RESEARCH STATEMENT
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In this document I describe the main themes, evolution, and contributions of my research. Section I offers an overview. My papers are then described in more detail: Section II focuses on my main theme–the production and diffusion of information in financial markets, and Section III on my secondary theme– exchange rates.

I. RESEARCH PORTFOLIO AND IDENTITY

My research falls in the general area of asset pricing. Within that area I focus primarily on understanding the sources and effects of information in financial markets. I have also published two papers on exchange rates. Most of my work belongs to the realm of applied theory, that is, it employs modelling tools to explain real-world phenomena, but I also conduct empirical research. Half of my published papers are theoretical (papers #1, 4, 5, 8, 9), and half empirical (#2, 3, 6, 7, 10).[1] A summary of my work is provided in Table 1.

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[1] The papers, which are listed in Appendix 1, follow the numbering in my curriculum vitae and are available at http://faculty.insead.edu/peress/personal/index.htm.

Table 1. Summary of Research by Stream, Status, and Impact

Research Stream		Publication	Working Paper	Citations (Google)	Awards
The Production, Diffusion and Impact of Information in Financial	Long-run economic growth	#1 (RFS)	#13	5	
	Firm characteristics	#4 (JF) #5 (JET)		152	-2010 Smith Breeden Distinguished Paper Prize -2012 Europlace-Louis Bachelier best paper award
	Investors' wealth	#9 (RFS) #8 (JFQA)		230	-2005 Europlace-Louis Bachelier best paper award
	The media	#7 (JF) #3 (JF) #2 (RFS)	#11 (R&R in RFS)	738	-2009 Smith Breeden Distinguished Paper Prize -2015 Europlace-Louis Bachelier award for the best paper on a current topic -2015 Smith Breeden Prize finalist
	Noise trading		#12 #14	3	
Exchange rates		#6 (RFS) #10 (JPM)		50	
			Total:	1178	

Note: JF: *The Journal of Finance*; RFS: *The Review of Financial Studies*; JET: *The Journal of Economic Theory*; JFQA: *The Journal of Financial and Quantitative Analysis*; JPM: *The Journal of Portfolio Management*. Data Extracted January 26, 2016.

I.A. THE PRODUCTION, DIFFUSION AND IMPACT OF INFORMATION IN FINANCIAL MARKETS

Information is everywhere and is crucial to the decisions we make, yet largely intangible, unobservable. My research focuses primarily on understanding the factors that determine the production and diffusion of information in financial markets, and their implications. Using rational choice models and novel data, I establish links from observable characteristics (e.g., the degree of competition in firms' product markets, coverage in the media, investors' wealth) to observable outcomes (e.g., income growth, trading volume, cost of capital, portfolio allocations). Hitherto such links have been lacking largely because of modelling or data limitations.

In a series of solo-authored theoretical papers, I expand the main paradigm for analysing competitive trading in stock markets developed by Grossman and Stiglitz (1980). While this framework elegantly captures the tension between the acquisition and transmission of information, it also imposes tight modelling constraints that limit the range of questions that can be addressed – preferences display constant absolute risk aversion ("mean-variance") and payoffs are normally distributed. Part of my work consists of extending the Grossman-Stiglitz framework to other preference and payoff structures, notably but not exclusively through the use of approximation techniques, in order to shed light on the forces that shape the information environment. My research addresses the following questions:

1. **What are the implications of information for long-run economic growth**?
In "Learning from Stock Prices and Economic Growth" (Paper #1, *The Review of Financial Studies*) and "Firm Innovation and Financial Analysis: How Do They Interact?" (Working Paper #13), I consider the impact of information production on income growth. The former focuses on the allocational role of the stock market over the long-run and the latter on the process of technological innovation. Both papers contribute to the understanding of the interplay between financial institutions and economic growth.

2. **What firm characteristics shape the information environment?**
In "Product Market Competition, Insider Trading and Stock Market Efficiency" (Paper #4, *The Journal of Finance*) and "The Trade-off between Risk Sharing and Information Production in Financial Markets" (Paper #5, *The Journal of Economic Theory*), I show respectively how competition in firms' product market and the size of their investor base influence the informational properties of their stock, and, as a result, can account for several observed features. Beyond improving our understanding of financial markets, these papers are relevant to the design of policies promoting product market deregulation and equity ownership.

3. **How does wealth influence how much information investors produce and how much equity they hold?**
Though empirically wealth is the strongest determinant of households' portfolios in the data, its effects are ruled out under the usual mean-variance preference. In "Wealth, Information Acquisition and Portfolio Choice" (Paper #9, *The Review of Financial Studies*) and "Information vs. Entry Costs: What Explains U.S. Stock Market Evolution" (Paper #8, *The Journal of Financial and Quantitative Analysis*), I relax this assumption and show how households' demand for information rationalizes the observed patterns of wealth and equity ownership.

4. **What role do the mass media play in financial markets?**
None if markets are frictionless; but if frictions are important they may matter by transmitting information to investors. The challenges of assessing their impact are, first, data availability (a serious limitation when I started working on this stream of research, although it no longer is), and, second, the endogeneity of the media which makes any causal relationship difficult to establish. The paper "Media Coverage and the Cross-Section of Stock Returns" (Paper #7, *The Journal of Finance*), co-authored with Lily Fang, shows how firms with more media coverage have a lower cost of capital. In "Media Coverage and Investors' Attention to Earnings Announcements" (Working Paper #11, "revise and resubmit" in *The Review of Financial Studies*), I show that the market underreacts less to earnings announcements covered in the media than to those out of the media spotlight. These findings support the notion that coverage by the media is associated with faster dissemination of information. In "The Media and the Diffusion of Information in Financial Markets: Evidence from Newspaper Strikes" (Paper #3, *The Journal of Finance*), I exploit labor strikes in the newspaper industry which are exogenous to the stock market to establish a causal effect for the media. In "Stock Media Coverage, Mutual Fund Trading and Performance" (Paper #2, *The Review of Financial Studies*), co-authored with Lily Fang and Lu Zheng, we consider the influence of media coverage on the trades of professional investors. We find that they display

a strong propensity to buy stocks covered by the media, and that such behavior hurts their investment performance.

5. **What are the empirical properties of noise trading and how does it impact asset prices?**
Information production in financial markets is only possible because noise trading prevents its full revelation through stock prices (the Grossman-Stiglitz paradox), but little is known about the empirical properties of a realistic noise process, or its impact on markets. In "Noise Traders Incarnate: Describing a Realistic Noise Trading Process" (Working Paper #14), Daniel Schmidt and I document the properties of a realistic noise trading process. In "Glued to the TV: The Trading Activity of Distracted Investors" (Working Paper #12) we identify exogenous shocks to noise trading, which are then used to assess its impact on the market.

What lies ahead?
I believe that this research theme – relating the information environment to observable predictors and testable outcomes – will continue to expand and permeate other fields such as macroeconomics or behavioural economics. Applications to business cycles, institutions and the media seem very promising. I am currently working on projects in these areas and plan to explore them further in the future.

I.B. EXCHANGE RATES

My secondary line of research is in the area of exchange rates. In **"**Do Demand Curves for Currencies Slope Down? Evidence from the MSCI Global Index Change" (Paper #6, *The Review of Financial Studies*), co-authored with Harald Hau and Massimo Massa, we use as a natural experiment, the redefinition of a global equity index to show that exogenous uninformative equity flows affect exchange rates. In other words, the well-documented finding that the demand for stocks slopes down carries over to currencies, probably the most liquid asset class. In "Optimal Portfolios of Foreign Currencies" (Paper #10, *The Journal of Portfolio Management*), with Jamil Baz, Francis Breedon and Vasant Naik, we show how to form portfolios of currencies that benefit from the forward bias and trade off risk and return optimally. I currently do not have an ongoing research project in the area of exchange rates.

The following sections expand on the above summary. They describe in more detail the contributions and insights of each paper, and suggest directions for my research in the future.

II. Main Research Theme: The Production, Diffusion and Impact of Information in Financial Markets

In my research, I identify determinants of the information environment that hitherto had been overlooked because of modelling or data limitations, and show that they explain various empirical patterns. I describe my contributions to this research area under the five questions/topics listed above.

II.A. Long-run economic growth

I analyse in a pair of papers the long-run real effects of information. That is, I investigate how economic growth, through capital allocation and technological innovation, is affected by investors' information production. Indeed there is extensive empirical evidence to suggest that these variables are related.

In **"Learning from Stock Prices and Economic Growth"** (Paper #3, *The Review of Financial Studies*) I study the information-processing role of the stock market, highlighting its real effects on the allocation of capital. For this purpose I present a fully integrated model of information acquisition and dissemination through stock prices, capital allocation and economic growth. I do so by combining, under a small risk approximation, two standard frameworks: the neoclassical overlapping generations growth model, and the stock market model of Grossman and Stiglitz (1980).[2] I focus on situations in which sharing information is highly beneficial; for example because listed firms operate complex new technologies, which are costly to evaluate and about which opinions diverge widely.

At the heart of the model lies a tension between the benefit from sharing information and the incentive to collect it in the first place. On the one hand, the partial revelation of private information through stock prices enables investors to share their information truthfully. On the other, the very existence of informative prices undermines the incentive to collect costly information (the Grossman-Stiglitz paradox). Noise trading (some trades are motivated by random shocks unrelated to fundamentals) resolves this tension by ensuring that acquiring private information remains profitable in spite of being partially revealed through prices

The model makes several contributions. First, it shows that the information sharing benefit outweighs the disincentive cost. That is, the allocation of capital improves when the intensity of

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[2] The difficulty with neoclassical growth models is that capital, output and therefore stock prices are nonlinear functions of productivity shocks. Indeed, the Grossman-Stiglitz model is solved by guessing that equilibrium stock prices are linear in random variables. Assuming that utility is mean-variance generates a demand for stocks linear in expected payoffs and prices, while assuming that random variables are normally distributed leads to expected payoffs linear in signals, including prices, thus validating the initial guess. For the same reason, I resort to an approximation when I study the influence of market power on stock price informativeness, and the impact of wealth on investors' portfolios.

noise trading decreases, and, moreover, converges to the first best as it approaches zero. Second, I show that the learning process improves the long-run level of income and its transitory growth rate. But it has no bearing on long-run growth in the absence of technological progress; that is, it does not counter the neoclassical diminishing returns to capital. Moreover, a calibration exercise indicates that, whereas informational efficiency improves Total Factor Productivity (TFP) considerably, income per capita is only moderately increased, a consequence of the strongly decreasing returns to capital.

Third, the model delivers predictions on the evolution of real and financial variables, including capital efficiency, TFP, industrial specialization, wealth inequality, stock trading intensity, liquidity and return volatility. Many such predictions are consistent with broad features of the data. Finally, the paper analyzes the growth impact of two common forms of investor irrationality, overconfidence and inattention, and finds, somewhat surprisingly, that they yield opposite implications. Inattention, on the one hand, hurts capital efficiency because having fewer stocks to choose from implies less value from being able to discriminate between them, and thus less information in equilibrium. Overconfidence, on the other hand, improves capital efficiency: investors who overestimate the precision of their private signals trade more aggressively, leading to more informative prices. Interestingly, the calibrated model suggests that the growth impact of these forms of irrationality is modest.

The previous paper focused on the allocation of capital to exogenous technologies. In **"Firm Innovation and Financial Analysis: How Do They Interact?"** (Working Paper #13), Jim Goldman, an INSEAD PhD student, and I endogenize the process of technological innovation – modelled as the outcome of entrepreneurs' research effort – to investigate how it is influenced by the quality of investors' information. We also study the reverse link, i.e., how technological innovation drives investors' learning effort. In contrast to the previous paper, information is incomplete rather than asymmetric, i.e. agents' information is imprecise but identical across agents.

The main implication of the model is that investors' learning about firms' technologies and firms' innovation are mutually reinforcing. That is, entrepreneurs innovate more when investors are better informed about the profitability of their projects because they expect to receive more funding should their projects be successful. Conversely, investors collect more information about projects when entrepreneurs innovate more because the opportunity cost of misinvesting, i.e. of allocating capital to unsuccessful projects, is higher. As an illustration of the positive feedback between learning and innovation, we show that the growth rate of income in an economy with both learning and innovation is larger than the sum of the growth rates that obtain in a no-learning economy and in a no-innovation economy. This implies, for example, that an economy that would converge to a steady-state when learning and innovation do not interact can experience unbounded growth once they do.[3]

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[3] Unlike other papers in the literature, this positive feedback is not a consequence of risk sharing since risk is fully diversified away, nor moral hazard since efforts are contractible. Instead, it follows from the complementarity between productivity and capital. Expressing output as $Y=AK$ where A and K denote respectively a project's uncertain return and the amount of capital it attracts, shows that the return on financiers' funds increases with A (every unit

We then bring the model to the data, test whether such an interaction is at work in reality and measure its economic magnitude. To address the endogeneity bias that this two-way relationship between learning and innovating generates, we exploit two quasi-natural experiments that create exogenous variations in firms' innovation and in investors' information collection.

The first experiment exploits the staggered implementation of R&D tax credits by US states. After confirming the beneficial effect of these tax incentives on innovation, we show that, following their passage, equity analysts significantly increase their coverage of firms subject to the tax credits compared to other firms in the country. Our second experiment uses the identification strategy pioneered by Hong and Kacperczyk (2010), who consider closures and mergers of brokerage houses which lead to the dismissal of analysts largely exogenous to firms' policies. We document that firms that lose analysts as a result of broker events significantly reduce their R&D expenditure relative to unaffected firms. We also test auxiliary predictions of the model based on the cross-sectional distribution of capital and returns, and find that they are confirmed in the data.

We find the feedback effect between learning and innovating to be economically important. Specifically, the indirect effect of an R&D tax credit, operating through analysts' response, is about the third of the size of its total effect. For example, for a policy that triggers a 1% increase in R&D expenditure (as a total effect), up to 36% of the increase indirectly comes from the stimulating effect of financial analysis. They illustrate the importance of maintaining learning incentives in order to enjoy the full benefits of R&D tax credits. They also show how policies aimed at improving the functioning of financial markets can act as catalysts for other policies aimed at boosting firm investment.

II.B. Firm characteristics

In two theoretical papers, I consider the influence of two characteristics of firms on their information environment, namely the degree of competition in their product market and the size of their investor base.

In **"Product Market Competition, Insider Trading and Stock Market Efficiency"** (Paper #2, *The Journal of Finance*), I link industrial organization to the informational properties of stocks. I analyse how competition in a firm's product market influences its behavior in the equity market. In particular, I examine whether product market imperfections create inefficiencies in the equity market. These questions are all the more relevant given that product markets have become increasingly competitive around the world as impediments to trade and barriers to entry are removed.

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of capital yields a larger payoff) while the reward for innovation rises with K (an invention can be applied on a larger scale). The complementarity between A and K leads to a complementarity between innovation and learning.

To answer them, I embed into the Grossman-Stiglitz framework a real sector in which firms operate under monopolistic competition – their equity in contrast trades in perfectly competitive markets, and solve the model thanks to an approximation. The driving force behind my results is that firms use their monopoly power to pass on shocks to customers and insulate their profits. This encourages investors to trade on their private information, expedites its capitalization into stock prices and improves the allocation of capital. Hence product market imperfections, rather than spreading to equity markets, tend to mitigate stock market inefficiencies. A similar argument applies to firms with lower operational or financial leverage since they too offer payoffs that are less sensitive to shocks.

The model yields predictions consistent with existing evidence (for example on the dispersion of analyst forecasts) and implications that I test directly. In particular, I document that trading volume, including trades initiated by insiders, and the information content of stock price are higher for firms with more market power, in line with the model.

In **"The Trade-off between Risk Sharing and Information Production in Financial Markets"** (Paper #4, *The Journal of Economic Theory*), I ask whether stocks held by more investors are more closely followed. This question is important both for companies and for policy makers who often take actions to promote broad equity ownership. The answer is clearly yes if each investor produces a fixed amount of information, independent of the number of investors in the company. But, as I argue in this paper, it is no longer clear-cut if this amount declines with the number of stockholders. I show that a trade-off exists between the number of informed shareholders and their research effort: the wider the shareholder base, the smaller the risk borne by each shareholder in equilibrium and the less valuable information. So a more widely-held stock can actually be *less* closely followed. This idea echoes the familiar concept from the corporate governance literature that a firm's ownership structure affects corporate control. However, the information I consider is not used for management monitoring but for portfolio selection. Therefore, it is acquired *ex ante*, i.e. before cash flows are observed, and is revealed through prices.

To establish this result, I extend the Grossman-Stiglitz framework to non-expected utility maximizers. Specifically, I assume that traders have mean-variance preferences of the Kreps-Porteus type. Though expected and non-expected mean-variance utilities lead to the same portfolios, the demand for information under mean-variance expected utility is not influenced by the extent of risk sharing – in particular it depends neither on the supply of shares nor on the number of investors. This non-dependence turns out to be an exception rather than the rule. For example, estimating numerically the demand for information under constant relative risk-aversion expected utility, I find that it is indeed a function of risk sharing. This effect is consistent with several puzzling phenomena reported in the empirical literature, such as the increase in stock return volatility following stock splits or cross-listings.

II.C. INVESTORS' WEALTH

The following two theoretical papers focus on the role of wealth for investors' portfolio decisions – by far the strongest determinant of households' portfolios in the data. I link agents' wealth to their portfolio decisions through their demand for information.

A pattern observed around the world is that the fraction of wealth households invest in stocks increases with their wealth. A common explanation is that relative risk aversion decreases with wealth. However, abstracting from portfolio data, there is not much evidence in favour of decreasing relative risk aversion. On the contrary, several studies reject this hypothesis using data on attitudes toward risk such as farm, survey or experimental data. In **"Wealth, Information Acquisition and Portfolio Choice"** (Paper #6, *The Review of Financial Studies*) I suggest an alternative explanation that relies on investors' demand for information and only requires *absolute* risk aversion to decrease with wealth, an assumption that is supported by all empirical studies.

I solve (with an approximation) a Grossman-Stiglitz economy under general expected utility, thus allowing for wealth effects that the traditional constant absolute risk aversion (mean-variance) utility rules out. Because the value of information increases with the amount to be invested, whereas its cost does not, wealthier agents acquire more information, perceive stocks as being safer and consequently invest a larger fraction of their wealth in stocks, even though they do not have lower relative risk aversion. I show further how to distinguish empirically the risk aversion story from the information acquisition explanation using data on investors' portfolio returns.

In **"Information vs. Entry Costs: What Explains U.S. Stock Market Evolution"** (Paper #5, *The Journal of Financial and Quantitative Analysis*), I move from the intensive margin to the extensive margin, i.e., I focus on households' decision to participate (or not) in the equity market. The stock market participation rate has increased remarkably over the second half of the century in many countries. In the U.S. for example, it was as low of 6% in 1952 and accelerated throughout the 80's and 90's to reach about half of households today. These observations raise two questions. First, why is stock market participation so low? Second, why does it increase over time? These questions are important not only for our understanding of financial markets, but also for the design of fiscal policies and social security systems.

In this paper, I investigate whether changes in the costs of participating in the stock market can explain the increasing trend in the number of U.S. stockholders. I separate these costs into two components: an information cost (the cost of collecting information about the market) and an entry cost (all other costs, including commissions and fees). Building on my previous work (Paper #4), I disentangle their general equilibrium implications in a Grossman-Stiglitz economy with Kreps-Porteus mean-variance preferences. While both components seem to have fallen in the last decades, I find that the equilibrium implications of their decline are radically different. In particular, a falling information cost cannot explain the observed increase in stock market participation, unlike a falling entry cost. In addition, a falling entry cost accounts for several other

features of the U.S. economy, (i) the falling equity premium, (ii) rising return variances and (iii) the boom in passive investing relative to active investing.

II.D. THE MEDIA

In a series of empirical papers, I study the role of the mass media in transmitting information to investors. In an efficient market, the media are a mere sideshow: information is incorporated into stock prices as soon as it is made public. Even if almost no investors pay attention to this information, the few who do will ensure, by trading on it, that it finds its way immediately into stock prices. On the other hand, if trading frictions are severe–and there is now considerable evidence that they are (in particular during times of market stress and for specific stocks, such as small stocks), the media may help propagate information across the investing public and contribute to the efficiency of markets. While anecdotes and cases in point have been suggestive of such a role, direct systematic evidence had been lacking.

To fill this gap, I constructed a database that systematically records the newspaper coverage of a large sample of U.S. stocks.[4] Data availability, was a serious limitation a decade ago when I first engaged in this stream of research. Nowadays, comprehensive datasets (tagging articles with standard company identifiers) are available at low cost; for more specific needs, algorithms are commonly written to crawl the web for data.

In **"Media Coverage and the Cross-Section of Stock Returns"** (Paper #3, *The Journal of Finance*), Lily Fang and I study the cross-sectional relation between media coverage–measured as the number of articles in four national U.S. daily newspapers–and expected stock returns. We find that stocks with no media coverage earn higher returns than stocks with high media coverage, even after controlling for well-known risk factors. This effect is robust, not subsumed by a host of well-documented return anomalies, and remarkably stable over time. We also report that it is most pronounced among the stocks that face the most severe information problems such as small stocks and stocks with high individual ownership, low analyst following and high idiosyncratic volatility.

Given publication delays, it is unlikely that the information contained in mass print media is genuine news. Our finding therefore suggests that the dissemination of information matters to stock returns, and that the media play a role in that process. Our work implies further that firms can reduce their cost of capital through media-relations activities. In recent years, regulation changes in the securities industry and cuts in Wall Street research departments have left many firms without analyst coverage. Our results suggest that the media may offer a substitute or a supplement to traditional channels of corporate information.

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[4] The dataset covers all companies listed on the NYSE (and 500 randomly selected companies listed on the NASDAQ) and four daily national newspapers (*The New York Times, USA Today*, *The Wall Street Journal*, and *The Washington Post*) over the 1993-2002 period.

One explanation for the media's impact on stock returns is that they are correlated with the attention that investors pay to events and news. Indeed, a growing body of theoretical and empirical work argues that investors' lack of attention explains why the market appears to underreact recurrently to corporate news. Firms' earnings announcements offer a good testing ground for such a story because analysts' earnings forecasts can be used to control how much news they contain, thus isolating an attention effect of the media. In **"Media Coverage and Investors' Attention to Earnings Announcements"** (Working Paper #11), I compare announcements made by the same firm in the same year and generating the same amount of earnings news, when one announcement is covered in *The Wall Street Journal* while others are not. I find that announcements with media coverage generate a stronger price and trading volume reaction at the time of the announcement and less subsequent price drift. This finding supports the notion that investors underreact because they are inattentive.

This paper received a "revise and resubmit" from *The Review of Financial Studies.* The referee and the editor were mainly concerned about the paper's contribution. Two other papers on investor's inattention, Hirshleifer et al. (2009) and DellaVigna and Pollet (2009), were close to being published in the *Journal of Finance*. All three papers use a similar empirical design. They examine how the stock market's response to earnings announcements varies with proxies for investors' inattention. Where they differ is in the proxies they employ. In Hirshleifer et al. (2009), low-attention announcements are those made on days on which many firms announce their earnings. In DellaVigna and Pollet (2009), they are those made on Fridays. In my own analysis, they are those not covered in the media. I carried out additional analysis to differentiate my paper but because I was not satisfied with the outcome, I did not resubmit the paper.

My two aforementioned papers on the media do not claim that the media cause the return documented patterns; they merely report correlations. Establishing a causal link from the media to financial markets is difficult. A simple correlation may reflect an omitted variable (both the media and the market respond to fundamental news without being directly related) or reverse causality (the media may report newsworthy market developments). I take up this challenge in **"The Media and the Diffusion of Information in Financial Markets: Evidence from Newspaper Strikes"** (Paper #3, *The Journal of Finance*), for which I use newspaper strikes to assess the causal impact of the media and shed light on the mechanism underlying this impact. I identify 52 strikes in the print media that prevent readers from receiving news. Specifically, these strikes 1) affect the press on a national scale, 2) involve the media sector only (i.e. I exclude general strikes affecting multiple sectors), and 3) occur on days on which stock markets are open. Crucially, they are exogenous to the stock market. They are called by journalists, print or distribution workers to protest against government policies that affect working conditions or the freedom of the press.

I find that on strike days, share turnover on the country's stock market drops by 12%, while remaining unchanged on the days before and after, demonstrating that newspaper blackouts deter some investors from trading. I also find that the level and absolute value of market returns, i.e. the return on the market from the close on the strike eve to the close on the strike day, are no different on newspaper strike days from other days. In contrast, intra-day volatility and the

dispersion of returns decline by 7%. Together these findings demonstrate that the media have a *causal* impact in financial markets: they stimulate stock trading, most likely by retail investors, and enhance the variability of stock prices within the day and cross-sectionally.

The reported decline in the return dispersion is consistent with a slowdown in the capitalization of firm-specific shocks into stock prices on newspaper strike days. To understand whether these shocks reflect fundamental news or just noise, I examine return autocorrelations. Suppose that newspapers help diffuse fundamental information rather than stimulate trading on noise. Then, bearing in mind that newspapers cover events from the preceding day (most are distributed in the morning), which are partially reflected in lagged returns, newspaper blackouts should reduce the return correlation between the strike eve and the strike day, and increase it between the strike eve and the day after the strike, as the market "misses a beat" and then catches up. This is precisely the pattern I find for small for stocks.

In "**Stock Media Coverage, Mutual Fund Trading and Performance**" (Paper #2, *The Review of Financial Studies*), Lily Fang, Lu Zheng and I take a close look at the impact of media coverage on the trades of professional investors. Indeed, recent evidence suggests that the media influence retail investors' trading behaviour. But it is not clear whether this influence extends to institutional investors, given that they have far more resources to process information.

Using detailed records of mutual funds' holdings and trades, we construct a measure that captures fund managers' propensity to trade media-covered stocks, and relate these propensities to future fund performance. We find a negative relation between funds' propensity to buy stocks covered by the media and their performance in the cross-section. Funds in the strongest propensity decile underperform funds in the weakest decile by 1.1% to 2.8% per year, depending on the performance metric used.

One explanation for our results is that managers cater to fund flows: if investors are attracted to funds that buy stocks heavily covered by the media, then fund managers may (rationally) buy these stocks because they want to generate inflows, rather than because of their own limited attention. However, our analysis reveals that fund flows are not related to the media coverage of purchased stocks in general. Thus, our documented media effect is unlikely to be explained by "flow catering." We conclude that our findings are consistent with the notion that attention is limited even for professional investors: specifically, they show a propensity to buy stocks covered by the media, and such behaviour hurts their investment performance

Beyond establishing that professional investors are subject to limited attention, our paper contributes to the literature on mutual fund performance, by identifying a new manager/fund characteristic that predicts fund performance.

II.E. NOISE TRADING

Incentives to collect information in financial markets are driven by noise trading. Without it, no information is ever produced (the Grossman-Stiglitz paradox). Understanding the behavior of noise trading is therefore important for building realistic models of information production and understanding the information environment. Yet, little is known about the empirical properties of a realistic noise process, and about its actual impact on markets.

In **"Noise Traders Incarnate: Describing a Realistic Noise Trading Process"** (Working Paper #14)**,** Daniel Schmidt (a former INSEAD PhD student, now at HEC-Paris) and I document empirical properties of noise trading. Noise trades are not straightforward to detect. According to theory, noise trades are trades that are weakly correlated with stocks' future fundamentals, and therefore, not profitable. We show, thanks to two complementary data sources (retail trading data from a large discount broker; and small trades from the New York Stock Exchange's Trade and Quote (TAQ) database, which until decimalization in 2001 were likely to have been initiated by retail investors), that retail trades satisfy both properties. Of course, not all retail trades are noise trades–some are actually informed; conversely, not all noise trades are retail trades, as some institutions trade on noise too. What our approach assumes is that retail trades are correlated with noise trades.[5] Ultimately, the validity of this identifying assumption cannot be directly assessed. In the absence of a better alternative, we believe that our study offers valuable guidance to theorists about an essential, yet little-known ingredient of models of trading under asymmetric information.

Our analyses documents three important aspects of noise trading: 1) its persistence–which determines the degree to which arbitrageurs are willing to correct any mispricing and, in turn, the informativeness of asset prices, liquidity, and the serial correlations of stock returns and trading volume; 2) its parametric shape–it is central in ruling out strategic complementarities in information acquisition and hence the possibility for multiple equilibria; and 3) its intensity.

We report remarkably consistent findings in spite of the dissimilarity of our data sources. Noise trading can be treated as i.i.d. normal at the monthly frequency, consistent with standard modeling assumptions. Weekly trades follow an AR(1) process, as is also commonly assumed, but their residuals are not normal. Daily trades require multiple lags and are not normal. Regarding the intensity of noise trading, we estimate that the standard deviation of noise trading represents from a fifth to a third of the standard deviation of total trading volume in the market, where the exact proportion depends on the trading measure and data frequency. We also quantify the noise trading intensity over groups of stocks in order to validate our estimation strategy and to help calibrate multi-stock trading models. We find that our estimates vary across stocks in ways that are largely consistent with the predictions of these models. In particular, our results confirm that noise trader risk is higher for stocks that are more liquid and/or exhibit greater return volatility.

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[5]For example, Stambaugh (2014), in his Presidential address, analyses the influence of noise trading on investment management using as a proxy for noise trading the fraction of US equity owned directly by individuals.

In **"Glued to the TV: The Trading Activity of Distracted Investors"** (Working Paper #12)**,** Daniel Schmidt and I exploit exogenous variations in noise trading to assess its impact on the stock market, and in particular on its liquidity. This exercise allows us to tell apart two distinct theories of liquidity. On the one hand, models of adverse selection (e.g., Kyle (1985), Glosten and Milgrom (1985)) suggest that insiders use noise trades to conceal their own informed trades. When noise trading drops suddenly, market makers who now face a better informed order flow, protect themselves by reducing liquidity (i.e., by increasing price impact and bid-ask spreads). On the other hand, models of "noise trader risk" or "inventory risk" (e.g., DeLong et al. (1990), Grossman and Miller (1988)) argue that, because arbitrage is limited, noise trading creates risk to market makers' inventory, who therefore require compensation. Accordingly, liquidity improves (i.e., price impact and spreads decline) when noise trading weakens.

The noise trading shocks we exploit are generated by sensational news exogenous to the stock market. Examples include the O. J. Simpson trial, the Cessna plane crash on the White House lawn, and the Summer Olympics in Atlanta. Such news draws investors' attention and distracts them from trading. We identify these news episodes thanks to a variable constructed by Eisensee and Strömberg (2007) for a different purpose, labelled "news pressure". Specifically, it measures the median number of minutes that U.S. news broadcasts devote to the first three news segments.

We check first that variations in news pressure trigger variations in noise trading. We find that, on high news pressure days, the share turnover on the stock market decreases by 1% to 3%, a modest but highly statistically significant decrease that we attribute to retail investors. Indeed, detailed trading records from a large broker reveal that about 6% retail investors stop trading when they are distracted. Transaction data from the TAQ database also displays a reduction in the volume of small trades (which are likely to come from retail traders), but not of large trades (which are likely to be institutional). Furthermore, this distraction effect is more pronounced for more overconfident – i.e., male, more active and money-losing – investors. These findings lead us to conclude that we have identified events which primarily distract biased retail traders– investors that the literature regards as the archetypical noise traders.

Moving to liquidity, we find that the reduction in trading activity goes hand in hand with an increase in price impact and bid-ask spreads, consistent with adverse selection models, but not with inventory risk models. Thus, our results suggest that market makers are more concerned with trading against insiders than they are with trading against noise traders

III. SECONDARY RESEARCH THEME: EXCHANGE RATES

My second research theme is in the area of international finance and focuses specifically on exchange rates. In **"Do Demand Curves for Currencies Slope Down? Evidence from the MSCI**

Global Index Change" (Paper #6, *The Review of Financial Studies*), Harald Hau, Massimo Massa and I use a natural experiment to provide direct empirical support for the traditional portfolio balance theory. The theory derives a downward sloping currency demand function from limited international asset substitutability but has enjoyed little empirical support because causal inference is hampered by a lack of clear identification. Indeed, while flows may trigger exchange rate movements, flows may themselves be induced by investors' trend-chasing behaviour.

We examine the exchange rate effect of a major redefinition of the MSCI global equity index in 2001 and 2002. The index redefinition implied large changes in the representation of different countries in the MSCI world index and therefore produced strong exogenous equity flows by index funds. Our event study reveals that countries with a relatively increasing equity representation experienced a relative currency appreciation upon announcement of the index change. Moreover, changes to country weights also modify the permanent correlation structure of exchange rates. Individual stocks have been shown to commove more with an index upon their addition to the index. We find that the same is true of currencies. We show that upweighted (downweighted) currencies tend to commove more (less) with the other currencies in the MSCI index.

In **"Optimal Portfolios of Foreign Currencies"** (Paper #10, *The Journal of Portfolio Management*), I demonstrate with Jamil Baz, Francis Breedon and Vasant Naik, how to form portfolios of currencies that benefit from the forward bias and trade off risk and return optimally. We show that a mean-variance analysis applied under the assumption that exchange rates behave as random walks leads to portfolio weights that are stable over time without resorting to exogenous constraints on weights. Optimal currency portfolios invested in the German deutschemark, the Japanese yen, the British pound and the Swiss franc, with the U.S. dollar as the risk-free asset, generate an average excess return of 2.79% per year over the period 1989 through 1999. Portfolios returns have a better Sharpe ratio than Treasury indices and are uncorrelated with major fixed-income and equity indexes. Thus, this methodology provides a useful benchmark for fund managers interested in optimal currency overlays.

IV. LOOKING AHEAD

These are exciting times for finance scholars, in particular those interested in the role of information. Advances in information and communications technology (e.g., the internet, electronic filings, social media, Big Data, cloud computing, etc.) are allowing information to diffuse much faster than ever before. Investors, both institutional and individual, as well as central bankers and regulators, now have access to vast amounts of data, available in real time and at low cost. News and "noise" are propagating through the economy much faster than ever before. These evolutions raise many important questions, such as:
- What is the impact of this deluge of information on financial markets?
- Does it improve financial decision-making or does it create more risks?

- How is real economic activity affected?

The recent financial crisis has shown how lack of information about financial intermediaries' exposures generates risks, above and beyond those originating in fundamentals, many of which are systemic because of the size of these intermediaries and their interconnections. This raises important questions about the organization and transparency of the financial sector, such as how much and what type of information about financial intermediaries should be made public? I plan to work on such questions in the future.

Research on the diffusion of information in financial markets has focused in recent years on understanding what role, if any, the media play. Figure 1, drawn from a review of this literature (Tetlock (2014)) illustrates the rapid growth in articles about the media. Likewise, the past three annual meetings of the American Finance Association featured special sessions on the media. I believe that this line of research will continue to thrive. What are needed are both new theories–models of the media are few and rudimentary, and novel data–detailed enough to shed light on the channels in which the media matter. I plan to continue contributing to this strand of research.
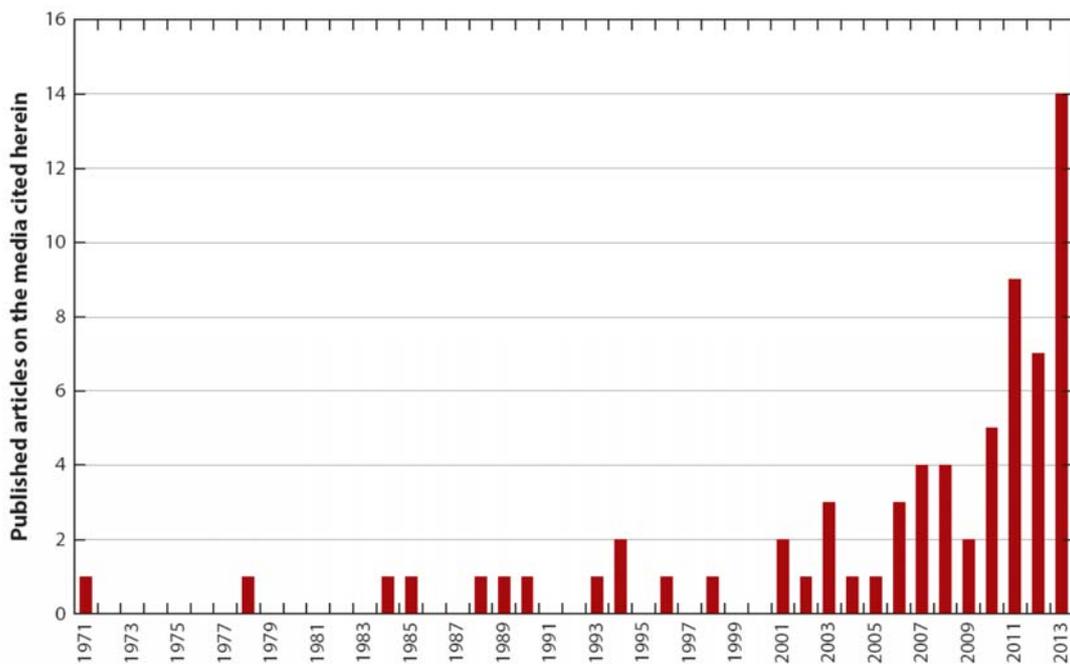

Figure 1: Growth in Research on the Media in Finance

This chart shows the number of published articles on the media cited in Tetlock (2014)'s review of the literature on diffusion of information in financial markets. Articles are displayed by year of publication (Source: Tetlock (2014)).

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APPENDIX 1 - PAPERS

PEER REFEREED PUBLICATIONS

1. "Learning from Stock Prices and Economic Growth", *The Review of Financial Studies*. 27(10) (2014), 2998-3059.

2. "Stock Media Coverage, Mutual Fund Trading and Performance" (with Lily Fang and Lu Zheng), *The Review of Financial Studies* 27(12) (2014), 3441-3466.

3. "The Media and the Diffusion of Information in Financial Markets: Evidence from Newspaper Strikes", *The Journal of Finance* 69(5) (2014), 2007–2043.
   Winner of Europlace-Louis Bachelier award for the best paper on a current topic.
   Finalist for Smith Breeden Distinguished Paper Prize.

4. "Product Market Competition, Insider Trading and Stock Market Efficiency", *The Journal of Finance 65(1) (2010)* (lead article).
   Winner of Smith Breeden Distinguished Paper Prize.
   Winner of Europlace-Louis Bachelier best paper award.

5. "The Tradeoff between Risk Sharing and Information Production in Financial Markets", *The Journal of Economic Theory, 145(1)* (2010), 124-155.

6. "Do Demand Curves for Currencies Slope Down? Evidence from the MSCI Global Index Change" (with Harald Hau and Massimo Massa), *The Review of Financial Studies 23(4)* (2010), 1681-1717.

7. "Media Coverage and the Cross-Section of Stock Returns" (with Lily Fang), *The Journal of Finance 64(5) (2009),* 2023-2052.
   Winner of Smith Breeden Distinguished Paper Prize.

8. "Information vs. Entry Costs: What Explains U.S. Stock Market Evolution?", *The Journal of Financial and Quantitative Analysis 40(3)* (2005), 563-594.

9. "Wealth, Information Acquisition and Portfolio Choice", *The Review of Financial Studies 17(3)* (2004), 879-914.
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10. "Optimal Portfolios of Foreign Currencies" (with Jamil Baz, Francis Breedon and Vasant Naik), *The Journal of Portfolio Management*, Fall 2001 Vol. 28(1).

COMPLETED WORKING PAPERS

11. "Media Coverage and Investors' Attention to Earnings Announcements" (2008), revise and resubmit to *The Review of Financial Studies*. Inactive working paper.

12. "Glued to the TV: The Trading Activity of Distracted Investors" with D. Schmidt.

13. "Firm Innovation and Financial Analysis: how do they interact?" with J. Goldman

14. "Noise Traders Incarnate: Describing a Realistic Noise Trading Process" with D. Schmidt.

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15. "Media Coverage and Corporate Bond" with X. Dong, D. Schmidt and J. Wang

16. "Mass Media and the Sale of Financial Information" with D. Schmidt.

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17. "Dynamics of Swaps Spreads: A Cross-Country Study" (with J. Baz, D. Mendez-Vives, D. Munves and V. Naik), *Lehman Brothers Analytical Research Series*, 1999.
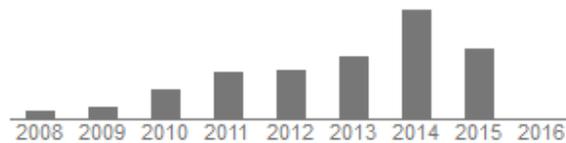
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