



March 2022

Northfield News

A Newsletter for the Friends and Clients of Northfield

Special Points of Interest:

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- ▶ **EE Approaching 100% Goal**
- ▶ **The Ukraine Crisis Puts the Focus on Crypto**



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Inflation, Interest Rates and Equity Evaluation

By Dan diBartolomeo

Introduction

Equity markets have recently seen significant volatility associated with spikes in inflation across developed countries (e.g. US and UK), and the associated expectations of ongoing interest rate increases by central banks. Energy cost increases arising out of sanctions on the Russia invasion of Ukraine have convinced some investors that broad inflation may extend well beyond the post-COVID recovery.

In this article we will explore the dependence of equity prices on inflation and interest rates in two ways. First, we will consider the impact of various combinations of interest rates and inflation on the financial statements of two hypothetical companies. We will then extend these results into a Gordon style dividend discount model for theoretical confirmation that real interest rates *should be a dominant factor*, rather than nominal interest rates or inflation considered separately. The final portion of the article will present a proprietary method for estimating real growth of companies over time.

A key finding of this work is that we assert an important departure from the assumptions of the Modigliani-Miller Theorem (*American Economic Review*, 1958). This theory argued

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The Ukraine Crisis Puts the Focus on Crypto

An Opinion Piece by Northfield's Peter Horne

The appalling invasion of the Ukraine by the Russian army is condemned and abhorred by all of us watching helplessly as it unfolds on our screens. It is a sharp reminder that the world does not let us pause and recover from one crisis before delivering another; it would seem that unfortunately global calm is in the fat tails and not the average course of events. As we stand with like minded people, it is also a reminder that despotic governments and their cronies are not the representatives of their good people, and that we have many colleagues in the financial and technology communities that are Russian and work with us both in our own countries and from home. No one wins from events like these.

Thankfully, those living in western countries are not under despotic rule, and we are going to expect our governments and institutions to take action on our behalf. It is encouraging that we have seen a rapid dissolution of quarrels within and between the countries

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Webinar - True NAV of Private Equity Funds - Alpha Generation by Limited Partners

March 29, 2022 • 11:00 AM EDT

Presented by Emilian Belev, Northfield's Head of Enterprise - Wide Analytics

Abstract

Private equity fund NAVs are reported as an addition of NAVs of individual illiquid portfolio companies. In contrast to private funds, public fund NAVs values are derived from securities that can change hands from one fund to another overnight, which guarantees that their market value reflects the top marginal diversification benefits that such a security can provide.

Shares of private companies in a PE Limited Partnership fund do not have this feature as they do not get traded. At best, one can assume that GPs and their valuers use DCF models with discount rates based on market betas from public analogues. If there is undiversifiable risk in the PE fund portfolio, however, this approach makes the fund appear to have the same NAV as another fund with the same average company beta but one that is fully diversified, all else the same. Even if the first fund is riskier.

Conversely, market multiples (e.g. EBITDA to EV, or Sales to EV) could be used to calculate individual company NAV. In that case the multiples are based on similar transactions. While some of the "comps" transactions may be acquisitions by publicly traded firms, the vast majority are buyouts. Therefore, the intrinsic value of such a transaction to one much larger fund in terms of diversification may not be the same as to another smaller one. Therefore, the market multiples may be misleading.

Over the long run, funds with seemingly similarly reported NAV will have different cumulative realized values because of their different diversification level. This is based on the well-known fact that geometric return is adversely affected by higher interim volatility. Then, the ability to calculate an NAV value which properly reflects diversification becomes a source of alpha as it will distinguish between two funds of different diversification levels, all else the same. In other words, LPs can create alpha by combining existing investments with new investments, effectively increasing the NAV of the existing portfolio by adding appropriately chosen new commitments that diversify the existing pool the most. That increase will be measurable and purely attributable to the LP's private equity team's investment decision.

[Click here to register.](#) There is no charge to register. If you cannot attend the live session, please register and we will send you the post webinar recording.

Recent Research Webinars and Online Workshops

Online Workshop - Asset Manager Compliance with the SEC Rule 18F-4

Presented by Northfield President Dan diBartolomeo, March 10, 2022.

Research Webinar - Inflation, Interest Rates, and Equity Valuation

Presented by Dan diBartolomeo, February 24, 2022

Research Webinar - The Alpha Lifecycle: New Research Into the Nature of Investment Alpha and What Portfolio Managers Can Do To Sustain It

Presented by guest presenter Chris Woodcock, Essentia Analytics, February 8, 2022

Research Webinar - The Other Road to Tax Efficient Investing

Presented by Dan diBartolomeo, January 27, 2022

Online Workshop - Reconciliation of Conflicting Risk Reports

Presented by Dan diBartolomeo, January 13, 2022

Research Webinar - Equity Style Factor Returns Revisited

Presented by Northfield President Dan diBartolomeo, December 30, 2021

The webinar slides are available at <https://www.northinfo.com/research.php> under "webinar proceedings." Contact your Northfield Sales Representative if you are interested in viewing the full presentation recording for any of the Northfield hosted events. A full list of all available webinar recordings is available at <https://www.northinfo.com/docs/webinars.htm>

2022 Newport Annual Summer Seminar Tennis Hall of Fame • Newport, Rhode Island • June 10, 2022

Northfield’s Annual Summer Research Seminar will be held at the International Tennis Hall of Fame in Newport, Rhode Island, on June 10, 2022. The purpose of the seminar is to present recent research and technical advances to our clients and friends. Our meeting date has been selected to coincide with the US Professional Championships of Court Tennis. Following the day’s presentations, there will be a Court Tennis demonstration by Northfield President Dan diBartolomeo, and then a Court Tennis match. Court Tennis, or “real tennis” is the medieval sport that is the progenitor of all modern racquet sports. After tennis, there will be a relaxing dinner party.



Tennis Hall of Fame

There is no charge to register for this event, however, we will be accepting donations on behalf of the Pine Street Inn, Boston’s largest homeless shelter. The full seminar agenda and registration information will be posted to www.northinfo.com/events.php as it becomes available.

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that the value of an enterprise could be defined solely as the present value of future earnings and was unrelated to capital structure *if markets are efficient*. The theory was later revised to include the tax deductibility of interest payments (*American Economic Review*, 1963). It is our assertion that taxation, inflation, the availability of credit, and interest rates all interact to impact enterprise valuation.

A Company Level Hypothetical

We will begin with looking at a hypothetical company ABC under five different economic scenarios with various combinations of inflation, interest rates, and restrictions on borrowing. The “fundamentals” of ABC are constant:

1. Unit cost of goods sold starts at 100
2. Unit revenue starts at 120
3. Tax rate is 40%
4. Dividends are 50% of after-tax earnings

We simulated five years of activity under each scenario and report the present value of the next five years of dividends under two scenarios (using inflation as the discount rate and using the interest rate as the discount rate).

In **Table 1** we present the simulated financial statement of ABC assuming no borrowing is allowed:

Table 1

ABC					
Inflation = 10%		Interest Rate = 0		No Borrowing	
	1	2	3	4	5
Book	100.00	106.00	112.36	119.10	126.25
Unit Cost	100.00	110.00	121.00	133.10	146.41
Unit Rev	120.00	132.00	145.20	159.72	175.69
Unit Profit	20.00	22.00	24.20	26.62	29.28
Units	1.00	0.96	0.93	0.89	0.86
Revenue	120.00	127.20	134.83	142.92	151.50
Costs	100.00	106.00	112.36	119.10	126.25
Profit	20.00	21.20	22.47	23.82	25.25
Tax	8.00	8.48	8.99	9.53	10.10
AT Earn	12.00	12.72	13.48	14.29	15.15
Div	6.00	6.36	6.74	7.15	7.57
Cash	6.00	6.36	6.74	7.15	7.57
PV Div	6.00	5.78	5.57	5.37	5.17
PV Inf	27.90				
PV Int	33.82				

We then created a similar analysis for ABC across multiple scenarios for inflation, interest rates, and availability of borrowing. As taxes are levied on nominal profits not adjusted for inflation, firms restricted from borrowing will be unable to finance even level unit operations. When both taxes and

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inflation are present, but borrowing is allowed, the **extreme** values of the real interest rate has a significant impact on valuation. For “slow process” enterprises (e.g. a wine maker who must age the product for years before sale) the impact of taxation not being adjusted for inflation is even more profound.

Table 2

ABC Summary				
Inflation	Interest Rate	Borrowing	PV Inflation	PV Interest
0	0	NO	33.82	33.82
10	0	NO	27.90	33.82
5	0	NO	30.58	33.82
10	0	YES	30.00	36.63
10	20	YES	27.90	23.77

Valuation in Theory

We begin with the Gordon Dividend Discount Model, the simplest “textbook” approach for valuing companies. It was first proposed in Gordon and Shapiro (*Management Science*, 1956) and was extended in Gordon (*Review of Economics and Statistics*, 1959). The model assumes companies survive in perpetuity and that cost of capital and company growth rate is constant over time.

$$P = D / (k - g)$$

P is the value of a share of stock

D is the current dividend

k is the cost of capital

g is the assumed perpetual growth rate

We can rewrite the Gordon model to isolate desired features.

$$P = D / (k - g) = D / [(Rp + I) - (Gr + F)] = D / [Rp + Ir + F - Gr - F]$$

$$P = D / [(Rp + Ir) - Gr]$$

Rp is the annual risk premium

I is the nominal interest rate

Ir is the real interest rate

Gr is the real growth rate

F is the inflation rate

It should be clear that Inflation (F) drops out, leading to a form where the important inputs are the equity risk premium (Rp), the real interest rate (Ir) and the assumed real

growth rate Gr. While beyond the scope of this article, our views on equity risk premia going forward appeared in diBartolomeo and Kantos (*Journal of Asset Management*, December 2020).

One key aspect of the specification is that we have not defined a time horizon for the real interest rate. Is the real interest rate short term, Treasury Bill rates versus recent CPI) or should we be thinking about longer horizons: 5 years, 10 years, 30 years? While companies do not survive in perpetuity, equity valuations imply average “half lives” over twenty years. See diBartolomeo (*Journal of Investing*, 2010).

Leibowitz (*Financial Analyst Journal*, September 1989) recognized the offsetting influence on inflation on corporate profits, effectively measuring “equity duration” against real interest rates. Equity durations against nominal interest rates looks short (e.g. a few years) because the volatility of real interest rates is much lower than the volatility for nominal rates. Equity durations are long and consistent with theory when measured against changes in real interest rates.

Rubinstein (*Journal of Finance*, 1976) provides an investor utility model that focuses on the present value of future consumption expenditure similar to the way a DDM represents investment earnings. If investors care about funding consumption in the far future, they should value economic payouts on similar horizons. Muijsson, Fishwick and Satchell (*Economics*, 2015) assert that the *relative outperformance of low beta, low volatility strategies* was related to pervasive declines in interest rates. We more precisely ascribe this differential effect to the fact that interest rates are much more volatile for short maturities, impacting near term cash flows more. See [Fixing Active Management: Why Value Investing Works \(or At Least Has Worked\)!](http://northinfo.com) (northinfo.com).

Estimating Real Growth Rates with the EUPS Model

While economists spend a lot of time forecasting real growth from a macro perspective, estimating growth in individual firm profits has been the domain of fundamental analysts. Back in 1989, Northfield invented a model called EUPS to estimate what we then called long-term “true growth.” The EUPS model says that a firm grows by finding projects to perform where the likely return on capital exceeds the cost of that capital. *Both finding high return projects and lowering the cost of capital provide new opportunities to grow.*

Imagine we start a company S that does nothing but hold cash in an interest-bearing account. Due to the compounding of interest, the reported earnings of S will get larger

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year by year, but this isn't doesn't fit with our common understanding of the growth of a business.

To illustrate the EUPS idea, let's take a typical company M that has annual earnings of \$10 per share, pays a \$4 dividend and retains \$6 in earnings. Now let's recast the transaction. Assume the company earns \$10 per share, pays out a \$10 dividend and on the dividend pay-out date holds an offering of new shares to existing shareholders at the market price of the stock. If we limit the number of new shares offered such that out of the \$10 dividend just received, each investor invests \$6 back into new shares. From a cash flow perspective, nothing has changed. The firm earned \$10, the net dividend paid was \$4 and the firm retained \$6.

What is different is that the shares-outstanding has increased. We are inferring the cost of capital for retained earnings by making the transaction an explicit issuance of new equity. *By calculating earnings per share with the adjusted value for shares outstanding we get a much better estimate of true growth of the enterprise.*

The growth rate of EUPS (we call this "true" growth) will be positive if the marginal return on equity is greater than the cost of marginal equity. Conversely, growth of EUPS will be negative if the marginal cost of capital is greater than the marginal return on equity. The classical definition of a free competitive market would suggest that the marginal return on capital should be driven to the cost of that capital, so the *relative rate of true growth* at the firm level should converge on zero. In the long run, the expected real growth rate (as measured by EUPS) of any firm should regress to the overall real growth rate of the total economy over time.

Looking Back and Looking Forward

If we believe that equity valuation should be assessed against expectations of the future, we can estimate the

"breakeven inflation rate" that would equate yields from fixed coupon US Treasury Bonds and TIPS (inflation protected). The ten-year breakeven inflation rate is presented in the **chart below** from the St. Louis Federal Reserve. As you can see, the implied inflation rate has been generally just over 2% with two short-lived dips during the Global Financial Crisis and the height of the COVID pandemic. These expectations are also consistent with realized inflation over the past ten years at an annual geometric mean rate of 2.41%. A similar analysis of the five-year breakeven inflation yields an extremely similar result, against a five-year realized inflation of 2.61%.

The striking part of this data is that despite the heavy coverage of inflationary pressures in both the general and financial press, the inference one can draw from actual market data is that investors expect long-term inflation to be only marginally higher than the typical central bank target of 2% annually.

Conclusions

Distinct from the earliest version of the Modigliani-Miller Theorem, we assert that valuation of enterprises is dependent on capital structure, primarily due to the practice of taxes being levied on nominal, not real profits. We illustrated this assertion with hypothetical financial statements of a firm.

We showed that both a restatement of the Gordon DDM and related analysis of equity duration indicate valuation is a function of real rather than nominal interest rates. Several studies were cited that give rise to the belief that equity valuations should be based on long term expectations of real interest rates rather than short term observations. We also provided the EUPS model to form expectations of real growth at the individual company level.

Market implied "breakeven" inflation estimates suggest that inflationary expectations are modest and consistent with the experience of recent years.

Ten-Year Breakeven Inflation Rate



(Ukraine, Continued from page 1)

in the western alliance to focus on how to deal with both the immediate threat of the Putin regime in Russia, and the newly strengthened alliance announced at the Beijing Winter Olympics with the Xi regime in China. The reality of the attack on Ukraine is that it has instantly highlighted that the world has been divided again into two financial and energy blocks. The wealth, resources, technology capacity and institutions of a nation state are the assets of the people in the West, and we can now expect that these will be deployed in varying degrees in the actions taken to punish a misguided attempt to overturn the world order. The Ukraine invasion under the pretext of it being old Russian territory and its response to it by the West is also in effect a rehearsal of the West's response to a Chinese invasion of Taiwan. I am making the clear point that this means that we are now entering into a period where what, how and to whom capital flows has become an immediate issue at the forefront of the western world's response to this event. The objective is to be punitive and contain the growing aggression and assertiveness of the Xi/Putin alliance.

My expertise is in understanding how cryptocurrency technology works and how it is integrated into financial systems. The immediate response in the cryptosphere has been to chatter about how blockchain based currencies such as ethereum and bitcoin are unstoppable and alternatively a threat or opportunity in this moment, depending on your bias. I thought it would be useful to present a few thoughts to help game out how the world of cryptocurrencies has also changed in the last week, and to orient clients should they be faced with pondering existing cryptocurrency risk, or considering good opportunities to take on some more, but with their eyes open.

To recap, the fundamental innovation of the blockchain is that it enables a peer to peer network of adversaries to trust a shared financial ledger and perform transactions. The early focus of blockchain value and transactions has been on the value and exchange of the native blockchain cryptocurrencies of BTC and ETH, where "native" means the currencies hypothecated on the creation of the chains, and their addition through the mining process. Today, additional value is also hypothecated or bonded to the blockchain through the development of smart contracts that are programs on the blockchain that implement a distributed version of a custody bank's unit trust record keeping systems. The convention is to call blockchain managed units "tokens," and the trade in these tokens is called decentralized finance which is better known by the "DeFi" acronym. DeFi also includes the management and trade of non fungible (NFT) tokens which are similar to custody banks holding property deeds or art works and collectibles. Party to party ISDA contracts can also be considered to be a traditional finance (TradFi) instrument that can be dealt with

as a NFT on a blockchain system. Decentralized Autonomous Organizations, or DAOs, are simply collectives controlling fungible and non fungible token smart contracts, and so when you hear the name "DAO," just think "a collective that is issuing and managing tokens." They are of interest to discussions of securities law, but the interesting concepts for payment discussions are the cryptocurrencies and fungible tokens.

At the time of writing this note, the notional value locked into native DeFi contracts is 78bn¹, the combined value of the top 10 cryptocurrencies is north of 1.5TN USD², and the amount of USD locked into the Coinbase USDC token (one of the US dollar backed tokens) is 53bn³. The NFT market was worth more than \$40bn at the end of 2021⁴. The turnover of exchanges is also huge; Coinbase's turnover was 547bn in the last quarter of 2021⁵, and the Uniswap DeFi distributed exchange (DEX) now turns over more than 1.2bn per day⁶. These numbers are clearly significant and cryptocurrencies and DeFi are both increasingly systemically integrated and important in global capital flows, and have largely been outside of regulations. And so one thing is definitely true - the Ukraine crisis has already made the world take crypto more seriously as capital controls are being deployed as a weapon against Russian aggression. The questions being raised are should it be controlled, can it be controlled, and if it can, what can we consider are possible controls that will be implemented?

I believe that the answer to the first question is that crypto will be and should be controlled. It's all very well to have an idealistic view of cryptocurrencies, but our world just got real and in the real world the financial systems of countries are used as tools to implement policy. The "know your client" (KYC) and "anti money laundering" (AML) rules post 9/11 rapidly focused the financial industry on its role in helping to control the funding of terrorism, and the financial exclusion that will be targeted at sanctioned Russian individuals and companies will see that process tighten and sharpen even further. This means that crypto exchanges can be expected to rise up to the existing standards of compliance and reporting, and be involved in their extension. A crypto account should not be any different to a cash account and the processes of client management and money transfer should be the same for a crypto exchange as it is for a bank.

The recent exclusion of Russian banks from the SWIFT international payment system raises some interesting questions and issues for cryptocurrency advocates and exchanges. A reflexive response from those in the idealist/anarchist side of the cryptocurrency community is that crypto can be an alternative as it is unstoppable. We will deal with the unstoppable claim, but first let's look at how SWIFT works and how cryptocurrency exchanges ultimate-

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ly use this system. SWIFT is a system used by regulated member banks, and it is the largest and most important payment system in the world. Cryptocurrency exchanges do their international transfers to clients and partners via correspondent banks with access to SWIFT, and these banks are the guardians of access to the system. Any exchange that tries to send unvetted transactions will find that their correspondent banks will vet them for them, and they will be fired as clients if they do not comply. Similarly, sending cryptocurrency to a person in a country that has a sanctioned banking system means that they can exchange the crypto into local currency, but the exchanges in that country will struggle to set a price because there is no exchange route back to other markets to get price discovery. How many rubles is a BTC worth in Russia if you can't exchange Russian sourced rubles for USD or EUR? The price of BTC ends up being worth only what it is worth in the Russian market and the global pricing mechanism fails because the arbitrageurs can't trade across banned and open jurisdictions. Who wants to send something valuable into a jurisdiction to have its value destroyed, and who will want it coming out if it can be traced at the exchange and show you are breaking sanctions? The Chinese have an alternative to SWIFT called CIPS, and they are mobilizing it with their banks signing on to use it, and you can rest assured that China will try to open up international payments and break sanction controls. But that is a long way away from being meaningful, and it is not assured of working. International banks like their Western banking licenses and will find it hard to sign on to any alternative payment process in China that breaks sanctions and risks their licenses in the West.

The crypto idealist/anarchist dream is that blockchains are unstoppable because you can't control math and peer to peer networks, and that cryptocurrency transactions are anonymous. This is naive. The traceability of cryptocurrency transactions for corporations, and increasingly retail users, is not well understood but it is very real. Cryptocurrency trades are pseudonymous not anonymous which means that they are meaningless transaction identifiers until one side discloses who they are, and then ALL transactions for both parties become traceable. It doesn't take too long for KYC and AML processes to basically disclose enough information for all information to be traceable. Likewise the idea that the laws of math give you a pass on the laws of the land is fanciful. The laws of nuclear physics are free to be known and you can put anything on a presentation slide, but if you swing into action to use that math against a nation state's interest you will quickly find that implementation is a different challenge to understanding theory. Wikileaks and torrent sites both use obfuscation and peer to peer technology that works, but the discomfort of trying to implement them to break the law is above most peo-

ple's pain threshold to operate them, and they can be blocked and excluded from networks. And let's not forget that using this technology can become a risk that changes its use. The idealists said that social media tools like Twitter and Facebook would be the tools that could be used to organize the Arab Spring and bring change to the Middle East, but all it did was create call lists for the oppressive regimes to use to tidy up the dissent. Technology is just a tool and it doesn't have any magical powers to defend itself on cloud computer networks who can also decide to stop hosting non-compliant cryptocurrency nodes and companies.

Finally, some consideration has to be given to how the Ukraine invasion impacts cryptocurrency valuations. I always answer the question as to why did crypto go down with the question - why do you think it went up? The answer is that I don't know in either case. There is a case to be made that if crypto is a USD alternative for stranded Russian oligarchs or international payments, its price will go up with demand. But likewise if this crisis means the government puts some strict controls around it, it can go down as the demand wanes from that use case. Then again it can go in either direction for completely unrelated reasons. The price will do what the price will do, but when it comes to regulation, I believe that be it TradFi or DeFi, the future of all "Fi" is participation in the processes the West implements to make their financial sanctions work. I am still a big fan of the technological innovations of programmable blockchains and the social dynamics of web3; I hope they grow and thrive unhindered for legitimate use cases. But congratulations cryptocurrencies, you are now at the big table and it's time to behave that way.

Endnotes

¹<https://www.defipulse.com/>

²<https://coinmarketcap.com/>

³<https://www.google.com/search?q=usdc+daily+volume&q=usdc+daily>

⁴<https://www.bloomberg.com/news/articles/2022-01-06/nft-market-surpassed-40-billion-in-2021-new-estimate-shows>

⁵<https://www.reuters.com/technology/crypto-exchange-coinbase-trading-volumes-jump-over-67-2022-02-24>

⁶<https://www.trustnodes.com/2022/01/04/uniswap-crosses-1-billion-in-revenue#:~:text=Uniswap%20has%20become%20the%20first,an%20income%20of%20%242.5%20million.>

Everything, Everywhere Close to 100% Goal

Nearly twenty years ago, Northfield undertook the unique goal of providing risk model coverage of all financial assets, globally across all asset classes both traded and private. We are now closing in completion of that monumental effort. Over the intervening years, coverage has been expanded from just equities and fixed income securities to include derivatives and a wide variety of private assets (real estate, private equity, private loans, public infrastructure). In recent months, we've upgraded coverage of unrated debt, frontier market currencies and cryptocurrencies. Further upgrades to derivative coverage and frontier market securities (e.g. stocks) will be coming online in the next couple months.

Just as important, we developed an internal system called **ACES** which analyzes a wide range of data sources (e.g. index constituents, mutual fund holdings, client holdings) to ensure the coverage of *every single asset of interest to our clients*. To illustrate the ACES concept, we recently processed every security held by even a single mutual fund among the tens of thousands of funds and ETFs in the Lipper database. This aggregation came to about 400,000 distinct asset identifiers. Of that vast number, more than 85% were immediately matched to existing Northfield data. The automated ACES system then did further processing on the missing 15% (mostly IDs inconsistent with Northfield conventions) and was able to provide records for more than two thirds of the initially mismatched items. Of the remaining items, most fell into categories that are being addressed by the aforementioned coverage expansions (e.g. frontier markets outside the normal geographic range of our models). With Clients allowing automated reporting, "data exceptions" in our local applications and those using our online applications will be able to achieve essentially 100% asset coverage of even the most exotic portfolio with minimal effort.

Optimizer Standalone Clients Transition to NEXUS

Nexus is Northfield's new online platform to access best-in-class Northfield analytics and services. Nexus offers a fresh new interface over the web with added features to analyze factor-based portfolio risk, performance attribution and optimization.

Current clients who are still using the Open Optimizer Stand Alone Service can now transition to Nexus at no additional cost.

A recording of a recent online workshop which outlines the features and benefits of Nexus is available [here](#):

<https://northinfoevents.webex.com/northinfoevents/lsr.php?RCID=e4b54031855f16453e9b3eefd7deb436>

Please contact Northfield Support for any questions or guidance. Technical Support in Boston can be reached at (617) 208-2080 and support@northinfo.com. European clients can contact +44 (0) 17-2244-RISK (7475) and support-europe@northinfo.com. Clients in Asia-Pacific can contact +81 (0) 3 5403 4655, +61 (0) 2 9238 4284 or support-asia@northinfo.com.

Staff Speaking Engagements

Northfield President Dan diBartolomeo will be at the May 10th Performance Measurement and Risk (PMAR) Conference in Philadelphia where he will be presenting "Three Ways to Assess Manager Skill."

On May 17th, Dan will be in New York City at the International Association for Quantitative Finance award ceremony where he will present the Northfield Financial Engineer of the Year Award to Professor Dilip B. Madan

Northfield's Emilian Belev and Rick Gold will be presenting their paper "Real Estate in the Role as a Risk-Adjusted Fixed Income Asset Class in Liability Driven Investor Portfolios" at the annual conference of the American Real Estate Society in Bonita Springs, FL between April 6 and 9.

For a complete index of all former Northfield News articles, visit <http://www.northinfo.com/documents/314.pdf>

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