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Smart Dealing in Stock Market with the Tools of Mathematical Econometric

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***Abstract:** Algorithm we are using is an interdisciplinary field that combines knowledge of economics, engineering, mathematics, and computer science to understand and improve complex markets and social networks. ... The experts of algorithms in the field of economics try to understand and document these processes. Algorithms of algorithms are everywhere. They play the stock market, decide if you can get a mortgage, and get your car back on track. On request, they will search the Internet, place carefully selected advertisements on the sites you will fix the price to display in the online store. Algorithms are a crazy way of doing smart work. These are a series of precise steps that do not require much mental effort, but if you follow them accurately and mechanically, you will get the desired result. Adding long partitions and columns are examples you know all too well - if you follow the process, you are guaranteed to get the right answer. The Internet has created new advertising platforms and trading platforms such as online ad auctions and social networks, including modern algorithms, economic exchanges, and social systems. Algorithm experts in the field of economics try to understand and document these processes.*

The science of economic algorithms and computer science are linked for various reasons. There are complex applications that are widely used by digital markets on popular shopping sites such as eBay and Amazon. The website is currently a global market serving millions of offers and visitors daily. These programs are an attractive gold medal for market researchers and economists. As an alternative, university researchers want to understand the computer complexity of topics such as game theory and Nash equilibrium. To explore product models and new algorithmic phenomena in the Internet, computer scientists need tools and knowledge in areas such as sociology, game theory, and economic theory.

Most economists believe that a computer point is necessary to understand the digital world of online markets and online economic transaction platforms. The computer economy is less than 20 years old, but it has already reached remarkable levels of cooperation in various fields and has made significant progress in the development of many common research problems and mechanisms related to digital auctions. Thus, the ultimate goal is to facilitate the development of interactions between theoretical economists and computer scientists to define and understand online financial transactions and relationships. As more information emerges in the computer economy, businesses will understand consumer behavior and economists will be able to better understand digital microeconomics.

The organization of graphic arts has rapidly changed traditional forms of corporate finance, with businesses and government organizations only needing to understand this digital phenomenon. Programs also include forecasting tools, digital monetization, market optimization and machine learning across markets. Currently, online service providers and businesses are seeking dual research in social and computer science. This means that they need integrated information from technical fields such as programming algorithms, interface systems and machine learning in social sciences such as economics, sociology and psychology.

Combine your experience in the fields of economics and computer science, behavioral modeling and human engineering among mass market systems with Gap. For example, researchers often study many problems associated with game theory in computer systems, network design, and e-commerce applications. When designing mechanisms, researchers try to create structures that optimize target functions, such as supplier revenues or global contacts. They use hardware training and online algorithms to understand and optimize systems engineering processes.

Distributed under the terms of the Creative Commons Attribution- engineering mechanics or structural design methods can be used to solve unresolved economic problems. This is particularly true of the matrix method of structural engineering, which is useful here [1–3]. We can use this method to measure a country's GDP and even the entire global economy from the individual consumer or partner. In this article, calculations related to the development of a computer algorithm for this purpose.

Market Value:

In Real Estate, the Market Value is the Net Operating Income divide by the Capitalization rate [7]:

M.V.=NOI/CR
For the US,
M.V.=M$
For the US Economy:
=$2 trillion/2%=$1 \times 10^{14}$

Optimum population density
Optimum Population Density =c=3.0 [3]
ρ=M/Vol.
$1 \times 10^{14/3}$=0.3333=1/c
But E=Mc^2
E/c^2=M
1/3^2=M=1/9=0.111

The GDP Equation
Y=C+I+G+S+(EX-IM)
We know from AT Math, that Y=Y' is the optimum solution.
And M$=Y
M$= e^{-t} M$=1/2.71828~1/c^3 =1/c $\times$1/ c^2
=(1/9)2=0.1234567
E=Mc^2 =(0.111)(9)=1=100%
Continuing,
Y=Y'
GDP=M$=1/e

The Dampened Cosine Curve
Y=e^{-1}cos (2πt)
1/e=e^{-t}cos (2πt)
1=cos (2πt)
t = 1
But E=1/t
E=1=t

The Superforce
F=Ma
8/3=M(0.8415) [1]
M=π=t
E=1/t=1/π=31.8
E=W=∫Fdt
Fdt=1/π
(8/3)(d)(1)=1/π
d=119.4~M

E=1/t
dE/dt=Ln t
1=Ln t ,t=0,t=M
M=t+Y
Y=e-t cons(2πt)
=0.432(cos (2π^2)
=0.406~Re
∫freq=∫dM/dt
∫(1/π)=M
Ln t=M
Ln t=1
t=e
1/e=1/t=E=GDP=Y
Y=C+I+G+S+0
Let S=I
1/e=C+G+ S^2
Let G=17%, S=1/7
1/e=C+0.17=$(1/7)^2$
C=0.1775~√π
C=17.5%, G=17%, I=14.3%, S=14.3%
Y=C+G+I+S
GDP=(1-sin 1)=Moment [1]
1/(1-sin1)=1/0.1580=Fd=F(1/7)
F=0.111=1/c^2
F=1/c^2
FL=1/c^2 $\times$/c

Stiffness Equation
From Structural Engineering, we know,
F=ks [7]
K=[F/A]/[ΔL/L]
[(8/3)(1/c/L]/[ΔL/L] =8/ΔL

k=8/ΔL=(π-e)=cuz=0.4233
ΔL=18.9
ε=ΔL/L=18.9/L And,
σ=F/A
(8/3)/(1/cL) =64/L
L=1/c=Vol.
E=M=Y=t
E=Mc^2=c^2 $\times$ c^2=81
L=1/c=vol.
c^2=1 C=√(1)=1
d/t=c=t
d=1/7=S
F=ks
1/c=ks^2
1/c=k$(\frac{1}{7})^2$
k=1.633~1.623=Mass of a proton

Golden Mean Parabola
k=(π-e)=cuz=0.4233
k=(t-E)
k=[(1/E) -E]
k=(1-E^2)/E
Let k=1
1(E)=1-E^2
E^2-E-1=0

Golden Mean Parabola y=y'
k=1=E=t
1=E=e^{-t}
Ln 1=Ln (e^{-t})
0= -t
t=0
Dampened Cosine Curve
k=E=t=GDP=y=m$
An individual's income his stiffness k.
But
k= [F/A]/[ΔL/L]
k=1
F/A=ΔL/L
FL=ΔL A
But FL=1/c^3
m$=1/$c^3$=ΔLA
ΔL=M.V./A
M$/ΔL=A
M.V./ΔL=A
[$2 Trillion/2%]/[2%] =A
2 trilllion/4%=A
A=0.5

Maxima:
Emin= -1.25 for the Golden Mean Parabola at t=0.5
(Note: 100%/8%=1.25;
8% is the historic ROI for the Stock Market;

It is a series of dampened cosine curves on an upward trend HH Individual GDP Contributor Equation:
m$=y=c+i+g+s+(Lending-Borrowing)

For the entire economy, a personal GPD Equation should be developed. The aggregate equation:
∑m$=M$=Y=E=GDP

The technique of electronic recording of debit transactions is possible for each transaction conclusion. In the article, we provide an algorithm for the entire economy, from GDP to a country with individual transactions. With knowledge of the optimal level of spending, i.e. structural matrix analysis, economics Woman can safely produce a frequency sensor and can make adjustments to optimize the overall performance of the global economy. The next step is to write a computer program to calculate these parameters to make a better estimate.

Costs and benefits of algorithmic decision making: Examine the solutions provided by the algorithm and fix the errors found. This becomes even more important if the algorithm is not very accurate (observers do not spend a lot of time making the right decisions) and the wrong benefits (i.e. salary) excess and remaining penalties) of correcting wrong decisions are high. Cost is also important. A rational organization is more likely to hire managers if they do not receive very high salaries and if they are very productive (that is, they only need a few jobs).

1. The algorithm has the ability to make all the decisions it makes and learn from the information it contains in new decisions. New learning methods help algorithms "learn from the learning experience" and make more accurate decisions. [7] However, other solutions may also reduce the accuracy of the algorithm. He may have to deal with strange things, or may not be ready to handle new situations. [4] Worse, when the algorithm becomes extremely popular (more decisions are taken), people have more reason to play.

2. The second race between data scientists developing decision-making algorithms and observers to solve these algorithms. Data researchers are likely to "defeat" human observers because their productivity is high: one algorithm or one algorithm improvement can make millions of decisions. Rather, supervisors must consider each decision individually. This means that as the number of decisions increases, the majority of the organization's workforce accounts will be spent on monitoring, as costs increase as monitoring becomes more and more common. Complicated and complicated.

Results on organizations and policies

The processes I mentioned above have many interesting organizational and political implications. Here are some of them:

1. Find the correct domain selection algorithm

As I said, the algorithm decides in situations where there is a problem with paying high fines Necessary. [10] On the other hand, even if the penalty is less than the error, a wrong algorithm can cause a malfunction.

For example, recommendation mechanisms on platforms such as Amazon or Netflix often give inappropriate recommendations, but this is not a big deal because the penalty for these errors is relatively low - we ignore them. Data researcher Hilary Parker recently cited a viable podcast version of non-standard deviations from the need to take model accuracy and consistency into account in decision making:

"Most statistical methods are built into clinical trials when you talk about people's lives and those who have died from abuse, and are completely different."

One result is that in low-level environments, organizations can experiment with new, verified algorithms, some with less accuracy. By improving them, they can be moved to "high-end domains". Technology companies that develop the technologies that make up these algorithms often publish them as open source that others can download and improve, making this overlap possible.

2. The decision algorithm has its limitations in the field of high rates.

Algorithms should be used with much greater caution in areas where sanctions outweigh errors, such as the health or criminal justice system, and when algorithms work with groups more vulnerable to errors. [11] Only high-precision algorithms are suitable for these risky decisions, unless they are complemented by expensive observers who can detect and correct errors. This algorithm will create a natural limit for decision-making: how many people can you employ to find a wide number of solutions? Human attention is more of a daisy column

The current data revolution puts us at risk for information processing and decision making, and algorithms can help us solve this problem. These are machines that automate decision making, thereby increasing the number of decisions made by the organization. [5] This explains why they are qualified in the first place in industries where the amount and frequency of possible solutions can facilitate human work processes. [6]

If policy makers want to make better use of algorithms in these areas, they need to be involved in research and development to improve the accuracy of algorithms, encourage high-level algorithms in other areas, and use these new methods of organization, including algorithms. Should invest and their monitoring areas work better. .

Businesses are not immune to some of these issues: for example, YouTube has started advertising with fewer than ten thousand video views. In these videos, the revenue generated by the right advertising algorithms is possibly low (their viewers are low) and the penalty may be high (many of these videos are of questionable quality). In other words, the expected value of these solutions is low, so YouTube decided to stop creating them. Meanwhile, Facebook has just announced that it employs 3,000 monitors (about a fifth of its current workforce) on its network. You can imagine how more decisions can be taken to increase the decision-making capacity of algorithms indefinitely.

3. The advantages and disadvantages of monitoring people

One way to keep control costs low and cover solutions is to monitor users, for example by providing them with the tools to identify bugs and problems. YouTube, Facebook and Google have done so in response to their algorithmic arguments. Unfortunately, users may feel inadequate and anxious to obtain police services online. Sara T. Roberts, a law professor, explained in a recent Facebook interview a violent video debate:

"Often it is interrupted because you or someone like me is found. It means that everyone saw it and celebrated it, which contributed a lot to their work and their untold work. How do I contact those members of the public who do I see today and who can get injured? "

"Given the work done so far, they have not quickly or adequately responded to some of the recommendations that they have received. They can appear very quickly if something goes viral. Then be able to investigate them Should. The story is true and if it is false, block it or tell people that it is controversial. It cannot just be used. Words that authenticate the story Micro explains. [Facebook] to decide whether the story is false or not. "

Before applying the economic model to inform action, we need to determine the model's accuracy, penalties, and rewards, as well as environmental instability, levels of supervision, and the change in algorithm performance value due to them, and this is just the beginning. . [14]

This is a difficult but important task on which to base the assessment of existing assessment technologies and tools, including non-economic methods of outcomes assessment (for example, in healthcare). [15] Enriched data used by an organization's information system even before algorithmic decision making and simulation of its organization's impact can go. We see examples of such applications, such as the Regtech Financial Pilot Project managed by the European Commission. A recent article in Economics on Price Discrimination mentions "economic incubators"?

A practical and widely used analysis of social systems asked all parties to have a potential impact on AI systems. ". The study of philosophy, law, sociology, anthropology and science and technology, among others." Callow and Crawford were economists on their list. did not get. However, as stated in this blog post, economic thinking can contribute a lot to these criticisms and discussions. When thinking of algorithmic solutions in terms of benefits and costs. Organizational design is their downside. When and how to use these algorithms to influence the cost of more decisions.

Every year the economy has to become more and more involved in the construction machines that people use on the network. Social will guide in a more detailed and literary way than politics. Another way to do this is to transform the economy into a largely systematic user interface design. "

Creating organizations where algorithms and people work together to make better decisions will be an important part of this agenda.

[1] I use the term "algorithm" in a limited sense to convert information into prediction (And predictions depend on the decision system). There are several processes for this, including rule-based systems, statistical systems, machine learning systems, and artificial intelligence (AI). These systems differ in learning accuracy, scope, interpretation, and ability from their own experience, their specific characteristics should therefore be taken into account when analyzing algorithm compromise.

[2] We can also say that machine learning algorithms are the science of impossibility to correct errors. The queen compromised. A good example of this is the well-known example of overlap between observations of known models and predictions of strangers.

[3] One would say that personalization is not desirable, as it can give rise to discrimination and filtering bubbles, but this is a question on another blog.

[4] Danny Roderick's "Rules of Economics" argues that the model is a simple but useful modality of a complex reality.

[5] In a 2014 Harvard Business Review article, Ajay Aggarwal and colleagues presented the economic analysis of machine learning as a method that reduces predictive value. In my opinion, this is similar to the algorithm, because estimates are a contribution to decision making.

[6] This includes personal experiences and recommendations on e-commerce and social networking sites, as well as fraud detection and algorithmic financial trading.

[7] For example, if YouTube shows me ads that are very relevant to my interests, I can buy this product and it will generate revenue for the ads, videos and YouTube creators. If this is completely inappropriate or offensive to me, I can stop using YouTube or cause problems with the social network of my choice.

[8] Fortifications create training agents who use rewards and punishments from previous assignments to create new assignments.

[9] The Google Flotrands system is used to predict influenza infections based on global influenza surveys - people have changed their search behavior and destroyed the algorithm.

[10] In many cases, the penalty may be so high that we decide to never use the algorithm unless it is controlled by the public.

[11] Unfortunately, high-stake conditions are not always taken into consideration when implementing an algorithmic system. Katie O'Neill's Weapon of Mathematical Destruction provides many examples from the criminal justice system to admission to university.

[12] Accountability and relevant process mechanisms are another example of human control.

[13] Using Albert Herschmann's output, voice, and loyalty models, we can say that monitoring organizations play the role of "voice", helping organizations determine quality degradation before release. Consumers. ,

[16] Some of my main beliefs are placed in the Appendix and additional suggestions have been made.

[15] It involves an in-depth evaluation of algorithmic decision making and their organization using randomized controlled trial methods proposed by the Nesta Innovation Growth Lab.

[16] This decision may be based on the quality of display of demographic information on people who match different types of videos or watch videos.

[1] Analysis on this blog shows that algorithm decisions are independent of each other. This assumption can be violated in situations where algorithms generate a self-fulfillment prediction (for example, a user clicks on an ad the most often to show it), this is a difficult problem, but An Ares researcher has developed methods to solve this problem based on the randomization of algorithm solutions. .

[1] This is a variety of errors (for example, false positives and false Negative) does not differentiate between. I'll be back at the end.

[19] Here I believe that human observers are excellent but true. As we know from behavioral economics, this is a very strong assumption. I consider this question.

Finally, the implications of various beliefs on reward and punishment.

Algorithm that will maximize the expected value of relevant solutions: This value depends on three factors:

[1 factor]- Accuracy of the algorithm (A): the probability (from 0 to 1) that the algorithm will make the correct decision.

[18] Solution Reward (R): This is the reward when the algorithm makes the right decision.

Penalty Error (P): These are the costs of a bad judgment.

We can add precision, profit and penalty to calculate the expected value of the solution:

$$E = ar - (1-a)\ p \quad [1]$$

This value is positive. When the expected benefit of the algorithm solution exceeds the expected value (or risk):

$$Ar > (1-a)\ p \quad [2]$$

What can i say:

$$a / (1-a) > p / r \quad [3]$$

Human observer algorithms can identify and improve solutions. The effect of this strategy on the expected value of the solution depends on two parameters:

- Coverage coefficient (k): k is the probability that a human observer studies a solution using an algorithm. If k is equal to 1, it means that all algorithm solutions have been verified by people.

-Supervision cost (cs(k)): This is the value of monitoring algorithm decisions. The expense ratio depends on Kashmir because it takes longer to make a decision.

The approximate meaning of the algorithm solution in human observation is as follows: [19]

$$Es = ar + (1-a)\ kr - (1-a)\ kp - cs\ (k) \quad [4]$$

This equation means that some errors were identified and corrected, and others are not. We subtract [4] - [3] from the observation to obtain an additional expected value. After algebra, we get it.

$$(r + p)\ (1-a)\ k > cs\ (k) \quad [5]$$

Economic observation works only when it has the expected benefit (it depends on the algorithm to detect an error, detect an error and replace it correctly, after making the wrong decision). Net profit) exceeds the cost of monitoring.

Proportional rate increase

Here I understand that when we start increasing n, the number of decisions made by the algorithm.

The expected value is:

E (n) = nar + n (1-a) kr - n (1-a) (1-k) p [6]

And the costs are c (n)

How does all this change when n increases?

We make some assumptions about simplification: the organization wants to keep Kashmir continuously, while the reward r and the penalty p increase continuously. [20]

This leaves us with two variables that change as n increases: a and c.

• We assume that the accuracy of the algorithm is reduced by the number of solutions, because the processes that reduce the accuracy are more reliable than the processes that improve it.

• We assume that C is the cost of production, depends only on the work of scientists and observers. Each of these two classes receives paid wads and ws.

Based on this and according to some calculations, we are changing the expected benefits with more decisions:

$\partial E(n)/\partial (n) = r + (a+n(\partial a/\partial n))*(1-k)(r+p) - p(1-k)$ [7]

This means that as more and more decisions are made, the expected cumulative gain increases in a way that varies with the marginal accuracy of the algorithm. On the one hand, more decisions mean increasing the benefits of fair decisions. On the other hand, decrease in accuracy leads to increase in the number of errors and penalties. Some of them will be paid by supervisors.

Here are the costs:

$\partial C/\partial n = (\partial C/\partial Lds)(\partial Lds/\partial n) + (\partial C/dLs)(\partial Ls/dn)$ [8]

As the number of solutions increases, costs increase because organizations need to employ more scientists and thieves as data controllers.

[8] is the same as saying:

$\partial c/dn = wds/(\partial Lds/dn) + ws/zs/(\partial Ls/\partial n)$ [9]

The labor cost of each enterprise is directly related to its wages and marginal productivity. Assuming that data professionals are more productive than supervisors, this means that costs will increase with N due to the staff growth of supervisors.

Decision making for the organization maximizes the expected value (profit value) of the decision balance, where the marginal cost of the additional decision is equal to its marginal cost:

$r + (a+nda/dn)(1-k)(r+p) - p(1-k) = wds/(\partial Lds/\partial n) + ws/zs/(\partial Ls/\partial n)$ [10]

Different types of errors. First, the analysis does not assume that different types of errors (such as false positives and negatives, errors of varying degrees, etc.) may have different rewards and restrictions. I was also confident about reward and punishment when the probability of their random distribution was more real. This expansion will contribute to capital and biases in the analysis process. For example, if errors affect more sensitive people (who are subject to heavy penalties) and are less likely to detect these errors, it may increase the expected error penalty.

The person is not even perfect: All of the above believe that the algorithm is bad, but not people. This is clearly not the case. In many areas, algorithms may be a preferred option for people with deep biases. In such situations, to recognize the mistakes of the people and to write them The ability to do is reduced, which reduces the incentive to invite them (this is to reduce their productivity). Organizations are faced with investing in technological innovations (for example, on platforms) and quality assurance systems (including additional levels of human and algorithms) that manage the risks of human and algorithm degradation.

Non-linear rewards and punishments: I felt that marginal penalties and rewards would be constant as the number of algorithmic solutions increased. It should not happen. The following table gives an example of situations where this parameter varies depending on the number of decisions made:

Empirical control of these processes is important because they can determine whether there is a natural constraint on the number of algorithmic decisions that an organization can make in an economy or market that may have potential consequences for its regulation. Market Value

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