Incwert Valuation Chronicles
Series 3 | 2023

The Cross-Section of Volatility in Returns of Enterprises from Micro to Large Cap

Assessment of volatility in equity return of enterprises stratified by size

March 2023

incwert Valuation | Research

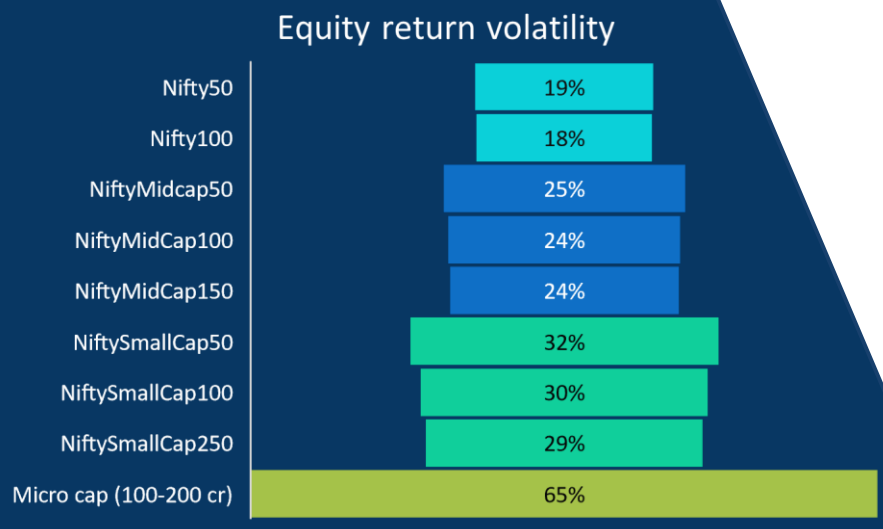
Foreword

The 3rd edition of our annual study on volatility in the returns of micro to large capitalisation enterprises listed in India shows persistence in the phenomena of high volatility in returns of smaller enterprises compared to the large ones. The empirical observations provide ample explanatory basis for the possibility of assigning volatility in excess of 65-70% to early-stage high-growth enterprises.

This study could be of relevance to valuation professionals in undertaking the valuation of **equity-based compensation and share-based payments** made by **privately held companies and start-ups**, for financial reporting purposes. The study could also offer an illustrative basis for assigning high volatility to several smaller, less diversified enterprises, and companies operating in riskier areas such as biotechnology.

In determining the volatilities, we have given due consideration to the observable time frame and selection of indices. For understanding the volatility of such enterprises, we have considered companies having market capitalisation ranging between INR 100-200 crore (or INR 1,000-2,000 million) as a benchmark.

We hope you find the results of our study of interest and value.



65-70%

High volatility band may of significance in capturing the risk factor in privately held companies and start-ups

About Authors

Punit brings with him 19 years of experience in sell-side and buy-side advisory across equity and fixed income. He has worked on several bespoke valuations and lent research support to dozens of asset managers/investment bankers/brokers/consulting firms across the globe.

In the fixed-income segment, he worked as a fundamental analyst across the capital structure: leveraged loans, distressed debt, insolvency/bankruptcy situations and high-yield asset classes. He has also helped sell-side & consulting firms increase their market presence by coming up with thematic and white-label papers.

He started his career as an analyst with Zacks Investment Research, was a part of a UK-based CLO manager's research team, and then moved on to set up research practices for a couple of startups before becoming the Global Head of Research at one of the largest BPO/KPO globally and finally co-founded Incwert.

He won 40 under 40 Alternative Professionals Awards 2020 by AIWMI.

Sunit has an overall experience of over 17 years in valuation advisory, transaction advisory and M&A advisory.

As a valuation professional, Sunit has undertaken valuations of businesses for transactions, fundraising, strategic decision-making, and corporate restructuring. He has also undertaken valuations of intangible assets, financial instruments, option valuation, litigation support, private equity portfolio valuation and valuation for reporting purposes such as purchase price allocation and impairment test under IFRS and Indian GAAP.

In past he has worked with KPMG India (as Associate Director), BDO, Grant Thornton, KPMG UK, and DBDBS a boutique M&A advisory firm.

Sunit has also been an active speaker on valuation at the National Institute of Finance Management (NIFM).

Professor Divya Aggarwal holds a Ph.D. in Finance from XLRI – Xavier School of Management. She has completed The Fellow Programme in Management from XLRI which is a full-time, residential doctoral programme. She is a Company Secretary (the Institute of Company Secretaries of India) and has done her Bachelors in Finance & Investment Analysis from the Delhi University. Her corporate work stints include working in corporate finance roles with McKinsey Knowledge Centre, KPMG, and investing banking roles with Avendus Capital. Before embarking on an academic career, she was working as an AVP in the financial planning team at SwissRe, a leading reinsurance firm.

In 2020 she got featured in the AIWMI list of "India's top 100 women in finance 2020" under the progressing category. She is a recipient of many awards and scholarships including "Peter Drucker essay competition 2014", "The Case Centre scholarship" and best paper awards at several national conferences.

Her research work has been published in international journals like the Journal of Behavioural and Experimental Finance, Research in Economics and Qualitative Research in Financial Markets. She has presented her research work in several national conferences like Pan-IIM, ISDSI, etc. along with international conferences such as biannual meetings of SPUDM.

Our **expertise includes valuation** for financial reporting, tax & regulatory compliances and transaction support

Business valuation
Purchase price allocation
Impairment testing

Complex valuations which includes the following:

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ABOUT INCWERT

Incwert focuses on rendering services in the area of valuations and financial research. As a leading valuation advisory firm in India, it supports clients across life cycles (from early-stage to mature) on valuations concerning transaction, tax and financial reporting. Incwert is trusted by clients for its incisive research which forms the basis of credible advice. The company also offers offshore valuation support services which include setting up valuation models and report writing.

Incwert's client footprint is across cities & metros in India and globally in the US, UK, Singapore and middle-east. Incwert has offices in Delhi (NCR) and Mumbai, along with Kolkata and Surat where it has affiliate/network partners.

In India, Incwert is registered with The Insolvency and Bankruptcy Board of India as a Registered Valuer Entity.

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DATA SOURCES

For producing the analysis, we have extensively relied on data available as part of the company filings, NSE/BSE, other publicly available information and proprietary database providers.

The information and data presented in the study have been obtained with the greatest of care from sources believed to be reliable but are not guaranteed to be complete, accurate or timely.

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Key findings of the study

Note:
1) Period considered for calculating volatility - 01 January 2018 to 31 December 2022
2) For Nifty Midcap 150, Nifty Smallcap 50 and Nifty Smallcap 250, data is available since 31 October 2017
Source: Publicly available information and Incwert analysis

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Large-cap companies have the least **volatility of 18-19%**

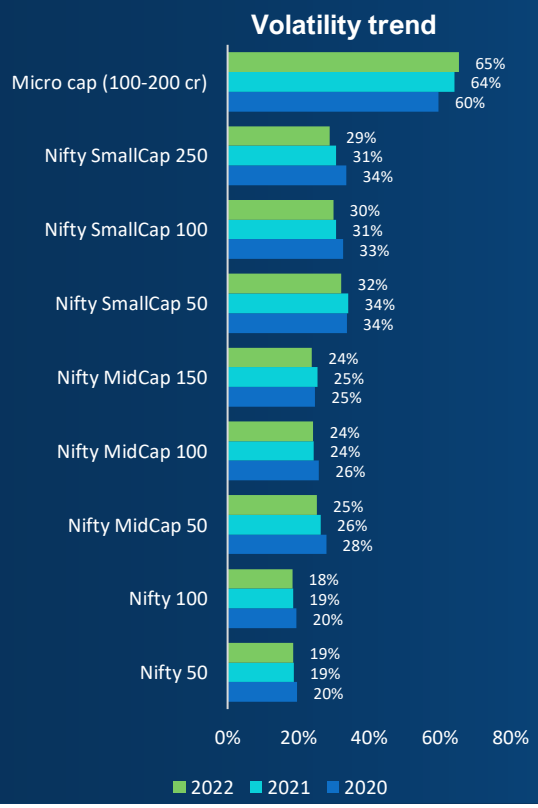
Mid-cap companies display moderate **volatility ranging between 24-25%**

Small-cap companies have **volatility in the band of 29-32%**

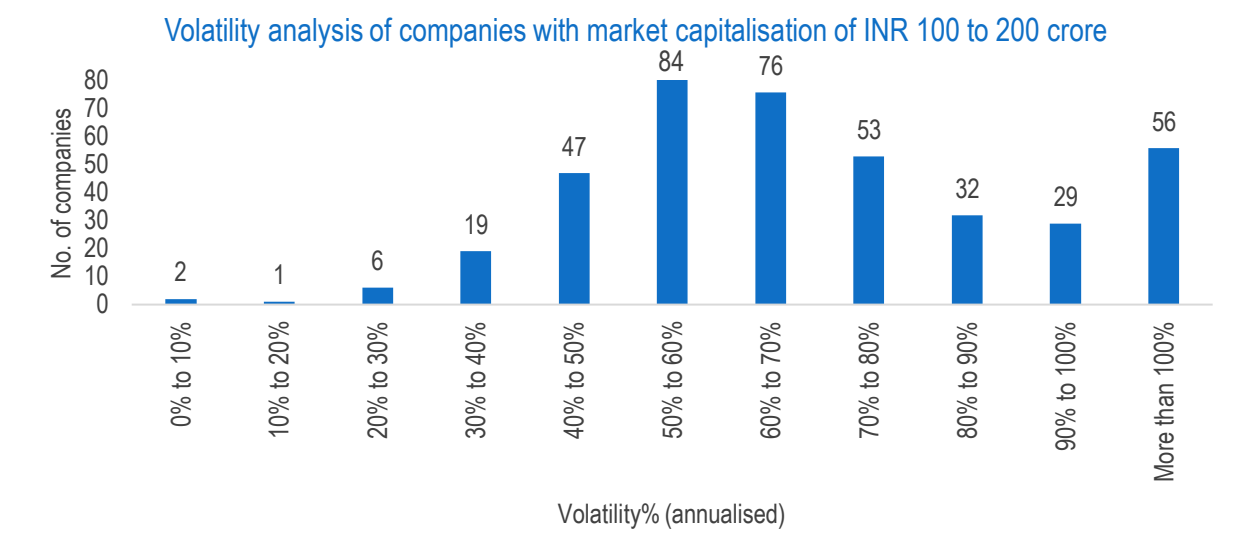
Micro-cap companies have high **volatility averaging 65%**

Based on our analysis, we observe that the volatility in the equity return band is increasing as the market capitalisation of the companies is decreasing. The finding is not surprising given that small-cap companies tend to be riskier investments than large-cap companies. They have greater growth potential and tend to offer better returns. Still, they do not have large-cap companies' resources, making them more vulnerable to adverse events and bearish sentiments.

The micro-cap companies (chosen as enterprises with a market capitalisation in the range of INR 100-200 crore) tend to be a good proxy for assessing the start-ups' risks. Also, non-trading days are typically high in micro-cap companies, making them a suitable alternative for testing the risk arising from the lack of marketability of unlisted start-up enterprises.



Micro cap companies (with market capitalisation of INR 100-200 crore) had volatility of 65-70% in equity returns



Note: 1) We have analysed stock prices using monthly data points for the period 01 January 2017 to 31 December 2022.
2) Companies whose volatility is in excess of 100% overflow in the last bin.
3) Volatility in monthly returns has been annualised.
Source: Publicly available information and Incwert analysis

Analysis of monthly returns of 405 micro-cap companies suggests the following:

- Mere 7% (company count: 28) of the selected sample displayed annualized volatility of less than 40%
- 79% (company count: 321) of the sample size displayed annualized volatility of more than 40% but less than 100%
- 14% (company count: 56) of the sample had annualized volatility of more than 100%
- The average annualised volatility was 72%
- The median annualised volatility was 65%

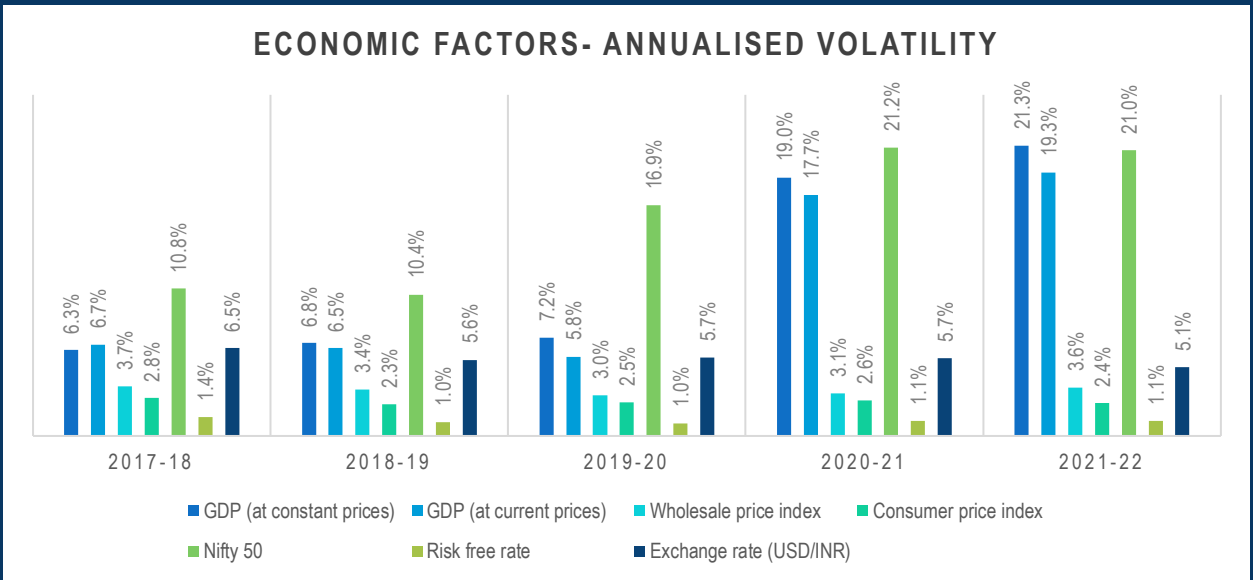
The empirical study is in line with volatilities observed in the security-based approaches used for measuring discount for lack of marketability in the US.

For example, Chaffee determined his proxy of a Discount for Lack of Marketability based on volatilities in excess of 60% based on analysis of small Over the Counter ("OTC") public companies.

Annualized volatility : 2022
Sample size-405 Companies

72% Average	65% Median
8% Minimum	542% Maximum
54% 25th Percentile	85% 75th Percentile

Volatility trends in real economy and financial economy factors….. a comparative analysis



Volatility heat map

Index is set at standard deviation = 100% for each parameter

- Above average (>125% of index value)
- Average
- Below average (<75%of index value)

Basic volatility

Real economy	2013 - 2022	FY2018	FY2019	FY2020	FY2021	FY2022
GDP (at constant prices)	16%	0.40	0.43	0.45	1.19	1.33
GDP (at current prices)	15%	0.45	0.44	0.40	1.20	1.31
Wholesale price index	4%	0.96	0.90	0.78	0.82	0.93
Consumer price index	3%	1.08	0.90	0.96	1.01	0.94
Financial economy						
Nifty 50	17%	0.80	0.79	1.10	1.11	1.13
Risk free rate	2%	0.91	0.66	0.63	0.72	0.73
Exchange rate (USD/INR)	6%	1.11	0.96	0.98	0.98	0.86

Note:
1) For FY2018 to FY2022, the volatility has been calculated using the quarterly data points (except for Nifty 50) for the past 5 years on a rolling basis. Annualised volatility of each FY has been computed by multiplying the quarterly volatility with the square root of time.
2) For Nifty 50, the volatility has been calculated using the monthly data points for the past 5 years on a rolling basis. Annualised volatility of each FY has been computed by multiplying the monthly volatility with the square root of time.
3) Basic volatility is the standard deviation calculated for the period April 2013 to March 2022
4) Analysis presented in the graph set above is based on a financial year and hence, there will be differences when compared to the volatilities calculated based on the calendar year.
5) Yield on 10-year G-Sec has been considered for the risk-free rate.
6) Base year for GDP index is 2011-12

Source: National statistics office (NSO); RBI; Oanda.com, NSE; CCIL; Proprietary databases

Comparative analysis of the real economic factors with financial economic factors illustrates the following:

- Risk free rate emerged as the least volatile factor ranging between 1% to 1.4%.
- Nifty 50 indicates volatility that ranges from 13.4% to 19.2% in last 5 years
- Exchange rate (USD in terms of INR) shows the volatility of around 5.1%-6.5%
- Wholesale price index has been more volatile than the consumer price index
- Generally, GDP (both at constant and current prices) shows the volatility of 6% to 8%, but in extraordinary situations i.e. COVID-19 it has moved upto 20% for FY21 and FY22.

A brief overview of our approach

- In performing the analysis, we analysed Nifty indices across different market capitalisations (i.e. large-cap, mid-cap and small-cap). For setting up the reference micro-cap sub-set, companies listed in India (in either NSE or BSE) with a market capitalisation of INR 100-200 crore were analysed.
- For the micro-cap, a total of 405 companies with a share price history of over two months or more at 31 December 2022 were selected. The selected set has a certain level of survivorship biases as some companies in the chosen sample have a trading history of fewer than five years.
- Monthly returns were computed for the past six years ending 31 December 2022.
- Volatility was computed based on monthly returns of the Nifty indices and share prices of the micro companies over the said period. The monthly volatilities were annualised using a factor of square root of twelve (√12).

Basis of bifurcation into large-cap, mid-cap and small-cap by the stock exchange/s?

As per SEBI circular SEBI/HO/IMD/DF3/CIR/P/2017/114 dated 06 October 2017, large cap, mid cap and small cap companies are classified as follows:

a. Large Cap: 1st-100th company in terms of full market capitalisation
b. Mid Cap: 101st-250th company in terms of full market capitalisation
c. Small Cap: 251st company onwards in terms of full market capitalisation

The Association of Mutual Funds in India (AMFI) publishes names of all listed companies in order of their average market capitalisation (in decreasing order). Applying the SEBI guideline on the latest list as of June 2020, we can perceive that on an average:

Large cap companies have market capitalisation of more than INR 25,000 crore,
Mid cap companies have market capitalisation in the range of INR 7,000 to 25,000 crore, and
Small cap companies have market capitalisation of less than INR 7,000 crore.

Volatility – Meaning and its role

Meaning

In finance, volatility is a measure of the dispersion of returns for a given security or market index. In other words, it gauges how much the value of securities or market indices can fluctuate.

Volatility is measured using either standard deviation or variance. In both the cases, higher the value – more volatile are the prices of the securities and market indices, hence it makes them riskier for the market participants. Companies with low volatility, such as regulated industries and other large-cap companies, are expected to grow slowly, but steadily, over time. On the other hand, the stock prices of higher volatility companies (e.g., start-ups) can move significantly from one day to the next.

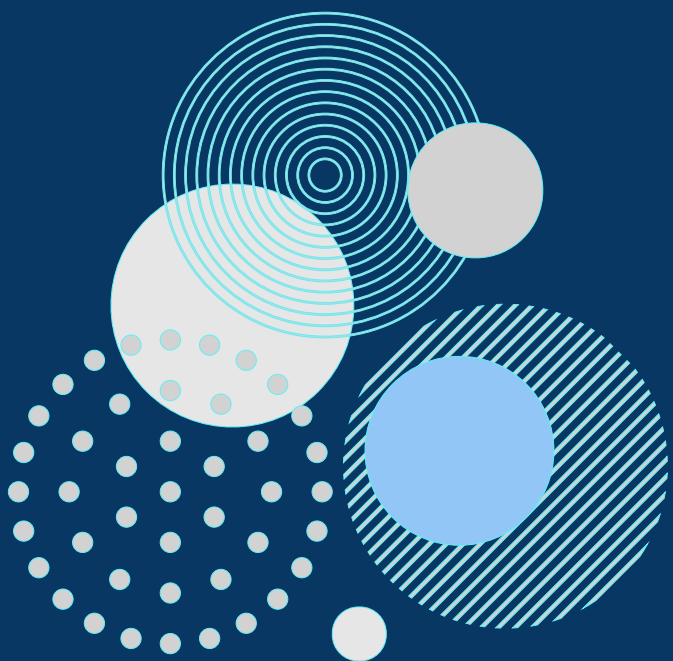
Generally, there are three measures to estimate volatility. The first, historical volatility, refers to the actual variability in the movement of own stock over a specified historical period. The second measure, implied volatility, is the volatility generated from the actual trading price of market-traded options; it is the market's "consensus" estimate on a company's expected future volatility. A third measure, used primarily by private or newly listed companies, involves deriving volatility by benchmarking with the historical (or implied) volatilities of peer companies.

Role in Valuation

Volatility has a remarkable role as a factor determining the valuations:

- valuation of stock options,
- assessment of discount for lack of marketability using security-based or analytical approaches,
- analysis of restricted stock,
- examination of other forms of equity-based compensation and share-based payments

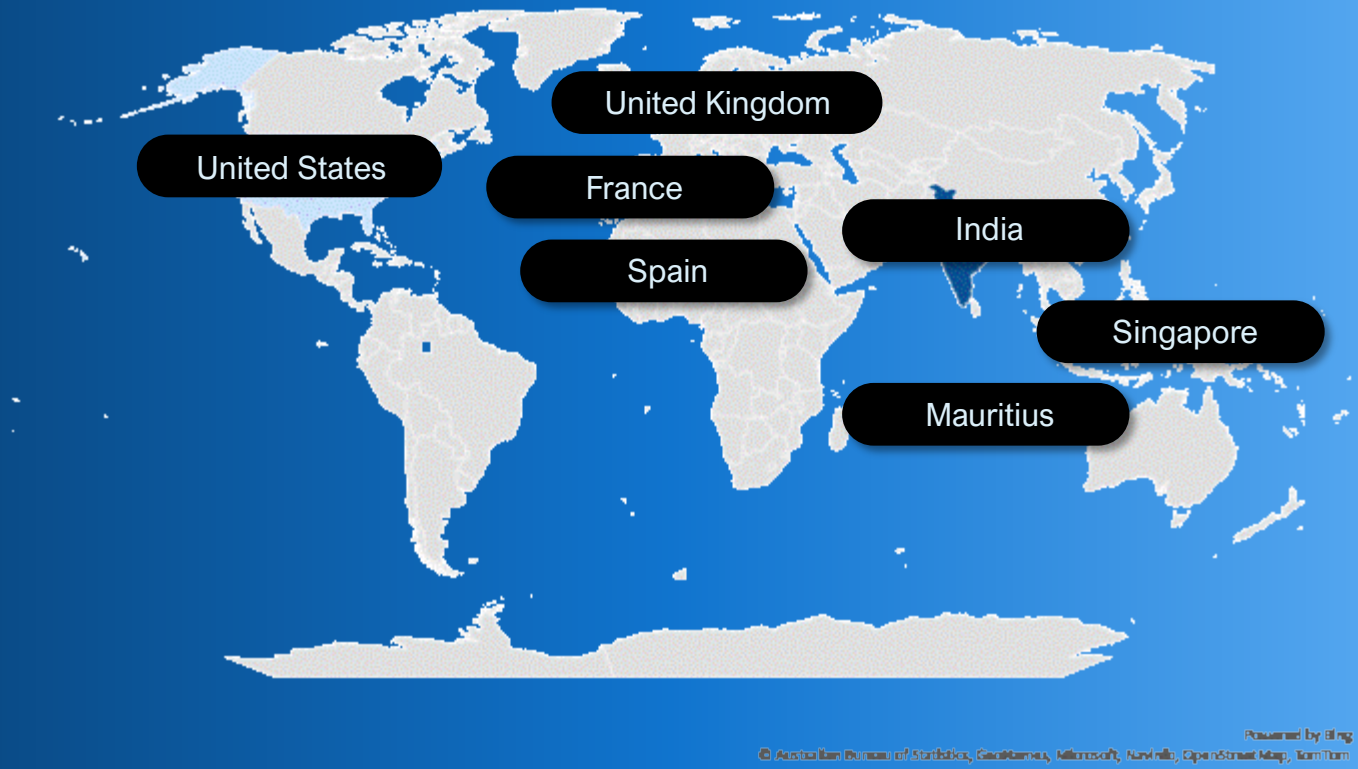
Understanding, selecting, and using an appropriate volatility factor is important to accurately determine the value of financial instruments issued by entities.



“For the investor who knows what he is doing, volatility creates opportunity”

- John Train

Client footprints across India and outside



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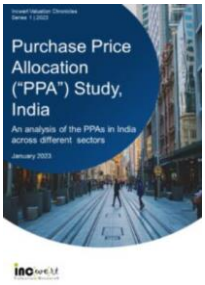
Holdco Discount January 2023

Purchase Price Allocation Study, India January 2023

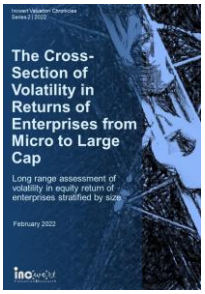


India Size Premium Study November 2022

Control Premium Study-India Sept 2022

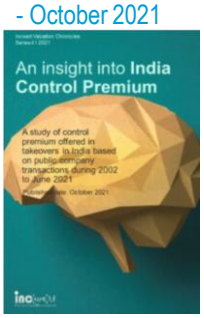
Equity Risk Premium - July 2022

Volatility in returns - February 2022



Holdco Discount - January 2022

India control premium study - October 2021



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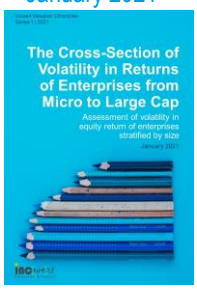
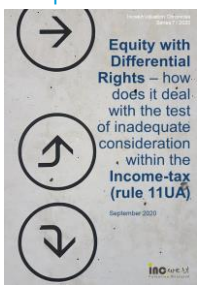


DVR and Rule 11UA - September 2020



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Purchase price allocation study (BFSI) - July 2020

Equity Risk Premium - June 2020

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Risk free rate in a negative yield economy - Feb 2020

India Beta Study - Jan 2020

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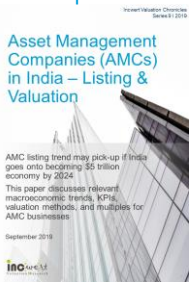
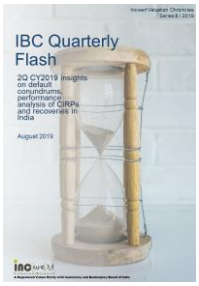
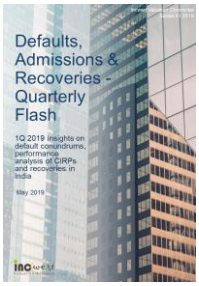


IBC Quarterly Flash - Aug 2019

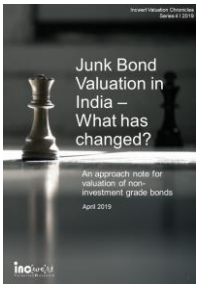


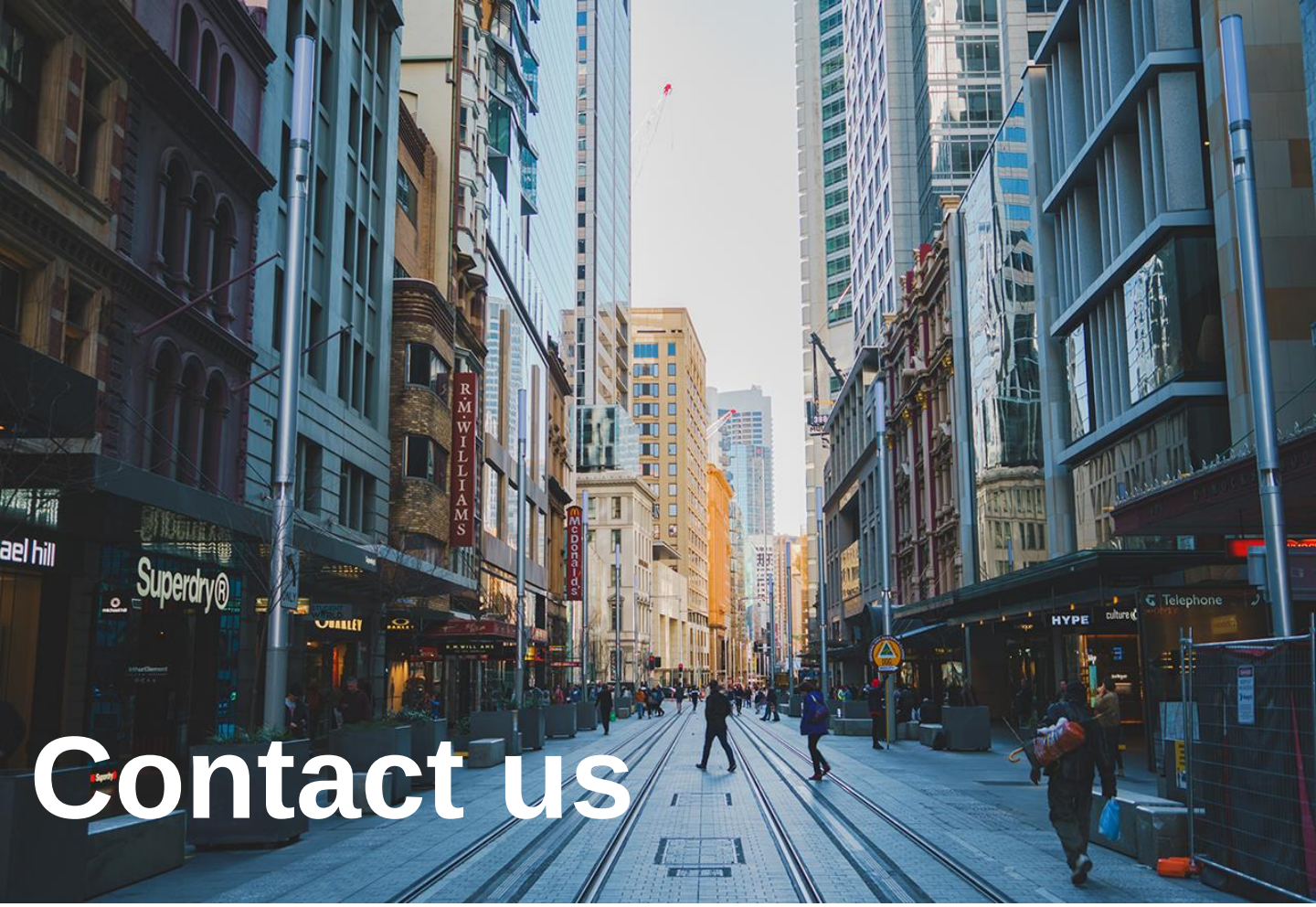
Rule 11UA valuation - Jun 2019

IBC Quarterly Flash - May 2019



Junk bond valuation - Apr 2019





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