HIERARCHY:**

Name of the Fat – Tailed Effects Probability Distribution	Frequency regardless of the Time Series
Log – Logistic (3P)	5
Cauchy	3
Pearson 5 (3P)	2
Burr (4P)	0
Fatique Life (3P)	1
Inv. Gaussian (3P)	1
Dagum (4P)	0
Lognormal (3P)	1
Normal, Pearson 6 (4P) , Gen. Gamma (4P), Error, Laplace, Hypersecant, Gamma, Johnson SU, Beta, and Uniform	Frequency less than or equal to 2

Toyota Motor Corporation (TM)

Daily, Weekly and Monthly Stock Return Probability Distribution (2014 – 2009)

Toyota Motor Corporation (TM) Best Fitted Fat – Tailed Effects Probability Distributions by their order of **HIERARCHY:**

Name of the Fat – Tailed Effects Probability Distribution	Frequency regardless of the Time Series
Log – Logistic (3P)	3
Cauchy	1
Pearson 5 (3P)	3
Burr (4P)	3
Fatique Life (3P)	2
Inv. Gaussian (3P)	0
Dagum (4P)	1
Lognormal (3P)	2
Normal -1, Pearson 6 (4P) , Gen. Gamma (4P), Error, Laplace, Hypersecant, Gamma, Johnson SU, Beta, and Uniform	Frequency less than or equal to 2

Volkswagen Group AG (VLKAY)

Daily, Weekly and Monthly Stock Return Probability Distribution (2014 – 2009)

Volkswagen Group AG (VLKAY) Best Fitted Fat – Tailed Effects Probability Distributions by their order of **HIERARCHY:**

Name of the Fat – Tailed Effects Probability Distribution	Frequency regardless of the Time Series
Log – Logistic (3P)	4
Cauchy	3
Pearson 5 (3P)	4
Burr (4P)	1
Fatique Life (3P)	0
Inv. Gaussian (3P)	1
Dagum (4P)	0
Lognormal (3P)	0
Normal , Pearson 6 (4P), Gen. Gamma (4P), Error, Laplace, Hypersecant , Gamma, Johnson SU, Beta, and Uniform	Frequency less than or equal to 2

Bank of America Corporation (BAC)

Daily, Weekly and Monthly Stock Return Probability Distribution (2014 – 2009)

Bank of America Corporation (BAC) Best Fitted Fat – Tailed Effects Probability Distributions by their order of **HIERARCHY:**

Name of the Fat – Tailed Effects Probability Distribution	Frequency regardless of the Time Series
Log – Logistic (3P)	5
Cauchy	3
Pearson 5 (3P)	4
Burr (4P)	1
Fatique Life (3P)	1
Inv. Gaussian (3P)	0
Dagum (4P)	0
Lognormal (3P)	0
Normal , Pearson 6 (4P) , Gen. Gamma (4P), Error , Laplace, Hypersecant , Gamma, Johnson SU, Beta, and Uniform	Frequency less than or equal to 2

Nestle India Limited (NESTLEIND.NS)

Daily, Weekly and Monthly Stock Return Probability Distribution (2014 – 2009)

Nestle India Limited (NESTLEIND.NS) Best Fitted Fat – Tailed Effects Probability Distributions by their order of **HIERARCHY:**

Name of the Fat – Tailed Effects Probability Distribution	Frequency regardless of the Time Series
Log – Logistic (3P)	5
Cauchy	4
Pearson 5 (3P)	0
Burr (4P)	1
Fatique Life (3P)	3
Inv. Gaussian (3P)	0
Dagum (4P)	2
Lognormal (3P)	0
Normal , Pearson 6 (4P) , Gen. Gamma (4P), Error , Laplace, Hypersecant , Gamma, Johnson SU, Beta, and Uniform	Frequency less than or equal to 2

International Business Machine Corporation (IBM)

Daily, Weekly and Monthly Stock Return Probability Distribution (2014 – 2009)

International Business Machine Corporation (IBM) Best Fitted Fat – Tailed Effects Probability Distributions by their order of **HIERARCHY:**

Name of the Fat – Tailed Effects Probability Distribution	Frequency regardless of the Time Series
Log – Logistic (3P)	5
Cauchy	3
Pearson 5 (3P)	4
Burr (4P)	2
Fatique Life (3P)	0
Inv. Gaussian (3P)	0
Dagum (4P)	1
Lognormal (3P)	0
Normal , Pearson 6 (4P) , Gen. Gamma (4P), Error , Laplace, Hypersecant , Gamma, Johnson SU, Beta, and Uniform	Frequency less than or equal to 2

Goldman Sachs Group Securities (GJS)

Daily, Weekly and Monthly Stock Return Probability Distribution (2014 – 2009)

Goldman Sachs Group Securities (GJS) Best Fitted Fat – Tailed Effects Probability Distributions by their order of **HIERARCHY:**

Name of the Fat – Tailed Effects Probability Distribution	Frequency regardless of the Time Series
Log – Logistic (3P)	5
Cauchy	3
Pearson 5 (3P)	3
Burr (4P)	1
Fatique Life (3P)	0
Inv. Gaussian (3P)	1
Dagum (4P)	0
Lognormal (3P)	0
Normal , Pearson 6 (4P) , Gen. Gamma (4P), Error , Laplace, Hypersecant , Gamma, Johnson SU, Beta, and Uniform	Frequency less than or equal to 2

Google Inc. (GOOG)

Daily, Weekly and Monthly Stock Return Probability Distribution (2014 – 2009)

(7/2/2015 – 3/27/2014)

Google Inc. (GOOG) Best Fitted Fat – Tailed Effects Probability Distributions by their order of **HIERARCHY:**

Name of the Fat – Tailed Effects Probability Distribution	Frequency regardless of the Time Series
Log – Logistic (3P)	4
Cauchy	3
Pearson 5 (3P)	2
Burr (4P)	2
Fatique Life (3P)	0
Inv. Gaussian (3P)	2
Dagum (4P)	1
Lognormal (3P)	0
Normal , Pearson 6 (4P) , Gen. Gamma (4P), Error , Laplace, Hypersecant , Gamma, Johnson SU, Beta, and Uniform	Frequency less than or equal to 2

Facebook Inc. (FB)

Daily, Weekly and Monthly Stock Return Probability Distribution (2014 – 2009)

Facebook Inc. (FB) Best Fitted Fat – Tailed Effects Probability Distributions by their order of **HIERARCHY:**

Name of the Fat – Tailed Effects Probability Distribution	Frequency regardless of the Time Series
Log – Logistic (3P)	6
Cauchy	3
Pearson 5 (3P)	0
Burr (4P)	1
Fatique Life (3P)	2
Inv. Gaussian (3P)	2
Dagum (4P)	2
Lognormal (3P)	0
Normal , Pearson 6 (4P) , Gen. Gamma (4P), Error , Laplace, Hypersecant , Gamma, Johnson SU, Beta, and Uniform	Frequency less than or equal to 2

RESULT AND DISCUSSION

Having successfully completed the test of goodness of fit, then we are now ready to **RANK** the Probability Distributions based on the Frequency of Occurrence of each distribution on each research Company, however, the one with the highest frequency of occurrence regardless of time series is the most appropriate distribution in terms of **Fat – Tailed Effects Magnitude** and is considered to be the **BEST** among others in terms of Global Economic and Financial crises Predictions using Stochastic Models. These can be prioritized as follows:

Global Economic and Financial Crises Best Fitted Fat – Tailed Effects Probability Distributions:

The Global Economic and Financial Crises Best Fitted Fat – Tailed Effects Probability Distributions are as follows by their order of **HIERARCHY:**

Name of the Fat – Tailed Effects Probability Distribution	Frequency regardless of the Time Series	Order of Hierarchy
Log – Logistic (3P)	50	1^{st}
Cauchy	33	2^{nd}
Pearson 5 (3P)	25	3^{rd}
Burr (4P)	19	4^{th}
Fatique Life (3P)	12	5^{th}
Inv. Gaussian (3P)	10	6^{th}
Dagum (4P)	9	7^{th}
Lognormal (3P)	8	8^{th}
Normal, Pearson 6 (4P), Gen. Gamma (4P), Error, Laplace, Hypersecant, Gamma, Johnson SU, Beta, and Uniform	Frequency less than or equal to 8	9^{th} and below it

Log – Logistic (3P) Probability Distribution (1^{st}):

$$f\left(x;\mu,\sigma,\xi\right)=\frac{\left(1+\frac{\xi\left(x-\mu\right)}{\sigma}\right)^{-\left(1/\xi+1\right)}}{\left[1+\left(1+\frac{\xi\left(x-\mu\right)}{\sigma}\right)^{-1/\xi}\right]^{2}}\quad;\quad x\geq\mu$$

Cauchy Probability Distribution (2^{nd}):

$$f\left(x;\mu,\sigma,\pi\right)=\left(\pi\,\sigma\left(1+\left(\frac{x-\mu}{\sigma}\right)^{2}\right)\right)^{-1}\quad;\quad-\infty<x<+\infty$$

Pearson 5 (3P) Probability Distribution (3^{rd})

$$f\left(x;\alpha,\beta,\gamma\right)=\frac{\exp\left(-\frac{\beta}{\left(x-\gamma\right)}\right)}{\beta\,\Gamma\left(\alpha\right)\left(\frac{\left(x-\gamma\right)}{\beta}\right)^{\alpha+1}};\quad\alpha,\beta>0$$

Burr (4P) Probability Distribution (4^{th}):

$$f\left(x;\alpha,\beta,\gamma\right)=\frac{ak\left(\frac{x-\gamma}{\beta}\right)^{\alpha-1}}{\beta\left(1+\left(\frac{x-\gamma}{\beta}\right)^{\alpha}\right)^{k+1}};\quad\alpha,\beta,k>0$$

Fatique Life (3P) Probability Distribution (5^{th}):

$$f\left(x;\alpha,\beta,\gamma\right)=\frac{\sqrt{\frac{\left(x-\gamma\right)}{\beta}}+\sqrt{\frac{\beta}{\left(x-\gamma\right)}}}{2\alpha\left(x-\gamma\right)}\,\Phi\left(\frac{1}{\alpha}\left(\sqrt{\frac{x-\gamma}{\beta}}-\sqrt{\frac{\beta}{x-\gamma}}\right)\right);\quad\alpha,\beta,\gamma>0$$

Inv.Gaussian (3P) Probability Distribution (6^{th}):

$$f\left(x;\mu,\lambda,\gamma\right)=\sqrt{\frac{\lambda}{2\pi\left(x-\gamma\right)^{3}}}\exp\left(-\frac{\lambda\left(x-\gamma-\mu\right)^{2}}{2\mu^{2}\left(x-\gamma\right)}\right);\quad\lambda,\mu,\gamma>0$$

Dagum (4P) Probability Distribution (7^{th}):

$$f\left(x;\gamma,\beta,\alpha\right)=\frac{ak\left(\frac{x-\gamma}{\beta}\right)^{ak-1}}{\beta\left(1+\left(\frac{x-\gamma}{\beta}\right)^{\alpha}\right)^{k+1}};\quad k,\alpha,\beta>0$$

Lognormal (3P) Probability Distribution (8^{th}):

$$f\left(x;\mu,\sigma,\gamma\right)=\frac{\exp\left(-\frac{1}{2}\left(\frac{\ln\left(x-\gamma\right)-\mu}{\sigma}\right)^{2}\right)}{\left(x-\gamma\right)\sigma\sqrt{2\pi}};\quad\gamma<x<+\infty$$

Proposed Theorem (Hashim – Jaz – Kabs - Dogo - Sult - Lam's Endurance):

Let A be any **World Biggest Pubic Quoted Bank or Company** listed on an arbitrary and organized Stock Exchange, let $\mu_{company}$ and $\sigma_{company}$ be the arithmetic stock return and volatility of Company **A** over a specific period of time $[a,b]$ such that a,b∈R respectively, let M_{Normal} be any stochastic Financial or Economic Model, let $f\left(x,\mu_{company},\sigma_{company},\xi\right)$ be an advanced **FAT – TAILED EFFECTS** company **A** stock return probability distribution then $f\left(x,\mu_{company},\sigma_{company},\xi\right)$ **FIRST BEST FITS** to address Economic and Financial Crises or otherwise make M_{Normal} more sophisticated by hierarchy regardless of company **A's** Stock Exchange, Listing year and time series (short or long) as follows:

(i) $f\left(x,\mu_{company},\sigma_{company},\xi\right)$ is **Log – Logistic (3P)** Probability Distribution

(ii) $f\left(x,\mu_{company},\sigma_{company},\xi\right)$ is **Cauchy** Probability Distribution

(iii) $f\left(x,\mu_{company},\sigma_{company},\xi\right)$ is **Pearson 5 (3P)** Probability Distribution

Proposed Theorem (Sharu Ali Dandago – Gumel's Prophecy):

Assume that Company **A** is not interested or did not agree with the general conclusion of Hashim - Jaz – Dogo – Sult – Lam's Endurance Theorem and feel that his stock returns (asset returns) follows different advanced fat - tailed probability distribution $f\left(x,\mu_{company},\sigma_{company},\xi\right)$ then he needs to runs goodness of fit test of the underlying stock returns satisfying **JAMEEL'S CRITERION** over a specific time series $[a,b]$ such that $a,b \in R^{+}$ to obtain the **Best** fitted fat – tailed effects Economic and Financial crises probability distributions of company **A** under consideration.

CONCLUSION

Based on the test runs, in terms of hierarchy, the Best Fitted Fat – Tailed Effects probability distributions that can be used to address the potential crises vis – a – vis completeness of the Economic and Financial Stochastic Models are: Log – Logistic (3P), Cauchy, Pearson 5 (3P), Burr (4P), Fatique Life (3P), Inv. Gaussian (3P), Dagum (4P) and Lognormal (3P) Probability Distributions respectively. Hence, the questions (a) to (e) queried in the introduction of this research article have being fully investigated and answered.

Considering Financial Instruments other than Stock for instance Bond Options, Currency Options, Commodity Options, Swap Options, Futures Options, Forward Options, Options on Options, Interest Rate Options then in that situations, we will be required to runs the Test of Goodness of Fit on the Bond Returns, Currency Returns, Commodity Returns, Swap Returns, Futures Returns, Forward Returns, Options Returns and Interest Rates respectively to obtain the Best Fitted Fat – Tailed effects $f\left(x, \mu_{underlying}, \sigma_{underlying}, \xi\right)$ to be incorporated into the existing Stochastic models using Jameel's Contractional and Extensional Stress Methods.

REFERENCES

1. Adegoke Olubummo (1979), Introduction to Real Analysis, Department of Mathematics, University of Ibadan, Girardet Press (W.A) Co; Ibadan.
2. A.Godman (2000): Additional Mathematics for West Africa, fifth impression, Longman Group UK Limited.
3. Alexander, C (2001) Market Models: A Guide to Financial Data Analysis. Chichester: Wiley.
4. Alexander Petrov (2012), Implementing PIT – TTC PD Framework in Credit Risk Classification System, Risk Minds 2012 Amsterdam, SaS.
5. Andre I. Khuri (2003). Advanced Calculus with Applications in Statistics, wiley series in Probability and Statistics. Second edition.
6. Arditti, Fred D. (1996). Derivatives: A Comprehensive Resource for Options, Futures, Interest Rate Swaps, and Mortgage Securities. Boston: Harvard Business School Press. ISBN0-87584560-6.
7. AsiaRisk (May, 2010), Risk Management.Derivative.Regulation, Risk Publications.
8. AsiaRisk (April, 2010), Risk Management.Derivative.Regulation, Risk Publications.
9. Basel committee on Banking Supervision (1994). Risk Management guideline for derivatives.
10. Basel Committee on Banking Supervision (2006), International Convergence of Capital Standards, A Revised Framework Comprehensive Version, Bank for International Settlement, CH – 4002 Basel, Switzerland
11. Charles Smithson et al (2000), How the Market Values Credit Derivatives, Journal of Lending & Credit Risk Management, March, 2000.
12. Christopher C. Finger, Sticks and Stones, The RiskMetrics Group.
13. Daniel Porath (2006), Estimating Probabilities of Default for German Savings Banks and Credit Cooperatives, University of Applied Sciences, Mainz, Ander Bruchspitze 50, D – 55122 Mainz
14. David E. Athen et al (2011), Xtreme Credit Risk Models: Implications for Bank Capital Buffers, Edith Cowan University, Research Online, ECU Publications 2011.
15. David M. Rowe (2012), Simulating Default Probabilities in Stress Scenarios, Presented to the PRMIA Global Risk Conference, New York, NY, May 14, 2012.
16. Deloitte & Touche LLP (2011), Basel II & Credit Risk Management: Risk Data and Modeling Considerations, Analytics2011 Conference Series.
17. Domenico et al (2009), Bank Loans Pricing and Basel II: A Multi – Period Risk Adjusted Methodology under the New Regulatory Constraints, Banks and Bank Systems, Volume 4, Issue 4, 2009.
18. Frankfurt amMain (2007), European central bank: simulating financial instability conference on stress testing and financial crisis simulation exercise.
19. Financial services authority (2008), stress scenario, consultation paper 08/24.
20. Gupton, Finger, Bhatia (1997), The Benchmark for Understanding Credit Risk, CreditMetrics™ - Technical Document, J.P. Morgan, New York, April 12, 1997.
21. Jamilu A. Adamu (2013), A Guide to Financial Mathematics and Risk Management for Nigeria, Book Published by Delcon Press, Suleja, Niger, ISBN: 978 – 223 – 529 – 6, First Edition 2013.
22. Jamilu A. Adamu (2014), Modern Approach to Financial Risk Management, Book Published by Delcon Press, Suleja, Niger, ISBN: 978-978-942-265-4, First Edition 2014.
23. Jamilu A. Adamu (2014), Understanding Financial Risks, Book Published by Delcon Press, Suleja, Niger, ISBN: ISBN: 978-978-942-266-1, First Edition 2014.
24. Jamilu A. Adamu (2015), Estimation of Probability of Default using Advanced Stressed Probability of Default Models, Ongoing Ph.D Thesis, Ahmadu Bello University (ABU), Zaria, Nigeria.
25. Jamilu Auwalu Adamu (2015), Banking and Economic Advanced Stressed Probability of Default Models, Accepted for Publication in the Asian Journal of Management Sciences, AJMS/2015/ May – June – 303 – 798 – 2 – RV.
26. J P Morgan, The J.P. Morgan Guide to Credit Derivatives, with Contributions from the RiskMetrics Group, Published by Risk.
27. Jose A. Lopez (2002), The Empirical Relationship between Average Asset Correlation, Firm Probability of Default and Asset Size, Federal Reserve Bank of San Francisco, San Francisco, CA 94705
28. Joseph Janer (2011), Bankruptcy Prediction and its Advantages: Empirical Evidence from SMEs in the French Hospitality Industry, Master's Thesis, Copenhagen Business School, 2011
29. Jorge A. Chan – Lau (2006), Market – Based Estimation of Default Probabilities and Its Application to Financial Market Surveillance, Monetary and Financial Systems Department, IMF Working Paper, WP/06/104
30. Nassim N. Taleb (2011), The Future has Thicker Tails Past: Model Error as Branching Counterfactuals, presented in

Honor of Benoit Mandelbrot's at his Scientific Memorial, Yale University, April, 2011.

31. Nassim N. Taleb (2011), A Map and Simple Heuristic to Detect Fragility, Antifragility, and Model Error, First Version, 2011
32. Nassim N. Taleb (2010), Why Did the Crisis of 2008 Happen, Draft, 3rd Version, August, 2010.
33. Nassim N. Taleb (2009), Errors, Robustness, and Fourth Quadrant, New York University Polytechnic Institute and Universa Investment, United States, International Journal of Forecasting 25 (2009) 744 – 759
34. Nassim N. Taleb (2010), Convexity, Robustness, and Model Error inside the "Black Swan Domain", Draft Version, September, 2010.
35. Nassim N. Taleb et al (2009), Risk Externalities and Too bid to Fail, New York University Polytechnic Institute, 11201, New York, United States.
36. Nassim N. Taleb (2012), The Illusion of Thin – Tails under Aggregation, NYU – Poly, January, 2012
37. Nassim N. Taleb (2007), Black Swans and the Domains of Statistics, American Statistician, August 2007, Vol. 6I, No. 3
38. M. Beitz and M. Ehrhardt (2010), A New Method for Stress Testing on Investment Products, World Scientific Review, Volume – 9in $\times$ 6in, September, 2010.
39. Olivier de Bandt et al (2013), Stress – Testing Banks Corporate Credit Portfolio, Banque de France, 61 rue Taltbout 75009, Paris.
40. Peter Miu et al (2008), Stress – Testing Probability of Default and Migration Rate with Respect to Basel II Requirements, Hamilton, Ontario, L8S 4M4, Canada.
41. Professional Risk Management International Association (PRMIA).
42. Sandica Ana – Maria (2010), Credit Scoring Modelling: A Micro – Macro Approach, Academy of Economic Studies, Doctoral School of Finance DOFIN, 2010
43. Stefan Van der Ploeg (2010), Bank Default Prediction Models: A Comparison and an Application to Credit Rating Transitions, ERNST & YOUNG, 2010
44. Stefan Trueck et al (2009), Rating Based Modeling of Credit Risk: Theory and Application of Migration Matrices, Academic Press Advanced Finance Series, Burlingon, MA 01803, USA.
45. Spreedhar T Bharath et al (2004), Forecasting Default with the KMV – Merton Model, University of Michigan, Ann Arbor MI 48109.
46. Svott D. Aguais et al, Point – in – Time versus Through – the – Cycle Ratings, Draft, Barclays Capital.

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