# Super-fair Platforms Widely Hidden in Multinational Securities Business


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## Abstract

A general phenomenon puzzles all investors is that on one hand, most individual investors believe they need to construct the portfolio consisting of 15 or more stocks to prevent risk because that large investment companies frequently get high returns is due to they obey the existing investment theory to make the portfolio consisting of more than 100 stocks, but the individual investors loss their wealth averagely. On the other hand, a few risk-likes bravely invest their total money on at most 3-4 securities with high "risk" and they get higher returns frequently. Fantastically, every single manager of these large investment companies only supervises 3-4 securities even though the whole portfolio consists of more than 100 securities. This phenomenon seems slightly against the existing investment theory, so we propose a new view, the super-fair platforms, to explain it. To answer the suspicion of the potential users, we prove that number of the super-fair platforms is big and the size of each super-fair platform is big enough so that any large investment company in this world can find a super-fair platform to fit his hopes. And we give an alarming function to hint the buying and shelling times so that the users can adjust their amount of securities for getting much higher returns.



**Keywords**:super-fair platform; odds; wave; independence; Alarming function.


## 1. Introduction

The concept of the super-fairness comes from a racehorses nhorse race defined as the set of satisfying [1]:

$$\begin{cases} \text{a sub-fair market, if } \sum \frac{1}{o_i} > 1 \\ \text{a fair market, if } \sum \frac{1}{o_i} = 1 \\ \text{a super-fair market, if } \sum \frac{1}{o_i} < 1 \end{cases} \qquad (1.1)$$

where, $O_i$ is the odds that means a gambler would get $O_i$ dollars by the end of the horse race for every dollar if the $i^{th}$ horse wins. The economical meaning of the super-fairness is that the organizers will contribute money to enlarge the odds $O_i$. So, the super-fairness does not exist in really horse race. However, it is very popular in securities businesses. For showing this issue, we introduce some concepts as follows:

**Odds**: Let $X$ be a security, we say the odds of $X$ is $O$ if we may get dollars with a certain probability while we invest every dollar at the beginning of the term. $O$

Let $A_i$ be the events of the $i^{th}$ securities arrives at its odds $O_i$, then the probability of $A_i$ was denoted by $p_i$ $(1,2,...,i\ n\ =)$. Let $A_i$ denote the opposite event of, then $p(\overline{A_i}) = 1 - p_i$ A positive number $O_\Sigma$ is called expectable odds if it satisfies

$$1 < \max\{p_i O_i\} < O_\Sigma < \min\{O_i\} \qquad (1.2)$$

**Completed wave**: We assume all investors have known Ralph Nelson Elliott's Wave Principle; they can familiarly to recognize the start point, the wave 1 and wave 2, the left shoulder, the head, the right shoulder and the last bottom as shown in the figure 1. Thus for most investors, they will get the odds $O = \overline{p} / p_0$, where $\overline{p}$ is the mean of the prices within N2 and N3, and $P_o$is the mean of the prices of the prices before the time 0 as shown in figure 1.

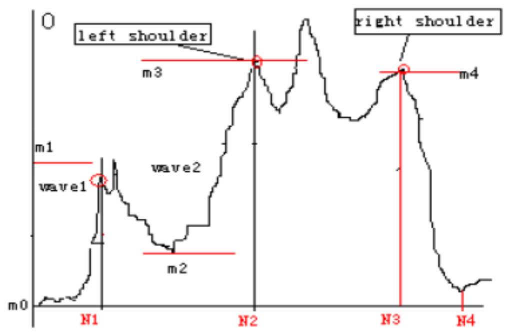


Figure 1 the relationship between standards variance and the means of prices within a wave

**Block:** For a given securities [X], block is the set of these securities whose characteristics are the same as X. In practice, we can decide a security belongs to which blocks according to its background. In mathematical view, a pair of securities is seemed as in the same block if their similar coefficient is great than a threshold (e.g. 0.95). All securities in the same block would have the same odds and same probability.

**Almost completeness:** Blocks $[x_1],[x_2]......[x_n]$ is called almost completed if

$p(A_1 \cup A_2 \cup ... \cup A_n) \approx 1$ or $p(\overline{A}_1\overline{A}_2...\overline{A}_n) = \alpha \approx 0$.

**The size of a block**: The total market values of all securities in the block [X] are called the size of the block.

**Super-fair platform:** $[X_1]......[X_n]$ is called super-fair platform if the super-fairness defined in (1.1) hold and that $n$ is the minimum such that the almost completeness holds.

## 2. Alarming Function

The calculation of the odds by formula $O = \overline{P}/P_0$ is too rough. There is another better estimation formula after we introduce an alarming function H(t) defined as follows:

$$H(t) = m(t) - E(\alpha_t)\sigma(t)$$

$$m(t) = \frac{1}{t}\sum_{n=1}^{t}(P_n - P_0), \qquad (1.3)$$

$$\sigma(t) = \left\{\frac{1}{t-1}\sum_{n=1}^{t}[(P_n - P_0) - m(t)]^2\right\}^{\frac{1}{2}}$$

$$E(\alpha_t) = \frac{1}{t}\sum_{i=1}^{t}\alpha_i, \quad where\ \alpha_i = \frac{m(i)}{\sigma(i)}$$

The alarming function has strong connection with the wave and we shown it by a really stock as figure 2:

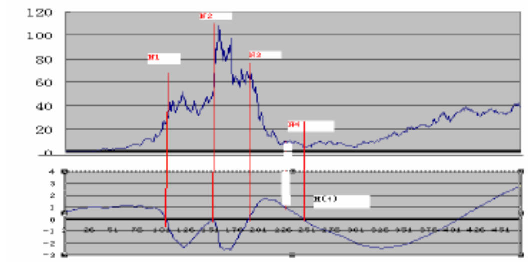


Figure2. The really effect of the alarming function created by yahoo (NYSE market). We have used more than hundreds waves to check the correctness is higher than 75%. On the set of the perfect waves, the correctness is much higher than 95%. We welcome the readers join us to do the test on more perfect samples.

Alarming function is very smooth and it has a few 0-points corresponding to the left and right shoulders, and the bottom of a perfect wave. The statistical law based on lots of perfect waves is significant as follows

$H(t) \square\ 0,\ as\ t \square\ N_1;\quad H(t) \square\ 0,\ as\ t \square\ N_2;$

$H(t) < 0,\ N_2 < t < N_3;\ H(t) \square\ 0,\ as\ t \square\ N_3.$

where $N_1$, $N_2$ and $N_3$ are the times that price arrives at the left shoulder of Wave1, the left shoulder of the whole wave, and the right shoulder of a wave respectively. Then we can get more highly odds $O$ as follows:

$$O = \begin{cases} \dfrac{m_1 + k_1(m_3 - m_2)}{m_0}, & k_1 = \dfrac{m_1}{m_2} > 1 \\ \dfrac{m_1 + k_1(m_3 - m_2)}{m_0} + \dfrac{k_2(m_4 - m_0)}{m_0}, & k_2 > 0 \end{cases} \qquad (1.4)$$

The second formula of (1.4) is used to estimate the odds for permitting sell-empty. Otherwise, use the first one.

Alarming function reflects the important turning of the prices statistically. Within a perfect wave, the first two 0-points are alarming users to sell but users need not to worry, until the curve turning it direction from bottom. The third 0-pint is alarming the user to sell empty, this the deadline, user should sell all amount of this security before curve closes to the third 0-point. The fourth 0-point awakes the users to buy back this security.

## 3. Testing the existence of super-fair platforms in multinational markets

Over-view all securities business, more than 80% of securities whose odds exceed 4 within a 5-year if we use our formula (1.4). But all stocks have ten years recordings that we can download from website provided by Yahoo is a set of 255 representative stocks, 213 of 255 stocks belong to New York Securities business, 28 of 255 belong to Shanghai

Market, and 14 of 255 draw from NASDAQ market during May 1 of 1996 to December of 2005. Based on this benchmark set, we have the following results:

- 81.5% of the 255 stocks can get the odds exceed 4 within 5-year.
- The probability that the odds exceed 4 within the second 5-year if the odds exceed 4 within the first 5-year is almost 0.6.
- Typically, we compute the correlation matrix for the 255 stocks based on the historical recording data during 1996-05-01 to 2001-12-30. Then we choose threshold 0.8, and the corresponding four blocks:

  $[X_i]=\{Y \mid cor\{Y,X_i\}\geq 0.8\}$ as shown in table 1.

| market | block1 | Block2 | Block3 | block4 |
|---|---|---|---|---|
| New York | AES Corp<br>Allergan Inc<br>America First Apartment Investors Inc.<br>Amphenol Corp.<br>AMVESCAP plc.<br>Archstone-Smith Trust.<br>Arthur J Gallagher & Co<br>Automatic Data Processing<br>Bank of New York Co. Inc<br>Barr Pharmaceuticals Inc<br>BCE Inc<br>Beckman Coulter Inc<br>Biovail Corp<br>C&D Technologies Inc<br>Camden Property Trust<br>CarrAmerica Realty Corp<br>Cleco Corp | AZZ incorporated.<br>Bedford Property Investors Inc. | Brandywine Realty Trust. | |
| Shanghai | G Second spin [illegible]<br>The sea birds<br>Happy Flying<br>G South Ocean | Da chang | | |
| NASDAQ | | | | Accelrys Inc.<br>Allied Motion Technologies Inc. |

Table1. [AES Corp], [AZZ incorporated], [Bradley Pharmaceuticals Inc.] and [Allied Motion Technologies Inc.]

The correlations between the four representative stocks were enclosed in table 2.

| Name of stocks | AES Corp. | AZZ incorporated. | Bradley Pharmaceuticals Inc. | Allied Motion Technologies Inc. (NASDAQ) |
|---|---|---|---|---|
| AES Corp. | 1 | 0.00635 | 0.00298 | -0.00644 |
| AZZ incorporated. | 0.00635 | 1 | 0.3469 | 0.345287 |
| Bradley Pharmaceuticals Inc | 0.00298 | 0.3469 | 1 | 0.244702 |
| Allied Motion Technologies Inc. (NASDAQ) | -0.00644 | 0.345287 | 0.244702 | 1 |

Table2. The correlations among above given four stocks. Two stocks are independent if the absolute of the correlation is less than 0.01.

If we think that the first and the second are independent and that the third and the fourth are independent and

$$\max_{i=1,2;j=3,4}\{cor\{X_i,X_j\}\}\leq 0.35$$

Then we may assume that

$$\max\{p(A_1A_2),p(A_1A_4),p(A_2A_{30}),p(A_2A_4)\}\leq 0.35$$

This is big enough to think these four blocks as a super-fair platform.

The total market value of this platform is US$ 182.85 billion according to the values given by table 3.

While the number one in this world is the Magellan whose total money is only 50 billion, it can not occupy this entire platform.

| Name of stocks | Market value (US$) | Name of stocks | Market value(US$) | Name of stocks | Market value(US$) |
|---|---|---|---|---|---|
| AES Corp | 276.63 | BCE Inc | 214.59 | G South Ocean | 1.9125 |
| Allergan Inc | 128.82 | Beckman Coulter Inc | 35.17 | AZZ incorporated. | 1.4 |
| AmericaFirst Apartment Investors Inc. | 1.58 | Biovail Corp | 40.28 | Bedford Property Investors Inc | 35.66 |
| Amphenol Corp. | 55.9 | C&D Technologies Inc. | 1.73 | Brandywine Realty Trust. | 56.19 |
| AMVESCAP plc. | 76.79 | CamdenPropertyTrust. | 36.66 | Accelrys Inc. | 1.75 |
| Archstone-SmithTrust. | 99.38 | CarrAmerica Realty Corp | 47.43 | Allied Motion Technologies Inc. | 4.53 |
| Arthur J Gallagher & Co | 26.06 | Cleco Corp | 10.8 | Sea Birds | 0.87 |
| Automatic Data Processing Inc. | 257.73 | G second spin | 2.125 | Happy Flying | 5.9 |
| Bank of New York Co. Inc | 253.91 | Barr Pharmaceuticals Inc | 154.7 | | |

Table3. The list of the market values of the platform; If we can download all stocks in the world, then the size of the platform is large enough so that the money of any company is only a sufficiently small amount related to this size of the platform, as well, if all securities are collected, then the market value of each of the four blocks will be large. The large investment companies can construct the portfolios within one or many platforms if they like

We have $p(\overline{A}_3 \mid \overline{A}_1)=1-p(A_3 \mid \overline{A}_1)\leq \frac{3}{8}$ since

$$p(A_3 \mid \overline{A}_1)=\frac{p(A_3\overline{A}_1)}{p(\overline{A}_1)}=\frac{p(A_3)-p(A_3A_1)}{p(\overline{A}_1)}$$

$$\geq \frac{0.6-0.35}{0.4}=\frac{5}{8}.$$

And we have the corresponding probability

$$\begin{aligned}p(A_1\cup A_2\cup A_3\cup A_4)&\\=1-p(\overline{A}_1\overline{A}_2\overline{A}_3\overline{A}_4)&\geq 1-0.0225\\=0.97725&\end{aligned}$$ since

$$\begin{aligned}&p(\overline{A}_1\overline{A}_2\overline{A}_3\overline{A}_4)\\&=p(\overline{A}_1\overline{A}_2)p(\overline{A}_3\overline{A}_4 \mid \overline{A}_1,\overline{A}_2)\\&=p(\overline{A}_1)p(\overline{A}_2)p(\overline{A}_3 \mid \overline{A}_1,\overline{A}_2)p(\overline{A}_4 \mid \overline{A}_1,\overline{A}_2)\\&=p(\overline{A}_1)p(\overline{A}_2)p(\overline{A}_3 \mid \overline{A}_1)p(\overline{A}_4 \mid \overline{A}_1)\\&=0.4^2\times(3/8)^2=0.0225\end{aligned}$$

## 4. The portfolios on super-fair platforms

In each super-fair platform, we propose a novel portfolio that differs from the existed portfolios [2, 5]. Let $r_j$ be the rate of the rest wealth of the $i^{th}$ securities within the term, and $\lambda_j$ be the missed rate of the $i^{th}$ securities: $\lambda_j=1-r_j$ if the investors have no prescript to stop mission, and $\lambda_j=v_j$ while the investors have the prescripts so that the loss $v_j<1-r_j$

**Theorem:** For any expectable odds $O_\Sigma$ and a given small positive number $\alpha>0$，we may find many large-size super-fair platforms such that $p(A_1 \cup A_2 \cup \ldots \cup A_n) \geq 1-\alpha$. And on any platform$[X_1],[X_2]\ldots[X_m]$ if we divide the money into $b_1\ldots..b_m$ such that

$$\begin{cases} \sum_{i=1}^{m} b_i < 1 \\ b_i(O_i - 1) > \sum_{j\neq i}^{m} b_j \lambda_j, \quad \forall i = 1,\ldots,m \end{cases} \quad (4.1)$$

Then within 5-year, the return is much greater than $\overline{r} =$

$$\min_{i\leq n} \log_2 \left\{ 1 + \sum_{j\neq i} b_j (1-\lambda_j) + (1 - \sum_{j=1}^{m} b_j)(1+r) \right\}$$

with probability that is larger than $1-\alpha$.

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