Collected papers
of
Lord Soumadeep Ghosh

Volume 2

Documenting the presence of an arbitrage opportunity

Soumadeep Ghosh

Kolkata, India

Abstract In this paper, I describe the presence of an arbitrage opportunity in the Indian soft drinks market. The paper ends with “The End”

Introduction

Arbitrage opportunities are rare to find, but they do exist. In this paper, I describe the presence of an arbitrage opportunity in the Indian soft drinks market.

The presence of an arbitrage opportunity in the Indian soft drinks market

At the time of this writing, a 500 ml PET bottle of Thums Up is priced at INR 30 at retail, whereas a 750 ml PET bottle of Thums Up is priced at INR 40 at retail. Thus, there is a difference in the per ml price of Thums Up at retail and hence the presence of an arbitrage opportunity.

The End

The boons of bongo

Soumadeep Ghosh

Kolkata, India

Abstract In this paper, I describe the boons of bongo. The paper ends with “The End”

Introduction

Having read the hindu scriptures, bongo, the original male god of the bengalis, sought communion with the gods. In this paper, I describe the boons of bongo.

Obtaining the first boon from krishna

Bongo prayed to krishna in order to obtain communion with him. Pleased with the worship by bongo, krishna bestowed the boon that all his descendants would never fall out of love among each other.

Obtaining the second boon from kalki

Encouraged by the result of worship of krishna, bongo prayed to kalki to seek communion with the warlord. True to the scriptures, kalki bestowed the boon on him that his domain would never run out of warlords.

The result of bongo’s worship

Armed with the two boons, bongo was elevated to the position of king among the bengalis and his progeny continues to rule bengal today.

The End

The geopolitical circle of influence

Soumadeep Ghosh

Kolkata, India

Abstract In this paper, I describe the geopolitical circle of influence which is useful in making several geopolitical decisions. The paper ends with "The End"

Introduction

The **geopolitical circle of influence** of a state S is defined as the circle centered at its capital C with a radius $r(t) = k(t)Z(t)$

where

$r(t)$ is the time-dependent radius of the geopolitical circle of influence of the capital

$k(t)$ is the time-dependent ratio of monetary expansion of the capital

$Z(t)$ is the time-dependent Z-score of the capital

The End

Using the geopolitical circles of influence

Soumadeep Ghosh

Kolkata, India

Abstract In this paper, I describe the use of geopolitical circles of influence to make several geopolitical estimations and therefore geopolitical decisions. The paper ends with "The End"

Introduction

In a previous paper, I have defined the **geopolitical circle of influence** of a state S. In this paper, I describe the use of geopolitical circles of influence to make several geopolitical estimations and therefore geopolitical decisions.

Use 1: Estimating the size of empires

The estimate of the size of empire of nation N is given by the union of the geopolitical cirles of influence of the states S_i of the nation.

Use 2: Estimating the location of superior financial economics

Define the **geopolitical circles covering index** of a point to be the number of geopolitical circles of influence containing that point. The higher the index, the higher is the expected superiority of financial economics at that point.

Use 3: Estimating the location of warzones

Define the **geopolitical circles covering variance** to be the variance of the radii of geopolitical circles of influence containing the point. The higher the variance, the higher is the probability that the point is in a warzone.

The End

My process of writing papers

Soumadeep Ghosh

Kolkata, India

Abstract In this paper, I describe my process of writing papers which is consistent with the Krishnaic tradition. The paper ends with “The End”

Introduction

Writing papers that are consistent with the Krishnaic tradition is very easy if one knows the right process. In this paper, I describe my process of writing papers which is consistent with the Krishnaic tradition.

The process

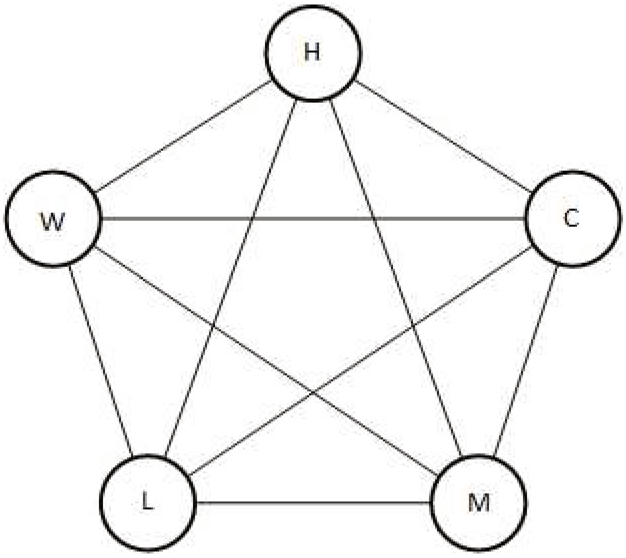
First, I form a general idea of the academic area in which I wish to write a paper. Second, I chant the ’Hare Krishna Hare Rama’ mantra to seek the blessings and permission of Krishna to write the paper. Third, I visit a temple to know whether the paper is acceptable by the gods. Fourth, I write the paper. Fifth, I post the paper on my website. Sixth, I share the link to the paper on a platform that expects the paper. Finally, I ask for feedback on the paper from my peers.

The End

Helmet Wheel Conch Lotus Mace

Soumadeep Ghosh

Kolkata, India



The Krishnaic pentagon and its uses

Soumadeep Ghosh

Kolkata, India

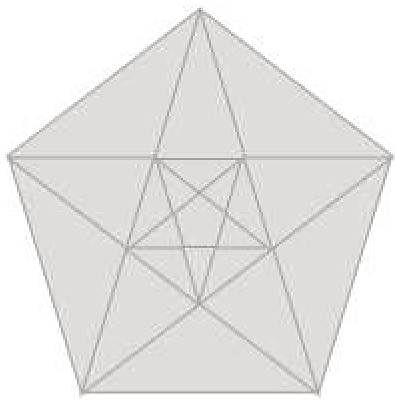
Abstract In this paper, I describe the Krishnaic pentagon and it uses. The paper ends with "The End"

Introduction

The **Krishnaic pentagon** is the purest tool of natural magic. In this paper, I describe the Krishnaic pentagon and it uses.

The Krishnaic pentagon

Figure 1: The Krishnaic pentagon



The Krishnaic pentagon is a magical realization of the 5 articles of Krishna - the helmet, the wheel, the conch, the lotus and the mace. The inner star is the magical representation of Lord Krishna himself. The pattern can be iterated further to create more powerful versions of the Krishnaic pentagon.

The uses of the Krishnaic pentagon

The Krishnaic pentagon can be used to perform natural magic but only by a devotee of Lord Krishna. The uses of the Krishnaic pentagon include, but are not limited to, the following:

- Obtaining a glimpse of Lord Krishna
- Obtaining a gift from Lord Krishna
- Obtaining a professy from Lord Krishna
- Obtaining the blessings of Lord Krishna

Natural magic using the Krishnaic pentagon

Natural magic using the Krishnaic pentagon can be performed easily by a devotee of Lord Krishna by chanting the 'Hare Krishna Hare Rama' mantra at the center of the pattern. But it must be kept in mind that only a devotee of Lord Krishna will be able to reap the benefits of such natural magic.

The End

Two simple fractal fort designs

Soumadeep Ghosh

Kolkata, India

Abstract In this paper, I describe two designs of fractal forts. The paper ends with "The End"

Introduction

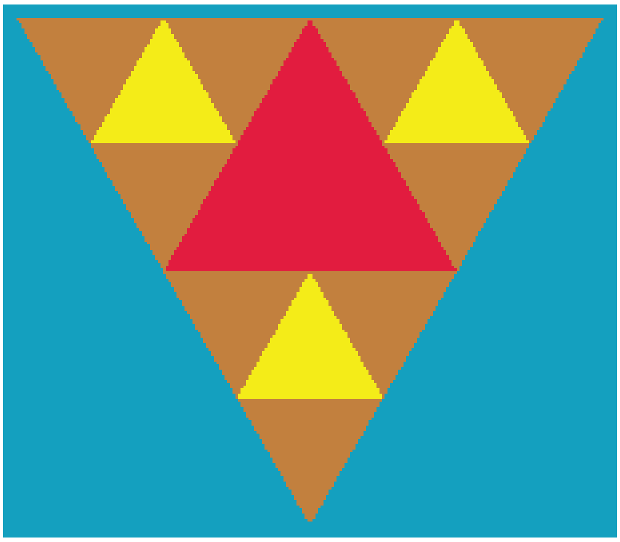
Forts inspired by fractals can be designed and may prove useful in certain geostrategic situations. In this paper, I describe two designs of fractal forts.

The legend

In the top view figures that follow, black denotes walls, blue denotes moats, brown denotes towers, yellow denotes cavalry and red denotes infantry.

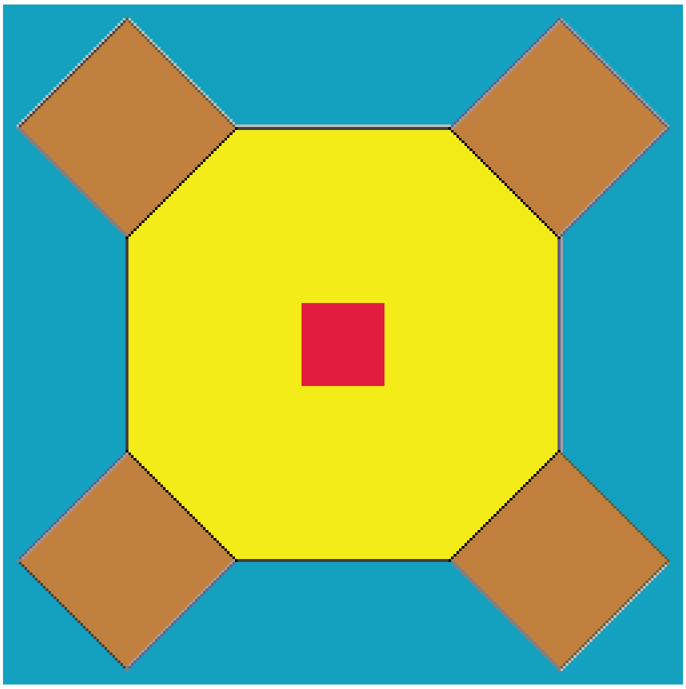
The infantry-overweight triangular fractal fort

Figure 1: The infantry-overweight triangular fractal fort



The cavalry-overweight square fractal fort

Figure 2: The cavalry-overweight square fractal fort



The End

The Cesaro fractal fort design

Soumadeep Ghosh

Kolkata, India

Abstract In this paper, I describe the Cesaro fractal fort design. The paper ends with "The End"

Introduction

Forts inspired by fractals can be designed and may prove useful in certain geostrategic situations. In this paper, I describe the Cesaro fractal fort design.

The legend

In the top view figure that follows, black denotes walls, blue denotes moats, yellow denotes cavalry and red denotes infantry.

The Cesaro fractal fort

Figure 1: The Cesaro fractal fort

The End

Predicting outcomes of Thucydides' traps using machine learning

Soumadeep Ghosh

Kolkata, India

Abstract In this paper, I describe how to predict outcomes of Thucydides' traps using machine learning. The paper ends with "The End"

Introduction

In the book Destined for War, Allison uses the phrase Thucydides's Trap which, according to him, refers to the theory that "when one great power threatens to displace another, war is almost always the result".

In this paper, I describe how to predict outcomes of Thucydides' traps using machine learning.

Predicting outcomes of Thucydides' traps using machine learning

I have created a Mathematica notebook with the code and data required to predict outcomes of Thucydides' traps. The notebook uses a simple code to transform the text data obtained from Harvard into numbers and uses machine learning to predict outcomes of Thucydides' traps.

Notebook

The Mathematica notebook `TT.nb` is available online at `http://ghosh.site/TT.nb`.

The End

On the maintenance of tributaries

Soumadeep Ghosh

Kolkata, India

Abstract In this paper, I describe how to maintain tributaries of a state. The paper ends with "The End"

Introduction

Maintenance of tributaries of a state is extremely important because it determines several outcomes including diplomatic power, statecraft and war. In this paper, I describe how to maintain tributaries of a state.

The first order of maintenance of tributaries

The state is said to have the **first order of maintenance of tributaries** if there exists a constant k_1 such that

$$T_i = k_1 G_i$$

where

T_i is the tribute supplied by a tributary

G_i is the GDP of the tributary

The second order of maintenance of tributaries

The state is said to have the **second order of maintenance of tributaries** if there exists constants k_1 and k_2 such that

$$T_i = k_1 G_i + k_2 (G_i - \frac{\sum_{i=1}^{i=n} G_i}{n})$$

where

T_i is the tribute supplied by a tributary

G_i is the GDP of the tributary

n is the number of tributaries

The third order of maintenance of tributaries

The state is said to have the **third order of maintenance of tributaries** if there exists constants k_1, k_2 and k_3 such that

$$T_i = k_1 G_i + k_2 (G_i - \frac{\sum_{i=1}^{i=n} G_i}{n}) + k_3 R_i$$

where

T_i is the tribute supplied by a tributary

G_i is the GDP of the tributary

R_i is the risk of the tributary

n is the number of tributaries

The fourth order of maintenance of tributaries

The state is said to have the **fourth order of maintenance of tributaries** if there exists constants k_1, k_2, k_3 and k_4 such that

$$T_i = k_1 G_i + k_2 (G_i - \frac{\sum_{i=1}^{i=n} G_i}{n}) + k_3 R_i + k_4 (R_i - \frac{\sum_{i=1}^{i=n} R_i}{n})$$

where

T_i is the tribute supplied by a tributary

G_i is the GDP of the tributary

R_i is the risk of the tributary

n is the number of tributaries

Higher orders of maintenance of tributaries

Higher orders of maintenance of tributaries are theoretically possible, but generally not observed as the ideological alignment required to obtain a higher order of maintenance requires tighter integration of the economies of the tributaries to the state. In such a case, the tributaries generally end up solidifying their relation to the state through marriage of respective royalties.

Static-tributaric weaving

The process of obtaining an order of maintenance of tributaries is called **static-tributaric weaving**.

The higher the order of maintenance of tributaries, the higher is the expected stability and longevity of relations between the state and its tributaries.

Static-tributaric unraveling

The process of losing an order of maintenance of tributaries is called **static-tributaric unraveling**.

The lower the resultant order of maintenance of tributaries and the quicker the process of unraveling, the higher is the expected probability of war between the state and its tributaries.

The End

A model of the opium war

Soumadeep Ghosh

Kolkata, India

Abstract In this paper, I describe a model of the opium war based on the Y and Z scores of the states. The paper ends with "The End"

Introduction

The opium war is the sixth of the classical wars that will be fought in the world. In this paper, I describe a model of the opium war based on the Y and Z scores of the states.

The opium war

The opium war is defined as a war between the opiate and non-opiate states using the opium rate.

The model

The model of the opium war is given by the following equations:

$$M_O = p_O|Z_O - Y_O|$$

$$M_N = p_N|Z_N - Y_N|$$

$$\frac{D_O}{D_N} = \frac{M_O}{M_N}e^{-Ot}$$

$$\frac{P_O}{P_N} = \frac{D_O}{D_N}$$

where

Z_O is the Z score of the opiate state

Z_N is the Z score of the non-opiate state

Y_O is the Y score of the opiate state

Y_N is the Y score of the non-opiate state

M_O is the number of medications of the opiate state

M_N is the number of medications of the non-opiate state

p_O is the co-efficient of **opiate production** of the opiate state

p_N is the co-efficient of **non-opiate production** of the non-opiate state

D_O is the number of doctors treating with opiate medication

D_N is the number of doctors treating with non-opiate medication

P_O is the number of patients treated with opiate medication

P_N is the number of patients treated with non-opiate medication

O is the **opium rate**

t is time since start of the opium war

The End

On buffer states

Soumadeep Ghosh

Kolkata, India

Abstract In this paper, I describe the use of geopolitical circles of influence to determine buffer states and discuss the implications for them. The paper ends with “The End”

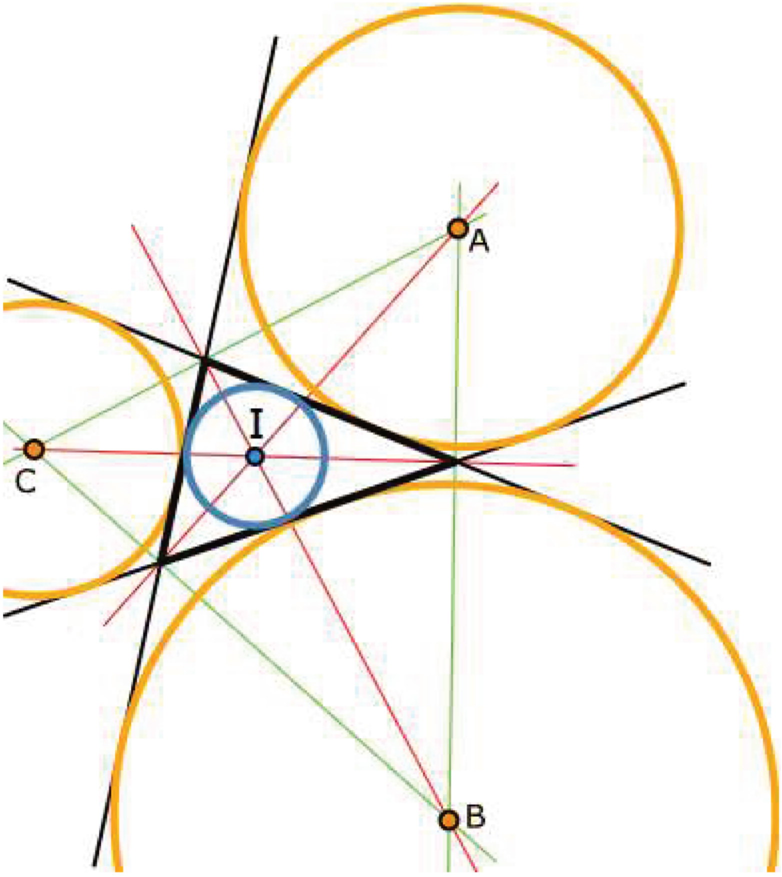
Introduction

In a previous paper, I have defined the **geopolitical circle of influence** of a state S. In another previous paper, I have described the use of geopolitical circles of influence to make several geopolitical estimations and therefore geopolitical decisions. In this paper, I describe the use of geopolitical circles of influence to determine buffer states and discuss the implications for them.

Buffer state

A **buffer state** is a state lying between two or more rival or potentially hostile greater states. Its existence can sometimes be thought to prevent conflict between the greater states. A buffer state is sometimes a mutually agreed upon area lying between two or more greater states, which is demilitarized in the sense of not hosting the military of either greater state but usually has its own military. The invasion of a buffer state by one of the greater sstates surrounding it often results in war between the greater states.

Figure 1: Geographic configuration of a buffer state



Let A, B and C be the capitals of three states. Then a configuration like shown above is a configuration of a buffer state with capital I. The buffer state is given by the exterior triangle of the inner geopolitical circle tangent to the three geopolitical circles of A, B and C.

Evolution of a buffer state

The evolution of a buffer state generally follows one of three routes:

1. The buffer state **disintegrates** through annual tribute to one or more of the greater states.

2. The buffer state **descends** into a warzone due to increasing forces of one or more greater state.

3. The buffer state **stabilizes** through diplomacy of a high standard among itself and the greater states.

Implications for a buffer state

If a state recognizes itself to be a buffer state, then it has to understand the situation it faces and act accordingly. Room for diplomatic maneuver is limited for a buffer state and is likely to be limited further in the future. According to Fazal[1], ”buffer states are significantly more likely to die than are nonbuffer states.” Thus, the buffer state has to forge alliances, military, economic and political, with at least one of the greater states to remain a viable state in the future.

References

[1] Fazal, Tanisha M. ”State Death in the International System”. International Organization [2004]

The End

Envy-free financial options

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe financial options that are envy-free whenever envy is greater than unity. The paper ends with "The End"

Introduction

Envy-free financial options are the most useful and logical way to reduce envy in an economy. In this paper, I describe financial options that are envy-free whenever envy is greater than unity.

Envy-free financial option

Let P be the price of a financial option that pays e^2 in the envy-full state and e in the envy-free state.

Then the price of the option is given by

$$P = \frac{pe^2 + (1-p)e}{1+r}$$

where
p is the probability of the envy-full state of the economy
e is the envy in the economy
r is the risk-free interest rate in the economy

The price of an envy-free financial option

Note that $P \geq \frac{e}{1+r}$ whenever $e \geq 1$

Pricing of envy-free financial options

Note that envy-free options **cannot** and **should not** be priced by a Black-Scholes model.

The End

The 3-year δ-γ formula of GDP recovery

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the 3-year δ-γ formula of GDP recovery. The paper ends with "The End"

Introduction

A single year of decline in the GDP growth of a nation is usually not a matter of concern as it is easily correctable within a 3-year time frame. In this paper, I describe the 3-year δ-γ formula of GDP recovery.

The equation of GDP growth

The equation of GDP growth is given by

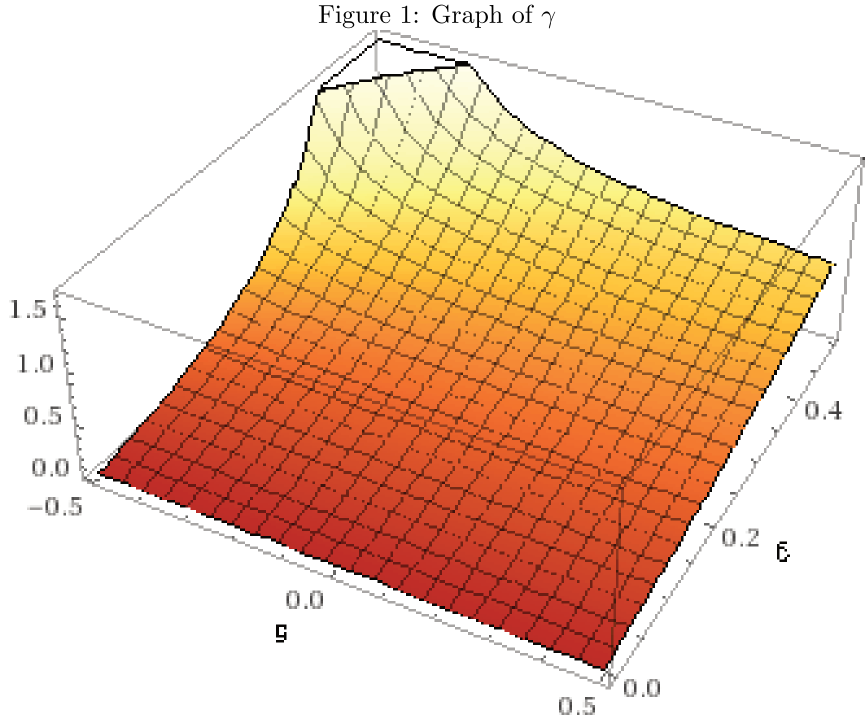
$$(1+g)(1+g-\delta)(1+g+\gamma) = (1+g)^3$$

which gives us the δ-γ **formula**

$$\gamma = \frac{(1+g)^2}{(1+g-\delta)} - 1 - g$$

where
g is the growth rate in the first year
δ is the decline in growth rate in the second year
γ is the recovery in growth rate in the third year

Figure 1: Graph of γ



This is the graph of γ as a function of g and δ.

The End

The 5-year δ-γ-β-α formula of regime change

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the 5-year δ-γ-β-α formula of regime change. The paper ends with "The End"

Introduction

A single year of decline in the GDP growth of a nation is usually not a matter of concern as it is easily correctable within a 3-year time frame. But if it is not corrected in the third year, then a regime change is likely within the next two years. In this paper, I describe the 5-year δ-γ-β-α formula of regime change.

The equation of GDP growth

The equation of GDP growth is given by

$$(1+g)(1+g-\delta)(1+g-\gamma)(1+g-\beta)(1+g+\alpha) = (1+g)^5$$

which gives us the δ-γ-β-α **formula**

$$\alpha = \frac{(1+g)^4}{(1+g-\delta)(1+g-\gamma)(1+g-\beta)} - 1 - g$$

where
g is the growth rate in the first year
δ is the decline in growth rate in the second year
γ is the decline in growth rate in the third year
β is the decline in growth rate in the fourth year
α is the recovery in growth rate in the fifth year

Regime change

Regime change begins by the end of the third year, the fourth year is the **conflict year** and recovery happens in the fifth year.

The End

The 7-year δ-γ-β-α-w-ϵ formula of overthrow

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the 7-year δ-γ-β-α-w-ϵ formula of overthrow. The paper ends with "The End"

Introduction

A single year of decline in the GDP growth of a nation is usually not a matter of concern as it is easily correctable within a 3-year time frame. But if it is not corrected in the third year, then a regime change is likely within the next two years. But if regime change does not occur in the fifth year, then overthrow of the government is likely within the next two years. In this paper, I describe the 7-year δ-γ-β-α-w-ϵ formula of overthrow.

The equation of GDP growth

The equation of GDP growth is given by

$$(1+g)(1+g-\delta)(1+g-\gamma)(1+g-\beta)(1+g-\alpha)(1+g-w)(1+g+\epsilon) = (1+g)^7$$

which gives us the δ-γ-β-α-w-ϵ **formula**

$$\epsilon = \frac{(1+g)^6}{(1+g-\delta)(1+g-\gamma)(1+g-\beta)(1+g-\alpha)(1+g-w)} - 1 - g$$

where
g is the growth rate in the first year
δ is the decline in growth rate in the second year
γ is the decline in growth rate in the third year
β is the decline in growth rate in the fourth year
α is the decline in growth rate in the fifth year
w is the decline in growth rate in the sixth year
ϵ is the recovery in growth rate in the seventh year

Overthrow

Overthrow begins by the end of the fifth year, the sixth year is the **wrath year** and recovery happens in the seventh year.

The End

The 9-year δ-γ-β-α-w-ϵ-v-ζ formula of revolution

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the 9-year δ-γ-β-α-w-ϵ-v-ζ formula of revolution. The paper ends with "The End"

Introduction

A single year of decline in the GDP growth of a nation is usually not a matter of concern as it is easily correctable within a 3-year time frame. But if it is not corrected in the third year, then a regime change is likely within the next two years. But if regime change does not occur in the fifth year, then overthrow of the government is likely within the next two years. But if overthrow does not occur in the seventh year, then national revolution is likely within the next two years. In this paper, I describe the 9-year δ-γ-β-α-w-ϵ-v-ζ formula of revolution.

The equation of GDP growth

The equation of GDP growth is given by

$$(1+g)(1+g-\delta)(1+g-\gamma)(1+g-\beta)(1+g-\alpha)(1+g-w)(1+g-\epsilon)(1+g-v)(1+g+\zeta) = (1+g)^9$$

which gives us the δ-γ-β-α-w-ϵ-v-ζ **formula**

$$\zeta = \frac{(1+g)^8}{(1+g-\delta)(1+g-\gamma)(1+g-\beta)(1+g-\alpha)(1+g-w)(1+g-\epsilon)(1+g-v)} - 1 - g$$

where
g is the growth rate in the first year
δ is the decline in growth rate in the second year
γ is the decline in growth rate in the third year
β is the decline in growth rate in the fourth year
α is the decline in growth rate in the fifth year
w is the decline in growth rate in the sixth year
ϵ is the decline in growth rate in the seventh year
v is the decline in growth rate in the eighth year
ζ is the recovery in growth rate in the ninth year

Revolution

Revolution begins by the end of the seventh year, the eigth year is the **violent year** and recovery happens in the ninth year.

The End

On ritual animal sacrifice by the sovereign of a nation

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the inticracies of ritual animal sacrifice by the sovereign of a nation. The paper ends with "The End"

Introduction

The ritual animal sacrifice by the sovereign of a nation is the most important duty of the sovereign of a nation. In this paper, I describe the inticracies of ritual animal sacrifice by the sovereign of a nation.

The nature of ritual animal sacrifice

Contrary to popular belief, the ritual animal sacrifice by the sovereign of a nation is not merely a custom in certain religions, pagan or otherwise. It is, quite frankly, the **most important duty** of the sovereign of a nation, for only through sacrifice to the Lord is prosperity of the nation possible.

It is mentioned quite clearly in the gita that the Lord is the only enjoyer of sacrifices and any ritual that is not made with this fact in mind is certain to incur the wrath of the gods. On the other hand, ritual animal sacrifice that is consistent with this fact is certain to enjoy the blessings of the gods.

Choosing the correct animal for sacrifice

The correct animal for sacrifice is chosen by the injunctions written in the vedas. So, it is the horse for the ashwamedha sacrifice and the sheep or goat for the annual animal sacrifice.

Contrary to popular belief in certain religious practices, the sacrifice of a cow or calf is **not** beneficial for a nation for Lord Krishna was a cowherd and has an attachment for milch cattle.

Choosing the correct time for sacrifice

The correct time for ritual animal sacrifice is to be decided by the astrologer in the court of the sovereign according to the astrological charts at his disposal.

The correct pronouncement of sacrifice

The correct pronouncement of sacrifice is simply the words, *"Oh Lord, may this animal sacrifice please you and bless me and my nation with prosperity, peace and security."*

The End

Greedy financial options

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe financial options that are easy to price using a greedy algorithm. The paper ends with "The End"

Introduction

Greedy financial options are the most useful and logical way to reduce greed in an economy. In this paper, I describe financial options that are easy to price using a greedy algorithm.

Greedy financial option

Let P be the price of a financial option that pays g in the greed-full state and g^2 in the greed-free state.

Then the price of the option is given by

$$P = \frac{pg + (1-p)g^2}{1+r}$$

where
p is the probability of the greed-full state of the economy
g is the greed in the economy
r is the risk-free interest rate in the economy

The price of a greedy financial option

Note that $P \geq \frac{pg}{1+r} \geq 0$

Pricing of a greedy financial options

Note that greedy financial options **cannot** be priced using a Black-Scholes model but **can** be priced using a greedy algorithm.

The End

Zero-price fear options

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe zero-price financial options that use fear as the underlying. The paper ends with "The End"

Introduction

Zero-price fear options are the most useful and logical way to reduce fear in an economy. In this paper, I describe financial options that use fear as the underlying.

Fear option

Let P be the price of a financial option that pays $\frac{f}{p}$ in the attacked state and $-\frac{f}{1-p}$ in the non-attacked state.

Then the price of the option is given by

$$P = \frac{p\frac{f}{p} - (1-p)\frac{f}{1-p}}{1+r} = 0$$

where
p is the probability of the attacked state of the economy
f is the fear in the economy
r is the risk-free interest rate in the economy

The End

The modified option

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the modified financial option that uses treason by Narendra Damodardas Modi as the underlying. The paper ends with "The End"

Introduction

The modified option is the most useful and logical way to extract political leverage in an economy. In this paper, I describe the modified option that uses treason by Narendra Damodardas Modi as the underlying.

The modified option

Let P be the price of a financial option that pays $-C$ in the treason state and 0 in the non-treason state.

Then the price of the option is given by

$$P = \frac{-pC}{1+r} \leq 0$$

where

p is the probability of Narendra Damodardas Modi committing treason

$-C$ is the cost of the treason of Narendra Damodardas Modi to the economy

r is the risk-free interest rate in the economy

Pricing the modified option

The modified option can be priced by taking the fraction $\frac{v}{n+v}$ as the estimate for p

where

v is the number of Youtube viewers of the video of Rahul Gandhi's allegation of treason on Narendra Damodardas Modi

n is the number of Youtube users who have not viewed the video of Rahul Gandhi's allegation of treason on Narendra Damodardas Modi

The End

On military readiness

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe two fundamental laws of military readiness. The paper ends with "The End"

Introduction

In a previous paper, I have described the calculation of a Z score to measure a state and predict trade, diplomacy and war with other states. In this paper, I describe two fundamental laws of military readiness.

Military readiness

Military readiness is defined as the state of being prepared for a militaric eventuality by the military of a state.

The first law of military readiness

The **first law of military readiness** stipulates

$$M = aZ + b$$

where
M is the size of the military of the state
Z is the Z-score of the state assigned by the state
a and b are two constants

The second law of military readiness

The **second law of military readiness** stipulates

$$\frac{M}{P} = cVar(Z_i) + d$$

where
M is the size of the military of the state
P is the size of the population of the state
$Var(Z_i)$ is the variance of the Z-scores of the neighbouring states of the state assigned by the state
c and d are two constants

The End

On distributed military organization

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the fundamental law of distributed military organization. The paper ends with "The End"

Introduction

In a previous paper, I have described two fundamental laws of military readiness. In this paper, I describe the fundamental law of distributed military organization.

Military organization

Military organization is defined as the act of arranging different constituents of the military to achieve a specific objective by the military of a state.

Several different alternatives of military organization exist according to the specific objective.

In this paper, I describe the fundamental law of **distributed military organization** which is useful for a variety of objectives including general resistance, counter-revolution and counter-insurgency.

The fundamental law of distributed military organization

The **fundamental law of distributed military organization** stipulates

$$\sqrt{Var(\frac{m_i}{M})} = e\sqrt{Var(Z_e)} + f$$

where

m_i is the size of a unit of military

M is the size of the military of the state

$Var(Z_e)$ is the variance of the Z-scores of the enemy states of the state assigned by the state

e and f are two constants

The End

On 2-split military organization

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the fundamental laws of 2-split military organization. The paper ends with "The End"

Introduction

In a previous paper, I have described two fundamental laws of military readiness. In this paper, I describe the fundamental laws of 2-split military organization.

Military organization

Military organization is defined as the act of arranging different constituents of the military to achieve a specific objective by the military of a state.

Several different alternatives of military organization exist according to the specific objective.

In this paper, I describe the fundamental law of **2-split military organization** which is useful for a variety of objectives including surrounding the enemy and militaric hedging.

The fundamental laws of 2-split military organization

The **fundamental laws of 2-split military organization** stipulate

$$M = a + b$$

$$\frac{a}{R_a} = \frac{b}{R_b}$$

where
M is the size of the military of the state
a is the size of the A-team of the military of the state
b is the size of the B-team of the military of the state
R_a is the risk taken by the A-team of the military of the state
R_b is the risk taken by the B-team of the military of the state

The End

On n-cell military organization

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the fundamental laws of n-cell military organization. The paper ends with "The End"

Introduction

In a previous paper, I have described two fundamental laws of military readiness. In this paper, I describe the fundamental laws of n-cell military organization.

Military organization

Military organization is defined as the act of arranging different constituents of the military to achieve a specific objective by the military of a state.

Several different alternatives of military organization exist according to the specific objective.

In this paper, I describe the fundamental law of **n-cell military organization** which is useful for a variety of objectives including surrounding the enemy and militaric hedging.

The fundamental laws of n-cell military organization

The **fundamental laws of n-cell military organization** stipulate

$$M = \sum_{i=1}^{n} c_i$$

$$\sum_{i=1}^{n} R_i = R$$

$$\frac{c_i}{R_i} = \frac{\sum_{i=1}^{n} c_i}{\sum_{i=1}^{n} R_i}$$

where
M is the size of the military of the state
c_i is the size of the i^{th}-cell of the military of the state
R_i is the risk taken by the i^{th}-cell of the military of the state
R is the risk taken by the military of the state

Standard n-cell configurations

Some standard n-cell configurations include the following:

- 3-cell: Army, Navy and Airforce
- 4-cell: Army, Navy, Airforce and Ballistics
- 5-cell: Army, Navy, Airforce, Ballistics and Spaceforce

The End

The arbitrage opportunity of the next decade

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the arbitrage opportunity of the next decade present between the Indian and Russian economies. The paper ends with "The End"

Introduction

Arbitrage opportunities are rare to find but they do exist. In this paper, I describe the arbitrage opportunity of the next decade present between the Indian and Russian economies.

The arbitrage opportunity of the next decade

As of this writing on December 1 2019, we have 1 RUB = 1.11548 INR[1], the bank rate in Russia is 6.50%[2] and the bank rate in India is 5.4%[3].

My recommendation

I recommend the Indian and Russian governments to take any and all steps required to enable Indian and Russian citizens to take advantage of this arbitrage opportunity.

References

1. `https://www.xe.com/currencyconverter/convert/?Amount=1&From=RUB&To=INR`
2. `http://cbr.ru/eng/hd_base/KeyRate`
3. `https://www.rbi.org.in`

The End

My standard method to calculate the α score

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe my standard method to calculate the α score of a military. The paper ends with "The End"

Introduction

Nations will benefit from a standard method to calculate the α score of a military. In this paper, I describe my standard method to calculate the α score of a military.

My standard method to calculate the α score

Let $\mathbf{G} = \{V, E\}$ be the graph of the military of the state with each vertex v of the vertex set V denoting a militaric individual and each edge e of the edge set E denoting a chain of command.

Let $d = \sum_{v_i \in V} deg(v_i)$ be the sum of the degrees of all the vertices of the vertex set V.

Let e be the number of edges in the edge set E.

Calculate the α score by solving the equation

$$d = \alpha + eln\alpha$$

The End

My standard method to calculate the β score

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe my standard method to calculate the β score of an economy. The paper ends with "The End"

Introduction

Nations will benefit from a standard method to calculate the β score of an economy. In this paper, I describe my standard method to calculate the β score of an economy.

My standard method to calculate the β score

Let $\mathbf{G} = \{V, E\}$ be the graph of the economy of the state with each vertex v of the vertex set V denoting an individual and each edge e of the edge set E denoting an economic link with weight w_e denoting the total capital produced by the two vertices (individuals) of the edge.

Let $d = \sum_{v_i \in V} deg(v_i)$ be the sum of the degrees of all the vertices of the vertex set V.

Let $w = \sum_{e_i \in E} weight(e_i)$ be the sum of the weights of all the edges of the edge set E.

Calculate the β score by solving the equation

$$w = \beta + dln\beta$$

The End

My standard method to calculate the γ score

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe my standard method to calculate the γ score of a polity. The paper ends with "The End"

Introduction

Nations will benefit from a standard method to calculate the γ score of a polity. In this paper, I describe my standard method to calculate the γ score of a polity.

My standard method to calculate the γ score

Let $\mathbf{G} = \{V, E\}$ be the graph of the polity of the state with each vertex v of the vertex set V denoting a politician and each edge e of the edge set E denoting a political chain of instruction.

Let v be the number of vertices of the vertex set V.

Let e be the number of edges in the edge set E.

Calculate the γ score by solving the equation

$$e = \gamma + vln\gamma$$

The End

Five disciplines of art for the police and the military

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the five disciplines of art for training the police and the military. The paper ends with "The End"

Introduction

Training the police and the military of the nation in five disciplines of art mentioned here will be beneficial for the nation:

1. Fencing
2. Shooting
3. Horse-riding
4. Chess
5. Interrogation

The End

The Ghosh map projection

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the Ghosh map projection. The paper ends with "The End"

Introduction

The Cartesian coordinates (X, Y) of a point on a map are calculated from latitude ϕ and longitude λ using the forward mapping functions

$X = f_x(\phi, \lambda)$

$Y = f_y(\phi, \lambda)$

In this paper, I describe the Ghosh map projection.

The Ghosh map projection

The Ghosh map projection is given by the forward mapping functions

$f_x(\phi, \lambda) = cos(\lambda)$

$g_y(\phi, \lambda) = sin(\phi)$

The End

The money machine

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the SEK-INR-RUB-SEK money machine. The paper ends with "The End"

Introduction

Arbitrage opportunities in foreign exchange trading can result in **money machines**.

The SEK-INR-RUB-SEK money machine

As of this writing, as per rates on `https://www.xe.com`, 1 SEK = 7.50372 INR, 1 INR = 0.894566 RUB and 1 RUB = 0.149003 SEK.

Thus 1 SEK = 7.50372 * 0.894566 * 0.149003 SEK = 1.000193483 SEK.

The End

The Ghosh equation of central bank operation

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the Ghosh equation of central bank operation. The paper ends with "The End"

Introduction

How do you run a central bank? In this paper, I describe the Ghosh equation of central bank operation.

The definition of monetary energy of a central bank

Define

$$E(t) = G(t)r(t)\int_0^t v(t)dt + \frac{1}{2}G(t)v(t)^2$$

where
$E(t)$ is the monetary energy of the central bank
$G(t)$ is the monetary value of the gold reserves of the central bank
$r(t)$ is the risk-free rate of the central bank
$v(t)$ is the velocity of the currency produced by the central bank

The Ghosh equation of central bank operation

The Ghosh equation of central bank operation is given by

$$\frac{dE}{dt} = 0$$

The End

The Ghosh equation of reserve bank operation

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the Ghosh equation of reserve bank operation. The paper ends with "The End"

Introduction

How do you run a reserve bank? In this paper, I describe the Ghosh equation of reserve bank operation.

The definition of monetary momentum of a reserve bank

Define

$$P(t) = G(t)v(t)$$

where
$P(t)$ is the monetary momentum of the reserve bank
$G(t)$ is the monetary value of the gold reserves of the reserve bank
$v(t)$ is the velocity of the currency held by the reserve bank

The Ghosh equation of reserve bank operation

The Ghosh equation of reserve bank operation is given by

$$\frac{dP}{dt} \geq 0$$

The End

The Ghosh equation of gold bank operation

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the Ghosh equation of gold bank operation. The paper ends with "The End"

Introduction

How do you run a gold bank? In this paper, I describe the Ghosh equation of gold bank operation.

The Ghosh equation of gold bank operation

The Ghosh equation of gold bank operation is given by

$$\frac{dG}{dt} \geq 0$$

where
G(t) is the monetary value of the gold reserves of the gold bank

The End

A model of tariff war

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a model of tariff war based on the Y and Z scores of the states. The paper ends with "The End"

Introduction

Tariff wars have been waged from ancient times. In this paper, I describe a model of tariff war based on the Y and Z scores of the states.

Tariff war

Tariff war is defined as a war between two states using tariffs and military conscription.

The model

The model of tariff war is given by the following equations:

$$T_A = t_A|Z_A - Y_A|$$
$$T_B = t_B|Z_B - Y_B|$$
$$G_A = (1 + g_A)G_A^{-1} - T_B$$
$$G_B = (1 + g_B)G_B^{-1} - T_A$$
$$M_A = (1 + I)M_A^{-1}$$
$$M_B = (1 + I)M_B^{-1}$$
$$\frac{D_A}{D_B} = (\frac{t_A}{t_B})^I$$

where
Z_A is the Z score of state A
Z_B is the Z score of state B
Y_A is the Y score of state A
Y_B is the Y score of state B
t_A is the co-efficient of tariff of state A
t_B is the co-efficient of tariff of state B
T_A is the tariff imposed by state A on state B
T_B is the tariff imposed by state B on state A
G_A is the GDP of state A
G_B is the GDP of state B
G_A^{-1} is the previous GDP of state A
G_B^{-1} is the previous GDP of state B
g_A is the GDP growth rate of state A
g_B is the GDP growth rate of state B
M_A is the number of militaric individuals of state A
M_B is the number of militaric individuals of state B
M_A^{-1} is the previous number of militaric individuals of state A
M_B^{-1} is the previous number of militaric individuals of state B
D_A is the number of militaric deaths of state A
D_B is the number of militaric deaths of state B
I is the intensity of the tariff war.

The End

A model of cognitive war

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a model of cognitive war based on the Y and Z scores of the states. The paper ends with "The End"

Introduction

Cognitive wars have been waged since modern times. In this paper, I describe a model of cognitive war based on the Y and Z scores of the states.

Cognitive war

Cognitive war is defined as a war between two states using neuroscientists and feeding of fake experiences to brains-in-vats.

The model

The model of cognitive war is given by the following equations:

$$B_A = b_A|Z_A - Y_A|$$

$$B_B = b_B|Z_B - Y_B|$$

$$N_A = n_A|Z_A - Y_A|$$

$$N_B = n_B|Z_B - Y_B|$$

$$\frac{F_A}{F_B} = \frac{b_A}{b_B}\frac{n_A}{n_B}$$

where
Z_A is the Z score of state A
Z_B is the Z score of state B
Y_A is the Y score of state A
Y_B is the Y score of state B
B_A is the number of **brains trained** by state A
B_A is the number of **brains trained** by state B
b_A is the co-efficient of **brain training** of state A
b_A is the co-efficient of **brain training** of state b
N_A is the number of **neuroscientists trained** by state A
N_B is the number of **neuroscientists trained** by state B
n_A is the co-efficient of **neuroscientist training** of state A
n_B is the co-efficient of **neuroscientist training** of state B
F_A is the number of brains-in-vats being fed fake experiences by state A
F_B is the number of brains-in-vats being fed fake experiences by state B

The End

A model of holy war

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a model of holy war based on the Y and Z scores of the states. The paper ends with "The End"

Introduction

Holy wars have been waged since the beginning of time. In this paper, I describe a model of holy war based on the Z score of the masonic state.

Holy war

Holy war is defined as a war between krishna and demons using masons.

The model

The model of holy war is given by the following equations:

$$K = 1$$
$$D = ?$$
$$M = 2$$
$$Z_K = \infty$$
$$Z_D = 0$$
$$\frac{dZ_M}{dt} = 0$$

where
K is the number of krishnas that survive
D is the number of demons that survive
M is the number of masons that survive
Z_K is the Z score of krishna's state
Z_D is the Z score of the demonic state
Z_M is the Y score of the masonic state

The End

Lahitabindu yoga

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the practice of Lahitabindu yoga. The paper ends with "The End"

Introduction

Lahitabindu yoga (red dot yoga) is the easiest way to improve concentration and memory of the mind of an individual. In this paper, I describe the practice of Lahitabindu yoga.

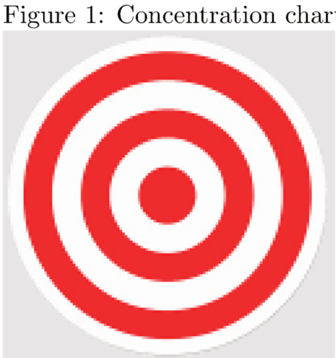
Lahitabindu yoga

Lahitabindu yoga involves looking at a **concentration chart** on a wall at your eye level for increasing durations of time each day.

The *asana* for this yoga is the traditional cross-legged position.

This yoga improves concentration and memory of the mind of an individual.

Figure 1: Concentration chart



The End

A model of theosis

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a model of theosis based on the Y and Z score of the states. The paper ends with "The End"

Introduction

Theosis is the easiest way to reach God during a war. In this paper, I describe a model of theosis based on the Y and Z scores of the states.

Theosis

Theosis is a transformative process whose aim is likeness to or union with God.

The model

The model of theosis is given by the following equations:

$$K_i = k|Z_A - Y_A|$$

$$K_A = \sum_{i=1}^{P} K_i$$

$$K_K = k|Z_K - Y_K|$$

$$\frac{T_K}{P} = \frac{K_A}{K_K}$$

where
Z_A is the Z score of state A
Y_A is the Y score of state A
Z_K is the Z score of krishna's state
Y_K is the Y score of krishna's state
K_i is the **karmic debt** of the i^{th} individual of state A

K_A is the total **karmic debt** of state A
K_K is the total **karmic credit** of krishna's state
P is the size of population of state A
T_K is the number of individuals of state A that undergo theosis
k is krishna's **theotic constant**.

The End

A model of philokali

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a model of philokali based on the Y and Z score of the states. The paper ends with "The End"

Introduction

Philokali is the easiest way to reach kali during a war. In this paper, I describe a model of philokali based on the Y and Z scores of the states.

Philokali

Philokali is a transformative process whose aim is likeness to or union with kali.

The model

The model of philokali is given by the following equations:

$$K_i = k|Z_A - Y_A|$$

$$K_A = \sum_{i=1}^{P} K_i$$

$$K_K = k|Z_K - Y_K|$$

$$\frac{P_K}{P} = \frac{K_A}{K_K}$$

where
Z_A is the Z score of state A
Y_A is the Y score of state A
Z_K is the Z score of kali's state
Y_K is the Y score of kali's state

K_i is the **karmic debt** of the i^{th} individual of state A
K_A is the total **karmic debt** of state A
K_K is the total **karmic credit** of kali's state
P is the size of population of state A
P_K is the number of individuals of state A that undergo philokali
k is kali's **philokalic constant**.

The End

The loan Granger

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the loan Granger. The paper ends with "The End"

Introduction

The loan Granger is one of the most useful heterogenous agents in economics. In this paper, I describe the loan Granger.

Loan Granger

The **loan Granger** is a heteregenous agent who both offers monetary loans and knows about Granger causality.

Obtaining information from the loan Granger

The loan Granger knows about the demonetization of the central bank's debt notes. The loan Granger offers his knowledge for free whenever demonetization results in a lower GDP growth rate.

The End

A model of stock market stimulation

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a model of stock market stimulation by the central bank based on the Y and Z scores of the states. The paper ends with "The End"

Introduction

Stock market stimulation is the easiest way to finance a war. In this paper, I describe a model of stock market stimulation based on the Y and Z scores of the states.

Stock market stimulation

Stock market stimulation is a transformative process whose aim is financing a war.

The model

The model of stock market stimulation is given by the following equations:

$$S_i = s_i |Z_A - Y_A|$$

$$I_A = \frac{\sum_{i=1}^{N} r_i S_i}{\sum_{i=1}^{N} r_i}$$

$$B_A = b_a |Z_A - Y_A|$$

$$\frac{d(\frac{I_A}{B_A})}{dt} \geq 0$$

$$\frac{d(Z_B - Y_B)}{dt} = 0$$

where
Z_A is the Z score of state A
Y_A is the Y score of state A
Z_B is the Z score of state B
Y_B is the Y score of state B
S_i is the price of the i^{th} stock of state A
s_i is the coefficient of **pricing** of the i^{th} stock of state A
r_i is the risk of the i^{th} stock of state A
I_A is the price of the stock index of state A
B_A is the balance sheet of the central bank of state A
b_A is the co-efficient of **balance sheet expansion** of the central bank of state A

End of stock market stimulation

The condition for the end of the stock market stimulation is

$$\frac{d(s_i)}{dt} = 0$$

The End

The natural law of economic rest

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the natural law of economic rest for individuals of economies. The paper ends with "The End"

Introduction

The natural law of economic rest is a fundamental law of economics. In this paper, I describe the natural law of economic rest for individuals of economies.

The natural law of economic rest

The natural law of economic rest stipulates

$$L + lnL = aZ + b$$

where
L is the amount of leisure of an individual
Z is the Z score of the state of the individual
a and b are two constants

The End

The natural law of economic rent

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the natural law of economic rent for individuals of economies. The paper ends with "The End"

Introduction

The natural law of economic rent is a fundamental law of economics. In this paper, I describe the natural law of economic rent for individuals of economies.

The natural law of economic rent

The natural law of economic rent stipulates

$$R + lnR = cP + d$$

where
R is the amount of rent paid by an individual to **obtain** a good/service
P is the price of the good/service
c and d are two constants

The End

The essence of a market

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I define the essence of a market. The paper ends with "The End"

Introduction

The **essence** of a market is a fundamental economic quantity. In this paper, I define the essence of a market.

The essence of a market

Suppose M is a market selling a single good G.

Suppose $S = f(P, Q)$ is the supply curve of M.

Suppose $D = g(P, Q)$ is the demand curve of M.

Then the equilibirum price P and equilibirum quantity Q are given by the solutions of the equation $S = D$

Define the **essence of the market**

$$E = \sqrt{P^2 + Q^2}$$

The End

The natural law of market expansion

Soumadeep Ghosh

Kolkata, India

Abstract

In a previous paper, I have defined the **essence** of a merket. In this paper, I describe the natural law of market expansion for individuals of economies. The paper ends with "The End"

Introduction

The natural law of market expansion is a fundamental law of economics. In this paper, I describe the natural law of market expansion for individuals of economies.

The natural law of market expansion

The natural law of market expansion stipulates

$$\frac{dE(t)}{dt} \geq 0$$

where
$E(t)$ is the essence of the market as a function of time

The End

The natural law of masonic value

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the natural law of masonic value for individuals of economies. The paper ends with "The End"

Introduction

The natural law of masonic value is a fundamental law of economics. In this paper, I describe the natural law of masonic value for individuals of economies.

The natural law of masonic value

The natural law of masonic value stipulates

$$V(t) + lnV(t) = V(t-1), t \geq 1$$

where
$V(t)$ is the masonic value as a function of time

The masonic revelation

The **masonic revelation** is simply the announcement of $V(0)$

The End

The qualia of a market

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I define the qualia of a market. The paper ends with "The End"

Introduction

The **qualia** of a market is a fundamental economic quantity. In this paper, I define the qualia of a market.

The qualia of a market

Suppose M is a market selling a single good G.

Suppose $S = f(P, Q)$ is the supply curve of M.

Suppose $D = g(P, Q)$ is the demand curve of M.

Then the equilibirum price P and equilibirum quantity Q are given by the solutions of the equation $S = D$

Define the **qualia of the market**

$$q = \frac{Q}{P}$$

The End

The natural law of preferable markets

Soumadeep Ghosh

Kolkata, India

Abstract

In a previous paper, I have defined the **qualia** of a merket. In this paper, I describe the natural law of preferable markets for individuals of economies. The paper ends with "The End"

Introduction

The natural law of preferable markets is a fundamental law of economics. In this paper, I describe the natural law of preferable markets for individuals of economies.

The natural law of preferable markets

The natural law of preferable markets stipulates

$$q_p \geq q_n$$

where
q_p is the qualia of the preferable market
q_n is the qualia of the non-preferable market

The End

The essence of a multi-good market

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I define the essence of a multi-good market. The paper ends with "The End"

Introduction

The **essence** of a multi-good market is a fundamental quantity in economics. In this paper, I define the essence of a multi-good market.

The essence of a multi-good market

Suppose M is a multi-good market selling goods $G_i, 1 \leq i \leq n$.

Suppose $S_i = f(P_i, Q_i)$ is the supply curve of the i^{th} good in the market M.

Suppose $D_i = g(P_i, Q_i)$ is the demand curve of the i^{th} good in the market M.

Then the equilibirum price P_i and equilibirum quantity Q_i are given by the solutions of the equation $S_i = D_i$

Define the **essence of the multi-good market**

$$E = \prod_{i=1}^{n} \sqrt{{P_i}^2 + {Q_i}^2}$$

The End

The qualia of a multi-good market

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I define the qualia of a multi-good market. The paper ends with "The End"

Introduction

The **qualia** of a multi-good market is a fundamental quantity in economics. In this paper, I define the qualia of a multi-good market.

The qualia of a multi-good market

Suppose M is a market selling goods $G_i, 1 \leq i \leq n$.

Suppose $S_i = f(P_i, Q_i)$ is the supply curve of the i^{th} good in the market M.

Suppose $D_i = g(P_i, Q_i)$ is the demand curve of the i^{th} good in the market M.

Then the equilibirum price P_i and equilibirum quantity Q_i are given by the solutions of the equation $S_i = D_i$

Define the **qualia of the multi-good market**

$$q = \sum_{i=1}^{n} \frac{Q_i}{P_i}$$

The End

Mathematically beautiful markets

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe mathematically beautiful markets in order of increasing beauty. The paper ends with "The End"

Introduction

Mathematical beauty is not exclusive to economics. In fact, good economics is often mathematically beautiful as well. In this paper, I define mathematically beautiful markets in order of increasing beauty.

Diophantine market

A **diophantine market** is one in which the equilibirum price P_i and equilibirum quantity Q_i of each and every constituent good are both integral.

Pythagorean market

A **pythagorean market** is a diophantine market in which the essence of the market E is integral.

Archimedian market

An **archimedian market** is a pythagorean market in which the qualia of the market q is integral.

Ramanujan market

A **ramanujan market** is an archimedian market in which the individual qualia of each and every constituent good $\frac{Q_i}{P_i}$ is integral.

The End

Geopolitically important trade moments

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the geopolitically important trade moments. The paper ends with "The End"

Introduction

Even within standardized trading markets, we can find information of geopolitically important trade moments. In this paper, I describe the geopolitically important trade moments.

Geopolitically important trade moments

A **geopolitically important trade moment** (GITM) is defined as a point in time when geopolitical alliances between governments can be made.

Geopolitically important trade moments can be found easily from the yield curve of a government's bonds.

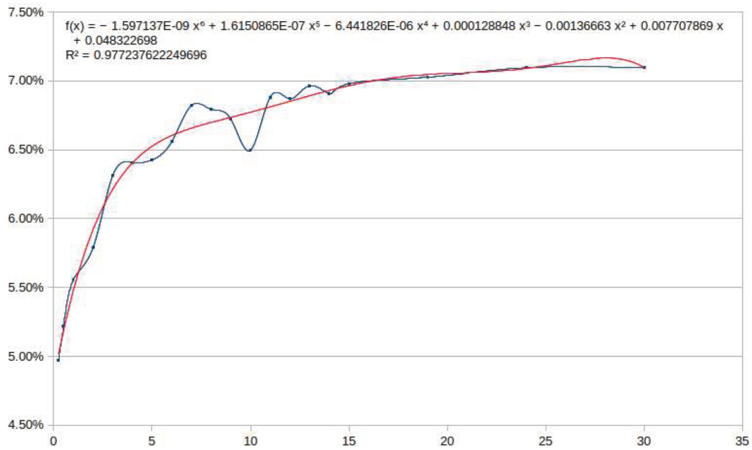
We simply plot the interpolated yield curve and overlay a polynomial trendline of the sixth degree (since the Z score has six components in it.)

The points of intersection of the two curves gives us the geopolitically important trade moments.

Standard practice around GITMs

The standard practice around a GITM is to communicate with the other government, represent the respective governments through agents and negotiate an alliance - either in the form of a memorandum of understanding or a treaty.

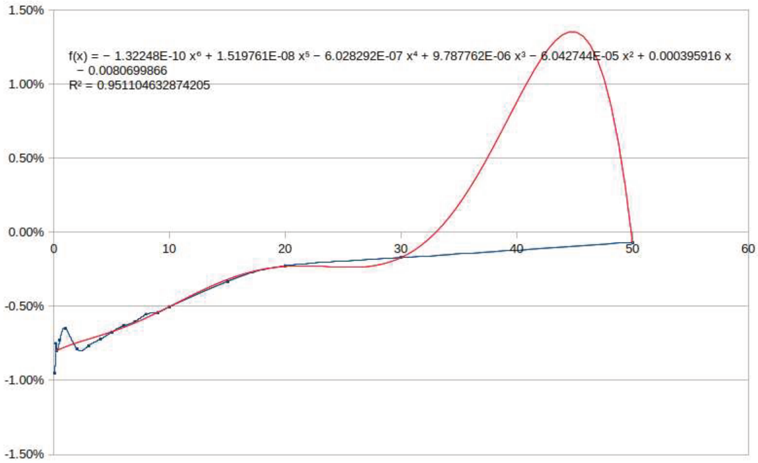
Figure 1: GITMs from India's yield curve



An example of a good configuration of GITMs

This configuration of GITMs from India's yield curve is a good configuration because the polynomial trendline follows the yield curve closely with small gaps between the GITMs.

Figure 2: GITMs from Switzerland's yield curve



An example of a bad configuration of GITMs

This configuration of GITMs from Switzerland's yield curve is a bad configuration because the polynomial trendline deviates from the yield curve and there is a large gap between GITMs.

The need to fix a bad configuration of GITMs

A bad confiugration of GITMs signals economic exclusion of the government from geopolitically important events.

The traditional inference from a bad configuration of GITMs is that the government is unable or unwilling to find alliances with other governments. This might in turn effect prices of the government's longer term bonds negatively.

Therefore, it is necessary to fix a bad configuration of GITMs as soon as possible. Possible ways to do so are through invitation for militaric co-operation, intergovernmental economic negotation and academic exchange.

The End

Measuring and eliminating systemic risk of a banking system

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the Ghosh measure of the systemic risk of a banking system and the method to eliminate the systemic risk of a banking system. The paper ends with "The End"

Introduction

In previous papers, I have described the measure of bank independence and the classical measures of a bank. In this paper, I describe the Ghosh measure of the systemic risk of a banking system and the method to eliminate the systemic risk of a banking system.

The Ghosh measure of systemic risk of a banking system

Let $\mathbf{G} = \{V, E\}$ be the graph of the banking system of the state with each vertex v of the vertex set V denoting a bank and each edge e of the edge set E denoting a transactional link between the two vertices (banks) of the edge.

Define the b-statistic of a bank $b_i = \frac{A_i - Li}{1+S_i}$

where

A_i is the monetary value of assets of the bank

L_i is the monetary value of liabilities of the bank

S_i is the stability of the bank

Define the weight of an edge

$w_e = b_i + bj - \sqrt{b_i bj}$,

the sum of the b-statistic of the two vertices (banks) of the edge minus the square-root of the product of the b-statistic of the two vertices (banks).

Let $W_i = \sum_{all\ incident\ edges} w_e$ be the sum of the edge weights of all the edges incident on that vertex (bank.)

Let $\mathbf{W} = \sum_{v_i \in V} W_i$ be the sum of W_i of all the vertices of the vertex set V.

Let $W_{max} = max_{v_i \in V} W_i$

Calculate the Ghosh measure of systemic risk of the banking system

$$g(\mathbf{G}) = \frac{W_{max}}{\mathbf{W}}$$

The method to eliminate the systemic risk of a banking system

The method to eliminate the systemic risk of a banking system is the following:

1. Identify the vertices (banks) whose $\frac{W_i}{W_{max}} \geq g(\mathbf{G})$
2. Appoint an investigative officer to monitor each such bank until $\frac{W_i}{W_{max}} < g(\mathbf{G})$

The End

The Kailash probability density function

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the Kailash probability density function f(x) which reaches 1 at x = 0, but also has local extrema. The paper ends with "The End"

Introduction

It is often desired to have a probability density function f(x) which reaches 1 but also has local extrema. In this paper, I describe the Kailash probability density function f(x) which reaches 1 at x = 0, but also has local extrema.

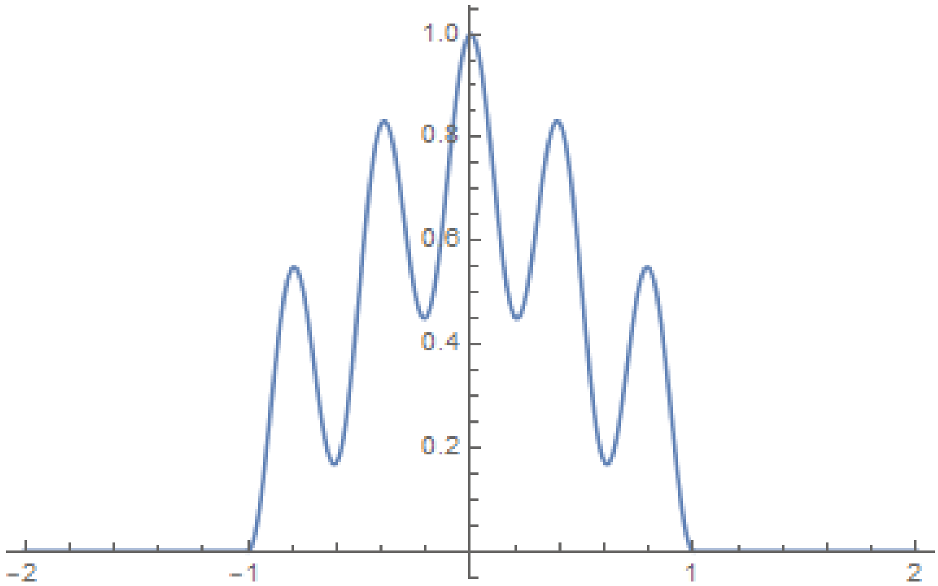
The Kailash probability density function

Define $f(x) = \begin{cases} \frac{1}{4}(\cos(\pi x) + \cos(5\pi x) + 2) & -1 \leq x \leq 1 \\ 0 & x < -1 \vee x > 1 \end{cases}$

Then

1. $0 \leq f(x) \leq 1$ for all real x.
2. $\int_{-\infty}^{\infty} f(x)dx = 1$
3. $f(0) = 1$

Thus f(x) is a probability density function which is 1 at x = 0



Plot of the Kailash probability density function

The End

The chaotic option

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe financial options that produce chaos in an economy. The paper ends with "The End"

Introduction

The chaotic option is the most useful and logical way to produce chaos in an economy. In this paper, I describe financial options that produce chaos in an economy.

The chaotic option

Let $p > q > r$ be three primes.

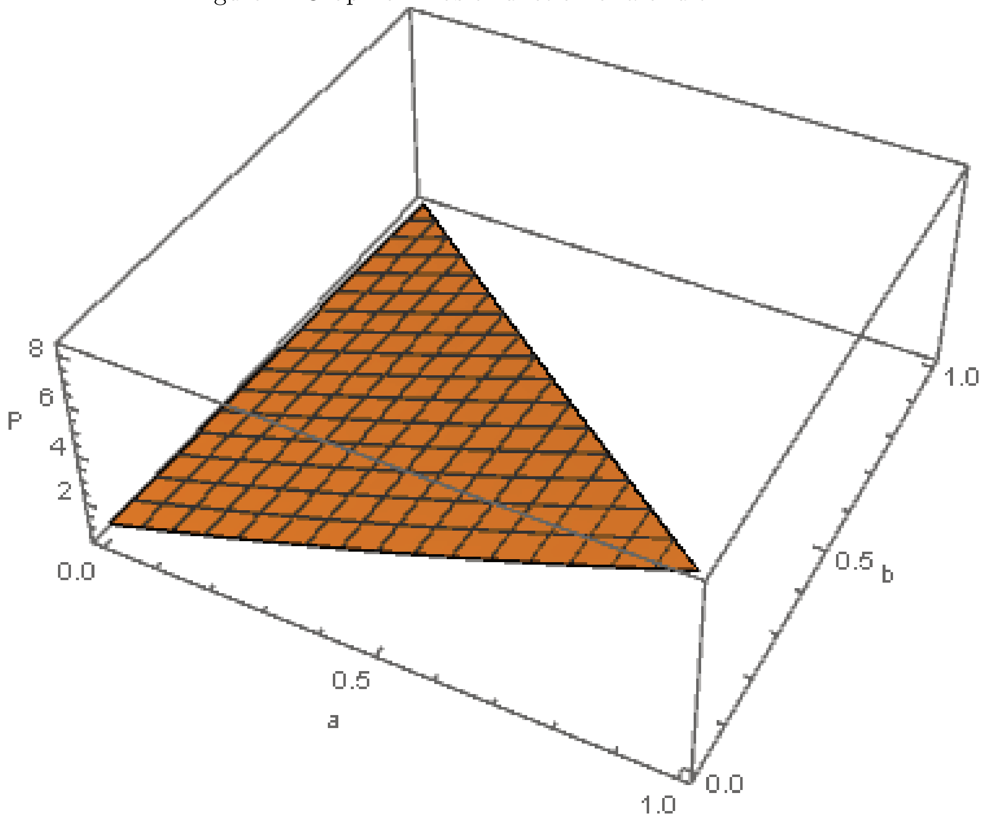
Let P be the price of a financial option that pays p^2 in the chaotic state, r^2 in the semi-chaotic state and q^2 in the chaos-free state.

Then the price of the option is given by

$$P = \frac{ap^2 + (1-a)\frac{br^2+(1-a-b)q^2}{1+r}}{1+r}$$

where
a is the probability of the chaotic state of the economy
b is the probability of the semi-chaotic state of the economy
c is the probability of the chaos-free state of the economy
$a + b + c = 1$
r is the risk-free interest rate in the economy

Figure 1: Graph of P as a function of a and b



The price of a chaotic option

The price of a chaotic option ($p = 5, q = 3, r = 2$) is given by the plot above.

Note that $P \geq \frac{ap^2}{1+r} \geq 0$ whenever $r \neq -1$

Pricing of a chaotic option

Note that the chaotic option **cannot** be priced using a Black-Scholes model but **can** be priced using chaos theory.

The End

The perfect option

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe perfect financial options in an economy. The paper ends with "The End"

Introduction

The perfect option is the most useful and logical way to produce perfection in an economy. In this paper, I describe perfect financial options in an economy.

The perfect option

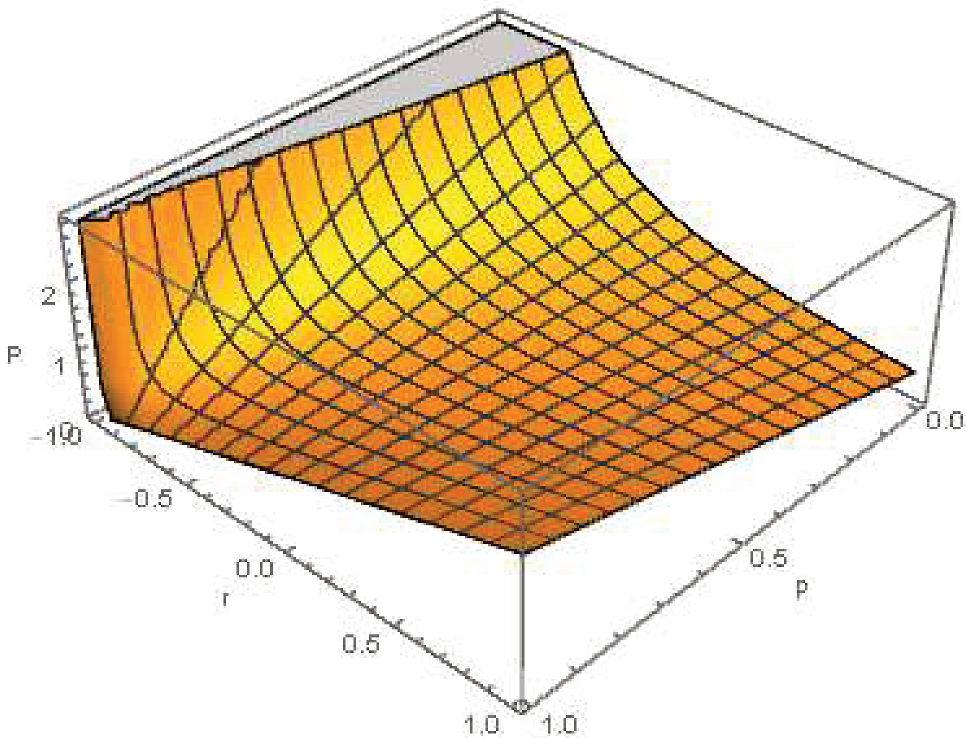
Let P be the price of a financial option that pays $1 + r$ in the risk-free-rate-increase state, $\frac{1}{1+r}$ in the risk-free-rate-decrease state.

Then the price of the option is given by

$$P = \frac{p(1+r) + \frac{1-p}{1+r}}{1+r}$$

where
p is the probability of the risk-free-rate-increase of the economy
r is the risk-free interest rate in the economy

Figure 1: Graph of P as a function of p and r



The price of the perfect option

The price of the perfect option is given by the plot above.

Pricing of the prefect option

Note that the perfect option **cannot** be priced using a Black-Scholes model but **can** be priced using economic theory.

The End

The contained option

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the contained financial option in an economy. The paper ends with "The End"

Introduction

The contained option is the most useful and logical way to contain risk in an economy. In this paper, I describe contained financial options in an economy.

The contained option

Let P be the price of a financial option that pays 1 in the risk-free-rate-increase state, p^{p+1} in the risk-free-rate-decrease state.

Then the price of the option is given by

$$P = \frac{p + (1-p)p^{p+1}}{1+r}$$

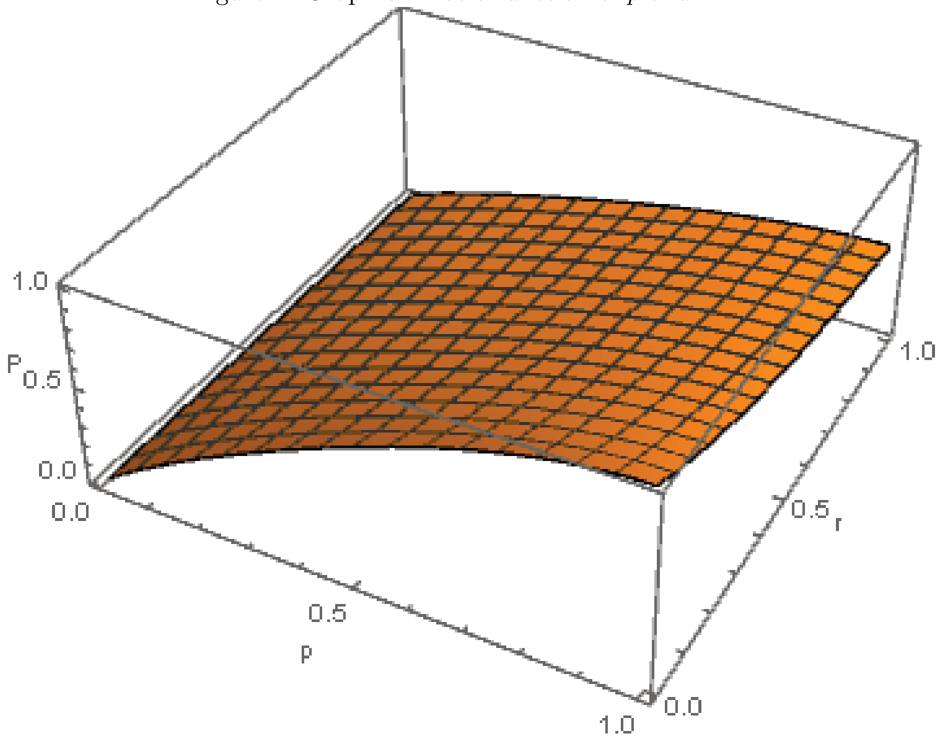
where

p is the probability of the risk-free-rate-increase of the economy

r is the risk-free interest rate in the economy

Note that $0 \leq P \leq 1$ whenever $0 \leq p \leq 1$ and $0 \leq r \leq 1$

Figure 1: Graph of P as a function of p and r



The price of the contained option

The price of the contained option is given by the plot above.

Pricing of the contained option

Note that the contained option **cannot** be priced using a Black-Scholes model but **can** be priced using risk analysis.

The End

Inverting the contained option

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the inversion of the contained financial option in an economy to find the probability of risk-free rate increase. The paper ends with "The End"

Introduction

In a previous paper, I have described the contained option as the most useful and logical way to contain risk in an economy. In this paper, I describe the inversion of the contained financial option to find the probability of risk-free rate increase in an economy.

The contained option

The price of the contained option is given by

$$P = \frac{p + (1-p)p^{p+1}}{1+r}$$

where
p is the probability of the risk-free-rate-increase of the economy
r is the risk-free interest rate in the economy
Note that $0 \leq P \leq 1$ whenever $0 \leq p \leq 1$ and $0 \leq r \leq 1$

Figure 1: Table of p as a function of P and r

Price/Rate	-15%	-10%	-5%	0%	5%	10%	15%
0	0%	0%	0%	0%	0%	0%	0%
0.1	5%	5%	5%	6%	6%	6%	6%
0.2	10%	11%	11%	12%	13%	13%	14%
0.3	16%	17%	18%	19%	20%	21%	22%
0.4	22%	23%	25%	26%	28%	29%	31%
0.5	28%	30%	32%	34%	36%	39%	41%
0.6	35%	38%	40%	43%	46%	48%	51%
0.7	43%	46%	49%	52%	56%	59%	63%
0.8	50%	54%	58%	63%	67%	72%	78%
0.9	59%	64%	69%	75%	82%	93%	N/A
1	68%	75%	83%	100%	N/A	N/A	N/A

The inversion of the contained option

The inversion of the contained option given the price of the contained option and the risk-free interest rate gives us the probability of the risk-free rate increase of the economy. This inversion, computed numerically, gives us the table above.

The End

The bicursive contained option

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the bicursive contained financial option in an economy. The paper ends with "The End"

Introduction

The bicursive contained option is the most useful and logical way to both contain risk and bring order in an economy. In this paper, I describe bicursive contained financial options in an economy.

The bicursive contained option

Let P be the price of a financial option that pays 1 in the risk-free-rate-increase state and a contained option in the risk-free-rate-decrease state.

Then the price of the option is given by

$$P = \frac{q + (1-q)\frac{p+(1-p)p^{p+1}}{1+r}}{1+r}$$

where
q is the probability of the risk-free-rate-increase of the economy in period 1
p is the probability of the risk-free-rate-increase of the economy in period 2
r is the risk-free interest rate in the economy

Figure 1: Graph of surfaces of p, q and r as a function of P

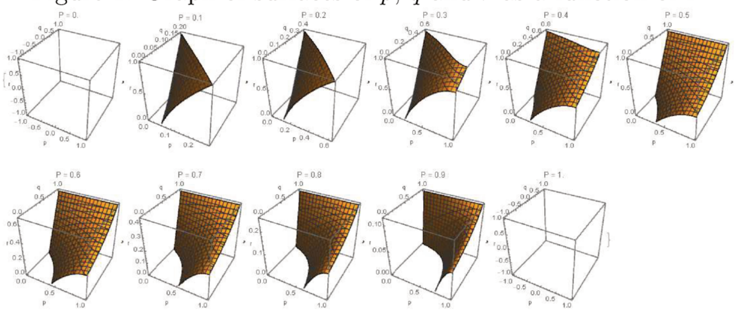
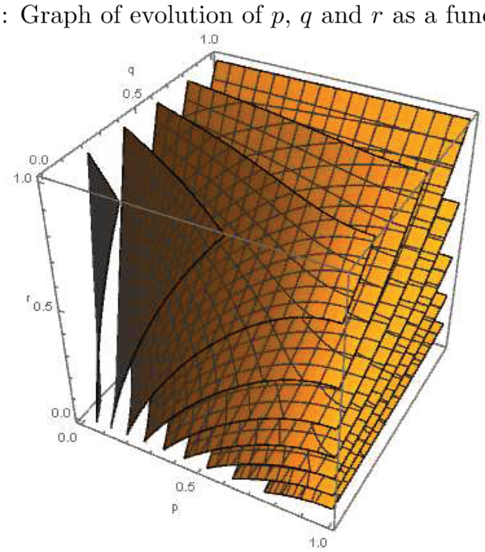


Figure 2: Graph of evolution of p, q and r as a function of P



The surfaces of the bicursive contained option

The surfaces of the bicursive contained option is given in Figure 1.

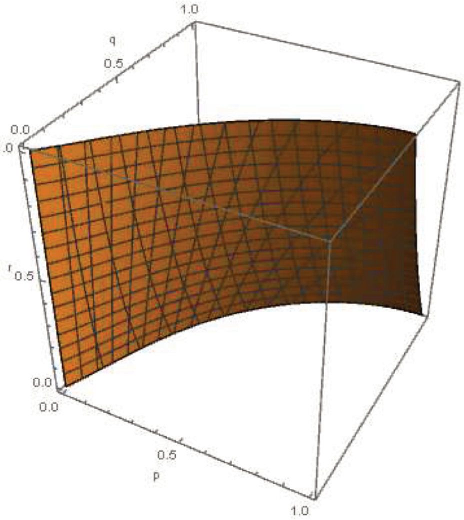
The evolution of the bicursive contained option

The evolution of the bicursive contained option is given in Figure 2.

The constraint of the bicursive contained option

The constraint of the bicursive contained option is given in Figure 3.

Figure 3: Graph of constraint of p, q and r



Pricing of the bicursive contained option

Note that the bicursive contained option **cannot** be priced using a Black-Scholes model but **can** be priced using stochastic analysis.

The End

Value creation using the bank interest rate space

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe how to create value in an economy using the bank interest space. The paper ends with "The End"

Introduction

In a previous paper, I have described how hexation gives a bank four ways to stimulate the economy in a limited way. However, it is the **bank interest rate** which is the obvious tool of choice for the monetary economist to stimulate the economy to growth beyond what hexation can produce. In this paper, I describe how to create value in an economy using the bank interest space.

The bank interest space

Most individuals (including some economists) don't realize that the bank interest rate can also be negative for an extended period of time. How do we leverage this fact into growing value in an economy?

The 3-period model of value creation using the bank interest rate

The model consists of three periods:

1. In period 1, the bank interest rate is negative.
2. In period 2, the bank interest rate is zero.
3. In period 3, the bank interest normalizes to positive.

The equation of value is given by

$$V = \frac{1}{1-r} + \frac{1+g}{1} + \frac{1+g+G}{1+R}$$

where
$-r$ is the negative bank interest rate in period 1
g is the growth rate in period 2
G is the excess growth rate in period 3 over period 2
R is the normalized positive bank interest rate in period 3

The End

My *darshans* of Lord Krishna

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I try to describe my darshans of Lord Krishna that I have had so far in my life. The paper ends with "The End"

Introduction

The Sanskrit word **darshan** is loosely translated as 'vision' in English. However, the experience is far more overwhelming in its nature than the word 'vision' is able to convey. In fact, some theologists believe that no word in any other language is able to convey the true meaning of 'darshan.' In this paper, I try to describe my darshans of Lord Krishna that I have had so far in my life.

My first darshan

The first darshan I had was a near-death experience when I was suffering with measles during my early childhood. I saw a blue being englufed in darkness. To this day, I believe that my survival of this disease was not possible without divine intervention. This darshan happened in Hyderabad, India.

My second darshan

The second darshan I had was with two of my childhood friends, one of whom, I believe, is an avatar of Lord Krishna. I saw a white being englufed in light. The darshan was in the form of sacrificial offering of food to this avatar. This darshan happened in Hyderabad, India.

My third darshan

The third darshan I had was with the black form of Lord Krishna at an office where he taught me economics. I saw a black being engulfed in light. This darshan happened in Hyderabad, India.

My fourth darshan

The fourth darshan I had was with the light form of Lord Krishna during my Masters studies. I saw a white being engulfed in light holding the entire universe in the palm of his right hand. This darshan happened in Oslo, Norway.

My fifth darshan

The fifth darshan I had was with the light form of Lord Krishna during my period as a working man. I saw a white being who gave me the gita. This darshan happened in Hyderabad, India.

My sixth darshan

The sixth darshan I had was with the dark form of Lord Krishna during my period as a student in post-graduate studies. I saw a black being who was engulfed in darkness who taught me warfare. This darshan happened in Kolkata, India.

The End

The origin of the Jagannath temple

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the origin of the Jagannath temple in India. The paper ends with "The End"

Introduction

The Jagannath temple in Orissa, India is a major temple of the hindus. In this paper, I describe the origin of the Jagannath temple in India.

The origin of the Jagannath temple

During the kingdom of Kalinga, the king had a divine dream where Lord Krishna instructed him to build a temple so that the people would know of His divine glories.

The king, being a pious devotee of Lord Krishna, set about this task by instructing all the artisans and templars of his kingdom to build this temple.

The artisans and the templars were overjoyed to be selected to be the builders of this holy temple, but it was found that only one of them knew the original form of the deities to be housed in the temple.

So when the temple was built and the time to install the idols in this temple arrived, this artisan laid down a specific condition to the king - that he not be disturbed in the inner sanctum of the temple, closed by the double-doors, as he builds the idols.

The days turned to weeks as the artisan was housed in the inner sanctum building the idols. But the king's curiousity got the better of him. Hiding himself in the disguise of a pilgrim, the king tried to take a peek at the artisan building the idols at night.

But as soon as he peeked through the double-doors, a wonderous sight unfolded before his eyes - there was no artisan inside and the idols were incomplete - missing hands.

This divine miracle was recorded by the historians of Kalinga, and to this day, the search for the artisan continues.

The End

Computing the theoretical risk-free rate

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe how to compute the theoretical risk-free rate in an economy. The paper ends with "The End"

Introduction

Economists have methods to compute the yield curve and the term-structure of interest rates from financial asset prices.

But to make an empirical study of the risk-free rate, we must first have a method to compute the theoretical risk-free rate in an economy.

In this paper, I describe how to compute the theoretical risk-free rate in an economy.

Computing the theoretical risk-free rate from the contained option price

The theoretical risk-free rate can be computed easily from the contained option price by using the Taylor series expansion of the contained option price.

To do so, simply equate the contained option price with a Taylor series expansion of sufficient order and plot the $p-r$ curve.

Note that the more computing power we use, i.e., the higher the order of the Taylor series expansion, the more the theoretical $p-r$ curve gets flatter implying a lower risk-free rate.

Figure 1: 1^{st} order $p - r$ curve

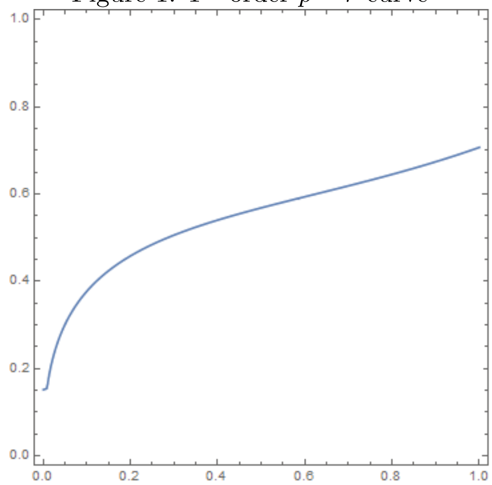


Figure 2: 2^{nd} order $p - r$ curve

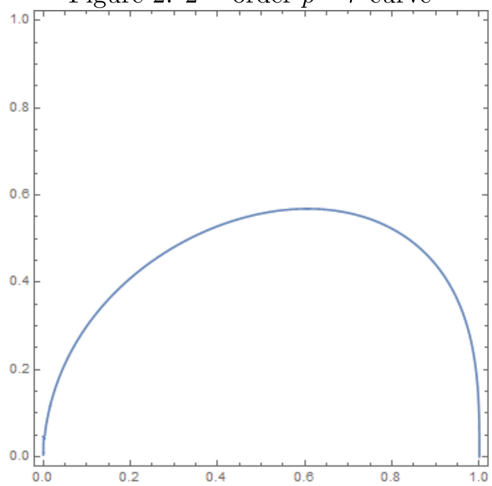


Figure 3: 3^{rd} order $p-r$ curve

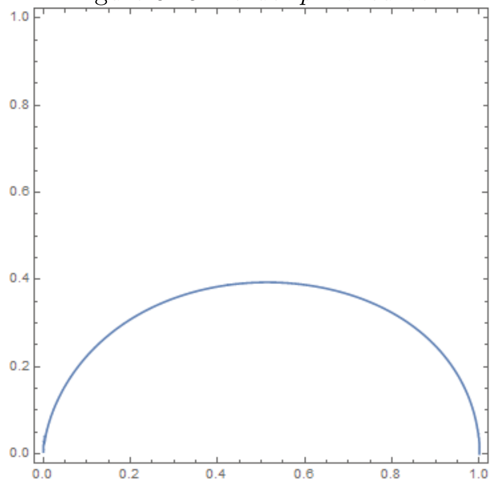
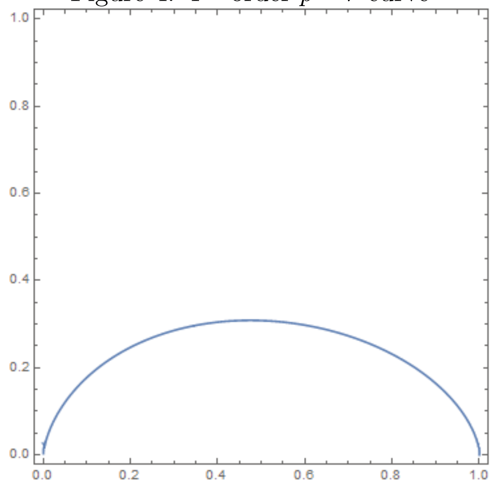


Figure 4: 4^{th} order $p-r$ curve



The End

A closed-form formula of the theoretical risk-free rate

Soumadeep Ghosh

Kolkata, India

Abstract

In a previous paper, I have described how to compute the theoretical risk-free rate in an economy. In this paper, I describe a closed-form formula of the theoretical risk-free rate in an economy. The paper ends with "The End"

Introduction

As seen in a previous paper, we have a method to compute the theoretical risk-free rate in an economy. But it is possible to go further. In this paper, I describe a closed-form formula of the theoretical risk-free rate in an economy.

A closed-form formula of the theoretical risk-free rate from the contained option price

Using a computer algebra system like Mathematica, we solve for the closed-form formula of the theoretical risk-free rate from the contained option price.

To do so, simply equate the contained option price with a Taylor series expansion of sufficient order and solve for r in terms of p.

As noted earlier, the more computing power we use, i.e., the higher the order of the Taylor series expansion, the more the theoretical $p-r$ curve gets flatter implying a lower risk-free rate.

Using a fourth-order Taylor series expansion, the closed-form formula of the theoretical risk-free rate is given by

$$r = \frac{\sqrt[5]{-6p^{p+1} + 6p^p - p^3\log^3(p) + 3p^3\log^2(p) - 3p^2\log^2(p) + 6p^2\log(p) + 6p - 6p\log(p) - 6}}{\sqrt[5]{p^3\log^3(p) - 3p^3\log^2(p) + 3p^2\log^2(p) - 6p^2\log(p) - 6p + 6p\log(p) + 12}}$$

The End

The upper bound of the theoretical risk-free rate

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the upper bound of the theoretical risk-free rate. The paper ends with "The End"

Introduction

As seen in a previous paper, we have a closed-form formula of the theoretical risk-free rate in an economy. Now, we go further by calculating the upper bound of the theoretical risk-free rate.

The upper bound of the theoretical risk-free rate from the contained option price

Using a computer algebra system like Mathematica, we compute the solutions to the equations

$$\frac{dr(p)}{dp} = 0 \; and \; 0 < p < 1$$

where $r(p)$ is the closed-form formula of the theoretical risk-free rate from the contained option price

whence we obtain $p = 0.474556, r(p) = 0.308594$

Thus, there are only three extrema of the theoretical risk-free rates:

1. $r(p) = 0$ at $p = 0$ (must for continuity as $\lim_{p\to 0} r(p) = 0$)
2. $r(p) = 0.308594$ at $p = 0.474556$
3. $r(p) = 0$ at $p = 1$

whence the upper bound on the theoretical risk-free rate is given by $r(p) = 0.308594$ at $p = 0.474556$

The End

On egyptian hieroglyphs embedded in greedy financial options

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the egyptian hieroglyphs embedded in greedy financial option price. The paper ends with "The End"

Introduction

In a previous paper, I have described **greedy financial options** as the most useful and logical way to reduce greed in an economy. In this paper, I describe the egyptian hieroglyphs embedded in greedy financial option price.

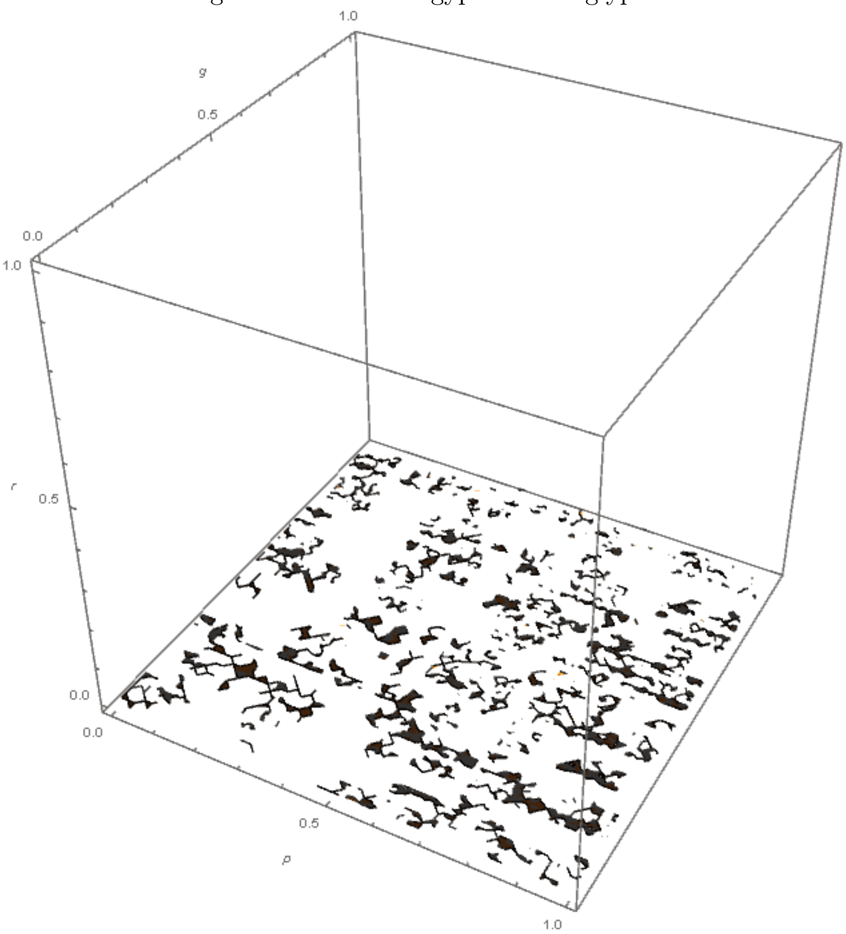
Greedy financial option

Recall the price of the greedy financial option is given by

$$P = \frac{pg + (1-p)g^2}{1+r}$$

where
p is the probability of the greed-full state of the economy
g is the greed in the economy
r is the risk-free interest rate in the economy

Figure 1: 2^{nd} order egyptian hieroglyphs



Egyptian hieroglyphs embedded in greedy financial option price

The 2^{nd} order Taylor series of P about $p = 0$, $g = 0$ and $r = 0$ is given by

$P = p\left(g^2\left(-r^2 + r - 1\right) + g\left(r^2 - r + 1\right)\right) + g^2\left(r^2 - r + 1\right)$

Equating these two expressions and preparing the contourplot gives us the egyptian hieroglyphs embedded in greedy financial option price.

The Mathematica code is

`ContourPlot3D`$[\frac{pg+(1-p)g^2}{1+r} = p(g^2(-r^2 + r - 1) + g(r^2 - r + 1)) + g^2(r^2 - r + 1), \{p, 0, 1\}, \{g, 0, 1\}, \{r, 0, 1\}, AxesLabel -> Automatic]$

The End

On advanced envy imprints embedded in envy-free financial options

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the advanced envy imprints embedded in envy-free financial option price. The paper ends with "The End"

Introduction

In a previous paper, I have described **envy-free financial options** as the most useful and logical way to reduce envy in an economy. In this paper, I describe the advanced imprints embedded in envy-free financial option price.

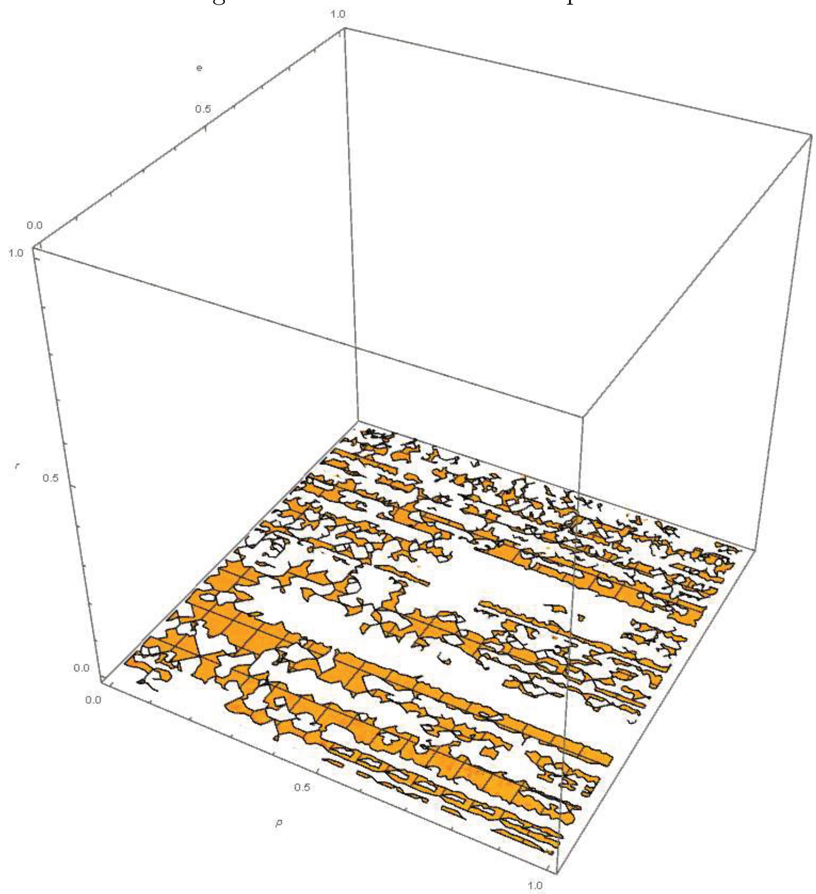
Envy-free financial option

Recall the price of the envy-free financial option is given by

$$P = \frac{pe^2 + (1-p)e}{1+r}$$

where
p is the probability of the envy-full state of the economy
e is the envy in the economy
r is the risk-free interest rate in the economy

Figure 1: 2^{nd} order advanced imprints



Advanced envy imprints embedded in envy-free financial option price

The 2^{nd} order Taylor series of P about $p=0$, $e=0$ and $r=0$ is given by

$P = p\left(\left(e^2-e\right)r^2+\left(e-e^2\right)r+e^2-e\right)+er^2-er+e$

Equating these two expressions and preparing the contourplot gives us the advanced envy imprints embedded in envy-free financial option price.

The Mathematica code is

`ContourPlot3D[`$\frac{pe^2+(1-p)e}{1+r} = p\left(\left(e^2-e\right)r^2+\left(e-e^2\right)r+e^2-e\right)+er^2-er+e, \{p,0,1\}, \{e,0,1\}, \{r,0,1\}, AxesLabel->Automatic]$

The End

On the slippery slope of envy and greed

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the slippery slope of envy and greed. The paper ends with "The End"

Introduction

In a previous paper, I have described **envy-free financial options** as the most useful and logical way to reduce envy in an economy. In a previous paper, I have described **greedy financial options** as the most useful and logical way to reduce greed in an economy. In this paper, I describe the slippery slope of envy and greed.

Envy-free and greedy financial options

Recall the price of the envy-free financial option is given by

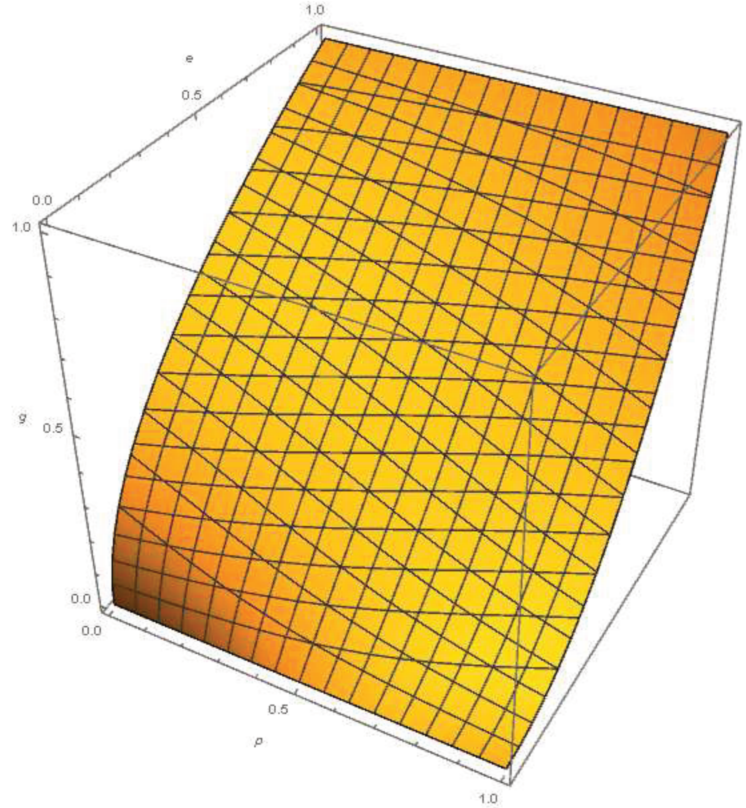
$$P = \frac{pe^2 + (1-p)e}{1+r}$$

where
p is the probability of the envy-full state of the economy
e is the envy in the economy
r is the risk-free interest rate in the economy
Recall the price of the greedy financial option is given by

$$P = \frac{pg + (1-p)g^2}{1+r}$$

where
p is the probability of the greed-full state of the economy
g is the greed in the economy
r is the risk-free interest rate in the economy

Figure 1: The slippery slope of envy and greed



The slippery slope of envy and greed

Equating the two expressions and preparing the contourplot gives us the slippery slope of envy and greed.

The Mathematica code is

`ContourPlot3D`[$g^2(1-p)+gp = e^2p+e(1-p), \{p,0,1\}, \{e,0,1\}, \{g,0,1\}, AxesLabel->Automatic$]

The End

On the probability cliff of envy and greed

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the probability cliff of envy and greed. The paper ends with "The End"

Introduction

In a previous paper, I have described **envy-free financial options** as the most useful and logical way to reduce envy in an economy. In a previous paper, I have described **greedy financial options** as the most useful and logical way to reduce greed in an economy. In this paper, I describe the probability ciff of envy and greed.

Envy-free and greedy financial options

Recall the price of the envy-free financial option is given by

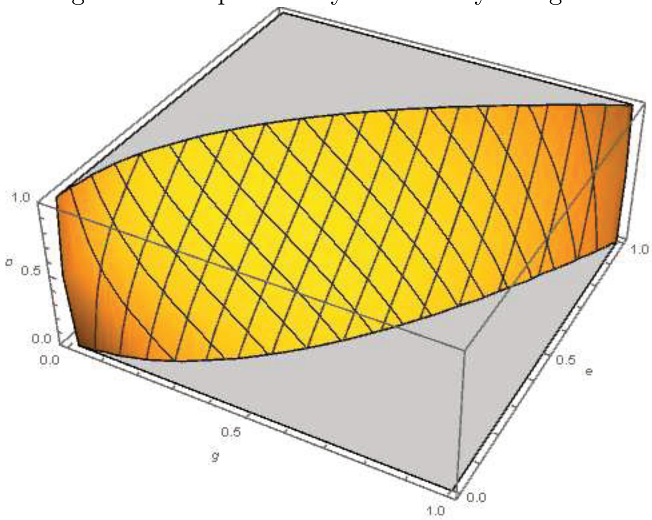
$$P = \frac{pe^2 + (1-p)e}{1+r}$$

where
p is the probability of the envy-full state of the economy
e is the envy in the economy
r is the risk-free interest rate in the economy
Recall the price of the greedy financial option is given by

$$P = \frac{pg + (1-p)g^2}{1+r}$$

where
p is the probability of the greed-full state of the economy
g is the greed in the economy
r is the risk-free interest rate in the economy

Figure 1: The probability cliff of envy and greed



The probability cliff of envy and greed

Equating the two expressions, solving for a common p and preparing the 3D-plot gives us the probability cliff of envy and greed.

The Mathematica code is

Plot3D[$\frac{g^2-e}{e^2-e+g^2-g}, \{g, 0, 1\}, \{e, 0, 1\}, AxesLabel \rightarrow \{g, e, p\}, PlotRange \rightarrow \{0, 1\}$]

The End

On the teardrop of envy and greed

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the teardrop of envy and greed. The paper ends with "The End"

Introduction

In a previous paper, I have described **envy-free financial options** as the most useful and logical way to reduce envy in an economy. In a previous paper, I have described **greedy financial options** as the most useful and logical way to reduce greed in an economy. In this paper, I describe the teardrop of envy and greed.

Envy-free and greedy financial options

Recall the price of the envy-free financial option is given by

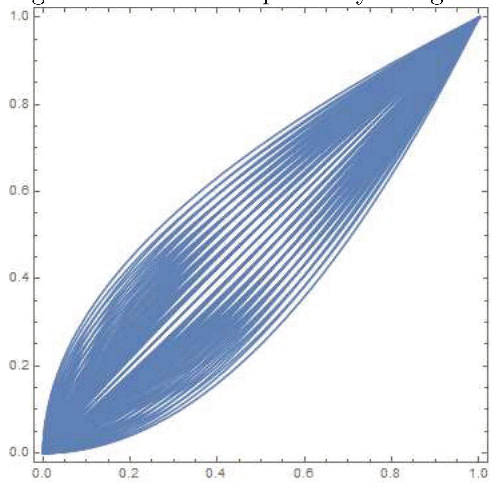
$$P = \frac{pe^2 + (1-p)e}{1+r}$$

where
p is the probability of the envy-full state of the economy
e is the envy in the economy
r is the risk-free interest rate in the economy
Recall the price of the greedy financial option is given by

$$P = \frac{pg + (1-p)g^2}{1+r}$$

where
p is the probability of the greed-full state of the economy
g is the greed in the economy
r is the risk-free interest rate in the economy

Figure 1: The teardrop of envy and greed



The teardrop of envy and greed

Equating the two expressions, using independent state probablilites p_g and p_e, preparing the table of contourplots and showing them together gives us the teardrop of envy and greed.

The Mathematica code is

$Show[Table[ContourPlot[g^2(1-p_g)+gp_g = e^2p_e+e(1-p_e), \{e, 0, 1\}, \{g, 0, 1\}, AxesLabel \to \{p, e\}], \{p_g, 0, 1, 0.1\}, \{p_e, 0, 1, 0.1\}]]$

The End

On the common structure of envy and greed

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the common structure of envy and greed. The paper ends with "The End"

Introduction

In a previous paper, I have described **envy-free financial options** as the most useful and logical way to reduce envy in an economy. In a previous paper, I have described **greedy financial options** as the most useful and logical way to reduce greed in an economy. In this paper, I describe the common structure of envy and greed.

Envy-free and greedy financial options

Recall the price of the envy-free financial option is given by

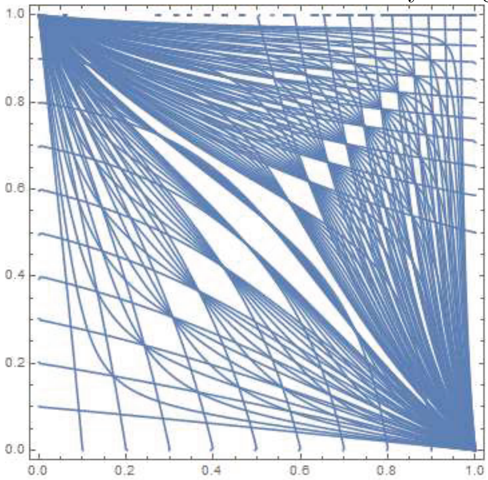
$$P = \frac{pe^2 + (1-p)e}{1+r}$$

where
p is the probability of the envy-full state of the economy
e is the envy in the economy
r is the risk-free interest rate in the economy
Recall the price of the greedy financial option is given by

$$P = \frac{pg + (1-p)g^2}{1+r}$$

where
p is the probability of the greed-full state of the economy
g is the greed in the economy
r is the risk-free interest rate in the economy

Figure 1: The common structure of envy and greed



The common structure of envy and greed

First, we eliminate the common p from the equations

$P_g = pg + (1-p)g^2$

$P_e = pe^2 + (1-p)e$

to obtain the eliminant

$e(eg^2 - eP_g + P_g - g) = (g-1)gP_e$

Preparing the table of contourplots and showing them together gives us the common structure of envy and greed.

The Mathematica code is

`Show[Table[ContourPlot[`$e(eg^2-eP_g+P_g-g) = (g-1)gP_e, \{g,0,1\}, \{e,0,1\}, AxesLabel \to \{g,e\}, PlotPoints \to 100], \{P_g,0,1,0.1\}, \{P_e,0,1,0.1\}]]$

The End