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Reforming Electronic Markets and Trading

Hazel Henderson
President & Founder, Ethical Markets Media (USA and Brazil);
Fellow, Royal Society of Arts; Honorary Member, Club of Rome

Abstract

Contexts a key, less-examined issue for the responsible investor community of the rapidly changing structure of securities markets due to high-frequency trading, the proliferation of "unlit", unregulated electronic platforms, conflicts of interest, and growing dangers these pose for long-term and institutional investors who rely on the integrity and stability of markets for publicly-traded stocks, bonds and other assets in their portfolios. Reviews the current situation as electronic markets and algorithms dominate trading on stock markets. Reports on proceedings of the Ethical Markets expert seminar (November 2014) on various reform proposals, testimony before government agencies, surveys, global debate on reforming markets, derivatives trading and imposing curbs, including financial transaction taxes (FTT), EU laws and potential actions by the G-20 and international cooperation.

1. Introduction

Electronic markets and high-frequency trading (HFT) now comprise over half of all securities trading on both public "lit" exchanges and "unlit" dark pools and electronic platforms. This kind of electronic and HFT trading has led to several "flash crashes" when computers and algorithms malfunctioned. This has led to withdrawal of some $75 billion of retail investments from Wall Street-based exchanges. While HFT proponents defend this kind of microsecond-based trading as "providing liquidity", this disappears quickly when markets become volatile. Further, these electronic exchange "maker-taker" models (paying rebates, i.e., "kickbacks" to brokers for steering their clients' order flow to these exchanges) have led to a race to the bottom where brokers who engage in these practices can then lower their execution fees, forcing others into this unethical practice. Financial and legal experts now describe this emerging market structure "The New Stock Market" in their forthcoming analysis.[1]

Since regulators, including the USA's Security Exchange Commission, are kept short of funds and staff often defect to Wall Street firms, these government overseers are unable to effectively police HFT and the many "unlit" dark pools and exchanges. Thus, market-based reforms may fill the gap, possibly helping prevent further "flash crashes" and market losses to retail and institutional investors.

In addition, socially responsible ethical investors, pension funds, endowments and other institutions are at risk, since they lose from these HFT firms' electronic front-running. While front-running is illegal in traditional markets, electronic front-running is technically different in that there is no prior relationship between the customer and the HFT. HFT poses many new issues and risks for the ethical, responsible investor movement which now accounts for $6.57 trillion invested according to SRI strategies in the US.* These firms rely for their ethical investment strategies on well-policed "lit" public markets for their screened portfolio strategies. Thus, they must be able to trust that these markets are fair and uncorrupted. Today's risks from these electronic and HFT dominated markets mean that this basic market structure and "plumbing" are corrupted and no longer reliable. For this reason, Ethical Markets Media (USA and Brazil), a Certified B Corporation, convened an expert seminar of securities market experts and traders to examine these issues and discuss the potential of several market-based reforms, including the IEX Investors Exchange;† Healthy Markets "Best Ex" accreditation‡ for brokers who eschew kickbacks for their clients' orders, and curbing the "maker taker" model, and other proposals. This paper documents the proceedings of this expert seminar, chaired by Ethical Markets Media founder, president and editor-in-chief, futurist/author Hazel Henderson, convened on November 3, 2014 in New York City at the offices of Cooley LLP law firm.

Initially invited and confirmed participants were Dr. Mariana Bozesan, AQAL, Munich, Germany; Dennis Bushnell, Chief Scientist, NASA; Katherine Collins, Honeybee Capital; Linda Crompton, Crompton Consulting; William Doll, Syneidesis Group; Amy Domini, Domini Social Investments; Garvin Jabusch, Green Alpha Advisors; Erika Karp and Joel Beck, Cornerstone Capital; Brad Katsuyama, John Ramsay and Gerald Lam, IEX; Gregory Larkin, Bloomberg; Dave Lauer, KOR Trading; Mindy Lubber, CERES; Scott Patterson, Wall Street Journal; Nick Robins, HSBC, London; Joe Saluzzi, Themis Trading; Tessa Tennant, UK Green Bank; Stuart Valentine, Centerpoint Investment Strategies; Michaela Walsh, author, *Founding a Movement*; Simon Zadek, UNEP Inquiry into the Design of a Sustainable Financial System, Geneva; Robert Zevin, Zevin Asset Management. Several had to cancel due to unforeseen circumstances and some offered email comments.

To optimize productive discussion, everyone was asked to contribute at least a one page memo circulated ahead of time in response to the following questionnaire:

- What is your assessment of the current state of financial markets and priorities for reform? Please indicate which of the following factors contributed to the decline and volatility:
    - ☐ Fed policy (QE, interest rates, etc.)?
    - ☐ Europe (ECB, euro policies)?
    - ☐ Structural issues in the global economy (deflation, stagnation)?
    - ☐ Oil prices?
    - ☐ Fears in the US (domestic issues, loss of trust, gridlock, Ebola, etc.)?
    - ☐ Structural issues in financial markets (changes due to new platforms, ATS, dark pools, derivatives, regulations)?
    - ☐ Investor loss of trust in the markets?
    - ☐ HFT, algorithmic trading, electronic front-running, etc.?

* Report on US Sustainable, Responsible & Impact Investing Trends 2014, USSIF, Washington, DC 2014.

† http://www.iextrading.com/

‡ http://kortrading.com/best-execution-accreditation-2/

- Other?

- What are your priority issues (market-based reforms, e.g. IEX, Better Execution Accreditation, transparency, government regulation) for reform and restoring trust?

Please check all boxes you think are relevant—add your comments, estimated percentages to each factor driving volatility and recent decline.

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Chair Henderson opened the seminar with this contextual statement:

2. Hazel Henderson, Ethical Markets Media

Computer-driven financial markets on unregulated electronic exchanges programmed by algorithms now dominate Wall Street, along with high-frequency trading (HFT).[2] The infamous "Flash Crash" in May 2010, driven by electronic trading, caused stocks in many 401Ks to suddenly fall to pennies, some recovering in split seconds. Small investors lost confidence, pulling some $70 billion out of stock markets.

While Wall Street recovered, trust eroded further due to the losses, foreclosures, job cuts and taxpayer bailouts after the 2008 meltdown. Today, the public's trust is battered by news of fraud, insider-trading, rigging of interest rates and huge fines on formerly admired banks paid by shareholders and taxpayers instead of indicting responsible financiers. Regulators in Washington are out-gunned by the faster computers and technology of HFT. Even market players are sounding alarms.

In 2011, after contacting the SEC, Themis Trading, a respected firm with many pension fund clients, later went public in Broken Markets (2012), co-authored by principals Sal Arnuk and Joe Saluzzi, alerting all investors to the dangers of electronic front-running and other manipulative practices of HFT and the electronic exchanges on which they trade. Wall Street Journal reporter Scott Patterson published Dark Pools (2012). CBS TV's 60 Minutes covered how Wall Street and global finance were morphing into a complex, unregulated casino. The public remained suspicious but mystified until Flash Boys by Michael Lewis, a former Wall Streeter, became a global bestseller in 2013, explaining in simple terms how "Wall Street is rigged." I reviewed all these books on www.seekingalpha.com, a London-based platform with 2 million traders registered.

Yet, while regulators were out-gunned, reforming financial markets remains urgent, since markets always perform vital services in all societies as recorded throughout human history and always circumscribed by cultural ethics, rules and regulations. Today, public and NGO pressure on companies and governments have forced reforms: on tax evasion, cancelling billions of un-repayable debts of poor countries, on safety, pollution control, working conditions, minimum wages and demands for below 1% taxes on all financial transactions, allowed in many countries. Investors' movements since the 1970s exclude weapons, tobacco, alcohol, pollution, unfair working conditions and excessive executive pay. Campaigns for human rights through divestment ended apartheid in South Africa and recent efforts shift assets from fossil fuels to cleaner, renewable energy.[3] 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.

Today's agenda is to reform electronic markets and trading, since 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. Today's broken markets are subject to new manipulations and misuse of computers and electronic platforms resting on global communications infrastructure: satellites, the internet, fiber optics, the electromagnetic spectrum—all public goods funded by taxpayers.

We seek to assure more stable market structures, restore confidence and prevent the next market crash that many believe is inevitable. Many proposals have been aired in Congressional hearings by the Senate Committee on Finance and chair Carl Levin (D-MI),† with testimony by Brad Katsuyama‡, CEO of IEX§ ("hero" of Michael Lewis' *Flash Boys*) and Dave Lauer,¶ CEO of KOR Trading.

We welcomed opening statements by all participants, starting with the official position of IEX, presented by John Ramsay, Chief Market Policy Officer, formerly with the SEC, since IEX has created a robust electronic market with technological and operational features designed to protect investors from electronic front-running, kickbacks on orders and other harmful practices.

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3. John Ramsay, IEX

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 that make it less likely that brokers will achieve 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.

* http://ethicalmtv.wpengine.com/?s=transforming+finance&submit-2=go

† Levin, C. (D-MI). "Opening Statement of Senator Carl Levin (D-MICH) Before Permanent Subcommittee on Investigations On Conflicts of Interest, Investor Loss of Confidence, and High Speed Trading in U.S. Stock markets." June 17, 2014.

‡ http://www.ethicalmarkets.com/2014/06/19/brad-katsuyama-on-conflicts-of-interest-investor-loss-of-confidence-and-high-speed-trading-in-u-s-stock-markets/

§ Katsuyama, B. "Conflicts of Interest, Investor Loss of Confidence, and High Speed Trading in U.S. Stock Markets," Testimony Before the U.S. Senate Permanent Subcommittee on Investigations of the Committee on Homeland Security and Governmental Affairs, June 17, 2014.

¶ http://www.ethicalmarkets.com/2014/07/11/the-role-of-regulation-in-shaping-equity-market-structure-and-electronic-trading/

3.1. IEX Philosophy

- **Just and Equitable Principles of Trade.** IEX aims—through the design and operation of our market center—to not just uphold, but also to exemplify, the precept of the SEC Exchange Act of 1934 that exchanges should be operated to "promote just and equitable principles of trade". In a fragmented, automated, intermediated marketplace where speed has been prioritized, this requires both a technical and trader's understanding of how minutely small time increments impact trading decisions and affect the way that markets do or don't work for various classes of participants.
- **Market Stewardship.** Market centers have a responsibility above and beyond that of other market participants to safeguard the public interest and to seek wherever possible to improve the health of the markets, and not just to advance their own commercial interests. The health of the markets depends on a range of factors, including, but not limited to, the extent to which they provide a level playing field for investors and traders of all types, and whether systems are designed to be highly resilient and reliable. Investor confidence depends critically on both the fact and perception that markets are designed and operated to serve investors.
- **Promote Natural Trading Interest.** Structural inefficiencies can, and do, lead to harmful phenomena in our markets, including order detection/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. Market practice is constantly evolving, and we continually look for ways to protect and promote the interests of natural investors.
- **The Market Can Self-Correct.** 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 centers, 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 center, and an anonymous breakdown of message traffic and message to trade ratio by subscriber on any registered trading venue (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 are standardized and available upon request. Define acceptable tolerances for trading, market center 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 which could allow unfair advantages to certain market participants, disadvantaging others.

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Dave Lauer, President & Managing Partner of KOR Group and co-founder and President of Healthy Markets and its "BestEx" (best execution accreditation) program for brokers who eschew accepting kickbacks for their clients' orders, also testified before the CFTC Technology Advisory Committee.[4] His statement follows:

4. Dave Lauer, KOR Trading

4.1. My assessment of the current state of financial markets and priorities for reform:

- Fed Policy

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.

- Macroeconomic issues
  - Europe
  - Deflation/stagflation
  - Oil prices

Macro issues strike me as relatively minor, considering the Fed influence in markets.

- Structural issues/HFT, algorithmic trading, electronic front-running

I'm including two categories in this issue, as I think this is an area of extreme concern. That being said, 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 serve to destabilize markets, the only reason they exist in this form and are 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 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/confidence, the complexity of markets, reports of problems/glitches, and resulting difficulty for investors to understand what is happening are certainly additional factors in investor flight from capital markets. These factors are, of course, dwarfed by the extreme volatility in financial markets from the dot-com boom to the housing crisis.

4.2. Priority issues for reform and restoring trust:

- Encouraging private-market solutions to structural problems and loss of trust:
  - 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:
  - Healthy Markets Initiative
  - 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.

4.3. Accelerating Data-Driven Regulation

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 rulemaking, disclosure, external analysis, and regulatory enforcement.

> *"Market quality metrics are woefully outdated."*
>
> *– Dave Lauer*

- Modernize market quality metrics (Rule 605) so practitioners can properly evaluate execution quality and make better order routing decisions.
- Modernize broker routing metrics (Rule 606) so the public can better understand how brokers are making order routing decisions and the potential conflicts they face.
- Enhance MIDAS and make data available on a delayed basis to ensure regulators and vetted academics/practitioners can perform comprehensive, independent study of market structure.

4.4. Modernize market quality metrics – Rule 605

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 behavior. 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 center order execution quality, Rule 605 must be updated.

4.5. Modernize broker routing metrics – Rule 606

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.

> *"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."* – *Robert Zevin*

4.6. Enhance and open up MIDAS

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 order. 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.

We strongly encourage the Commission to prioritize these initiatives as quickly as possible. The need for these changes is great and the impact would be profound.

4.7. Best Execution Accreditation

KOR Group is excited to announce our Best Execution Accreditation service. KOR will perform comprehensive analysis for buy-side firms of all policies and procedures and quantitative analysis of order flow and routing decisions. KOR's holistic approach to Best Execution will ensure firms are meeting current and future execution requirements, even as the regulatory landscape shifts and evolves.

With decades of experience in US equity and options markets, including years of experience sitting on Best Execution Committees, KOR Group is uniquely positioned to help firms audit, measure, improve and achieve true Best Execution. This results in higher fund returns and better use of invested capital. KOR's Best Execution Accreditation provides buy-side firms with:

- Independent evaluation and accreditation of your firm's adherence to Best Execution
- Identification of opportunities to improve execution quality and reduce implementation shortfall

- Identification of improvements to execution partner relationship
- The only guarantee in the industry against Best Execution violation

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Robert Zevin, a pioneering asset manager, principal of Zevin Asset Management, has been designing ethical, responsible portfolios for decades, including the mutual funds offered since 1982 by the Calvert Group, offered his insights and recommendation:

5. Robert Zevin, Zevin Asset Management

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 mostly outside of the circle of financial professionals. 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 don't obey the rules of the Wall Street Mafia.

I take space and employ colorful 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, healthcare, defense 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. And 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 Secretary of the Treasury serving an exceptionally conservative 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.

> *"The capital markets exist to serve the developmental needs of society."*
>
> *– Stuart Valentine*

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 $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 a constitutional amendment.

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Joe Saluzzi, partner, Themis Trading, had tried with his partner Sal Arnuk to alert the SEC to the problems posed by HFT firms, to no avail. After the "flash crash" of 2010, they decided to co-author *Broken Markets* (2012)[*] and even appeared on CBS TV's top-rated *60 Minutes* to blow a whistle on these practices. In 2012, Henderson persuaded Joe Saluzzi to present pro bono at a global webinar for institutional investors and asset managers, hosted by the UN Principles for Responsible Investing,[†] based in London, in which Ethical Markets is a participant and whose membership represents some $45 trillion of assets under management. Joe Saluzzi's statement for Themis Trading follows:

6. Joe Saluzzi, Themis Trading

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

* http://seekingalpha.com/article/690831-book-review-broken-markets-by-sal-arnuk-and-joseph-saluzzi

† http://www.unpri.org/

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
- Overhaul of the Securities Information Processor

However, major problems persist. There are a number of industry observers who see a need for a holistic, top-down review of market structure. We do not think that's 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.

Action: Eliminate payment for order flow

– Where brokers sell their orders to a trading firm, **along with the maker-taker policy**, and where exchanges provide rebates to traders for posting liquidity
– There's nothing unprecedented in either of these suggestions, and markets can readily adjust and adapt.
– Rebates are polluting the trading ecosystem with unnecessary incentives and need to be done away with.

Action: Complete disclosure of dark pool and smart order router practices

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

Action: 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.

Action: Cross-Regulation

– Develop inter-agency regulatory task force to share surveillance information across asset classes.

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Co-chair with Henderson, Stuart Valentine, principal of Centerpoint Investment Strategies, who also serves on the Advisory Board of Ethical Markets, offered this personal assessment:

7. Stuart Valentine, Centerpoint Investment Strategies

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 401k 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 that the average "Main Street" American can understand.

> *"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." – Katherine Collins*

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 bips 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 $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 their well-being but for the good of society. In my career I have encountered the ethic "Get Mine & 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 crises. 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. (See Building True Wealth Model at www.centerpointinvesting.com).

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Katherine Collins managed a successful, multi-billion dollar portfolio for Fidelity in Boston prior to forming Honeybee Capital and writing *The Nature of Investing* (2014).* She also serves on the Advisory Board of Ethical Markets and is a co-investor with Henderson in the biomimicry company Biomimicry 3.8. Also see Collins in our TV series *Transforming Finance*.† Katherine Collins contributed to the discussion as follows:

* http://seekingalpha.com/article/2142303-review-of-nature-of-investing-and-world-we-made

† "Bypassing Wall Street." (Show #2). Ethical Markets TV Transforming Finance, 2012. http://ethicalmarkets.tv/video-show/?v=1971

8. Katherine Collins, Honeybee Capital

Honeybee Capital's recent research has focused on using natural systems models to analyze investment issues (please see honeybeecapital.com or the book, *The Nature of Investing*, for more details). 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. Addressing these fundamental gaps should lead to more effective ideas for corrective action.

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 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's 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 centered 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 behavior 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, necessary for survival.

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Another member of Ethical Markets Advisory Board, lawyer Ellen Brown, author of *Web of Debt* and *The Public Banking Solution* (2013), agrees that only the speed with which HFTs front-run investors is new.[5] A key observer of communications and electronic systems and markets, NASA Chief Scientist Dennis Bushnell at Langley Research Center, Virginia, added his wide-ranging contextual comments prior to the seminar. Bushnell wrote a Foreword to my *Mapping the Global Transition to the Solar Age*.[6] His statement follows:

9. Dennis Bushnell, NASA

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 issues 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.

There are always the issues with who/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 more to a value (whether your values or those of others is not the issue at this meeting as I understand) based market that is doable with regards to the IT/Technical aspects.

The other issue, of TRUST, is another matter entirely. The "insane" bank/market writ large aspects/thoughts/actions that led up to what has been termed the GREAT RECESSION in '08 was a clear indication of the then prevailing ethics situation within the financial community up to the then most elite levels. Neither the public writ large nor the government [to the extent the latter is not influenced by the top financial folks] is going to easily forgive and forget actions/attitudes/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, since profits are their unit of measure. Usually only after they have made their bonus profit-wise do many folks turn, for disparate reasons, to "helping society", seriously exhibit a social "consciousness" . The current shift to sustainable energy is on the heels of their costs dropping through the fossil energy price points, i.e., the shift is probably far more due to economic realities than climate, social concerns, at least that is the perception. A huge percentage of the new generation capacity is renewables, 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 the climate change issues/effects, a crashing ecosystem, population growth, shift to "tele-everything", the virtual age. All this before quantum computing, autonomous robots, molecular manufacturing and machine Intelligence approaching that of humans are 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/issues and overall in need of all the "help" it can get. Society includes all of us, and our progeny.

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During the closing general discussion, viewpoints widened further to embrace philosophical concerns and the rapidly evolving global system and how best to address the "global casino" aspects of financial markets. These are dominating the real economies in every country and exploiting the unpriced resources of the biosphere and global commons: oceans, atmosphere, the electromagnetic spectrum, space and the digitized internet-based commons and cultures. Setting a historical note, veteran Wall Streeter Michaela Walsh, founding director of Women's World Banking,[7] former broker with Merrill Lynch, program officer at the Rockefeller Brothers Fund, reminded the group of Wall Street's history: that 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. Walsh added:

10. Michaela Walsh, Founding President, Women's World Banking

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 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.

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 and NYC, 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 Europeans being more serious about the euro should be thought through. It will be a very different world!

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Simon Zadek picked up this global theme, as the co-director of the UNEP Inquiry Into the Design of a Sustainable Financial System,* with a stellar advisory board of central bankers and stock exchange presidents from key emerging countries in the world. Zadek founded the well-known firm Accountability in Europe monitoring corporations' social and environmental performance. Zadek's question: "Why are we sitting here trying to retrofit this broken market system on Wall Street based on its Western model?" He noted that in the global context today, this model is no longer that important, witnessing the rise of alternative models in China, other Asian countries, Africa and Latin America. Zadek urged the group to contribute to the UN Inquiry and help redesign the global financial system for the future, adding the following:

11. Simon Zadek, UNEP Inquiry

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 in a nutshell 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 of 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 smartphones to advertising or pile-it-high 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, real economy and longer 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 behavior 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 work-arounds and alternatives that might be rational at the micro-level but lead to loss of overall value to the system.

* http://www.unep.org/inquiry/

- Fourth, the complexity and political economy of electronic trading, as we have seen, have made its effective regulation virtually impossible, 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 loss of efficiency of the financial system. If it is the case that real economy and especially long term investment suffer, then the logical conclusion is that over time so will the productivity, growth and development of the real economy. The Bank of International Settlements has concluded that over-sized 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 are 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 whilst 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, and the topic of a major report by the influential G30 think tank. 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 analyzed 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.

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Since the November 2014 seminar, physicist Mark Buchanan warned that problems with speeding up financial markets will likely result in more “flash crashes” or cause a catastrophic event that could set off an economic collapse.[8] In April 2015, US authorities sought to extradite from Britain the 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.[9] 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 (in MF Global, Jon Corzine's ill-fated fund). Lewis wondered why it took so long.[10] In March 2015, China released official studies on how it would reform its financial system for broader risk analysis and to finance its next "green" circular economy.[11] Former Fed Chair Paul Volcker called for further overhaul of US financial regulations in April 2015.[12]

Meanwhile, CEO Jamie Dimon of JP Morgan Chase warned his shareholders that the core behaviors in markets by all players "each individually doing the right thing for themselves, but collectively creating the market disruption that we've witnessed before,… there will be another crisis."[13] This response is all too familiar from large firms and their executives. Unfortunately, these views obscure the evolving structure of markets themselves and the limitations of regulatory frameworks which were the focus of our seminar. We agree with watchdogs, including Dennis Kelleher of Better Markets[†] which focuses on need for overhauling US market structure and regulatory approaches, especially HFT which "is not only damaging markets, but also killing investor confidence."[‡]

My concern with the unregulated globalization of finance began while serving on the Advisory Council of the US Office of Technology Assessment (OTA) which produced reports on the social and market impacts of electronic trading in Electronic Bulls and Bears (1990). In researching my *Paradigms in Progress* (1991, 1995), this concern deepened as I co-edited the report *The UN: Policy and Financing Alternatives*, with NATO Ambassador Harlan Cleveland and economist Inge Kaul (Elsevier Science, London, 1995; US edition, 1996).[14] Expert contributors assessed proposals for levying fees on all commercial uses of the global commons, including a less than 1% financial transaction tax (FTT) as advocated by James Tobin in the 1970s and by former US Secretary of the Treasury Larry Summers (1989).[15] These proposals were 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). Thus, I and my partner Alan F. Kay, internet pioneer and founder of the first computer platform on Wall Street for block-trading, AutEX, Inc. (now owned by Thomson-Reuters) designed a computer system FXTRS to automatically collect such fees on foreign exchange transactions.[16] The FXTRS was granted a patent by the US PTO, and we pledged any revenues to UN special agencies. After our offer of FXTRS to the US Treasury was rejected, we were invited to present at the Peoples Bank of China and gave them the Chinese-language rights.

By 2012, Alan F. Kay voiced his concern[§] on how computers were being misused on Wall Street.[17] In 2011, my editorial "Global Finance Lost in Cyberspace"[¶] sounded alarms

* http://seekingalpha.com/article/2127323-book-review-flash-boys-by-michael-lewis

† http://www.bettermarkets.com/

‡ Better Markets. www.bettermarkets.com

§ http://www.ethicalmarkets.com/2012/11/06/calling-wall-street-to-account/

¶ http://www.ethicalmarkets.com/2011/11/29/global-finance-lost-in-cyberspace/

on HFT,[18] citing the 2010 "flash crash"; Hibernia Atlantic's $300 million trans-Atlantic cable between New York and London to shave 6 milliseconds off the 65 millisecond transmission speed: and the Swiss Federal Institute of Technology report on 43,000 interlinked global corporations with less than 1% controlling 40% of this global financial network.[19] In 2014 in my 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 G-20 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.[20]

Clearly these trading speeds do nothing to enhance investing in real economies and fundamental valuation of companies traded in public markets. Many public officials agree with Britain's former top financial regulator Lord Adair Turner and others who see no social utility in such market trading.[†] Special pleadings by HFT firms' two main claims, that 1) HFT provides liquidity and 2) improves price discovery, are easily refuted by the evidence: liquidity disappears during market turbulence since HFT firms have no obligation to market-making that statutory specialists used to undertake. As to price discovery, HFT adds only noise by merely 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.[21] This is why I advocated FTT and addressing these taxes as "cancellation fees."[22]

This is a priority, along with regulating the soaring "unlit" derivatives markets with a notional value of over $1 quadrillion (11.5 times higher than global GDP of $87 trillion).[23] We support the World Future Council's view that derivatives are actually bets, not financial instruments, and thus should be regulated by state gaming commissions in the USA and according to laws in Germany, Switzerland and Austria that make gaming winnings uncollectable and unenforceable.[24] China's final report, *Establishing China's Green Financial System*, released on April 22, 2015, outlines its fundamental redesign criteria and goals.[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. Wall Street is learning this as I discussed in Electronic Bulls, Bears & Pigs.[‡] Confidence among retail investors has dropped since the 2010 Flash Crash and 16% of small investors have fled. Hearings in the US Senate[§] on June 17, on investor loss of confidence, conflicts of interest, high-frequency trading and maker-taker models saw academic experts and even insiders calling for reforms.[26, ¶]

Today, trust is breaking down in many societies around the world. Populist distrust of governments, elites, corporations, media, finance, academia, science, churches, is evident in protest groups, movements, whistle blowers and public demonstrations.

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* http://www.ethicalmarkets.com/2014/05/20/43830/

† "Lord Adair Turner on Money Creation and Banks," video posted on EthicalMarkets.com, February 22, 2013.

‡ Notes http://www.ethicalmarkets.com/2014/06/17/electronic-bulls-bears-and-pigs-predicting-the-next-flash-crash/

§ http://www.hsgac.senate.gov/templates/watch.cfm?id=187f4ffe-5056-a032-5264-39292e913c7d

¶ 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, June 17, 2014.

> *"As our technologies and innovation accelerate exponentially, so do our expanding human awareness and consciousness."*

Charles Darwin actually saw that our human genius for bonding, cooperating and sharing and our evolving altruism were the basis for humanity's spectacular success. Humans now dominate the Earth, using 40% of its primary production from photosynthesis, causing extinctions of many other species and altering the planet's biogeochemical cycles and climate. We have built trust over the centuries and learned wider cooperation and sharing, as I documented in *Building a Win-Win World* (1996). Evidence is in our journey from nomadic tribes to settled agriculture, towns, cities, nations, corporations, to today's vast web of international treaties, agreements and associations of nations from the OECD, ASEAN to the EU and the UN. Finance became part of our global cultural commons in 1944 with the Bretton Woods Agreement. Today transforming finance to conform with Nature's laws and ethics leads to the Principles of Ethical Biomimicry Finance®.

All our human cooperative achievements required trust and have brought us to our current global transition to the next stage in our evolution, now driven by our globe-girdling technologies, jet travel, satellites, networks of communications, undersea cables, electricity grids, the internet and social media. These technologies enabled by tax-supported infrastructure and research also spawned high-frequency trading and algorithms.

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 do our expanding human awareness and consciousness. We demand more of ourselves and our institutions. We still trust that 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. Even advertising, a $500 billion global industry targeting our amygdalae, is responding, as we see the new genre in the EthicMark® Awards* for advertising that uplift the human spirit and our human potentials.

Our current global transition† from our fossil-fueled, early industrial era to the more ethical, equitable, knowledge-rich green economies of the Solar Age‡ is our next evolutionary stage.

Author contact information
Email: hazel.henderson@ethicalmarkets.com

* http://worldbusiness.org/the-ethicmark-award/
† http://youtu.be/kGDKQlTfSO8
‡ http://www.ethicalmarkets.com/wp-content/uploads/2014/02/tecpln12453-solarage-web.pdf

Notes

1. Merritt B. Fox, Lawrence R. Glosten and Gabriel V. Rauterberg, "The New Stock Market: Sense and Nonsense," *Duke Law Journal,* March 2015.
2. Henderson, H. "Global Finance Lost in Cyberspace," *Inter Press Service,* November 16, 2011.
3. Hazel Henderson, *Mapping the Global Transition to the Solar Age.* ICAEW and Tomorrow's Company, London, 2014.
4. Lauer, D. "The Role of Regulation in Shaping Equity Market Structure and Electronic Trading," *Senate Committee on Banking, Housing, and Urban Affairs,* July 8, 2014.
5. Brown, E. "Computerized Front Running: Another Goldman-Dominated Fraud." *EthicalMarkets.com*, April 26, 2010.
6. Henderson, H. *Mapping, op. cit., p. v.*
7. Walsh, M. *Founding a Movement,* Cosimo Books, 2012.
8. Buchanan, M. "Physics in finance: Trading at the speed of light," *Nature,* February 11, 2015.
9. "Flash Boy." *The Economist,* April 25, 2015, p. 69.
10. Crowe, P. "Michael Lewis: The 'Flash Crash' trader's arrest is a 'parody' of Wall Street." *Bloomberg View*, April 24, 2015.
11. Henderson, H. "China: The Emerging Green Giant," *CSRWire*, April 3, 2015.
12. "Fed up." *The Economist,* April 25, 2015, p. 68.
13. Udland, M. "Jamie Dimon: 'There will be another crisis.'" *Business Insider*, April. 8, 2015.
14. Cleveland, H., Kaul, I., and Henderson, H. *The United Nations: Policy and Financing Alternatives,* Elsevier Science, London, 1995; USA, 1996.
15. Summers, L. "When Financial Markets Work Too Well: A Cautious Case for a Securities Transaction Tax," *Journal of Financial Services Research,* 1989.
16. Kay, A. and Henderson, H. "A Foreign Exchange Transaction Reporting System for Central Banks," *Futures,* 1999.
17. Kay, A. "Calling Wall Street to Account," *Ethical Markets*, 2012.
18. Henderson, H. "Global," op. cit.
19. Vitali S, Glattfelder JB, Battiston S (2011) The Network of Global Corporate Control. *PLoS ONE* 6(10): e25995. doi:10.1371/journal.pone.0025995
20. Buchanan, M. "Physics in finance: Trading at the speed of light," *Nature,* February 11, 2015.
21. Henderson, H. "Fossilized Asset Allocation Still Mis-Pricing Energy and Risk," *SeekingAlpha.com*, January 22, 2015.
22. Ibid
23. CIA. "Country Comparison: GDP (Purchasing Power Parity)" *World Fact Book.*
24. "Mandatory Approval of Complex Financial Instruments: The Need for a Precautionary Policy to Make Financial Markets Economically Sustainable," *World Future Council,* September 22, 2014.
25. Establishing China's Green Financial System. Forewords by Pan Gongsheng, Ma Jun and Simon Zadek. *People's Bank of China*. April 2015.
26. Levin, op. cit.