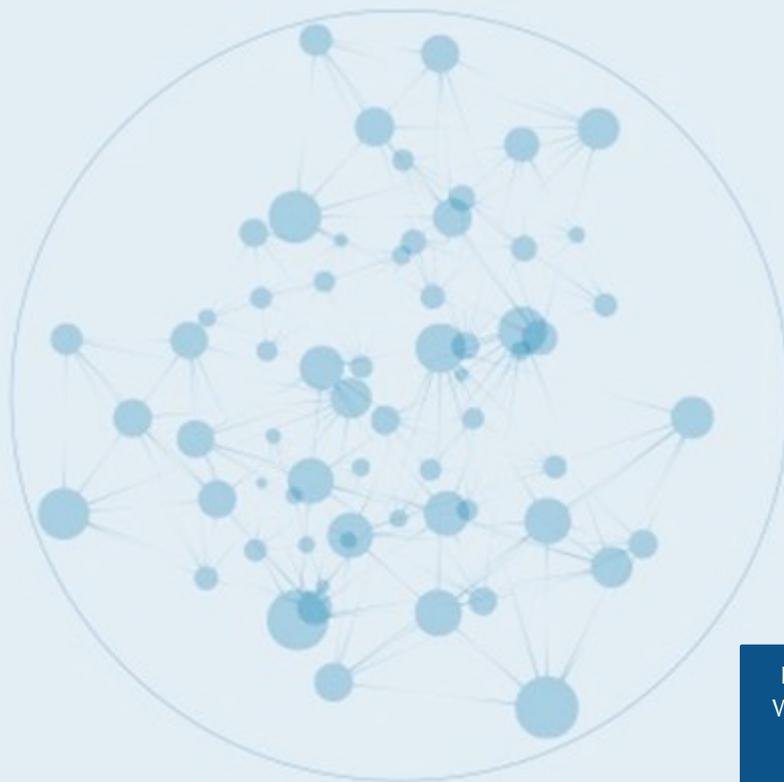




PERSPECTIVES ON REFORMING ELECTRONIC MARKETS AND TRADING

Report of the Ethical Markets
expert seminar



INQUIRY
WORKING
PAPER

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The UNEP Inquiry

The Inquiry into the Design of a Sustainable Financial System has been initiated by the United Nations Environment Programme to advance policy options to improve the financial system's effectiveness in mobilizing capital towards a green and inclusive economy—in other words, sustainable development. Established in January 2014, it published its final report, *The Financial System We Need*, in October 2015.

More information on the Inquiry is at: www.unep.org/inquiry and www.unepinquiry.org or from: Ms. Mahenau Agha, Director of Outreach mahenau.gha@unep.org.

Ethical Markets Media

Ethical Markets Media is a Certified B Corporation promoting the emergence of a sustainable, green, more ethical and just economy worldwide. It promulgates new standards, including the Principles of Ethical Biomimicry Finance®, the Green Transition Scoreboard® and carries out research, assists and reports on new organizations: civic, non-profit and for-profit, as well as individuals working for the transition to the new economies of the dawning information-rich solar age. Ethical Markets Media is a signatory member of the Principles for Responsible Investment. Its 'Ethical Markets' and 'Transforming Finance' TV series are distributed globally to colleges and libraries at www.films.com.

More information from www.ethicalmarkets.com/

Hazel Henderson is President and Founder of Ethical Markets Media (USA and Brazil) and is a Fellow of Britain's Royal Society of Arts; Honorary Member of the Club of Rome and Fellow of the World Business Academy. She served as a science policy advisor in Washington, D.C. on the US Office of Technology Assessment Advisory Council; the National Science Foundation and the National Academy of Engineering Committee on Public Engineering Policy from 1974 until 1980. She also writes for the investment research platform Seeking Alpha (<http://seekingalpha.com/author/hazel-henderson/articles>).

hazel.henderson@ethicalmarkets.com

About this report

On 3 November 2014 Ethical Markets Media and the UNEP Inquiry convened an expert seminar in New York, bringing together securities market experts and traders to examine how the issues of electronic markets and high-frequency trading relate to the broader efficiency, effectiveness and resilience of financial markets in the face of environmental and social challenges, and to consider the potential of several market-based reforms. This paper documents the proceedings of this expert seminar, chaired by Ethical Market's Media founder, president and editor-in-chief, futurist and author Hazel Henderson.

Comments are welcome and should be sent to simon.zadek@unep.org.

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We are grateful to all who attended the seminar and took part in the discussions, and to Cooley LLP law firm for hosting the meeting. Each section of the report represents the presentations given by individual participants, rather than the views of the UNEP Inquiry. We are grateful to John Ramsay, IEX; Dave Lauer, KOR Trading; Robert Zevin, Zevin Asset Management; Joe Saluzzi, Themis Trading; Stuart Valentine, Centerpoint Investment Strategies; Dennis Bushnell, NASA; Katherine Collins, Honeybee Capital; Michaela Walsh, Women's World Banking who are featured in the report as well as Erika Karp and Joel Beck, Cornerstone Capital Group, William Doll, Syneidesis Group, and Brad Katsuyama and Gerald Lam, IEX who also contributed to the event.

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1 INTRODUCTION

Hazel Henderson, Ethical Markets Media



Hazel Henderson is the founder of Ethical Markets Media LLC and the creator and co-executive Producer of its TV series. She is a futurist, evolutionary economist, worldwide syndicated columnist, consultant on sustainable development, and author of nine books including *Ethical Markets: Growing the Green Economy* (2006). She also writes for the investment research platform *Seeking Alpha*.¹ Previously she was on the board of Worldwatch Institute, Calvert Social Investment Fund, the Social Investment Forum and the Social Venture Network. She remains on the International Council of the Instituto Ethos de Empresas e Responsabilidade Social, Sao Paulo, Brazil.

www.ethicalmarkets.com

Computer-driven financial markets on unregulated electronic exchanges programmed by algorithms now dominate Wall Street, along with high-frequency trading (HFT). Electronic markets and high-frequency trading comprise over half of all securities trading on both public “lit” exchanges and “unlit” private exchanges (so called dark pools).² Sal Arnuk and Joe Saluzzi’s *Broken Markets*,³ Scott Patterson’s *Dark Pools*⁴ and Michael Lewis’s *Flash Boys*⁵ have all raised the alarm on the dangers of electronic front-running and other manipulative practices of HFT and the electronic exchanges on which they trade.⁶ We have already seen a number “flash crashes” such as the one in May 2010, where stocks in many pension funds suddenly fall to pennies before recovering in split seconds.⁷

Confidence among retail investors has dropped since the 2010 Flash Crash and 16% of small investors have fled. Hearings in the US Senate, on investor loss of confidence, conflicts of interest, high-frequency trading and maker-taker models saw academic experts and even insiders calling for reforms.^{8,9}

While HFT proponents defend microsecond-based trading as “providing liquidity”, this disappears quickly when markets become volatile. Furthermore, these electronic exchanges use “maker-taker” models (giving a transaction rebate to market makers providing liquidity (the makers); and charging a transaction fee to customers who take liquidity out of the market (the takers)). This has led to a race to the bottom where brokers who engage in these practices can then lower their execution fees – forcing others to follow suit.¹⁰

Today, public trust in markets is battered by news of fraud, insider trading, rigging of interest rates and huge fines on formerly admired banks, but lack of individual indictment of the responsible financiers.

A particular concern in relation to regulation of electronic trading is that since regulators, such as the US Securities and Exchange Commission have limited funds, and have to compete for staff with Wall Street firms, they are being out-gunned by the faster computers and technology of HFT.¹¹ Thus, people are looking to market-based reforms to help fill the gap, and prevent further “flash crashes” and market losses to retail and institutional investors.

“Regulators are being out-gunned by the faster computers and technology of high frequency trading. Thus, people are looking to market-based reforms to help fill the gap, and prevent further “flash crashes” and loss of confidence.”

HFT poses many new issues and risks for the ethical, responsible investor movement, which now accounts for US\$6.57 trillion invested according to SRI strategies in the US.¹² These firms rely, for their ethical investment strategies, on well-policed “lit” public markets for their screened portfolio strategies. Therefore, they must be able to trust that these markets are fair and uncorrupted.

“All the progress by investors in shaping more responsible corporate and financial practices can be undermined if the markets’ underlying plumbing and structure remain unsound. “

Public and NGO pressure on companies and governments have played a key role in enhancing regulation and encouraging and enforcing responsibility: reducing tax evasion, cancelling billions of un-repayable debts of poor countries, improving safety, pollution control, working conditions and minimum wages. Investor movements since the 1970s have sought to divest from companies involved in weapons, tobacco, alcohol, pollution, unfair working conditions and excessive executive

pay. Campaigns for human rights through divestment contributed to the ending of apartheid in South Africa and there have been many recent efforts to shift assets from fossil fuels to cleaner, renewable energy.¹³ All have reformed and continue to *transform finance*, along with all the new metrics forcing formerly “externalized” social costs back on to financial balance sheets.

However all the progress by investors in shaping more responsible corporate and financial practices can be undermined if the markets’ underlying plumbing and structure is unsound. Today’s broken markets are subject to new manipulations and misuse of computers and electronic platforms resting on global communications infrastructure: satellites, the Internet, fibre optics, the electromagnetic spectrum – all public goods funded by taxpayers.

2 Perspectives

John Ramsay, IEX



John Ramsay is Chief Market Policy Officer at the IEX Alternative Trading System. John has 26 years of experience in positions that concern the regulation and oversight of securities markets and intermediaries. While at the SEC since 2010, John led the staff's response to numerous significant market events, its participation in global regulatory initiatives, the development of new analytical tools for equity market oversight, and the proposal for Regulation SCI. He also led SEC efforts to implement significant elements of the Dodd-Frank Wall Street Reform and Consumer Protection Act, including the Volcker Rule and derivatives reform rules. From December 2012 to February 2014, John oversaw the Division of Trading and Markets, the group responsible for regulating broker-dealers and self-regulatory organizations, such as securities exchanges and FINRA.

www.iextrading.com

Publicized structural problems in our stock markets have damaged investor confidence and hindered the ability of our markets to efficiently allocate capital and promote economic growth. At IEX, we are working to improve the current equity market structure so that it better serves the interests of investors and public companies, not just exchanges and professional trading firms. To that end, we have created a trading market that is fully transparent, that combats the ability of certain trading firms to use structural inefficiencies to gain an advantage over investors, that avoids conflicts of interest which prevent brokers from achieving the best result for their customers, and that adopts a simplified structure of prices and order types. Apart from supporting private sector efforts to provide traders and investors with a better choice of trading venues, we think that it is critical that market participants be given much better comparative disclosure so that they can evaluate and make more informed choices among intermediaries and exchanges and other market venues. Exchanges need to be more transparent and accountable in terms of their various business lines and the associated inputs, costs, fees and other revenues, as well as the governance of critical market infrastructure.

The fact that we were able to create IEX without a change in regulations is a testament to the ability of innovative and constructive market-based solutions to arise within the current general regulatory framework.

Our requests of market stakeholders:

- **Standardize data:** When data is requested of participants, ensure that a clear and concise standard is established for how the data should be derived and presented. Require market systems, broker-dealers, market centres, including exchanges and Alternative Trading Systems, and SIPs to time stamp messages sent, received and used internally at a standard granularity of at least microseconds. Improve atomic clock synchronization from a one second tolerance to one millisecond or finer.
- **Disclose participant activity:** Public disclosure of an anonymous breakdown of subscribers by volume on any registered market centre, and an anonymous breakdown of message traffic and

“It is critical that market participants be given much better comparative disclosure so that they can evaluate and make more informed choices among intermediaries and exchanges and other market venues.”

message to trade ratio by subscriber on any registered trading venue (Alternative Trading Systems (ATSS) and Exchanges).

- **Disclose routing activity:** A complete audit trail of how client orders are handled, including both routing and trading information, available to the client upon request.
- **Disclose market operations:** Plain language rules and common use examples for proposed rules describing new products and services offered by exchanges. Require public disclosure of alternative trading systems' Form ATSS and subsequent products, services and pricing. Ensure an adequate amount of reporting between exchanges and brokers, as well as between brokers and clients – whereby execution data and routing data is standardized and available upon request. Define acceptable tolerances for trading, market centre and inter-market communication system performance to ensure there are no meaningful risks to the integrity of the system in the context of structural inefficiencies that could allow unfair advantages to certain market participants, disadvantaging others.

Solution in Focus: Markets designed to serve investors

IEX is an [alternative trading system](#), which opened in 2013. It is owned by a group of mutual funds, hedge funds and venture capitalists.

- **Just and Equitable Principles of Trade:** IEX aims, through the design and operation of its market centre, to exemplify the precept of the SEC Exchange Act of 1934 that exchanges should be operated to “promote just and equitable principles of trade”.
- **Market Stewardship:** Investor confidence depends critically on both the fact and perception that markets are designed and operated to serve investors. Market centres have a responsibility to safeguard the public interest and to seek wherever possible to improve the health of the markets. This includes providing a level playing field for investors and traders, and designing systems to be resilient and reliable.
- **Promote Natural Trading Interest:** Structural inefficiencies can, and do, lead to harmful phenomena, including order detection and anticipation, fading liquidity and price dislocation, which in turn can work against the interests of investors who seek to invest based on fundamentals and market factors.

www.iextrading.com/policy/testimony/

Dave Lauer, KOR Trading



Dave Lauer is President and Managing Partner of KOR Group LLC, specializing in Market Structure and Technology. Dave has extensive experience designing and building the infrastructure that underpins many modern electronic trading systems and several years of experience as a quantitative analyst and trader on high-frequency trading desks. Dave's current work focuses on massively scalable technology, predictive analytics, complex systems design and consultation for organizations working to better understand and navigate modern equity markets. He is Chairman and co-founder of Healthy Markets, a non-profit coalition of asset managers working to promote data-driven reforms to market structure. Healthy Markets has established Conduct Standards and Accreditation Programs.

www.healthymarkets.org/congressional-testimony-1/

Perspective on key factors defining the current state of financial markets and priorities for reform:

Federal Reserve Bank Policy: Questions about the withdrawal of Fed support from markets is leading to tremendous instability in financial markets, and will continue to do so. This factor dwarfs the others in terms of significance, although the resulting volatility is exacerbated by structural issues in markets.

HFT, algorithmic trading, electronic front-running is a key area of extreme concern. I do not demonize HFT, or even firms that engage in so-called electronic front-running (EFR). While EFR creates little to no value, and serves to destabilize markets, the only reason it exists in this form and is able to cause such problems is because of a broken regulatory framework that incentivizes speed over everything else, and leads to unnecessary complexity and intermediation. HFT is far too broad of a term to have much meaning, and is generally a valuable service in the market that is simply being driven along in a latency race by poor regulation and structural inefficiencies/incentives.

Investor loss of trust: While I have my doubts that market structure and structural issues are primary contributors to investor loss of trust and confidence, the complexity of markets, reports of problems, and resulting difficulty for investors to understand what is happening is certainly an additional factor in investor flight from capital markets. This factor is, of course, dwarfed by the extreme volatility in financial markets from the dot-com boom to the housing crisis.

Priority issues for reform and restoring trust include:

- **Encouraging private-market solutions** to structural problems and loss of trust such as IEX (US), Aequitas (Canada) and other efforts to promote better business models and governance structures.
- **'Best execution' accreditation** to ensure independent, third-party analysis and interpretation of execution and routing decisions.
- **Broadly pushing for third-party analysis and verification** of metrics from brokers, venues and asset managers.
- **Pushing for regulatory reform to simplify structure**, increase transparency, encourage more variety in displayed liquidity.

Solution in focus: Healthy markets, better metrics

The Healthy Market is a non-profit coalition of asset managers working to promote data-driven reforms to market structure. Its members have come together behind one basic principle: *Informed investors and policymakers are essential for healthy capital markets.* Key measures it advocates are:

- Better metrics, access to data, advanced analytics and computation
- Elimination of rebates and a trade-at rule.
- Educating public and industry participants on the issues, advocating for change by increasing awareness of problems and possible solutions.
- Accelerating Data-Driven Regulation

www.healthymarkets.org

“HFT is far too broad of a term to have much meaning, and is generally a valuable service in the market that is simply being driven into a race by poor regulation and structural incentives.”

With the increasing complexity of US capital markets receiving attention at every level of government, Healthy Markets and KOR Group believe that the SEC can take three critical steps to better facilitate data-driven regulation and encourage the investing public. These steps are non-controversial, require little effort and are high-impact. The benefits would be substantial for future rule making, disclosure, external analysis and regulatory enforcement.

Modernize market quality metrics (Rule 605) so that practitioners can properly evaluate execution quality and make better order routing decisions. As has been outlined in the Healthy Markets platform, market quality metrics are woefully outdated. As initially envisioned in 2001, these metrics helped to spur competition for order execution quality and drove changes in behaviour. These statistics now cover very few of the multitude of available order types and are easily manipulated because they have not kept up with advances in technology. In order to help the public and brokers make informed decisions about market centre order execution quality, Rule 605 must be updated.

Modernize broker routing metrics (Rule 606) so that the public can better understand how brokers are making order routing decisions and the potential conflicts they face. Also outlined in the Healthy Markets platform, broker routing disclosures have significant shortcomings, including no coverage of large orders, no uniform specification for rebate and payment information, and no requirements to be machine-readable. While the SEC seeks to expand coverage of the current rule to institutions, the public would be well served by expanding Rule 606 to cover all orders and mandating uniform disclosure.

Enhance MIDAS and open up MICAS. Data-driven regulation requires accurate and comprehensive data. The SEC's MIDAS platform was an important first step, but its shortcomings are critical flaws. MIDAS must be expanded to include other asset classes, hidden orders on lit exchanges, resting orders and IOIs on dark pools, un-filled IOCs and exotic orders. Access to MIDAS should also be opened up to qualified practitioners and academics. The benefits of expanding and opening MIDAS are difficult to overstate – doing so would broaden its reach, resources and the scope of research that can be performed. If there are legal impediments, the Commission should strive to overcome them. The impact on market structure and regulation is too important.

Solution in Focus: Best Execution Accreditation

Brokers are legally required by regulators such as the SEC to seek the best execution reasonably available for their customers' orders. To comply with this requirement, brokers evaluate the orders they receive from all customers in the aggregate and periodically assess which competing markets, market makers, or electronic communications networks offer the most favourable terms of execution. Some of the factors a broker must consider when seeking best execution of customers' orders include: the opportunity to get a better price than what is currently quoted, the speed of execution, and the likelihood that the trade will be executed.

SEC rules require broker-dealers to provide quarterly reports on routing of customer orders and require markets to supply monthly reports on execution quality.

KOR Group's Best Execution Accreditation service provides buy-side firms with independent evaluation and accreditation of their firm's adherence to Best Execution as well as identification for improvements.

Robert Zevin, Zevin Asset Management



Robert Zevin is Chairman, Chief Investment Officer, and Senior Portfolio Manager. He has been a leader in socially responsible investing since 1967. At the same time he also pioneered the use of modern portfolio theory seeking to protect his clients against the losses that are so often the result of conventional investment approaches. He started what is now Walden Asset Management in 1975 and was a principal architect of the first Calvert Social Investment Fund in 1982. Robert was a leader in the movement to divest from apartheid South Africa. His activism and commitment to civil disobedience has led to arrests and beatings as well as boardrooms. He has founded, co-founded and led numerous social change organizations such as Resist, United States Servicemen's Fund, Haymarket Foundation, Affirmative Investments and Shared Interest. Robert is also a Harvard PhD in economics, who has taught at Berkeley, Columbia, Harvard, Boston University, UMass Amherst, and Simmons College.

www.zevin.com/

High-Frequency Trading is essentially no different from a highwayman standing in the road with his knife or gun or high-speed computer technology demanding a tributary toll from all who would pass by and go about their business to the better without him. Michael Lewis has succeeded in arousing some moral outrage about this highway robbery among his readers outside of the circle of financial professionals. However, most financial professionals seem to think that the amount it is costing other investors is small enough to fall off their moral radar screens and that the HF traders deserve some reward for their ingenuity and investment. Most of these professionals I find have not actually read *Flash Boys*, and are not aware of the ways in which brokers breached their fiduciary duty by literally selling their clients' trades to HFTs, or how banks and brokers allowed HFTs to shine a bright light into their dark pools, completely betraying their fiduciary duties to their clients. Nor do they see as clearly as Michael Lewis does in his book how the SEC has been a willing collaborator with the HFT industry, obligingly letting it invent absurdly contorted and distorting order types which are of no use to anyone else; or of how the powers of government law enforcement have been used not to punish those who are stealing (however little at each time) from their clients, but those who do not obey the rules of the "Wall Street Mafia".

“High-Frequency Trading is essentially no different from a highwayman standing in the road with his knife or gun or high-speed computer technology demanding a tributary toll from all who would pass by.”

I employ colourful rhetoric to emphasize the point that HFT is just one part of an economic and political system that is increasingly dominated by rent collecting, or rather the collection of the highwayman's or medieval duke's toll, along with many bribes and other forms of protection money. *Flash Boys* makes very clear how much this is the culture and nature of most of the investment management and banking industry. To which we could easily add the similar foundation of extraordinary profits in the legal, health care, defence, and oil and gas industries among others.

If we call it what it is, a system in which politicians are bought and paid for, and various gangs of bandits attempt to appropriate permanent streams of income that should have been someone else's, we have a pretty good explanation of our sclerotic economy and government. We also have a pretty good notion that most of the simple, rational solutions to the problems of HFT have about as much chance of

happening as all of the other regulatory reforms of the financial system that have been proposed, compromised, passed and still stymied since the financial crisis.

Just to be clear, those simple, rational solutions include: defining a market maker as an entity that has knowledge of other entities trades within less than some number of milliseconds; enforcing the deployment of time delay technology like that employed by IEX at all exchanges; disapproving all of the deliberately deceptive order types used by HFTs; and a financial transactions tax (FTT). Even the conservative economists who wrote the Simon Report on the Crash of 1987, under an exceptionally conservative US Secretary of the Treasury serving an exceptionally conservative US President, discovered the obvious fact that over the preceding hundred years of NYSE history, periods of very low transaction costs had also been periods of very high turnover and volatility. The whole point of an FTT is to impose a tax that mimics the social cost of excessive and volatile trading, just as a carbon tax mimics the social cost of greenhouse gas emissions.

Perhaps one more example will clarify my point. Many writers have pointed out that many people in the financial services industry went to jail for their violations of laws designed to protect investors and depositors after the Crash of 1929 and again after the Savings and Loan Crisis of the late 1980s and early 1990s. Since the 2008 financial crisis, only a handful of people in finance have gone to jail, and perhaps without exception their crime has been to disobey their superiors, often as “rogue traders”. Those superiors are quite clearly guilty of massive frauds and deceptions – but none of them have gone to jail. Instead, federal and state prosecutors threaten them with jail sentences and they buy their freedom by agreeing to have their companies pay over US\$100 billion and more of fines, in effect stealing this amount of money from their shareholders in order to buy their own immunity.

Instead of an FTT or a change in SEC rules, perhaps the first thing we should be thinking about to solve the HFT problem and a plethora of similar criminal incursions into our economy is a massive effort to achieve campaign finance reform, probably through an amendment to the US Constitution.

Joe Saluzzi, Themis Trading



Joseph Saluzzi is partner, co-founder and co-head of equity trading of Themis Trading LLC. He is also the co-author of Broken Markets -- How High Frequency Trading and Predatory Practices on Wall Street are Destroying Investor Confidence. He wrote the book after he had tried with his partner Sal Arnuk to alert the SEC to the problems posed by HFT firms, to no avail. Mr. Saluzzi is a frequent speaker at industry conferences on issues involving market access, algorithmic trading and other sell- and buy-side concerns. He has presented on this issue to the [UN Principles for Responsible Investing](#).

<http://www.themistrading.com/>

“We believe that there are a few small, surgical changes that can dramatically change the way stocks are traded and that will lead to improved capital flow and allow for a refocusing of our equity market on investors and issuers.”

Themis Trading believes that markets exist to facilitate the free flow of investment capital that enables companies and the US economy to grow. Regulation should focus on promoting the markets for those purposes.

Dramatic shifts in market structure have created a significant liquidity problem in the US equity market, particularly in small cap stocks, and sizable problems in

transparency and inequitable information flow. There has been some progress in addressing these problems, and discussion of further initiatives that will help. Those include the SEC Tick Size Pilot Program, the SEC Consolidated Audit Trail and overhaul of the Securities Information Processor.

However, major problems persist. A number of industry observers see a need for a holistic, top-down review of market structure. We do not think that is necessary. We believe that there are a few small, surgical changes that can dramatically change the way stocks are traded and that will lead to improved capital flow and allow for a refocusing of our equity market on investors and issuers.

Eliminate payment for order flow: Rebates are polluting the trading ecosystem with unnecessary incentives and need to be done away with. Practices where brokers sell their orders to a trading firm should be eliminated, along with the maker-taker policy, and where exchanges provide rebates to traders for posting liquidity

Complete disclosure of dark pool and smart order router practices: Without knowing how orders are routed and how dark pool policies factor in, it is hard to determine whether they contribute to or detract from the market's well-being and designated objective as a means of allocating capital.

Regulate data feeds: Trading information should not be fair game to be made available by the exchange to the highest bidder. Exchanges should grant investors the right to opt out of having their data sold to trading firms, which can then track and act in advance on information.

Cross-Regulation: Develop inter-agency regulatory task force to share surveillance information across asset classes.

Stuart Valentine, Centerpoint Investment Strategies



Stuart Valentine is a registered Representative of Financial West Group (FWG) and member of The Progressive Asset Management Group, the socially responsible division of FWG. Stuart has played an active role in the Green Private Placement sector of the Socially Responsible Investing (SRI) industry since 2000. As owner of Centerpoint Investment Strategies, he is passionate about building the personal relationships and networks necessary to create meaningful, systemic change in the world of finance today. In September 2010, Stuart served on the Ethical Markets Drafting Committee on Transforming Finance—an initiative to recognize finance as a global commons. He currently serves on the board of Progressive Asset Management, Inc. (PAMI) and the Research Advisory Board for Ethical Markets.

www.centerpointinvesting.com/

“For the average person investing for their pension, the Wall Street culture has long since lost its connection and relevance to their “Main Street” real economy.”

The capital markets exist to serve the developmental needs of society. By extension, financial sector tools also need to be designed and applied to ensure that the environmental conditions, upon which a healthy society depends, are provided for.

My assessment of the evolution of the capital markets, over the 27 years I have been involved in the retail advisory business, is that capital markets are increasingly prioritizing the needs of capital and the regulatory agencies serving that capital. For the average IRA or 401(k) investor, the Wall Street culture has long since lost its connection and relevance to their “Main Street” real economy. The application of machine

intelligence enabled by rapidly advancing computer technology has enabled the HFT community to generate extremely high profit margins relative to the risk taken. Yet there is no apparent net value delivered to society that the average “Main Street” American can understand.

The investing public that I interface with has an overall cynicism towards Wall Street and at least an intuitive sense that their interests are not being represented nor are they being treated fairly. As such they are looking for alternatives outside the box of mainstream electronic markets. While the HFT community is trading electronic bids in milliseconds, the rising Socially Responsible and Impact Investing community has responded to this discontent by increasingly seeking direct “Green Street” investment alternatives that deliver real value to their communities and the environment. Michael Shuman, Co-founder of the Business Alliance for Local Living Economies (BALLE), a key resource developing examples in community investing, predicts that over US\$1 trillion will come out of Wall Street accounts and flow into community investment models in the coming decade.

In my view, the priority for reform in the electronic markets to better serve the Main Street real economy first requires a re-commitment to a service-based philosophy that guides individual actors to work not only for their well-being but for the good of society. In my career I have encountered the ethic “Get Mine and Get Out” within the financial services community more times than I can count. Is it any wonder that the average American lacks trust in the financial markets? Addressing mechanical and regulatory issues, while vital to ensuring fair dealing, is still but a symptom of a deeper philosophical and moral crisis. In short, we need a long-term plan to restore the “Golden Rule” to our Wall Street business culture and redirect capital, with triple bottom line design objectives, back into the communities capital was designed to serve.

Katherine Collins, Honeybee Capital



Katherine Collins is Founder and CEO of Honeybee Capital which provides long-term, thematic research, centred around topics that lead to resilient, regenerative investing activity. Fields include behavioural finance, biomimicry, impact investing, and complexity science. She is also the author of [The Nature of Investing](#) (2014). Prior to founding Honeybee, Katherine served in numerous capacities at Fidelity Management and Research Company: as head of US Equity Research, she led one of the largest buy-side research operations in the world. As Portfolio Manager, she was solely responsible for investment decisions for the multi-billion dollar Fidelity America funds. Katherine serves on the board of the Biomimicry Group, led by Janine Benyus, and on the Advisory Board of Ethical Markets Media. Collins can also be seen in the Ethical Media TV series ‘Transforming Finance’.¹⁴

Honeybee Capital’s recent research has focused on using natural systems models to analyse investment issues. The importance of this work is rooted in the observation that much of our current financial activity is based on mechanical, factory-like mindsets. However, many of our most important investing questions are better informed by biological, ecosystem frameworks. With this backdrop in mind, there are three essential issues with respect to HFT where we see gaps in understanding and analysis.

Efficiency versus Effectiveness: Often in finance we focus on a shallow definition of efficiency – fast and cheap. HFT is certainly efficient based on speed alone, and some argue that this makes for a more liquid, more efficient market. It does not. It makes for a faster, higher volume market – which may

“Defining effectiveness requires defining the function of the system. What is the function of HFT? It is unclear that there is any function for some practitioners, beyond their own profitability.”

or may not have anything to do with real efficiency. Speed, in and of itself, should not be inherently profitable. A deeper view of efficiency is seen in natural systems, where time, space, and true cost are optimized (not minimized). This deeper form of efficiency is not just fast and cheap; it is truly effective. Importantly, defining effectiveness requires defining the function of the system or organism at hand. What is the function of HFT? It is unclear that there is any function for some HFT practitioners beyond their own profitability. Define the purpose, and we can define what constitutes deep efficiency. I guarantee the answer will not just be “fast”.

Risk versus Uncertainty: Much of our infrastructure in finance is based on models of risk – situations where the outcome is unknown, but the range of outcomes is known. These situations are model-able, and we can make bets based on those models that are reasonable and responsible. However, those same models are no help in situations of uncertainty – where the outcome is not known, and neither is the range of possible outcomes. Uncertainty is the realm of “unknown unknowns”, and it is under uncertain conditions – not risk – that fortunes are often created or destroyed. HFT amplifies uncertainty and increases fragility of the system by exaggerating trading volume under normal market conditions, while allowing participants to step away when the market is under strain. This is the antithesis of market-making, and a serious systemic weakness. Natural systems develop variation and adaptability to increase resilience. In contrast, our current trading ecosystem has variety without diversity, reaction without resilience.

Transparency and Trust: It was not long ago that these words were common on Wall Street, said without irony when companies presented their mission statements or investment bankers spoke of relationships with their clients. These same ideas are reflected in the 1934 Act: “just and equitable principles of trade”. While much biological research (and much investment research) has centred on predator-prey relationships and competition, when we look at the broader landscape of the natural world, cooperation and mutualisms dominate. It is precisely because predatory behaviour is not the norm that we study it. The same could be said for our financial system. Our business schools and business settings train us to be the investment equivalent of the shark, but the reality is, we are all swimming in the same ocean of markets, and if that ocean is unhealthy, it creates less opportunity for all. Conversely, a healthy system is generative, meaning that I can win without you having to lose. The rules and practices governing today’s trading systems have created a toxic environment, where overall opportunities are shrinking, creating a predatory mindset of scarcity. Predators that do not somehow contribute back to the health of their own ecosystem eventually die out – and in fact, the biggest predators tend to die first, as they are the most dependent on the system that supports them. I say this not to threaten those who are taking advantage of the current system, but rather to encourage all participants to recognize that transparency and trust are not warm and fuzzy attributes to paste on the wall. They are essential markers of a healthy, high-functioning, generative system and necessary for survival.

Dennis Bushnell, NASA



Dennis Bushnell is Chief Scientist at NASA's Langley Research Center. He is responsible for technical oversight and advanced program formulation with emphasis in the areas of atmospheric sciences and structures, materials, acoustics, flight electronics/control/software, instruments, aerodynamics, aerothermodynamics, hypersonic airbreathing propulsion, computational sciences, and systems optimization for aeronautics, spacecraft, exploration, and space access.

I am an outsider to the financial world, a research techie. These are the simplex perceptions of a “citizen”, not a professional financial world critique. I am merely responding to my perception of the issues at your workshop as I understand them. You can build latency into the IT systems (at whatever level folks agree on – seconds to minutes) so that all have the same time advantage with regards to the technical aspects of the electronics and communications. That would tend to shift the overall dynamic from latency-related gain aspirations back hopefully toward real value considerations.

“The current shift to sustainable energy is on the heels of its costs dropping; the shift is probably far more due to economic realities than climate or social concerns.”

There are always the issues with what constitutes real value and why, this uncertainty is part of why some folks play this game instead of going to Las Vegas. Then there are the major psychological aspects: trying to game the herd proclivities. So, if the community wants to revert back more to a value-based market that is doable with regards to the technical aspects.

The other issue, of trust, is another matter entirely. The actions that led up to the financial crash in 2008 were a clear indication of the then prevailing ethics within the financial community up to the most elite levels. Neither the public nor the government (to the extent the latter is not influenced by the top financial folks) is going to easily forgive and forget decisions that very nearly “took us down”. How close a call that was is only now surfacing. Efforts to insert some “social consciousness” into the markets will always be uphill due to the innate “greed” aspects of that community; profits are their unit of measure. Usually only after they have made their bonus profit-wise do many people turn, for disparate reasons, to “helping society” or seriously exhibiting a social consciousness. The current shift to sustainable energy is on the heels of its costs dropping through the fossil energy price points: the shift is probably far more due to economic realities than climate or social concerns, at least that is the perception. A huge percentage of the new generation capacity is renewables, and they are winning. Their prices have been dropping year on year for a very long time and that trend, accelerated by the nano and other technology research, along with the usual economies of scale and the Japanese nuclear accident and much else, has now made them competitive. Along with this is the increasing shift to distributed generation. We now have some 200,000 off-grid homes, with that number growing to the point where the then year business case for centralized utilities is under discussion.

The machines appear to be taking the jobs; there are now many books written about this. The income disparity is growing apace to historic levels. Society is beset by the likes of this, plus climate change and

its impacts, a crashing ecosystem, population growth, shift to "tele-everything", and the virtual age. All this before quantum computing, autonomous robots, molecular manufacturing, and near-human level artificial intelligence have been fully developed and add their societal disruptive potential(s). Society is in need of consideration – consideration of how to navigate all of these serious changes. Society includes all of us, and our progeny.

Michaela Walsh, Women's World Banking



Michaela Walsh was a member of the Founding Committee of Women's World Banking, and served as the organization's Founding President from 1975 to 1990. Women's World Banking is a global non-profit devoted to giving more low-income women access to the financial tools and resources they require to build security and prosperity. Prior to that, Ms. Walsh served as a Project Director for the US Congressional Office of Technology Assessment, and as a Program Associate with the Rockefeller Brothers Fund.

www.womensworldbanking.org

Financial firms were never organized with any mandate to serve the public interest. This was overlaid on them after the 1929 Crash and imposed with regulations and the SEC.

My first years on Wall Street introduced me to the private sector. There was no government involved – Wall Street never went to Washington. It was not until Merrill Lynch Pierce Fenner and Smith (MLPFS) did a study with the University of Chicago on "who owned the shares on the NYSE" (AMEX had very few shares at the time). MLPFS was a member of the NYSE – we used to have 300,000 share days. Then Wall Street came to Main Street – and international offices opened. Then hedge funds and then the first mutual fund traded on the NYSE.

“It seems to me that we are approaching a new era in which the private exchanges will become trusted again.”

People who had been in the FBI after the Second World War based in South America, Japan and Cuba became reps for Merrill – in Kansas City (my home town), Washington, D.C. and New York, and MLPFS became a corporation.

It seems to me that we are approaching a new era in which the private exchanges will become trusted again – people invest their own money instead of “mine” and “yours”. Local/regional finance will become more important to each of us again. News about the new Asian Development Bank, BRICS and the Europeans being more serious about the euro should be thought through. It will be a very different world.

3 Reflections

Simon Zadek, UNEP Inquiry into the Design of a Sustainable Financial System



Dr Simon Zadek is Co-Director of the UNEP Inquiry into the Design of a Sustainable Financial System. Previously he was Founder and Director of AccountAbility. He is a Senior Fellow at the International Institute of Sustainable Development, Visiting Scholar at Tsinghua School of Economics and Management in Beijing and non-resident senior fellow at Chongyang Institute for Financial Studies, Renmin University of China. He is on the Advisory Board of Generation Investment Management, and was Visiting Professor at the Singapore Management University, Senior Visiting Fellow at Harvard's JF Kennedy School of Government and Senior Fellow at the Centre for International Governance Innovation, Visiting Professor, Copenhagen Business School, and Honorary Professor at the University of Southern Africa.

www.unepinquiry.org

As the co-director of the UNEP Inquiry into Design Options for a Financial System, I am ultimately interested in the alignment of the financial system with sustainable development, which means that it needs to *provide the finance needed to shape an inclusive economy that can be sustained within planetary boundaries*. Such an alignment involves of course many factors, from the capital weightings imposed by the Bank for International Settlements through to the fiduciary responsibilities of institutional investors, the provision of material information about environmental and social risks, the appropriate remuneration arrangements for asset managers and lenders, and the right mandates, cultures and competencies of financial actors and the markets' governing institutions, such as central banks.

Electronic trading is not “bad” in itself, except for the downsides of speed or the wastefulness of investment in the enabling infrastructure. Some would argue that its badness is an inherent function of its absorption of smart minds and institutional attention, always in short supply and perhaps better deployed to address for example public health problems. Such concerns are meaningful, but are not specific to electronic financial trading but could equally be applied to everything from smart phones to advertising or fast food.

The real question is how such trading impacts the likelihood of the financial system realizing its higher purpose of serving the needs of sustainable development. Four observations about micro-dynamics seem worthy of this ambitious litmus test:

First, the more exotic forms of electronic trading can either disadvantage traditional or specifically long-term investors, or else pose a tariff on their earnings.

Second, the real economy and long-term investing are negatively impacted, unlike the positive offer that electronic trading increases real liquidity and reduces volatility by accelerating the speed of price discovery.

Third, the loss of neutrality of public markets, particularly publicly traded equities, is accentuated by the effect of electronic trading on the behaviour of brokers, other intermediaries in the trading chain, and indeed stock exchanges themselves. This simply reduces their efficiency and creates private tax take-offs, diminishes underlying trust in such markets, triggering a growth in market workarounds and alternatives that might be rational at the micro-level but lead to loss of overall value to the system.

Fourth, effective regulation may be virtually impossible due to the complexity and political economy of electronic trading, weakening adequate market stewardship on all fronts, not just in relation to electronic trading practices.

Added to this are the macro, real economy impacts of such distortions and the loss of efficiency of the financial system. If it is the case that the real economy – and especially long-term investment – suffers, then the logical conclusion is that over time so will the productivity and so growth and development of the real economy. The Bank for International Settlements has concluded that oversized financial systems relative to the overall economy do empirically create exactly such a drag. If the transition, furthermore, of the real economy to one that is low-pollution (including carbon), climate resilient, and more natural resource efficient requires relatively capital intensive measures that deliver returns over the longer term, we can also posit reasonably that the distortions under discussion will relatively disadvantage the green transition over the current, unsustainable economic paradigm. Such a drag on green productivity increases even further if one views the financial sector as having successfully developed a powerful rent-taking role in the overall economy. Extending our analysis to embrace inequality as well as the environmental aspects of sustainability, we can also see the direction of such rent-taking as increasing inequality.

Although hard to measure, it is a reasonable hypothesis that the combined effects of these micro and more macro factors impact negatively on the alignment of the financial system to sustainable development, although the materiality of these impacts is not quantified at this stage. Most work on this topic has rightly focused on the US situation, but the broader question of how these trends might impact other financial systems internationally, particularly in major emerging markets. Today, electronic trading is at an early stage of development in these markets, but this will not remain the case for long, and there is a need to offer pathways to grow the sophistication of these financial and capital markets while not having to embrace the dysfunctions apparent in some mature financial systems today. This may mean that some financial product and market innovations should be banned outright, as synthetic derivatives are for example in Indonesia, or that they might be impacted by policy driven incentives, such as the consideration by China of a Tobin tax on capital inflows as the country's capital account is liberalized.

Today, there is an active policy debate about how to unlock private capital to finance much needed infrastructure, a major theme of the G20 last year in Australia in 2014, and the topic of a major report by the influential G30 think tank.¹⁵ This debate has to date, however, taken place devoid of any consideration of the factors discussed above and their consequence. Clearly this needs to change with urgency. Long-term investment needs, and the contextual need to transition to an inclusive green economy, has to be analysed and policies formed with the problems associated with electronic trading, short-termism and rent-taking in mind. Indeed, policy recommendations need to be formulated with this nexus firmly in view, both in mature financial systems and those currently in development.

Hazel Henderson, Ethical Markets Media



Hazel Henderson is the founder of Ethical Markets Media LLC and the creator and co-executive Producer of its TV series. She is a futurist, evolutionary economist, worldwide syndicated columnist, consultant on sustainable development, and author of nine books including *Ethical Markets: Growing the Green Economy* (2006). She also writes for the investment research platform *Seeking Alpha*. Previously she was on the board of Worldwatch Institute, Calvert Social Investment Fund, the Social Investment Forum and the Social Venture Network. She remains on the International Council of the Instituto Ethos de Empresas e Responsabilidade Social, Sao Paulo, Brazil.

www.ethicalmarkets.com

Since our November 2014 seminar, physicist Mark Buchanan warned that the problems caused by speeding up financial markets will likely result in more “flash crashes” or cause a catastrophic event that could set off an economic collapse.¹⁶ In April 2015, US authorities sought to extradite from Britain 36-year-old British day trader Navinder Singh Sarao to face civil and criminal charges. They accuse him of “spoofing”, a common form of market manipulation that helped cause the May 2010 Flash Crash.¹⁷ Author of *Flash Boys*, Michael Lewis commented that this arrest of Sarao is a “parody of Wall Street”, adding that Sarao is not an exception as he repeatedly placed and cancelled trades. Lewis wondered why it took so long.¹⁸ US Federal Reserve Chair Paul Volcker called for further overhaul of US financial regulations in April 2015.¹⁹ Clearly these problems are not going away.

Many public officials agree with the UK’s former top financial regulator Lord Adair Turner and others who see no social utility in such market trading.²⁰ There appears to be little evidence to support the two main arguments for HFT – that it provides liquidity and improves price discovery. Liquidity disappears during market turbulence since HFT firms have no obligation to market making that statutory specialists used to undertake. As for price discovery, HFT adds only noise by churning markets with its additional hundreds of thousands of trades per second – most of which are quickly cancelled in what are clearly “phishing” to see orders ahead of the public markets. In addition, equities markets are failing in price discovery, as mispricing of risks and stranded assets proliferate.

There is a strong case for levying a less than 1% financial transaction tax as advocated by James Tobin in the 1970s and by former US Secretary of the Treasury *Larry Summers* (1989).²¹ These proposals have been fiercely opposed by financial firms, the IMF and the World Bank, using the argument that such fees on transactions were “uncollectable” (even though many countries collected similar fees). My own work with Internet pioneer Alan F. Kay has demonstrated practically how such fees can be collected in relation to foreign exchange transactions.²² In my 2014 editorial *Speed and Efficiency Becoming False Goals*, I argued that FTT of less than 1% were being adopted in some European countries and advocated that FTT become global in G20 ruling. Britain’s National Physics Laboratory (NPL) weighed in, and I reported that their atomic clocks could set global standards for HFT accurate to a few milliseconds, yet even this speed was slower than the 1000 times faster algorithms of such traders.²³

Another priority should be regulating the soaring “unlit” derivatives markets with a notional value of over US\$1 quadrillion (11.5 times higher than global GDP of US\$87 trillion).²⁴ The World Future Council argues that derivatives are actually bets, not financial instruments, and thus should be regulated by state gaming commissions in the US and according to laws in Germany, Switzerland and Austria that make gaming winnings uncollectable and unenforceable.²⁵

Restoring trust in markets and politics is becoming a priority in many countries, corporations and equities markets. It is common knowledge that human societies work most effectively and harmoniously where there are high levels of trust – in each other and our institutions. Markets cannot operate without trust. Today, trust is breaking down in many societies around the world. Populist distrust of governments, elites, corporations, media, finance, academia, science and churches is evident in protest groups, movements, whistle blowers and public demonstrations.

The good news about today's widespread loss of trust among so many citizens and investors is their growing awareness of future possibilities, better alternatives – still often suppressed by the prevailing order and incumbent interests. Ubiquitous information, cell phones, the Internet are now shifting ever more power to the people. Few corporate or government secrets survive for long. Breakdowns drive breakthroughs, and stress is evolution's tool.

Our loss of trust in past successes is driving reforms of all our institutions as we awaken to our new situation as a 7-billion plus human family, changing our planet visibly from NASA's Earth-observing satellites in this new Age of the Anthropocene. As our technologies and innovation accelerate exponentially, so does our expanding human awareness and consciousness. We demand more of our institutions and ourselves. Civil society, NGOs, social movements, ethical investing, professional and trade unions, students, women and community groups, open-source and other volunteers can lead the way. Our current *global transition* from our fossil-fuelled, early industrial era to the more ethical, equitable, knowledge-rich green economies of the *Solar Age* is our next evolutionary stage.

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- ⁴ Patterson, S. (2013). Dark Pools: Dark Pools: The Rise of the Machine Traders and the Rigging of the U.S. Stock Market. Crown Business Publishing.
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- ⁸ <http://www.hsgac.senate.gov/templates/watch.cfm?id=187f4ffe-5056-a032-5264-39292e913c7d>
- ⁹ See for example, “Conflicts of Interest in US Equity Markets,” testimony of Professor of Finance Robert Battalio, University of Notre Dame, before US Senate Permanent Subcommittee on Investigations, 17 June 2014.
- ¹⁰ See Fox, M.B., Glosten, L.R. and Rauterberg, G.V., (2015). The New Stock Market: Sense and Nonsense Duke Law Journal, Forthcoming; Columbia Law and Economics Working Paper No. 513; Columbia Business School Research Paper No. 15-32. Available at SSRN: <http://ssrn.com/abstract=2580002> for an analysis of how the new stock market functions and the implications for regulatory choices.
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Inquiry: Design of a Sustainable Financial System

International Environment House

Chemin des Anémones 11-13

Geneva,

Switzerland

Tel.: +41 (0) 229178995

Email: inquiry@unep.org - Twitter: @FinInquiry

Website: www.unep.org/inquiry/