

Development of Banking and Insurance in India – An overview

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Abstract

This paper author explores the banking and insurance sectors and its impact on India's growth in the post liberalised world. Risk is an inherent part of business and individual lives. The insurance providers offer a variety of products to businesses and individuals to provide them protection from risk which can give financial security. They also provide support in stabilizing the markets by evening out any fluctuations. The insurance business is broadly divided into three categories, life insurance, health insurance, and non-life insurance. Individuals face many risks like premature death, depletion in income because of retirement, health risks, loss of property, risk of legal liability, etc. To cover these risks the insurance companies offer life insurance, pension and retirement income, property insurance, legal liability insurance, etc. Businesses also depend on these companies for various property and liability covers, employee compensation, and marine insurance. Therefore, insurance is considered as the backbone of a country's risk management system.

Deposit insurance, as we know it today, was introduced in India in 1962. India was the second country in the world to introduce such a scheme - the first being the United States in 1933. Banking crises and bank failures in the 19th as well as the early 20th Century (1913-14) had, from time to time, underscored the need for depositor protection in India. After the setting up of the Reserve Bank of India, the issue came to the fore in 1938 when the Travancore National and Quilon Bank, the largest bank in the Travancore region, failed. As a result, interim measures relating to banking legislation and reform were instituted in the early 1940s. The banking crisis in Bengal between 1946 and 1948, once again revived the issue of deposit insurance. It was, however, felt that the measures be held in abeyance till the Banking Companies Act, 1949 came into force and comprehensive arrangements were made for the supervision and inspection of banks by the Reserve Bank. It was in 1960 that the failure of Laxmi Bank and the subsequent failure of the Palai Central Bank catalyzed the introduction of deposit insurance in India. The Deposit Insurance Corporation (DIC) Bill was introduced in the Parliament on August 21, 1961 and received the assent of the President on December 7, 1961. The Deposit Insurance Corporation commenced functioning on January 1, 1962. The Deposit Insurance Scheme was initially extended to functioning commercial banks. Deposit insurance was seen as a measure of protection to depositors, particularly small depositors, from the risk of loss of their savings arising from bank failures.

Keywords— Deposit insurance, information technology, India, mobilisation, Reserve Bank of India

Introduction

In the 1960s, it was also felt that an additional the purpose of the scheme was to increase the confidence of the depositors in the banking system and facilitate the mobilisation of deposits to catalyst growth and development. In 1968, the Deposit Insurance Corporation Act was amended to extend deposit insurance to 'eligible co-operative banks'. When the DIC commenced operations in the early 1960s, 287 banks registered with it as insured banks. By the end of 1967, this number was reduced to 100, largely as a result of the Reserve Bank of India's policy of the reconstruction and amalgamation of small and financially weak banks so as to make the banking sector more viable.

The process of extension to cooperative banks, however took a while it was necessary for state governments to amend their cooperative laws. The amended laws would enable the Reserve Bank to order the Registrar of Co-operative Societies of a State to wind up a co-operative bank or to supersede its Committee of Management and to require the Registrar not to take any action for winding up, amalgamation or reconstruction of a co-operative bank without prior sanction in writing from the Reserve Bank of India. Enfolded the cooperative banks had implications for the DIC - in 1968 there were over 1000 cooperative banks as against the 83 commercial banks that were in its fold. As a result, the DIC had to expand its operations very considerably. The 1960s and 1970s were a period of institution building. 1971 witnessed the establishment of another institution, the Credit Guarantee Corporation of India Ltd. (CGCI). While Deposit Insurance had been introduced in India out of concerns to protect depositors, ensure financial stability, instill confidence in the banking system and help mobilise deposits, the establishment of the Credit Guarantee Corporation was essentially in the realm of affirmative action to ensure that the credit needs of the hitherto neglected sectors and weaker sections were met. The essential concern was to persuade banks to make available credit to not so creditworthy clients.

In 1978, the DIC and the CGCI were merged to form the Deposit Insurance and Credit Guarantee Corporation (DICGC). Consequently, the title of Deposit Insurance Act, 1961 was changed to the Deposit Insurance and Credit Guarantee Corporation Act, 1961. The merger was with a view to integrating the functions of deposit insurance and credit guarantee prompted in no small measure by the financial needs of the erstwhile CGCI. After the merger, the focus of the DICGC had shifted onto credit guarantees. This owed in part to the fact that most large banks were nationalised. With the financial sector reforms undertaken in the 1990s, credit guarantees have been gradually phased out and the focus of the Corporation is veering back to its core function of Deposit Insurance with the objective of averting panics, reducing systemic risk, and ensuring financial stability. The insurance sector in India has grown at a fast rate post-liberalization in 1999. In the last decade, total premium grew at a CAGR of 25% and reached a total of \$67 billion in 2010.

Objective:

This paper author studies the evolution of banking and insurance sector in India post and pre liberalisation and also suggest the measures to make banking system more inclusive

Growth of Banking and Insurance

Banking sector in India has the advantage of access to one of the largest and most stable global financial networks. It has been strengthened by a series of financial and regulatory reforms implemented recently, such as flexibility in lending rates, gradual dilution of government holdings in public-sector banks, and the easing of restrictions on private-sector and international banks. As the Indian economy is poised for a faster growth rate, its financial sector dominated by both insurance and banking companies

looks attractive for long-term investment. Indian banks and insurance companies can take advantage of the growing domestic market while aspiring for global competitiveness.

Although the international banking giants of the US and elsewhere were shaken by the financial crisis—resulting in large bailouts by the US and other federal governments, the Indian banking industry remained stable, thanks to the conservative approach adopted by Reserve Bank of India (RBI). The potential growth of the banking sector stems from the fact that only 15 percent of the population has ever borrowed from banks, and more than 40 percent do not even have bank accounts. Continued urbanization and rising middle-class incomes are the other indicators of the long-term potential of banks.

While most banks lend primarily to industry and services (to the tune of 68 percent), farm lending is 13 percent and personal lending 19 percent. Home mortgages account for more than 50 percent of personal lending.

The banking sector witnessed a surge in credit demand from 2005 to 2010, as the corporates came up with huge expansion plans, and the growth in the spending power of the middle class led to a significant expansion in retail banking. However, the growth opportunities resulted in serious issues of capital adequacy, and the prolonged recession led to the generation of a bulge in non-productive assets, invariably making the sector look vulnerable. This led to continued volatility in banking stocks. Major issues faced by public-sector banks are:

- Capital adequacy
- Competence in risk management
- Adoption of new technology
- Merger of smaller banks into viable entities
- Professionalism in management and supervision to replace the control of the finance ministry
- Freedom to acquire global talent

Indicators of banking strengths in India:

- Between FY 2009-10 and FY 2012-13 (during the period of global recession):
- Bank deposits grew from 44,928 billion rupees (710 billion USD) to 67,504 billion rupees (1.1 trillion USD)
- Bank credit grew from 32,448 billion rupees (510 billion USD) to 52,605 billion rupees (830 billion USD)
- Per-capita credit surged from 28,431 rupees (450 USD) to 44,028 rupees (690 USD), indicating a strong appetite for bank credit
- Credit-deposit ratio grew from 74 percent to 79 percent (largely controlled by RBI)
- By the end of FY 2012-13, the banking sector had 109,811 branches

The Indian banking sector reported a net profit of 1,027.51 billion rupees (approximately 16 billion USD), with almost an 11.5-percent net-profit margin on its gross turnover of 149 billion rupees for the FY 2012-13. Private banks have generally outperformed PSU (public sector undertaking) banks in terms of net- interest margins and returns on total assets:

Net-interest margins: PSU banks 3.8 percent, private banks 5.1 percent

Rate of return on assets: PSU banks 1.0 percent, private banks 1.3 percent

Capital adequacy: PSU banks 13.3 percent, private banks 17.5 percent

Newly formed private banks have the competitive advantage due to strong business models, larger proportion of fee-based income in total income earned, better technology, leaner organization and aggressive marketing strategies generating new revenue streams.

The Pradhan Mantri Jan Dhan Yojana (Prime Minister's People Money Scheme) launched by Prime Minister Narendra Modi last August helped to add 115 million accounts with 8,698 crore rupees (1.4 billion USD) in bank deposits.

Foreign direct investment (FDI) and portfolio investment limits in private banks have been hiked to 74 percent, but in the cases of PSU banks they remain at 20 percent. FDI in banking and insurance can improve financial stability and capitalization, Use of better technology and Risk-management capability.

Financials of some typical banks and listed insurance companies are shown in the table below:

(State Bank of India and Bank of India are PSU banks, whereas the remaining companies are private companies. Max India and Bajaj Finserv have substantial insurance businesses apart from other businesses).

Current prospects of the banking sector

The government has undertaken some major reforms in the financial sectors, including banking and insurance. Hiking the FDI limit in the insurance sector is one of them. In private-sector banking, the FDI limit is 75 percent. As inflation showed an easing trend, RBI indicated a dovish monetary policy by reducing the policy rate by 25 basis points in March 2015 after a similar cut in January 2015, thus effecting a total cut of 50 basis points in 2015. The effective repo rate now stands at 7.5 percent. Banks are expected to lower lending rates and deposit rates in a phased manner, while some have already passed on the benefits to borrowers. With commodity prices continuing to fall globally, RBI is expected to cut its policy rate further, and a pickup in borrowing is expected. Although banking stocks were hammered down in the market during the month of March, as company results indicate growth in their bottom lines (around the middle of FY 2015-16), banking stocks may recover and remain steady for the remaining months of 2015-16. Real gains in the banking and insurance sectors could be seen during FY 2016-17.

PSU banks, too, could do well during FY 2016-17, as now they are permitted to raise additional capital to meet the latest capital-adequacy norms, while diluting the government's holdings to the 52-percent level. More private banks are likely to be set up as in-principle approvals are being given to applicants. RBI has announced guidelines for local area and payment banks, which have received a good response.

Recently a scare regarding NPAs (non-performing assets or bad loans) of the banking sector shook the market. While announcing H1 as well as Q3 results, banks continued to report lower earnings and a higher provisioning for bad debt on a year-on-year basis. RBI has taken timely action to manage the issue of NPAs. (For the banking sector, NPAs had accelerated from 4.1 percent in March 2014 to 4.5 percent in September 2014). Due to the prolonged recession, major sectors of the economy such as engineering

construction and infrastructure, mining, textiles, metals as well as aviation accounted for more than 55 percent of the major stressed assets of PSU banks.

The bank regulator has tightened rules for asset reconstruction companies, hiking the minimum requirement of investment in security receipts from 5 to 15 percent. RBI has also issued revised guidelines allowing flexibility in infrastructure-project loans and advances for core-industry project financing. Norms for converting loans into the equity of defaulting companies, too, have been made more flexible and workable.

The government has also strengthened the powers of the IRDA (Insurance Regulatory and Development Authority) to ensure a more effective regulation of the sector.

The fortunes of the financial sector, including that of banks and insurance, are driven by the performance dynamics of the core economies of manufacturing, trade and services. Current indicators show that growth has bottomed out, and the RBI has been indicating a dovish policy stance. Gradual reduction in NPAs with growth in credit demand could be a couple of quarters away. Private banks could be the first to recover when the economy shows signs of sustainable recovery. Very large spending programmes outlined in the budget of FY 2015-16 along with optimistic railway outlays indicate the positives of the economy and the banking sector. The revival of the infrastructure and housing sectors could perk up the banking space. As loss-making infrastructure, mining and metal companies turn around, even the PSU banks could show smart recovery. While shares in private banks such as Axis Bank, Kotak Mahindra Bank, Karur Vysya Bank, HDFC Bank and South Indian Bank could be accumulated during dips, State Bank of India, Bank of Baroda and Bank of India should be on the watch list.

Housing finance: steady growth prospects

The home-mortgage financial sector in India is bullish again. This sector has witnessed a growth rate of almost 20 percent on average between 2009-10 and 2013-14, and the government budget could provide further momentum to the home-building sector. Current growth prospects are much better, thanks to the policy initiatives of the government and allocations for low-income housing. Loans are expected to grow at 30 to 40 percent, and NPAs are much lower for the commercial-banking sector.

HDFC Bank has been the biggest player in the home-loan segment apart from insurance. It has the largest market share.

Other renowned players include:

- Dewan Housing Finance Corp Ltd
- GRUH Finance Ltd
- Can Fin Homes Ltd
- GIC Housing Finance Ltd
- LIC Housing Finance Ltd
- SBI Home Finance Ltd
- BOB Housing Finance Ltd

The focus in the latest budget on housing and infrastructure projects indicates that the new government is committed to its goal of “Housing for All”. The National Housing Bank has been refinancing housing-finance companies and banks. Most of the home-loan stocks are now available at attractive prices, as these are not fancy stocks.

Insurance-sector developments

The Parliament of India recently ratified the Insurance Laws (Amendment) Bill, promulgated earlier as an insurance ordinance through presidential proclamation, hiking the upper limit of foreign investment in insurance from 26 to 49 percent. The law requires that management control and ownership of insurance companies remain with Indian collaborator entities. The aim is to reduce the restrictions on entry to the insurance market and enable flows of much-needed capital into the sector. MetLife and AIG are some of the foreign players who already have operations in India through joint ventures.

Significant joint ventures in the insurance sector include:

- Bajaj with Allianz SE of Germany
- Aditya Birla Group with Sun Life Financial of Canada
- SBI Life is a joint venture of SBI with BNP Paribas Assurance of France
- Future Generali India Insurance is a joint venture between Future Group and Italy’s Generali Group
- Bharti AXA General Insurance Co. is a joint venture between Bharti Enterprises and France’s AXA Group.

India, along with other countries in the Asia-Pacific region, is considered important by the global players in the insurance space. The large insurable population exceeding 550 million is an important consideration in determining the attractiveness of this sector. India’s insurance market could grow 400 percent in the next 10 years from its current size of 60,000 crore rupees. India’s life insurance sector is one of the largest in the world, with an approximate 40-percent growth rate based on new business premium collections. The number of policies is expected to grow at a 12-to-15-percent CAGR (compound annual growth rate) in the next decade. With the penetration level expected to reach 5 percent from the present level of 3.9 percent in the next five years, the total market size could reach the one-trillion-USD mark within seven to nine years.

The life insurance business

India, with the second largest population in the world, has very low life insurance coverage, in terms of life insurance premium collections, accounting for only 2 percent of global premium collections against a population that is more than 16 percent of the world’s population. Penetration of life insurance (based on a premium-to-GDP ratio) has remained at 3.5 to 3.9 percent of GDP in India, compared to 11 percent in Japan and 9 percent in the developed world. A projected growth rate of 7 to 8 percent in GDP means a huge rise in demand for insurance products, considering the rise in life expectancy and income levels of the upper-middle and middle class populations with fast-changing lifestyles. In terms of the number of life insurance policies, India is at the top with almost 360 million policies, the number growing at a rate of more than 12 percent annually.

The recent relaxation of foreign ownership and investment limits has evoked a positive response from global insurers, and some of them have shown interest in increasing their stakes in the existing joint ventures. Many more such joint ventures are likely to follow.

International joint ventures could face some challenges at initial stages in the Indian market. The life insurance market has been completely dominated by LIC (Life Insurance Corporation), wholly owned by the central government. The market share of LIC fell gradually from 100 percent to 75 percent since the insurance sector was opened up to private investors 15 years ago.

In an environment of strong competition, a bancassurance model could help both banks and insurance companies, as this would strengthen existing distribution channels, particularly in rural markets. The anticipated evolution of post offices as banks in a couple of years would further accelerate the penetration of banking and insurance in rural markets.

Non-life segment

Out of 28 major non-life insurers, some companies from the private sector also operate as underwriters of policies for accident coverage, travel and health insurance. Some well-known names in this category are:

- Cigna TTK Health Insurance Co
- Max Bupa Health Insurance Co
- Star Health and Allied Insurance Co
- Religare Health Insurance Co
- Apollo Munich Health Insurance Co

The major public-sector, non-life insurers include:

- Agricultural Insurance Co
- Export Credit Guarantee Corp
- General Insurance Corp (reinsurance business)
- New India Assurance Co
- National Insurance Co
- United India Insurance Co
- Oriental Insurance Co

The general insurance or non-life insurance market size is around 770,000 million rupees (12.41 billion USD) in premiums per annum. The growth rate of this segment has been 17 percent per annum. Health insurance accounts for a quarter of the non-life insurance market. The markets in the non-life segment could show an accelerated growth rate of 20 to 25 percent per annum.

Insurance regulator IRDA has estimated that this sector will require additional capital to the tune of 500,000 million rupees within the next 10 years.

Some of the state-run, non-life insurers such as National Insurance Company as well as New India Assurance Co are considering an IPO (initial public offering) ahead of listings on the stock exchange, with the central government considering a divestment of its stake in the insurance arm. The giant Life Insurance Corporation being listed could be a huge opportunity for investors. Such

a move, however, is bitterly opposed by unions. Complete privatization of insurance and banking is not going to happen anytime soon. As far as PSU banks are concerned, the government has decided to keep a 52-percent stake.

The RBI has permitted banks to earn brokerage fees by selling insurance products. The central government plans to launch some additional insurance schemes to protect farmers against various risks related to agriculture. Growing upper-middle and middle classes with fast-rising young, educated, insurable populations will help make market growth sustainable.

Conclusion

Indian Life insurance industry (which contributes 88% of total Life and General insurance premium in India) has emerged as the 9th largest life insurance market in the world. Yet, Insurance penetration (measured as ratio of premium underwritten to GDP) was only at 5.2 % in 2010 – significantly lower than Asian peers like South Korea, Taiwan, Japan and Hong Kong which boast an insurance density greater than 10%. With low insurance penetration levels, growth potential remains promising. More importantly, the pace and nature of growth will likely see a change where new behaviors and dynamics of demand and supply will apply. On the demand side, growth is being fuelled by the growing population base, rising purchasing power, increased insurance awareness, increased domestic savings and rising financial literacy. The suppliers are correspondingly playing a market making role as competition heightens and differentiation become necessary for profitable growth. In the new order, innovating across the business lifecycle has become a necessity. The insurance industry is regulated by Insurance Regulatory & Development Authority. The industry can be divided into three types of insurance providers: Life and health insurance, General Insurance or non-life insurance and reinsurance. Both public & private players are there in Life & Health insurance and general insurance.

The potential and performance of the insurance sector is universally assessed with reference to two parameters, of the population Insurance Penetration and Insurance Density. Insurance penetration is defined as the ratio of premium underwritten in a given year to the Gross Domestic Product (GDP). Insurance density is defined as the ratio of premium underwritten in a given year to the total population (measured in USD for convenience of comparison). The insurance penetration was 2.32 per cent (Life: 1.77 per cent and Non-life: 0.55 per cent) in the year 2000 when the sector was opened up for private sector. The banking history is interesting and reflects evolution in trade and commerce. It also throws light on living style, political and cultural aspects of civilized mankind. The strongest faith of people has always been religion and God. The seat of religion and place of worship were considered safe place for money and valuables.

The history of banking begins with the first prototype banks of merchants of the ancient world, which made grain loans to farmers and traders who carried goods between cities. This began around 2000 BC in Assyria and Babylonia. In olden times people deposited their money and valuables at temples, as they are the safest place available at that time. The practice of storing precious metals at safe places and loaning money was prevalent in ancient Rome. However modern Banking is of recent origin. The development of banking from the traditional lines to the modern structure passes through Merchant bankers, Goldsmiths, Money lenders and Private banks. Merchant Bankers were originally traders in goods. Gradually they started to finance trade and then become bankers. Goldsmiths are considered as the men of honesty, integrity and reliability. They provided strong iron safe for keeping valuables and money. They issued deposit receipts (Promissory notes) to people when they deposit money and valuables with them. The goldsmith paid interest on these deposits. Apart from accepting deposits, Goldsmiths began to lend a part of money deposited with them.

References

1. " Rob Iati, The Real Story of Trading Software Espionage Archived July 7, 2011, at the Wayback Machine, AdvancedTrading.com, July 10, 2009
2. Times Topics: High-Frequency Trading, The New York Times, December 20, 2012
3. A London Hedge Fund That Opts for Engineers, Not M.B.A.'s by Heather Timmons, August 18, 2006
4. "Business and finance". The Economist.
5. "Algorithmic trading, Ahead of the tape", The Economist, 383 (June 23, 2007), p. 85, June 21, 2007
6. "MTS to mull bond access", The Wall Street Journal Europe, p. 21, April 18, 2007
7. Lauricella, Tom (October 2, 2010). "How a Trading Algorithm Went Awry". The Wall Street Journal.
8. Mehta, Nina (October 1, 2010). "Automatic Futures Trade Drove May Stock Crash, Report Says". Bloomberg L.P.
9. Bowley, Graham (October 1, 2010). "Lone \$4.1 Billion Sale Led to 'Flash Crash' in May". The New York Times.
10. Spicer, Jonathan (October 1, 2010). "Single U.S. trade helped spark May's flash crash". Reuters.
11. Goldfarb, Zachary (October 1, 2010). "Report examines May's 'flash crash,' expresses concern over high-speed trading". Washington Post.
12. Popper, Nathaniel (October 1, 2010). "\$4.1-billion trade set off Wall Street 'flash crash,' report finds". Los Angeles Times.
13. Younglai, Rachele (October 5, 2010). "U.S. probes computer algorithms after "flash crash"". Reuters.
14. Spicer, Jonathan (October 15, 2010). "Special report: Globally, the flash crash is no flash in the pan". Reuters.
15. TECHNICAL COMMITTEE OF THE INTERNATIONAL ORGANIZATION OF SECURITIES COMMISSIONS (July 2011), "Regulatory Issues Raised by the Impact of Technological Changes on Market Integrity and Efficiency" (PDF), IOSCO Technical Committee, retrieved July 12, 2011
16. Huw Jones (July 7, 2011). "Ultra fast trading needs curbs -global regulators". Reuters. Retrieved July 12, 2011.
17. Kirilenko, Andrei; Kyle, Albert S.; Samadi, Mehrdad; Tuzun, Tugkan (May 5, 2014), The Flash Crash: The Impact of High Frequency Trading on an Electronic Market (PDF)
18. Amery, Paul (November 11, 2010). "Know Your Enemy". IndexUniverse.eu. Retrieved March 26, 2013.
19. Petajisto, Antti (2011). "The index premium and its hidden cost for index funds" (PDF). Journal of Empirical Finance. 18 (2): 271–288. doi:10.1016/j.jempfin.2010.10.002. Retrieved March 26, 2013.
20. Rekenhaller, John (February–March 2011). "The Weighting Game, and Other Puzzles of Indexing" (PDF). Morningstar Advisor. pp. 52–56 [56]. Archived from the original (PDF) on July 29, 2013. Retrieved March 26, 2013.
21. "High-Frequency Firms Tripled Trades in Stock Rout, Wedbush Says". Bloomberg/Financial Advisor. August 12, 2011. Retrieved March 26, 2013.
22. Siedle, Ted (March 25, 2013). "Americans Want More Social Security, Not Less". Forbes. Retrieved March 26, 2013.
23. "The Application of Pairs Trading to Energy Futures Markets" (PDF).
24. Jackie Shen (2013), A Pre-Trade Algorithmic Trading Model under Given Volume Measures and Generic Price Dynamics (GVM-GPD), available at SSRN or DOI.

25. Jackie Shen and Yingjie Yu (2014), *Styler Algorithmic Trading and the MV-MVP Style*, available at SSRN.
26. Jackie (Jianhong) Shen (2017), *Hybrid IS-VWAP Dynamic Algorithmic Trading via LQR*, available at SSRN.
27. Wilmott, Paul (July 29, 2009). "Hurrying into the Next Panic". *The New York Times*. p. A19. Retrieved July 29, 2009.
28. "Trading with the help of 'guerrillas' and 'snipers'" (PDF), *Financial Times*, March 19, 2007, archived from the original (PDF) on October 7, 2009
29. Lemke and Lins, "Soft Dollars and Other Trading Activities," § 2:29 (Thomson West, 2015–2016 ed.).
30. Rob Curren, *Watch Out for Sharks in Dark Pools*, *The Wall Street Journal*, August 19, 2008, p. c5. Available at *WSJ Blogs* retrieved August 19, 2008
31. *Artificial intelligence applied heavily to picking stocks* by Charles Duhigg, November 23, 2006
32. "How To Build Robust Algorithmic Trading Strategies". *AlgorithmicTrading.net*. Retrieved August 8, 2017.
33. Geoffrey Rogow, *Rise of the (Market) Machines*, *The Wall Street Journal*, June 19, 2009
34. "OlsenInvest – Scientific Investing" (PDF). Archived from the original (PDF) on February 25, 2012.
35. Hendershott, Terrence, Charles M. Jones, and Albert J. Menkveld. (2010), "Does Algorithmic Trading Improve Liquidity?", *Journal of Finance*, 66: 1–33, doi:10.1111/j.1540-6261.2010.01624.x, SSRN 1100635
36. Menkveld, Albert J.; Jovanovic, Boyan (2010), "Jovanovic, Boyan, and Albert J. Menkveld. Middlemen in Securities Markets", working paper, SSRN 1624329
37. James E. Hollis (September 2013). "HFT: Boon? Or Impending Disaster?" (PDF). *Cutter Associates*. Retrieved July 1, 2014.
38. "Citigroup to expand electronic trading capabilities by buying Automated Trading Desk", *The Associated Press*, *International Herald Tribune*, July 2, 2007, retrieved July 4, 2007
39. *Event Arb Definition* Amex.com, September 4, 2010
40. "Quote Stuffing Definition". *Investopedia*. Retrieved October 27, 2014.
41. Diaz, David; Theodoulidis, Babis (January 10, 2012). "Financial Markets Monitoring and Surveillance: A Quote Stuffing Case Study". SSRN 2193636.
42. *High-Speed Devices and Circuits with THz Applications* by Jung Han Choi
43. "Low Latency Trading". Archived from the original on June 2, 2016. Retrieved April 26, 2015.
44. Saar, Gideon; Hasbrouck, Joel (May 22, 2013). "Low-Latency Trading". SSRN 1695460.
45. "Archived copy" (PDF). Archived from the original (PDF) on March 4, 2016. Retrieved April 26, 2015.
46. *FIXatdl – An Emerging Standard*, *FIXGlobal*, December 2009