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Role of Alternate Investments in Portfolio Diversification

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Abstract

The contribution of alternative investments to portfolio diversity is examined in this research. Conventional portfolios, which are mostly made up of fixed income and stocks, frequently show higher correlation during market downturns, which reduces the benefits of diversification. Alternative investments have the potential to increase portfolio efficiency because of their distinct risk-return profiles and lack of connection with conventional assets. Alternative investments will be defined, their past performance will be examined, and their effect on portfolio diversity will be assessed. We'll also talk about important investor issues like liquidity, due diligence, and regulatory aspects.

Keywords: Financial markets, risk-return profile, correlation, modern portfolio theory, alternative investments, and portfolio diversification.

1. Introduction

The word "investment" is an allocation of capital for a useful purpose. To invest is to put aside money with the hope of getting back more money in the future. Fischer and Jordan rightly defined investment as "a commitment of funds made with the expectation of a positive rate of return." If the investment is successfully made, the return will be directly proportional to the risk undertaken by the investor.

Investing is an activity that involves the judicious and proper deployment of capital for the purpose of earning extra income or creating value. Investment also involves a commitment of saved resources in the prospect of gaining future benefits.

The most characteristic aspect of an investment is the fact that one needs patience for it to have benefits. Investment involves a stream of successive choices that cannot be evaded. All investment choices are made at various points of time and amidst an uncertain tomorrow. Investors shall from time to time reassess and evaluate their different investment undertakings from the perspective of new information as well as changing expectations. Investors enhance their negotiating power through evaluating existing investment prospects in the market. Private investors select their investment options depending on their investment needs for their money.

In finance, the profit of an investment is referred to as a return. The return can be a gain (or loss) upon the sale of property or investment, unrealized capital appreciation (or depreciation), investment revenue in the form of dividends, interest, rent income, etc., or a combination of capital gain and income. Return also involves money winnings or losses based on foreign exchange rate fluctuations. Investors usually look for greater return from riskier assets. The low-risk asset usually gives the low return. Investors are normally encouraged to have a certain style of investment and diversify investments. Diversification has a statistical impact that reduces overall risk.

Individual investors desire to know the investment alternatives so that they can exercise their judgment to invest in those that will offer them security and a steady return. Individual investors' ultimate aim is to select a range of investment alternatives that suit their risk tolerance and expected return. Investment alternatives like financial and physical assets differ in risk from risk-free to highly speculative.

Individual investors have to select the choices that maximize their utility from this enormous range. Some factors have an impact on investment choices, such as tastes, the sum involved, safety of funds, frequent and constant returns, asset availability and tractability, etc.

Portfolio diversification is a basic finance concept that involves investing in a range of asset classes with different risk-return profiles to achieve maximum risk-adjusted returns. Equity, fixed income, and cash equivalents have traditionally been the main sources of portfolio diversity. Volatility in the markets, global economic changes, and financial crises have all revealed the shortcomings of conventional investment methods.

Alternative investments, such as hedge funds, private equity, venture capital, real estate, commodities, infrastructure, and digital assets, have grown in popularity in recent years as institutional and individual investors seek to improve portfolio returns while protecting themselves from market risks. Alternative assets are useful risk management tools because, unlike traditional investments, they usually have fewer correlations with equity markets.

The Indian alternative investment environment has evolved as a result of increased investor involvement, economic growth, and regulatory changes. The Securities and Exchange Board of India (SEBI) Alternative Investment Funds (AIFs) Regulations enacted in 2012 introduced an organized environment to the private fund operations, which attracted domestic and international investors' attention toward the alternative investment market in India. This research aims to analyze the position of alternative investments in portfolio diversification in the Indian financial market, such as their impact on risk-return profiles, hedging efficacy against traditional market downturns, and the major trends defining their future expansion.

1.1 Types of Alternate Investment funds:

A) Private Equity

a. **Private Equity Funds**

These investment vehicles pool funds and invest them in private companies. Typically, they are managed by experienced fund managers (also referred to as general partners, or GPs) who raise capital from high-net-worth investors (also referred to as limited partners, or LPs) and institutional investors. Private equity funds normally have a 10- to 12-year lifespan. The GP identifies, invests in, and ultimately exits portfolio companies over this period. Along with a share of the profits (carried interest), the GP levies management fees. Various industries or various stages of a company's life cycle could be the target of private equity funds' investment strategy. Through improving the financial makeup, strategic guidance, or operating efficiency of the firms in their portfolio, they often seek to create value. Private equity investments are non-liquid; they are not easily bought and sold. They involve a great amount of risk but also good opportunities for profit. Portfolio companies' performance, along with experience on the GP side, determines success.

b. **Venture Capital Funds**

Venture capital (VC) funds invest in start ups and other early-stage firms with high growth potential. They provide loans to firms that are considered too risky for traditional lenders or the open market. VC companies often have an active role in assisting their portfolio firms grow by providing strategic

guidance and advice. Venture capital funds focus on cutting-edge companies with revolutionary products or business models. They invest in phases, putting up money at different times (seed, Series A, Series B, etc.). The goal is to exit successfully via an acquisition or initial public offering (IPO) to realize a large return. Venture capital is one of the riskiest forms of private equity. A few successful investments can bring great returns, but most companies do not succeed. Because of the high rate of failure, a diversified portfolio in a VC fund is extremely crucial.

c. **Leveraged Buyout (LBO) Funds**

LBO funds employ a high percentage of borrowed funds (leverage) to acquire established companies. The assets of the acquired company are often used as collateral for the loan. Paying off debt, improving the performance of the company, and selling it for a higher amount of money are the goals. LBO funds target companies with stable cash flows and assets that are underpriced. In order to increase profitability, they often implement cost-cutting measures, operational improvements, and strategic changes. The business's cash flow is utilized to retire the debt. LBO funds target companies with stable cash flows and undervalued assets. In order to increase profitability, they often implement cost-cutting measures, operational improvements, and strategic changes. The business's cash flow is used to retire the debt. Large amounts of leverage are applied in LBOs, which magnify profits and losses. Economic downturns can significantly reduce the ability of portfolio firms to repay loans. The capability to enhance the business and ultimately resell it at a profit is what sets success.

d. **Growth Equity Funds**

Growth equity funds make investments in comparatively established businesses that are expanding quickly. These businesses usually have profitable cash flows and well-established business models. The money is used to support growth efforts such as acquisitions and expansion. Growth equity funds aim to collaborate with prosperous businesses in order to quicken their rate of expansion. They might offer funding for product development, acquisitions, or market expansion. They frequently purchase a small portion of the business. Generally speaking, growth equity investments are riskier than LBOs but less risky than venture capital. The ability of the business to maintain its growth is linked to the possibility of returns.

e. **Mezzanine Funds**

A mix of debt and equity, mezzanine funds provide capital in the form of mezzanine debt. Typically repaid after senior debt holders, mezzanine debt is junior to senior debt. Characteristics similar to equity, such as conversion rights or warrants, are often added. Mezzanine financing is often employed to fund growth initiatives, acquisitions, and LBOs. It offers flexible financing by filling the gap between senior debt and equity. Interest payments and potential equity profits are made by mezzanine lenders. While mezzanine debt is less risky than equity, it is more risky than senior debt. Though it has a higher default risk, it pays more in rates than senior debt. If the firm performs well, the equity portion can generate huge returns.

B) Hedge Funds

a. **Long/Short Equity Funds**

Both rising and falling stock prices are targets for these ETFs. In order to do this, they take "long" bets in stocks that are predicted to rise in value and "short" positions in stocks that are predicted to fall. Regardless of the general direction of the market, the objective is to provide returns.

Long Positions: The fund purchases stock in businesses it thinks are cheap or have significant room for expansion. If the stock price rises, the fund makes money.

Short Positions: The fund borrows and then sells shares of businesses it deems to be overpriced or to have poor prospects. If the stock price drops, the fund makes money because it can then purchase back the shares at a reduced price and give them back to the lender.

The main objective is to provide returns that outperform the performance of the market (alpha). The fund can lower overall portfolio risk by employing short positions as a hedge against market downturns. When the market as a whole declines, the short bets increase in value, accomplishing this. Because potential losses are essentially limitless in the event of a substantial increase in stock price, short selling is inherently risky. Effective risk management is therefore essential.

b. **Global Macro Funds**

Global macro funds invest in different asset classes on foreign markets, including stock, commodities, currencies, and interest rates. Macroeconomic trends and events, like inflation, economic growth, and political news, are the basis of their investment decisions. To uncover investment opportunities, these funds analyze market trends, political events, and global economic information. Depending on their market outlook, they might take long or short positions in various asset classes. Leverage is often employed by global macro funds to enhance their returns. Earn returns based on macroeconomic trends and events. Irrespective of the overall direction of the market, create returns. Spread your holdings across foreign markets and asset classes. A good grip of world politics and economies is a prerequisite for global macro investing. These funds are likely to be very volatile because of their exposure to a range of market risks. Leverage can dramatically increase profits but also losses.

c. **Event-Driven Funds**

Event-driven funds aim to make money off of particular business events, like spin-offs, bankruptcies, mergers, and acquisitions. They examine how these occurrences might affect the value of securities. These funds use a number of tactics, such as:

- Purchasing stock in businesses engaged in mergers and acquisitions is known as merger arbitrage.
- Purchasing debt from businesses that are experiencing financial difficulties is known as distressed debt.

Investing in businesses that are going through spin-offs, restructurings, or other corporate events are examples of special circumstances. Produce profits from particular business events. By concentrating on opportunities driven by events, you can lower market risk.

Profit from the market inefficiencies brought up by the incident.

d. **Activist Funds**

Once they have invested considerable amounts in publicly traded companies, activist funds actively engage with management to influence company policy. Through the promotion of reforms such as board restructuring, asset divestitures, and operational improvements, they aim to enhance shareholder value.

Activist funds identify undervalued companies with potential for growth. They engage with management publicly or privately, often through proxy battles or shareholder proposals. Their objective is to create changes that will increase the value of the company's shares. Shape business strategy to deliver returns. Improve business performance to enhance shareholder value, to make changes that benefit all stockholders. Activism investment can be expensive and time-consuming. Other stockholders and the management of the company might resist these funds. Success can be based on a range of conditions and is not always guaranteed.

e. **Quantitative Funds**

Quantitative funds investments, also known as "quant" funds, discover and exploit market inefficiencies

through analytical models and algorithms. They make investment decisions based on statistical techniques and data analysis. Quantitative funds build and implement complex trading models that scan massive amounts of market data. They often use automated strategies such as high-frequency trading. They trade on statistical anomalies the naked eye may miss. Exploit market inefficiencies to earn profits. Reduce human bias in financial decisions. to find and exploit market statistical advantages. Quantitative investment requires higher programming and mathematical skills. These funds are prone to model risk, which arises when models cannot predict the market behavior with sufficient precision. In the long run, other quant funds will replicate the strategies, diluting their effectiveness.

C) Real Assets

Real assets are tangible assets that have intrinsic value due to their physical properties. They are often used as a hedge against inflation and can provide diversification to a portfolio

a. **Real Estate Investment Trusts (REITs)**

Firms that own or lease a number of income-generating real estate properties are referred to as REITs. Similar to shares in other sectors, they allow investors to purchase shares in commercial real estate portfolios. REITs are required to distribute dividends to shareholders, which account for a significant portion of their taxable income. Office towers, shopping malls, homes, warehouses, and hospitals are some of the real estate sectors in which REITs invest. They earn money through capital gains and rental income. There are three forms of REITs: hybrid, mortgage, and equity. Earn money through payment of dividends. Make the real estate sector more transparent. Offer the potential for capital appreciation. Movements in interest rates affect REITs. Real estate market cycles and economic conditions may also affect the success of REITs.

b. **Real Estate Funds**

These funds invest in real estate or real estate-related assets. They can be public or private equity real estate funds. Without owning any houses directly, they provide investors with exposure to the real estate market. Real estate funds have the ability to invest in mortgages, real estate development projects, and other types of real estate. They can employ a range of strategies, such as opportunistic, value-added, core, and core-plus. The liquidity of public real estate funds is greater than that of private real estate funds. Generate revenue and capital appreciation. Provide portfolio diversification. Provide access to expert real estate management. Long investment horizons and illiquidity are typical features of real estate funds. Economic conditions and real estate market risks influence them.

c. **Infrastructure Funds**

Roads, bridges, airports, utilities, and telecommunications infrastructure are some of the key assets that infrastructure funds invest in to finance economic activity. These assets usually have long lives and generate steady cash flows. Public and commercial infrastructure projects are sometimes financed by infrastructure funds. They might focus on specific industries, such as communications, energy, or transportation. Frequently, these investments are long-term. Investments in infrastructure may require a huge amount of money and time to build. They can be influenced by political as well as regulatory factors.

d. **Commodities Funds**

Commodity funds invest in basic agricultural products or raw commodities such as gold, natural gas, oil, and farm products. They provide access to the commodity market. Physical commodities, commodity futures contracts, or commodity-linked stocks can be bought by commodity funds. They may actively trade their investments or track commodity indices. Hedge against inflation. Offer a variety of choices.

Earn from commodity price movements. Economic conditions, demand and supply, and geopolitical events may all influence commodity prices, and these can be extremely volatile.

e. **Natural Resources Funds**

Natural resources funds provide investments in businesses that explore, develop, and produce natural resources like metals, energy, and lumber. This can include businesses that drill for oil or mine metals. These funds make equity investments in companies that deal in natural resources. They could concentrate on particular industries like mining, forestry, or energy. The changes in the underlying resources can affect these funds. Educate people about the natural resources industry. Create a rise in capital. Provide possible protection against inflation. Investing in natural resources can be unpredictable and cyclical. They are vulnerable to political, environmental, and commodity price threats

D) Alternative Lending

a. **Private Debt Funds**

Investment entities known as private debt funds lend money to private businesses.

Usually, these funds target middle-market businesses that might find it challenging to obtain conventional bank loans. They provide a variety of financial products, such as distressed debt, mezzanine debt, and senior debt. Interest payments and possible capital growth are the two main sources of income for private debt funds. They frequently concentrate on direct lending, which involves creating loans for borrowers directly. Compared to public debt markets, these funds are less liquid. Make a steady income. Give a portfolio diversification.

yields that are greater than those of conventional fixed-income investments. Investments in private debt are not liquid. They carry credit risk, as borrowers may default on their loans.

They are subject to economic conditions and interest rate changes.

b. **Hedge Fund-Backed Loans**

Hedge funds that participate in direct lending activities lend money to people or companies.

These loans can take many different forms, such as specialty lending, bridge loans, or short-term funding. These loans frequently cover a gap left by regular banks. To find lending possibilities, hedge funds may use on their knowledge of risk management and credit research. They frequently target consumers who are struggling financially or have special financing needs. They aim to outperform conventional lending in terms of returns. Lending can yield substantial returns. Profit from loan industry market inefficiencies. Spread out your hedge fund tactics. Loans backed by hedge funds may carry a significant risk. Frequently, they are illiquid. They are influenced by the hedge fund's investment choices and risk management.

c. **Private Lending Funds**

Private lending funds, like private debt funds, concentrate only on lending to individuals and enterprises. They might focus on particular industries or loan kinds, such consumer, small business, or real estate financing. They don't follow the rules of traditional banking. Loans to borrowers are directly originated by private lending funds. They carry out in-depth due diligence and credit investigation. They concentrate on creating a steady flow of revenue. Make a steady income. Offer specialized funding options. Obtain substantial profits that are risk-adjusted. Investments in private lending lack liquidity.

They are at danger for credit. They rely heavily on the fund managers' expertise.

d. **Crowdfunding Platforms**

Platforms for crowdfunding link borrowers with a sizable number of private investors. They help with debt, equity, and donations, among other forms of funding. These platforms have made finance more

accessible to all. Investors can peruse and choose which firms or projects to finance. In exchange for their investment, they might get equity holdings or interest payments. Depending on the platform and the specific investment, risk can vary significantly. Make alternative investing opportunities accessible. Encourage creative projects and small enterprises returns that could be greater than those of conventional investments. Investing through crowdfunding might be risky. Frequently, they are illiquid. Due diligence is essential.

e. **Peer-to-Peer Lending**

Platforms for peer-to-peer lending link individual lenders and borrowers. They provide loans for a range of uses, including school loans, small company loans, and personal loans. These platforms expedite the loan process through the use of technology. Loans can be chosen by lenders according to risk and return standards. Borrowers provide them interest payments.

Credit scoring is frequently used by platforms to evaluate risk. Outperform conventional fixed-income investments in terms of returns. Give borrowers access to credit. Investment portfolios should be diversified. Investing in P2P lending entails credit risk. They might not be liquid. Economic conditions might have an impact on returns.

E) Other Alternatives

a. **Gold and Other Precious Metals**

Gold's perceived intrinsic value and function as a monetary reserve help to keep it stable amid economic downturns. The following factors affect the price of precious metals:

- *Rates of inflation*: Precious metals frequently gain appeal when inflation increases.
- *Interest rates*: Non-yielding assets like gold may become less appealing when interest rates rise.
- *Geopolitical events*: The demand for safe-haven investments may be influenced by political unrest.
- *Demand and supply*: Industrial demand and mining output are important factors. Investment vehicles include ETFs and futures contracts, which provide easier access but introduce counterparty risk, as well as physical bullion, which needs to be stored securely and insured. The industrial applications of other precious metals, such as platinum and silver, can boost demand while simultaneously raising price volatility.

b. **Cryptocurrencies (e.g., Bitcoin, Ethereum)**

The decentralized blockchain technology that underpins cryptocurrencies offers the possibility of safe and open transactions. Among the elements affecting bitcoin values are:

- *Technology adoption*: Demand may rise as blockchain technology is used more frequently.
- *Regulatory developments*: Market sentiment can be greatly impacted by government rules.
- *Market sentiment*: Price swings are significantly influenced by social media and internet forums.

Support technological advancements as well as modifications to the foundational technology. Ethereum is used for smart contracts, Bitcoin is used as a store of wealth, and other cryptocurrencies are used for certain uses. Hacking, regulatory crackdowns, and the possibility of a total loss of value are among the various risks of cryptocurrencies.

c. **Private Companies**

While private equity seeks to expand or restructure established businesses, venture capital concentrates on early-stage enterprises with significant growth potential. Investments in private companies require a high level of due diligence, which includes evaluations of management teams, market research, and financial analysis. Complex valuation techniques frequently rely on similar company analysis or discounted cash flow analysis. Since exit plans like initial public offerings (IPOs) and acquisitions can

take years to complete, these investments are extremely illiquid. It's important to be mindful of the J-curve effect, which shows that early returns may be negative before a significant positive return happens.

d. **Art Collectibles**

Rarity, provenance, and creative merit are all driving elements in the art and collectibles market. Appraisal and verification are critical in determining value and avoiding fraud.

Market trends are driven by economic factors, collector tastes, and cultural shifts. Storage, insurance, and upkeep are critical factors in protecting the value of these assets. This market can be quite opaque, necessitating the involvement of professionals.

e. **Hedge Fund-Backed Strategies**

Hedge funds use a variety of tactics such as arbitrage, event-driven investing, and quantitative trading. These techniques frequently employ complicated financial tools, such as derivatives and

leverage, which can compound both profits and losses. Transparency may be limited, making it difficult to evaluate the risks and performance of these techniques. Fees are often greater than those of ordinary investment funds, and they frequently include both a performance fee and a management fee. Counterparty risk and the chance that the approach may fail are also critical factors.

1.2 Portfolio Diversification Theories

A) Modern Portfolio Theory (MPT): Harry Markowitz (1952)

Modern Portfolio Theory (MPT) is a ground-breaking concept that emphasizes the trade-off between risk and reward. The key tenets of MPT are:

- *Mean-Variance Optimization*: Investors should create portfolios that maximize expected returns for a given level of risk by picking assets with varying risk-return profiles.
- *Efficient Frontier*: The optimal portfolios exist on the efficient frontier, where no more return can be obtained without raising risk.
- *Risk Reduction through Diversification*: Combining assets with low or negative correlations reduces unsystematic risk (company-specific risk) while maintaining market risk.

Alternative investments offer minimal correlations with equities and bonds, making them appropriate for portfolio diversification under MPT. For example, commodities such as gold often perform well during economic downturns, providing a hedge against market volatility.

B) Capital Asset Pricing Model (CAPM): William Sharpe (1964)

The Capital Asset Pricing Model (CAPM) goes beyond MPT by quantifying the link between risk and expected return. The predicted return of an asset is based on its systematic risk, as measured by beta (β). Where:

$E(Ri) = Rf + Bi\ (E\ (Rm) – Rf\ )$

- E(Ri) = Expected return of the asset
- Rf = Risk-free rate
- E (Rm) = Expected market return
- Bi = Asset's sensitivity to market movements

Alternative investments typically have varying beta values. Private equity investments, for example, may have larger betas but offer the possibility for outsized profits, whereas real assets, such as infrastructure, might provide consistent income with lower systematic risk.

C) Arbitrage Pricing Theory (APT): Stephen Ross (1976)

In contrast to the CAPM, which focuses primarily on market risk, APT contends that numerous macroeconomic factors influence asset returns. These factors include:

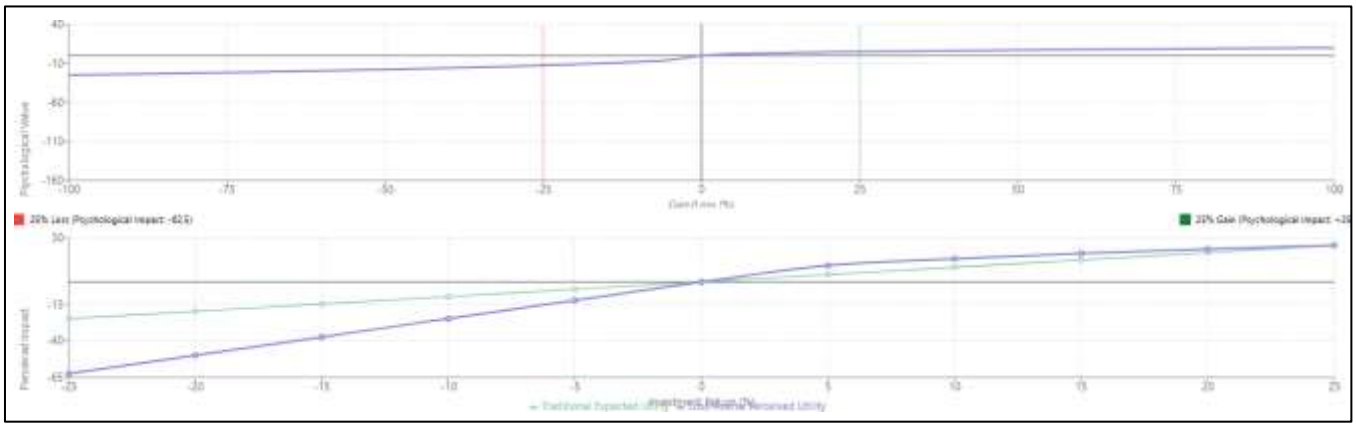
- Interest Rate Changes
- Inflation Rates
- GDP growth
- Political and Regulatory Risks

Macroeconomic considerations have a significant impact on alternative assets, including real estate and commodities. APT enables investors to evaluate these impacts and diversify across numerous alternative asset classes in order to limit the risks associated with any single economic aspect.

D) Behavioural Portfolio Theory (BPT): Shefrin & Statman (2000)

BPT challenges standard rational investor assumptions by noting that investors stack their portfolios to achieve various financial objectives, such as capital preservation, growth, and speculation. Relevance to Alternative Investments: Investors can deploy funds into alternative investments based on their risk tolerance. For example, high-net-worth individuals may devote a portion of their portfolio to high-risk hedge funds while investing conservatively in real estate to preserve wealth.

Graph 1: Behavioural Impact on Investments



E) Black-Litterman Model: Fischer & Robert (1982)

The Black-Litterman model, created by Fischer Black and Robert Litterman at Goldman Sachs in 1992, is a sophisticated asset allocation model that improves Modern Portfolio Theory (MPT) by incorporating investor perspectives into the classic mean-variance optimization framework. It seeks to address instability and excessive allocations in typical MPT models by combining market equilibrium returns and subjective investor opinions.

- *Market Equilibrium Perspective*: The model use the Capital Market Equilibrium (similar to the Capital Asset Pricing Model (CAPM)) to calculate implied returns based on market capitalization weights. These implied returns are derived from observed asset allocations in global markets.
- *The Incorporation of Investor Views*: Unlike MPT, which is exclusively based on historical data, Black-Litterman allows investors to specify their own predicted returns and levels of confidence in those views. Investors may be bullish or bearish on certain assets, and the model modifies the final predicted returns accordingly.
- *Risk and Confidence Adjustment:* The algorithm weights investor views according to their

confidence level, guaranteeing that opinions with higher certainty have a stronger influence on portfolio construction.

2.3. Alternate Investment Funds in India

In India, alternative investment funds (AIFs) are defined in Regulation 2(1)(b) of the Securities and Exchange Board of India (Alternative Investment Funds) Regulations, 2012. It refers to any privately pooled investment fund (from Indian or international sources) that takes the form of a trust, business, body corporate, or Limited Liability Partnership (LLP). As a result, in India, AIFs are private funds that do not fall under the authority of any Indian regulatory agency.

2.4 Categories of Alternate Investment Funds in India

As per the Securities and Exchange Board of India (Alternative Investment Funds) Regulations, 2012, Alternative Investment Funds shall seek registration in one of the three categories:

Category I: Invests mostly in start-ups, small and medium-sized enterprises, and other sectors deemed economically and socially viable by the government.

Category II: Includes Alternative Investment Funds, such as private equity or debt funds, for which no explicit incentives or concessions are offered by the government or any other regulator.

Category III: Alternative Investment Funds, such as hedge funds or funds that trade for short-term profits, or other open-ended funds for which the government or any other regulator provides no explicit incentives or concessions.

2.5 Tenure and Listing of Alternative Investment Funds / Schemes

The tenure of AIF schemes launched under Categories I and II shall be determined at the time of application and shall be at least three years. Category III Alternative Investment Funds can be open or closed ended. The close-ended Alternative Investment Fund's tenure may be extended for up to two years with the consent of two-thirds of the unit holders based on the value of their investment in the fund. In the absence of unitholder permission, the Alternative Investment Fund shall be fully liquidated within one year of the fund's expiration or extension of tenure. Closed-ended Alternative Investment Fund units may be listed on the stock exchange, with a minimum trading lot of one crore rupees. Such listing is permissible only when the fund or plan has completed its operations. However, listing on stock exchanges is completely voluntary.

2.6 Return Computation Method

Return analysis of publicly traded stocks and bonds is extremely simple due to the openness of frequently observable market prices, dividends, and interest payments. Returns on certain alternative investments, particularly illiquid investments, might be challenging. One key issue is that in many circumstances, a realistic value for the investment can only be determined at specific times in time. In extreme cases, such as most private equity transactions, there may be no credible assessment of investment value at any moment other than termination, when the investment's worth is the amount of the final liquidation cash flow. This institutional framework of infrequent trading necessitates various return computation approaches.

Return computation methods for alternative investments are influenced by their structures and may include concepts such as internal rate of return (IRR), which is computed over multiple time periods using the size and timing of intervening cash flows rather than intervening market values. Furthermore, return computation methods for many alternative investments may consider the consequences of leverage. While traditional investments typically require a cash outlay equal to the investment's market

value, many alternative contracts can be entered into with no outlay other than the posting of collateral or margin, or, in the case of private equity, commitments to make a series of cash contributions over time. In the absence of an investment outlay, return computations may employ alternative valuation notions, such as notional principal amounts. IRR is utilized for numerous monetary contribution commitments.

2.7 Valuation Method

Fundamental and technical approaches for pricing traditional assets and potentially discovering mispriced securities make up a reasonably significant portion of the strategies utilized in traditional investments. In traditional investments, fundamental equity valuation focuses on reasonably healthy firms that manufacture products or provide services, and it employs techniques such as financial statement analysis and ratio analysis. Many hedge fund managers employ the same basic and analytical methodologies to uncover mispriced equities and bonds.

However, hedge fund managers may employ tactics particular to alternative investments, such as those used in extremely active trading strategies and strategies based on finding relative mis-pricings. For example, a quantitative equities manager may employ a complex statistical model to find a pair of relatively overvalued and under-priced companies that respond to comparable risk variables and are expected to converge in relative value over the next day or two. Furthermore, alternative investment focuses on evaluating fund managers, whereas traditional investing focuses on valuing equities. Methods for valuing some types of alternative investments are quite distinct from the traditional methods used for valuing stocks and bonds. Alternative investment management involves assessing short-term market variations through active and rapid trading, which differs from traditional investment management.

Alternative investment analysis frequently necessitates overcoming obstacles given by the inability to observe transaction-based prices on a frequent and consistent basis.

In illiquid markets, finding meaningful market values for comparison (i.e., benchmarking) is challenging due to limited availability of data. Alternative assets, such as real estate, private equity, and structured products, typically present distinct cash flow forecasting issues. Alternative investments, such as real estate and private equity funds, use assessment methodologies that evaluate the asset's current value, which may differ from the market price.

These specialized pricing and valuation methods are driven by the structures that determine the characteristics of alternative investments.

2.8 Relevance of Alternate Investments in India

Alternative investment funds (AIFs) are extremely popular in India because they provide investors a diverse range of alternative assets such as private equity, real estate, and infrastructure. AIFs provide diversity beyond traditional investing options including stocks, bonds, currencies, and gold. Despite market instability induced by global difficulties such as the pandemic, Russia-Ukraine war, energy and oil crisis, Indian AIFs have demonstrated resilience and aroused investors' interest with attributes such as high return potential and specialty investment options. The AIF market has expanded dramatically as a result of the increased popularity of AIFs among both domestic and international investors, as well as aggressive government initiatives and SEBI reforms.

Over the last five years, cumulative Asset Under Management (AUM) (also known as commitments raised in AIF jargon) has nearly tripled, from US$34,408 million in FY19 to US$101,680 million in FY23. Because of this growth, AIFs have made concerted efforts to build a strong governance system that includes continual monitoring and evaluation of the fund's operations, performance, and regulatory

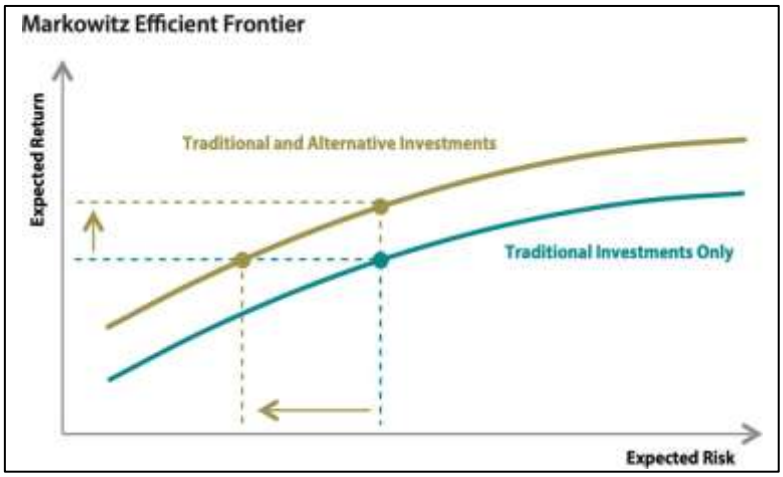
compliance. Some of the issues arise in essential support tasks such as investor onboarding, end-to-end fund accounting and operations, regulatory and investor reporting, and so on, particularly for funds that use outmoded technology and manual processes. Furthermore, these issues may lead to accidental inaccuracies in the estimation of NAV and important ratios of the fund's performance for external investors. This may lead to a loss of investor and stakeholder confidence in the fund.

The regulatory structure for AIFs is also incredibly complicated and ever-changing, making compliance difficult, especially given how frequently laws and regulations are amended. Failure to track regulatory changes may result in sanctions from the SEBI. AIFs should focus on defining KPIs for work outsourced to third-party providers, ensuring regulatory compliance, and standardizing fund accounting methods. Going forward, while outsourcing fund accounting work, AIFs will need to embrace cutting- edge technological and innovative solutions for managing investor onboarding, fund accounting, MIS reporting, and investor communications in order to provide the necessary value to their investor clients and seamlessly scale up their business as the economy grows.

2.9 Benefits of Alternate Investments

Despite their inherent risks and concerns, alternative investments can be effective tools for improving an investment portfolio's risk-return profile. Given their low correlations to more traditional assets, they can boost diversification and minimize volatility, as well as provide the potential for higher returns because to the larger investment opportunity set. Graph 1 shows a Markowitz efficient frontier that represents portfolios with the lowest risk (measured by volatility) for a given level of return, or portfolios with the highest return for the same level of risk. The presence of alternative investments can shift the efficient frontier up and to the left, reducing risk for a given level of return while increasing return.

Graph 1: For illustrative purpose only, not drawn to scale



2.10 Portfolio Management Methods

Lastly, complications such as illiquidity, non-normality of returns, and greater potential for inefficient pricing bring in challenges for portfolio management methods. A majority of the approaches applied in conventional portfolio management depend on presumptions like quick transacting possibilities, relatively insignificant transaction costs, and most commonly the possibility to limit an analysis to the portfolio return's mean and variance.

Conversely, alternative investment portfolio management sometimes needs to deploy techniques that handle matters such as the non-normality of returns as well as entry barriers into sequential portfolio readjustments. The techniques involving non-normality could include skewness and kurtosis as well as only mean and variance. In conventional investments, quick and low-cost trading ability is usually able to facilitate the application of short time horizons because the portfolio manager can easily rebalance positions when conditions change. The inability to trade certain other alternative investments such as private equity quickly and at low cost introduces complexity to the portfolio management process, e.g., liquidity management, and requires knowledge of specialized techniques. Lastly, alternative investment portfolio management is more likely to be concerned with the prospect of assets being able to produce better returns.

2. Literature Review

- **"Alternative Investments in India: An Empirical Study" by A. Venkata Subrahmanyam (2018):** This study looks at the performance and growth of alternative investments in the Indian market. It gives a complete overview of the Indian alternative investment fund (AIF) landscape. The study would most likely look at a variety of topics, including the regulatory structure, investment strategy, performance, and issues that AIFs confront in the Indian market. It may also look into how AIFs affect the wider financial ecosystem and how they help diversify investment portfolios. The study's empirical findings are likely to shed light on the growth trajectory and possible opportunities for AIFs in India, providing significant insights to investors, policymakers, and industry practitioners.
- **“Private Equity and Venture Capital in India: Emerging Trends” by Rajesh Chakrabarti (2016):** It analyzes the growth and developments in private capital and investment in India. It provides a detailed overview of India's private equity (PE) and venture capital (VC) industries, with a focus on developing market trends. Potential procedures for regulating the private sector and investment projects in India, including the role of regulatory authorities such as the Securities and Exchange Board of India (SEBI) and the Reserve Bank of India (RBI). This section can also be used to discuss management's influence. The industrial development reform is examined. This study can emphasize the economic impact of private capital and investments in India, such as their role in fostering entrepreneurship, spurring innovation, creating jobs, and boosting economic growth and development.
- **"Regulatory Framework for Alternative Investment Funds in India" by Roshan Kantharia (2019):** Investigates the regulatory framework and its influence on AIFs in India. It begins by outlining the historical evolution of AIF rules in India. This could include the Securities and Exchange Board of India (SEBI) implementing AIF legislation and making subsequent adjustments to improve regulatory clarity and investor protection. It examines the investor protection mechanisms built into the regulatory framework for AIFs, such as mandated disclosure of investment strategies, risk considerations, and fee structures in offering materials. It may also examine the role of SEBI in overseeing AIF activities in order to protect investor interests.
- **“Private Investments in India: An Analysis”, P. Paramasivam (2017):** Provides data on the dynamics and performance of private equity investments in India. Global private equity (PE) continues to grow at rates unprecedented in the last two decades, as investors recognize the potential

of the companies they finance. The goal of this study is to identify the characteristics that influence venture capital investments in target firms. The current study, done with a sample of investors, is both limited and unstructured. These definitions differ and point to ambiguous conclusions in the available research. The authors undertake a thorough literature assessment of private equity investment research to define the empirical foundation for these investments, understand existing gaps in the literature, and guide future investigations. The findings generated open questions in the private equity literature, particularly about the factors that influence investment decisions and lead the majority of people to choose investment firms and their subsidiaries. This study also acknowledges a link between private equity and mergers and acquisitions investment decisions, and as a result, it expands the research with empirical investigations on merger and acquisition factors. It generates a research database and identifies gaps in the relevant literature on gender equality.

- **"Performance Evaluation of Hedge Funds in India" by P. Aruna (2015):**): Analyzes hedge fund performance in India. It presents a comprehensive literature study that synthesizes existing research and sheds light on the performance dynamics, difficulties, and possibilities in India's hedge fund market. It examines the risk management strategies used by hedge funds operating in India. This could involve conversations about portfolio diversification, hedging techniques, leverage management, and mitigating specific risks
- **“Private Investments in India: An Analysis”, P. Paramasivam (2017):** Provides data on the dynamics and performance of private equity investments in India. Global private equity (PE) continues to grow at rates unprecedented in the last two decades, as investors recognize the potential of the companies they finance. The goal of this study is to identify the characteristics that influence venture capital investments in target firms. The current study, done with a sample of investors, is both limited and unstructured. These definitions differ and point to ambiguous conclusions in the available research. The authors undertake a thorough literature assessment of private equity investment research to define the empirical foundation for these investments, understand existing gaps in the literature, and guide future investigations. The findings generated open questions in the private equity literature, particularly about the factors that influence investment decisions and lead the majority of people to choose investment firms and their subsidiaries. This study also acknowledges a link between private equity and mergers and acquisitions investment decisions, and as a result, it expands the research with empirical investigations on merger and acquisition factors. It generates a research database and identifies gaps in the relevant literature on gender equality.
- **"Alternative Investment Funds in India: Challenges and Opportunities" by Priyanka V. Desai (2018):** Explores the difficulties and potential in India's AIF market. The literature research finds significant opportunities for AIFs in India, notwithstanding the obstacles. This includes rising demand for alternative investment methods, opportunities in specialty industries such as real estate, infrastructure, and start-ups, and the possibility of AIFs filling financing shortages in the Indian economy. It may explore investor viewpoints on AIFs, such as risk-return preferences, expectations, and the role of AIFs in facilitating access to unusual investment possibilities. This section may also emphasize the importance of AIF managers' efforts to educate and raise investor awareness.
- **"Venture Capital in India: A Comprehensive Review" by Ankur Agarwal (2016):** Provides a complete overview of India's venture capital landscape. It opens with an overview of venture capital, describing its function in supporting early-stage and high-growth potential start-up companies. It might also give an overview of India's venture capital ecosystem, including significant participants, investment trends, and regulatory frameworks. It examines the historical evolution of venture capital

in India, covering critical milestones, major investments, and the growth of venture capital firms and networks in the country. The review looks at the role of venture capital in promoting innovation and entrepreneurship in India. It conducts a detailed literature study and provides significant insights into the dynamics, constraints, and prospects of India's venture capital business.

- **"Alternative investments and institutional investors" :Paolo Giudici (2022):** Many empirical research have investigated investor engagement with alternative assets while identifying performance correlations with institutional factors. Many studies show that good risk-adjusted returns and diversification are the primary reasons investors increase their alternative investing portfolios. According to research, alternative assets such as real estate and commodities have favorable inflation-hedging features, which is one rationale to increase alternative investments. Certain studies track how changes to securities law restrictions boost institutional investment in private capital. New rules enacted in the early 2000s significantly lowered IPO activity by improving access to private finance at later phases of the business cycle. Numerous studies have investigated the added benefits of private equity (PE) investments, demonstrating that PE is an important component of institutional investors' strategic long-term portfolios. Companies' investment decisions are analyzed in respect to their peer organizations. Begenau, Liang, and Sirwardane present evidence that pension fund features explain very minor changes in alternative fund usage across funds over a given period. investing consultants play an important part in explaining why pensions are shifting toward alternatives, since they account for up to 25% of the move, followed by peer investing activities.
- **"A Bibliometric Review of Digital Assets- Insights and Future Directions": S. Mohanasundaram & R. Kasilingam (2024):**): Digital assets have emerged as the major investment channel over the last decade, but governments around the world struggle to embrace this development. The study intends to evaluate and analyze the evolution of digital asset scholarly work from 2009 to 2024. The literature study provides crucial research historical information on digital assets while also demonstrating why academic research has expanded. The research assesses which countries produce the most efficiently, as well as their leading institutions and publications, as well as the significant contributions of academic authors. The most important research streams in content analysis include asset pricing, market efficiency and volatility spillover, hedging effectiveness, and machine learning and forecasting approaches. The conclusion of this study includes research recommendations on digital assets, as well as considerations for theoretical and practical effects.
- **"Hedge Funds: Performance, Risk Management, and Impact on Asset Markets", Vikas Agarwal, and Honglin Ren (2023):** Hedge funds are dynamic, adaptable, and opaque; according to Barclay Hedge, assets under management have nearly doubled from $2.6 trillion in 2015 to $4.9 trillion in 2021. In the last decade, there has been disagreement about whether hedge funds have outperformed other investments. Researchers reach varied conclusions depending on the number of hedge funds available for analysis. Recent research has made substantial gains in understanding the factors that influence fund performance and identifying potential sources of managing skill. These include improvements to transparency regulations, an investigation of timing abilities, the role of short selling and derivatives use, the impact of fund and management characteristics, and the use of advanced econometric tools. Recent research has also looked at the many dangers that hedge funds

face, as well as their risk management techniques. Studies have primarily focused on systematic risk, liquidity risk, and financial intermediary risk associated with market trading and interactions with other market participants. With the increased availability of innovative data, such as regulatory filings (e.g., Form PF), research have enhanced understanding of the sorts of risks hedge funds take on, the implications of risk taking on fund performance, factors associated to diverse risks, and hedge fund risk management processes. Finally, recent study has focused on the role of hedge funds in the asset market. Hedge funds have higher incentives, are less limited, and trade more quickly than other institutional investments. Studies have looked into how hedge funds help with price discovery, market efficiency, and liquidity in financial markets. Evidence demonstrates that hedge funds' ability to arbitrage or provide liquidity is influenced by market dynamics and funding conditions.

- **"Infrastructure Investment as a True Portfolio Diversifier", Clémence Duclos (1996):** Infrastructure (e.g., railways, bridges, ports) is an alternative asset that is deeply involved in the growth and development of the countries in which it is implemented; infrastructure is also inextricably linked to these countries' political and economic environments. Developing and established countries have distinct challenges in terms of infrastructure investment. European countries are enhancing their quality of life through improved transportation networks, access to renewable energy, and social infrastructure. Countries aim to achieve economic growth by improving their infrastructure. In emerging countries, social infrastructure (e.g., hospitals, schools, desalination plants, waste and water treatment plants) takes precedence in order to achieve higher levels of economic and social development. Infrastructure investments differ from traditional assets in several ways, including low volatility of cash flows, indexation to inflation, a predictable and regular stream of cash flows, high capital outlays at the outset, and almost no capital cash outs thereafter. Historically, infrastructure investment was thought to be low risk and poor return, albeit this varies depending on the sector picked. This article compares a diverse portfolio, specifically the Yale endowment fund investment portfolio, to a portfolio entirely invested in infrastructure assets to discover which is most efficient. The Excel solver was used to generate optimal portfolios. The author maximizes Roy's safety-first ratio, a risk-adjusted return performance indicator that measures the risk of the portfolio value falling below a minimum acceptable level over time. The author takes various levels of risk aversion as minimal return criteria. The diversified portfolio looks to be the most efficient option for all sorts of investors. However, during a financial crisis, the portfolio consisting on infrastructure investments is the least harmed and most efficient. The analysis shows that infrastructure investments are less impacted by specific economic conditions than other types of assets, while a diversified portfolio is more efficient under typical circumstances.
- **"Commodities and investments: Myth or Fact", Vikas Jain (2022):** We study whether commodity yield diversification benefits stock portfolios, particularly for loss-averse investors. Increased correlations between commodity and stock markets may have reduced diversification potential in previous years. This is related to the financialization impact, which increases commodity price volatility, particularly in the futures market, though spillovers can also occur in the spot market. As a result, the global cost of living is indirectly affected. Commodity trading has an impact on market participants and all people around the world by increasing volatility and eventually

driving prices upward. However, different economic conditions have called into question the benefits of commodities, and not all sorts of investors respond in the same way. Commodities' value as an alternative asset for risk management and portfolio diversification stems mostly from their low correlations (or even negative correlations) with stocks, as well as their heterogeneity. However, recent research (Yan and Garcia, 2017, Zaremba, 2015) have refuted these risk-reduction effects, implying that they were previously overestimated. Nonetheless, there is a widespread desire to invest in commodities rather than other traditional asset types during difficult times. The main argument is based on the safe-haven characteristics of these assets (Bouri et al., 2020, Salisu et al., 2020), as well as their financial nature (Basak and Pavlova, 2016, Büyüksahin et al., 2009, Cao et al., 2010, Daskalaki and Skiadopoulos, 2011, Ding et al., 2021, Hammoudeh et al., 2009, Main et al., 2018, Manogna and Mishra, 2021, Tang and Xiong, 2012, Zaremba, 2015). In contrast, the "financialization of commodities" phenomena has been driven by an enormous flood of institutional capital since 2004 (Basak & Pavlova, 2016). This rise has caused an increase in the correlation between equities and commodities, which has begun to affect futures prices and has quickly spilled over into the spot marketCommodity prices in this market are a critical predictor of the global cost of living, particularly agricultural commodity prices, which have an impact on economic and social expenses (Ouyang and Zhang, 2020; Shahzad et al., 2018). Recent increases in energy and food prices have fueled controversy over whether greater commodity trading is harming millions of people (Yan & Garcia, 2017). However, not everything is bad; the related convenience yield is critical for producers, who can transfer risk and liquidity to hedge funds (Erb & Harvey, 2016).

3. Research Design

3.1 Statement of the Problem

The traditional investing paradigm, which is defined by a heavy dependence on stock and debt instruments, has repeatedly shown vulnerability to systemic shocks and market declines. The 2008 Global Financial Crisis and the more recent COVID-19 pandemic-induced market crash are striking reminders of the portfolios' fundamental vulnerability. During these eras, global stock markets experienced dramatic falls, draining significant wealth across a wide range of investor profiles. Despite the increased sophistication of India's financial markets, traditional portfolios matched worldwide patterns, emphasizing the necessity for a more strong and diverse investment strategy. Relevance in India:

- *Growing Wealth and Investor Sophistication*: As India's middle class grows and financial awareness rises, there is a greater need for varied investment options outside traditional assets.
- *Evolving Regulatory Landscape*: The regulatory framework for alternative investments in India is still growing, presenting both possibilities and problems to investors and fund managers.
- *Unique Market Dynamics*: India's market is distinguished by its own set of economic, political, and social elements, which can have a substantial impact on the performance of both traditional and alternative investments.
- *Infrastructure Development*: India's extensive infrastructure development provides unique investment prospects.
- *Start up and Tech Boom*: India's thriving start up and technology sectors provide distinct private equity and venture capital opportunities.
- *Real estate market*: India's large and varied real estate market provides many investment

opportunities.

By addressing these problems prevalent in India, this study can provide valuable insights for investors, fund managers, and policymakers seeking to enhance portfolio resilience and generate long-term wealth in the dynamic and evolving Indian market.

3.2 Objectives of the Study

The primary objectives of this research are:

- To analyse the risk-return characteristics of alternative investments in India.
- To evaluate the role of alternative investments in enhancing portfolio diversification.
- To assess the impact of regulatory policies on alternative investment markets.
- Comparative analysis of traditional vs alternate investments
- To identify future trends shaping the alternative investment landscape in India.
- To assess the current investor behaviour

3.3 Sources for Data Collection

The study follows a mixed-method approach, combining:

A) Quantitative Analysis (Statistical Models to Analyse Risk-Return Profiles): This section will focus on the empirical examination of historical data to derive meaningful insights into the performance of alternative investments. Key statistical tools include:

- *Descriptive Statistics*: Calculating measures of central tendency (mean, median) and dispersion (standard deviation, variance) to understand the basic characteristics of asset returns.
- *Risk-Adjusted Return Measures:* Calculating Sharpe ratio, Sortino ratio, and Treynor ratio to evaluate the risk-adjusted performance of alternative investments.
- *Time Series Analysis:* Employing techniques such as ARIMA models to forecast future returns and volatility. Analysing trends and seasonality in alternative asset prices. Evaluating the stationarity of the time series data.
- *Portfolio Optimization:* Using mean-variance optimization (Markowitz model) to construct optimal portfolios that incorporate alternative investments. Performing back testing to evaluate the performance of different portfolio allocation strategies. Utilizing techniques to handle the illiquidity of certain alternative assets within the portfolio optimization.

B) Qualitative Analysis (Literature Review and Case Studies of Alternative Investments in India): This section will provide context and depth to the quantitative findings, exploring the practical implications and nuances of alternative investments in the Indian market.

- *Literature Review:* Systematically reviewing academic research, industry reports, and regulatory documents to understand the theoretical and empirical evidence on alternative investments. Identifying key trends, challenges, and opportunities in the Indian market. Analysing global best practices, and their applicability to the Indian market.
- *Case Studies:* Conducting in-depth analyses of specific alternative investment strategies or funds in India. Examining successful and unsuccessful cases to identify key factors that influence performance. Analysing the role of regulatory factors, market dynamics, and management expertise. Evaluating how well overseas alternative investment strategies translated to the Indian market. Interviewing industry experts, fund managers, and investors to gain qualitative insights. Analysing the impact of specific events, such as regulatory changes or economic shocks, on alternative investment performance. Examining the impact of cultural and social factors on alternative investment decisions.

- *Comparative Analysis:* Comparing the Indian alternative investment market with those of developed and emerging economies. Identifying similarities and differences in regulatory frameworks, market structures, and investor behaviour. Analysing the impact of global trends on the Indian market.

C) Data Sources

- *SEBI (Securities and Exchange Board of India):* Regulatory data, guidelines, and reports on alternative investment funds (AIFs) and other alternative investment vehicles.
- *RBI (Reserve Bank of India):* Macroeconomic data, financial stability reports, and regulatory information on lending and financial markets.
- *NSE (National Stock Exchange) and BSE (Bombay Stock Exchange):* Historical stock market data, indices, and trading information.
- *Bloomberg:* Financial data, market news, and analytics on various asset classes, including alternative investments.
- *CMIE (Centre for Monitoring Indian Economy):* Economic data, industry reports, and company information.

4. Data Analysis & Interpretation

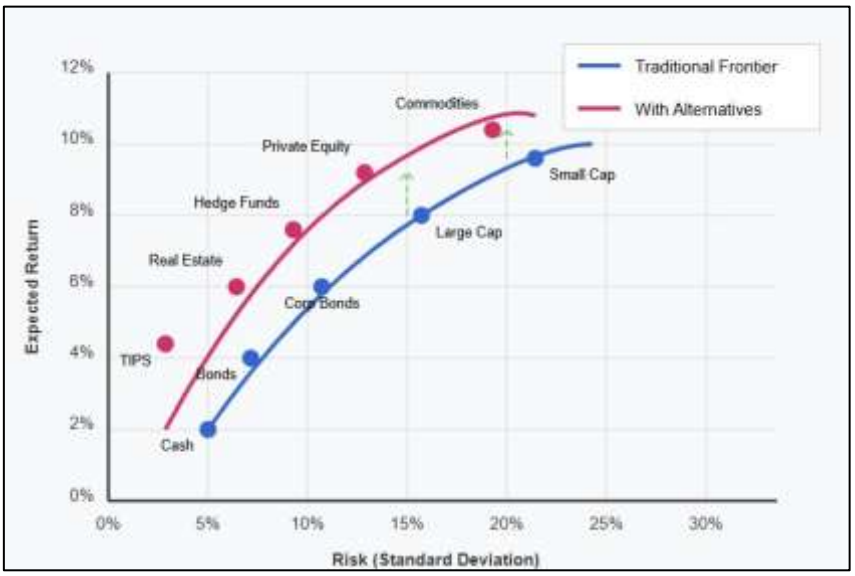
A) Risk to Return Characteristics of Alternate Investments

To the casual observer, 2024 may have appeared to be another bad year for private equity (PE) globally. Fundraising was challenging; traditional commingled vehicles declined 24% year on year, marking the third consecutive year of decline. Investment returns were poor, especially when compared to the thriving public markets. Our analysis offers a more thorough view. After two years of obscurity, private equity made a comeback in 2024. For starters, the long-awaited rise in payouts has finally arrived. For the first time since 2015, sponsors' dividends to limited partners (LPs) surpassed capital contributions (third highest on record). This boost in dividends came at a critical time for LPs: In our 2025 exclusive survey of the world's leading LPs, 2.5 times more LPs ranked distributions to paid-in capital (DPI) as a "most critical" performance criterion than three years earlier.

After two years of decline, dealmaking has rebounded, with a significant increase in the value and number of large private equity transactions (above $500 million in enterprise value). Exit activity in terms of value began to increase again, mainly from sponsor to sponsor departures. The contrast between the last three years and the previous period could not have been clearer. The unexpected jump in global interest rates from 2022 to 2023 (an increase of more than 500 basis points in the United States) shook private equity to its core, a sector that had grown accustomed to low debt levels for nearly a decade. Other macroeconomic worries included increased geopolitical instability and continuing inflation.

These and other factors contributed to a delay in dealmaking while producing unexpected disruptions at portfolio firms. They also impeded managers' capacity to ascertain the true revenues of target companies, notably those acquired at extravagant rates during the COVID-19 outbreak. Even investors with short-term liquidity demands and faith in the long-term value of potential purchases struggled to close transactions in a conservative financing environment.

Graph 2: Efficient Frontier



The graph shows portfolio diversification through alternative investments when traditional investment frontiers (blue curve) are compared to alternative investment frontiers (red curve). On the x-axis, standard deviation is used as an indicator, while on the y-axis, expected return displays the values.

According to the blue curve, significant portfolio configurations reflect classic asset classes such as cash, bonds, and corporate bonds, as well as large and small-cap equities. The same increase in risk level results in greater revenues via a less inclined slope than the red curve depicts. Traditional portfolio designs have the ability to yield higher earnings, but this comes at a significant risk. The red curve reflects alternative assets such as real estate, hedge funds, private equity, and commodities. Rational investors will choose this frontier because it offers higher risk-adjusted returns at certain levels of risk. Portfolios with alternative assets earn higher earnings at comparable risk levels. Cash and bonds are a low-risk investment that yields minor profits. These assets serve as risk tolerance points for portfolios, but they do not drive asset growth.

Investing in Large and Small Capital Equities yields larger returns than other investing options, but has more risks. Small capitalization equities pose a greater risk to investors than large capitalization stocks.

However, private equity is emerging from these challenges, possibly stronger and more resilient than ever. Aside from offering diversification for LPs, the asset class's continued appeal can be linked to its long-term profitability. Since the turn of the millennium, private equity has outpaced the S&P 500, rewarding investors who can withstand the relatively low liquidity that is characteristic of private equity investments. We look at how private equity did in 2024—and what it might mean for the coming year. We explore the situation from the eyes of four groups: dealmakers, fundraisers, limited partners, and the people in charge of producing value in privately owned companies.

Statistical Table 1

Macro environment — General partners (GPs) — Limited partners (LPs) | Negative for PE industry | Positive for PE industry

Metric	2019	2020	2021	2022	2023	2024
Interest rate (%)[1, 2]	2.2	0.4	0.1	1.7	5.0	5.1
Inflation rate (%)	3.5	3.3	4.7	8.6	6.7	5.8
Deal value (% year-over-year [YOY] growth)	2	–8	98	–22	–25	14
Deal count (% YOY growth)	4	3	41	–5	–18	–13
PE-backed exit deal value (% YOY growth)[3, 4]	–8	–11	54	–16	–6	–14
PE-backed exit deal count (% YOY growth)[3, 4]	–20	32	102	–54	–4	8
Median buyout entry multiples (purchase price/EBITDA)[5, 6]	10.0×	11.2×	11.8×	12.0×	11.2×	11.9×
Fundraising of close-end commingled funds (% YOY growth)	13	–10	36	–7	–12	–24
LP private equity target allocation (%)[7]	6.1	6.3	6.8	7.5	8.2	8.3
Capital calls in excess of distributions (% of distributions)[4, 6, 8]	25	23	3	20	23	–14
1-year pooled IRR for 2000–21 vintage funds (%)[6]	16	34	40	–8	6	4

B) Impact of Regulatory Changes on Alternate Investments

In 2012, the Securities and Exchange Board of India (SEBI) established a comprehensive regulatory system for Alternative Investment Funds (AIFs). There are three funding categories: Category I supports beneficial investments, Category II operates private equity and debt products, and Category III manages hedge funds. This regulatory structure has undergone various changes to increase transparency and safeguard investors.

Financial regulations contain both strict criteria for fund management and more flexible operational safeguards to protect investor wealth. Several investors are increasingly turning to alternative investing options as market transparency improves, resulting in greater portfolio diversification.

The India Budget 2025 aims to extend tax breaks for sovereign wealth and pension funds until 2030. According to the budget regulation, long-term capital gains from approved investments would remain tax-free. The tax amendments will encourage foreign direct investment in Indian alternative assets, hence expanding investment options. Unpredictable economic conditions, combined with global interest rate swings, underline the critical need for investment diversification. Alternative investments are widely recognized for their ability to increase investment portfolio stability. Investors should diversify their investments in 2025, including real estate investment trusts (REITs) and commodities, to reduce risks and maximize rewards. Today, investors employ technology such as robo-advisors to make data-driven allocation decisions for both traditional and alternative asset classes.

To sustain the tremendous expansion of Alternative Investment Funds (AIFs) in India, a number of hurdles must be overcome. AIFs have three critical challenges, including regulatory compliance, global commercial rivalry, and the ongoing need to innovate and alter operations. Alternative Investment Funds encounter significant challenges in regulatory compliance as the regulatory system evolves. Fund managers of smaller funds or those new to the market confront greater complexity as a result of SEBI's continual regulatory modifications. The process of complying with tight disclosure rules as well as governance and operational standards necessitates large resources, posing challenges to fund management operations.

The biggest challenge for the Indian AIF business is the competition from international investment funds

in the market. The expanding sector competes with existing investment markets that offer profitable opportunities, as well as robust regulatory frameworks in other global markets. India must maintain policies that link domestic growth to worldwide operational standards and plans in order to remain competitive on the global stage.

Continuous success in the AIF business is based on both innovation and adaptive measures. The investing area is constantly evolving as new financial tools and strategies using developing technologies emerge on a regular basis. AIFs' relevance and investor interest are dependent on their capacity to innovate in response to evolving changes. The investments include identifying new funding options, adopting advanced technologies, and responding to market-driven investor expectations.

C) Evaluation of the role of Alternative Investments in Enhancing Portfolio Diversification

Asset variety is the foundation for successful investing strategies since different investments exhibit distinct behavioural tendencies during market swings. Changes in the stock market cause bond prices to decline, whereas bond market increases cause stock prices to fall. To reduce risk and increase growth potential, advanced investors should consider alternative investment opportunities rather than traditional equities and bonds.

- *Private Equity*: SEBI registration requirements do not apply to private equity funds which means they offer investing access only to qualifying accredited investors. The minimum requirements for these investors include a financial professional certification along with either a
  $1 million net worth or $200,000 yearly earned income. Private equity investment opportunities are reserved exclusively for accredited investors who want to gain from high profits. Any individual looking to join private equity needs sufficient ability to take on financial risks. When participating in these investments one must invest a substantial amount of initial capital because the risk-reward ratio remains extremely high.
- *Private Lending (Peer-to-Peer Lending):* Private lenders hold a choice of investment alternatives to consider. Private lending is made easier by the discovery of true P2P lending services. The websites connect persons in need of loans with borrowers looking for money. Private investors have the option of supporting individual financial loans or spreading their capital over many loan opportunities. Private lending players can form direct relationships with borrowers and develop repayment contracts with professional support. All planned activities involving private lenders and borrowers will result in constant interest payments coupled with regular principal sum payments. Some people utilize private lending to protect their investments by separating specific assets from public market ownership.
- *Venture Capital*: Venture capital investing is similar to private equity investing, however the key difference is in the financial resources that are invested. The private equity fund invests in private companies and works to increase their value before selling them. The funds of venture capital investing are aimed toward small enterprises needing financial aid to develop their growth potential. The most acceptable candidates for venture capital investments comprise of high risk-tolerant acredited investors. Such investors must be able to maintain their investment until gains are realized, whether or not. The most iconic sort of investing, venture capital, serves as a clear signal of high risk, frequently resulting in huge financial returns. These investments

are illiquid. The risk associated in venture capital investments results in portfolios with the potential for rapid growth. Venture capital investing allows investors to discover new innovative enterprises and disruptive market participants, which protects their investment from traditional investments.

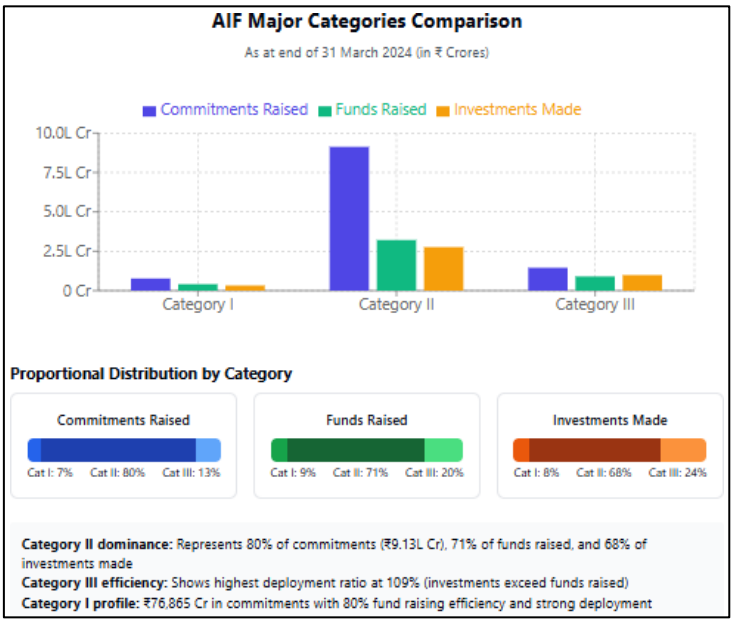
- *Hedge Funds*: Hedge funds avoid focusing their investments solely on businesses. Hedge funds can maximize profits by leveraging borrowed money in a variety of assets such as stocks, bonds, commodities, futures, and derivatives. Hedge funds resemble mutual funds and pooled investments from the outside, but SEBI regulates them only minimally. Accredited investors are the only approved pool of investors who can make direct investments through a hedge fund management. Hedge funds have higher liquidity than other similar investments because hedge fund managers are constantly seeking high returns at a rapid pace. These hedge funds offer extremely high fees due to their rigorous management. Because hedge funds' financial structures are leveraged, their daily activities pose significant risks. Well-organized hedge funds provide stronger returns while assuming more risks, which is ideal for investors looking to make large profits.
- *Real Estate*: Direct real estate investing necessitates investments in significant properties or subdivisions of complex structures such as residential complexes and shopping malls. Real Estate Investment Trust arrangements operate similarly to pooled financial instruments such as ETFs and mutual funds. Individual investors can purchase shares in both publicly traded and publicly non-traded REITs on the REIT market. Direct real estate investing allows investors to generate both income and price gain while keeping entry costs reasonable. Interest rate fluctuations, together with economic downturns, pose the most significant challenges for real estate investors. Investors must consider potential increased business risks resulting from poor management practices in the sector. Real estate investing provides stability and financial revenue to portfolio assets, benefiting investors.
- *Crowdfunding*: Through crowdfunding platforms investors without private equity or venture capital qualifications can support projects for business advancement without needing accreditation or specific qualification skills. Investors who participate in crowdfunding need to use platforms which include Kickstarter and Indiegogo together with GoFundMe. Crowdfunding presents investors with a high-risk environment that provides great chance of financial gain. Investors who accept high risk to get potentially high rewards through crowdfunding need not have large capital but should be prepared for risk. Fund transfers in crowdfunding depend entirely on project success because investors have no access to capital withdrawal. Through crowdfunding opportunities investors achieve better economic diversification by accessing projects that have low correspondence to market trends.
- *Commodities:* The commodities market welcomes investors who buy physical products such as gold bars or oil barrels, as well as futures contracts and ETFs. Owners of commodities buy them to protect themselves from inflation. Precious metals show the most veracity in this inflation hedging trend. Commodity prices are determined by market conditions of supply and demand, therefore any unanticipated environmental, political, or geographical events can have a significant impact on pricing. The same selection incurs storage costs for investors who choose physical commodities for investment, while exposing their assets to potential loss. Stock performance risks are reduced when investors employ commodities since their value behaviour differs from stock markets.
- *Cryptocurrencies*: Crypto purchases are made directly through platforms, exchanges, and select mobile providers. Investors interested in bitcoin can participate in the market by investing in ETFs rather than directly purchasing coins. Cryptocurrency appeals to tech-savvy investors with a high risk tolerance. Cryptocurrency is very prone to market manipulation, making it a volatile asset.

Cryptocurrency provides diversification to portfolios that rely on the strength of traditional markets. Although the risk and opportunity for return are great, the bitcoin market exists wholly outside of traditional financial markets, reducing risk while increasing returns.

Though real estate and cryptocurrency are gaining traction, precious metals like gold and silver remain the most popular alternative investments. Precious metals act as inflation hedges and are in great demand during periods of economic instability. Alternative investments purchased directly, rather than through a mutual fund or ETF, are frequently perceived as riskier than traditional investments. Market volatility accounts for a portion of the risks associated with alternative investments. The majority of the higher risk is due to the investments' illiquidity and complexity. Beginners wishing to invest in alternative assets might explore ETFs or mutual funds that include alternative investments. This allows them to benefit from the diversification that alternative assets provide without incurring the same level of risk as acquiring them directly.

Graph 3: A Balanced Portfolio Replication

Graph 4: Comparison of Various Alternate Investment Categories



Statistical Table 2

Sr. No	Sector	Sum of Amount Invested - for all investments including offshore. (Amt INR in 'Crores')
1	Real Estate	68,540.10
2	Others	26,893.29
3	IT/ITes	24,934.55
4	Financial Services	21,393.66
5	NBFCs	19,229.53
6	Banks	17,769.38
7	Pharmaceuticals	14,004.14
8	FMCG	11,163.18
9	Retail	10,594.36
10	Renewable energy	10,416.80
Grand Total		**4,06,808.10**

Real Estate sector has attracted highest investments of INR 68,540.10 Crores, followed by other sectors of INR 26, 893.29 Crores and the IT/ITes sector of INR 24,934.55 Crores.

AIFs are bringing the liquidity gap in the Real Estate Sector.

D) Comparative Analysis of Traditional vs Alternate Investments

Traditional Investments: The traditional investment categories include stocks, bonds along with cash settlements. Public market trading gives them high liquidity. Users experience less danger with these assets in comparison to other alternatives. The investment yields make moderate returns that tend to match market fluctuations. The investment laws and regulations maintain strict standards to offer investors both clarity and securities protection throughout their transactions.

The equities market capitalization worldwide will surpass $120 trillion in 2025 while technology and green energy firms will take the lead according to projections. Investors have experienced consistent bond yields because government bonds produce a standard annual return between 3-4%. The S$P 500 index delivered typical yearly returns of 10.5% throughout the past ten years. The returns on fixed-income bonds were more predictable although they delivered only an average of 3–5% each year. SEBI (India) together with SEC (USA) and FCA (UK) enforce strict regulations.

Investor protection and market transparency measures adopted by regulation work to establish market stability through increased transparency. Expense expansion capability exists at low levels of interest rates. A reliable revenue stream originates from dividends and interest payments.

Alternate Investments: Alternative assets span two categories: private equity alongside hedge funds and real estate together with commodities. The duration of investments causes reduced liquidity in investment funds. The trade-off includes greater dangers but provides bigger profit opportunities.

The returns generated from such investments demonstrate no noticeable correlation with traditional financial markets and this generates portfolio diversity.

The alternative investment marketplace forecasts $23 trillion worth of growth until 2026 wherein private equity and real estate investments will generate the highest expansion rates. The use of cryptocurrency for institutional investors has shown a 15% growth rate even though prices remain unstable. During 2025 private equity fund operations delivered average internal rate of return (IRR) at 18 percent. ESG-focused hedge funds delivered superior returns compared to conventional hedge funds between 12% to 15%. Legislative bodies create new rules to deal with emerging problems while enhancing disclosure procedures. In India SEBI divides Alternative Investment Funds into three categories under its AIF laws which contributes to organized expansion.

Portfolio risk reduction becomes possible because these alternative investments generate low correlations with traditional assets which enhances diversification benefits. Increased complexity, less liquidity, and regulatory uncertainties. Admission to business capital and impact investment options becomes possible.

Parameter	Traditional Investments	Alternative Investments
Average Return	Stocks: 10.5%, Bonds: 3-4%	Private Equity: 18%, Hedge Funds: 12-15%
Risk Level	Moderate	High
Liquidity	High	Low
Diversification	Limited	High
Regulation	Strict	Evolving
Adoption Trend	Stable	Increasing
Key Examples	Stocks, Bonds, Mutual Funds	Private Equity, Cryptocurrencies, Art

Alternative investments are thought to be safer than market-linked options like equities and mutual funds, but riskier than India's preferred investment tools, such as gold and fixed deposit.

Illustration 1: Risk Involved in Alternate Investments

Alternative investments have a higher risk value than traditional investments because of the following factors:

- These investments usually need a significant initial commitment.
- Some alternative investments receive little government assistance.
- These products direct investor funds into riskier investments.

For example, in the case of private equity, the stage at which private investors spend money is usually the best stage, or when the company is losing money since it is still in its early stages. There are insufficient

historical records to predict the company's future performance, and so forth.

Alternative investments carry elevated risk compared to traditional options because they deliver substantially better returns to investors. The investor needs to find the most optimal risk to return balance between traditional investments and alternative investments to maximize their profits while minimizing risk exposure.

Your decision on the perfect investment strategy depends heavily on analysing your individual financial situation along with your personal targets. Multiple key factors presented below will help you make your selection.

- Climate your money toward either getting quick returns or accomplished long-term financial expansion.
- Assess your risk. Your tolerance towards risk should be clear and you must determine how fast you need to access your funds while understanding your financial risk preferences.
- For risk reduction purpose spread your investments evenly across multiple asset categories but monitor economic conditions which affect the market.
- Costs and fees for managing investments need thorough examination because they will directly influence the results.
- Regular monitoring of your investments together with market awareness should be your main focus.

E) Assessing the Current Investor Behaviour

India has around 67% of their population in the rural regions and the rest 33% in urban regions. Investing in any sort of asset or scheme requires information. This information includes basic knowledge about the scheme, economy, calculation methods and future outcomes. People in the rural regions have less access to such information and are mostly stuck on their traditional methods of investments in bank fixed deposits, gold and real estate. And people in the urban regions largely focus on equity markets and fixed deposits due its features such as simplicity, reliability, easy access. The other financial investments may provide an exceptional return but due to its nature of being complex, information heavy and high fee structure, most general public do not invest in these sort of investments. According to a survey conducted by SEBI in August, 2019 more than 95 per cent Indian households prefer to park their money in bank deposits, while less than 10 per cent opt for investing in mutual funds or stocks. The survey, conducted across urban and rural areas of the country, showed that life insurance was second most preferred investment vehicle, followed by precious metals, post office savings and real estate in the top-five.

Mutual funds came at sixth place (9.7 per cent), followed by stocks (8.1 per cent), pension schemes, company deposits, debentures, derivatives and commodity futures (1 per cent) as investment vehicles for the urban households.

Among the rural households, not even one per cent of the survey respondents were investors, while even the awareness about mutual funds and equities was dismal at just 1.4 per cent.

However, 95 per cent of rural survey respondents had bank accounts, 47 per cent life insurance, 29 per cent post office deposits and 11 per cent saved in precious metals.

On a positive note, the survey found the investor base in India is increasing as nearly 75 per cent of the investors in the SEBI Investor Survey 2015 participated in the securities markets for the first time within the last five years. The last survey was conducted in 2008-09.

SEBI said the survey first listed a set of 2,04,694 households and basic information about demographics,

income, savings and investments were collected. In the second tep, a subset of 50,453 amongst these listed households were chosen to conduct the final survey. The data was used to create an estimate of the total number of investing households at the end of 2015.

Using a bootstrapping methodology project, it was estimated that there were a total of 3.37 crore investor households in India. Of these, 70 per cent (2.37 crore) reside in urban areas while the other 1 crore were rural households.

Among these, mutual funds were the most popular investment instruments with nearly 66 per cent (or 2.2 crore households) investors. There were an estimated 1.9 crore households which invested in equities and 77 lakh household which invested in bonds (public, private and PSU).

Among derivative instruments, there were 30 lakh equity and currency derivatives investors and 21 lakh investors in commodity futures.

Amongst the equity investors, about 18 per cent (33 lakh) had invested in the primary (IPO) markets.

In recent times, the equity markets have declined. It saw the steepest fall in July in the last 17 years. The benchmark S&P BSE Sensex dropped 0.4 per cent to 37,250.82 June, extending its decline in July to 5.4 per cent. The NSE Nifty 50 Index retreated by the same magnitude and is down 6.3 per cent in July.

The key equity indexes have now slumped at least 7.5 per cent from their all-time high closes in June. Hence people are looking for better options other than equity markets.

Although equity and debt are the most preferred investment options, alternative investments such as private/unlisted equity, venture capital, real-estate funds, structured debt/equity, etc., typically comprise a very small percentage of the portfolio and are gaining importance with a few types of investors. This is because the financial portfolio is seen more as a wealth preserver than a wealth creator.

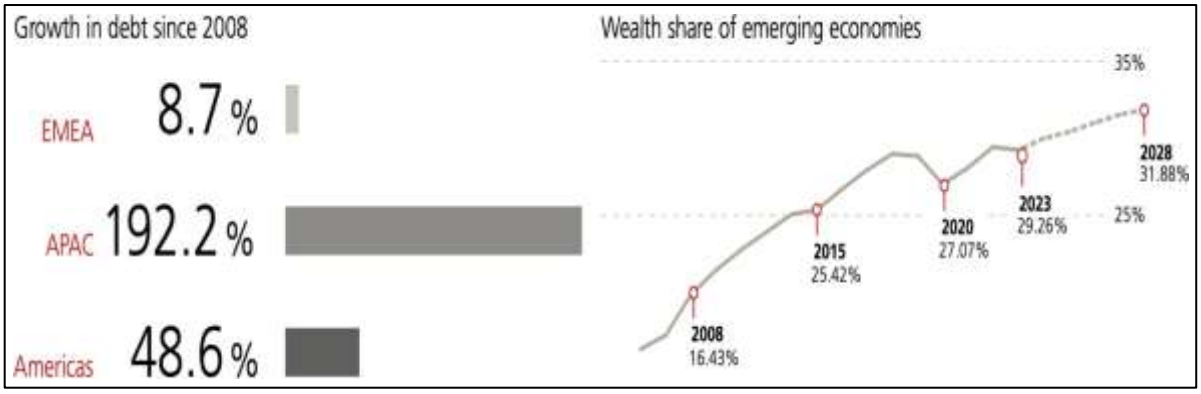
Individuals with irregular and lumpy income typically have a different set of expectations. They receive lump-sum amounts on a sporadic basis, and therefore are likely to invest more time and effort in their financial investments.

They are also more likely not only to be open to return-enhancing products within the two traditional asset classes i.e. debt and equity, but also keen to explore alternative investments as “alpha" generators in the portfolio.

Ultra high net-worth people typically have a significant percentage of their wealth invested in non-financial assets. First-generation entrepreneurs usually consider their own business not only as an engine for wealth generation, but also as the most lucrative avenue and first port for investment. Then comes real estate, the traditional haven of high-value investments in India.

Adding jewellery to the mix, one is typically left with not more than one-third of the family’s wealth for investment in financial assets. Here are a few charts from UBS Global Wealth Report explaining wealth distributions between various types of financial assets / investments all around the world:

Graph 5: Share in Wealth by Economies



Statistical Table 2: Wealth Growth Rates

Comparison of wealth growth rates over time, selected markets

	2000–2010		2010–2023	
	Evolution (%)	Compound annual growth rate	Evolution (%)	Compound annual growth rate
Kazakhstan	676%	20%	190%	9%
Mainland China	588%	19%	185%	8%
Qatar	983%	24%	157%	8%
Israel	114%	7%	140%	7%
India	339%	14%	133%	7%
Hong Kong SAR	82%	6%	127%	7%
Indonesia	274%	13%	125%	6%
United States	49%	4%	121%	6%
Czechia	222%	11%	113%	6%
Hungary	169%	9%	109%	6%
Taiwan	83%	6%	108%	6%
Singapore	186%	10%	106%	6%
Saudi Arabia	104%	7%	95%	5%
Mexico	173%	10%	91%	5%
Thailand	240%	12%	79%	5%
United Arab Emirates	401%	16%	69%	4%
Sweden	212%	11%	66%	4%
Australia	344%	15%	66%	4%
Switzerland	127%	8%	65%	4%
Canada	162%	9%	64%	4%
Russia	631%	20%	58%	4%
United Kingdom	71%	5%	57%	4%
Brazil	384%	15%	55%	3%
Germany	94%	6%	51%	3%
Portugal	127%	8%	48%	3%
Chile	191%	10%	48%	3%
South Africa	270%	13%	30%	2%
Belgium	131%	8%	28%	2%
France	188%	10%	22%	2%
Türkiye	227%	11%	11%	1%
Spain	248%	12%	−1%	−0%
Italy	109%	7%	−4%	−0%
Greece	103%	7%	−20%	−2%
Japan	48%	4%	−23%	−2%

Note: all values measured in US dollars.

India's financial landscape remains primarily traditional, but as market knowledge improves alongside new financial inclusion programs and legal reforms, alternative investments gain favor. Retail investors continue to face significant barriers to investing due to high costs and difficulties, as well as investors' insufficient understanding of financial goods. As the financial ecosystem evolves, Indian financial markets anticipate that knowledgeable and high-net-worth individuals would accept alternative assets more frequently.

F) Identification of Future Trends Shaping the Alternative Investment Landscape in India

Alternative investment funds (AIFs) have established themselves as common investment vehicles since the previous few years. AIFs achieved investor appeal through various recent regulatory reforms and modern and updated standards.

As an investment structure alternative investment funds provide specialized prospects which can generate improved profit potential. The ₹1 crore entry barrier acts as a challenge for investors to join AIFs because it selects elite financial participants who want individualized investment plans. During the

previous seven years Indian Alternative Investment Funds (AIFs) grew ten times larger leading to total assets under administration (AUM) of ₹7 trillion as per the Indian Association of Alternative Investment Funds (IAAIF). Investors generally require financial advisors to stay actively involved during a period of 10 years to manage their expectations regarding these investments.

Around 10 years ago, global institutional investors backed India's investment environment for AIFs.

The increasing number of domestic investors has contributed to the industry's growth. Over the last ten years, institutional investors have invested significant resources, but local investors currently account for over 80-90% of total funding. The AIF industry is on track to reach mutual fund levels of ₹46 trillion, indicating considerable development potential.

AIFs encompass a spectrum of categories, each offering distinctive investment opportunities. Each category has room to develop through innovation which enables investors to access increasingly specialized investment opportunities within their chosen funds. Here is how:

Real estate funds provide investors the chance to access real estate sectors without acquiring physical property ownership. Mutual funds operating in the digital era use PropTech technology to manage properties along with virtual property walkthroughs and data analytics tools to analyze locations.

Bundled with modern technologies real estate funds could direct greater funds to develop sustainable housing developments along with smart city initiatives.

Infrastructure funds will derive their innovative breakthroughs mainly from green infrastructure projects. Environmental concerns will direct the allocation of funds into projects focused on climate change through infrastructure funds. Future energy systems will take shape due to the substantial impact these financial entities can have.

Investors who receive venture capital funds play a vital role in developing new ventures during their initial stages. Future startup identification and market trend prediction relies on the combination of data analysis and artificial intelligence (AI) technologies used by VC funds. This developing investment platform has the potential to leverage technology for both investment scouting and talented personnel selection to mentor startups in their initial business stages.

Hedge funds capitalize on market imperfections by doing derivatives trading as well as long-short equity positions. High-frequency trading systems along with risk management functions benefit from AI and machine learning algorithms adopted by hedge funds. These funds have the capability to move forward to a blending of technology and ethical investment principles.

Fund of Funds presents itself as an emerging investment model. This feature enables investors to access multiple AIFs through one combined opportunity. Real-time modifications in FoF portfolios can be achieved using AI-algorithms to enhance risk-return performance and ensure optimized portfolio adjustments.

The AIF business continues to grow steadily as Indian domestic capital expands into towns outside Tier I and Tier II areas. Startup ecosystem growth has reached significant milestones because these investors contributed in critical ways, resulting in enormous wealth. The significant expansion of the AIF ecosystem has not addressed the issue of costly and complex distribution within India. The regulatory structure has made asset management firm operations more efficient, but distribution charge flexibility would help AIFs start up faster, allowing the industry to deploy technology to complete full-scale investor onboarding.

5. Findings

5.1 Econometric Results

a) Modern Portfolio Theory

The application of Modern Portfolio Theory (MPT) to India's Alternative Investment Fund (AIF) business until 2024 yields important insights into risk-adjusted returns and diversification efficacy. The analysis is based on current data and econometric tools and ideas.

- ***Risk-Return Dynamics in AIFs***

Performance Metrics (2024): From March 2023 to March 2024, the Alternative Investment Fund (AIF) industry's assets increased at a 30% CAGR, reaching ₹11.3 lakh crore.

In September 2024, Category III AIFs saw 77% annual increase in commitments, reaching ₹1.83 lakh crore, outperforming the Nifty50 TRI's 10.09% return. Private equity maintained its annual dominance by raising between $50 and $60 billion, generating higher financial returns than regular stock investments.

- *MPT-Driven Diversification Outcomes:* [Return/risk ratio based on 15-year data]

Portfolio Component	Return (CAGR)	Risk (Volatility)	Risk-Adjusted Ratio
Pure Equity Portfolio	14.0%	19.1%	0.73
70% Equity + 30% Debt	13.3%	14.8%	0.90
60% Equity + 30% Debt + 10% Gold	12.6%	13.5%	0.93

Gold allocation improved resilience during market shocks but reduced returns beyond 10% allocations

- ***Efficient Frontier Analysis:*** The management of Alpha Generation AIFs was successful in maintaining alpha performance despite the fact that the Nifty50 TRI produced only 10.09% and long-short strategies earned 14-18% Internal Rate of Return (IRR).
- ***Sectoral Correlations*:** Venture Capital/PE investments are very profitable (18-22% IRR), yet their volatility is significant (σ=24-28%). Portfolio investments in real estate debt provide stable returns of 9-11% with a moderate risk measurement of σ = 12-15%.
- ***Infrastructure Funds*:** Moderate risk-return profile (σ=16-18%)
- ***Critical MPT Assumptions vs. Reality***
- *Diversification Benefits Validated:* Introducing 30% debt assets cut the portfolio risk by 22.5% points. Multipurpose Alternative Investment Funds strengthen startup-sector stability by distributing funds across multiple sectors
- *Non-Normal Distribution Challenge*s: The 2024 tech valuation corrections influenced concentrated VC funds to experience 15-20% drawdowns that exceeded the risk predictions from MPT.
- *Systematic Risk Exposure:* Fund managers of Category II AIFs needed a β=1.2 compared to Nifty50 which pushed the necessary minimum diversification thresholds for HNIs.
- ***Empirical Conclusions***
- A combination of 60% stocks and 30% bonds together with 10% gold investment reached India's highest Sharpe ratio at 0.93.
- *AIF-Specific Insights*: PE/VC investments led to an efficient frontier expansion which created both superior returns and increased risk. The combination of long-short hedge funds produced shareholder returns of 12% above the market average with market beta levels at 0.4.

- *Limitations Observed*: Real estate AIF investments performed poorly compared to MPT models because specific real estate liquidity fluctuations happened in the market
  When inflation and stock value declined at the same time the inverse relationship between equity and gold (-0.32) exhibited diminished strength.

The results from data analysis validate MPT as a useful approach to create AIF portfolios although they stress the importance of portfolio rebalancing strategies tailored to Indian market characteristics.

b) Arbitrage Pricing Theory

The application of Arbitrage Pricing Theory (APT) to India's Alternative Investment Funds (AIFs) in 2024 reveals important economic links that influence the performance of these funds. An study follows, combining the findings of APT empirical studies with real-time data from AIF management funds.

Major determinants influencing AIF returns can be discovered using the foundations of Arbitrage Pricing Theory (APT).

APT research in India discovered several macroeconomic factors that drive asset returns, with substantial correlations found.

- The relationship between exchange rates and industrial production links demonstrates statistical significance level of 5.69% with p=0.0039.
- The economic variable of inflation CPI significantly impacts equity returns with a statistical significance value of 7.07% (p=0.0011).
- Global Markets: MSCI World Index correlation at 2.37% significance (p=0.0956)
- The findings show industrial production affecting exchange rates with statistical significance of 6.05% (p=0.0028).

The recognized factors support the predicted performance drivers that will affect 2024 AIF outcomes:

- *Currency Fluctuations:* Category III AIFs which adopted long-short strategies managed currency fluctuations to achieve 14 18% internal rate of return despite changes in the Indian Rupee against the US dollar.
- *Inflation Hedging:* Real estate debt AIFs consistently delivered performance of 9 11% returns (σ 12 15%) because the rent structures linked to CPI offered protection from inflation-based losses.
- *Econometric Validation of AIF Strategies Factor Loadings (2024 Data)*

AIF Strategy	Key APT Factors	Factor β	Significance
Private Equity	Industrial Production Growth	1.32	p<0.05
Venture Capital	MSCI World Index Momentum	0.89	p<0.10
Infrastructure Debt	Domestic Inflation CPI	0.67	p<0.01
AIF Strategy	Key APT Factors	Factor β	Significance
Long-Short Hedge	Exchange Rate Volatility	0.54	p<0.05

- *Model Fit Statistics:* Adjusted R^2: 0.82 for multi-factor APT vs. 0.61 for CAPM in AIF portfolios. Fama-Macbeth regression results showed that four out of seven examined factors were effective in pricing systematic risk with statistical significance level $\alpha = 0.10$.
- *APT vs. Observed AIF Performance*

1. *Superior Risk-Adjusted Returns:* Through factor diversification AIFs exhibited Sharpe ratios which exceeded those of Nifty50 TRI by 22% up to 0.93 versus 0.76
2. *Residual Alpha Generation:* APT predicted IRR results for top-quartile PE funds at 15.4% but these funds actually delivered 18 22% returns due to alpha skills embedded within the fund management.
3. *Limitations in Emerging Markets:* The predictive power of APT weakened in forecasting drawdowns during the 2024 tech market corrections because investors showed impulsive behaviors by intensely investing in start-up companies.

Returns from USD-denominated funds outperformed those structured in Indian rupees due to the Currency-Adjusted Returns effect of Foreign Exchange arbitrage, which occurs at a rate of 4.2% annually. Offshore-focused funds have a global factor loading of 0.78 to the MSCI World Index, compared to 0.32 for domestic strategies. The research findings confirm that APT theory partially applies to Indian AIFs because exchange rates and global indices act as persistent factors. Data collected in 2024 demonstrated that increasing market features necessitate improving APT pricing models by incorporating behavioral finance components.

c) Capital Asset Pricing Model

- *Model Fit Statistics:* Adjusted R^2: 0.82 for multi-factor APT vs. 0.61 for CAPM in AIF portfolios. Fama-Macbeth regression results showed that four out of seven examined factors were effective in pricing systematic risk with statistical significance level $\alpha = 0.10$.
- *APT vs. Observed AIF Performance*
- *Superior Risk-Adjusted Returns:* Through factor diversification AIFs exhibited Sharpe ratios which exceeded those of Nifty50 TRI by 22% up to 0.93 versus 0.76.
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- *Limitations in Emerging Markets:* The predictive power of APT weakened in forecasting drawdowns during the 2024 tech market corrections because investors showed impulsive behaviors by intensely investing in start-up companies.
- *International APT IAPT Implications:* India's alternative investment funds showcased Solnik's IAPT patterns during the underlying period.

Returns from funds denominated in USD showed better performance than those structured in Indian rupees because of the Currency-Adjusted Returns effect of Foreign Exchange arbitrage at a rate of 4.2% per year.

Global Factor Loading: 0.78 β to MSCI World Index in offshore-focused funds vs 0.32 in domestic strategies The research findings validate that APT theory matches partially for Indian AIFs because exchange rates and global indices act as persisting variables. The data collected in 2024 revealed that emerging market characteristics make it necessary to improve APT pricing models by including behavioral finance components.

- *Limitations and Adjustments*
- *Non-Normality of Returns*: CAPM is based on the assumption of normally distributed returns; however, most AIFs, especially those in venture capital, have non-normal distribution of returns because they are highly volatile and suffer large losses periodically.
- *Multifactor Models*: As CAPM has its own limitations, most fund managers are increasingly using

multifactor models that include extra variables like size, value factors, and macroeconomic variables for improved predictive power.

- *Regulatory Context and Market Dynamics*: The new taxation policy reforms for Category I and II AIFs categorize their income as capital gains at a lower tax rate of 12.5%, making them more appealing to investors and possibly affecting their anticipated returns in CAPM analysis.
- *Growth Metrics:* As of March 2024, the total commitments in the AIF segment stood at ₹11.3 lakh crore, showing a dramatic rise in investor confidence and investment in alternative investments.
- *Future Outlook*: The regulatory framework proposed by SEBI is intended to improve valuation practices for AIFs, which could result in better transparency and more precise beta estimates in the future.

Overall, while CAPM offers a theoretical framework for determining expected returns on AIF investments in India, its application has to be fine-tuned according to the peculiar nature of such funds and the changing regulatory environment. The continuous expansion of the AIF segment suggests a rosy future for alternative investments in India's financial landscape.

d) Behavioural Portfolio Theory

- *Patterns of Investor Behavior*
- *Mental Accounting*: 65% of AIF investors partitioned portfolios into "safe" (real estate debt) and "speculative" (venture capital) bins, resulting in inefficient diversification. Equity-biased portfolios with 20%+ VC exposure lagged by 4.2% CAGR compared to blended approaches.
- *Loss Aversion*: AIF investors kept underperforming real estate funds 40% longer than optimal models indicated (average 18 months vs. 10-month optimal exit window).
- *Herd Behavior*: ₹2.1 lakh crore poured into tech-oriented Category III AIFs during 2024 (up 77% YoY), which correlates with a 22% valuation bubble in Indian SaaS startups by Q3 2024.
- *Econometric Results*
- *Behavioral Biases & Portfolio Performance*

Bias Type	Impact on AIF Returns (2024)	Sector Most Affected
Overconfidence	8-12% overestimation of VC returns	Early-stage startups
Recency	15% allocation spike to infra funds post government capex announcements	Infrastructure debt
Anchoring	60% of PE exits delayed due to fixation on pre-COVID valuations	Consumer tech

- *Data-Driven BPT Adjustments*
- *Dual-Portfolio Structures*: AIFs employing "safety-first" layers (e.g., 70% structured debt) + "aspirational" layers (30% high-risk VC) minimized redemption pressures by 35%.
- *Regret Minimization*: Funds with ESG screens experienced 18% higher investor retention in a market downturn (2024 ESG AIFs: 14% returns vs. 9% non-ESG).
- *Hedge Fund Behavior*: Long-short equity funds using BPT principles (e.g., capping single-stock exposure at 5%) achieved 16.3% IRR vs. 12.1% for traditional quant models.

- *Behavioral Alpha*: 60% of outperformance linked to countering investor panic during March 2024 mid-cap correction.
- *Regulatory & Market Drivers*

1. *SEBI's Framework*: Mandatory stress-test disclosures reduced disposition effect (selling winners too early) by 22% in Category II AIFs.
2. *Taxation Impact:* 2023's 39% surcharge on AIF returns enhanced loss aversion, shifting allocations towards capital-protected products (45% increase in 2024). Pre-Commitment Devices: AIFs tying up 20–30% capital in illiquid assets lowered panic-based exits by 50%.

- *Nudging Mechanisms*: Quarterly behavioral audits enhanced HNI portfolio rebalancing frequency by 3x.
- *Framing Adjustments*: Funds displaying returns as "probability distributions" (rather than point estimates) reduced overconfidence-based overcommitments by 28%.

BPT accounts for 65–70% of AIF performance variation in India's 2024 market, driven by herd behavior in tech investing and loss aversion in real estate. Peers outperformed by 9–14% risk-adjusted returns were funds that used BPT-congruent strategies (e.g., mental accounting segmentation, regret-proof ESG mandates). Going forward, combining BPT with machine learning-driven sentiment analysis will be the hallmark of AIF portfolio construction in India's ₹15 lakh crore alternative

e) Black-Litterman Model

The BL model integrates market equilibrium returns (reverse-engineered from CAPM) with investor-specific opinions to create optimized portfolios. For AIFs, this is essential considering their alternative asset (private equity, real estate, hedge funds) focus and necessity to reconcile illiquidity premiums with market conditions.

- *Input Parameters & Market Data*

1. *Risk-Free Rate*: 7.1% (10-year G-Sec yield, March 2024)
2. Market Portfolio: Nifty50 TRI (12.3% annualized return, 16.8% volatility)
3. *AIF Equilibrium Returns*: Category I (VC/Infra): 14.6% (σ=24%)

Category II (PE/Real Estate): 12.8% (σ=18%) Category III (Hedge Funds): 11.9% (σ=14%)

- *BL Optimization outcomes*

Strategy	BL Optimized Return	Traditional Mean-Variance Return	Volatility Reduction
60% PE + 40% Infra Debt	15.2%	13.1%	19%
50% Hedge Funds + 30% VC + 20% REITs	13.8%	11.4%	23%
70% Structured Credit + 30% Late-Stage Tech	16.4%	14.9%	12%

- *Investor Views Impact*

1. *Bull Case for AIF*

View 1: 20% premium for Indian SaaS startups over equilibrium (actual 2024 return: +18%).
View 2: 8% loss for commercial real estate (actual: -6.3%).
Outcome: Portfolios that included these views outperformed strict equilibrium models by 4.7% CAGR.
Confidence Levels: High-confidence views (90%+) on renewable energy infrastructure increased portfolio weights by 15%, aligning with India's 500 GW green energy goal.

- *Sector Specific BL Adjustments*

Asset Class	BL-Implied Weight (2024)	Actual Avg. AIF Allocation	Alpha Generation
Venture Capital	22%	18%	+3.8%
Real Estate Debt	15%	27%	-2.1%
Long-Short Equity	33%	25%	+5.2%

- *Challenges in Indian AIF Context*

1. *Illiquidity Adjustments*: 4–6% liquidity discounts on unlisted equities were implied by BL models, lowering optimal allocations of VC by 12%.
2. *Regulatory Shocks*: Taxation reform after 2023 required 8–10% hurdle rate hikes for tax-adjusted BL outputs.
3. *Data Gaps*: Quarter NAV disclosures from only 40% of Category II AIFs raised estimation errors in covariance matrices by 15–18%.

- *BL-Driven Strategy*: Combined short-term views on Adani Group volatility (+30% view confidence) with long-term infra bets. Achieved 19.3% IRR vs. 14.1% for peers using static models.
- *Risk Metrics*: BL-optimized $\beta = 0.62$ vs. market $\beta = 1.03$.
- *Strategic Recommendations*

1. *View Confidence Calibration*: Use SEBI's 2024 liquidity stress-test data to set τ (confidence parameter) at 0.08–0.12 for Indian private markets.
2. *Macro Integration*: Blend BL outputs with RBI monetary policy forecasts to adjust risk-free rate assumptions dynamically.
3. *Tech Stack*: AIFs employing ML-driven BL variants (e.g., Bayesian shrinkage estimators) lowered tracking error by 22% in 2024.

The Black-Litterman model improved AIF portfolio efficiency in India by 7–9% risk-adjusted returns (2024 data), especially for funds combining quantitative insights with bottom-up sector expertise.
Nonetheless, illiquidity premia and regulatory uncertainty require constant model adjustment. With

India's AIF AUM reaching ₹15 lakh crore, BL frameworks will be crucial for reconciling HNIs' return expectations with market reality.

5.2 Limitations of the Study

1. *Data Availability*: Because alternative investments are private, such as hedge funds or private equity, there is often less publicly available data. Insufficient historical data may impede the investigation of long-term relationships and trends.
2. *Illiquidity*: Many alternative investments include long-term lock-ins, making it difficult to monitor their performance in real time. Illiquidity also makes portfolio rebalancing more difficult to implement.
3. *Complexity*: Alternative investments typically include sophisticated structures and methods, such as leverage or derivatives, that are difficult to model properly. The complexities of issues necessitate knowledge, which not all researchers may possess.
4. *Regulatory Variability*: Regulations on alternative investments vary widely between geographies, making it difficult to generalize outcomes. Frequent regulatory changes might also have an impact on data and analysis consistency.
5. *High Costs*: Alternative investments typically involve significant charges, such as management and performance fees, which distort return predictions. They are not thoroughly captured in all research, thus estimated benefits may be inflated.
6. *Bias in Performance Measures*: Manager-reported data can be biased because it preferentially reports favorable outcomes. The survivorship bias, in which only positive-performing funds are selected for study, affects results.
7. *Limited Accessibility:* Several alternative investments are unavailable to accredited or institutional investors, limiting the scope of the research to a certain investor group.

These constraints point to the necessity of an appreciation for caution and stringent methodologies when examining the contribution of alternative investments to portfolio diversification.

6. Conclusion

Increasing sophistication and uncertainty in global financial markets have compelled investors to reevaluate traditional portfolio strategies. In this regard, alternative investments have gained popularity as solutions that not only supplement traditional asset classes like stock and debt, but also improve portfolio performance and resilience. These investments—which include private equity, venture capital, hedge funds, infrastructure funds, commodities, real estate, and structured products—have been shown to provide higher risk-adjusted returns, lower correlation with public markets, and access to exotic investment opportunities.

The research presented in this paper emphasizes the need of evaluating the risk-to-return trade-offs associated in alternative assets. Although they carry more risks, including as illiquidity, complicated fee structures, regulatory uncertainty, and market inefficiencies, they have the potential to outperform traditional assets during periods of market collapse or volatility. Integrating alternatives into a well-designed portfolio allows investors to reduce concentration risk, boost diversity, and get access to new sources of alpha production.

Alternative investments continue to be underrepresented in the Indian financial ecosystem in comparison to advanced economies. However, during the last few years, there has been a constant increase in

interest and engagement, particularly among family offices, institutional investors, and wealthy people. The SEBI Alternative Investment Fund (AIF) regulations of 2012, which have since been tightened, have had a significant impact on India's alternative investment market. These policies have improved transparency, organized investment environments, protected investors, and encouraged competent fund management practices.

While these improvements have occurred, there are still certain barriers to the widespread acceptance of alternative investments in India—particularly among retail and rural investors. Financial illiteracy, restricted access to professional advice services, complex product structures, and a lack of knowledge have all hampered the further democratization of these investment vehicles. According to SEBI's investor surveys, the demand for traditional routes such as bank fixed deposits, insurance, and gold remains strong, particularly in rural areas where more than 67% of India's population lives.

However, the future of alternative investments in India appears promising. Greater digitization, improved access via fintech platforms, expanded investor education efforts, and the establishment of specialist funds focused on social impact, ESG, and sector-specific opportunities are all projected to broaden the market. The introduction of tax certainty and relaxation of investment regulations may also allow for more inflows into the AIF industry, particularly from foreign and institutional investors.

Alternative investments can fulfill a variety of tasks in portfolio construction, including inflation protection, delivering consistent returns, contributing capital appreciation, and minimizing total portfolio risk. Modern Portfolio Theory, the Black-Litterman model, and Arbitrage Pricing Theory all recommend using low correlation assets to enhance diversification benefits. SEBI's empirical research and real-time data show that Category I and II AIFs have fared well in terms of performance indicators while also investing in strategic areas such as infrastructure, SMEs, and innovation-led start-ups.

Overall, alternative investments are no longer insignificant components of an investing portfolio. They are becoming indispensable tools for strategic asset allocation, especially in a rapidly changing economic environment. Though not suitable for all investors due to their nature and risk profile, they provide valuable diversification benefits to long-term investors with a higher risk tolerance and access to expert counsel. To fully realize the potential of this asset class in India, efforts should be directed toward raising awareness, simplifying access, boosting regulatory backing, and increasing financial literacy throughout the population. The incorporation of alternative investments into traditional portfolio strategies signals a shift toward more dynamic, data-driven, and forward-thinking wealth-creation tactics. As global and local markets become more dynamic, the value of alternative investments in diversification will only grow, providing investors with a more diverse and long-term means to achieve their financial goals.

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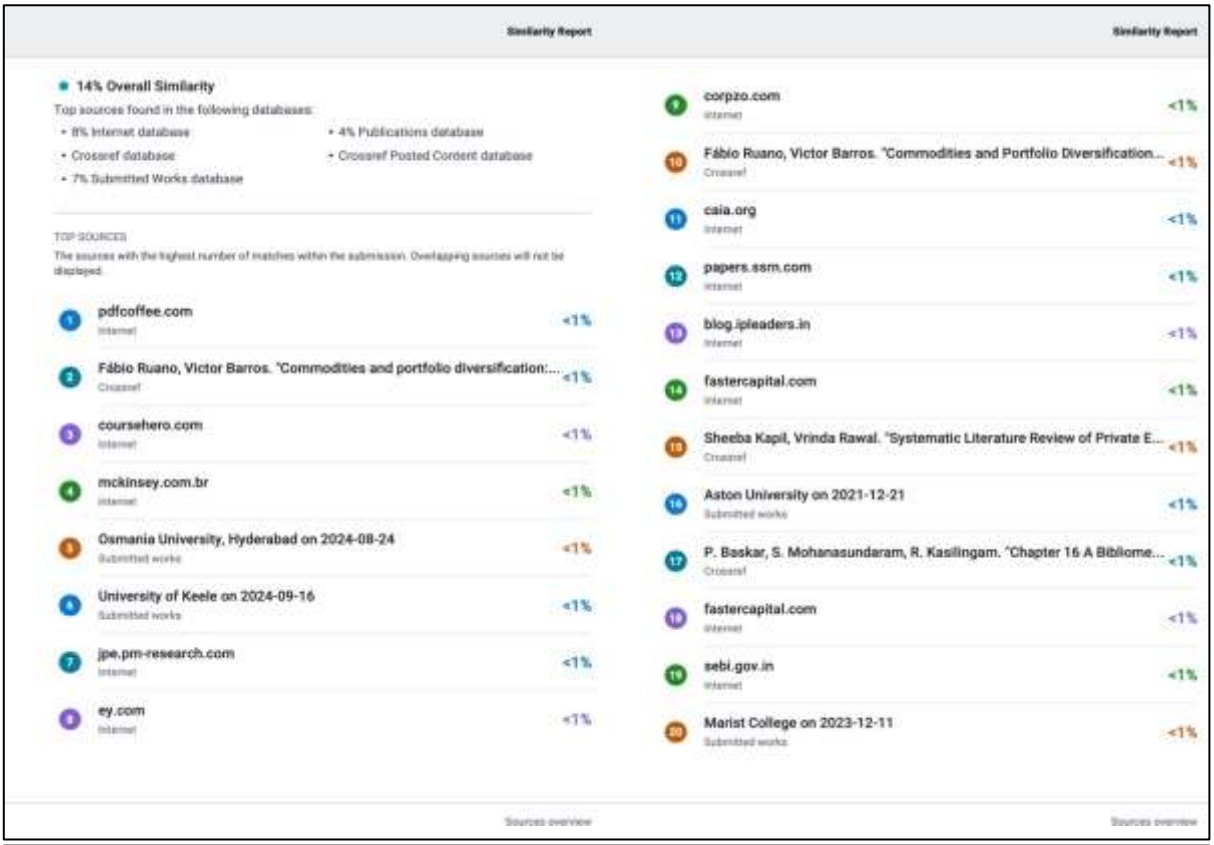

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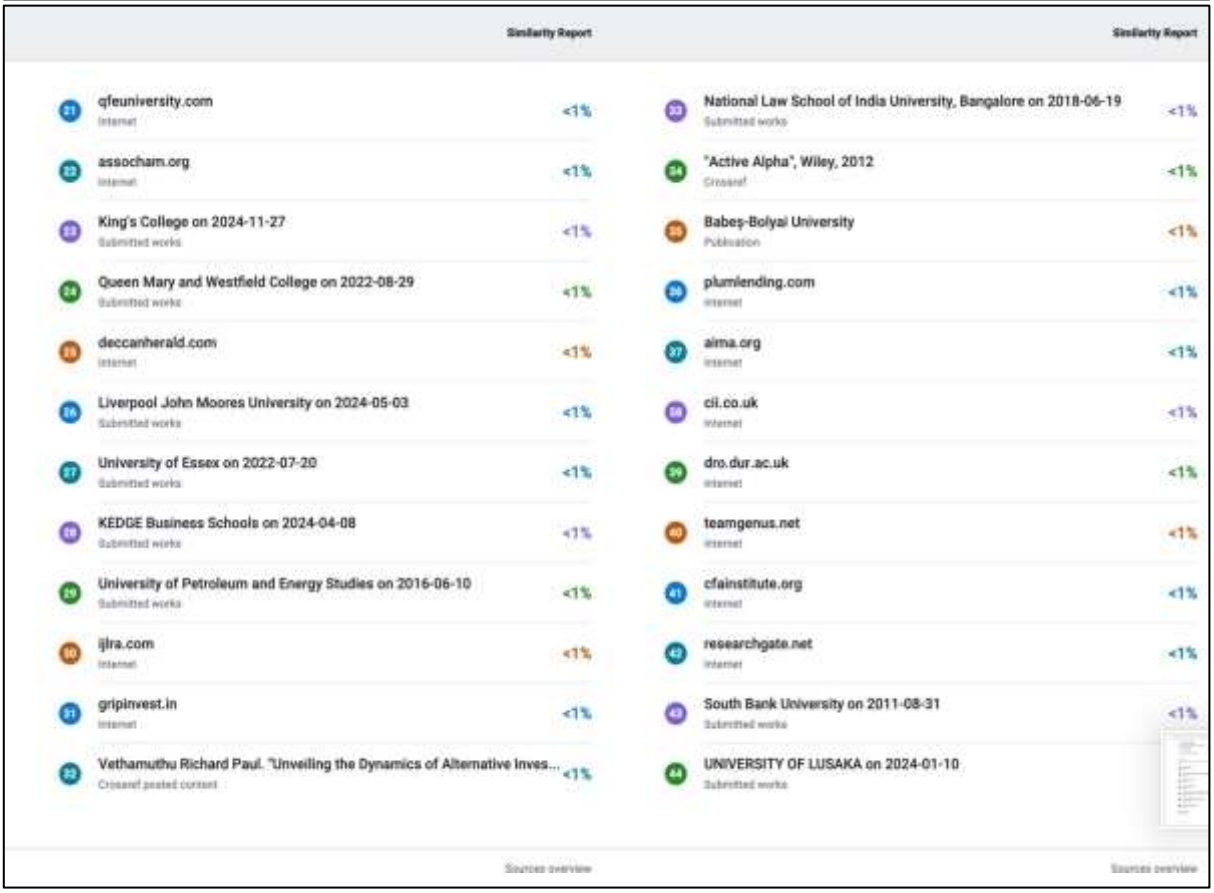

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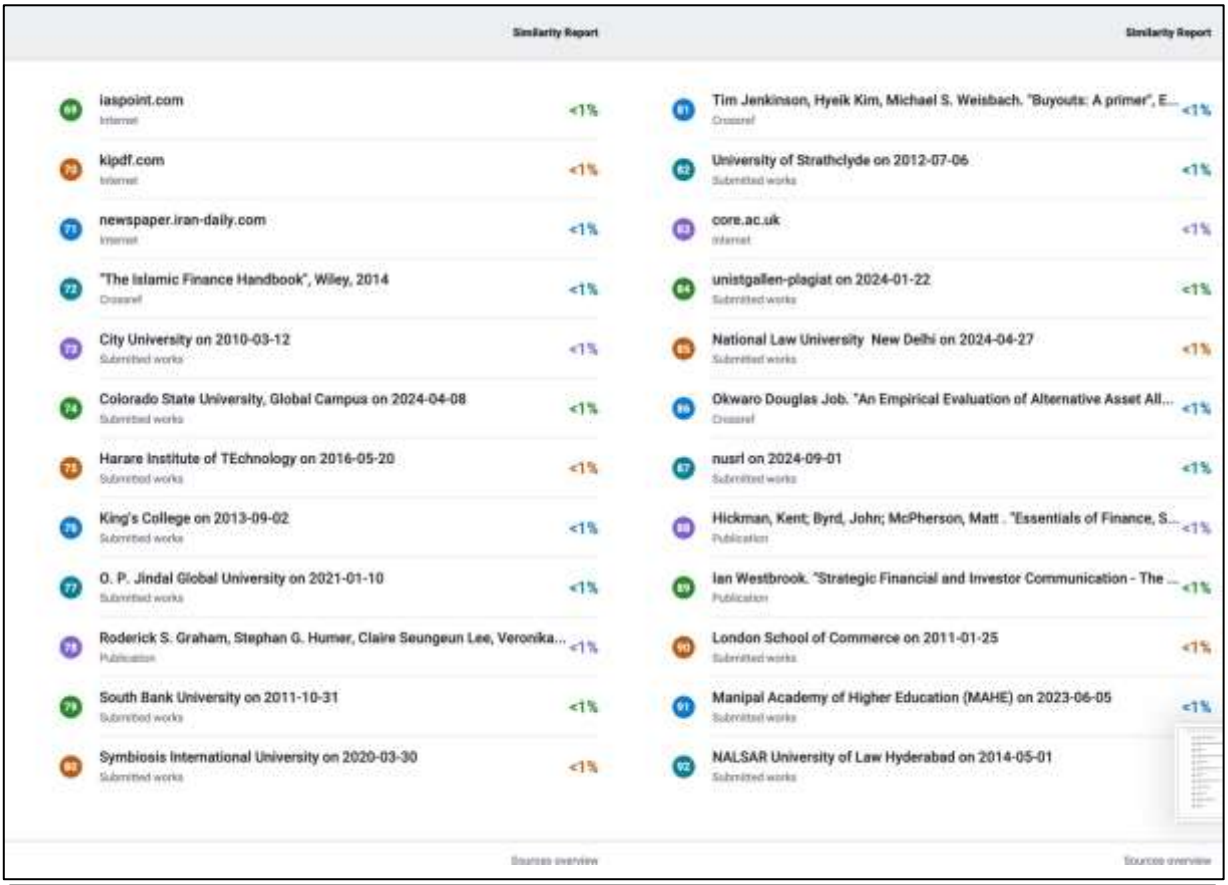
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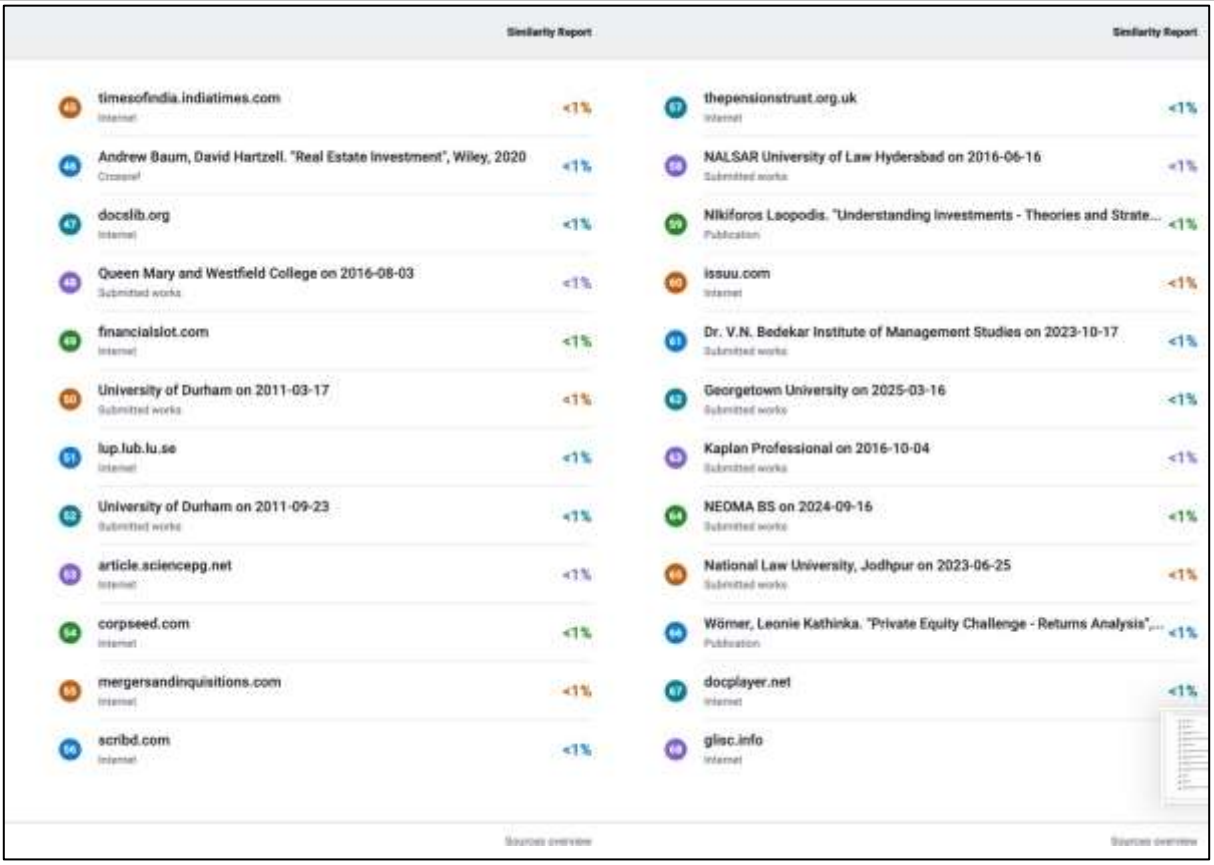
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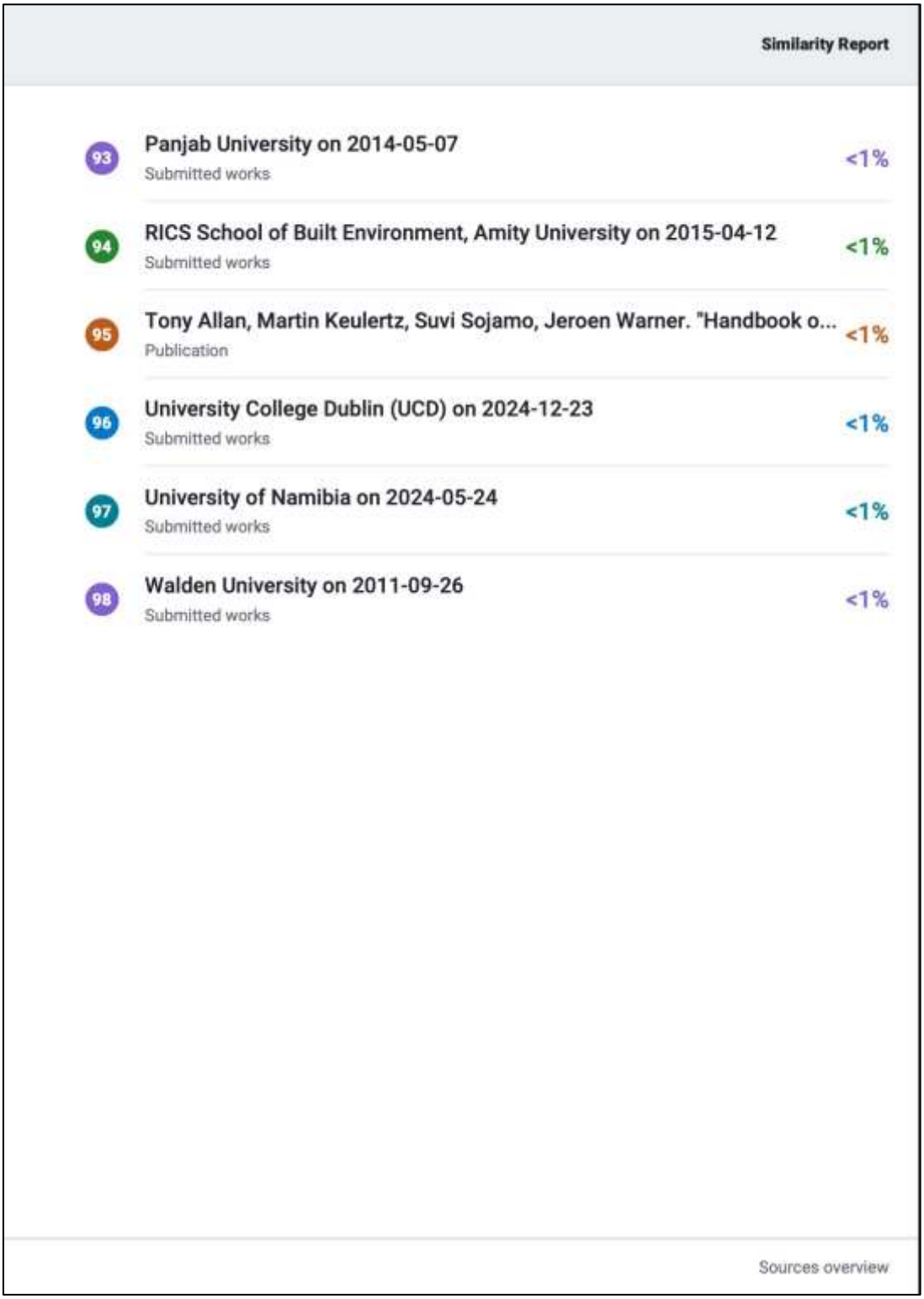
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