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s:fi KNOWLEDGE

Swiss Finance Institute Practitioner Roundups

Academic and Practical Insights on Finance Matters

Editorial

The most valuable asset of any industry is the expertise of its labor force—its knowledge capital. For Switzerland to maintain its position as a leading financial center, such capital must continue to grow throughout the financial marketplace. Swiss Finance Institute (SFI) makes an important contribution in this context by providing forward-thinking ideas and fostering knowledge exchange and dialogue between researchers and practitioners.

With the support of the Swiss Confederation and the Swiss banking industry, SFI plays an important bridging role for the Swiss financial industry, connecting it to the academic world of finance, and ranks among the ten best finance research centers worldwide. Our faculty currently comprises more than 50 renowned SFI professors spread across three language regions in Switzerland at our six partner universities—the Swiss Federal Institute of Technology Lausanne, the Swiss Federal Institute of Technology Zurich, the Università della Svizzera italiana, the University of Geneva, the University of Lausanne, and the University of Zurich.

By disseminating knowledge, SFI reveals the value of fundamental research and nurtures innovation and expertise. Our events, workshops, publications, and continuing education programs boost the competency of all members of the financial marketplace. *SFI's Practitioner Roundups* address relevant finance matters, providing the latest research insights of SFI professors, as well as practical insights from experienced practitioners in a concise, focused manner. Read more in this magazine and join us in exchanging the knowledge and expertise that will keep Switzerland at the top in banking and finance.

We wish you an enjoyable read.

Prof. François Degeorge
Managing Director

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Do Exchange-Traded Funds Increase Stock Volatility?

Exchange-traded funds (ETFs) have become increasingly popular, but might their success lead to unintended consequences for the underlying securities in ETF baskets?

Do Exchange-Traded Funds Increase Stock Volatility?

Exchange-traded funds (ETFs) have become increasingly popular over the past two decades. The share of market cap ownership by ETFs in the S&P 500 universe rose from 0.1 percent in 2000 to 7.1 percent in 2015—the amount of assets under management by ETFs is currently more than twice that managed by index mutual funds. ETFs' increased popularity relative to traditional index funds is largely driven by the increased access they provide to liquidity and diversification. One could, however, wonder whether the ease of trade that makes ETFs' success leads to unintended consequences for the underlying securities in ETF baskets.

SFI Professor Francesco Franzoni, together with Itzhak Ben-David, Ohio State University, and Rabih Moussawi, Villanova University, contribute to the literature with their paper *"Do ETFs Increase Volatility?"*, forthcoming in *The Journal of Finance.* Their results show that increases in ETF ownership increase the non-fundamental volatility of securities since liquidity shocks propagate through arbitrage channels.

What are ETFs?

ETFs are investment companies whose objective is to replicate the performance of an index, similarly to index mutual funds. Yet unlike index funds, ETFs are listed on an exchange and traded throughout the day. ETFs are similar to futures in the sense that they track an index, but unlike futures ETFs do not involve a rollover of the expiring contract. Overall, ETFs offer a cost-effective and liquid way for investors with uncertain trading horizons to track an index.

How are ETFs created?

ETFs are traded in the secondary market by retail and institutional investors. However, unlike closed-end funds, new ETF shares can be created and redeemed by certain institutional investors—called "authorized participants"—and such transactions constitute the primary market for ETFs. Arbitrage opportunities may arise when the price of ETF shares, determined by the supply and demand in the secondary market, diverges from the value of the underlying securities. For example, in the case where an ETF trades at a premium relative to the underlying securities, authorized participants have an incentive to buy the underlying securities and to sell the newly created ETF shares on the secondary market.

How do ETFs impact the market?

Empirical data, covering ETFs listed on US exchanges between 2000 and 2015, show that because arbitrage-driven investors buy and sell ETFs, and simultaneously sell and buy the underlying shares, demand and supply shocks are transferred from the ETFs on to the underlying securities and volatility increases. According to some industry participants, 50 percent of the volume in the S&P 500 tracker is related to arbitrage. Research results show that a one standard deviation increase in ETF ownership leads to an increase in the volatility of S&P 500 stocks of up to 16 percent. Further estimates show that such increases in stock volatility are hardly imputable to the improvement in price discovery brought about by ETFs.

What are the implications of ETF-driven increases in stock volatility?

The increase in stock volatility brought about by ETFs is partly non-diversifiable and therefore represents, especially for investors with a short trading horizon, a form of systemic risk. Data supports the fact that ETF ownership may deserve a risk premium; empirical estimates suggest that portfolios of stocks with high ETF ownership display positive alphas of about 50 bps.

What should investors be aware of?

Recent events have shown that the behavior of exchange-traded products, of which ETFs are a sub-category, does not always comply with investors' expectations. For example, the collapse of the exchange-traded note "XIV", which provided the inverse of the return of the VIX, shows that some of these instruments bear high risks and can lead to extreme losses.

In conclusion, ETFs have brought desirable diversification to investors' portfolios at low cost and are overall a welcome innovation in financial markets. As all forms of financial innovation, however, they may have unintended consequences. Investors, as well as regulators, should pay special attention to the risks involved in such financial instruments to prevent them from becoming toxic.

Prof. Francesco Franzoni
Francesco Franzoni is Professor of Finance at the Università della Svizzera italiana (USI) and holds an SFI Senior Chair. He obtained his PhD in Economics from MIT and directs the Institute of Finance at USI. His research concentrates on institutional investors, such as hedge funds and ETFs, and their effect on asset prices.

These insights draw on the academic paper by Prof. Itzhak Ben-David, Prof. Francesco Franzoni and Prof. Rabih Moussawi.

The full academic paper can be accessed at: https://bit.ly/2HcixI1

ETFs: The Importance of Investor Education

Exchange-traded funds (ETFs) have probably been the biggest success story of the investment management business over the last 25 years. With more than USD 3 trillion of AuM they are one of the fastest growing segments of the industry, with an outlook for continued, strong future growth. Like all success stories, ETFs attract both enthusiastic support and harsh criticism. The main rationale in their favor is market access at low cost. ETFs have made it possible to invest in a wide range of asset classes, from mainstream equities and bonds to less traditional classes such as precious metals, emerging markets, volatility, or alternative assets. They are available at the price of index funds and are also exchange-traded, and therefore cheaper to run and distribute than mutual funds.

Criticisms—old, and new

The criticisms have focused on suitability for retail clients, complexity, and trading costs. ETFs sometimes cover esoteric assets that are unfamiliar to retail investors. Some ETFs ("synthetic ETFs") provide exposure through swaps or notes, involving portfolio structures and counterparty risks. ETFs offering exposure to leveraged and inverse returns or volatility are particularly complex. Investing in ETFs involves trading commissions, bid–ask spreads, and sometimes significant price gaps to net asset values, especially when the underlying assets are less liquid. The study by SFI Prof. Franzoni et al. adds another critical point concerning ETFs—namely, the increase in volatility of the underlying securities due to the trading activities of ETF arbitrageurs. This effect is little known even by professional investors and raises some questions regarding how these instruments might effectively be used.

The strategic and tactical use of ETFs

There are two ways in which professional investors can utilize ETFs, tactical and strategic. Examples of a tactical use of ETFs include investing excess cash in order to remain fully market-exposed or using them to respond to short-term market conditions. For those engaged in such investments the increase in volatility brought about by ETFs is definitely relevant, because of these investors' short-term horizon. It is possible that within short time periods the increased volatility introduced by ETFs' inclusion influences the outcome of the intended strategy. In theory this effect should be less relevant for long-term strategic users of ETFs, since there should be more time for fundamental price discovery regarding the underlying securities. In reality though, even the strategic use of ETFs involves challenges and opportunities.

Let's take an example of a strategic application—a smart beta product used to replace an actively managed fund to get exposure to a specific factor risk premium (e.g., mid-cap value). The challenge: the proliferation of indexes and smart beta strategies could generate "crowded trade" effects on single securities, since most of

the products tend to follow similar rules to generate factor exposures. These "crowded trades", in turn, would amplify the volatility effects studied by SFI Prof. Franzoni et al., causing a less efficient implementation of the factor strategy itself. Looking at the opportunities, the ETF inclusion effect generates an "ETF risk premium" with a specific alpha associated. This enables investors to capture additional sources of alpha, either by investing in the securities most affected by the inclusion effect, or—on the contrary—by investing in the securities not included in crowded ETF trades, therefore offering a more stable return profile over time.

In sum, the study of SFI Prof. Franzoni et al. contributes to the debate as to whether the proliferation of (quasi-) passive instruments produces more market inefficiencies. The study also emphasizes the importance of investor education concerning ETFs given their specific and not well understood complexities. And this not only in relation to retail investors: while significant professional resources are dedicated to the analysis of and research into active managers, fund buyers and investment consultants spend considerably less effort analyzing passive or rule-based instruments like ETFs. Here too then, the old motto, *caveat emptor,* rings true.

Giordano Lombardo
Giordano Lombardo is the Chairman of Rationis Srl. He is a former CEO and Group CIO of Pioneer Investments, former Head of Asset Management at Unicredit, and former Chairman of Assogestioni, Italy's AM industry association. He is a trained economist with 30 years of experience in the asset management industry, having started his career as an analyst and portfolio manager.

Does It Pay to Be an Optimist on the Option Trading Floor?

Optimism may be a helpful attitude in many situations in life, but how does it fare on the option trading floor?

Does It Pay to Be an Optimist?

SFI Professor Paul Schneider tackles this question in his research paper *Does it Pay to Be an Optimist?*. Optimism may help when securing jobs or promotions, but how does it fare on the trading floor? Schneider connects subjective views such as optimism and pessimism with prices and trading strategies in the options market. He finds pessimists to be far and away the most successful agents, with optimists being their unfortunate counterparties. Perhaps surprisingly, the pessimist's success is based upon his or her role as insurance vendor.

To reach his conclusions, Schneider develops a framework in which he takes quoted bid–ask spreads in the liquid S&P 500 options market as input and investigates how different subjective views imply risk preferences, and consequently trading strategies. In his model, the options market is populated by optimists, pessimists, and pragmatists. The optimist believes in the exceptional upside potential of the market, while the pessimist believes disaster is highly likely; the pragmatist believes that the market does not quote a certain region of option strikes by accident and hence considers it the most informative.

The surprising impact of optimism on the swap and insurance markets

Schneider then develops an equilibrium model of a market in which the three agent types trade option portfolios with each other. He identifies the trading rules each type of agent would choose under no arbitrage and market clearing. The presence of different views in the marketplace is essential for there to be any trading at all. With positions in both S&P 500 forwards and variance swaps replicated from option portfolios, individual agents will choose the trading strategies they believe to be optimal depending on their subjective preferences—whether optimistic, pessimistic, or pragmatic. Schneider's model thus yields a snapshot of the real S&P 500 options market, along with portfolio positions that optimists, pragmatists, and pessimists would choose.

Following the evolution of profits of these model-implied portfolios over time from 1990 to 2016, Schneider finds that the three types of agents use a surprisingly small variety of strategies. With few exceptions, pessimists short both the S&P 500 itself and variance swaps, with the optimists as their counterparty. The pragmatists fill in the trading gaps opportunistically. This market-clearing allocation in variance comes as a surprise: the generally accepted interpretation of the negative variance premium in the S&P 500 market is as an insurance premium against market crashes.

Pessimism is not risk aversion

To appreciate the background to these unexpected trading allocations, one ought to discard the notion that pessimists are necessarily more downside risk averse than optimists. Likewise, optimists are not necessarily more risk loving. Analogies are easy to find. Pessimists may pack their bathing suits and beach towels despite their expecting bad weather. In contrast, optimists decide to leave them at home, because they simply do not want to be bothered by the extra weight, despite their strong expectations of a sunny day. Downside risk aversion is the most prominently and robustly observed trait of human decision-making, but there is a great variation in its strength that is not necessarily connected to expectations.

Could there be another explanation?

Schneider's results hold true even when he modifies his baseline model in various ways. Transaction costs (or lack thereof), market power, noise traders, or the ability to learn about the underlying distributions over time through sample averages—none of these elements change the outcome. The pessimist remains the most successful agent, with the optimist paying for that success.

Positive thinking, it is clear, does not always pay off. On the option trading floor, it seems, optimism all by itself is rather unhelpful.

Prof. Paul Schneider
Paul Schneider is Associate Professor of Finance at the Università della Svizzera italiana and holds an SFI Junior Chair. He obtained his PhD in Finance from the Vienna University of Economics and Business. His main research areas are asset pricing and empirical finance.

These insights draw on the academic paper by Prof. Paul Schneider.

The full academic paper can be accessed at: https://bit.ly/2JgOmww

Who Wants to Be an Optimist and How to Profit from Optimism

In finance, taking risks is associated with collecting premia that compensate investors for their exposure to uncertainty while smoothing future income. The most commonly known and traded risk factors in finance are equity risk (equity premia) and sovereign bond risk (term premia). In each of these two markets (equities and bonds) investors will usually gain if markets actually do not move. If markets do not move, investors will collect an equity dividend, in bonds an interest rate coupon. On top of this, investors will collect risk premia via price appreciation in both markets as uncertainty about future cash flow vanishes (e.g., a sovereign bond drifts to its par value of 100). Collecting profits over the course of time is the most general definition of a positive carry strategy and will serve as my definition of an optimist. Optimists are confident that risk taking will be properly compensated as they assume that future cash flows are sufficiently discounted relative to the risk-free rate such that each day on which uncertainty is resolved they profit by moving closer to the final, "certain" cash flow.

The triumph of optimism?

Dimson, Marsh and Staunton[1] analyzed a century of investment performance concluding that optimism has triumphed in equities (collecting the equity risk premium vs. bonds) and in bonds (collecting the bond term premium vs. cash). Similar results are shown by Jorda et al. (2017)[2] and other researchers. In a nutshell, their analysis shows that being exposed to equity and bond risk was incredibly beneficial to investors; hence, it paid off for investors to be optimistic since future cash flows have been discounted sufficiently beyond the risk-free rate. I will refer to this investor as the premium optimist.

SFI Prof. Schneider's focus on optimism is conducted via the option derivatives market. The author defines optimists, pessimists, and pragmatists and extracts via a unique equilibrium model the positioning behavior among the three agents. The results show—leaving the pragmatists aside—that pessimists sell forward equity and volatility variance swaps to the optimists. This, however, is a loss-making strategy for the optimist and a very profitable strategy for the pessimist, as the author shows. Does this contradict the results from Dimson, Marsh and Staunton? I believe not. Neither should it lead us to conclude that pessimists do better on the trading floor.

What is the portfolio position of the derivative optimist? The optimist ends up with a long forward and a long variance swap position. This, however, is equivalent to being actively long a call option. When buying a call one effectively engages in a delta-adjusted long position in the underlying (long the forward contract) and in a long volatility position. However, in premium terms this trade is a negative carry trade (loses money over time). One element is the negative carry coming from the forward if interest rates are positive. However, over one month this is likely to be negligible. The much larger negative carry comes from being long on volatility (long gamma risk)—that is to say, with the passage of time a call will lose value. The derivatives optimist will gain only if the market moves beyond what is implied in the call price or the variance swap. If the market moves less, the premium paid for the call was overpriced. Hence, the derivatives optimist loses if the implied volatility of the call option is higher than the realized volatility (the volatility premium is negative, for which we have plenty of historical evidence[3]). The loss for the derivatives

[1] E. Dimson, P. Marsh and M. Staunton (2002), "Triumph of the Optimists", Princeton University Press.
[2] O. Jorda, K. Knoll, D. Kuvshinov, M. Schularick and A. Tylor (2017), "The Rate of Return on Everything, 1870-2015", NBER working paper.
[3] J. Jackwerth and M. Rubinstein (1996), "Recovering Probability Distributions from Option Prices", Journal of Finance.

optimist comes hence from the fact that he or she is an insured optimist and that the insurance is overpriced.

The relevance for practitioners

SFI Prof. Schneider's remarkable results show that the option market is highly efficient and that the price-setting mechanism is controlled by the sell side rather than the buy side—that is to say, a derivative optimist will be the price taker while the trading floor (now revealed to be the pessimist) is the price maker. By applying his unique equilibrium model he confirms, from a new angle, that the volatility risk premium is negative.

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Discriminatory Pricing of Over-the-Counter Derivatives

In order to improve market liquidity and financial stability, the G20 countries decided in 2009 that over-the-counter (OTC) products should be centrally traded on electronic platforms. This reform also included the worldwide foreign exchange market. Does centralized trading of OTC derivatives stabilize the real economy?

Discriminatory Pricing of Over-the-Counter Derivatives

In 2009, the governments of the G20 decided that to improve market liquidity and reduce financial instability all standardized over-the-counter (OTC) derivatives contracts should be centrally traded on electronic platforms. This reform also included the largest financial market: the worldwide foreign exchange (FX) market. In April of 2016, global daily OTC FX turnover was USD 5.1 trillion.[1] For comparison, the daily New York Stock Exchange group volume turnover was USD 42 billion during the same period.[2]

SFI Professor Harald Hau, together with fellow researchers Peter Hoffmann and Sam Langfield, European Central Bank, and Yannick Timmer, Trinity College Dublin, shed light on the pricing mechanisms at work in the FX derivatives market in their paper "*Discriminatory Pricing of Over-the-Counter Derivatives*". Their research shows how request-for-quote multi-dealer electronic trading platforms (RFQ-platforms), as envisaged by the G20 reform project, will reshape the OTC FX market, benefit SMEs, and improve overall market stability.

How does the OTC FX market currently operate?

In the current OTC FX market there is no obligation for dealer-banks to publicly disclose quotes and transaction prices; therefore real-time prices are not readily available. This allows dealer-banks to offer identical financial services at different prices to different non-financial clients. To better understand how this opaque market functions and prices are fixed, the researchers use data covering more than half a million trades executed between 2016 and 2017 in the EUR/USD currency pair. First, they find that the most sophisticated non-financial clients (25 percent) are charged spreads of 2.5 pips, or less, over the market mid-price, whilst the least sophisticated non-financial clients (25 percent) are charged spreads of 30 pips, or more. Second, dealer-banks exploit the general lack of transparency in the OTC FX market and earn information rents. For example, client orders that are placed in the direction opposite of recent price changes incur higher spreads than orders placed in the market direction.

Third, there are client–dealer relationships at play. Non-financial clients pay higher spreads when trading with their relationship dealer-banks, and non-financial clients that are important to their dealer-banks receive discounts. Finally, despite the absence of central clearing in the FX derivatives market, credit risk is not priced.

Where does the future of the OTC FX market lie?

The technology required to meet the objectives of the governments of the G20 is available in the form of RFQ platforms. On such platforms, non-financial clients post their requests and dealer-banks then compete against one another to provide the best price. The data used for the study reveal that the usage of RFQ platforms is not yet mainstream, as only 12 percent of all clients use RFQ platforms, but that such technology allows less-sophisticated non-financial clients to benefit from the same financial deals than their more-sophisticated counterparts. First, the discriminatory spread markup for less-sophisticated non-financial clients virtually vanishes

[1] Bank for International Settlements (2016) "Triennial Central Bank Survey—Foreign exchange turnover".
[2] https://bit.ly/2JLxIVZ

on RFQ platforms. This result holds despite the fact that dealer-banks are still aware of the identity of their non-financial clients. Second, trading on multi-dealer RFQ platforms helps non-financial clients reduce dealer-banks' market power in cases of asymmetric FX price adjustments and eliminates discriminatory pricing.

What are the overall consequences for non-financial clients?

Over the past years, RFQ platforms for OTC FX deals have become increasingly popular. This trend reduces search costs and opacity frictions, gives rise to pricing competition, and allows firms, essentially SMEs, to find customized financial products. Such platforms allow non-financial clients to better hedge their cash flow related to international business and at a lower financial cost. Overall, trading on RFQ platforms provides improved execution quality for these firms. This greatly enhances the attractiveness of FX risk hedging and contributes to a reduction of financial risk in the real sector.

Prof. Harald Hau

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These insights draw on the academic paper by Prof. Harald Hau, Dr. Peter Hoffmann, Sam Langfield, and Yannick Timmer.

The full academic paper can be accessed at: http://bit.ly/2GQvyU8

"RFQ" Multi-Dealer Electronic Trading Platforms Eliminate Disciminatory Pricing

The research paper *"Discriminatory Pricing of Over-the-Counter Derivatives"* by SFI Prof. Harald Hau, Dr. Peter Hoffmann, Sam Langfield, and Yannick Timmer confirms Thomson Reuters' view that trading foreign exchange (FX) on a request-for-quote multi-dealer electronic trading platform (RFQ platform) is the optimum way to execute for all types of clients—regardless of their sophistication level—as price competition between providers effectively eliminates discriminatory pricing.

Thomson Reuters has been a crucial partner to the FX market throughout that market's evolution, which has seen it move from phone trading through single-bank platforms to RFQ platforms, and now incorporates more sophisticated execution methods. The common thread in this timeline is that each development has made it progressively easier for the end user to trade in competition and to get better pricing. Trading on RFQ platforms has experienced huge growth as the FX community has become more aware of the benefits of trading with all your existing providers in a structured and consistent manner.

In addition to the competitive pricing benefits of trading on a RFQ platform demonstrated in the research paper by Hau and coauthors, clients trading on such a platform also gain significant efficiencies in many areas of their execution workflow. Key functions such as regulatory reporting, transaction cost analysis, and straight-through processing can all be provided by a single vendor alongside a trading platform. This linkage of the pre-trade, trade, and post-trade workflow reduces the number of partners you have to work with and reduces risk. This in turn improves efficiency and drives productivity. Some RFQ platforms even offer seamless execution for multiple products across both regulated and unregulated liquidity pools, allowing users to easily comply with new derivatives legislation (such as FinfraG, MiFID II, and Dodd–Frank). Complex order management functions such as trade netting and allocations can also be automated, allowing traders to focus on higher value activities.

Traders should look for RFQ platforms that provide transparency with regard to their operational procedures so that they fully understand the process by which trades are formed. Independent RFQ platforms that are neutral and un-conflicted offer additional benefits to traders. By not taking positions, making markets, or having any bias regarding the direction of currency movements, these trusted platforms allow traders to execute with confidence knowing that the information on their trades will not be used in any way against their interests.

One of the few remaining hurdles we see to clients' deciding to adopt a RFQ platform is the apprehension that their relationships with provider banks will change. It is crucial to recognize that implementing a RFQ solution is not the end of the traditional sell-side-to-buy-side relationship. A RFQ platform is merely an extension of a bank's distribution. RFQ platforms and banks have partnered to deliver this solution to the buy-side community since the former's inception.

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Do High Salaries in Finance Hurt the Wider Economy?

High salaries in the financial sector have regularly been blamed for attracting top talent into finance jobs and away from activities that are more beneficial for society. Do skilled workers actually change into the financial sector when finance salaries rise? What are the consequences of such reallocations for the economy?

The Finance Wage Premium and the Reallocation of Skilled Workers

The size of the financial sector, like the compensation of its workers, has been growing considerably over the past 40 years. Since the 2008 financial crisis, academics, policy makers, and the press have been concerned that excessive compensation in the sector might be distorting the economy, as talented workers reallocate from occupations that generate high social returns to more lucrative jobs in finance.

SFI Professor Laurent Frésard and fellow researcher Francesco D'Acunto (University of Maryland) study the effect of growing finance wages on worker reallocation and economic growth in their research paper *Finance, Talent Allocation, and Growth*. They contribute to the literature, whose focus has been on the rising finance wage premium, by focusing on the consequences of the rise in that premium for talent allocation across the job market and the economy. Their results show that growing finance wages are associated with a modest reallocation of skilled workers from non-finance sectors to finance, but that such a reallocation carries no consequences for the overall economy.

What do higher salaries mean?

Although it is quite clear that higher salaries attract talented individuals, this does not mean that higher salaries induce a harmful misallocation of talent in the economy. One could indeed argue that the increase in salaries and skills in a given sector reflects an improvement of the services provided by that sector to the overall economy. One must not forget that the financial sector helps talented individuals start and develop new companies, which affect our everyday lives.

The adjusted growth of finance wages

To determine whether the increase in finance salaries leads to an increase in the value added the financial sector provides to the economy one must compare one to the other. To do so, the authors develop the finance wage premium (the wage of skilled workers in finance relative to the wage of skilled workers in the rest of the economy) and the finance value added premium (the value added per skilled worker in finance relative to the value added per skilled worker in the rest of the economy). The difference between the two equals the adjusted growth of finance wages (AGFW). If, for example, this difference equals zero, then the private return of working in finance is equal to the social return that finance provides to the economy.

What does data reveal regarding the AGFW?

Data covering 24 countries in Asia, Europe, North America, and Oceania for 35 years show that the AGFW yields a positive value, suggesting that the relative wages in the financial sectors have grown faster than the contributions of the financial sectors of these countries' respective economies. Further analysis reveals that the AGFW has decreased over time and is now close to zero. Data also reveal that the share of skilled workers in the economy increased by 30 percent between 1970 and 2005, that skilled workers have benefited from a largely time-consistent wage premium of 74 percent in comparison to medium- and low-skilled workers, and that workers in the financial sector have a largely time-consistent wage premium of close to 60 percent over the other sectors of the economy.

Does the workforce reallocate when the AGFW changes? And does this affect the overall economy?

Analysis reveals that skilled workers shift away from non-financial sectors and into financial sectors when the AGFW increases. Further estimates show that this effect was particularly strong in the early nineties and is not concentrated in either high- or low-income economies. Data show that sectors in which workers have skills that are easier to transfer to finance jobs are the most affected by reallocations induced by changes in the AGFW and that sectors that rely heavily on finance in order to grow are the least affected. Although reallocation between non-finance and finance sectors due to changes in the AGFW is significant, it exerts little overall impact as it affects less than 1 percent of the overall skilled workforce. The researchers find no impact of changes in the AGFW and of workforce reallocation on usual economic performance measures such as output, value added, total factor productivity, or GDP.

Prof. Laurent Frésard
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These insights draw on the academic paper by Prof. Francesco D'Acunto and Prof. Laurent Frésard.

The full academic paper can be accessed at: http://bit.ly/2oj4kMW

Rethinking the "Golden Cage"

The research by SFI Professor Frésard and Professor D'Acunto examines whether high salaries in finance hurt society by pulling individuals away from jobs that would make better use of their talents. A similar issue, known as the "Golden Cage" is often cited as being among the top challenges for entrepreneurship in Switzerland, particularly in the area of Fintech. It refers to the effect that the high salaries available in finance have on would-be entrepreneurs and the pool of talent available to start-ups. Whether talking about the opportunity costs of leaving a job in finance or the high cost of hiring talent, there is no doubt that money is a major factor. That said, my experience on both sides of the issue has led me to believe that the Golden Cage is not a real roadblock. Why? Because entrepreneurs find a way to pursue their vision in all conditions, and the high salaries in Swiss finance actually offer a number of advantages.

Valuable experience

Working in finance provides experience not available outside the industry, which can be valuable in Fintech and in all areas of entrepreneurship—it includes negotiating financing and managing risks. Also, unlike in many other areas of start-up activity, where youth has a clear advantage, experience still counts for a lot in Fintech. Attracting talent to work for a number of years in a well-paid finance job creates a great foundation for a career in Fintech or entrepreneurship, specifically by training people to better understand risk and reward.

Stockpiling cash

The ability to save money to support entrepreneurial endeavors is an obvious advantage to working in finance. While gaining experience, it makes sense to start putting money aside and working on your business plans. The costs of launching a start-up may continue to drop, but well-paid financial professionals still have an advantage when it comes to being financially prepared for entrepreneurship.It should also be possible to develop networks that allow access to more funds with which to finance future ventures.

Extreme conditions

Much like running in the mountains can push the body to new levels of performance, dealing with the high salaries in Switzerland makes Fintech entrepreneurs more adaptive, innovative, and internationally competitive. Teams learn to become more efficient with manpower and to leverage technology; they become more effective by working virtually; they develop international supply networks. Extreme conditions also have the benefit of discouraging amateurs or lifestyle entrepreneurs, simply because they cannot afford the high cost environment of the Swiss financial center. Anyone choosing to become a Fintech entrepreneur in Switzerland knows that the high cost of industry talent requires them to make full use of its productivity.

Fintech offers the best of finance and tech industries

The data by SFI Professor Frésard and Professor D'Acunto shows that sectors in which workers have skills that are easier to transfer into finance jobs and innovative sectors are the most affected by reallocations induced by changes in the adjusted growth of finance wages, or AGFW. This is consistent with the strong interest from financial professionals to enter Fintech, where company valuations have risen to high levels, versus bank salaries which have become more modest in recent years.

It is no fluke that many talented people pursue well-paid careers in finance. The jobs are demanding and rewarding for those who can obtain them. At the same time, the experience, financial resources, and competitive experiences developed by working in finance also put talented people in an excellent position to evaluate the potential risks and rewards of leaving the Golden Cage to pursue Fintech and entrepreneurship. When entrepreneurs find a great opportunity, there is no holding them back until it has been realized.

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John Hucker is CEO of Elliott Capital, a venture builder and deconstructed accelerator, and the founder and President of the Swiss Finance +Technology Association. He holds an MBA from Saïd Business School (Oxford) and is a CFA charterholder. His previous roles were in wealth and asset management at Credit Suisse, UBS, and TD Bank.

Effectiveness of the Basel III Reforms

Responding to the most recent financial crisis, the Basel Committee on Banking Supervision developed a new regulatory framework, known as Basel III, to increase capital requirements for banks in order to improve financial system stability. Will the Basel III reforms be effective or induce banks to decrease their credit exposure to corporate and retail clients?

Bank Capital Requirements Increases and Their Effects on Banks and Firms

To further strengthen financial markets after the crisis, regulators have resorted to taking measures to increase capital requirements. The Basel III agreement, due to be implemented in 2019, seeks to further increase the amount and quality of bank capital, enhance risk capture, contain leverage, improve liquidity, and limit procyclicality. With this reform, minimum capital requirements are increased by 50 percent, requiring banks to increase their risk-based capital ratios. Banks can reach this goal by increasing the amount of regulatory capital they hold or by decreasing the quantity of risk-weighted assets they finance.

SFI Professor Steven Ongena, together with fellow researchers Reint Gropp, Halle Institute for Economic Research, and Thomas C. Mosk and Carlo Wix, Goethe University Frankfurt, study the impact of the 2011 European Banking Authority (EBA) capital exercise—which unexpectedly required certain banks to increase their regulatory capital ratios—on banks' balance sheets and the real economy. Based on this exercise, the researchers forecast that the Basel III agreement may induce banks to reduce the amount of assets they finance by lowering their credit exposure to certain businesses, but that they will likely not increase their amount of regulatory capital.

What is the purpose of the risk-based capital ratio?

The goal of the risk-based capital ratio is to ensure that banks hold sufficient capital available to allow them to absorb a financial loss. The ratio is obtained by dividing the amount of regulatory capital a bank owns by the amount of risk-weighted assets that bank finances. Regulatory capital is equal to the amount of equity, retained earnings, and reserves a bank owns. Risk-weighted assets are equal to the total value of each asset financed by the bank multiplied by their respective risk weights. Riskier deals require banks to allocate more funds, making such deals less attractive.

The EBA capital exercise

Any attempt to identify the effect of regulatory changes with regard to capital requirements faces the methodological challenge of finding an external change in capital requirements. The 2011 EBA capital exercise provides a setting which allows the authors to isolate the effect of changes in capital requirements on banks' lending behavior. The exercise required a subset of European banks to hold a 9 percent capital ratio—up from 5 percent. The selection rule included banks in descending order of their market share, such that 50 percent of each country's banking sector was included in the exercise. Since banks differ in size within countries, as do banking sectors across countries, banks with significantly different balance sheets were included, or excluded, from the exercise. In their paper—*Bank Response To Higher Capital Requirements: Evidence From A Quasi-Natural Experiment*—the researchers take advantage of this selection process and observe how seemingly identical banks reacted differently depending on whether or not they were included in the exercise.

What does the EBA capital exercise teach us?

Data from nearly 200 European banks reveal that the banks included in the exercise increased their risk-based capital ratio by 2 percent more than the excluded banks. The amount of regulatory capital evolved identically for both groups of banks, whilst the included banks reduced their amount of risk-weighted assets by 16 percent compared to the excluded banks. These results provide evidence that when banks face increases in capital requirement ratios they tend to reduce their levels of risk-weighted assets instead of raising new capital.

Further analysis shows that the reduction in levels of risk-weighted assets was carried out via reductions in corporate and retail credit exposure. Firms that relied on the treated banks for funding grew less, and exhibited less investment and sales growth than those that were less reliant on such banks.

The exercise may have been a somewhat blunt instrument, as the results suggest that banks did not raise their capital ratios by increasing their levels of regulatory capital but by decreasing their exposure to corporate and retail clients. Requiring banks to increase their amount of regulatory capital, instead of their regulatory capital ratio, may be a more effective policy that would both strengthen the banking sector and avoid penalizing business activities.

These insights draw on the academic paper by Prof. Reint Gropp, Prof. Thomas C. Mosk, Prof. Steven Ongena, and Carlo Wix.

The full academic paper can be accessed at: http://bit.ly/2DXhQj9

Prof. Steven Ongena
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Basel III: No Material Impact on Credit Granting Process Expected

The authors' analysis indicates that banks subject to the 2011 European Banking Authority (EBA) capital exercise, which required them to increase their capital ratios, reacted by reducing their average credit exposures (de-leveraging) rather than by increasing their level of capital. Therefore, the authors anticipate that the finalized Basel III reforms will lead banks to decrease the assets they finance as they will face higher required capital ratios.

There are several reasons why the quantitative conclusions of the research paper by SFI Professor Steven Ongena et al. are likely to be of a different magnitude following the implementation of the finalized Basel III reforms. In particular, one has to bear in mind that the 2011 EBA capital exercise was conducted in a fragile market environment dominated by the sovereign debt crisis whereas today the economic cycle is on a stronger footing, which is consistent with the positive market reactions across jurisdictions observed after the 7 December Basel Committee on Banking Supervision (BCBS) announcement of the finalization of Basel III.

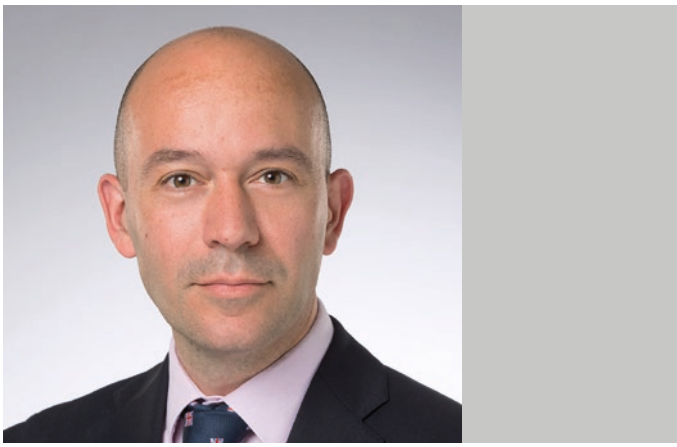
First, the finalized Basel III is a comprehensive set of reforms that are not limited to capital ratios, but include liquidity and leverage ratios as well. Therefore, the implications for banks' willingness to extend credit will be a blend of the impacts of these different regulatory measures. In particular, the reforms address all types of risk that attract capital—namely, credit, market, and operational risks—and do not focus only on credit risk requirements.

Second, the stated objectives of the reforms have included reducing excessive variability in credit risk risk-weighted assets (RWA) (between internal rate based approaches and standardized ones) with the additional aim to not significantly increase overall capital requirements, as publicly stated by the Basel Committee in March 2016.

Third, the reforms have also increased the risk sensitivity of the credit risk framework, in particular for exposures under the standardized approach. As the relative price (in RWA terms) changes, capital becomes more or less expensive for a certain asset class, which incentivizes an optimal—and more risk-sensitive—reallocation of resources from more expensive to less expensive assets.

Finally, an important feature of the Basel III reforms is the timing of their implementation. While the EBA required banks to increase capital ratios within six to nine months following the exercise, the Basel III reforms are expected to be implemented by 2022, with some important elements of the framework—such as the RWA floor limiting the difference between RWAs under internal rate based and standardized approaches—to be fully binding only in 2027. This timeline allows jurisdictions to adequately implement the new framework and provides banks with the opportunity to smoothly adjust to the new requirements, avoiding potentially negative consequences for the broader economy.

In conclusion, my expectations are that the implementation of the Basel III reforms will lead to a combined set of reactions from banks and no material impact on the credit granting process. Banks that might see capital requirements increase will be incentivized to restructure or reduce certain businesses while achieving enhanced efficiency and increasing the capital base through issuance or revenue retention. Other banks will have the opportunity to expand or further optimize their balance sheets.



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Risk Premia in the Portfolio Context

Several risk factors influence the risk-return profiles of financial assets and portfolios. While most strategies use aggregated static measures to estimate risk factor premia, a time-varying individual stock market methodology would result in reduced portfolio risk.

A Premium is a Factor—but a Factor is Not Always a Premium

Factors, premia, and risks are the magic words in modern finance. Smart beta strategies apply this concept and have attracted considerable attention in recent years. Several factors have been shown to influence the risk-return profile of financial assets and portfolios. But not all factor exposures compensate through higher returns all the time. Risk premiums are time varying, because of economic cycles and changing market integration. In global asset allocation, it is vital to consider such aspects and to extract information from a large number of individual stocks, as this enables one to target diversification benefits in particular in emerging markets.

Historical price variations for a set of assets are actually nothing more but a multidimensional cloud in dimension *n*-securities x *t*-periods of time. Such a large volume of data necessarily requires isolating the "principal components", namely criteria that best separate price movements from each other. We therefore find that the size or the economic sector in which a business operates better characterize its historical returns than do its logo or its founder's first name. For 60 years, in financial theory the first of these axes has been referred to as the market effect ("beta"), and the subsequent ones as "factors". In asset management, identifying these factorial exposures makes it possible to understand and allocate the risks of a portfolio. As far as these factors remain independent of each other, they diversify the portfolio and improve its risk-return ratio.

Yet not all of these factors are "premia", since they are not all necessarily remunerated over a complete cycle. To create value with non-remunerated factors, it is necessary to understand their behavior in order to tactically allocate risk to them. Exposures to premia, on the other hand, produce an excess return over a complete cycle, in a quasi-static manner. The premia therefore primarily determine a long-term strategic allocation, whereas active management may integrate a wider set of factors. When analyzing active management—that is to say, when isolating the individual talent of a manager ("alpha")—one must first identify whether performance results from factors and premia. In this respect, the discovery of a new premium might then reduce the measured alpha. However, only "pure alpha" merits a high price, precisely because the emphasis on premia reveals that this unique and non-diversifiable, independent talent is indeed rarer than one might think.

Both practice and academic studies suggest that premia and factors are unstable over time. They evolve during crises and also as a result of their discovery. Like the famous Schrödinger's cat, observing factors disrupts their nature, since rational investors try to take advantage of them once this is made possible by financial technology. The following applies to beta: because of its success, index management is only passive by name, since the mere fact of an asset belonging to a popular index sometimes has more influence on its performance

than the market factor itself. Ironically then, market premia are altered by the very development of indices whose sole purpose is to measure them. This has two consequences:

1. Since all factors are susceptible to this irony, the choice of indices is never neutral. It never has been, and any serious study must take into account the widest possible set of individual securities since the scope of the study probably has an influence on its result. In this respect it seems inevitable that the international dimension, and therefore the cross-integration of markets, should be taken into account.

2. For a premium to remain a premium—that is to say, to remain paid over a complete cycle—it is necessary to have an economic rationale, and not just statistical or historical evidence. For decades this has been the case for robust "size" or "value" factors; is this also the case for the "market integration" effect?

In any case, it is economically plausible that an "integration" effect exists in common-currency areas, proximate time zones, and fungible marketplaces. It is also plausible that this effect is less pronounced in emerging economies, where exchange rates are subject to local rules and regulation, and stock market connections are less developed. This reinforces the natural interest of investors in these emerging markets: they structurally provide a better diversification effect, and preserve their risk premia in the face of the irony of index management.

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Integration and Risk Premia in International Equity Markets

Pricing risk factor premia accurately is the cornerstone of asset selection and optimal portfolio creation. Several factors—such as market, size, value, momentum, investment, and profitability—have been shown to influence the risk and return profile of financial assets and portfolios. When investing in an international setting two additional factors—market integration and currency risk—must also be accounted for in the overall asset selection process. SFI professors Ines Chaieb and Olivier Scaillet, along with fellow researcher Professor Hugues Langlois from HEC Paris, contribute to the asset pricing literature with their research paper *Time-Varying Risk Premia in Large International Equity Markets* by using individual stock level data instead of aggregated measures such as portfolios or indices to estimate world-, regional-, and country-specific factors. Such an approach avoids the loss of information caused by aggregation biases. They further allow the risk premia factors to vary over time instead of being static through economic and financial cycles. Data shows that market, size, value, momentum, investment, and profitability factors delivered positive average returns in almost all regions during the considered period.

What are the implications of your methodology?

Quantifying risk factor premia accurately in today's global capital market has significant implications due to the sheer size of the market itself. A recent survey shows that more than a third of all asset managers questioned already use smart beta allocations and that a further third is currently evaluating the benefits of such allocations.[1] Among those that use smart beta allocations, nearly half have more than 20 percent of their overall portfolio invested in smart beta strategies. Any better understanding of the mechanisms at work brings with it benefits in terms of both return and risk.

What are the pros and cons of market integration?

Imperfect market integration allows financial actors to benefit from investment diversification and reduce their overall portfolio risk for a given level of expected financial return. In the extreme case in which all financial markets are fully integrated, there is no advantage in investing in different stock markets as they would all move perfectly in sync. With imperfectly integrated markets, overall portfolio risk can be reduced and specific risks can be exploited. One could, for example, capitalize on value factors in emerging markets and momentum factors in developed ones.

What does the data reveal regarding market integration and its time-varying effect?

Results obtained using 58'674 stocks across 46 countries from 1985 to 2017 show that different factors are at work. The analysis focuses on the world-, regional-, and country-specific pricing impact of these factors. For developed markets, results show that country market premia are smaller than world or regional market premia. Diversification benefits are thus limited. Results differ for emerging markets and suggest that the country factor

[1] FTSE Russell. (2016). "Smart beta: 2016 global survey findings from asset owners".

risk premia are large relative to the world or regional factor risk premia and that investors can further benefit from diversification within such regions. Estimations reveal that factor risk premia change over time. In developed markets, market and value premia spiked during the global financial crisis. Value and momentum premia show more variability across countries and over time than profitability and investment. Moreover, momentum premia are more volatile in emerging markets.

What are the implications of this research for market participants?

The understanding and promotion of international equity market integration contributes to economic growth and the overall global stability of the financial markets, and provides more stable long-term saving and investment opportunities. At the investor level, asset managers are aware of the theoretical benefits of portfolio diversification but there is still potential to fully exploit them. This research highlights the benefits of employing a time-varying individual stock market methodology to estimate risk factor premia and reduce portfolio volatility, and further provides the framework needed to implement such strategies. Finally, firms can benefit from these findings by better estimating the cost of their equity by using risk factor premia estimated from individual stocks instead of portfolios or indices.

These insights draw on the academic paper by Prof. Ines Chaieb, Prof. Hugues Langlois, and Prof. Olivier Scaillet.

The full academic paper can be accessed at: http://bit.ly/2p99E6a

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