

CHAPTER 18

FINANCE AND BUSINESS ECONOMICS

Doctoral Theses

01. AGGARWAL (Vandana)
Study of Investment and Regulatory Aspects of Deep-Sea Mining in the Indian Ocean.
Supervisors: Prof. Sanjay Sehgal and Dr. Ritesh Kumar Mishra
Th27030

Abstract

The study draws out the historical developments across techno-economic, financial, legal, political, social and environmental aspects of the marine mining sector. The three main deposits, namely, polymetallic nodules, seafloor massive sulphides, and cobalt-rich ferromanganese crusts, are of interest as they contain high grades of economically interesting metals, including precious metals, some of which greatly exceed the known land-based resources and reserves. Based on a critical assessment of the major research gaps, it carries out an empirical study to determine the economic value and financial feasibility of mining polymetallic nodules from the Indian Ocean. The oft-used cost-benefit analysis is supplemented with real options-based valuation of the investment in a marine mining venture. This greenfield industry stands at the cusp of commercial exploitation of marine nodules after four decades of ebbs and flows relating to fluctuations in metal prices. The developmental aspirations of countries and the need to secure their supplies of critical raw materials by developed countries are driving the race to carve out a more equitable share in these marine resources from the Area beyond national jurisdiction. Resource exploitation faces restrictive concerns stemming from the need to conserve the common heritage of mankind and to prevent “serious harm” to the marine environment, rich with fascinating species that habit unique ocean ecosystems. The imperatives of deploying commercially-viable, mineral-intensive but low-carbon technologies, such as for renewable energy, are spearheading the reliance on these deposits to supplement land-based resources. Metals critical for this green transition include cobalt, nickel, copper, and lithium. But, calls for a deeper understanding of carbon sequestering by seafloor sediments, the role played by living ocean-organisms in sustaining life on Earth, and the potential impacts on climate change would need to be duly reckoned when commercial-scale mining is enabled to take-off. The study finds a healthy, but as yet unfinished, development of technologies, equipment and methods required for prospecting, exploring and exploiting marine minerals. The mining system would have three sub-assemblies: a surface mining-platform, seafloor miner or collector, and an ore-lift system comprising of pipeline(s) and pump. Across the three types of minerals, the overall mining system could have similarities, but equipment could be different in conformance with their different geotechnical characteristics and distribution of resources. Alternative metallurgical processes for leaching 4-5 metals have also been developed albeit in onshore facilities. These technological advances are impressive given the early realisation that without substantial changes, terrestrial mining technologies cannot meet the emergent marine mining needs. Nodule mining techniques and processes would also markedly differ from those used in extracting marine oil and gas. Further, in light of likely

environmental impacts of mining nodules, a smaller technically-derived mine size at the licenced area could be considered economic and desirable the higher are the average nodule abundances and the smaller is the abundance variance. Regulatory certainty is a *sine qua non* for the high-risk, high-investment marine mining industry. However, under the provisions of the UN Convention on the Law of the Sea, 1982 (UNCLOS-III) and the 1994 Agreement on the Implementation of Part XI, regulations have been issued by the International Seabed Authority (ISA) for prospecting and exploration, separately for the three types of deposits. In order to fill the regulatory gap for mining these resources, the ISA has issued the Draft Regulations on Exploitation of Mineral Resources in the Area in March 2019, or the Draft Mining Code. This study critically examines its conceptual underpinnings and the main provisions that are proposed to be codified in terms of the objectives of the matter. The complex interplay between conflicting provisions contained in various international laws and regulations and also the domestic laws enacted by various countries is drawn out observing that these will influence the finalisation of the Mining Code. Specific concerns for India and the stance that could be taken in the consultations being held in the ISA have been attempted to be drawn out and rationalised. The issues arising for the associated standards and guidelines are also examined. As per its revised schedule of work, the consultation by ISA on the proposed draft provisions on mining are to conclude by mid-year 2023.

Contents

1. Introduction 2. Overview of the development of the deep-sea mining system 3. Review of literature 4. Legal and regulatory aspects 5. Estimation of critical inputs for exploitation (Cost benefit analysis) 6. Valuation framework 7. Summary, conclusion and policy suggestions. References. Appendix.

02. KASANA (Shrishty)

Outward Climate Change on Small and Marginal Farmers: An Analysis of Wheat Crop of Uttar Pradesh, India.

Supervisors: Prof. Yamini Gupt and Dr. Amarnath Tripathi
Th27031

Abstract

This research work has been conducted at the district level of Uttar Pradesh instead of state as a whole because some of the districts might be experiencing high rainfall/ temperature, however, other districts might be experiencing deficient rainfall/temperature and aggregating the data may not be an appropriate step. For secondary data analysis, the current study is based on a long time span (118 year). It also attempts to generate detailed and authentic primary survey based data on the impact of climate change on the farmers of the district-Ghaziabad and Baghpat; their perceptions of these changes and their impact and related adaptations. The outcome of this research work will assist policy makers and stakeholders to access the objective of the future's agricultural policy, namely maintaining a certain level of rural income. Government farm policies and farm research programs will be based on how much crop yield and variability is getting affected due to climate change, thus observation made by this study will help the state government. Research findings from the current research work highlight the necessity to commence appropriate policy actions to make Uttar Pradesh agriculture resilient to climate change.

Contents

1. Agriculture, wheat crop and climatic features in Uttar Pradesh 2. Review of literature 3. Trends in climate and non-climate variables on wheat yield in Uttar Pradesh 5. Farmers perception of climate change, its associated risks and adaptation techniques 6. Summary and policy implications. Appendices. References.

03. KHANNA (Pooja)
Outward Foreign Direct Investment: An Assessment for India.
 Supervisor: Prof. Ananya Ghosh Dastidar
Th26659

Abstract

In the Indian context, outward investment has become one of the key mechanisms of Indian entities to globalize their operations. Following the economic reforms in 1991, India's outward investment increased in the 1990's and surged in the consecutive decades. India's share in global FDI outflows increased from 0.0 percent in 1990 to 1.42 in 2020, while its share in developing countries' outflows was up from 0.05 percent to 2.98 percent and from 0.5 percent to 2.93 percent in the Asian countries for the same period. OFDI is expected to benefit home firms through linkages in foreign countries (learning by doing hypothesis). However, evidence also points out that these effects on firms' performance can work in both directions, depending on factors such as nature and motive of investment, host country's level of development, characteristics of the investing multinational firms and others. Recent trends in Indian OFDI, indicate that outbound investments from India have undergone a considerable change not only in terms of magnitude but also in terms of regional concentration and sectoral composition. Therefore, it is important to do an in-depth analysis of recent trends and determinants of outward FDI and a sound empirical assessment to get a better understanding of the effects of outward FDI on domestic firms. These constitute the three objectives of this study. The first objective of the study is characterising Indian OFDI to assess the overall trend patterns in outward foreign direct investment from India for the period. Furthermore, in the wake of the current Covid-19 pandemic, it also becomes important to analyse its effects on Indian OFDI. Therefore, short run Covid-19 effect on overall and sectoral Indian OFDI flows is also assessed This is done through extensive data analysis and statistical tests at an aggregate level using data from UNCTAD, for the period 1991-2020 and at a sectoral level for the period 2008-2020, using the data from RBI dataset. The **second objective** is to identify the macroeconomic determinants of Indian OFDI for the period 1991-2019. Macroeconomic and policy related factors such as level of economic development, inflows of FDI, trade openness, human capital, exchange rate and corporate tax rate are assessed as determinants of Indian OFDI in this study using Granger Causality framework. Finally, the third objective of the study is to empirically investigate the impact of outward investment on performance of Indian manufacturing and services sector firms where, the performance indicators were total factor productivity, R&D intensity, export intensity and sales (revenue) for manufacturing and services sector firms for the period 2008/09 to 2018/19. For the third objective of impact evaluation, data on Indian firms investing abroad from 2008/09 to 2018/2019 is compiled from RBI. Data on firm specific characteristics is obtained from Prowess database. Data from the two sources is then compiled by matching the names of outward investing firms from RBI to the firms' data obtained from prowess. This dataset of matched firms is used for impact evaluation study. Before carrying out the final objective of impact

evaluation, for the set of matched firms, total factor productivity has to be estimated as it is one of the firms' performance indicators. Using a Cobb- Douglas Production Function, total factor productivity is estimated for the Indian manufacturing sector and the services sector firms employing the semiparametric, Levinsohn-Petrin (L-P) technique for the period 2008-09 to 2018-19. Data for firm specific variables for estimating TFP has been obtained from Prowess database. The impact evaluation study to estimate OFDI effects on performance of Indian manufacturing and services sector firms is done by employing Average Treatment Effect on Treated (ATT) using Propensity Score Matching-Difference in Difference (PSM-DID) estimator. Results show that for the period 2009-2019, services sector continues to be the leading sector of overseas investment by Indian companies with its share in cumulative OFDI flows at 53.4% followed by manufacturing sector at 31.4%. Services subsector, financial insurance and business services commanded the highest share(38.5%) during the years 2009-2019. Wholly owned subsidiaries (WOS's) continue to be the preferred mode of entry for Indian firms globally as compared to joint ventures (JV's), with their share in cumulative outflows at 75% and 25% respectively. Destination patterns for Indian OFDI reveal that Indian global overseas investments are chiefly targeted to developing countries of which 22% and 18% are in Singapore and Mauritius respectively. Statistical tests reveal that India's OFDI is concentrated amongst a few large firms targeted into countries such as Mauritius, Singapore, British Virgin Islands and Cayman Islands, considered to be tax havens of the world. Investments in these tripping countries could be due to tax evasion and meant for transshipping or round tripping of capital flows into India i.e., coming back as FDI inflows.

Contents

1. Introduction 2. Emerging trends in outward foreign direct investment from India 3. Macroeconomics determinants of Indian outward foreign direct investment 4. Home country effects of outward foreign direct investment: firm level analysis 5. Estimation of total factor productivity for Indian firms 6. Impact of outward foreign direct investment on Indian manufacturing and services sector firms 7. Conclusion and policy implications. References.

04. MAGGO (Vidhi)
A Study of the Relationship between Education, Poverty and Inequality in Urban India.
 Supervisor: Prof. Yamini Gupta
Th26658

Abstract

Over the last few decades India has witnessed rapid pace of urbanisation which has increased its GDP but also confronted with twin problems: urban poverty and inequality. The existing literature suggests that education assists in reduction of poverty and inequality while poverty and inequality negatively impacts quantity and quality of education. If education does not facilitate reduction in inequality and poverty in urban India, then the educational opportunities of the future generation are likely to be jeopardised, resulting in vicious circle of education-poverty-inequality. Against this backdrop, this study investigates the nexus between education, poverty and inequality in urban India with special reference to capital city, Delhi. It employs empirical analysis on the data collected from latest NSSO rounds. This research explores the relationship between education, multidimensional poverty and inequality at the state, district and household level. The thesis reveals that education is a weapon against poverty and inequality. It plays an important role in reducing monetary and non-monetary poverty. Nonetheless, the main contribution

in reducing poverty is played by secondary and higher secondary level of education. It also emerges that education equalises inequality in income and schooling but higher level of education does not necessarily enable escape from multidimensional inequality. At a unit level, Right to Education Act proves to have a positive impact on children's school attendance and completion, but the thesis reports poverty and inequality in schooling to be the reasons for school drop-out. There may be a chance of escaping multidimensional poverty and inequality through education but this association is found to be weak for deprived households in terms of religion and caste. The thesis concludes by suggesting some policy implications drawn from the main findings of the research that can be executed in the context of urban India.

Contents

1. Introduction 2. Literature review 3. Trends in education, poverty and inequality in Urban India 4. Urbanisation and its impact on poverty and inequality in Urban India 5. Education, Urban poverty and inequality 6. Right to education and its impact on elementary school attendance and school completion in Urban India 7. Conclusion & policy implications. References. Appendix.

05. RAKHYANI (Sarika)
An Empirical Examination of Betting Against Beta Anomaly for Major Asian Markets.
 Supervisor: Prof. Sanjay Sehgal
Th27272

Abstract

According to the widely accepted Capital Asset Pricing Model, high beta stocks are expected to have higher returns. However, empirical evidence over the last five decades shows low-beta stocks outperform high-beta stocks, a phenomenon referred to as 'Betting against Beta' anomaly. The anomaly has persisted in the literature, challenging the basic premise of the risk-return trade-off. The Betting against Beta strategy suggests that buying low-beta and shorting high beta stocks can yield significant positive excess returns. Prior work has primarily focused on the United States and other European nations. In light of this, the present study empirically examines the Betting against Beta anomaly in five major Asian markets: India, China, South Korea, Japan and Indonesia, using data from January 1999 to March 2021. The thesis consists of three essays. The first essay of the thesis, titled "Does Betting against Beta (BAB) strategy work in major Asian Markets?" examines if the BAB phenomenon exists in the five major Asian markets and what drives the premiums on this strategy. The second essay of the thesis, "The Performance of Beta and other risk-based trading strategies in major Asian Markets", analyzes the performance and interaction of anomalies based on beta and four other risk measures: idiosyncratic volatility (IVOL), MAX (lottery behavior), Skewness, and Tail risk. The third essay of the thesis, "Time-varying performance of beta and other risk-based trading strategies" evaluates the conditional performance of beta and other risk-based trading strategies across two market states, Downturn and Upturn. Our findings indicate that the Betting against Beta strategy is not universally applicable, and its drivers vary across sample markets. Strategies based on components of beta outperform those based on beta. The profitability factor plays an important role in explaining BAB premiums. Beta and other risk measures are observed to be non-overlapping in nature. Different risk-based trading strategies are successful in different markets. The performance of risk-based trading strategies is conditional on time with exception of skewness. Thus, conditional performance is more relevant for strategy design than their unconditional performance. The Fama French 5 factor

model performs fairly well in explaining the time-varying return premiums except in case of three strategies. The over performance of these three strategies can be attributed to various behavioral biases exhibited by both retail and institutional investors. The next ten years might go down as the Asian decade, where these economies warrant a more prominent place in many global portfolios. Thus, the present study is relevant for investors and contributes to the existing body of knowledge on beta anomaly in the financial literature.

Contents

1. Introduction 2. Review of literature 3. Does Betting against Beta Strategy Work in Major Asian Markets? 4. Time performance of Beta and other risk based strategies in Major Asian markets 5. Time varying performance of beta and other risk based strategies 6. Summary and concluding remarks. References. Definitions.

06. SACHDEVA (Ishita)

Policy Instruments to Achieve Energy Efficiency: A Case Study Approach India.

Supervisors: Prof. Yamini Gupt and Prof. Purnamita Dasgupta

Th27032

Abstract

India is undergoing periods of rapid economic activity and is experiencing a corresponding increase in energy demand. Consumption of energy has been expanding across sectors at a Combined annual growth rate (CAGR) of 5.3% every year since the 2000s (Vishwanathan et al., 2017). In contrast, the total production of energy sources (including a composite of coal, lignite, crude oil, natural gas, and electricity) has expanded annually by 0.04% between 2018-19 and 2019-20. As per the current figures reported by Energy Statistics, 2021 published by Central Statistical Office, the country's per capita energy consumption stands at 24,206 mega joules in the year 2019-20, up from 19,669 mega joules in 2011-12, whereas the current production of energy sources stands at 15,311 peta joules in 2019-20. Further expansion in this demand is likely on account of the country's recent policy emphasis to cover unelectrified households with electricity under the Pradhan Mantri Sahaj Bijli Har Ghar Yojana-Saubhagya scheme (—No free power!, 2017) and to provide and promote the use of clean cooking fuel such as Liquefied Petroleum Gas (LPG) among energy poor households under Pradhan Mantri Ujjwala Yojana (Koshy,2019). In line with the sustainable development goal SDG 7.1, “to ensure universal access to affordable, reliable and modern energy services by 2030”, the country has embarked upon an ambitious target to provide sustainable, reliable, and modern energy access to its citizens. To match the ongoing and upcoming demand, the production of electricity has increased at 7.35% compounded annually between 2010-11 and 2019-20, outpacing the production of all other energy resources, including coal (3.58%), lignite (1.23%), crude oil (-1.74%) and natural gas (-5.57%) (Energy Statistics, India, Central Statistical Office, 2021). However, the gross share of thermal-based electricity production still dominates the overall electricity production profile of the country. Energy Statistics, India published by Central Statistical Office, 2021 reports this share stands at 75.4% while the contribution of hydro, nuclear, and renewable energy sources (excluding hydro) was 11.25%, 0.03%, and 0.09%, respectively, for the provisional estimates for the year 2019-20. In the household sector, electricity is primarily used for lighting, cooling, and heating purposes, whereas Liquefied Petroleum Gas (LPG) and solid fuels are used as cooking fuels. Around two-thirds of the Indian population continue to use solid fuel to meet their cooking energy needs. The prominence of biomass as primary cooking and heating fuel remains high in rural areas (about 80%), whereas its utilization has

decreased substantially in urban areas (about 25%). The challenge with the rampant utilization of solid fuels is that they emit PM 2.5 on burning, making them a dominant source of indoor air pollution producing drastic health impacts for children and women predominantly (IEA, 2020)

Contents

1. Introduction 2. Literature review 3. Policy instruments to promote efficient Electricity Consumption: Global and National Narrative 4. Research methodology 5. Result and Findings.