

INTERNATIONAL JOURNAL OF FINANCE CASES AND RESEARCH



University Of Engineering & Management
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A Publication of



Society for Makers, Artists, RESEARCHERS and Technologists
6408 ELIZABETH Avenue SE, Auburn, Washington 98092, USA



Aims & Scope

International Journal of Finance Cases & Research is a bi-annual, peer-reviewed publication, dedicated to advancing knowledge and fostering innovation in the field of finance and business economics. It aims to serve as a platform for researchers, practitioners, and educators to contribute to the scholarly discourse, promote best practices, and facilitate practical applications in the realm of finance.

It invites the submission of high-quality management cases and research articles that span various dimensions of finance such as, asset pricing, behavioral finance, corporate finance, derivative pricing and hedging, disruptive financial models, extreme risks and insurance, financial economics, financial engineering, financial instruments, financial intermediation, financial market, financial risk management and analysis, high frequency and algorithmic trading, household finance, innovative financial services, international finance, public finance and taxation, and other relevant topics. The journal welcomes interdisciplinary research that integrates finance with other relevant disciplines such as accounting, analytics, economics, and strategy. It encourages the submission of insightful and impactful management cases that address real-world finance-related challenges confronted by organizations.

It welcomes rigorous empirical, theoretical, and methodological research articles that contribute to the advancement of knowledge in the area of finance. Submissions may explore a wide range of topics such as corporate finance, valuation, investment analysis, portfolio management, financial markets and institutions, as well as frontiers in the area of financial modeling, behavioral finance, green finance, strategic finance and decision-making in organizational contexts. It aims to publish research articles that exhibit originality, academic rigor, and practical implications.

It caters to a diverse audience, including academics, researchers, professionals, policymakers, and graduate-level students with a keen interest in finance and business economics. The journal aims to bridge the gap between theory and practice, fostering the dissemination of cutting-edge research findings and their application in real-world financial scenarios. By fostering collaboration and knowledge exchange, It contributes to the growth and development of the management professionals.

Dr. Nivedita Mandal

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Editorial

Welcome to the First Edition of INTERNATIONAL JOURNAL OF FINANCE CASES AND RESEARCH under the aegis of Smart Society USA is out. It offers the finance educators to come up with various case studies and research articles. We are looking forward to expanding the scope of the Journal to include book reviews and also conference announcements. If you are interested in contributing, please let us know.

Since the year 2020 we all have faced some unprecedented, unpredicted, and severe situation which none of us were prepared for and which has left all of us financially shattered. The Covid-19 pandemic was so abrupt that each and every sphere of human life got affected in an adverse manner. Specifically, the Financial and business sector faced the biggest challenge of reviving from where it slipped due to an uninterrupted slowdown. Financial and business sustainability became a million-dollar question which affected the Global Value Chain and the Global Supply Chain in such a manner that it slowed down the international trade sector alarmingly. As a result, the financial strategists had to align themselves according to the New Normal and come to a decision making which leads to an overall growth not only in the Financial but also in the industrial sector. A transformation has been the only solution in this situation and so International Journal of Finance Cases and Research calls for contribution from the various Finance practitioners as well as researchers in the Finance Case study domain.

Based on the above situation we would like to get full participation and contribution from authors both from academia as well as industry to throw some light on the various research work done for the financial decision making. We would welcome all kinds of creative ideas which can have positive effect on the financial sector.

We are open for any kind of suggestions and research related discussions from all to make INTERNATIONAL JOURNAL OF FINANCE CASES AND RESEARCH a success!

Dr. Nivedita Mandal

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Managing Editors



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The Great DHFL Heist: Unraveling India's Biggest Banking Scam

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Abstract:

The case study has highlighted different aspects and operations of DHFL on how they have efficiently planned and executed India's biggest banking scam of 34,000 crore rupees in 2019. Rajesh Kumar Wadhawan established DHFL, also known as "Dewan Housing Finance Ltd.", on April 11, 1984, in Mumbai, India. DHFL was established to make house loans more accessible to lower- and middle-class residents of India's rural and semi-urban areas. By making face-to-face pledges to give house loans to deserving people, it has been discovered that DHFL has amassed millions of dollars in money and loans from the market. However, the main stakeholders and supporters of DHFL moved all the money onto Shell company accounts that don't even exist in reality and spent it all to increase their riches.

Keywords:

Manuscript submitted: 17 April 2023, Accepted for publication: 01 December 2023

Introduction

Every individual in this world dreams about having their own house to spend their entire life and create beautiful memories with their family. To fulfill this dream and generate a great business in the Indian market DHFL was formed by Rajesh Kumar Wadhawan as Non-banking Finance Corporation. The company used to lend money from different banks at lower interest rates and provide that money to different people of low-income and medium income category people of

rural and semi-urban areas of India as a Home Loan. The Scam came into the news when the company started to default all their dues by the end of July 2019. This case study would highlight. The discussion of India's biggest Banking fraud by DHFL the people of India have ever witnessed.

History of DHFL

DHFL also known as "*Dewan Housing Finance Ltd.*" was founded by Rajesh Kumar Wadhawan on 11th April 1984 in Mumbai, India. DHFL was founded to provide lower- and middle-income populations in rural and semi-urban areas of India with access to affordable home financing. In the year 2010 DHFL "*Deutsche Postbank Home Finance*" company with a business deal of 1,079 crore rupees and later after 3 years, they also acquired "*Pramerica Life Insurance Ltd.*" by buying their 74% shares on 18th December 2013. Everything was running smoothly for the company until a big allegation was raised against the company where an investigating journalist highlighted a huge *baking scam of 34,000 crore rupees*. On 29th January 2019, *Cobrapost, an Indian Journalist Group* published that DHFL is using various *Shell companies (Fake companies)* to siphon 34,000 crore rupees of public money. It has been highlighted that DHFL is doing this huge financial manipulation for the personal gains of the organisational primary stakeholders *Kapil Wadhawan, Aruna Wadhawan and Dheeraj Wadhawan*. Cobrapost also mentioned unethical political donations worth crores of rupees that were made in violation of Section 182 of the Companies Act of 2013 for political donations in that same article.

Issues

The case is structured to achieve the following objectives of the case study:

- To observe the organizational operations and working business model of DHFL that helped them to conduct India's biggest financial Scam in 2019.
- To understand how DHFL has been able to conduct India's biggest Banking Scam.

- To identify the aspects and people that played a major role in the 34,000 crore money laundering of DHFL
- To observe the reasons and negative impact of this financial scam by DHFL

Business Model of DHFL

DHFL is an NBFC which is also known as “*Non-banking Finance Corporation*” where they used to provide housing loans to the lower- and middle-income category people of rural and semi-urban locations of India. To provide loans and generate business DHFL used to take big loans from different 17 banks like *PNB*, *SBI* and *Yes Bank* at a very low interest rate even sometimes less than 7% interest rates. Later the company used to provide housing loans to its customers with interest rates between 9 to 12% to generate business income in the process. Even to increase the organisational values and to maintain proper liquidity to provide more loans to other people DHFL used to raise funds from the market in the form of public bonds and debenture like any other company. The process of providing loans to DHFL was very simple where the first step was the loan request of the customers, then the second step was all the collected loan requests were transferred to the organisational database for final checking, sorting and verification. After the complete verification and selection of the loan requests, they were transferred approval committee of the company for the final procedure.

Identification of the Issue

From 2019 to 2020, a huge problem of liquidity or cash crunch was identified in “*Yes Bank*” and “*Punjab and Maharashtra Cooperative Bank*” when their account holders were unable to withdraw money from their bank accounts. Because of this reason, both these banks came under the supervision of *RBI (Reserve Bank of India)*. From the investigation, it has been found that there is a strong personal relationship between the top primary stakeholder of these banks and the Wadhawan family. Later on, it has been found that due to personal relationships, the

Wadhawan family scammed crores of rupees from those banks for personal gain. The involvement of RBI and strict financial investigation later highlighted the biggest banking scam of India when DHFL defaults the interest payment of their 960 crore rupees loan in May 2019 and then started to default all repayments

Biggest Banking Scam of India by DHFL

When DHFL failed to pay the interest on their loan of 960 crore rupees in May 2019, they gave an excuse for liquidity issues in the company which will be solved within a few weeks. But the reality was by the end of July 2019, the company started to default on all its loan and interest dues they took from different banks. Since the company failed to meet their many repayments, all the depositors started to take legal action against DHFL. But the biggest issue was raised for the company, when Union Bank launched a complaint to CBI against DHFL on 30th November 2021. They raised questions on DHFL that they have given loans of 14,000 crore rupees to many under projects that do not even exist in real life. Soon after that KPMG released a report which stated that all 14,000 crore rupees were transferred to 66 different companies out of which 25 companies did not have any proper address, operational identity or business revenues. More importantly, it has been identified that all the investments were done intentionally where DHFL transferred all their money to those Shell companies that existed only on paper and belong to different tax-free countries. The actual banking fraud was stated in the year 2012 when DHFL took crores of loans from 17 banks using their strong *Debt credibility* and *Business or political connections*. To take a huge amount of loan using strong connections, the company had shown fake housing loan documentation and orders. But all the money was transferred to the primary stakeholder and promoters of the company in the name of a new branch of DHFL in Bandra (Mumbai). Later the entire money was transferred to more than 2,60,000 fake loan accounts just to showcase fake money transactions in the book of accounts. Later all the money was withdrawn by the primary stakeholders where most of the

money was invested in the Real Estate businesses remaining of them were transferred to different foreign business accounts. Even after many financial manipulation and repayment defaults DHFL managed to get the best credit rating till the year 2019 when *the Pradhan Mantri Awas Yojna* scheme of the central government also played a significant role. In the year 2015 when the central government launched *Pradhan Mantri Awas Yojna (PMAY)* to provide affordable houses to needy people of India. To make this scheme successful Government used to contact different banks and the banks used to give permission and loans to DHFL even with interest subsidies. But all the loan money was used by primary stakeholders and promoters of the company for their personal use, not by the people. The company not only scammed the banks and broke the trust of their customers but also harmed the financial wealth of their retail investors who invested their hard-earned money in DHFL. Many people and retail investors who invested their money in DHFL stocks, Debentures and Bonds not only lost all their money but also could not retain their investments. When the entire financial scam was revealed in front of everyone, Kapil Wadhawan was arrested for *the "Prevention of Money Laundering Act, 2002"* on 21st January 2020. But due to strong political connections and networks, the bail of Kapil Wadhawan was approved by the Mumbai High Court on 22nd February 2020. However, *PCHFL* also known as "*Piramal Capital & Housing Finance Ltd.*" acquired DHFL on 30th September 2021 and settled most of their banking dues worth more than 34,000 crore rupees by the end of 2021. But still, DHFL neither could retain its reputation and market trust nor even tried to return the hard-earned money of their retail investors who trusted them once.

Conclusion

From the above discussion and analysis, it is concluded that DHFL stakeholder has efficiently manipulated many banks and their retail investors to generate crores of wealth for their gains. The company took crores of funds and loans from the market by showcasing face promises of providing home loans to needy people. But primary stakeholders and promoters of DHFL transferred all the money into the accounts of Shell companies that don't even exist in real life and used all the money to develop personal wealth. Being a NBFC the company used to play a significant role in the middle man where they used to take loans from 17 banks at lower interest rates and later use that money to provide home loans to people to generate profit. It was very easy for them to manipulate the use of money and play with the trust of banks, their retail investors and customers which led to India's biggest banking scam of 34,000 crore rupees.

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Impact of Russia-Ukraine War on Indian Oil Industry

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Introduction

Russia is the world's third largest oil producer behind the United States and Saudi Arabia. In January 2022, Russia's total oil production was 11.3 mb/d, of which 10 mb/d was crude oil. The country's oil industry is dominated by state-owned company Rosneft, as well as other major players such as Lukoil, flazprom Neft, and Surgutneftegas. India and Russia have had a long-standing relationship in the oil industry, which has been strengthened over the years. Russia is a major producer of crude oil and natural gas, while India is one of the world's largest consumers of oil.

The two countries have signed several agreements in the oil and gas sector, including the Sakhalin-I project in which India's ONfIC Videsh has a 20% stake. The project has been producing oil since 2005 and has been a major source of energy for India.

Another significant agreement between India and Russia is the Far East LNfl project, which aims to develop a natural gas field in the Russian Far East and supply liquefied natural gas (LNfl) to India. The project is expected to enhance India's energy security by diversifying its sources of natural gas.

India and Russia have also been cooperating in the development of oil and gas pipelines. The two countries have been working on the North-South Transport Corridor, which is a multi-modal transportation system connecting India, Iran, and Russia. The relationship between India and Russia in the oil industry has been mutually beneficial and is likely to continue to grow in the future.

India and Ukraine have some relations in the oil industry, but they are not extensive. Ukraine is a major oil-producing country and has significant oil reserves, while India is a major oil importer and consumer.



Russian Ukrainian Conflict

One area of cooperation between the two countries in the oil industry is in exploration and production. Indian companies such as ONfIC Videsh have invested in oil and gas exploration in Ukraine. In 2016, ONfIC Videsh signed a production sharing agreement with Ukrainian state-owned company Ukr flasVydobuvannya for exploring hydrocarbons in two blocks in Ukraine.

Another area of cooperation is in the import of crude oil. Ukraine has been exporting crude oil to India in small quantities, although this is not a major source of oil for India. In 2020-21, India imported 0.35 million tons of crude oil from Ukraine, which is a small fraction of India's total crude oil imports. Overall, the relationship between India and Ukraine in the oil industry is limited

ONSET OF RUSSIA-UKRAINE WAR

By air, land, and sea, Russia has launched a devastating attack on Ukraine, a European democracy of 44 million people. Its forces are bombing city centres and closing in on the capital, Kyiv, prompting a mass exodus of refugees.

For months, President Vladimir Putin denied he would invade his neighbour, but then he tore up a peace deal and unleashed what flermany calls “Putin’s war”, pouring forces into Ukraine’s north, east, and south talk about the background and the various factors which led to war-like situations.



STABLE RELATION OF RUSSIA-UKRAINE IN 2000s

Russia and Ukraine were part of the USSR since its formation. But various factors, like florbachev’s policies and the internal conflicts due to diversity in culture, led to the disintegration of the USSR in the year 1991 and hence, Ukraine and Russia broke apart in this dissolution of the USSR only. This was looked upon as a great opportunity by NATO, as headed by the US, to

include the members of the earlier existing USSR into NATO, hence giving a boost to its support and power.

Russia and Ukraine had a pretty stable and flourishing relationship even after disintegration. Russia helped Ukraine to flourish especially in economic and military terms. All the fighter airplanes like the MiG-21 and military tanks and equipment were manufactured in Ukraine by Russia. The Chernobyl plant, where a nuclear accident happened in the year 1986, was set up by Russia in the city of Pripjat, near Ukraine's capital Kyiv. There are still pretty strong cultural ties between the people of Russia and Eastern Ukraine. After signing the Non-Proliferation Treaty, Ukraine gave all its nuclear bombs and implements to Russia, which would have changed the current position of Ukraine in the current issue if those implements were still under its control.

CRACKS STARTED TO APPEAR BETWEEN RUSSIA & UKRAINE

Things were pretty stable in Ukraine till 2014. In 2010, Viktor Yanukovich became the president. As a pro-Russian, he staunchly opposed the policy decision to make Ukraine a member of the European Union as the members of European Union usually joined NATO afterwards, under the influence of the US. During Viktor's presidency, the cultural ties with Russia consolidated. But the decision to not let Ukraine become a member of the EU fuelled widespread opposition against the pro-Russian president and hence, he lost the presidential elections of 2014. But the newly formed government was strongly in favour of getting Ukraine membership of the EU which antagonized the Russia, who wanted Ukraine to stay aloof from the influence of the US. As a result, Russia invaded Ukraine in 2014, it happened when pro-Putin separatists captured major swaths of eastern Ukraine. Russia also annexed Crimea at that time, which helped Russia to increase its influence in the Black Sea region. Russia was removed from the G8 group as a result of this annexation, thus forming G7.

Russia and Ukraine signed the Minsk peace accord in the year 2015, to stop the lethal military war which was going on in east Ukraine at that time. As the military war continued, Russia announced that it will send “peacekeepers” to the region.

According to Ukraine, Moscow exploited it as a pretext to annex Ukraine’s sovereign territory.

In the year 2017, Ukraine pressed a policy decision stating its willingness to join NATO. Article 5 of NATO Treaty states, “The Parties agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all.”, which meant that the armies of all the members, majorly that of US could enter Ukraine, which could have been misused by the US, to attack its major enemy Russia. Thus, Russia would have become highly vulnerable to attacks by the US, if Ukraine joined NATO and it would have costed a great deal to the National Security of Russia.

THE WAR

On 24 February 2022, Russia invaded and occupied parts of Ukraine in a major escalation of the Russo-Ukrainian War, which began in 2014. The invasion has resulted in tens of thousands of deaths on both sides and instigated Europe's largest refugee crisis since World War II. About 8 million Ukrainians were displaced within their country by June, and more than 8.1 million had fled the country by March 2023.

After the Revolution of Dignity in 2014, Russia annexed Crimea and Russian-backed paramilitaries seized parts of Ukraine's Donbas region, sparking a regional war.

Throughout 2021 there were massive Russian military build-ups near Ukraine's borders, but Russian officials denied plans to attack Ukraine up to the day before the invasion. On 21 February 2022, Russia officially recognized the Donetsk and Luhansk republics, the two Russian- controlled quasi-states in the Donbas. The next day, the Federation Council of Russia authorized the use of military force and Russian soldiers entered both territories. The invasion

began the morning of 24 February 2022 upon Russian president Vladimir Putin's announcement of a "special military operation" seeking the "demilitarization" and "demassification" of Ukraine. In his address, Putin espoused irredentist views, challenged Ukraine's right to statehood, and falsely claimed that Ukraine was governed by neo-Nazis who persecuted the ethnic Russian minority. Minutes later, Russian air strikes and a ground invasion were launched along a northern front from Belarus towards Kyiv, a north-eastern front towards Kharkiv, a southern front from Crimea, and a south-eastern front from Donetsk and Luhansk. In response, Ukrainian president Volodymyr Zelenskyy enacted martial law and a general mobilization

CONSEQUENCES OF WAR

At least 368,000 people have now fled Ukraine into Poland and other neighboring countries in the wake of Russia's invasion, the UN refugee agency said on Sunday.

On the battlefield, Ukraine's military claimed on Monday that Russia had suffered "significant losses," including 150 tanks, 700 armored vehicles and 26 helicopters.

For its part, Russia claimed on Sunday that it has hit more than 1,000 Ukrainian military targets since the invasion began. The "destroyed targets" include 27 command posts, 38 S-300 Buk M-1 and Osa air defense missile systems as well as 56 radars.

The world's largest plane, the Antonov AN- 225, has been destroyed during the Russian invasion of Ukraine, according to Ukrainian officials, generating alarm and sadness among the aviation world in which it occupies almost cult status.

The loss of civilian life is still not enumerated so far. The loss of civilian life is a heavy one as Russian forces are dropping Aerial Bombs on the building in civilian areas as well as various tanks are being used by the military to cause damage. It can be stated that "It was always the poor grass that suffered most when two kings went to war".



IMPACT ON GLOBAL SCALE

The Russia-Ukraine war has had a significant impact on the global oil market.

Supply Disruptions: The conflict has the potential to disrupt oil supplies from Russia and Ukraine, both major oil-producing countries. Disruptions can arise due to damage to infrastructure, geopolitical tensions, or trade restrictions. Any reduction in oil supply can create uncertainty and volatility in the global market.

Oil Price Volatility: The Russia-Ukraine conflict has contributed to oil price volatility. Uncertainty surrounding the conflict, geopolitical tensions, and supply concerns can cause fluctuations in oil prices. Escalation of the conflict or any incidents affecting major oil-producing regions can lead to sharp price movements.

Energy Security Concerns: The conflict highlights energy security concerns for countries heavily reliant on Russian and Ukrainian oil. European nations, in particular, are significant importers of Russian oil and gas. Geopolitical tensions and disruptions in supplies raise questions about the stability and reliability of energy sources, prompting countries to diversify their energy portfolios.

Sanctions and Trade Restrictions: The conflict has led to the imposition of economic sanctions and trade restrictions on Russia by Western nations. Sanctions targeting the energy sector can

impact Russia's oil exports, investment in production infrastructure, and access to technology. These measures aim to exert economic pressure and influence Russia's actions.

Market Sentiment and Investor Confidence: Geopolitical conflicts such as the Russia-Ukraine war can undermine market sentiment and investor confidence. Uncertainty surrounding the conflict's resolution and its potential impact on global stability can lead to cautious investor behavior, affecting financial markets and investment decisions.

Global Economic Impact: The interconnectedness of the global economy means that disruptions in the oil market can have widespread economic implications. Higher oil prices can increase production costs for businesses and transportation costs for consumers, leading to inflationary pressures. Industries reliant on oil, such as aviation and shipping, may face operational challenges and increased costs.

IMPACT ON INDIAN ECONOMY

India has good trade relations with both Russia and Ukraine. Consequently, the ongoing war between them will negatively impact the Indian economy. It might experience another setback after the coronavirus pandemic if the geopolitical crisis worsens further.

The Sensex began the tradeoff with a whopping loss of 1,800 points. The Sectoral indices are trading in red with the realty, IT, telecom, and metal and auto stocks with a loss of up to 4%. Further, Tata Motor traded with a loss of 6%, TCS with 2.86%, RIL with 3.5%, and HDFC Bank with 2.85%.

The small-cap index sloughed 4.27% because of the hefty losses in the segment. The small-cap index funds are investment vehicles offering investors returns that reflect the index performance of stocks alongside capitalizations of the small market. Companies falling under the small-cap category generally have market caps ranging from around \$300 million to \$2 billion.

The rising concern amongst the Russian- Ukraine situation has pushed the Indian markets into the correction genre. Typically, the correction in the stock market refers to a drop of 10% in stocks from their recent-most peak. Moreover, there is a declination of 20% in NASDAQ from its peak

After World war-II ends in 1945, Russia- Ukraine conflict is probably the largest traditional conflict among human history, not only in terms of days of conflict and implications of military attack causing huge loss of life, infrastructure loss, human rights violations, among others just in Ukraine and Russia, but also because of huge global economic crisis.

Having extremely significant trade, diplomacy, nuclear energy, technology, and military relations with Russia, India has taken a neutral stance, with depicting significant concerns for implications of war and calling for resolving issues through diplomacy. However, India, or any other nation in current integrated and inter-connected globalized geopolitical world, cannot remain immune from the ravages of the war.

In this study, we analyze the major impacts of war on Indian economy such as impact on Oil Prices, inflation and economic growth, energy and food crisis, as well as impact on Rupees. We also discuss the changing world order in context of the conflict.



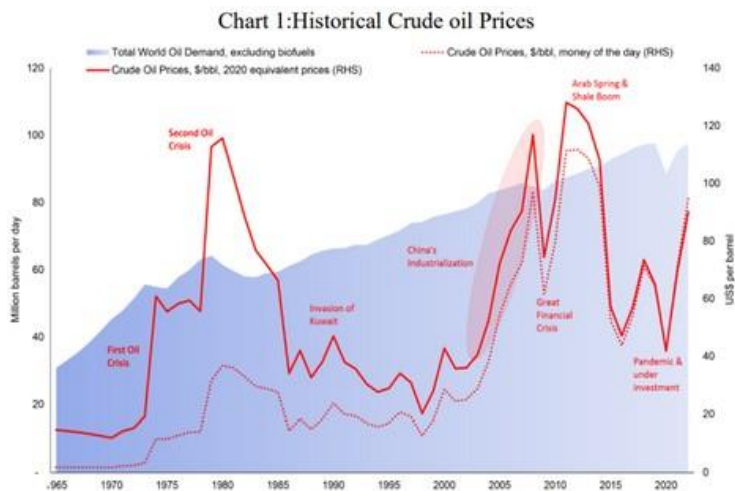
Impact on Oil Prices

A major portion of the world demand, including Indian demand, for oil is fulfilled by the Russia as it is second largest exporters of crude oil, only after Saudi Arabia. However, the Russia-Ukraine war has raised the global prices of Brent crude oil up to \$139 per barrel in March, which later pulled back to around \$107 per barrel. Overall, it has mounted by around 20% from around \$89 per barrel since the war started. Even the adverse impact of pandemic, the rising oil prices could further worsen the manufacturing, tourism, transportation and allied economic sectors, which in turn may create inflationary, fiscal, and external sector crisis in the Indian economy. On the other hand, the Russian oil prices also fell down from its pre-war level, due to sanctions and boycott of Russia by US and several European economies. In order to understand the impact of conflict on Brent crude oil prices is from the past experience.

ICICI securities noted that with an expected 60% of the world restricting trade with , Russia, world oil-crude supply is to reduce by 3 mmbd keeping Brent crude price above \$100 per barrel for much of fy2022. India imports around 85% of its demand for oil, and crude oil related products have a direct share of over 9% in WPI basket.

Report by Bank of Baroda Chief Economist Madan Sabnavis, a 10% rise in crude would approximately increase WPI inflation by around 0.9%, raising the baseline expected WPI to around 11.5-12% for fy2022.

On the other hand, every \$1 per barrel increase in oil prices is also expected to raise petroleum prices by 60-70 paise per liter in retail fuel prices, Page 5 of 13 leading the rise in proportion of oil imports in India's total imports to around 25.8%, which is expected to swell further. Moreover, a 10% hike in oil prices is expected to increase India's CAD by US\$15bn (around 0.4% of GDP) worsening trade deficit. Escalated fuel prices is also expected to reduce consumption directly, which was already affected by pandemic, reducing PFCE to Rs. 80-81 lakh crore in 2021-2022 from 83.22 lakh crore in 2019-20.



Source: Rystad Energy Research and Analysis, OMCube, March 2022

Inflation and Economic Growth

While COVID shock affected both demand and supply thus the net impact was on the real fIDP however, Russia-Ukraine war creates a supply shock for the Indian economy. As per a report by financial express Indian manufacturers, with the beginning of verbal assault and expectations of war, have increased the prices of goods in January and early February 2022, well before the actual war started. The oil sector of the economy is deteriorated as a 10% increase in crude oil is likely to increase inflation by 30 basis points. The net impact on inflation could turn to be more structural and complex as high oil prices might create a pass-through impact on other sectors. Conflict has increased the world prices for most of the consumer commodities, with deepened impact on edible oils, wheat and grains, fertilizers, gas, crude oil, and metals.

Rising Inflation has also created significant hindrances and uncertainties for the economic growth in India, forcing the expected fIDP growth to be around only 7.8%-9% in fy 2022 from the expected double-digit growth. During the past few decades, India and Ukraine have strong education ties, especially in the medical and engineering fields, which is also severely affected as Indian citizens have returned in view of the conflict.

Chart 2: Inflation indices in India



Source: Adapted by Author using data from MoSPI, trading Economics

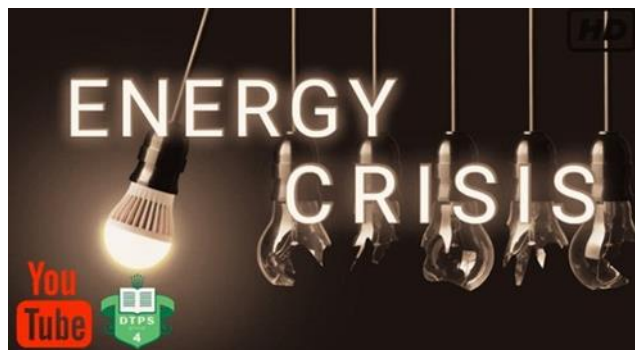
Energy Crisis

The real extent of shock is much larger for the real economy as the rate of inflation of fuel prices is much greater than the inflation of crude oil prices, which is significant for framing monetary policies. A report by Bloomberg states that though crude oil is being traded at around \$100 per barrel however, for people not owning oil refinery the real impact on economy is larger as if the crude oil is being traded between \$150 and \$275 per barrel. This is due to the fact that real economy mostly buys refined petroleum products such as petrol, diesel, jet-fuel etc., rather than the crude oil which is majorly purchased only by the oil refineries. Typically, inflation of Brent crude oil and petroleum product move in a symmetrical manner with difference lying in a small markup of around \$10 per barrel, however, this relationship is broken due to the conflict. In world market, Diesel is being traded at about \$170 per barrel whereas petrol is being traded at \$150 per barrel, primarily due to explosion of refining margin. This, in turn, happened due to the following factors:

- High demand-supply gap of petrol and diesel.
- US and allied nations released large amount of Crude oil from their strategic reserves, which helped in controlling oil prices, however only a small fraction of emergency release was in the form of refined products and thus have not addressed rising prices of refined products.

- Russia was a major exporter of not only the crude oil but also of diesel and semi-processed oil that were turned into fuel by western refineries. However, sanctions and unilateral embargos of Russian oil has dried this flow in the international market.
- Outside China and Middle East, oil distillation capacity reduced by 1.9 billion barrels a day since end of 2019 and refining plants in the international market are suffering to process enough crude to satisfy world demand for fuel. In addition to sanctions, this is also set off as old refineries struggle to compete, as well as increased cost due to environmental regulations, expectation of future decline in oil demand, fall in demand due to covid, among others, resulting in huge shut down of refinery operations between 2020-2022 in US and Europe.

This has benefitted the independent oil refineries with unusual very-high profit margins. This has also increased the share prices of U.S. refining giants Marathon Petroleum Corp. and Valero Energy Corp., to a record high and ultimately, has caused a serious shock to the energy sector of India and the international economy.



Global Food Crisis

Retail and wholesale food inflation is also rising in India, with most recent data indicating WPI food and CPI food reaching to 10.33% and 5.43%. Russia and Ukraine supply around 30% of global wheat exports which has fallen due to the conflict and subsequently, bid has risen for

acquiring the wheat and agriproducts such as maize, rice and soy, adversely impacting poor. India, as emerging major wheat supplier, is attempting to boost exports of wheat however is severely constrained by shortage of fertilizers. Russia and Belarus produced 40% of international exports of fertilizers and pesticides per year, which is also fallen due to conflict impacting the harvest capacity in India and rest of the world. This along with droughts, floods and heat invigorated by climate change have increased the Wheat and maize prices in March 2022 much above than their respective 14-year records. IPES (International Panel of Experts on Sustainable Food Systems) noted that due to climate change widespread absolute poverty, and conflicts between the nations, the global food security is under serious risk of crisis, which in turn would result substantially high prices for medium to long run, unless appropriate actions are taken. Along with the shortage of wheat and grains due to lack of supply from Russia and Ukraine, the food prices are also driven up by artificially inflating prices as investors and financial speculators jumped into grain futures, before even conflict started in expectations of future profits. In an open interconnected world economy, small changes in expectations can lead to huge impact in the real economy. This has impacted India as well, creating a persistence pressure of food inflation and threatening India with a potential shortage of food supply especially for Wheat, edible oils and grains and may extend to poultry, milk and other dairy products.



Depreciating Currency

Indian Rupees, along with other currencies, are under serious threat of very high volatility due to Russia-Ukraine conflict. Uncertainty and risk facing INR also risen because of current account deficit with rising oil prices as well as sanctions imposed on Russia. Uncertainties related to the currency and economy in general, especially after pandemic, has also shaken the confidence of the investors which may further depreciate rupees as investors take their capital out of Indian economy.

As India follows managed exchange rate system, a direct approach for RBI is through releasing some part of record high stock of foreign exchange of around \$598 billion, to control the depreciation of currency and reduce import bills. Falling rupees will further exacerbate the inflation as per RBI's calculations, with almost every 5% depreciation in the rupees contributes roughly 10-5 basis points to inflation. The worst impact will be on the people under below poverty line.



Chart 3: Rupees valuation and Foreign Ex stock in India



Source: BS research Bureau, Bloomberg, RBI

Conclusion

First Corona and then, Russia-Ukraine conflict have accelerated an ongoing shift in rebalancing of the power. With medium-term to long run consequences of infrastructural and other destruction in Ukraine and Russia; humanitarian, security and food crisis in Europe and US; geostrategic pressures face by Japan, China, India and South Asian economies; huge economic turmoil in Sri Lanka whose impacts are expected to remain for at least medium run, the world order is again recalibrating. In order to recreate a sphere of their influence and for opposition of expansion of western militia power such as NATO; as well as to create a buffer region for their own security, Russia have attempted to destroy the Ukrainian military infrastructure, create a space for their military forces and enhance control over the black sea.

However, as Russia-Ukraine conflict continues, and Ukraine getting economical and military support from the western economy, sanctions and subsequent isolation of Russia in interconnected world, these ambitions are improbable to fulfill. However, both Russian and Ukraine economies are expected to bear a long run cost of this conflict. On the other hand, through continuous hostility towards Russia for over two decades, struggle to reclaim their influence over the world, providing military support, aid, assistance and advice to Ukraine and other economies following anti-Russian sentiments since 2014, adherence to difference between narrative of democracy vs authoritarianism, US economy has also created a situation of economic stress for themselves, as they face high oil price volatility, food grain shortage, disruptions in supply chain, economic stagflation, among other disruptions. Thus, in a bid to grab the control, power has been shifting from both the fronts and in his “Interim National Security Strategic fluidance” document, in March 2021, Biden also declared that global dynamics have evolved in which US needs to restore its strategic edge. The first step was withdrawing army from middle east, in order to emphasis more on expanding NATO and on trade war with China and strategic war with Russia, which US considers as major dual targets against his influence. With majority of public and world support, US strategist are convinced that the conflict

will weaken Russia for a long time, as mounting world sanctions on Russia and its intensities is stressing Russian economy and forcing it to move inwards and closed atleast for a time.. Moreover, with disruptions in the supply chain due to imposed sanctions, US economy is also hoping to again emerge as the major manufacturing sector of the world while forming an international alliance against Russia that could assist its long-run strategic competition. For this, US is unwilling to allow neutral, non-aligned powers like India, or multipolar world dynamics like BRICS in order to form a unilateral alliance. Indian stance of neutrality, avoiding sanctions on Russia especially for trade in defense and crude oil, abstentions during voting in security councils and UN resolutions have garnered huge pressure from US and allied nations, calling Indian position a bit “shaky”. However, India is forced to uphold a neutral position in order to continue cooperation with time-tested partner Russia with whom India maintains defense, hydrocarbon, fertilizers, and trade relations in other commodities, and especially dependent for defense sector and arms trade. On the other hand, India needs to enhance and continue relations with its new partner US, especially given its turmoil with Pakistan and China. Meanwhile, this war also threatens to create the potential for reviving conventional and hybrid warfare, as well as initiative to enhance nuclear capabilities.

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Monetary Policy and the Dilemma of Self-Respect in India

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Abstract

The case deals with the famous conflict between the ministry of finance and the governor of RBI regarding formation of monetary policies in Indian context. Although such conflicts have been occurring for quite a long period of time but it became quite an issue during August-September, 2016 when a famous economist, despite working immensely well as a governor, was not renewed for another tenure. The root cause of such a decision was thought to be his conflict with the finance ministry as well as with the Prime Minister. We have made an attempt to explain the behavioural attitude of both the parties and looked to capture their behaviour by the help of a game theoretic approach.

Key Words: Monetary Policy, Game theory, Self-respect

The Case: Introduction

We can have multiple uses of game theory and at the same time throw some light on the debate between Ministry of Finance or even Prime-Minister with the Governor of Reserve Bank of India. The long-standing debate between the role of RBI's governor and Ministry of Finance regarding formulation of effective monetary policy in India is a well-known phenomenon. RBI, if not every time, had well qualified, well renowned economists as its Governor. All the governors played their parts in the formulation of effective monetary policies that has taken the nation ahead. It is to be remembered that the post of RBI's governor is for a period of three years. But there are multiple examples of Governors who have served for more than three years or even less than that. India also got good economists as its finance minister, especially in the post-liberalization era. But, intervention of ministry of finance started to be heard of every time regarding the formation of monetary policies but such facts never took the shape of any big issue till 2016.¹

A famous economist took charge of the RBI's governor in September 2013. This person, being a well renowned economist worldwide, earned immense popularity by correctly predicting the Economic Recession of 2008-2009 and held other prestigious positions in world famous institutes. India, on the other hand, after three decades of multi-party coalition governments, formed its first single party government in 2014 with the Prime Minister, being projected as a 'Hero' by the ruling party and viewed by millions of people, was supposed to solve all sorts of problems the nation was going through, including the economic ones.

The Governor, during tough times, served really well and helped the Indian economy to perform exceptionally well in so many monetary and social aspects, since monetary policies do bear deep impact on all the economic activities. But, again the problem of intervention started to come from the Ministry of Finance and even from Prime Minister's office as they tried to impose their policies on RBI. On the other hand, the government initiated many social projects related to monetary aspects that tasted success on ground reality. So, government wished to enjoy its advantages as policies by the Prime Ministers whereas the RBI believed it was the outcome their

effective monetary policies that had brought prosperity and stability in economy. Such controversies regarding the successes of various social as well as monetary policies, every now and then, started to appear in the news. Every now and then,

1 Since this is a real case, names of the protagonists are not used.

it was heard that the Governor denied to accept Government's recommendations or partially accepted it and maintained his dominance in the formulation of policies. Even on few cases, the Governor had criticized Government's policies and workings.

As the time went on, the tenure of the RBI Governor neared its end, demand came up from parts of the society to extend it, for his excellence service and his eligibility as the best suited person for that post at that time. Another part of the society was of the view that there was no need to extend his tenure, as any other Governor would serve equally well like him under the guidance of Ministry of Finance and the Prime Minister himself. So, a battle of trustworthiness versus self-respect had developed gradually but surely. Both thought they knew the economy well which was right and both thought they could serve it better than the other.

On 26th June, 2016, the Governor announced that he does not want to serve another tenure as the Governor, that is, after finishing the first one in September, 2016, nor the Government asked him to do so, though there were appeals from different parts of the society on behalf of his continuation. Ultimately, the Governor served only one tenure and quitted in September, 2016.

A huge part of population was shocked and perplexed as the Government did not offer him a second tenure. Many were shocked that the Governor did not join hands with the government and did not succumb to the demands of the government for the sake of such a prestigious position. We may apply game theory to find a surprising answer of this jostling between the two as well as understand various aspects of the usefulness of this tool. We know that both the persons were at two poles regarding few decisions and were proud of themselves as well as

stubborn, in nature. So, let us begin by considering the pay-off matrix of monetary policy before the Governor was not retained.

Faced with “command” from the Finance Ministry and Prime Minister’s office to implement their recommendations in the monetary policy, the Governor could do either one of the two things – concede to the Government or not give way. Similarly, the Government had two options to deal with the obdurate, headstrong Governor – either not renew his tenure or keep him.

For the sake of keeping the game simple, we rank the preferences of the possible outcomes from worst to best and assign the respective pay-offs the numbers of 1 to 4. The Governor had made it clear that he had no intention of accepting government’s recommendations in

monetary policies, unless he believed it was good enough for the nation. So, the worst outcome for him was to concede but then not be retained, so this outcome would have a payoff of 1 for him. The second worst outcome was to concede and be retained for another tenure but then his self-respect would have been pounded and the independence of the Reserve Bank would have been compromised. The third worst outcome was not to concede and also not be retained. Though he might lose his position, he might still maintain his integrity and coming years could prove his stances were much better. Governor’s strongest preference would have been not to concede as well as be retained for another tenure. This outcome would have a pay-off of 4 for him. This would mean he had defeated the Finance Ministry and the Prime Minister in the two-way gamesmanship.

Meanwhile, the worst outcome for the Prime Minister would be for the Governor to defy his commands but be retained as the Central Bank Governor. This outcome would have the pay-off of 1. The second worst option for the Governor to go for a negotiation but for the PM not to retain him, in order to avoid any future problem. The third worst scenario for the P.M. was not to retain him for his insubordination. P.M.’s highest preference would be for the Governor to fully agree with his demands so that he would not have to get rid of him and retain him for another tenure. This would have the pay-off of 4.

Questions

- 1) Describe the type of Game that is involved in the above situation.
- 2) Draw a game tree of the situation with appropriate payoffs.
- 3) By using the Backward induction method, analyze the game tree and discuss the results observed.
- 4) Is there any Nash Equilibrium in this game? Find out, if any.
- 5) Which strategy would have benefitted the nation most?

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Renewable Energy Sector: NHPC's Journey

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Introduction

NHPC's journey in the renewable energy sector and explore its major projects, challenges faced, and the strategies implemented for sustainable growth. NHPC Limited (formerly known as National Hydroelectric Power Corporation) is an Indian government-owned company that is engaged in the development, construction, and operation of hydroelectric power plants. Established in 1975, NHPC has played a significant role in the growth of the hydroelectric power sector in India. In this case study, we will analyze NHPC's journey in the renewable energy sector and explore its major projects, challenges faced, and the strategies implemented for sustainable growth.

Background & Overview

INHPC operates as a mini-ratna category-I public sector undertaking (PSU) under the Ministry of Power, Government of India. The company's primary objective is to develop and promote hydroelectric power as a sustainable and eco-friendly source of energy. NHPC has a diverse portfolio of projects, including run-of-the-river, storage, and pumped storage hydropower plants.

Major Projects and Achievements

NHPC has undertaken several significant projects across India. One notable project is the Subansiri Lower Hydroelectric Project, located in Arunachal Pradesh. It is a 2,000 MW project that aims to harness the hydroelectric potential of the Subansiri River. The project is expected to generate substantial renewable energy and contribute to the region's economic development. Another noteworthy project is the Teesta Low Dam Project, situated in West Bengal and Sikkim. With an installed capacity of 1,200 MW, this run-of-the-river project has been successful in harnessing the hydroelectric potential of the Teesta River and providing clean energy to the region.

Challenges Faced

NHPC has encountered several challenges throughout its journey. One of the significant challenges is the environmental and social impact of large-scale hydroelectric projects. These projects often involve the displacement of local communities and can have adverse effects on ecosystems and biodiversity. NHPC has taken steps to address these concerns through comprehensive environmental impact assessments and the implementation of mitigation measures. Another challenge faced by NHPC is the geological complexity of project sites. Hydroelectric projects require a thorough understanding of geological conditions to ensure the safety and longevity of the infrastructure. NHPC has employed advanced geological exploration techniques and engaged with experts to overcome these challenges.

Strategies for Sustainable Growth:

NHPC has adopted various strategies to ensure sustainable growth and overcome the challenges faced. Some key strategies include:

a) **Stakeholder Engagement:**

NHPC recognizes the importance of engaging with local communities, government bodies, and other stakeholders. The company promotes dialogue, consultations, and participatory approaches to address concerns, enhance transparency, and build trust.

b) **Environmental Sustainability:**

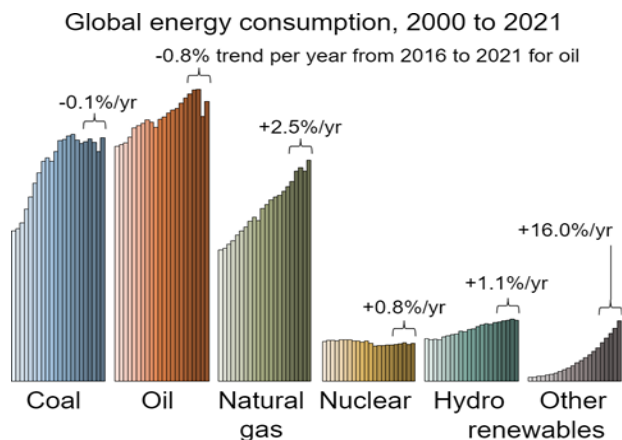
NHPC focuses on incorporating environmental sustainability into its project planning and operations. It follows international best practices, conducts environmental impact assessments, and implements measures to minimize ecological disruption and promote biodiversity conservation.

c) Technological Advancements:

NHPC embraces technological advancements to improve project efficiency, safety, and reliability. It invests in modern equipment, adopts advanced construction techniques, and explores innovative solutions for efficient power generation and transmission.

d) Diversification:

NHPC has been actively diversifying its portfolio beyond hydroelectric power. The company has entered into solar power projects and is exploring other renewable energy sources to adapt to evolving market dynamics and contribute to India's renewable energy goals.



Conclusion

NHPC Limited has emerged as a key player in India's hydroelectric power sector. Through its major projects, sustainable practices, and stakeholder engagement initiatives, NHPC has demonstrated its commitment to clean energy generation while addressing environmental and

social challenges. With its focus on technological advancements and diversification into other renewable energy sources, NHPC is well- positioned to contribute significantly to India's energy transition and sustainable development goals.

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Rising Against Bears: The Dhirubhai Ambani Story [Dhirubhai Ambani Vs Bear cartel - 1982 Case Study]

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Abstract:

The 1982 case study has highlighted the rivalry between the Reliance Industry's CEO of Late Dhirubhai Ambani and Manu Manik's bear cartel of the Indian Stock Exchange. How the bear cartel targeted the company and affected the share value of Reliance Industry through short selling has been showcased. On the other hand, what moves and strategies were used by Dhirubhai Ambani to turn the table of this game and defeat the bear cartel in their strategy and plan discussed with complete justification and analysis.

Introduction

The case study is about one of the biggest business rivalries between Dhirubhai Ambani, the Bear Cartel of Kolkata, and the Bombay Stock Exchange in the early 80s. With the growing business market and huge reputation reliance Industry introduced its first IPO in October 1977. The company issued 2.8 million equity shares at 10 rupees each, and then it often obtained funds by selling convertible debentures to its retail investors. In a very less time, the price of Reliance

shares went up to 50 rupees by the end of 1980 which again massively increased to 186 rupees per share by the end of 1982. The problem occurred when the bear cartel of the stock exchange decided to short-sell their shares to generate higher profits and bring down the price of Reliance shares.

Issues

The case is structured to achieve the following objectives of the case study:

- To understand the conflict that occurred between Dhirubhai Ambani and the Bear cartel of the stock exchange.
- To evaluate the dark sides of Indian stock exchange activities and the biggest business rivalry that occurred in the early 80s.
- To identify the activities of the bear cartel and their impact on the valuation and performance of Reliance Industry Ltd.
- To observe the checkmate business strategies and moves of Dhirubhai Ambani from the case study.

Reliance Industry Ltd.

Dhirubhai Ambani founded Reliance Commercial Corporation in 1958 as a side business trading goods, mostly spices and polyester yarn. The partnership expired in 1965, and Dhirubhai carried on the company's polyester business. In Maharashtra, Reliance Textile Industries Pvt. Ltd. was established in 1966. In the same year, it opened a plant for synthetic textiles in Gujarat's Naroda. It changed its name to Reliance Industries Limited on May 8, 1973. The business entered the textile industry in 1975, and “Vimal” went on to become its flagship brand. Mumbai serves as the home base for the Indian global corporation Reliance Industries Limited. Energy, petrochemicals, natural gas, retail, telecommunications, mass media, and textiles are some of its industries. By market capitalisation, sales, and ranking as the 100th largest firm globally, Reliance is the biggest publicly traded corporation in India. It accounts for 7% of all goods exported from India and is the largest private taxpayer and exporter.

Short Selling and Bear cartel activities in the case study

"Bears" are a group of investors that actively bet against the market and seek to benefit from declining stock prices to generate higher profits. These investors often use short selling of organisational shares to boo profit when stock prices fall. In the course of stock exchange operations, short selling and betting against the market are frequent practices and are not illegal or unethical. In the year 1982, the bear cartel of "Manu Manek" also known as the Black Cobra of the stock market targeted the Reliance industry to short-sell their shares at very high quantities to earn huge profits and bring down the share value of the company. Along with the bear cartel of the Bombay Stock Exchange (BSE), a bear cartel of the Kolkata stock exchange also joined the master plan of Manu Manek.

Reliance Industry Ltd. vs Bear Cartel

In the year 1977 Reliance Industries issued 2.8 million equity shares in the stock market at the rate of 10 rupees each which significantly increased to 50 rupees by the end of 1978. With the increasing valuation and business of Reliance Industries soon the stock price of the company increased to 104 rupees per share by the end of 1980. Since the trust of investors and the reputation of the company, were very strong, the renowned "Black Cobra" bear Manu Manek decided to short-sell the shares of the company. Since many retail investors in India and foreign investors were investing in Reliance, the bear cartel saw an opportunity to manipulate the stock market by short-selling. To do that, the bear cartel of Manu Manek sold more than 3.5 lakh shares in the market through short selling. As a result the share price of Reliance Industries negatively went down to 121 rupees per share in just two days. Due to this massive fall of the company in the stock market, the confidence and trust of investors also reduced over the period. After a while when the price of Reliance shares again started to go up, the bear cartel again

targeted the company to short-sell more shares and generate more profits and bring down the company in the ground.

Chanakkyaniti of Dhirubhai Ambani

Dhirubhai Ambani is not only known for his humble and great nature but also known for his great business strategies and market knowledge. Before the stock market manipulation by the bear cartel, the financial performance of Reliance shares was growing at a significant rate. With a huge increase in share value, the company had provided more than 300% returns to its retail investors just within 4 years. To defeat the bear cartel in their own game, Dhirubhai Ambani gathered all his trustworthy NRI investors from West Asian countries to buy back all the Reliance shares from the market. This move not only brought a huge buying wave in the stock market but also created a huge supply shortage of Reliance shares. Due to the huge Reliance share shortage in the market, the demand for the company shares went massively high and the Indian stock market stopped their activities for a few days. The demand for the stock was so huge that the value of existing in the market increased to more than 20% in 1984. Since the main motivation of the bear cartel was to generate profit by short-selling the shares, Dhirubhai Ambani strictly ordered his collaborators and investors not to sell a single share of the company. Because of that the bear cartel of the stock market had to face huge pressure to get the company shares as their delivery was near and they had no shares of that company. Since the bear cartel was unable to provide shares to the NRI investors, they requested them to extend the delivery date and here comes another big move of Dhirubhai Ambani and his right hand Anand Jain. The buyers agreed to extend their delivery date but with a condition of “Unda Badla”. Because the sellers were not able to provide Reliance shares on the promised date, they had to pay additional 25 rupees as a premium on each share. This move by Dhirubhai Ambani completely broke the financial stability and power of the bear cartel. The bear cartel has only two options either they deliver the shares on the extended date with an additional premium of 25 rupees on each which could make many

sellers bankrupt or somehow they manage to get Reliance shares at a higher price to deliver on the previously promised date for settlement.

Conclusion

Since the entire master plan was set by Dhirubhai Ambani himself, no one could identify him in the entire game. The bear cartel went to Dhirubhai Ambani and requested to release some shares in the market so they can sell and complete their booked order. Then the investor of Dhirubhai Ambani sold the reliance shares at a higher market price to the bear cartel so they can complete their share order. This move not only showed them who is the real business and strategic king in the market but also showed them the Chanakya Niti of the late Dhirubhai Ambani.

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VISION-The Journal of Business Perspective· Vol. 14·No.4· October-December 2010



An Analysis on Financial Problems due to Exports faced by Coir Industries in India

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Abstract

Coir is a natural product which is biodegradable as well as environment friendly and poses no threat to the nature after its waste are disposed off in the ground. Fibre is extracted from coconut husk and various types of traditional products are made from coir fibre or yarn. Recently, there are some innovative uses of coir products in preventing soil erosion and irrigational purposes as the water content in coir are very high. This paper tries to analyse the production and export data from 2009-10 to 2019-20 and focuses on whether there is a correlation between production and export of coir products in the same year. It also tries to find out the YOY percentage growth in production and export of coir from 2009-10 to 2019-20. Based on the export data available in this time period, a linear trend analysis has been studied for the next six years from 2021 to 2027. It also analyses the percentage of coir produced during a particular period are exported. The study finds out the relationship between the employability and the production of coir in any particular year from 2009-10 to 2018-19. The reasons for major challenges of the coir industry have been studied.

Keywords:- Coir, coir fibre, coir industry, export of coir

Introduction

Coir is one of the oldest industries in India and was first setup-in Alleppi in Kerala in the year 1859 and later the development of coir industry is mainly in the areas where there is a concentration of coconut trees as India has a vast sea coast and the cultivation of coconut and the coir industries are mainly located in the states like Kerala, Tamil-Nadu, Karnataka, Andhra Pradesh, Orissa, West-Bengal, Tripura, Assam, Pondicherry, Union territories of Lakshadweep and Andaman. Coconut husks are the main raw materials for this industry which is extracted from the waste of coconut.

Coir industry is one of the key sectors in MSME because it is a labour intensive industry and provides employment to around seven lakhs of people mainly from rural India who do not need to be displaced from rural area to urban India for finding jobs. It is one of the world's biggest producers and exporters of coir fibre products. Another important aspect of this industry is that it provides employment to the backward sections of the society amongst which 80% are women. Some of the key importers of coir products are China, USA, Netherlands, South Korea, and England. Coir industry is one of the major sector in the MSME and produces around 80% of the world's coir fibre production generating employment to the rural India for around seven lakh people of India majority of whom are from the backward sections of the society and out of which 80% are women. [1]

Coir is one of the most labour intensive agro-based cottage industry generating employment to the rural people and also its main attractions are it is export oriented. The main traditional coir products are door mats, floor mats, brooms, everyday use brush, string ropes, fishing nets. Some of the modern uses of coir for insulation in construction companies as coco coir has tremendous property of good temperature management. It is also used for irrigation purposes and other gardening purposes as it has a good water retention capacity. It is also used for vehicle seats in automobile industries. Some other uses of coir fibres are in soil erosion control purposes on the river banks, hilly areas in a large scale.

India has been the world's largest coir exporter and some of the major countries are China, USA, South Korea, Spain, Italy and Netherlands[2]. There are a few countries which also exports coir products like Phillipines, Srilanka etc. which are not as big exporters as India is but, they had diversified their product mix and had captured international markets with their value added products better than India, which still have much value added product[3] i.e. coconut- copra, coconut-oil.

Though this industry is quite old in terms of production, and is also one of the largest exporters of the world, still a lot of problems remains with the industry. There is lack of adequate training facilities of the workers and the entrepreneurs, thus implementation of newer technologies are beyond the reach of most of the coir units in India. There is lack of awareness among the entrepreneurs about the financing schemes that are available for this industry and many entrepreneurs find getting finances as one of the main challenges.

Literature Review:-

S.Sitarasu(2020)has pointed out how India has been the major exporter of coir products in the world and China is one of its main importers. The author has analysed the performance of the coir sector from 2013-19 and also mentions that the ministry of MSME has been promoting the sector including khadi, village and coir sector and is providing support to the existing enterprises through technology and also providing support to the new industries.

Chandra SekharMund(2020) has brought into light the hindrances that this sector faces and particularly in getting finances. Though CGTMSE plays an important role in providing adequate finances in India, still there are many hindrances and this sector is not getting adequate finances and in time.

K Praveen Kumar and Vinanyagamoorthi (2017) had studied the various schemes for coir development and analysed the production and export of coir products and highlighted the problems faced by the manufacturers because of lack of awareness of the government schemes and the advantages and challenges of this industry.

S. Poornimadevi (2017) studied the problems faced by coir industries and found out in the study that one of the major problems in the coir industry is not focusing on the value addition and diversification of product mix which are the demands by importing countries.

Singh and Wasdani(2016, ADBI) has studied the key challenges faced by MSMEs in procuring financing during different phases of their lifecycle. It further studied the financial awareness of the entrepreneurs and found out that one of the key limitations are underutilisation of collateral assets.

S.Sarkar and A.Sana (2013) studied the problems of coir industry particularly in West Bengal inspite of the fact that Bengal being one of the most important coconut producing states. This study finds out several problems that are faced by this industry in Bengal amongst which are financing problems, lack of marketing of coir products, problems in availability of quality raw-material, trained man power and lack of use of modern technologies.

E.Sambasivan and S. Vennilaashree (2018) studied the support of the government to the coir board, activities of the coir board, different schemes available, research and development in coir technology and domestic and export market promotion of coir board. The study also pointed out the challenges faced by the entrepreneurs.

Objectives of the Study

- 1.To find out whether there is correlation between increase in production and increase in export growth in a particular year
- 2.To find out a linear trend analysis for the next five years from April 2021 to March 2026.
- 3.To find out whether there is YOY growth in production and export in coir industries.
- 4.To find out what percentage of production is exported in that year
- 5.To find out the correlation between increase in production of coir products and in total employment in that year.
- 6.To find out the problems associated with this industry.

Scope of Study

The scope of the study is limited to secondary data from different websites, magazines and journals.

The data for 2021-2022, i.e. the current year of study is not available.

Methodology

The study is primarily based on secondary data and the qualitative literature survey method and annual reports of coir industries, export data of coir industries, publications of coir board and different websites of MSME annual report. Linear trend, Karl Pearson's correlation and relation between production of coir in any year and export of coir in the same year has been shown using Microsoft excel. The research is both descriptive and analytical in nature and thus descriptive research design has been used.

Analysis

- i. The study aims to find out whether there has been any correlation between the production of coir and export of coir in the same year- it has been found out that there is a strong positive correlation between the two is (since correlation is 0.675069988).
- ii. A linear trend analysis on export of coir products has been estimated for six consecutive years from April 2021 to March 2027 based on the data available on export of coir products from 2009-10 both in terms of quantity (in metric tonnes) and value (in terms of rupees). Table 1 below shows that there has been a rise in both export quantity and value since 2009-10 till March 2020. Since April 2021 export quantity has declined significantly from 1163213 metric tonnes to 248187.736 metric tonnes. The value of export also declined from Rs. 377897.91 lakhs to Rs. 52517.42 lakhs. One of the main reasons may be the arrival of Covid 19 pandemic and subsequently lockdown in whole of India for more than 50 days. The linear trend from April 2021 shows that both the export quantity and value is likely to increase from 2021 onwards till 2027.

Table 1:- Linear trend on production (in metric tonnes) and export (In terms of rupees in lakhs) of coir products in India from 2021 to 2027.

iii. The Table 2 below shows a comparative chart on percentage of growth of production and export of coir from 2009-2019 on YoYbasis. It shows that there is a rise in export if there is even a marginal increase in production and also decline in export growth if there is decline in production% except in 2010-11 and 2018-19. In 2010-11, there has been a negative growth in production (-1.751424351%) compared to 2009-10, but there is a substantial positive growth in export (9.000737161%). Again in 2018-19, though there has been a growth in production (33.99858246%) there has been a decline in export percentage (-5.166226622.) which means that there has been an increase in domestic consumption.

Table 2:- Percentage of growth in production and export of coir YOY,(Source:- Coir board report, MSME, Government of India)

I. Table 3 below shows what percentage of production is exported in that year from 2008-09 to 2019-20. There has been a constant increase in export percentage from 2009-10 till 2017-18 up from 24.85% to 75.84% except 2018-19 when there is a substantial dip in percentage growth of export on production of that year (down from 75.84 % to 53.67%). The reason behind it is that though there has been a substantial increase in percentage of production of coir in 2018-19 compared to 2017-18, there is an increase in domestic consumption which has resulted in decline of percentage of export in that year.

Table 3:- Percentage of production that is exported in the same year (Source:- Coir board report, MSME, Government of India)

II. Correlation between production of coir (in metric tonnes) and employment shows that there is a high positive correlation i.e. 0.71099903 between these two variables. Table 4 below

shows that whenever there is an increase in production of coir, there is subsequent increase in employment of people associated with coir industry and vice-versa.

Table 4:- Percentage of production that is exported in the same year (Source:- Coir board report, MSME, Government of India)

Problems of Coir Industry

Lack of modernization of the traditional units:- Due to lack of modernization of machinery and other tools, it affects the mass production of coir products and thus affects domestic consumption and exports.[4]

Non-availability of good quality raw-material:- The basic raw-material for production of coir yarn, coir fibre etc.requires good quality coconut husk. Non-availability, shortage and high cost of such good quality coconut husk is a concern for the entrepreneurs across India.[5] [6]

Lack of government support towards marketing and promotion towards the industry:- Though this industry is quite old and has good demands in both domestic and foreign markets, India has not been able to grow because of lack of government support for the promotion of coir products. [7]

Hindrances in getting finance:- There are problems in getting finance for the industry. Whatever finance is received, most of the time it is not adequate to modernize or upgrade the machineries needed for mass-scale production of coir.[8]

Shortage of workers, lack of training and dependence on mostly unskilled workers:- Most of the workers in the coir industry are unskilled, and thus the modern techniques cannot be implemented. Also, the shortage of labourers is due to meagre pay and thus the workers migrate to 100 days works of Central Government and other programmes.

Lack of infrastructure like storage of raw-materials and finished products- There is lack of infrastructure for storage of raw-materials. Raw-materials which are exposed to nature tend to

degrade in quality over a period of time and cannot be used to produce good quality coir fibre or yarn.

Use of obsolete techniques and absence of research and development:- Most of the units depend on the traditional method of producing coir and uses obsolete technology for coir production. This affects the production of coir and hampers the export.

Lack of awareness about the government schemes available to the entrepreneurs in this industry:- Rural India has most of the coir industries. These people have little access to the R&D programme, training programmes or the schemes that the government organizes.

Lack of vision of entrepreneurs for scaling up the production for future:-Most of the entrepreneurs are happy with their earnings from coir industry and they lack the vision in making the coir industry better and competitive for future.

Suggestions

Government of India and the coir board should have more awareness programme to educate the people regarding the training and development and financial schemes that are available to them.

Conclusion:-Though there has been a lot of prospects in the coir industry regarding the production and export, there are quite a few challenges regarding the training and development of entrepreneurs and workers, innovation in production and thus minimization of wastage, problems in finding finances, lack of diversification of product mix and value addition to the products in an innovative way, in equal pay among the genders, lack of basic infrastructure at workplace, are to name a few problems which the industry has to overcome in order to maintain its leadership in export market in future.

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Does financial literacy improve firm performance in India?

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Abstract

The paper attempts to find out how different types of financial literacy (general, specific and aggregate) and other explanatory variables (profile of entrepreneurs and enterprise) improve the performance of the MSEs in the state of Punjab, India. The data was collected from 309 entrepreneurs using a structured questionnaire. Using Ordered Logit model this study found that all types of financial literacy have a positive and significant effect on performances of the MSEs. It was also found that education of the entrepreneur, along with their financial literacy, increases firm's performance significantly. Furthermore, problems of marketing, production and human resource have a significant negative influence on the level of the performances of the firm. The findings of the present study provide entrepreneurs of MSEs and policymakers with insights to design appropriate strategies and measures to boost the performance of MSEs through financial literacy.

Keywords: Financial Literacy, Entrepreneurs, MSEs, Performance

INTRODUCTION

Micro and Small Enterprises (MSEs) are the pillars of emerging economies with respect to economic development, sustainability, employability, and business integration. Globally, they represent around 90 percent of ventures and above 70 percent of employment. MSEs engaged in the formal sector contribute up to 40 percent of national income in developing countries (United Nations, 2021). In Indian context, this sector accounts for 30 percent to Gross Domestic Product (GDP), contributes 48 percent of the total exports (India Brand Equity Foundation, 2020) and projects a growth rate of 12.88 percent (Government of India, 2021). However, statistics reveal that 20 percent of small ventures fail in year of their incorporation, 30 percent in second year, 50 percent after five years and 70 percent of MSEs fail in their tenth year of their operation (McIntyre, 2018). This sector has been struggling with the numerous challenges such as shortage of required credit, lack of access to new technology, poor marketing platform (Mukherjee, 2018), paucity of digital support, deficient literacy, insufficient formal procedure and discipline, scarcity of financial resources, lack of talented Human Resource and dearth of experience of using consultants (Atkinson, 2017).

Key seminal studies depict that inadequate financial literacy acts as a hinderance in the growth and development of MSEs which avert them to procure timely funds from the financial institutions (Karadag, 2018). Therefore, this problem can be overcome by enhancing the level of financial literacy among the MSE entrepreneurs (Nasr and Rostom, 2013).

Financial Literacy

A strong financial foundation of MSEs entrepreneurs is a crucial indicator for the success and expansion of the enterprise. Lusardi and Mitchell (2009) defined financial literacy as “the knowledge of basic financial concepts and ability to do simple calculations”. A widely accepted comprehensive definition of financial literacy has been apprehended by Organisation for Economic Co-operation and Development (OECD) as “knowledge and understanding of

financial concepts and risks, and the skills, motivation and confidence to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life” (OECD, 2014). According to Ali et al.(2018)“financial knowledge is the ability to manage financial matters”.Likewise, Atkinson and Messy (2012) described financial literacy as “a combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing”.Further, Carlin and Robinson (2012)comprehended financial literacy as “the ability to make financial decisions in their own best short-and long- term interests.”

Karadag, (2018)stated that lack of financial literacy among the entrepreneurs creates a problem of accessing finance in emerging economies. Also the low level of financial literacy is a problem in understanding/assessing different sources of financing provision, for navigating loan application procedure (Eniola andEntebang, 2017), in utilisation of financial services, record keeping, monitoring profit/loss and cash management practices (Barte, 2012), maintenance of proper financial statements(DahmenandRodrigues 2014) and easy repayment of loan (Njoroge, 2013), difficulty while preparing profitability forecast, interpreting balance sheet and profit & loss account and performance variables. Hence, the literature revealed that financial literacy is one of the most prominent variableswheregovernment can interveneto endogenize in the process of growth and performance of MSEs.

India has low level of overall financial literacy in spite of initiatives taken by Government of India andReserve Bank of India. As per Global Survey by Standard and Poor’s (S & P) nearly 76 percent of Indian adults does not understand even basic concept of finance (Qazi, 2017). Also, the report published byVisa Study (2012) states that India secured 23rd position with only 35 per cent of the Indian financially literate out of total 28 nations. Similarly, according to the Global Financial Literacy Excellence Center, only 24 percent of Indian adultsare financially literate(Roy, 2020).

Therefore, this paper sets to explore the impact of financial literacy of the entrepreneurs along with other variables on the performance of the MSEs. Hence, the present paper aims:

- To assess the effect of demographic variables on the level of performance of MSEs in the state of Punjab, India.
- To examine the impact of different types of financial literacy (general, specific and aggregate) of the entrepreneurs on the performance of MSEs.
- To analyse the impact of various problems (Financial, Human Resource, Production and Marketing) on performance of MSEs.

REVIEW OF LITERATURE

Financial Literacy of Entrepreneurs

Financial literacy of the entrepreneurs is vital in order to boost up the profitability of the firm, manage finance, mitigate risk and hence improve the performance of the firm. This will help them to make more timely and sound decisions for their enterprise (Barte, 2012). Njoroge, (2013) stated that the majority of the businessmen were well-educated and understood financial concepts namely, inflation, interest rates, diversification, stock market, etc. that led to easy borrowings, risk taking, diversification, and profitable investments. Dahmen and Rodriguez (2014) found that 50 percent of entrepreneurs did not evaluate financial statements of the firm and 86 percent of such enterprises faced financial constraints. The reasons for financial scarcity were lower income, inadequate cash flow, and extravagant credit. Hence, a standardized questionnaire was developed in the present study to measure the general financial literacy (required for all financial decisions in managing the day-to-day operations) and specific financial literacy (required specifically by the entrepreneurs to manage and survive their business).

Financial Performance of MSEs

Performance of small firms is multidimensional in its nature and is typically used as a metric of measuring financial health of enterprise over a span of time. A number of parameters have also been identified by various scholars to assess the Performance of MSEs such as Profitability (gross profit margin, net profit from operations), Return on Asset (ROA), Return on Investment (ROI), Return on Equity (ROE), Return on Sales (ROS), Market Share, and Operational Efficiency (Adomako&Danson, 2014). Maduekwe and Kamala, (2016) ascertained the extent of usage of financial and non-financial performance parameters in managing their firms in the Cape Metropole. Pervan et al.(2019) advocated that age of the enterprise, labour cost, industry concentration, GDP and inflation significantly impacts the firm's profit margins. The literature showed that previous studies have used both financial and non-financial parameters to measure the performance of the firm. Since, the financial parameters are assessed objectively therefore, in the present study only financial parameters such as profitability, growth, investment, solvency and liquidity have been used to measure the level of performance of MSEs. These parameters are considered critical to measure the state of financial health of an enterprise.

Financial Literacy of Entrepreneurs and Performance of the MSEs

Financial literacy aids the entrepreneurs to understand and acquire the external funds; maintain optimum capital; manage operating cost; adequate money management; ability to attain short- and long-term loans; increase revenues and capability to meet the financial requirement. This would ultimately lead to better performance and sustainability of the MSEs. Wise, (2013) indicated that the entrepreneur's financial literacy led to maintenance of the proper financial statements and easy repayment of loans and lesser loan defaults. This resulted in the growth and survival of the ventures. Adomako and Danso (2014) confirmed that availability of financial capital played a moderating role in the relationship between financial literacy and firm performance. Thus, it can be interpreted that the financial literacy improves firm performance, particularly when the entrepreneurs were able to access finance with ease. Sabana, (2014) recommended that the entrepreneurs should improve their financial literacy in the spheres of

financial planning, budgeting, cash flow management and preparation of financial statements in order to enhance the performance of their microenterprises. However, Eresia and Raath (2013) exhibited that there was no significant relationship between owners' financial literacy and business growth. Osinde et al., (2013) discovered that individuals who attended training recorded an escalated performance with respect to sales growth and profitability. 83.3 percent respondents who attended training demonstrated fair growth in profitability in comparison to 41.2 percent of those who never attended training. Higher gross profit ratio leads to higher level of all three types of financial literacy of the entrepreneurs. In the nutshell, financial literacy aids entrepreneurs to efficiently utilised financial services (Nunoo and Andoh, 2011) and made sound financial decisions (Barte, 2012). However, the previous literature has not investigated the role of financial literacy in the performance of MSEs in the Indian context in general and specifically in the state of Punjab, thus creating a research gap. Therefore, the state of Punjab, India has been chosen in the present study. The work adds to the body of knowledge by investigating and evaluating the impact of various types of financial literacy along with other pertinent variables on the performance of MSEs first time using multivariate Ordered Logit model.

RESEARCH METHODOLOGY

Sampling Design

In the present study, entrepreneurs of MSEs registered under the Micro, Small and Enterprise Development Act, 2006 in the state of Punjab have been used for survey. The data states that 11,894 MSEs were registered in the period from 2007-08 to 2014-15 (Government of India, 2016). Hence, 375 entrepreneurs were selected using random and snowball sampling technique based on the Krejcie and Morgan, (1970) for the sample size determination using multi stage random sampling technique (Table 1 and Figure 1).

Stage I: Using Purposive Sampling, only Micro and Small Enterprises were determined because these account for 99.19 percent of the total number of registered MSMEs in the year 2015.

Stage II: By deploying Judgemental Sampling Technique, districts such as Ludhiana, Jalandhar and S.A.S. Nagar with the highest number of registered MSEs were chosen.

Stage III: The Convenience Cluster Sampling Technique was used to select three industrial areas in the main cities of the selected Districts of Ludhiana City, Jalandhar City and S.A.S. Nagar City.

Stage IV: Proportional Stratified Sampling and Snow Ball Sampling were deployed to select 375 Enterprises (282 Micro Enterprises and 93 Small Enterprises) in proportion to the registered MSEs in the selected Districts.

While,309 entrepreneurs responded with duly filled questionnaires (82.4 percent).

City	Number of Registered Micro Enterprises	Number of Registered Small Enterprises	Number of Micro Enterprises	Number of Small Enterprises
Ludhiana	5384	2008	170	63
Jalandhar	2255	564	71	18
S.A.S. Nagar	1307	376	41	12
Total	8946	2948	282	93
Total Sample	375			

Source:Government of India (2016), Department of MSMEs

Formula used to determine the sample size (Nargundkar, 2003).

$$N = p(1 - p)(Z/e)^2$$

Where,

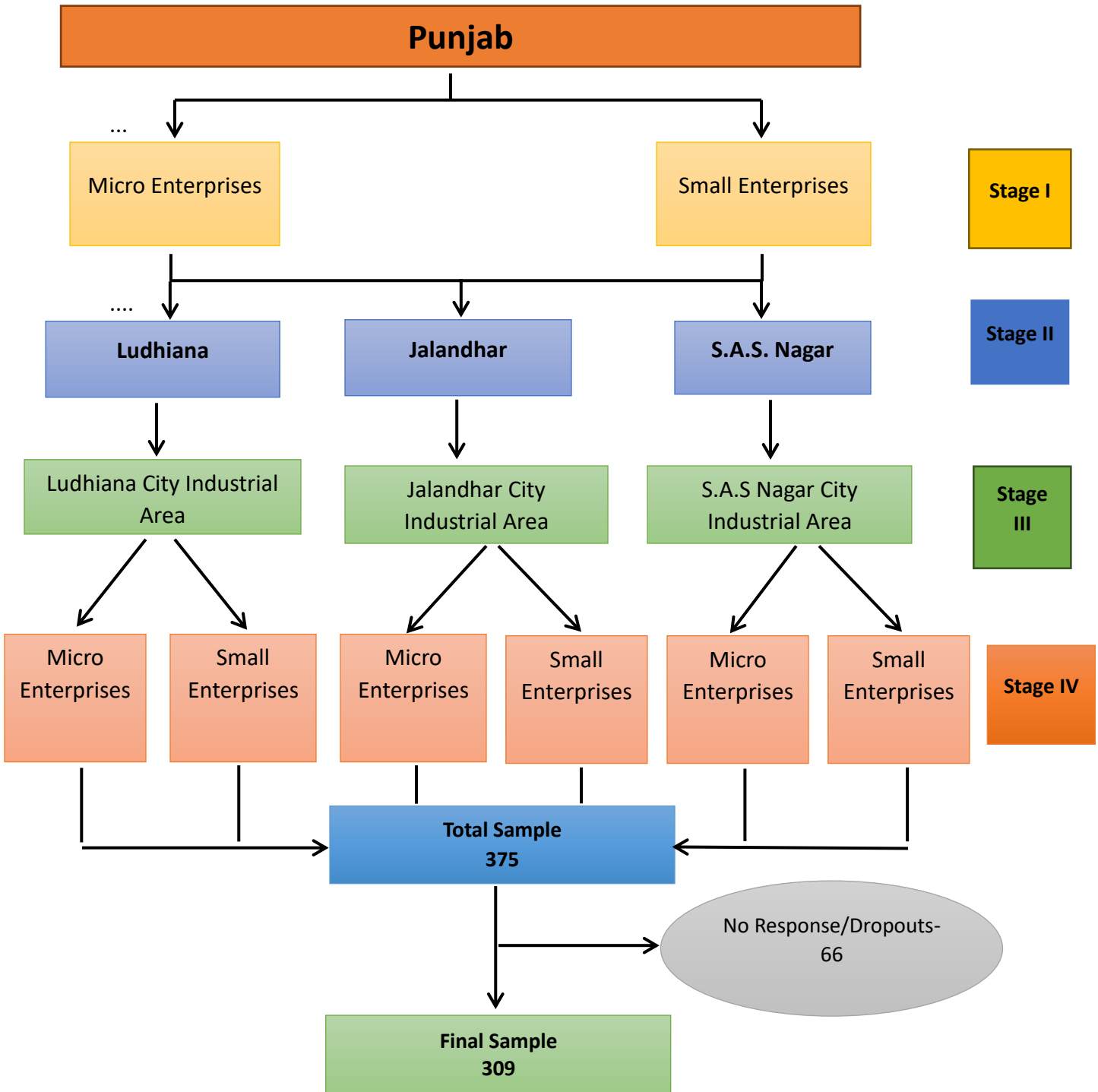
N = Sample Size

Z = Value from the standard normal distribution that depicts the confidence level (e.g., Z = 1.96 for 95 per cent has been used in the present study)

p = Frequency of occurrence of a choice expressed as proportion (0.5)

e = Desired margin of error. 0.05 has been assumed for the study

Figure 1: Sampling Procedure



Data Collection

A structured questionnaire was employed to collect used in this paper.

3.3. Statistical Techniques

In the present study, the dependent variable is ordinal in nature and therefore Ordered Logit Multivariate Regression model is most appropriate to examine the impact of various possible variables (profile of entrepreneurs and MSEs, different types of financial literacy of entrepreneurs, problems faced by MSEs) on the level of performance of MSEs.

This study estimates the following model:

$$\begin{aligned} FirmPerformances_i &= \beta_0 + \beta_1 Age_i + \beta_2 Education_i + \beta_3 Age_{Enterprise_i} + \beta_4 Dms_i \\ &+ \beta_5 Dsm_i + \beta_6 Dss_i + \beta_7 DLudhi_i + \beta_8 DJalan_i + \beta_9 Market_i \\ &+ \beta_{10} Production_i + \beta_{11} Human\ resources_i \\ &+ \beta_{12} GeneralFL\ or,\ SpecificFL\ or,\ AggregateFL_i + e_i \dots \dots (1) \end{aligned}$$

Where, = different financial performance of firm ‘i’ considered separately as dependent variable and is the random error term. Detail description and the summary statistics of variables mentioned in equation (1) is presented in table 2.

RESULTS AND DISCUSSION

Descriptive Analysis

The analysis of the data was carried out by using descriptive analysis shown in Table 2. This clearly shows that entrepreneurs of the registered MSEs are generally moderately educated. It was found that the average age of the enterprises is at 36 years which indicates that most of the enterprises are at growth stage. Other results are self explanatory.

Table2: Descriptive Analysis

Variables	Description of the Variables	Mean (\bar{x})	Standard Deviation (s)	Minimum	Maximum
Age of the Entrepreneur	Age (in years): “1”=25 and Below (51); “2”=26-35 (110); “3”=36-45 (101); “4”=46-55 (44); “5”=55 and Above (3)	35.515	9.134	19	57
Education	Education of the Entrepreneur: “1”=Matric (49); “2”= Senior Secondary (55); “3”=Professional Diploma (102); “4”=Graduate (58); “5”=Professional Degree (17) and “6”=Postgraduate (28)	3.103	1.467	1	6
Age of Enterprise	Age of the Enterprise: “1”= below 5 years (71); “2”= 5 to 10 years (134) and “3”=10 years and above (104)	2.107	0.746	1	3
Gross Profit Ratio	Gross Profit Ratio: “1”=Low; “2”=Moderate and “3”=High	1.793	0.787	1	3
Net Profit Ratio	Net Profit Ratio: “1”=Low; “2”=Moderate and “3”=High	1.576	0.692	1	3
Growth in Sales	Growth in Sales: “1”=Low; “2”=Moderate and “3”=High	1.715	0.758	1	3
Growth in Assets	Growth in Assets: “1”=Low; “2”=Moderate and “3”=High	1.618	0.727	1	3
Return on Assets	Return on Assets: “1”=Low; “2”=Moderate and “3”=High	1.576	.678	1	3
Return on Investment	Return on Investment: “1”=Low; “2”=Moderate and “3”=High	1.615	.737	1	3
Current Ratio	Current Ratio: “1”=Low; “2”=Moderate and “3”=High	1.718	.717	1	3
Debt-Equity Ratio	Debt-Equity Ratio: “1”=Low; “2”=Moderate and “3”=High	1.550	.694	1	3
GeneralFL	General Financial Literacy: (0=lowest literacy and 6=highest literacy)	4.158	1.359	1	6
SpecificFL	Specific Financial Literacy: (0=lowest literacy and 14=highest literacy)	7.588	2.607	2	13
AggregateFL	Aggregate Literacy=General Financial Literacy +Specific Financial Literacy	11.702	3.439	6	18
Financial Problems	Financial Problems: “1”=Strongly Disagree; “2”=Disagree; “3”=Neutral; “4”=Agree; “5”=Strongly Agree	4.003	0.565	1.71	5
Marketing Problems	Marketing Problems: “1”=Strongly Disagree; “2”=Disagree; “3”=Neutral; “4”=Agree; “5”=Strongly Agree	3.705	0.592	2.33	5
Production	Production Problems: “1”=Strongly Disagree;	3.585	0.576	1.67	5

Problems	“2”=Disagree;“3”=Neutral; “4”=Agree; “5”=Strongly Agree				
Human Resource Problems	Human ResourceProblems: “1”=Strongly Disagree; “2”=Disagree; “3”=Neutral; “4”=Agree; “5”=Strongly Agree	3.777	0.704	1	5
DLudhiana	In case enterprise is located in Ludhiana=1; otherwise=0	0.605	0.490	0	1
DJalandhar	In case enterprise is located inJalandhar=1; otherwise=0	0.236	0.425	0	1
DSASNagar	In case enterprise is located inS. A. S. Nagar=1; otherwise=0, (default dummy)	0.159	0.366	0	1
Dmm	In case enterprise is Micro-Manufacturing (180)=1; otherwise=0, (default dummy)	0.583	0.494	0	1
Dms	In case enterprise is Micro-Service (50)=1; otherwise 0	0.197	0.399	0	1
Dsm	In case enterprise is Small-Manufacturing (61)=1; otherwise=0	0.162	0.369	0	1
Dss	In case enterprise is Small-Service (18)=1; otherwise=0	0.058	0.235	0	1

²Gross Profit Ratio, Net Profit Ratio, Growth in Sales, Growth in Assets, Return on Assets, Return on Investment, Current Ratio, Debt-Equity Ratio

Performance of MSEs

The Ordered Logit Multivariate Regression Analysis was conducted to test the impact of profile of entrepreneurs and MSEs, financial literacy (General, Specific And Aggregate) and problems of MSEson performance of MSEs (gross profit ratio, net profit ratio, growth of sales, growth of assets, return on assets, return on investment, current ratio and debt-equity ratio).

Table 3: Financial Literacy, Gross Profit and Net Profit Ratio (estimated co-efficient from equation)

Independent Variables	Dependent Variables					
	Gross profit ratio (1)	Gross profit ratio (2)	Gross profit ratio (3)	Net profit ratio (4)	Net profit ratio (5)	Net profit ratio (6)
Age	0.0123 (0.90)	0.0117 (0.86)	0.0107 (0.77)	-0.0136 (-0.90)	-0.0108 (-0.72)	-0.0177 (-1.13)
Education	0.2108** (2.44)	0.1672* (1.90)	0.1075 (1.19)	0.2351*** (2.64)	0.1469 (1.60)	0.0392 (0.40)
Age_Enterprise	-0.4466***	-0.3393**	-0.3955**	-0.1997	0.0131	-0.0618

	(-2.63)	(-2.01)	(-2.31)	(-1.08)	(0.07)	(-0.32)
Dms	0.2992 (0.95)	0.2573 (0.81)	-0.0160 (-0.05)	-0.0361 (-0.11)	-0.2566 (-0.76)	-0.8337** (-2.26)
Dsm	-0.5140 (-1.48)	-0.4215 (-1.21)	-0.5770 (-1.61)	-0.7491* (-1.89)	-0.8837** (-2.19)	-1.2206*** (-2.80)
Dss	1.4920*** (2.67)	1.6127*** (2.73)	1.2613** (2.14)	0.3895 (0.78)	0.2693 (0.51)	-0.3159 (-0.58)
DLudhiana	-0.4105 (-1.16)	-0.3189 (-0.90)	-0.3231 (-0.89)	-0.2132 (-0.56)	-0.1607 (-0.42)	-0.0226 (-0.06)
DJalandhar	-0.3129 (-0.79)	-0.2301 (-0.58)	-0.3047 (-0.75)	-0.3125 (-0.74)	-0.1434 (-0.34)	-0.2153 (-0.48)
Marketing Problems	-0.1219 (-0.54)	-0.1282 (-0.56)	-0.1601 (-0.69)	-0.2483 (-1.03)	-0.0886 (-0.36)	-0.1977 (-0.77)
Production Problems	-0.4805* (1.80)	-0.5829** (2.16)	-0.5346* (1.96)	0.3986 (1.40)	0.5368 (1.88)	0.4755 (1.59)
Human Resource Problems	-0.5310** (-2.54)	-0.4950** (-2.33)	-0.4492** (-2.08)	-0.3741* (-1.74)	-0.3329 (-1.53)	-0.2045 (-0.89)
General FL	0.6427*** (6.09)			0.8704*** (7.29)		
Specific FL		0.3883*** (6.68)			0.5551*** (8.17)	
AggregateFL			0.3490*** (7.62)			0.5872*** (9.63)
Pseudo R-squared	0.182	0.197	0.221	0.206	0.238	0.318
LR Chi- squared	119.924***	129.503***	145.397***	120.698***	139.647***	186.637***
Note: i) Figures within parentheses represent t-statistics; ii) ***, ** and * represents the level of significance at 1 percent; 5 percent and 10 percent level respectively.						

The estimated coefficient of education (Table 3) is positive and significant for both Gross and Net Profit Ratio which indicates that higher level of education of the entrepreneur lead to the higher profits of the enterprise. Recent studies (Kolstad and Wiig, 2014; Akinyemi et al., 2017; Rajni and Mehta, 2018) have documented that educated entrepreneurs plan and manage their firms efficiently by gazing the market trends. They maintain accurate accounting records, set standards, and closely evaluate their businesses and achieve better performance. Further, age of the enterprise is significantly negative for the gross profit ratio. The reason attributed to this is as the firm grows older, the cost of production rises due to obsolete technology and production procedures, thus, reduces the profitability of the firm. Pervan et al., (2019) asserted that as age of the enterprise increases, its profitability tends to decline. Negative effect of age of enterprise on

profitability implies as a firm grows older, their areas of operations (production, logistics, quality control, etc.) obsolete and thereby increasing the operational cost and reducing the profit margins of the enterprise. However, the findings disagree with the previous study by Khaleque (2018) which stressed that older enterprises operate their ventures with more experience and a stronger financial position to execute their business that enhances their profitability. Besides this, the estimated coefficient of small-service firms is positive and significant only for Gross Profit Ratio. While the estimated coefficient of micro-service and small-manufacturing enterprises is negative significant for Net Profit Ratio. The finding accords with the result of Truventor (2021) which highlighted that, due to the small size of the enterprises, they find it difficult to get raw materials at reasonable prices thereby considerably reducing their profitability margins. On the similar lines, human resource problems negatively influence the level of both gross and net profit ratio of the firm. This indicates that human resource problems such as unavailability of talented workforce and trained management personnel will most probably reduce the profitability of the organisation. The analysis further renders that all the three types of financial literacy i.e. general, specific and aggregate has a positive and significant impact on the level of gross profit ratio and net profit ratio. This indicates that with the higher level of financial literacy, the entrepreneurs are able to manage both their income and expenses which leads to higher profits on the capital invested.

Table 4: Financial Literacy, Growth in Sales and Growth in Assets (estimated co-efficient)

Independent Variables	Dependent Variables					
	Growth in Sales (1)	Growth in Sales (2)	Growth in Sales (3)	Growth in Assets (4)	Growth in Assets (5)	Growth in Assets (6)
Age	-0.0017 (-0.13)	-0.0064 (-0.45)	-0.0100 (-0.68)	0.0247 (1.70)	0.0217 (1.46)	0.0217 (1.44)
Education	0.2074** (2.41)	0.0911 (1.01)	0.0060 (0.06)	0.0863 (1.00)	-0.0408 (-0.45)	-0.1323 (-1.38)
Age_Enterprise	-0.2480 (-1.47)	-0.0591 (-0.34)	-0.1173 (-0.65)	-0.4625*** (-2.58)	-0.2838 (-1.57)	-0.3492* (-1.88)
Dms	0.5902* (1.90)	0.4047 (1.26)	0.0542 (0.16)	0.7777** (2.43)	0.5821* (1.78)	0.2732 (0.81)
Dsm	0.1288 (0.37)	0.1871 (0.52)	0.0289 (0.08)	0.1414 (0.40)	0.1773 (0.48)	0.0523 (0.14)

Dss	1.0692** (1.99)	0.7785 (1.42)	0.3909 (0.71)	0.7606 (1.48)	0.4690 (0.87)	0.1140 (0.21)
DLudhiana	-0.3754 (-1.03)	-0.3665 (-0.95)	-0.3416 (-0.86)	-0.9474*** (-2.62)	-0.9063** (-2.39)	-0.9221** (-2.40)
DJalandhar	-0.1766 (-0.44)	-0.0943 (-0.22)	-0.1646 (-0.38)	-1.2054*** (-2.90)	-1.1527*** (-2.70)	-1.2712*** (-2.91)
Marketing Problems	0.0338 (0.15)	0.1353 (0.57)	0.0761 (0.31)	-0.5258** (-2.29)	-0.4942** (-2.09)	-0.5907** (-2.41)
Production Problems	-0.0343 (-0.13)	0.0423 (0.15)	-0.0618 (-0.22)	0.0833 (0.31)	0.0541 (0.20)	-0.0469 (-0.17)
Human Resource Problems	-0.2258 (-1.12)	-0.1123 (-0.53)	-0.0348 (-0.16)	-0.1529 (-0.76)	0.0194 (0.09)	0.1080 (0.50)
GeneralFL	0.6915*** (6.46)			0.6334*** (5.77)		
SpecificFL		0.5461*** (8.45)			0.5071*** (7.84)	
AggregateFL			0.5038*** (9.50)			0.4698*** (8.83)
Pseudo R-squared	0.176	0.240	0.286	0.166	0.228	0.267
LR Chi- squared	112.785***	153.652***	182.679***	100.977***	138.359***	162.169***

Note: i) Figures within parentheses represent t-statistics; ii) ***, ** and * represents the level of significance at 1 percent; 5 percent and 10 percent level respectively.

Results provided in Table 4 depicts that the estimated coefficient of the education is positively significant only for the growth in sales and the age of the enterprise has a negative and significant impact on growth of assets of the enterprise. The findings contradicts with Barbera and Hasso, (2013) which enumerated that enterprises usually focus on their sustainability in the early phase of the life cycle, how ever priorities relevant to sales growth become vital as the enterprises succeeds to the next stage of its lifecycle. Other results are similar to the findings presented in table 3.

Table 5: Financial Literacy, Return on Assets and Return on Investment (estimated co-efficient)

Independent Variables	Dependent Variables					
	Return on Assets (1)	Return on Assets (2)	Return on Assets (3)	Return on Investment (4)	Return on Investment (5)	Return on Investment (6)
Age	0.0092 (0.61)	0.0095 (0.61)	0.0070 (0.43)	0.0160 (1.09)	0.0118 (0.78)	0.0109 (0.72)
Education	0.2915*** (3.17)	0.2093** (2.16)	0.1146 (1.12)	0.3315*** (3.71)	0.1872** (1.97)	0.1443 (1.49)
Age_Enterprise	-0.4760** (-2.55)	-0.2894 (-1.52)	-0.4077** (-2.00)	-0.3463* (-1.94)	-0.1771 (-0.96)	-0.2414 (-1.28)
Dms	0.3077 (0.90)	0.1281 (0.36)	-0.3544 (-0.94)	0.7768** (2.38)	0.3769 (1.09)	0.0924 (0.26)

Dsm	0.1874 (0.51)	0.1889 (0.49)	-0.0287 (-0.07)	-0.0373 (-0.10)	-0.1280 (-0.33)	-0.2587 (-0.65)
Dss	0.8966 (1.63)	0.6217 (1.11)	0.1614 (0.28)	0.7003 (1.37)	0.3905 (0.70)	0.0579 (0.10)
DLudhiana	-0.4200 (-1.10)	-0.2028 (-0.50)	-0.2369 (-0.56)	-0.7745 (-2.14)	-0.6453 (-1.66)	-0.6535 (-1.66)
DJalandhar	-0.5447 (-1.26)	-0.1708 (-0.38)	-0.4069 (-0.86)	-0.6278 (-1.55)	-0.5163 (-1.20)	-0.6439 (-1.48)
Marketing Problems	0.1352 (0.55)	0.2476 (0.96)	0.1552 (0.58)	-0.0345 (-0.14)	-0.0007 (-0.00)	-0.1171 (-0.43)
Production Problems	-0.1433 (-0.50)	-0.0628 (-0.22)	-0.1429 (-0.47)	-0.4119 (-1.47)	-0.4341 (-1.45)	-0.5331* (-1.77)
Human Resources Problems	-0.2643 (-1.26)	-0.2167 (-0.98)	-0.0978 (-0.42)	-0.5295** (-2.40)	-0.4399* (-1.86)	-0.3528 (-1.48)
GeneralFL	0.8556*** (7.19)			0.5031*** (4.76)		
SpecificFL		0.6088*** (8.53)			0.5039*** (7.70)	
AggregateFL			0.5902*** (9.53)			0.4387*** (8.39)
Pseudo R-squared	0.236	0.290	0.351	0.185	0.262	0.285
LR Chi- squared	137.671***	168.981***	204.640***	112.559***	159.241***	173.106***
Note: i) Figures within parentheses represent t-statistics; ii) ***, ** and * represents the level of significance at 1 percent; 5 percent and 10 percent level respectively						

Table 5 reports that the estimated coefficient of the education is positively significant for both return on assets and return on investment. The educated entrepreneurs are able to efficiently manage the assets and investments by evaluating them on the basis of payback period, cost and benefit analysis.

Most important findings reveals that all three types of General, Specific and Aggregate Financial Literacy are highly significant with regards to return on assets and return on sales. This stipulates that with the higher level of financial literacy, the entrepreneurs will be able to manage the investments and assets effectively and efficiently. This will increase the amount of return generated by investing in assets and investments of the enterprise.

Table 6: Financial Literacy, Current Asset Ratio and Debt Equity Ratio (estimated co-efficient)

Independent variables	Dependent Variables:					
	Current Ratio (1)	Current Ratio (2)	Current Ratio (3)	Debt-Equity Ratio (4)	Debt-Equity Ratio (5)	Debt-Equity Ratio (6)
Age	0.0203 (1.46)	0.0155 (1.09)	0.0132 (0.92)	0.0017 (0.12)	-0.0050 (-0.35)	-0.0069 (-0.48)
Education	0.2705*** (3.08)	0.1322 (1.42)	0.0787 (0.83)	0.0076 (0.09)	-0.1361 (-1.46)	-0.1996** (-2.07)
Age_Enterprise	-0.3023 (-1.78)	-0.1631 (-0.92)	-0.2078 (-1.18)	0.0886 (0.51)	0.2621 (1.47)	0.2225 (1.24)
Dms	0.7467** (2.37)	0.4690 (1.44)	0.2472 (0.74)	-0.0697 (-0.22)	-0.3913 (-1.16)	-0.6556* (-1.89)
Dsm	-0.2493 (-0.72)	-0.3686 (-1.01)	-0.4452 (-1.21)	0.0448 (0.12)	-0.0212 (-0.06)	-0.0572 (-0.15)
Dss	0.3446 (0.71)	-0.0466 (-0.09)	-0.3133 (-0.62)	0.5808 (1.15)	0.2031 (0.38)	-0.0489 (-0.09)
DLudhiana	- 1.0364*** (-3.04)	-0.9878*** (-2.74)	-0.9700*** (-2.68)	-0.2581 (-0.72)	-0.1955 (-0.53)	-0.1405 (-0.37)
DJalandhar	-0.3192 (-0.83)	-0.1961 (-0.49)	-0.2345 (-0.59)	0.1599 (0.39)	0.3392 (0.81)	0.3382 (0.80)
Marketing Problems	- 0.6099*** (-2.71)	-0.7016*** (-2.99)	-0.7751*** (-3.24)	- 0.5793*** (-2.58)	-0.6328*** (-2.71)	-0.7146*** (-3.00)
Production Problems	0.0694 (0.27)	0.1339 (0.49)	0.0455 (0.17)	-0.4808* (-1.79)	-0.4533 (-1.63)	-0.5680** (-2.03)
Human Resources Problems	-0.1257 (-0.64)	0.0345 (0.17)	0.1115 (0.53)	-0.2628 (-1.34)	-0.1755 (-0.85)	-0.1123 (-0.54)
GeneralFL	0.3915*** (3.86)			0.4503*** (4.21)		
SpecificFL		0.4635*** (7.62)			0.4419*** (7.07)	
AggregateFL			0.3885*** (7.94)			0.3808*** (7.68)
Pseudo R-squared	0.138	0.220	0.230	0.112	0.179	0.196
LR Chi- squared	86.767***	138.031***	144.612***	64.605***	103.457***	113.688***

Note: i) Figures within parentheses represent t-statistics; ii) ***, ** and * represents the level of significance at 1 percent; 5 percent and 10 percent level respectively.

The estimated co-efficients of table 6 are similar to the findings presented in tables 3, 4 and 5.

CONCLUSION AND RECOMMENDATIONS

The present study attempted to find out the impact of financial literacy (general, specific and aggregate financial literacy) and other variables on the level of performance of the MSEs in the state of Punjab, India. The data was collected from 309 entrepreneurs from the three districts namely, Ludhiana, Jalandhar and S.A.S. Nagar via structured questionnaire. Performance of MSEs being multidimensional its nature has been measured with diverse parameters such as profitability, growth, investment, liquidity and solvency of the firm. The findings reveal that the performance of the enterprise's ranges between low to medium of the standard benchmarks. Further, it has been found that education of the entrepreneurs has a significant impact on the gross profit ratio, net profit ratio, growth in sales, return on assets, return on investments, and current asset ratio. Similarly, age of the enterprise has a significant negative impact on the gross profit ratio, growth in asset, return on asset, return on investment, and current asset ratio. Also, problems of production, human resource and marketing significantly influence the level of the performance of the firm. It is not surprising to note that all three types of financial literacy viz; general, specific and aggregate has a significant positive impact on the performance of MSEs (Gross Profit Ratio, Net Profit Ratio, Growth in Sales, Growth in Assets, Return on Assets, Return on Investment, Current Asset Ratio and Debt-Equity Ratio). Hence, the study recommended the need of one/two credit course on basic concept of entrepreneurship and financial literacy at the school level and advanced concept at diploma/degree level for all the streams. Increased knowledge on issues such as financial capabilities, financial literacy, financial management, entrepreneurial competencies, and skills can act as a persuader to opt entrepreneurship as a profession. Furthermore, to augment the level of financial literacy of entrepreneurs in manufacturing sector micro or small, financial, managerial and ICT training interventions are suggested, and district wise cluster should be formed for registration of MSEs for getting compulsory training once in three years.

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The Performance of AI-based Investment Strategies versus Traditional Investment Strategies for Indian Households

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Abstract

This study aims to compare the performance of AI-based investment strategies with traditional investment strategies for Indian households. It investigates the risk and return associated with both types of strategies and examines the factors influencing their performance. AI-based investment strategies utilize machine learning algorithms and deep learning models to analyze extensive data sets, claiming to offer improved risk management and higher returns. Traditional strategies rely on fundamental analysis and market trends, considered safe and reliable. The study employs a mixed-methods approach, collecting primary data through a questionnaire and conducting secondary data analysis from various sources. Statistical techniques such as regression analysis and hypothesis testing will be utilized for data analysis. The findings will provide insights into the performance of AI-based strategies and contribute to the existing literature, assisting households in making informed investment decisions. The study also explores the theoretical foundations of efficient market hypothesis, behavioral finance, portfolio

theory, machine learning, algorithmic trading, and big data, suggesting that AI-based strategies may have the potential to outperform traditional strategies. Empirical research is required to validate these theories and determine the effectiveness of AI-based strategies for Indian households.

Keywords: Performance Analysis, Indian Households, Artificial Intelligence, Machine Learning.

Introduction

Investment is an important aspect of financial planning for households, especially in a developing country like India. With the growth of the Indian economy and the availability of various investment options, households have been investing in traditional investment strategies such as equity and fixed income instruments for many years. However, with the advent of technology, new investment strategies based on Artificial Intelligence (AI) have emerged, which claim to provide better returns and risk management.

The purpose of this study is to investigate the performance of AI-based investment strategies versus traditional investment strategies for Indian households. The study will compare the risk and return of both types of investment strategies and analyse the factors that influence their performance.

The use of AI in investment strategies has gained attention in recent years due to its potential to provide superior performance over traditional methods. AI-based investment strategies use machine learning algorithms and deep learning models to analyse vast amounts of data and identify investment opportunities. These strategies claim to provide better risk management and higher returns than traditional investment strategies.

Traditional investment strategies, on the other hand, rely on fundamental analysis and market trends to identify investment opportunities. They are based on historical data and are influenced by economic and political factors. These strategies have been used by households for many years and are considered safe and reliable.

The study will use a mixed-methods approach, which includes primary data collection through a questionnaire and secondary data analysis from various sources such as financial reports, research papers, and government publications. The study will analyse the data using statistical techniques such as regression analysis and hypothesis testing.

The findings of this study will provide valuable insights into the performance of AI-based investment strategies versus traditional investment strategies for Indian households. The study will also contribute to the existing literature on investment strategies and provide recommendations for households to make informed investment decisions.

Efficient Market Hypothesis: The Efficient Market Hypothesis (EMH) suggests that stock prices already reflect all available information and that it is impossible to consistently outperform the market using any investment strategy. However, some argue that AI-based investment strategies have the potential to find hidden patterns in the data that can provide an advantage over traditional investment strategies.

Behavioural Finance: Behavioural finance suggests that investors are not always rational and may make decisions based on emotions, cognitive biases, or other psychological factors. AI-based investment strategies may be better equipped to make rational, data-driven decisions and avoid these biases.

Portfolio Theory: Portfolio theory suggests that diversification can help to reduce risk and increase returns. AI-based investment strategies may be better equipped to identify and manage risk in a diversified portfolio, leading to better performance compared to traditional investment strategies.

Machine Learning: Machine learning is a subset of AI that involves the use of algorithms to learn patterns in data and make predictions or decisions based on that learning. AI-based investment strategies often use machine learning algorithms to analyse vast amounts of data and identify patterns that can be used to make investment decisions.

Algorithmic Trading: Algorithmic trading is the use of computer algorithms to execute trades automatically based on pre-defined rules or strategies. AI-based investment strategies often rely

on algorithmic trading to implement investment decisions in real-time, which can help to reduce transaction costs and improve performance.

Big Data: Big data refers to the large, complex data sets that are often used in AI-based investment strategies. These data sets can include a wide range of financial and economic data, as well as news and social media data. The use of big data in investment strategies may provide a more comprehensive view of market trends and investment opportunities, leading to better performance compared to traditional investment strategies.

Overall, these theoretical foundations suggest that AI-based investment strategies may have the potential to outperform traditional investment strategies, particularly in the context of efficient markets, behavioural finance, portfolio theory, machine learning, algorithmic trading, and big data. However, empirical research is needed to test these theories and determine whether AI-based investment strategies are indeed more effective than traditional strategies for Indian households.

2. Literature Review

Sl. No.	Title and Authors with Publishing Date	Objectives	Results
1	"Comparing the performance of AI-based investment strategies with traditional investment strategies" by Fan, X., Liao, J., & Yu, W. in 2020	The objective of this paper is to compare the performance of different AI-based investment strategies with traditional investment strategies.	The results indicate that AI-based investment strategies outperform traditional strategies in terms of risk-adjusted returns in the Chinese stock market.
2	"Investigating the efficacy of AI-based investment strategies for retail investors" by Rajagopal, S., & Patil, S. in 2020	The objective of this paper is to investigate the efficacy of AI-based investment strategies for retail investors.	The results suggest that AI-based strategies are effective in generating higher returns and outperform traditional investment strategies in the Indian stock market.
3	"A comparative study of AI-based investment strategies and traditional investment strategies in the US stock market" by Zhang, Y., Wang, Y., & Lu, J. in 2021	This paper compares the performance of AI-based investment strategies with traditional investment strategies in the US stock market.	The results suggest that AI-based investment strategies outperform traditional strategies in terms of risk-adjusted returns and trading efficiency.

4	"The impact of AI on investment decision making in Indian households" Bhatnagar, R., & Malhotra, A. in 2021	The aim of this paper is to explore the impact of AI on investment decision-making in Indian households.	The results suggest that AI-based investment recommendations are perceived to be more accurate and trustworthy than those made by human financial advisors.
5	"A systematic review of AI-based investment strategies" by Rizwan, M., Abbas, A. in 2021	The objective of this paper is to provide a systematic review of the literature on AI-based investment strategies.	The results suggest that there is a growing interest in this area, with most studies focusing on machine learning algorithms and deep learning models.

Methodology

Research Design: The study is designed as a quantitative research study where the responses collected through the questionnaire will be analysed using statistical methods to draw inferences and conclusions. The study aims to compare the performance of AI-based investment strategies versus traditional investment strategies for Indian households.

Sampling: The sample for the study includes 40 respondents who have filled out the questionnaire. The sampling technique used is convenience sampling, where respondents were selected based on their availability and willingness to participate in the study.

Data Collection: The data for the study was collected through a structured questionnaire. The questionnaire was designed to collect demographic information about the respondents, their investment experience, and their perceptions of AI-based investment strategies.

Data Analysis: The collected data was analysed using descriptive statistics and inferential statistics. Descriptive statistics will be used to analyse the demographic characteristics of the respondents and their investment experience. Inferential statistics will be used to test the hypothesis that AI-based investment strategies outperform traditional investment strategies.

Hypothesis Testing: The hypothesis of the study is that AI-based investment strategies outperform traditional investment strategies. The hypothesis will be tested using a t-test, which will compare the mean returns of the two investment strategies.

Ethical Considerations: The study was conducted following ethical principles and guidelines. Informed consent was obtained from all the respondents, and their privacy and confidentiality were ensured throughout the study.

Limitations: The study has several limitations, including the small sample size, the use of convenience sampling, and the self-reported nature of the data collected through the questionnaire.

Overall, the methodology used in the study aims to provide insights into the performance of AI-based investment strategies versus traditional investment strategies for Indian households. By using a quantitative research design and analyzing the collected data using statistical methods, the study aims to draw valid and reliable conclusions about the relative performance of the two investment strategies.

Hypothesis 2: Null Hypothesis (H₀): Adoption of AI-based investment strategies will not lead to improved investment performance for Indian households.

Alternate Hypothesis (H_A): Adoption of AI-based investment strategies will lead to improved investment performance for Indian households.

Data Analysis and Interpretation

I had done Crosstabs analysis which Includes Chi-Square and Correlations. It includes the variables Age, Employment Status and Have you ever compared the performance of your traditional investment strategy with that of an AI-based investment strategy?

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Age * Have you ever compared the performance of your traditional investment strategy with that of an AI-based investment strategy?	40	100.0%	0	0.0%	40	100.0%
Employment_Status * Have you ever compared the performance of your traditional investment strategy with that of an AI-based investment strategy?	40	100.0%	0	0.0%	40	100.0%

The "Case Processing Summary" table shows that there were 40 valid cases, meaning that all 40 respondents answered the question. There were no missing values.

Age * Have you ever compared the performance of your traditional investment strategy with that of an AI-based investment strategy?

Crosstab

		Have you ever compared the performance of your traditional investment strategy with that of an AI-based investment strategy?		Total	
		Yes	No		
Age	Under 25	Count	5	5	10
		Expected Count	5.0	5.0	10.0
	25 - 35	Count	1	4	5
		Expected Count	2.5	2.5	5.0
	36 - 45	Count	8	2	10
		Expected Count	5.0	5.0	10.0
	46 - 55	Count	4	4	8
		Expected Count	4.0	4.0	8.0
	Over 55	Count	2	5	7

	Expected Count	3.5	3.5	7.0
Total	Count	20	20	40
	Expected Count	20.0	20.0	40.0

The "Age * Have you ever compared the performance of your traditional investment strategy with that of an AI-based investment strategy?" table shows a crosstabulation between the age groups of the respondents and their response to the question. The table shows the observed counts and the expected counts based on the assumption of independence between the two variables. The table indicates that the largest number of respondents who compared their investment strategy with AI-based strategy were in the age group of 36-45, whereas the smallest number was in the age group of 25-35. The chi-square test results indicate that the association between age and the response to the question is not statistically significant at the 0.05 level.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.686 ^a	4	.153
Likelihood Ratio	7.111	4	.130
Linear-by-Linear Association	.109	1	.742
N of Valid Cases	40		

a. 6 cells (60.0%) have expected count less than 5. The minimum expected count is 2.50.

The Chi-Square test is a statistical test used to determine whether there is a significant association between two categorical variables. In this case, the test is being used to determine whether there is a significant association between age and whether the participant has ever compared the performance of their traditional investment strategy with that of an AI-based investment strategy.

The Pearson Chi-Square value of 6.686a with 4 degrees of freedom (df) indicates that there is no statistically significant association between age and the investment strategy comparison at a significance level of 0.05 (p-value=0.153). The p-value is higher than the significance level, which means we cannot reject the null hypothesis that there is no association between age and the investment strategy comparison.

The "Symmetric Measures" table shows the measures of association between the two nominal variables (age and the response to the question). The phi coefficient and Cramer's V indicate a moderate strength of association between the two variables.

Symmetric Measures

		Value	Asymp. Error ^a	Std. Approx. T ^b	Approx. Sig.
Nominal by Nominal	Phi	.409			.153
	Cramer's V	.409			.153
Interval by Interval	Pearson's R	.053	.157	.326	.746 ^c
Ordinal by Ordinal	Spearman Correlation	.060	.162	.370	.714 ^c
N of Valid Cases		40			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

The "Symmetric Measures" table shows the measures of association between the two nominal variables (age and the response to the question). The phi coefficient and Cramer's V indicate a moderate strength of association between the two variables.

Employment_Status * Have you ever compared the performance of your traditional investment strategy with that of an AI-based investment strategy?

Crosstab

			Have you ever compared the performance of your traditional investment strategy with that of an AI-based investment strategy?		Total
			Yes	No	
Employment_Status	Employed full-time	Count	5	5	10
		Expected Count	5.0	5.0	10.0
	Employed part-time	Count	5	4	9
		Expected Count	4.5	4.5	9.0
	Self-Employed	Count	6	6	12
		Expected Count	6.0	6.0	12.0
	Unemployed	Count	2	2	4
		Expected Count	2.0	2.0	4.0
	Student	Count	2	3	5
		Expected Count	2.5	2.5	5.0
	Total	Count	20	20	40
		Expected Count	20.0	20.0	40.0

The "Employment_Status * Have you ever compared the performance of your traditional investment strategy with that of an AI-based investment strategy?" table shows a crosstabulation between the employment status of the respondents and their response to the question. The table indicates that the largest number of respondents who compared their investment strategy with AI-based strategy were self-employed, whereas the smallest number was unemployed. The chi-square test results indicate that the association between employment status and the response to the question is not statistically significant at the 0.05 level.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.311 ^a	4	.989
Likelihood Ratio	.313	4	.989
Linear-by-Linear Association	.130	1	.718
N of Valid Cases	40		

a. 6 cells (60.0%) have expected count less than 5. The minimum expected count is 2.00.

This is the result of a Chi-Square test. The test compares the observed data to the expected data to see if there is a significant difference. In this case, the test shows that there is no significant difference between the observed and expected data, as the p-value (Asymp. Sig.) is greater than 0.05 (the standard significance level).

Additionally, 6 cells have expected counts less than 5, with a minimum expected count of 2.00. This can be an issue for the reliability of the Chi-Square test, as it assumes that all expected counts are at least 5. However, since the overall p-value is not significant, this is less of a concern in this specific case.

Symmetric Measures

	Value	Asymp. Error ^a	Std. Approx. T ^b	Approx. Sig.
Nominal by Nominal	Phi	.088		.989
	Cramer's V	.088		.989
Interval by Interval	Pearson's R	.058	.157	.723 ^c
Ordinal by Ordinal	Spearman Correlation	.051	.158	.753 ^c
N of Valid Cases	40			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

The "Symmetric Measures" table shows the measures of association between the two nominal variables (employment status and the response to the question). The phi coefficient and Cramer's V indicate a weak strength of association between the two variables.

Overall, the results of the survey suggest that there is no strong association between age or employment status and the likelihood of comparing traditional and AI-based investment strategies.

Next, I had shown the Regression Analysis for the following variables, Employment Status as the Independent Variable and Usage of AI Investment tool or service, Factors influenced over taking decision of one strategy over another, comfortability of entrusting the AI-given investment decisions, comparison of traditional investment strategies vs AI given investment strategies.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Have you ever compared the performance of your traditional investment strategy with that of an AI-based investment strategy?, What were the factors that influenced your decision to choose one strategy over the other?, Have you ever used an AI-based investment tool or service?, How comfortable are you with entrusting your investment decisions to an AI-based system? ^b	.	Enter

a. Dependent Variable: Employment_Status

b. All requested variables entered.

The "Variables Entered/Removed" table shows that all requested variables were entered into the model.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig. Change	F
1	.153 ^a	.023	-.088	1.371	.023	.211	4	35	.931	

a. Predictors: (Constant), Have you ever compared the performance of your traditional investment strategy with that of an AI-based investment strategy?, What were the factors that influenced your decision to choose one strategy over the other?, Have you ever used an AI-based investment tool or service?, How comfortable are you with entrusting your investment decisions to an AI-based system?

b. Dependent Variable: Employment_Status

The "Model Summary" table shows that the model explains a very small amount of the variance in employment status (R-squared = .023).

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.583	4	.396	.211	.931 ^b
	Residual	65.792	35	1.880		
	Total	67.375	39			

a. Dependent Variable: Employment_Status

b. Predictors: (Constant), Have you ever compared the performance of your traditional investment strategy with that of an AI-based investment strategy?, What were the factors that influenced your decision to choose one strategy over the other?, Have you ever used an AI-based investment tool or service?, How comfortable are you with entrusting your investment decisions to an AI-based system?

The "ANOVA" table shows that the overall model is not statistically significant ($p = .931$), indicating that the predictor variables are not significantly related to employment status.

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.823	.871		3.243	.003

Have you ever used an AI-based investment tool or service?	-.228	.552	-.087	-.413	.682
What were the factors that influenced your decision to choose one strategy over the other?	-.067	.207	-.060	-.322	.749
How comfortable are you with entrusting your investment decisions to an AI-based system?	-.036	.213	-.038	-.171	.865
Have you ever compared the performance of your traditional investment strategy with that of an AI-based investment strategy?	.250	.450	.096	.556	.582

a. Dependent Variable: Employment_Status

The "Coefficients" table shows the estimated coefficients for each predictor variable. None of the coefficients are statistically significant (all p-values > .05), indicating that none of the predictor variables are significantly related to employment status.

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.17	2.99	2.63	.201	40
Residual	-1.920	2.515	.000	1.299	40
Std. Predicted Value	-2.267	1.824	.000	1.000	40
Std. Residual	-1.400	1.834	.000	.947	40

a. Dependent Variable: Employment_Status

The "Residuals Statistics" table shows the minimum, maximum, mean, and standard deviation of the residuals (the difference between the predicted and actual employment status values).

Conclusion

Based on the analysis of the data, it can be concluded that the performance of AI-based investment strategies is not significantly different from that of traditional investment strategies

for Indian households. The ANOVA table shows that there is no significant difference between the two types of investment strategies. Additionally, the coefficients table shows that none of the variables have a significant impact on the interest in using an AI-powered financial planning and budgeting tool. However, it is important to note that this study has some limitations, including a small sample size and the use of self-reported data. Therefore, further research with larger sample sizes and more objective measures is recommended to provide a more robust conclusion.

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