Progress vs Security

High Frequency Trading

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Abstract

In such a competitive environment like *high finance* is, long-term incomes are usually discarded to satisfy the always demanding short-term necessities of shareholders. Thanks to use of computer tools, some software has been developed to let computer programs acquire securities like stocks or options. The particularity of the these commercial activities consists on that they take place in a matter of milliseconds. Therefore, it could be a little bit frightening to make a reflexion of how many billionaire transactions flow in those unbelievable short periods, even more, realizing that those operations are managed by machines instead of specialized persons. So, this paper will try do a significant analyse of these complex systems that can have a tremendous influence on global economy. Varying opinions have been given about these revolutionary tools, so different point of views will be exposed and analysed. Finally the author of the present text will expose its own opinion and conclusions.

Key Words: *High Frequency Trading, quote stuffing, securities, stocks, algorithms, game theories*

1. Introduction

If a paper like this one arrived to the hands of a common reader, that person, if it doesn't have any formation on economy or informatics, would probably think that a *High Frequency Trading* system (known in specialized environments as HFT system (**see Ref. 1**)) is a Pandora box that could become in an uncontrollable force that could be able to destroy world's economy in a matter of minutes thanks to blind faith of men in the machines. Furthermore, with an unstable world economic situation where newspapers sell us appealing news headlines about economy that can be mistaken or only tell us a small part of the truth, and whose aim is just to attract a mouse click of the reader.

So it's totally convenient to start defining what a HFT is. A High-Frequency-Trading is a sophisticated tool to automatize acquisition/sale of securities like options or stocks under the following conditions:

- ➔ Every investment position is only kept during brief periods of time, purchases and sells of the very same market "product" can happen in second fractions; in any case, an option nor a stock won't be maintained more than a daily session of a national stock market.

➔ At the end of the day, no open operations are kept, whatever their values are, all of them are settled.

The use of HFT systems began in 1999, during the full expansion of the *Dot-Com Bubble*, but a year earlier, the US Securities & Exchange Commission (*SEC*) (**see Ref. 2**) approved the electronic commercial operations. Bit by bit, the market has been growing up with non-stop until controlling almost the seventy percent of the *New York Stock Exchange (NYSE)*. Such a great expansion has provoked a great concerning for the public administration, just to give an example, HFT systems only represent the 2% of the 20,000 different firms which compound the *NYSE* but they control the 70% of the market, it's quite easy for public opinion to think that there's another element to take economy out of control once more (**see Ref. 3**). So, it could be a little bit worrying leaving those billions of dollars in hands of machines instead of trustable persons. This way, we can say that the traditional image of brokers shouting because of a purchase or sale, it has become part of the films and economic history.

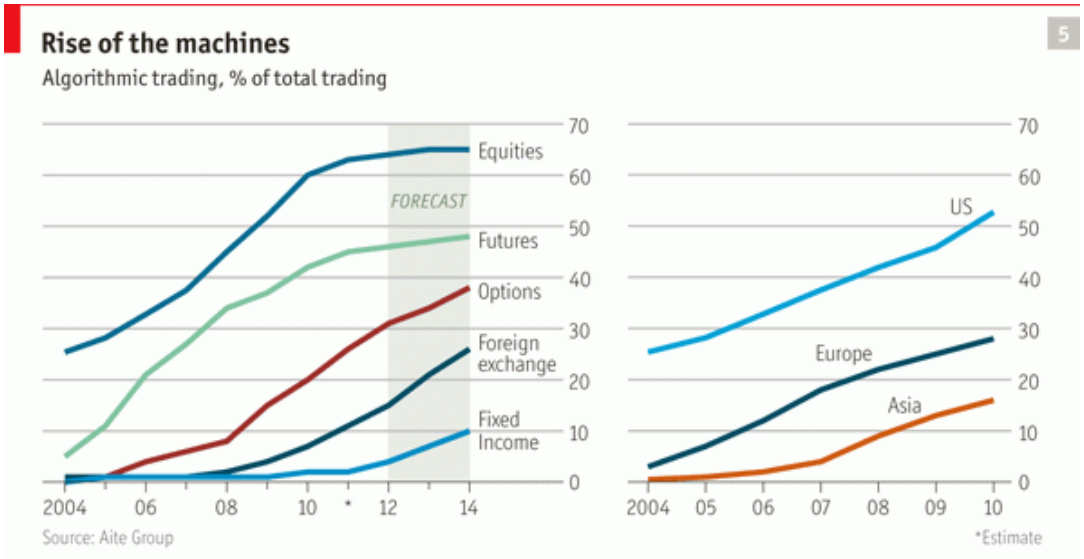

Fig. 1 The evolution trading percentage weight © The Economist

Living in an every time more globalized and interconnected world, being pessimists HFT systems could have more connotations than "simple" dangerous market bubbles. This is to say, after having stared at graphic it's quite clear to notice that in not all the globe zones HFT systems have the same percentage importance for the economy. Traditionally, the United States of America – since the XVIII century – have always had the most liberal conception of economy; however Europe markets have suffered much more the interventionism of the states just to avoid harmful bubbles for the economy, it's enough to show the eternal obsession of Germany to freeze the inflation. On the opposite extreme we have the Asian markets – mainly starred by the Chinese giant which is under a communist regime yet – where some countries keep having interventionist conceptions from the past or don't have developed complex systems because they're still nations in process of development.

Fig. 2 Shia Labeouf interpreting the results of an HFT system interface (*Wall Street 2 - 2010*) © 20th Century Fox

Therefore, HFT could also behave as a legal lobby – it they're not properly managed by honorable people – because they can perform much better if they have no barriers to buy some stocks in a concrete country market and sell them in a different one with the best sale price and the lowest rates of taxes. So, such a potential technology requires a slow and deep analysis to find out the pros and the cons of the use of this kind of tools, to configure them in the best way to make them the most productive and the less damnific ass possible. All of those likely consequences will be much better understood after having read how an HFT system works and which non-computing variables of the real environment can influence on their performance.

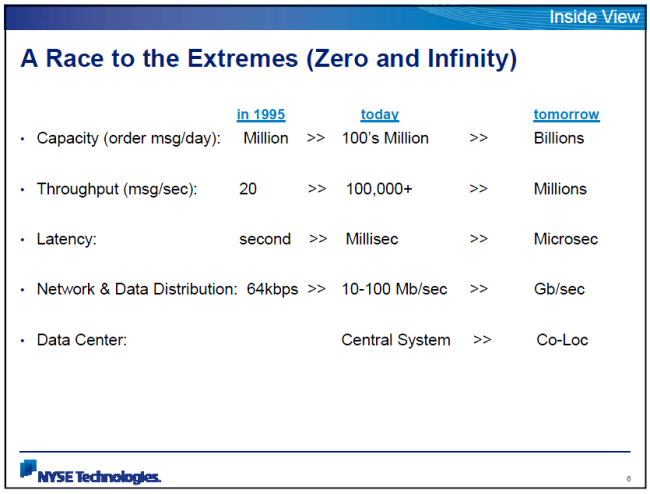

Fig. 3 Evolution of calculation power of HFT trading systems © NYSE Technologies

2. How does a HFT system works?

It's been already said that a High-Frequency-Trading (**see Ref. 4**) is a sophisticated tool to automatize the acquisition/sale of securities that can be executed in fractions of a second, and the maintenance of those products cannot be kept longer than the duration of an stock market session (technically known as *short portfolio holding*), not mattering which price can have by the end of the session; in no case long-term incomes are considered. Well, once we know what an HFT does, the next two steps to explain would be *why do they have the mentioned purpose* and *how do they achieve it?*

A priori, if it is just said that HFT trading systems – which are held on distributed super computers – have the chance to arrange thousands of transactions in a simple second, not explaining why, an ignorant reader could just applause and say *bravo* for the power of computing not comprehending the real aim of the invention; the main target of High Frequency Trading tools is to buy a stock as cheap as possible and to sell it as expensive as possible. Literally read, it may seem that it's not doing something different than what a broker does (**see Fig. 3**), the main difference is, contrary to a broker, such a powerful computer can perform the above activity thousands of times per second. Apart from that, a broker continues being a person that many times is carried away by hunches instead of obeying its solid academic background – if it has it – or even worse, there's something else worse than hunches: the greed, not being able to distinguish when it's the perfect moment to release an stock when its price is not going to increase anymore.

Unlike real brokers, the profit margins which are obtained by a single operation which is carried out by an HFT are much smaller than a lucky acquisition/sale made by an agent. The reason is obvious, instead of investing an important quantity of money to buy some stocks and waiting until there's a good market price to sell; the initial quantity of money which is invested is always small. So, where are the benefits? There are benefits, but the philosophy is one hundred and eighty degrees opposite. The secret is to start investing little money, until making that money become a huge amount under the minimum risk. Traditionally, low-risk operations haven't given a great benefit, but thanks to the power of computing we can multiply those small profits up to they had become a good business. This is possible because the type of systems, which are under examination by this paper, can monitor the price of a stock in many different markets of the world in real time; for instance, if the price of hundredweight of coffee in New York is the lowest one, an HFT will look for the best place to sell those goods in any part of the world, no mattering if it's Tokyo or Frankfurt. The average profit of a good HFT is estimated around 0.1% per operation, but if it's possible to multiply that percentage four hundred times per second (0.0025s/operation), the benefit will become a 4% or more, being this quantity what a good intermediary could achieve in an journey with a remarkable inspiration. To summarize, the motto could be expressed as *many few always sum more than few many*.

Once we have seen in what HFT systems are focused on, making money would look easy for every single company which is able to afford a super computer, but unluckily of investors, we don't live in *Neverland*. First of all, this type of trading doesn't escape from the number one law of economy: *"in a competitive market, the unit price for a particular good will vary until it settles at a point where the quantity demanded by consumers (at current price) will equal the quantity supplied by producers (at current price), resulting in an economic equilibrium of price and quantity"* [see *The Wealth of Nations.* Adam Smith. 1776]

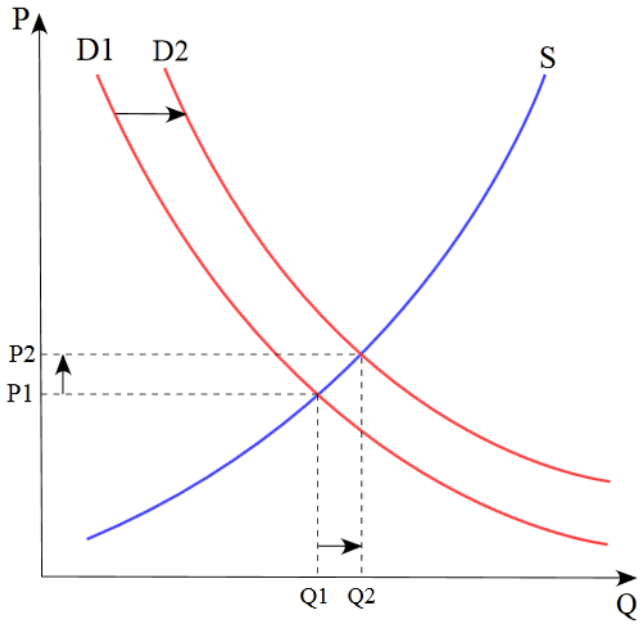

Fig. 4 Classical Supply-Demand curves. S = Supply; D1,D2 = demands; P = Unit Price; Q = Nº of Produced Units

Just to give an example, let's imagine that there's a great demand of wheat by the population, obviously obeying Adam Smith's "dogma of faith", automatically the acquisition price of cereals would increase if the production doesn't increase. Agriculturists, as any other person with a desire to make money, would increase the production of their product. Obviously HFTs would try to search for the best place to buy the wheat and the most expensive market to sell, but the problem is if there're too many intermediaries, the bubble sooner or later will get deflated, or even worse, it will explode. So after this trivial example, it's possible to arrive at two important and basic conclusions: acquisition operations have to be taken in a very elaborated way, this is to say, they have to be able to analyse how much close is the equilibrium point of a product supply-demand curve to determinate when it's not convenient keep longer a portfolio. But not only that, as in the real world, HFT systems compete among each other, that's why inside computer engineering environments, artificial intelligence is considered much more important and influential for electronic trading instead of computer architectures (distributed systems, power of calculus etc.). Therefore, the cornerstone in which is based the HFT is the game theory.

3. The "Intelligence" of an HFT system

As it happens in almost every game, there's a winner and a loser. Artificial intelligence has studied for a long time which algorithms (known as game strategies inside this scientific area) are the best ones to find out the shortest solution to the victory, and how that solution can be achieved using the minimum amount of computational resources.

There are many kinds of game strategies; lots of them produce decisions depending on the opponent "movements", but HFT algorithms have taken the state of the art one step further. They analyze something else than the market state or the performance of the competence; they're particularly special because they have developed such a level of sophistication that decisions are made knowing that the competence is supposedly sure about what we are going to do.

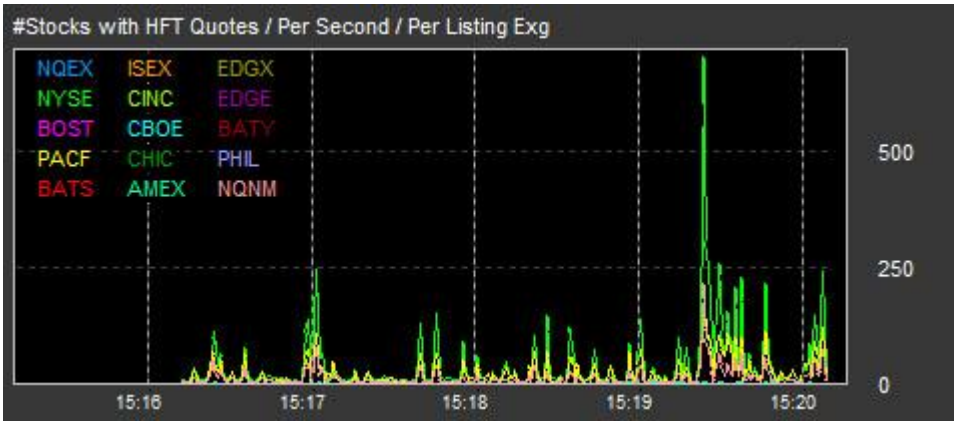

Fig. 5 Possible Quote Stuffing phenomenon (green peak) © Nanex

New strategies also involve new methods to have an advantage position on the market. The level of rivalry has arrived to an unbelievable rate that a new distraction system is born, its name is *Quote Stuffing* (**see Ref. 6**). This smokescreen is defined as: *"tactic of quickly entering and withdrawing large orders in an attempt to flood the market with quotes that competitors have to process, thus causing them to lose their competitive edge in high frequency trading. This tactic is made possible by high-frequency trading programs that can execute market actions with incredible speed. Only market makers and other large players in the market are capable of executing these tactics, since they require a direct link to the exchange in order to be effective"*.

This way of working takes advantage that HFT algorithms can be very obsessed with what the rivals do (**see Ref. 7**). So, if an algorithm or human experts who are behind an HFT system (It mustn't be forgotten that an electronic trading system – if it's needed – has to be completely submissive to a human operator) have detected a possible unexplored market in which it would be quite convenient to start in an advantageous position, they can distract the rivals emitting numerous orders of acquisition of options which belong to non-profitable market, assuming that that money is going to be lost or won't be extremely productive; and while the rivals are busy analyzing those false orders, it's possible to "attack" another virgin area of business with is still "unexplored".

The most amazing part of the affair is that all can happen in milliseconds. In such a brief period of time, it's possible to take and advantage from the commercial rivals, or even worse, making the competence sink while it's trying to operate in an already saturated area of the market. This way, an algorithm can be considered as a good one not only because can make lots of money in such a short period of time, we can consider an algorithm as intelligent if it's not susceptible of being deceived by another different algorithm. It sounds funny to say that algorithmic applied on economics, in addition than effective, smart and lightweight, has also become sullen and suspicious.

Fig. 6 Nasdaq data-center in Connecticut © Nasdaq

The last aspect to mention about the behavior of HFT solutions is that the eagerness to force them make money has achieved mad levels (**see Ref. 8**). As it has been exposed in many occasions before, it's not only critical making the most appropriate trading operation but also doing it in a privileged situation versus the competitors. So, to chase this aim, the obsession of private investment firms have taken these companies to install their own distributed systems in the very same physical places where the markets function. This last fact could seem inappropriate for modern times, where the invention which has revolutionized the world is the Internet, a communication channel that allows the interconnection of two different points of the globe, no mattering how much distance there's among them. But, an indistinguishable fact like a normal like a web page that is charged a millisecond sooner or later because the packets of information have followed a route a little bit longer than the best one – for readers who are not acquainted with how it's managed the information routing, it would be appropriate to say that all the portions of data which are used for networking are lead to their destination thanks to a series of devices called routers. Thanks to them, information arrives to its destination, but there's a delay introduced due to that management – instead of the shortest one, can be extremely harmful for a HFT system, because a competitor could have received the updated price of a stock before, and already completed the acquisition of that likely profitable commercial product. So, said in common language, the more physical distance there's between an electronic trader the likelier to be in a disadvantageous position against other competitors who are closer to markets where the prices of goods are regulated.

4. The pros and the cons of High Frequency Trading

The divergence of point of views about matters that are important for the society is totally common on the conduct of human individuals from the beginning of the time. An apparently distant topic from news bulletins like High Frequency Trading, if it was appropriately explained to the public opinion, it could become a world trendy topic on social networks and news headlines, due to the consequences that can have for many different fields of our way of life as an organized society, starting from the legislation field up to the social welfare. Just because of the previous reasons, this point of the paper will explain in an individualized sub-section several of the most important debate fronts that could be generated by this commercial way of operations.

4.1 HFT vs Legislation

Normally a law is elaborated to fill the moral vacuum of certain actions or behaviors of individuals who live in a society. Traditionally, legislation has been always accused of moving forward two or three steps slower than the society that regulates. But the problem right now is that there's an element that moves billions of times faster than the society.

Fig. 7 U.S. Securities and Exchange Commission logo © US gov

The commercial laws have a great frontline with electronic trading activities. To legislate about a sector. To begin with, there's the need of advising from experts on that concrete sector before taking a step. In this case, judges and legislators need the help of specialists on informatics and telecommunication to help them to elaborate the most appropriate legislation to regulate this sector. Just to give an example, the first legislative measure to be taken and long-time asked by the discordant voices of public opinion it would be fixing the minimum time latency of a trading operation (**see Ref. 9**). In other words, an electronic trading activity couldn't be taken in less time than that pre-established quantity of time. Well, the idea is laudable, but how long does that interval have to be? Milliseconds? Microseconds? It's seem surrealistic that such an insignificant duration of time can be so influential for the smooth running of the economy. Even more unthinkable that a legislator can determinate that concrete latency without help; here there is case of a professional who is not used to deal with problems with such a tremendous technical complexity which hasn't been included on his academic background.

To talk about the need of legislation, before it's indispensable to expose real examples that can behave like formal sources of law creation. A good one was the investigation opened by the United States Securities and Exchange Commission on September 2010 (**see Ref. 10**). The mentioned commission had warned a non-normal quantity of orders to buy/sell stocks that had been commanded and cancelled almost instantly and with some kind of periodicity (what it had been previously explained as *quote stuffing*). Behind this sort of unusual phenomenons there's always been the suspect of distorting the markets under controlled attacks, but before falling on hysteria, it's quite convenient to investigate the facts carefully.

Talking about making law reformations is easy, but it's much harder to make them real, because legislation power is not immune to some external groups of pressure. That's the reason why it's been set apart an special sub-paragraph to talk about the politics and its relation of HFT instead having included inside the legislation sub-unit.

4.2 HFT vs Politics

It could seem diametrically opposed that something like a field of computer engineering can have some kind of relationship with politics. The reason is obvious after having studied the possibilities of HFT systems, realizing that they can operate with the same stock in two different countries (for example buying hundredweights of coffee in Colombia and selling them in Paris); so they crash against the legislation of different nations. But, why hasn't this problem been exposed on the previous arguments?

That part of legislation has been mainly influenced since the XVIII by the only one political-economic current which has survived until the present days: Capitalism. One of the basic ideas of capitalism is suppressing the barriers which derivate due to the interventionism of the states in economy. The level of suppression varies from one country to another, but knowing that the big cake of HFT is cooked on the USA, it's not something strange to think that the liberal economic conception hadn't arranged to permeate its essence to field of electronic trading. Putting legislation obstacles to an activity like HFT can be tremendously unpopular in a region like North America. On the United States, examples of government interventionism like the creation of a nation healthcare public system have always been treated as socialist conducts – or even as communist attempts – by neo-con movements, so what could it happen if "daddy state" tries control the sancta sanctorum of the American dream: making money. The relationship is clear, almost 70% of the American stock markets are controlled by HFT systems.

Fig. 8 Critical graphical bullet against the Barack Obama's interventionism economy plans © Roger Maynard

Another aspect that has made economy experts be concerned about the possible good or bad effects of automatic trading has been the essential interconnection among international markets that is needed. Once again liberal policies comes to the fore, one of the other main dogmas in which modern conceptions of capitalism are based is globalization, something that occurs continuously while international stock exchanges take part (**see Fig. 8**).

Fig. 9 Simple illustration of the fast interconnection of markets thanks to High Frequency Trading © Quant House

4.3 HFT vs Economy

But what about the relationship of an economic tool like HFT with rest of the economy? From the pure academic point of view, this type of trading is almost brilliant: obtaining profits risking the smallest amount of capital.

Maybe it could seem that there are no advantages using HFT, but thanks to this system of stock exchange there's a flow of liquidity among international different countries almost instantly. Apart from that, machines don't suffer of panic or hunches as a person. In addition that person has to be paid via commission per one just transaction, so is there any reason to keep that kind of worker? Knowing that there is the chance to do the same operation thousands of times per second just paying the bill of the light?

On the other hand, inside the initial spirit of HFT it was contented the idea of suppressing the intermediaries among a private investor and the market. The problem is that computers that can operate in a such high frequency are extremely expensive to purchase, and even more important, the software that makes the difference is not standard at all. Every private investment firm has its own HFT algorithm which is maintained as top secret, so there's one more impediment to make this technology more accessible for investor like the ordinary citizen. Because as it's essentially known inside software engineering: customized software is expensive, and don't talk about a software like the one which is studied in this text, which is not only complex from the algorithmically point of view, it also needs a significant maintenance for the demanding networking service that requires.

This impediment is creating a new economic phenomenon: the oligopoly. Very few investment firms are controlling the market: Goldman Sachs, JP Morgan Chase, Merril Lynch etc. These enterprises have a power of acquisition of material that other smaller rivals cannot compete with. So, private investors would prefer to trust their money to these solid companies which have the best tools to make their money as productive as possible. In any case, these extremely dynamic operations are positive for the states from the point of view of the state coffers, more operations and benefits for investors mean more taxes to be collected.

4.4 HFT vs Morality

Can we plead ignorance if something goes wrong while high frequency trading? If there isn't any technical fail or a more competitive strategy, absolutely not. Explaining possible indirect effects of HFT using the arguments like "I didn't know it could happen", "I didn't know that there could be relationship", "nobody could imagine it before" etc. is not valid at all.

The echo of HFTs for society is not something banal. What does a Colombian coffee farmer know about HFT that influences on the price of the product which offered by him? Can he imagine that he could lose its harvest? Not because of the meteorological conditions; just because of the frenetic rhythm of the market that may provoke a bubble of the price of the product that he cultivates. Translated into a more general argumentation, it would be unavoidable to ask ourselves if HFT systems respect what many multinationals advertise and get proud of: social responsibility.

As the last point of this sub-section, a real case of questionable conduct is the one which was starred by Sergei Aleynikov (**see Ref. 11**), a Russian genius of programming who was arrested by the FBI under the charges of having improperly copied sophisticated, high-speed and high-volume trades on various stock and commodity markets, property of Goldman Sachs. Aleynikov was initially condemned to 97 months of prisons, but he alleged how was he punished when he had taken source coded which hadn't been patented and officially didn't exist because of all of the privacy agreements which try protect those algorithms. Finally, Aleynikov was absolved because he convinced New York district court that his arguments were valid (**see Ref. 12**).

4.5 HFT and Pressure Lobbies

On the contrary than what it could be thought, pressure lobbies wouldn't be represented by someone else than the always accused neocon groups. The first interested one on the use of HFT is the hardware/software industry. Unluckily the fabrication of some concrete products like super computers cannot only be maintained for scientific purposes, there's no better way amortize the high cost of a high performance computer than using it to make money.

Seen like this, there is a feedback among the area of scientific super-computing research and HFT. Mainly because this activity HFT has made super computers profitable. The production costs of these products cannot be reduced because cannot be mass produced. As another advantage, there's another feedback for super computing, HFT activities are a great source of information of how super computers work. Thousands of trading operations per second is not a depreciable input variable for super-computing research field, so there can be discoveries that can be applied onto another disciplines that make use of super computers like biomedical engineering.

Fig. 10 Nasdaq Data-Center super-computers © Nasdaq

To sum up, the level of requirement performance level which is asked by markets it's something that could be translated into benefits onto other disciplines. Formula-1 is a sport which is highly criticized because is its inventions are extremely expensive, but many people don't see that lots of those creations have arrived at our cars: ABS brakes, turbo engines, active suspensions, semi-automatic gear change, hybrid propulsion etc. Something similar could be happening with HFT and at same time not being valorized: the reduction of risks on strategies for artificial intelligence research, improvement of the network communication protocols, improvement of distributed computing etc.

5. Conclusions

To properly finish a paper like the present one, there's only the lack of the exposition of the personal position of the author about the corresponding matter. Being fair and honest, the opinions that will be given have been reached after the study and analyze of the possible advantages or disadvantages of the use of HFT technology. So they following conclusions – even being given by the less objective being of nature: human being – are trying to be the most object as possible. Something really strange to be understood while speaking about economy – it's not common at all that in a round-table debate there are economists with the same opinions – or politics; probably the most vitiated debate: if you don't agree with me, you're opponent.

To begin with legislation, this is the closest link of the chain to HFT. But the problem is that legislation suffers the inherent slowness of bureaucracy. Further slowed by the world of politics, which is able to fight legally until the eternity, not permitting the modification of laws which were created fifteen years ago by a commission after the necessities of the market. So the battle of legislation can be considered as a lost battle, that won't be revenged if there's not a significant collapse, unluckily many times measures are taken to avoid woes after they had happened.

Lobby pressures around HFT is not something new on economy, cronyism is something that is always under suspect in the USA. Not falling on conspirator theories, it's natural to believe that there are no coincidences when some political decisions are made. USA is a country that considers legal the donation of private funds to finance election campaigns. Are those private funds donated jus for tax breaks?

Maybe what it's not been analyzed about HFT is its influence on other areas of the economy. When an algorithm is processing information, this last one doesn't consider if its actions will have consequences for third parties; the only target is to make money, it doesn't matter what it happens around. This way, there is a remarkable emptiness on economy and legal area. Maybe saying that there's a legal emptiness on economy about something could sound presumptuous. The reason why this argument held is clear, there's a double emptiness for the professionals who design and make HFT system works. Basically the specialists who really understand the working of these systems are engineers, mathematicians or physicians, people who really comprehend how a complex algorithm can have the best profits but cannot understand the consequences of their actions in the interdependent world of economy. On the other side, we have the economists who maybe visualize the likely repercussion of malfunctioning HFT system, but don't really know how thing works. The solution would be making these two different kinds of professional work together, but do they speak the same language?

To cancel this problems of communication between professionals there would be no other chance than starting to form a new generation of double-degree students who can understand at the same time the repercussions of electronic trading and its complexity. But once again the slowness, creating those academic programs require the approval of public administration which are not precisely known by being fast. The alternative would be waiting for an engineer who decides to complete its background with some economy master degree, but that case requires at least six years, a such a long time period for galloping rhythm of today's economy. HFT systems are a powerful tool that if it is among the wrong hands, it would be like giving a bazooka to a kid or a pair of revolvers to a monkey. Maybe those weapons were given with good intentions, but under ignorant management – it's not said inappropriate management, it insists on ignorant use – the consequences can be unpredictable.

Fig. 11 Wall Street brave bull sculpture. The representation of the unpredictable character of stock markets

About morality, it's something we cannot make the machines understand, or at least not yet. Algorithms are only focused on making money in the best possible way, they don't understand if their actions will have influence in environments which are far away of the price-screens of the parquet. Other aspects like industrial espionage – this a crime that also happens on other economy activities, so it wouldn't be worthy to be deeply revised – could be studied among the lines of this paragraph, but the most concerning fact is social responsibility. So, is there any significant benefit for society if these activities are permitted? To be sincere with our consciousnesses, the mere profit of HFT is pure speculation. It's quite different than what a car company gives when producing cars: paid manpower, derivate Small-And-Medium-Enterprises (SMEs) etc.

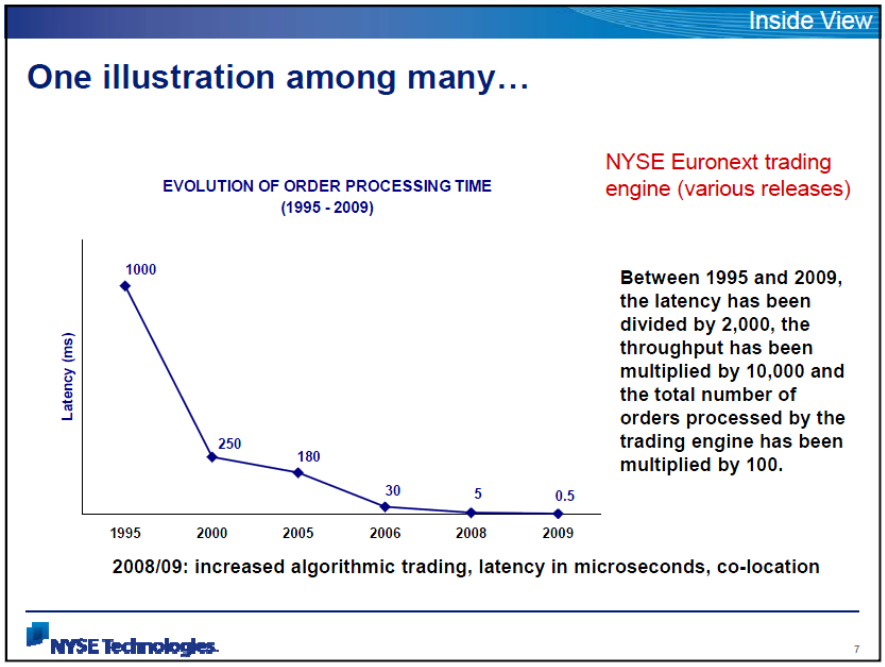

Fig. 12 HFT systems' evolution of order processing time © NYSE Technologies

Well, but the certainty of controlling an activity at the 100% level, it's something that can be never affirmed with a total security, the most famous case of Pandora's box which has been caused by an HFT is the *2010 Flash Crash* (**see Ref. 13**). When the industrial Dow-Jones index fell more than one thousand points, being this fall the second most significant one of the index history. Luckily for us the panic and the recovery only took half an hour. But, what could have happened if there hadn't been no turning back?

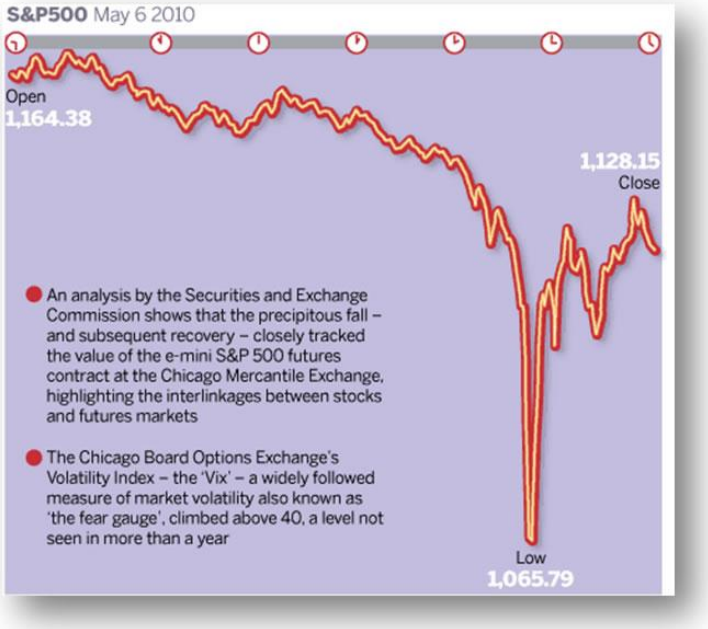

Fig. 13 Dow-Jones graphic of the 6th May 2010 Flash-Crash

As a final conclusion to close the text, it won't be said the risks of HFT are too big to be taken, so electronic trading has to be abolished. Totally not, they vision is quite different; being conscious that there's no turning back on HFT because there are too many implicated interests. However, there's a series of measures that wouldn't be indispensable for the safeguard of society's welfare; the institution of patterns like the minimum latency of an operation or the formation of dedicated professionals to avoid harmful phenomenons like disloyal competence, bubbles, industrial espionage etc. Under no circumstance, carrying out this measures will block the running of HFT activities, the problems comes when those factors whose aim is to earn money cannot understand they're not only elements of society that have to receive a remuneration. A good way to brake those lobbies is thanks to the force of public opinion – if it's not submissive to a corporate editorial line – but how is it possible to inform the big audience that 70% of markets activities are controlled by machines that they will never comprehend? Do HFT systems appear on the general news bulletins headlines very often?

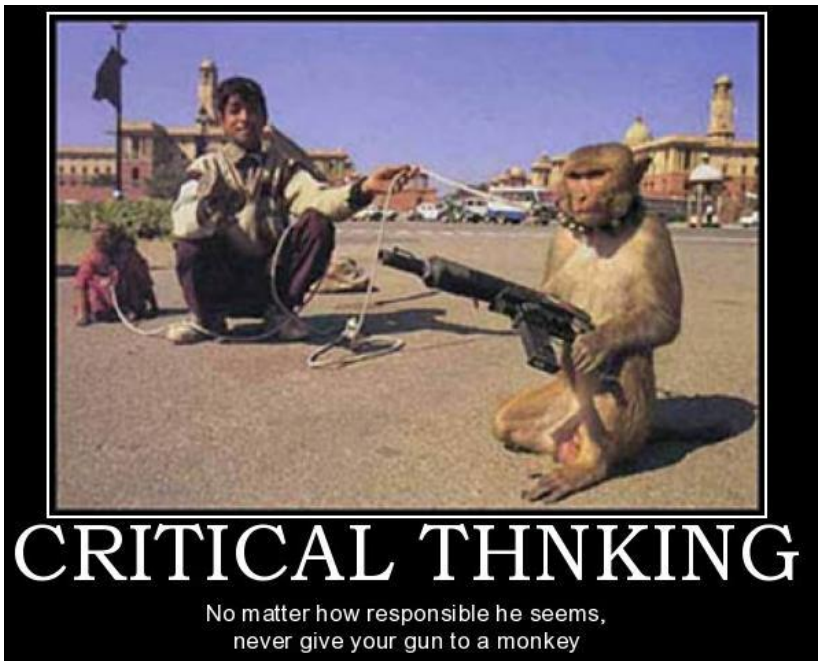

Fig. 14 Ironic Graphic Bullet about High Frequency Trading © Capital Chronicle

In any case, blaming on machines on our own ignorance it's easy, but it mustn't be forgotten that computers are essentially calculators, so they don't do what we want them to do, in fact, they do what we ordered them to do. In the end, behind a massive smokescreen stocks acquisition there's always a group of competitors who rule the machine in the best way to get the best incomes.

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