White Paper:
A Call For Exchange Neutrality

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A Call For Exchange Neutrality

Imagine a world where access to data used by seekers and providers of goods, services and information is inherently biased. Would you enter into an exchange where you know that there is censorship and unequal access to price, rating, and supply and demand indices? Without the free flow of factual information on which decisions are based, a state of exchange bias rather than exchange neutrality constitutes the state of affairs.

In this white paper, we argue that the free flow of information relevant to exchanges constitutes a "public good," as defined by economists. We then discuss what we believe is the coming breakthrough in the availability of exchange-related information through the vehicle of online search. Finally, we call for ***exchange neutrality***, a state where all participants can exchange goods, services and information freely and fairly, and argue that free access to exchange-related information is a key component of exchange neutrality.

1. Is Access to Information a "Public Good"?

Milton Friedman provided us with the definition of a public good[1] as being:

- non-rivalrous: i.e. the use of the good by one individual does not limit the amount of the good available for consumption by others
- non-excludable: i.e. no one can be prevented from using the good once the good exists.

He gave the example of a lighthouse as the model example of a public good. One party's use of the beacon did not preclude another's use, and no one could be excluded from such usage. Everyone in the public was presumably better off from the free and fair access to the real time beacon provided by a functioning lighthouse. Other traditional examples of public goods include national defense, free-to-air television, and air itself.

Is it right to think of the public's ability to retrieve factual, exchange-related information in the public domain as a worthy candidate to include in the above list? The ability to search for information would seem to fall directly into Friedman's definition. Currently available high-quality on-line search engines provide a case in point. By scraping content all over the web and integrating GPS information from public network of heavens-based satellites, Google has assembled a private offering that (given its

[1] See Dotan Oliar, "Making Sense of the Intellectual Property Clause: Promotion of Progress as a Limitation on Congress's Intellectual Property Power," 94 Georgetown L.J. 1771 (2006).

ad-supported business model permitting it to offer its search tool for free) quite nearly approximates a public good to its users. One user's searching is non-rivalrous with the searching of another (except in circumstances of very limited bandwidth that net neutrality detractors would have a say about). And each search is non-excludable, as long as a seeker can reach Google's cloud, which has already pre-collected and pre-processed the data of interest and is just waiting to be accessed by any and all via search.

A recent incident involving on-line search suggests that "equal access" to information in the form of search results should not be taken for granted, however. The government of China, far from seeing free and equal access to search as a public good, sees it as a public harm, and has mandated the disallowance of open search results through such services as Google on those grounds. For the time being, the Chinese authorities dictate that controlling what is known by its population represents a greater public good than free and equal access to what could be known. It has been the modus operandi of every totalitarian government to control access to information as a means of maintaining control over their population. Outside of a few authoritarian government officials, however, most of us see the great benefit of open access to information through online search.

2. <u>Big Facts vs. Little Facts</u>

Most of us would agree that unrestricted and timely access to "big facts" like news about protests in Iran or earthquakes in Haiti holds great value for society. But what about "little facts" in the exchange space for goods, services and information generally? In addition to the big facts – what might be called "news" – finding its way onto the Internet, little facts have made a parallel migration into the online world. These little facts are contained in what we call ***postings***, transaction-specific information about items offered for sale. A posting might describe a watch for sale on eBay, and include a description of the watch, the price to purchase it now and other information important to a buyer, such as when and where the item will ship. The online presence of postings for everything from buying a toaster to finding one's love mate has meant that the full breadth and diversity of human exchange has moved online and into the public domain.

While the public rapidly reacts when it encounters attempts to limit access to big facts, encroachments on access to the smaller, exchange-specific facts does not lead to the same kind of

outcry. The average person is most likely unaware of such encroachments, or may see such events as nothing more than private disputes between individuals, rather than incursions on the public sphere of discussion and information exchange. This perception is sadly misplaced, however. Far from a private affair, the quality of access to exchange-related facts deeply affects society as a whole, and the standard of living we all can expect to enjoy. Good access to market-related information – all of those "little facts" put together – is the foundation of a well-functioning marketplace. Economists who wax eloquent about the power of free markets to support innovation and supply consumers with excellent products at a reasonable price base their views on the fundamental assumption that market participants have equal access to information. If private parties can control or distort access to market-related information, then all bets about the benefits of markets are off.

The SEC's investigation of the May 6, 2010 "flash crash" provides a case in point – both for the damage that unequal access to market information can do, and for the lack of public outcry related to it. The investigation found that a group of hedge funds that purchase the stream of market information from exchanges on a differential timing basis suddenly withdrew from the market, causing a collapse in liquidity and wild price gyrations in the marketplace.[2] Those same firms, when the market is functioning normally, make money by trading on price, supply and demand level information ahead of other market actors. While the time gaps are small, the asymmetry is sufficient to enable "latency arbitrage" – the firms pay to get information a fraction of a second before the public, and leverage that to enormous profits, estimated to be in the range of $3 billion per year.[3] This practice clearly limits the public's access to – and the average person's ability to benefit from – market information. It is far more difficult to realize a decent return on your 401(k) if someone is paying for access to stock information several milliseconds ahead of you or your mutual fund manager. But, perhaps because latency arbitrage is so technical, the general reaction to it outside of the industry press has been muted.[4] Meanwhile, the

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[2] See Scott Patterson, "Fast Traders' New Edge, Investment Firms Grab Stock Data First, and Use It Seconds Before Others," Wall Street Journal, June 4, 2010.

[3] See, for example, "Rigged Market: How Latency Arbitrage Picks $3 Billion From Your Pockets" DailyFinance, June 5, 2010: http://www.dailyfinance.com/story/investing/rigged-market-latency-arbitrage-3-billion/19503388/?icid=sphere_copyright

[4] Most criticism of latency arbitrage has come from within the financial industry. See, for example, "Measuring Arbitrage in Milliseconds" Market Beat, Wall Street Journal, March 9, 2009 (comparing latency arbitrage to earlier "market timing" scandal), http://blogs.wsj.com/marketbeat/2009/03/09/measuring-arbitrage-in-milliseconds/; "Latency Arbitrage," Themis Trading White Paper, December 4, 2009 (stating that latency arbitrage "raises serious

hedge funds have found that private stock exchanges are willing to sell them a stream of information that gives them an insider's edge and is (not yet) prohibited. And under a "rules of the game" reasoning, anything that is not strictly illegal is deemed acceptably legal.

Public reaction (or lack of reaction) to the hedge funds' use of latency arbitrage points to a more general problem: changes are happening in the world of search that have or soon will make facts of all kinds easier to access on a real-time basis. These changes have particularly significant implications in the realm of exchange; yet the general public appears not yet to have recognized the potential benefits of these changes. Failure to claim the benefits of these advances for the good of all leaves them open to encroachments of the few.

3. <u>Advances in On-Line Search – Who Will Benefit?</u>

A number of advances in technology and thinking about data availability have set the stage for a "leap forward" in access to information relevant to exchanges of all kinds.[5] Google and Wikipedia represent the current state of search – they reflect a relatively recent set of advances in technology and thinking that vastly extended public access to information. Both collect and assemble a view of semi-static facts and opinions about those facts. Their focus is on providing a snapshot of the "state of the world" at a given point in time, which is truly a valuable and needed service to society.

When it comes to providing updates on the *change* in status of facts, however, it is Twitter and the Twitter ecosystem that is increasingly providing a view of the "change in the state of the world" for both big and little news. Breaking big news might be rumors about Michael Jackson's death, whereas breaking little news might be the offer of a used iPhone for sale in Kankakee, Illinois. Both the big and little news are public facts once they appear on the internet, the former of which will eventually make its way into Google and Wikipedia, though likely not as fast as it first appears in Twitter. But what about the little news about new items or services for sale, or ratings of those goods and services or the parties engaging in those exchanges? Those little facts are unlikely to ever merit highly ranked inclusion in Google's authoritative assessments of page rank or Wikipedia's compendium of knowledge, and as such

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questions about the fairness and equal access of US equity markets.")
http://www.themistrading.com/article_files/0000/0519/THEMIS_TRADING_White_Paper_--_Latency_Arbitrage_--_December_4__2009.pdf

[5] Greg Kidd discuss the evolution of search in more detail in his paper "A Brief History of Search," available at http://wp.3taps.com/wp-content/uploads/2010/04/A-Brief-History-of-Search.pdf

will not be searchable using their methods. For the proverbial rhetorical question of whether if there is no one to hear a tree falling in the wilderness of the things searchable by Google or Wikipedia, there is only the silence of obscurity.

Small facts, or postings, can be searched within the websites where they are posted – but that implies an intermediate step of a user finding those sites in the first place. The type of ubiquitous searching for knowledge across all sources and geographies that one takes for granted with Google and Wikipedia searches simply has not existed in the exchange space, where content is typically searchable only within local databases. What has existed is exchange portals where there is a critical mass of particular kinds of seekers and providers: eBay or Amazon for goods, Craigslist and other online classified sites for local goods and services, Match.com for personals, Monster.com for jobs, and Zillow for real estate. While large and even dominant in their particular domain spaces, each of these services is focused on searching for postings listed within their sites rather than across the web (and one another). Unlike a horizontal search engine of Google, knowledge base of Wikipedia, or status update registrar of Twitter, these sites are vertical silos of their own resident data.

The promise of the Semantic Web is that the location of a particular piece of data on a particular website – including a small fact such as an exchange posting – should not affect a user's ability to find that data across the entire expanse of the Internet. The scope of what Google has done for web pages, and that Wikipedia has done for knowledge in general, could therefore conceivably be extended to all posted information underlying exchange activity. As a practical matter, this means that soon, users could use online search engines to discover comprehensive lists of postings of items offered for exchange. The question then becomes, who will reap the benefit of these developments?

4. A Call for Exchange Neutrality

Society at large, not just a few, should benefit from the coming breakthroughs in availability of exchange-related information. This will not happen, however, unless the public demands it – otherwise, there are simply too many interests that will happily take private control of this public good. For this reason, we call for the public to claim its rights by supporting ***exchange neutrality,*** a state where all participants can exchange goods, services and information freely and fairly.

What would exchange neutrality look like in practice? Take the example of seekers and providers of tickets to the Burning Man event held each year in the California desert. There are a limited number of tickets sold at escalating prices as the event draws near. At a point in time, the original tickets sell out, so the only way to garner admission after that is via a secondary market for already pre-purchased tickets to the event. Offers from seekers and providers inevitably appear on everything from eBay to Craigslist and Twitter, along with a number of other secondary market ticket sales sites. Searching on Google will produce some references to these secondary market sites – but Google's PageRank methodology turns out to be a poor method for collecting all the currently available offers from seekers and providers. Because Google equates authority with number of links pointing to a page – the most authoritative page is also likely to be oldest and therefore expired page – in terms of the potential for a market exchange. Thus seekers and finders would do well to find one another by getting closer to the most recent rather than most decrepit exchange offers.

In a world where exchange neutrality prevails, all seekers and providers of tickets would be able to see one another's offers in a ubiquitous real time exchange that was free and accessible to all. Such a best execution scenario would engender fairness and efficiency. The exchange itself might hold no actual underlying offers, but rather act purely as a search engine for all ticket offers – regardless of source. Thus, whether the ticket offer emanated from eBay, Craigslist, Twitter or some other site would be immaterial. Each of these entities would hold the listing of the original seeker or provider offer, but the exchange is the point at which all offers would be visible and the public good of a best execution exchange could materialize.

This scenario has enormous intuitive appeal. Anyone who has ever shopped online can see the benefit of being able to search for and find the most comprehensive information about the item they are looking for. Increased access to exchange information benefits many groups – better access to price information clearly benefits consumers, and increased exposure for sellers can increase business. The economy as a whole tends to grow when market activity can be conducted more efficiently and participants have confidence that markets are functioning fairly.

Yet a number of internet-based exchange sites have sought to thwart exchange neutrality by imposing technical barriers or taking aggressive legal stances to impede public access to exchange-related facts. Why anyone would oppose a world of free and fair access to exchange-related

information? Without presuming to know the minds of others, we suggest a few possibilities for this conduct:

- First, market participants who could benefit greatly from increased business resulting from easier access to information about their products, may simply be unaware of this possibility and fearful of change that could affect their way of doing business.
- Second, vested interests may seek to thwart exchange neutrality out of fear that equal access to postings undermines their control over exchange-related information. Such interests may think that they can profit from "exchange bias," operating in imperfect markets where seekers and providers still need a commissioned broker to complete a transaction.
- Finally, and perhaps most troubling, differential access to facts can be key to enjoying riskless and outsized returns in the marketplace – as in the example of latency arbitrage we discuss above. When facts are known to a select few rather than the public at large, there is chance to lock in beneficial outcomes that cannot be replicated on a level playing field.

Opponents of free access to exchange-related facts may not fully appreciate the mischief they do, or the great public benefit that the free flow of such information provides. Nonetheless, freedom from burdensome impediments to exchange is as much a founding pillar of the U.S. as other areas of freedom, such as freedom of speech or the freedom to practice one's own religion. The ability to realize the American dream – that if you are willing to work hard, you can build a better life for yourself – is based on the concept that markets function fairly and all participate on an equal footing. For this reason, our country has from its inception placed a high value on unrestricted exchange and the economic opportunity it engenders. Remember, a rebellion against an onerous tax on exchanges – the stamp tax – helped to spark the War of Independence with Britain. One of the most fundamental powers delegated to Congress by the founders, the Commerce Clause of the U.S. Constitution, prohibits state legislation that unduly burdens interstate commerce, eliminating the kinds of onerous tolls and other state restrictions on the free flow of traffic on public highways that limited the growth of the national economy under the earlier Articles of Confederation.

Our government's recognition of the important public benefits of markets that function fairly and efficiently has continued into the digital age. In fact, when the Clinton administration launched its

"Information Superhighway" initiative in 1993, it explicitly made the connection between improved access to information and the public benefit of strong markets:

> Today's "Information Age" demands skill, agility and speed in moving information. Where once our economic strength was determined solely by the depth of our ports or the condition of our roads, today it is determined as well by our ability to move large quantities of information quickly and accurately and by our ability to use and understand this information. Just as the interstate highway system marked a historical turning point in our commerce, today "information superhighways" -- able to move ideas, data, and images around the country and around the world -- are critical to American competitiveness and economic strength.[6]

The public benefits of improved access to the "small," exchange-related facts were thus understood and very much part of the driving force behind the Information Superhighway initiative, which played a critical role in the development of the internet.

Now, at a time when technological advances offer the possibility of vastly improved access to market-related facts, are these little facts to be afforded less protection than big facts? Proponents of exchange neutrality must make their case heard, and the net neutrality movement offers a good model. While net neutrality involves technical issues at least as complicated as the practice of latency arbitrage, it became a meaningful topic in the eyes of the public when it became clear that the flow of types and sources of data could be controlled, in terms of speed and pricing, by a self-interested intermediary with no incentive to maximize the public good. A loss of net neutrality in the U.S., while a win for certain commercial interests, would be a net loss for consumers and businesses alike – i.e. the greater public good. The crystallization of this issue has become clear in the past year or so, though the laws have not (yet) been rewritten to enshrine these principles.

Net neutrality and exchange neutrality present parallel issues – private interests distorting our access to information in different ways – and the public's interest in both are similar. In fact, imagine having the later without the former. One could search for exchange-related data without fear of interference about the speed or amount of access – but without guarantees of equal access to data in the public domain, the search results will be distorted. Net neutrality would then provide users fast but incomplete market information – and that outcome is clearly inconsistent with the public good.

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[6] President William J. Clinton and Vice President Albert Gore, Jr., "Technology for America's Economic Growth, A New Direction to Build Economic Strength," February 22, 1993, available at http://www.itsdocs.fhwa.dot.gov/JPODOCS/BRIEFING/7423.pdf at p. 29.

The basic values of democratic access and fair play apply as much in the exchange sphere as anywhere else on the Internet. "Small facts" can and do add up, and have important impact on the quality of life we all enjoy. We must keep the public interest in our sights as we break new technological ground in this area.