CHAPTER 30

MANAGEMENT STUDIES

Doctoral Theses

01. AGANIHOTRI (Shalini) **Financial Risk Analysis : A Study of Select Indian Companies.** Supervisor : Prof. Pankaj Sinha <u>Th 23949</u>

Abstract (Verified)

The global financial crisis of 2008, increased exposure of Indian non-financial firms to external debt (as per IMF report) and section 134 of Companies Act, 2013, emphasised again the role of risk factors identification and reporting in a precise manner. The current study investigates the effect of Brownian risk factors (like foreign exchange risk) on leverage decision using panel robust system GMM methodology. Results highlight that idiosyncratic risk, interest rate risk and foreign exchange risk affects leverage decision of Indian non-financial firms. If Brownian risk factors form an important component of leverage decisions, then a firm's managers are looking at these factors while issuing and retiring debt as well as issuing and retiring debt v/s equity. This analysis is done using panel logit model. It is observed that mangers gives importance to idiosyncratic risk and interest rate while taking debt issuance and retirement decisions but foreign exchange risk exposure is overlooked. Looking at the increased exposure of Indian non-financial firms to external commercial borrowing, the current study estimates VaR using EVT methodology by taking bivariate distribution of stock returns and foreign exchange rate. It can act as an indirect method of checking foreign exchange risk exposure of firms and hedging effectiveness. If managers are overlooking foreign exchange exposure while issuing or retiring debt, then they must be hedging foreign exchange exposure of the firms. Hence, looking at all these factors the study also investigates the correlation of debt and VaR values of the firms. It is observed that the correlation is very high. That means firms having high downside risk are maintaining higher debt, which is a cause of concern. Copula technique is used to find the lower left tail correlation between foreign exchange rate and stock returns. Firms having high debt face high foreign exchange risk exposure.

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1. Introduction 2. Firm specific risk calculation through black – scholes-merton models 3. Effect of jump and brownian risk on capital structure decision 4.Effect of brownian risk on debt issuance and retirement decision 5.Estimating VaR by fitting empirical distribution to return series 6. Bayesian and evt value – at – risk model estimation 7. Estimating foreign exchange rate and stock return correlation using coupula 8. Concusion. References. Glossary. Appendicies. List of publications.

02. DEVESH SHANKAR

Behavioral Finance in Asset Pricing : Evidence from Indian Stock Market. Supervisor : Prof. Raj S. Dhankar <u>Th 23947</u>

Abstract (Not Verified)

The study focuses on three aspects that include informational efficiency, multi-factor asset pricing models, and investor sentiment. The informational efficiency part discusses Efficient Market Hypothesis (EMH), and empirically examines a relatively new proposition of Adaptive Markets Hypothesis (AMH) under linear as well as non-linear framework. The multi-factor model aspect empirically examines the suitability of Fama-French three-factor model and Carhart four-factor model in the Indian stock market, and checks if the residual momentum strategy, which has emerged in recent studies, holds significance in the Indian context. The risk-adjusted returns of residual momentum have been compared to the total return momentum, and then the performance of four factor asset pricing model based on residual momentum has been examined. In the third aspect, an investor sentiment index has been developed using readily available market proxies, and then its significance as a factor has been tested by augmenting it in the asset pricing framework for each of the three models. The third aspect has been extended to explore the effect of different sentiment states on the factor returns, and also examines the impact of persistence of these sentiment states on factor returns. A survey of professional investors has also been performed to validate the hypotheses and results of the study. The responses of the questionnaire-based survey suggest that the stock market practitioners, whose profession is directly linked with the Indian stock market, disregard the concept of informational efficiency as suggested in EMH. The respondents largely agree with the behavior of stock market as described under AMH. They agree that investor sentiment influences asset prices. The respondents also exhibit vulnerability to certain psychological and behavioral biases, thus suggesting that irrationality exists even among the professional investors.

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1. Introduction 2. Review of Literature 3.Research Methodology 4.Adaptive market hypothesis 5. Multi – Factor models and residual momentum. 6. Investor sentiment and asset pricing 7. Investor sentiment states, persistence, and factor returns 8. Practitioners' perspective 9. Conclusions, recommendations, and suggestions. References, annexure.

03. HARPREET KAUR

Food Security in South Asia : Implications for Public Policy. Supervisor : Prof. Simrit Kaur <u>Th 23951</u>

Abstract (Not Verified)

Food security is a major concern in South Asia. Therefore, addressing concerns pertaining to rising food prices, climate change and armed conflicts becomes pertinent. Econometric analysis incorporating panel data fixed effects regression and GMM finds that lagged domestic food prices, global food prices, greater economic access and reliance on food imports increase domestic food prices. To examine the impact of climate change on agricultural production and food security, deviations in rainfall and temperature from their respective prestructural break averages, estimated using Bai-Perron tests and from pre-industrialisation averages are employed. Our results indicate that climate variables have a non-homogenous impact on agricultural production and food security, maximum temperatures have an adverse impact. The impact of conflicts on food security is studied using panel data regressions. Our results show that conflicts worsen food insecurity with prolonged conflicts and conflict-climate interactions having a greater impact. Given the importance of diversified diets, OLS and

Quantile Regression analysis is employed to study the correlates of diet diversity at the House hold, District and State level for rural farm and non-farm sectors for India. Based on NSS 68Round, our results indicate that agricultural production diversity and greater financial access have favourable impacts on diet diversity. Cereal prices, increased rainfall deviations and rural road density negatively impact the same. Increased rainfall deviations matter more for farm households while cereal prices have a larger impact on diet diversity of non-farm households. Importantly, the significance and magnitude differs across quantiles of diet diversity. To address food insecurity it is important to strengthen effective safety nets; adopt measures promoting agricultural diversification and productivity; improve infrastructure; lay emphasis on climate change *adaptation* and *mitigation* policies; address root causes of conflicts and promote regional cooperation.

Contents

1. Food Security in South Asia 2. Determinants of food prices in South Asia 3.Impact of climate change on agricultural production and food security in South Asia 4. Conflict, climate change and food security in South Asia 5. Diet diversity in South Asia 6. Determinants of dietary diversity in India 7. Conclusion and policy recommendations. Bibliography.

04. HEENA

Work Values of Organizations Associated with Social Innovation. Supervisor : Prof. Mala Sinha <u>Th 23953</u>

Abstract (Not Verified)

Socially innovative organizations work in social development sectors. Such organizations combine innovation, entrepreneurship and social purpose and seek to be financially sustainable. Work values of these organizations are hypothesized to be significantly different from "for profit" organization as they have a social mission which prioritize social benefit above financial profit. While there has been a lot of research in the area of social enterprises, entrepreneurship and innovation independently, there is still a gap in research body relating to work values of social enterprises that employ socially innovative solutions to solve social problems. The research gap identified for this study relates to the relationship between work values and outcomes (Impact). The study is designed to gain insight into work values of social enterprises and investigate the social impact of these organizations in the society. In our study, we have tried to examine the social impact these organization create and the work values & practices that help sustain these impacts. The study also delves into the workforce characteristics that determine the values and behaviors required to create the desired social impact. Based on the statistical findings, theoretical model has been proposed which describes the work values of socially innovative organization and their relationship with different types of social impact achieved. Key findings are that relationships, nurturing and experiential style of work values contribute to impact related to transforming stakeholder's life. Transactional and material values do not contribute to increasing social value. The study has increased theoretical and empirical understanding of work values and social impact created by social enterprises. Secondly, it has related work forces characteristics to work values within the social enterprises. Lastly, it has suggests how demographics, work values and Social Innovation are related.

Contents

1. Introduction 2. Review of Literature 3. Research Methodology 4. Results and Finding 5. Discussion. References and Appendix.

05. KLER (Rajnish Kumar) **FII Flows and Stock Markets in India.** Supervisor : Prof. S. K. Tuteja <u>Th 23948</u>

Abstract (Not Verified)

Indian stock markets are preferred as the favourite investment terminus throughout worldwide by the foreign institutional investors. Study attempts to find new underlying forces of the FII flows and its influence on stock markets of India. Initially, the study reveals that there is a significant positive relationship between FII flows and stock market capitalization. Furthermore, the study reveals that there is significant relationship between FII flows and stock market volatility, however that has substantially reduced after introduction of new FPI Act established with ARCH & GARCH model. Finally, study examines the short run and long run dynamics during the period of sub-prime crisis and post FPI Act. Study give insight to understand the behaviour pattern of financial institutions especially during the time of policy changes and crisis time period. Sub-time frames were constructed on the basis of important events and confirmed with Chow test of structural breaks. Study was based on methodology of VAR model, Granger causality test, IRF and VDC. Study reveals that the returning back of FII flows after crisis period was only possible because of strong base of macro-economic variables in the economy and its positive relationship with stock markets. The unwanted attention to FII out flows behaviour have adversely affected the stock market investors during the crises period. Larger base of DII participation against the FIIs has given new life to stock markets and has improved bearing capacity of negative shocks. Although previous behaviour patterns cannot be ignored but there is emergent need of involving DIIs for long term investments and restraining the risk of FIIs and their flows. Indian economy should gears up to counter adverse situations, introduce firm policies to curb sudden out flows and restore investment potential of Indian stock markets.

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MAINI (Rashmi) Study of Correlates of Women's Participation in Trade Unions in India. Supervisor : Dr. Mahima Thahur <u>Th 23945</u>

Abstract (Not Verified)

This empirical investigation attempts to study the correlates of women's participation in trade unions in India. The study adopted a mixed method approach, both qualitative and quantitative data were collected. Qualitative data was collected using a qualitative interview schedule to tap on the hidden resources and lived experiences of women trade unionists and quantitative data was collected through the administration of standardized questionnaires/scales. The questionnaires were administered on 825 Indian women trade union members. The data were subjected to univariate, bivariate and multivariate techniques. The main objectives of the study are as follows1. To measure the participation of women in trade unions in India 2. To study the relationship between independent variables such as psychological factors, socio-cultural factors & union related cognitions with the dependent variable of participation of women in

trade unions. 3. To prepare a comprehensive framework for correlates of participation of women in trade unions in India. Results indicates that Political efficacy, Self-Efficacy, Egalitarian attitude towards women in unions, Social approval, Collective Relative Deprivation, Egoistic Relative Deprivation, Union Identification, Union Commitment, Need for affiliation, Extraversion, Egalitarian attitude towards women in organization, Union Instrumentality, Need for achievement, Internal locus of control were found to be correlating with participation of women in trade unions. These factors also emerged as predictors of participation of women in trade union. The study has implications for researchers, policy framers, experts as well as for organizations. It may help organizations to draw upon new initiatives and interventions to help women in not merely getting their positions and say in trade unions but also at the same time involve women in organizations towards achievement of larger organizational goals..

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1. Introduction 2. Theoretical Framework 3. Review of Literature 4. Research and Methodology 6. Discussion and Conclusion 7. Implications, limitations and recommendations for future research. References. appendices, List of Publications.

07. MALIK (Kunjana)

Flow of Private Equity and Growth of Corporate India : A sectoral Analysis. Supervisor : Prof. Raj S. Dhankar <u>Th 23955</u>

Abstract (Not Verified)

Indian Venture Capital Association (IVCA) defines private equity as a fund that typically provides funding to expand working capital within an owned company, make acquisitions or to strengthen a balance sheet. The aim of this study is to evaluate the effect of private equity finance on the sectoral analysis of the Indian corporate sector. Five major sectors of private equity investment have been considered in the study: IT & ITes, Banking and Financial Services, Healthcare and Life Sciences, Manufacturing, and Real Estate. The first objective determines the effect of private equity on performance of different sectors. Performance variables like return on assets (ROA), return on capital employed (ROCE), Tobin Q, net profit margin (NPM), and asset turnover (AT) are evaluated. The second and the third objectives focus on the effect of private equity finance on investment spending and investment cash flow sensitivity of the firms. Investment cash flow sensitivity is a standard measure for finding imperfections in the capital market. A review of literature, especially the major work of Cleary (1999) and Fazzari, Hubbard and Peterson (1997), indicates that a decrease in investment cash flow sensitivity (dependence of investment on cash flow) results in a reduction in financial constraints of the firm The fourth objective compares the earning quality of private equity backed firms with non-private equity firms. Operating income after depreciation has been set as the dependent variable and cash flow and accrual component of earnings are designated as independent variables. The fifth objective attempts to discover the interrelation between private equity, inflation and economic growth of India over the 1996-2014 period. Johansen cointegration test is used to estimate a long run as well as short run relationship between private equity, inflation and economic growth..

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1. Introduction 2. Conceptual framework 3. Review of literature 4. Research methodology 5. The Effect of private equity on performance of Indian corporate sector 6. Effect of private equity in investment and financial constraints of Indian companies 7. Earnings quality of private equity backed and non private equity backed firms in India 8. Relationship between private equity, inflation and economic

growth 9. A critique of flow of private equity and growth of corporate India 10. Conclusion and recommendations. References. Research Papers from the Thesis. Questionnaire. Appendix.

08. NARENDER

Foreign Capital Flows and Growth of Indian Economy : A Sectoral Analysis.

Supervisor : Prof. Raj S. Dhankar <u>Th 23954</u>

Abstract (Not Verified)

Inflow of foreign capital has played important role in the Indian economy. There has been a rapid increase in the flow of foreign capital after the liberalization policy of 1991. This study analyzes the global trends, patterns, and impacts of foreign capital (FDI, FPI, ECB, NRI Deposits) in India. It further investigates the impact of FDI on major sectors and sub-sectors from different aspects like GDP, export and employment. To determine the impact of foreign capital, Unit root, Johansen co-integration, and multiple regression analysis have been performed. The data has been taken from 1991 to 2014, and collected from the databases of the World Bank, DIPP and RBI. The macro level analysis shows that FDI, FPI, and export has a positive and significant impact on overall GDP, whereas ECB and NRI Deposits have negative impact. Further study also shows that FDI has a positive impact on overall export and employment in private sector. FDI in the manufacturing sector has a positive impact on the growth, export and employment. However, employment and FDI in service sector show negative relationship. Agriculture sector growth and its export have not been promoted by FDI as much of service and manufacturing sectors. The study finds that FDI in automobile, drugs and pharmaceuticals, chemical, metallurgical industries, hotel and tourism, and IT have significant positive effects, whereas telecommunication sector has a negative impact. Sectors related to infrastructure, like housing and real estate, petroleum and natural gas, nonconventional energy and coal sector have a positive impact on GDP. Finally, the study recommends that foreign investment should be increased in manufacturing and infrastructure sectors for achieving higher GDP growth rate in the economy..

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1. Introduction 2. Review of literature 3. Research methodology 4. Global scenario of foreign direct investment 5. Indian scenario of foreign direct investment: Macro level 6. Indian scenario of FDI: Sectoral and sub-Sectoral level 7. Foreign direct investment policy framework in India 8. Empirical analysis: Macro level 9. Empirical analysis: Sectoral level 10. Empirical analysis: Sub sectoral level 11. Conclusions & recommendations. Bibliography. Appendices. List of publications

09. PANDEY (Jaya) Nee Jaya Mishra Scrutinizing the Dimension of European Crisis Through Indices: A Study of Pllgs and BRIC Nations Supervisore : Dr. Apielo Koleie

Supervisors : Dr. Anjala Kalsie <u>Th 24295</u>

> Abstract (Not Verified)

"Scrutinizing the Dimension of European Crisis Through Indices: A Study of PIIGS and BRIC Nations "The study started with the objective of finding reasons of Eurozone crisis and then developed indices of crisis. The study has collected 113 variables in each of the PIIGS nations and 82 variables in each of the BRIC nations. These variables are tested for presence of structural breaks with the help of

dummy variables exercise and Chow test. The sample period is divided into pre-crisis (2001 to 2007), during crisis (2007-08) and post-crisis period (2010 to 2015). With the help of these structural break studies we found Ireland and Spain as least and most affected country among PIIGS nations and India and Russia as least and most affected country among BRIC nations. The Granger causality test and correlation exercise gives a full list of causal and impacted variables of crisis in Ireland and India. The Principal Component Analysis is applied on causal and impacted variables of crisis in Ireland and India and gives principal components with their weights. These principal components were multiplied by their weights for each of the PIIGS and BRIC nations and arranged in panel data form. Study found FGLS estimator suitable for coefficient estimation and PCSE estimator suitable for probability estimation. In case of PIIGS nations the study found the crisis was basically erupted by fiscal, financial, social and macro variables but not because of banking variables. In case of BRIC nations the crisis effect was basically fuelled by macro, banking, social, forex, productivity and financial variables but not because of fiscal set of variables. The main policy contribution of this study is that it makes the European countries aware and cautious about principal components variables to avoid such a severe crisis in future.

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1. Introduction 2. Review of literature 3. Causes of crisis in Greece: The origin of euro crisis country 4. Causes of crisis in Portugal, Ireland, Italy and Spain: The spillover effect in Eurozone. 5. Causes of crisis at Eurozone level 6. Explaining Eurozone crises through structural breaks in pllgs nations 7. Effects of euro crisis on Bric nations through structural breaks 8. Structural break analysis through chow test 9. Methodology to measure the euro debt crisis in pllgs and Bric nations 10. Formation of different indices of variables in pllgs and Bric countries 11. Measuring the Eurozone crisis in pllgs nations 12. Measuring the eurozone crisis in Bric nations 13. Conclusion. Bibliography. Publications.

POONIA (Archana) Organizational Ethics & Sustainable Business Practices Pharmaceuticals : A Comparative Study of Multi National & National Firms. Supervisor : Prof. Sunita Singh Sengupta <u>Th 23946</u>

Abstract (Not Verified)

Since medicine is not a usual commodity, pharmaceutical industry is more relevant to explore ethics and sustainability. Globally for an industry low on public trust while Indian pharmaceutical industry poised as pharmacy capital of the world, it makes an interesting case to explore ethics and sustainable business practices. Primarily, the study attempts to comparatively analyse ethical-sustainable business practices adopted by Indian and MNC pharmaceutical firms. Employing mixed method approach, guantitatively data was collected from top and middle managers while qualitatively sustainability reports were content coded and statistically analysed asper research objectives. Literature review revealed voluminous contradicting studies and most cited key influential five variables that impact organisational ethics and sustainability adoption. Both primary and secondary data analysis confirmed that Multinational and National firms vary, with MNCs leading in ethical sustainable business practices. To facilitate better management of responsibility and thus sustainability adoption, an interactive model is proposed and empirically tested. Since sustainability is complex and contentious concept, the study utilised system's perspective to sustainability. Though independence of critical factors is important, but since both sustainability and ethics are abstract concepts, the study relatively emphasises inter-relations more. Study offers evidence based management approach that governmental enforcement coupled with voluntary adoption by firms is better suited for sustainability adoption while mere presence ethical structures like code of ethics are essentially insufficient. On compromising organizational ethics, the devastating ill consequences are more severe than public relations debacle or revenue loss but the entire sustainability system failure challenging the mere survival of the firm. Thus, the study explores the understudied aspect of role of ethics in sustainability adoption. For an industry creating miracles, sharing an intricate social contract and currently reeling under high tension in grand bargain of community versus profits, mandates this contemporary study from emerging markets perspective in Indian pharmaceutical sector.

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1. Introduction 2. Conceptual framework 3. Literature review 4. Research methodology 5.Primary data analysis, findings and discussion 6. Secondary data analysis, findings and discussion 7. Summary, conclusions & recommendations. References and annexure.

SIKKA (Rajesh) Study of Strategies of IT SMEs in India. Supervisor : Prof. Vivek Suneja <u>Th 23950</u>

Abstract (Not Verified)

IT Services is a huge industry globally. Strategies of IT SMEs in India were researched. Questionnaire survey, case studies and personal interviews were done with promoters and key management persons. Strategies studied were financial, core competencies, marketing, operational, human capital, technology evolution. Skilled resources, low costs and stakeholders of Indian origin are important in decision for starting operations in India. Location depends on the availability of IT and social infrastructure. Home state of the entrepreneur was another factor in selecting location. Senior and skilled employees working in metro and tier 1 cities are somewhat reluctant to move to smaller cities due to lack of physical and social infrastructure, schools etc. Risks perceived for doing business in India include bureaucracy, delays in decision making, data pilferage high attrition rate, infrastructure, safety, security and policy uncertainties. Core competencies of SMEs enable customer acquisition. Business development strategies for international and domestic markets are different. As branding is quite expensive, not many IT SMEs go for branding campaigns. Branding is done by participation in conferences and exhibitions. Local cultural aspect is one of the main challenges in international marketing. Compensation package is key in hiring and retaining talent. Limited career growth options in IT SMEs and lack of long term opportunities are major constraints in employees retention. Cloud based solutions are very important for business growth of IT SMEs, as these reduce costs. Mobility and social media enable IT SMEs to reach to their customers quickly. Industry should provide opportunities for skill development of employees, as it is key for retaining customers and business growth. Further detailed research is recommended on each of the strategy areas studied here.

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1. Introduction 2. Literature review 3. Research design 4.Questionnaire analysis 5.Case studies 6.Discussion of research findings 7.Conclusions & policy implications. Appendices, bibliography.

12. SINGH (Virender)

Organizational Pride & Performance : A Study of Two Service Organizations in the National Capital Region of India Supervisor : Prof. J. K. Mitra Th 24273

Abstract (Not Verified)

Organizational pride is a positive feeling that member of an organization feels due to his/her identification with the company's success and reputation. The objectives of the present study were multiple, for which two organizations in the service sector from the NCR of India were selected: (i) to identify the components of Organizational Pride; (ii) to develop an instrument for measuring relationship between Organizational Pride components and Performance Parameters; (iii) to assess the relationship between Pride Components of two selected organizations; (iv)to explore any possible difference between Pride Components of two selected organizations; and (v) to understand and document organizational initiatives to enhance Organizational Pride of organization members in two selected cases over a period of time. For organizational performance parameters, along with HR outcomes (Intention to Leave or ITL, Job Satisfaction or JS), Performance Outcome (Extra Effort, Effectiveness, Satisfaction) or PO were included in the study. A purposive samples of 314 working professionals from the two selected organizations was used. A 50 item questionnaire, constructed for this study with items from available scales was used after pilot survey, reliability analysis, both in Hindi and English. The results, in sum, are that all the self-reported measures of Intention to Leave, Job Satisfaction and Performance Outcome correlated in expected direction although as an exploratory study the hypotheses were framed as null hypotheses of no difference and/or no relationship. The interesting element is to note that a single global item of organizational pride mentioned above throws up significant relationship with all variables. Therefore, just as in Job Satisfaction research, a single item that is used to rate Overall Pride can be a reasonable predictor for ITL, JS and PO. The Case studies showed that two organizations attempted different initiatives to restore glory or promoting pride in their employees.

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 SHRUTI ASHOK Nee SHRUTI SARAF
Reverse Mortgage : Opportunities and Challenges in The Indian Context.
Supervisor : Prof Madhu Vij Th 24296

Abstract (Not Verified)

Reverse Mortgage was introduced in India in 2008, yet it has not proven to be very successful till date. The potential market for Reverse Mortgage loans in India is approximately Rs 20,000 Crore. However only Rs 1800 Crore worth of loans have been sanctioned till now. The first objective attempts to identify the determinants affecting the reverse mortgage purchase decision in India. Data is collected through a structured questionnaire containing 28 questions distributed to 360 respondents. Using PLS SEM, perception for reverse mortgage has emerged as the factor having the maximum impact on the purchase decision for Reverse mortgage loans. The other factors found to be significant are bequest motive, savings level and risk in the order of relevance. The second objective ascertains the reasons behind the reduced awareness level of Reverse Mortgage in India by studying the effect of demographic factors using Chi Square test. Age, education level, home ownership and monthly income are found to significantly impact the awareness level. The third objective explores the relationship between the macroeconomic variables and the Reverse Mortgage market in India using secondary data collected from various sources. The data was tested for OLS regression and the results show a significant positive effect of GDP on the home ownership rates in India. Interest rate and market capitalization as a percentage of GDP indicate significant negative impact on the home ownership rates. The fourth

objective study explores Reverse Mortgage as a financial planning tool using a case study analysis. This case study advocates a coordinated strategy proposing the client borrows from the reverse mortgage only during bear markets, thereby maximizing his wealth post retirement. It is expected that the present study will enrich the existing literature on Reverse Mortgage and that the empirical results will have meaningful implications for all the stakeholders.

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1. Introduction 2. Theoretical Background 3. Review of literature 4. Research Methodology 5. Empirical investigation – 1 6. Empirical investigation –ll 7. Summary of research, recommendations and conclusion. Bibliography. Appendices.

14. VIRANDER KUMAR

Cost Optimization for power procurement by an Indian Power Distribution Utility: A Supply Chain Perspective.

Supervisors : Prof. M. L. Singla and Prof. Debadyuti Das $\underline{Th}\ \underline{23952}$

Abstract (Not Verified)

This study has been carried out under three distinct phases - demand forecasting, optimization of procurement cost and determining bidding strategies for power purchase under day-ahead arrangement. Essence of the research is to minimize the total power procurement cost for power distribution utility with a supply chain perspective. Separate research methodologies have been utilized for each phase and historical data form a Delhi-based power distribution utility for five years periods have been used. First phase deals with demand forecasting for which ARIMA model of Box-Jenkins method was applied to make estimation of demand of power for a distribution utility on intra-day basis, arranged in standard 96 slots, each of 15 minutes interval. It was discovered that demand followed a particular pattern and no single model can be used for forecasting demand for a day. In the second phase of the study a Mixed Integer Linear Programming (MILP) based cost optimization model was developed for sourcing decision related with procurement of power at optimal cost. In this phase, it was decided how much volume of power is to be purchased by the distribution utility from a particular supplier at a particular point of time under long-term agreement or from exchange at a particular cost. Volume of surplus power to be sold through exchange has also been worked out under different scenario in a particular time slot of the day. Sensitivity analysis for certain vital parameters by varying their values from (-) 5% to (+) 25%, in a slab of 5% each was carried out to study the behaviour of optimal results. News vendor model was developed for third phase and with the help of Monte-Carlo Simulation method, we have computed four optimal price-volume slabs to be used by the distribution utility for purchase of power from exchange in spot market at optimal cost.

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1. Introduction 2. Supply chain management in power sector 3. Literature review 4. Research methodology 5. Model data analysis and discussion 6. Conclusion. bibliography. Appendices.