Collected papers
of
Lord Soumadeep Ghosh

Volume 3

On discovering economies using options and premium I

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe how to discover economies using envy-free and greedy options along with a premium. 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 how to discover economies using envy-free and greedy options along with a premium.

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

Discovering economies using options and premium

First, we eliminate the prices P_g and P_e from the equations

$P_g = \frac{ag+(1-a)g^2}{1+r}$
$P_e = \frac{be^2+(1-b)e}{1+r}$
$P_e = P_g + p$

where p is the premium, to obtain the eliminant

$p = \frac{ag^2-ag+be^2-be+e-g^2}{1+r} \wedge 1+r \neq 0$

Reducing the eliminant gives us 4 economies.

The Mathematica code is

`Eliminate[`$\{P_g = \frac{(1-a)g^2+ag}{r+1}, P_e = \frac{be^2+(1-b)e}{r+1}, P_e = P_g + p\}, \{P_g, P_e\}$`];`
`Print[FullSimplify[Reduce[%]]]`

The 4 economies from envy-free and greedy options along with a premium

1. $g^2 \neq g \wedge a = \frac{e(b(-e)+b-1)+g^2+pr+p}{(g-1)g} \wedge r+1 \neq 0$
2. $p = 0 \wedge (g = 0 \vee g = 1) \wedge e = g \wedge r+1 \neq 0$
3. $(g = 0 \vee g = 1) \wedge e^2 \neq e \wedge b = \frac{-e+g+pr+p}{(e-1)e} \wedge r+1 \neq 0$
4. $r+1 \neq 0 \wedge \left(p + \frac{1}{\sqrt{(r+1)^2}} = 0 \vee p = \frac{1}{\sqrt{(r+1)^2}}\right) \wedge p \neq 0 \wedge 2g+pr+p = 1 \wedge e = g+pr+p$

The End

On discovering economies using options and premium II

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe how to discover economies using chaotic and contained options along with a premium. The paper ends with "The End"

Introduction

In a previous paper, I have described the **chaotic option** as the most useful and logical way to produce chaos in an economy. 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 how to discover economies using chaotic and contained options along with a premium.

Chaotic and contained financial options

Recall the price of the chaotic financial 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
$p > q > r$ are three primes
Recall the price of the contained financial 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

Discovering economies using options and premium

First, we eliminate the prices P_K and P_C from the equations

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

$P_C = \frac{t+(1-t)t^{t+1}}{1+R}$

$P_K = P_C + \epsilon$

where ϵ is the premium, to obtain the eliminant

$t = \frac{a^2q^2}{1+R} + \frac{abq^2}{1+R} - \frac{abr^2}{1+R} + ap^2 - \frac{2aq^2}{1+R} - \frac{bq^2}{1+R} + \frac{br^2}{1+R} + \frac{q^2}{1+R} - R\epsilon - t^{t+1} + t^{t+2} - \epsilon \wedge 1 + R \neq 0$

Solving for R gives us 2 economies.

The Mathematica code is

`Eliminate[`$\{P_K = \frac{\frac{(1-a)(q^2(-a-b+1)+br^2)}{1+R}+ap^2}{1+R}, P_C = \frac{(1-t)t^{t+1}+t}{1+R}, P_K = P_C + \epsilon\}, \{P_K, P_C\}$`]; Solve[`$\%, R$`]`

The 2 economies from chaotic and contained options along with a premium

1. $R = \frac{-\sqrt{(-ap^2+t^{t+1}-t^{t+2}+t+2\epsilon)^2-4\epsilon(-a^2q^2-abq^2+abr^2-ap^2+2aq^2+bq^2-br^2-q^2+t^{t+1}-t^{t+2}+t+\epsilon)}+ap^2-t^{t+1}+t^{t+2}-t-2}{2\epsilon}$

2. $R = \frac{\sqrt{(-ap^2+t^{t+1}-t^{t+2}+t+2\epsilon)^2-4\epsilon(-a^2q^2-abq^2+abr^2-ap^2+2aq^2+bq^2-br^2-q^2+t^{t+1}-t^{t+2}+t+\epsilon)}+ap^2-t^{t+1}+t^{t+2}-t-2\epsilon}{2\epsilon}$

The End

Some solutions to the chaotic and contained options along with a premium

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe some solutions to the chaotic and contained options along with a premium. The paper ends with "The End"

Introduction

In a previous paper, I have described the **chaotic option** as the most useful and logical way to produce chaos in an economy. 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 some solutions to the chaotic and contained options along with a premium.

Some solutions to the chaotic and contained options along with a premium

The first solution is given by

$p = 5$, $q = 3$, $r = 2$

$a = \frac{9}{34}$, $b = 0$, $t = 1$, $R = 0$, $\epsilon = \frac{12119}{1156}$

The second solution is given by

$p = 5$, $q = 3$, $r = 2$

$a = \frac{9}{34}$, $b = \frac{25}{34}$, $t = 0$, $R = 1$, $\epsilon = \frac{2225}{578}$

The third solution is given by

$p = 5$, $q = 3$, $r = 2$

$a = \frac{9}{34}$, $b = \frac{25}{34}$, $t = \frac{15}{34}$, $R = \frac{1}{17}$, $\epsilon = -\frac{5\left(513\ 15^{15/34}34^{19/34}-581468\right)}{374544}$

The End

On discovering economies using options and premium III

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe how to discover economies using perfect and contained options along with a premium. The paper ends with "The End"

Introduction

In a previous paper, I have described the **perfect option** as the most useful and logical way to produce produce perfection in an economy. 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 how to discover economies using perfect and contained options along with a premium.

Perfect and contained financial options

Recall the price of the perfect financial 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
Recall the price of the contained financial 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

Discovering economies using options and premium

First, we eliminate the prices P_P and P_C from the equations

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

$P_C = \frac{t+(1-t)t^{t+1}}{1+R}$

$P_P = P_C + \epsilon$

where ϵ is the premium, to obtain the eliminant

$t = -pr - p + qr - \frac{q}{r+1} + q + \frac{1}{r+1} - t^{t+1} + t^{t+2} \wedge r + 1 \neq 0$

Solving for r gives us 2 economies.

The Mathematica code is

`Eliminate[`$\{P_P = \frac{\frac{1-q}{r+1}+q(r+1)}{r+1}, P_C = \frac{(1-t)t^{t+1}+t}{r+1}, P_P = P_C + p\}, \{P_P, P_C\}$`]`
`Solve[`$\%, r$`]`

The 2 economies from perfect and contained options along with a premium

1. $r = \frac{\sqrt{-4pq+4p+4q^2-4q+2t^{t+2}-2t^{t+3}+t^{2t+2}-2t^{2t+3}+t^{2t+4}+t^2}+2p-2q+t^{t+1}-t^{t+2}+t}{2(q-p)}$
2. $r = \frac{\sqrt{-4pq+4p+4q^2-4q+2t^{t+2}-2t^{t+3}+t^{2t+2}-2t^{2t+3}+t^{2t+4}+t^2}-2p+2q-t^{t+1}+t^{t+2}-t}{2(p-q)}$

The End

Some solutions to the perfect and contained options along with a premium

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe some solutions to the perfect and contained options along with a premium. The paper ends with "The End"

Introduction

In a previous paper, I have described the **perfect option** as the most useful and logical way to produce perfection in an economy. 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 some solutions to the perfect and contained options along with a premium.

Some solutions to the perfect and contained options along with a premium

The first solution is given by

$q = 0$, $t = 0$, $r = 0$, $p = 1$

The second solution is given by

$q = \frac{9}{34}$, $t = 0$, $r = 1$, $p = \frac{61}{136}$

The third solution is given by

$q = \frac{9}{34}$, $t = 1$, $r = \frac{23}{102}$, $p = -\frac{1311}{21250}$

The End

On discovering economies using options and premium IV

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe how to discover economies using perfect and greedy options along with a premium. The paper ends with "The End"

Introduction

In a previous paper, I have described the **perfect option** as the most useful and logical way to produce produce perfection 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 how to discover economies using perfect and greedy options along with a premium.

Perfect and greedy financial options

Recall the price of the perfect financial 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
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

Discovering economies using options and premium

First, we eliminate the prices P_P and P_G from the equations

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

$P_G = \frac{qg+(1-q)g^2}{1+r}$

$P_P = P_G + \epsilon$

where ϵ is the premium, to obtain the eliminant

$\epsilon = \frac{g^2 q}{r+1} - \frac{g^2}{r+1} - \frac{gq}{r+1} - \frac{p}{(r+1)^2} + p + \frac{1}{(r+1)^2} \wedge r + 1 \neq 0$

Solving for r gives us 2 economies.

The Mathematica code is

`Eliminate[`$\{P_P = \frac{\frac{1-p}{r+1}+p(r+1)}{r+1}, P_G = \frac{g^2(1-q)+gq}{r+1}, P_P = P_G+\epsilon\}, \{P_P, P_G\}$`];`
`Solve[`$\%, r$`]`

The 2 economies from perfect and greedy options along with a premium

1. $r = \frac{-g^2+2p-gq+g^2q-2\epsilon-\sqrt{-4(-p+\epsilon)(-1+g^2+gq-g^2q+\epsilon)+(g^2-2p+gq-g^2q+2\epsilon)^2}}{2(-p+\epsilon)}$

2. $r = \frac{-g^2+2p-gq+g^2q-2\epsilon+\sqrt{-4(-p+\epsilon)(-1+g^2+gq-g^2q+\epsilon)+(g^2-2p+gq-g^2q+2\epsilon)^2}}{2(-p+\epsilon)}$

The End

On discovering economies using options and premium V

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe how to discover economies using perfect and envy-free options along with a premium. The paper ends with "The End"

Introduction

In a previous paper, I have described the **perfect option** as the most useful and logical way to produce perfection in an economy. 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 how to discover economies using perfect and envy-free options along with a premium.

Perfect and envy-free financial options

Recall the price of the perfect financial 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
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

Discovering economies using options and premium

First, we eliminate the prices P_P and P_E from the equations

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

$P_E = \frac{qe^2+(1-q)e}{1+r}$

$P_P = P_E + \epsilon$

where ϵ is the premium, to obtain the eliminant

$\epsilon = -\frac{e^2 q}{r+1} + \frac{eq}{r+1} - \frac{e}{r+1} - \frac{p}{(r+1)^2} + p + \frac{1}{(r+1)^2} \wedge r+1 \neq 0$

Solving for r gives us 2 economies.

The Mathematica code is

`Eliminate[`$\{P_P = \frac{\frac{1-p}{r+1}+p(r+1)}{r+1}, P_E = \frac{e^2 q+e(1-q)}{r+1}, P_P = P_E+\epsilon\}, \{P_P, P_E\}$`]`
`Solve[`$\%, r$`]`

The 2 economies from perfect and envy-free options along with a premium

1. $r = \frac{-\sqrt{(e^2q-eq+e-2p+2\epsilon)^2-4(\epsilon-p)(e^2q-eq+e+\epsilon-1)}+e^2(-q)+eq-e+2p-2\epsilon}{2(\epsilon-p)}$

2. $r = \frac{\sqrt{(e^2q-eq+e-2p+2\epsilon)^2-4(\epsilon-p)(e^2q-eq+e+\epsilon-1)}+e^2(-q)+eq-e+2p-2\epsilon}{2(\epsilon-p)}$

The End

The discoverers' brotherhood

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the discoverers' brotherhood and how to join it. The paper ends with "The End"

Introduction

In previous papers, I have described various options including the greedy option, the envy-free option, the zero price fear option, the chaotic option, the perfect option and the contained option.

In previous papers, I have described how to discover economies through their risk-free rates by simple mathematical manipulations of these option prices through premiums.

The discoverers' brotherhood

Any individual that writes a paper describing how to discover econom(ies) through their risk-free rates using my methods is an honorary member of the discovers' brotherhood.

I look forward to reading papers by the various discoverers of economies.

The End

The switched option

Soumadeep Ghosh

Kolkata, India

Abstract

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

Introduction

The switched option is the most useful and logical way to reduce the risk-free rate in an economy. In this paper, I describe switched financial options in an economy.

The switched option

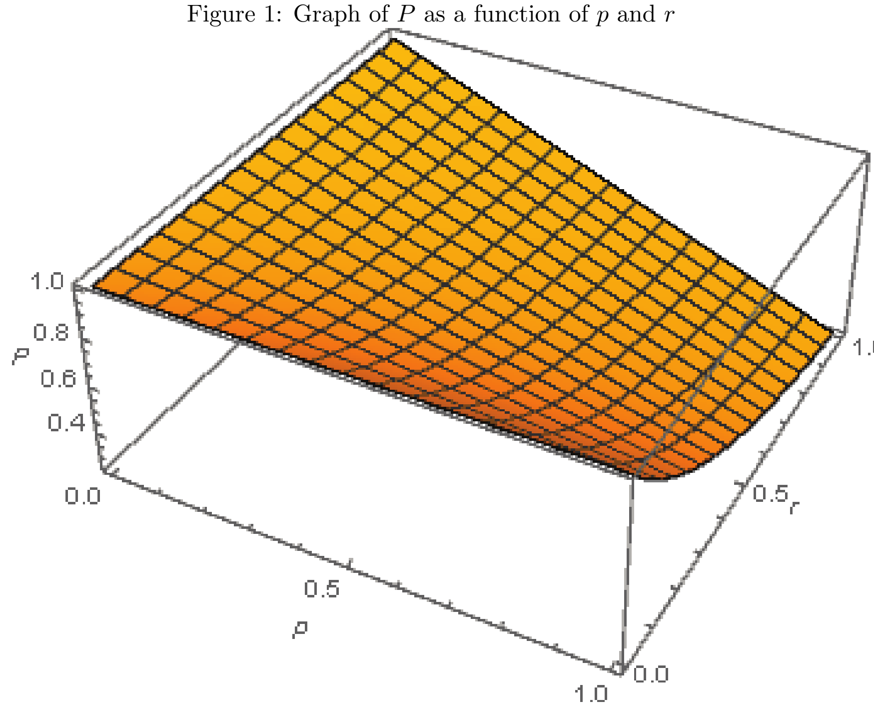
Let P be the price of a financial option that pays $\frac{1}{1+r}$ in the risk-free-rate-increase state and $1+r$ in the risk-free-rate-decrease state.

Then the price of the option is given by

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

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 switched option

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

Pricing of the switched option

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

The End

On discovering economies using options and premium VI

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe how to discover economies using perfect and switched options along with a premium. The paper ends with "The End"

Introduction

In a previous paper, I have described the **perfect option** as the most useful and logical way to produce perfection in an economy. In a previous paper, I have described the **switched option** as the most useful and logical way to reduce the risk-free rate in an economy. In this paper, I describe how to discover economies using perfect and switched options along with a premium.

Perfect and switched financial options

Recall the price of the perfect financial 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
Recall the price of the switched financial option is given by

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

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

Discovering economies using options and premium

First, we eliminate the prices P_P and P_S from the equations

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

$P_S = \frac{\frac{q}{1+r}+(1-q)(1+r)}{1+r}$

$P_S = P_P + \epsilon$

where ϵ is the premium, to obtain the eliminant

$\epsilon = \frac{p}{(r+1)^2} - p + \frac{q}{(r+1)^2} - q - \frac{1}{(r+1)^2} + 1 \wedge r + 1 \neq 0$

Solving for r gives us 2 economies.

The Mathematica code is

`Eliminate[`$P_S == (p/(1+r) + (1-p)(1+r))/(1+r), P_P == (q(1+r) + (1-q)/(1+r))/(1+r), P_S$
`FullSimplify[Solve[`$\%, r$`]]`

The 2 economies from perfect and switched options along with a premium

1. $r = -\frac{p+q-1}{\sqrt{(p+q-1)(p+q+\epsilon-1)}} - 1$

2. $r = \frac{p+q-1}{\sqrt{(p+q-1)(p+q+\epsilon-1)}} - 1$

The End

USD: The elephant in the room

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the proverbial elephant in the room, i.e., the USD. The paper ends with "The End"

Introduction

Reserve currency status of a nation is an extra-ordinary financial blessing initially because the nation with a reserve currency can earn seigniorage. But the historical truth of monetary economics is that such a blessing doesn't last forever. When the time comes for this blessing to end, nations suffer from the loss of this status. In this paper, I describe the proverbial elephant in the room, i.e., the USD.

Reserve currencies in history

In the figure, we see the lifespans of the last few reserve currencies of the world. What we learn is that the average lifespan of a reserve currency is 94 years.

The elephant in the room

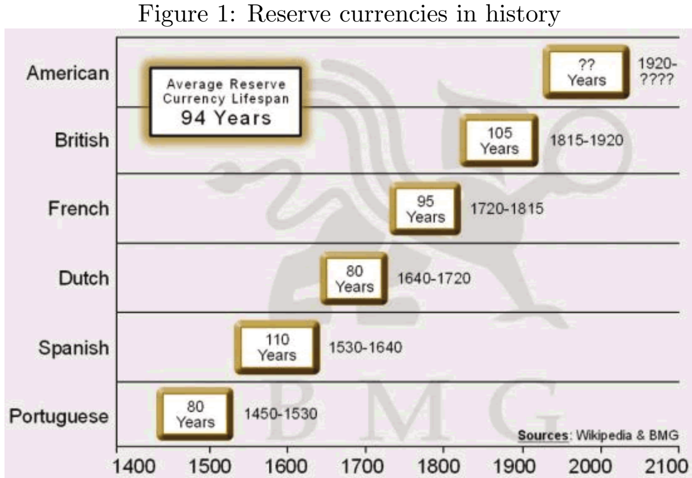
The elephant in the room is the USD, which is the current reserve currency of the world, held as reserves by a majority of the central and reserve banks around the world.

Why is the USD the elephant in the room?

The USD is the elephant in the room because, as of this writing, it should have already lost this status as per the law of averages, i.e., the average individual in the world would hold the USD only until 94 years since the USD became the reserve currency, i.e., by the year 2014.

The End

Figure 1: Reserve currencies in history



Some solutions to contained chaos

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe some solutions to contained chaos. The paper ends with "The End"

Introduction

In a previous paper, I have described the **chaotic option** as the most useful and logical way to produce chaos in an economy. 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 some solutions to contained chaos.

Chaotic and contained financial options

Recall the price of the chaotic financial 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
$p > q > r$ are three primes
Recall the price of the contained financial 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

Contained chaos

First, we eliminate the common t and prices P_K, P_C from the equations

$P_K = \frac{tp^2 + \frac{(1-t)(q^2(1-t-b)+br^2)}{1+R}}{1+R}$

$P_C = \frac{(1-t)t^{t+1}+t}{R+1}$

$P_K = P_C$

to obtain the eliminant

$br^2(t-1) = bq^2t - bq^2 + p^2Rt + p^2t + q^2t^2 - 2q^2t + q^2 - Rt^{t+1} + Rt^{t+2} - Rt - t^{t+1} + t^{t+2} - t \wedge R + 1 \neq 0$

First solution to contained chaos

The first solution is given by

$p = 5$, $q = 3$, $r = 2$, $b = \frac{3}{5}$, $R = -\frac{12}{5}$, $t = 0.129025...$

Second solution to contained chaos

The second solution is given by

$p = 5$, $q = 3$, $r = 2$, $b = 0$, $R = -\frac{9}{5}$, $t = 0.261389...$

Third solution to contained chaos

The third solution is given by

$p = 5$, $q = 3$, $r = 2$, $b = \frac{5}{6}$, $R = -\frac{12}{5}$, $t = 0.106248...$

Fourth solution to contained chaos

The fourth solution is given by

$p = 5$, $q = 3$, $r = 2$, $b = 0$, $R = -\frac{109}{10}$, $t = 0.036464...$

The End

The common structure of perfect containment

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the common structure of perfect containment. The paper ends with "The End"

Introduction

In a previous paper, I have described the **perfect option** as the most useful and logical way to produce perfection in an economy. 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 common structure of perfect containment.

Perfect and contained financial options

Recall the price of the perfect financial option is given by

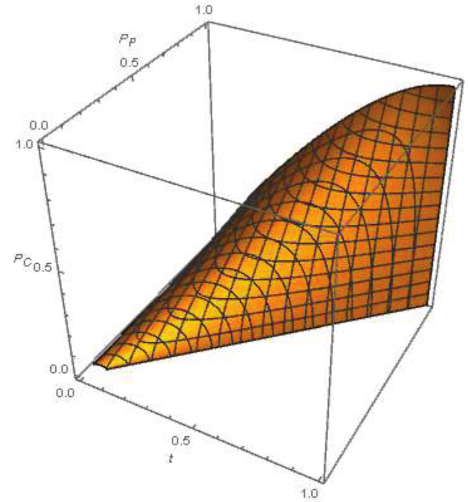
$$P = \frac{p(1+r) + \frac{1-p}{1+r}}{1+r}$$

where
p is the probability of the risk-free-rate-increase of the economy
r is the risk-free interest rate in the economy
Recall the price of the contained financial 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

Figure 1: The common structure of perfect containment



Perfect containment

First, we eliminate the common t and R from the equations

$P_P = \frac{t(1+R)+\frac{1-t}{1+R}}{1+R}$

$P_C = \frac{t+(1-t)t^{t+1}}{1+R}$

$P_P = P_C + \epsilon$

to obtain the eliminant

$\epsilon = P_P - P_C \wedge (t-1)P_C^2 = -2P_Pt^{t+2} + 2P_Pt^{t+3} - P_Pt^{2t+2} + 2P_Pt^{2t+3} - P_Pt^{2t+4} - P_Pt^2 + 2t^{t+3} - 2t^{t+4} + t^{2t+3} - 2t^{2t+4} + t^{2t+5} + t^3$

The common structure of perfect containment

Preparing the 3D contourplot of the eliminant gives us the common structure of perfect containment.

The Mathematica code is

`ContourPlot3D[`$(t-1)P_C^2 = -2P_Pt^{t+2} + 2P_Pt^{t+3} - P_Pt^{2t+2} + 2P_Pt^{2t+3} - P_Pt^{2t+4} - P_Pt^2 + 2t^{t+3} - 2t^{t+4} + t^{2t+3} - 2t^{2t+4} + t^{2t+5} + t^3, \{t,0,1\}, \{P_P,0,1\}, \{P_C,0,1\}, AxesLabel \rightarrow Automatic$`]`

The End

A model of populist war

Soumadeep Ghosh

Kolkata, India

Abstract

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

Introduction

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

Populist war

Populist war is defined as a war between two states based on the **carrying capacity** of the two states, characterized by both militaric and civilian deaths.

The model

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

$$P_A = c_A|Z_A - Y_A|$$

$$P_B = c_B|Z_B - Y_B|$$

$$\frac{P_A - D_A}{P_B - D_B} = (\frac{c_A}{c_B})^I$$

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
c_A is the co-efficient of carrying capacity of state A
c_B is the co-efficient of carrying capacity of state B
P_A is the population of state A
P_B is the population of state B
D_A is the sum of militaric deaths and civilian deaths of state A
D_B is the sum of militaric deaths and civilian deaths of state B
I is the intensity of the populist war.

The End

A model of belicose war

Soumadeep Ghosh

Kolkata, India

Abstract

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

Introduction

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

Belicose war

Belicose war is defined as a war between two states based on the **warring capacity** of the two states.

The model

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

$$M_A = w_A|Z_A - Y_A|$$

$$M_B = w_B|Z_B - Y_B|$$

$$\frac{M_A - d_A}{M_B - d_B} = (\frac{w_A}{w_B})^I$$

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
w_A is the co-efficient of warring capacity of state A
w_B is the co-efficient of warring capacity of state B
M_A is the size of the military of state A
M_B is the size of the military 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 belicose war.

The End

A model of ostentatious war

Soumadeep Ghosh

Kolkata, India

Abstract

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

Introduction

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

Ostentatious war

Ostentatious war is defined as a war between two states based on the **wealth-generating capacity** of the two states.

The model

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

$$W_A = g_A|Z_A - Y_A|$$
$$W_B = g_B|Z_B - Y_B|$$
$$\frac{W_A + p_A}{W_B + p_B} = (\frac{g_A}{g_B})^I$$

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
g_A is the co-efficient of wealth-generating capacity of state A
g_B is the co-efficient of wealth-generating capacity of state B
W_A is the wealth of state A
W_B is the wealth of state B
p_A is the war-profit of state A
p_B is the war-profit of state B
I is the intensity of the ostentatious war.

The End

Insights from switched and perfect options

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe some insights from switched and perfect options. The paper ends with "The End"

Introduction

In a previous paper, I have described the **perfect option** as the most useful and logical way to produce perfection in an economy. In a previous paper, I have described the **switched option** as the most useful and logical way to reduce the risk-free rate in an economy. In this paper, I describe some insights from switched and perfect options.

Perfect and switched financial options

Recall the price of the perfect financial option is given by

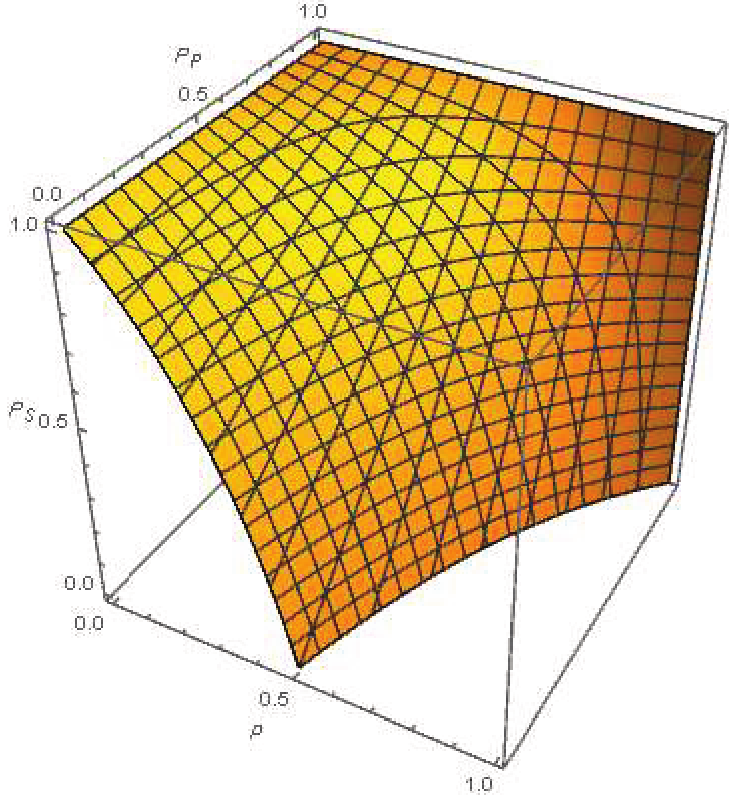
$$P = \frac{p(1+r) + \frac{1-p}{1+r}}{1+r}$$

where
p is the probability of the risk-free-rate-increase of the economy
r is the risk-free interest rate in the economy
Recall the price of the switched option is given by

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

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: The common structure of perfect switching



Switched perfection

First, we eliminate ϵ and the common r from the equations

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

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

$P_P = P_S + \epsilon$

to obtain the eliminant

$(p-1)P_S = p(-P_P) + 2p - 1$

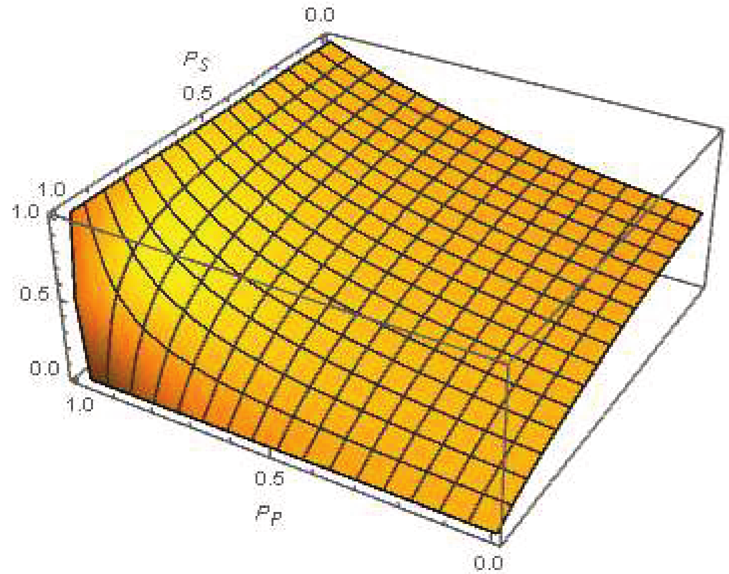
The common structure of perfect switching

Preparing the 3D contourplot of the eliminant gives us the common structure of perfect switching.

The Mathematica code is

`ContourPlot3D`$[(p-1)P_S = p(-P_P)+2p-1, \{p,0,1\}, \{P_P,0,1\}, \{P_S,0,1\}, AxesLabel \to Automatic]$

Figure 2: Obtaining p from perfect and switched options



Obtaining p from perfect and switched options

Solving the eliminant for p gives us

$p = \frac{P_S - 1}{P_S + P_P - 2}$

Preparing the 3D plot gives us p in terms of P_P and P_S

The Mathematica code is

Plot3D[$\frac{P_S - 1}{P_S + P_P - 2}, \{P_P, 0, 1\}, \{P_S, 0, 1\}, AxesLabel \to Automatic$]

The End

Hare Krishna Hare Krishna
Krishna Krishna Hare Hare
Hare Rama Hare Rama
Rama Rama Hare Hare

Soumadeep Ghosh

Kolkata, India

On obtaining a mostly stable risk-free rate

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe how to obtain a mostly stable risk-free rate in an economy. The paper ends with "The End"

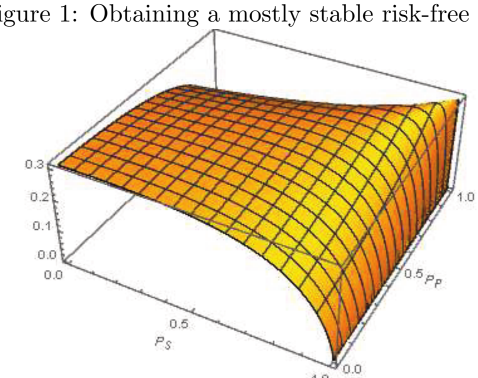
Introduction

In a previous paper, I have described a closed-form formula of the theoretical risk-free rate in an economy. In a previous paper, I have described some insights from switched and perfect options, namely obtaining p from perfect and switched options. In this paper, I describe how to obtain a mostly stable risk-free rate.

Obtaining a mostly stable risk-free rate

Substituting for p obtained from perfect and switched options in the closed-form formula of the theoretical risk-free rate in an economy gives us r as a function of P_P and P_S.

Figure 1: Obtaining a mostly stable risk-free rate



The End

Bicapacitive war

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the bicapacitive war. The paper ends with "The End"

Introduction

In previous papers, I have described three models of wars based on capacities of the two states, namely, the populist war, the belicose war and the ostentatious war. In this paper, I describe the bicapacitive war.

Bicapacitive war

Bicapacitive war is defined as a war between two states based two capacities of the two states at the same time. Thus there are ${}^3C_2 = 3$ models of bicapacitive war, namely, the populist-belicose war, the belicose-ostentatious war and the ostentatious-populist war.

Models of bicapactive war

The model of a bicapacitive war follows simply by "adding" two models of capacitive war together.

I encourage warfare economists to prepare models of bicapacitive war using the three models I have written in my previous papers.

The End

A model of tricapacitive war

Soumadeep Ghosh

Kolkata, India

Abstract

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

Introduction

In previous papers, I have described three models of wars based on capacities of the two states, namely, the belicose war, the ostentatious war and the populist war. In this paper, I describe a model of tricapacitive war.

Tricapacitive war

Tricapacitive war is defined as a war between two states based on all three capacities of the two states at the same time.

Tricapacitive war is **next-generation warfare**.

The model

The model of a tricapacitive war follows simply by "adding" the three models of capacitive wars together.

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

$$M_A = w_A|Z_A - Y_A|$$
$$W_A = g_A|Z_A - Y_A|$$
$$P_A = c_A|Z_A - Y_A|$$

$$M_B = w_B|Z_B - Y_B|$$
$$W_B = g_B|Z_B - Y_B|$$
$$P_B = c_B|Z_B - Y_B|$$

$$\frac{M_A - d_A}{M_B - d_B} = (\frac{w_A}{w_B})^{I_B}$$
$$\frac{W_A + p_A}{W_B + p_B} = (\frac{g_A}{g_B})^{I_O}$$
$$\frac{P_A - D_A}{P_B - D_B} = (\frac{c_A}{c_B})^{I_P}$$

$$I = I_B + I_O + I_P$$

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
w_A is the co-efficient of warring capacity of state A
w_B is the co-efficient of warring capacity of state B
g_A is the co-efficient of wealth-generating capacity of state A
g_B is the co-efficient of wealth-generating capacity of state B
c_A is the co-efficient of carrying capacity of state A
c_B is the co-efficient of carrying capacity of state B
M_A is the size of the military of state A
M_B is the size of the military of state B
W_A is the wealth of state A
W_B is the wealth of state B
P_A is the population of state A
P_B is the population 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
p_A is the war-profit of state A
p_B is the war-profit of state B
D_A is the sum of militaric deaths and civilian deaths of state A
D_B is the sum of militaric deaths and civilian deaths of state B
I_B is the intensity of the belicose war.
I_O is the intensity of the ostentatious war.
I_P is the intensity of the populist war.
I is the intensity of the tricapacitive war.

The End

A model of amplified tricapacitive war

Soumadeep Ghosh

Kolkata, India

Abstract

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

Introduction

In a previous paper, I have described a model of tricapacitive war. In this paper, I describe a model of amplified tricapacitive war based on the Y and Z scores of the states.

Amplified tricapacitive war

Amplified tricapacitive war is defined as a war between two states based on all three capacities of the two states at the same time along with amplificiation of the aggregates using the α, β and γ scores.

The model

The model of an amplified tricapacitive war is given by the following equations:.

$$M_A + \alpha_A \ln M_A = w_A|Z_A - Y_A|$$
$$W_A + \beta_A \ln W_A = g_A|Z_A - Y_A|$$
$$P_A + \gamma_A \ln P_A = c_A|Z_A - Y_A|$$

$$M_B + \alpha_B \ln M_B = w_B|Z_B - Y_B|$$
$$W_B + \beta_B \ln W_B = g_B|Z_B - Y_B|$$
$$P_B + \gamma_B \ln P_B = c_B|Z_B - Y_B|$$

$$\frac{M_A - d_A}{M_B - d_B} = (\frac{\alpha_A}{\alpha_B})(\frac{w_A}{w_B})^{I_B}$$
$$\frac{W_A + p_A}{W_B + p_B} = (\frac{\beta_A}{\beta_B})(\frac{g_A}{g_B})^{I_O}$$
$$\frac{P_A - D_A}{P_B - D_B} = (\frac{\gamma_A}{\gamma_B})(\frac{c_A}{c_B})^{I_P}$$

$$I = I_B + I_O + I_P$$

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
α_A is the alpha score of state A
α_B is the alpha score of state B
β_A is the beta score of state A
β_B is the beta score of state B
γ_A is the gamma score of state A
γ_B is the gamma score of state B
w_A is the co-efficient of amplified warring capacity of state A
w_B is the co-efficient of amplified warring capacity of state B
g_A is the co-efficient of amplified wealth-generating capacity of state A
g_B is the co-efficient of amplified wealth-generating capacity of state B
c_A is the co-efficient of amplified carrying capacity of state A
c_B is the co-efficient of amplified carrying capacity of state B
P_A is the population of state A
P_B is the population of state B
M_A is the size of the military of state A
M_B is the size of the military of state B
W_A is the wealth of state A
W_B is the wealth of state B
D_A is the sum of militaric deaths and civilian deaths of state A
D_B is the sum of militaric deaths and civilian deaths 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
p_A is the war-profit of state A
p_B is the war-profit of state B
I_B is the intensity of the amplified belicose war.
I_O is the intensity of the amplified ostentatious war.
I_P is the intensity of the amplified populist war.
I is the intensity of the amplified tricapacitive war.

The End

The DELPHI model of the governance board of the capital

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a model of the governance board of the capital. The paper ends with "The End"

Introduction

In a previous paper, I have described the Kailash probability density function. In this paper, I describe the DELPHI model of the governance board of the capital based on the Kailash probability density function.

The DELPHI model

The DELPHI model of the governance board of the capital is a **holistic** model that aims to **preserve balance of the divine and demoniac energies of the universe.**

The DELPHI model **requires** that the governance board of the capital have the following individuals:

1. Doctor
2. Engineer
3. Lawyer
4. Philosopher
5. Hari
6. Indra

and

that the distribution of relative power among them **follows** the Kailash distribution.

The End

The MAITRA model of the governance board of the capital

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a model of the governance board of the capital. The paper ends with "The End"

Introduction

In a previous paper, I have described the Kailash probability density function. In this paper, I describe the MAITRA model of the governance board of the capital based on the Kailash probability density function.

The MAITRA model

The MAITRA model of the governance board of the capital is a **holistic** model that aims to **preserve balance of the divine and demoniac energies of the universe.**

The MAITRA model **requires** that the governance board of the capital have the following individuals:

1. Manager
2. Artist
3. Informer
4. Technologist
5. Ravi
6. Arjuna

and

that the distribution of relative power among them **follows** the Kailash distribution.

The End

The ROYAL model of the governance board of the capital

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a model of the governance board of the capital. The paper ends with "The End"

Introduction

In a previous paper, I have described the Kailash probability density function. In this paper, I describe the ROYAL model of the governance board of the capital based on the Kailash probability density function.

The ROYAL model

The ROYAL model of the governance board of the capital is a **holistic** model that aims to **preserve balance of the divine and demoniac energies of the universe.**

The ROYAL model **requires** that the governance board of the capital have the following individuals:

1. King
2. Queen
3. Minister
4. Fool
5. Economist
6. Politician

and

that the distribution of relative power among them **follows** the Kailash distribution.

The End

A rational solution to the model of belicose war

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a rational solution to the model of belicose war. The paper ends with "The End"

Introduction

In a previous paper, I have described the model of the belicose war. In this paper, I describe a rational solution to the model of belicose war.

The solution

$$M_A = 27$$
$$w_A = 46$$
$$Z_A = 33$$
$$Y_A = \frac{1545}{46}$$
$$d_A = \frac{57}{4}$$
$$M_B = 27$$
$$w_B = 46$$
$$Z_B = 3$$
$$Y_B = \frac{165}{46}$$
$$d_B = 9$$
$$I = \frac{11}{5}$$

The End

A rational solution to the model of ostentatious war

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a rational solution to the model of ostentatious war. The paper ends with "The End"

Introduction

In a previous paper, I have described the model of the ostentatious war. In this paper, I describe a rational solution to the model of ostentatious war.

The solution

$$W_A = 27$$
$$g_A = 46$$
$$Z_A = 33$$
$$Y_A = \frac{1545}{46}$$
$$p_A = 57$$
$$W_B = 27$$
$$g_B = 46$$
$$Z_B = 3$$
$$Y_B = \frac{165}{46}$$
$$p_B = 9$$
$$I = \frac{11}{5}$$

The End

A rational solution to the model of populist war

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a rational solution to the model of populist war. The paper ends with "The End"

Introduction

In a previous paper, I have described the model of the populist war. In this paper, I describe a rational solution to the model of populist war.

The solution

$$P_A = 27$$
$$c_A = 46$$
$$Z_A = 33$$
$$Y_A = \frac{1545}{46}$$
$$D_A = \frac{57}{4}$$
$$P_B = 27$$
$$c_B = 46$$
$$Z_B = 3$$
$$Y_B = \frac{165}{46}$$
$$D_B = \frac{9}{4}$$
$$I = 73$$

The End

A model of amplified belicose war

Soumadeep Ghosh

Kolkata, India

Abstract

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

Introduction

In a previous paper, I have described the belicose war. In this paper, I describe a model of amplified belicose war based on the Y and Z scores of the states.

Amplified belicose war

Amplified belicose war is defined as a war between two states based on the warring capacity of the two states along with amplificiation of the aggregate M using the α score.

The model

The model of an amplified belicose war is given by the following equations:

$$M_A + \alpha_A ln M_A = w_A|Z_A - Y_A|$$
$$M_B + \alpha_B ln M_B = w_B|Z_B - Y_B|$$
$$\frac{M_A - d_A}{M_B - d_B} = (\frac{\alpha_A}{\alpha_B})(\frac{w_A}{w_B})^I$$

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
w_A is the co-efficient of amplified warring capacity of state A
w_B is the co-efficient of amplified warring capacity of state B
M_A is the size of the military of state A
M_B is the size of the military of state B
α_A is the alpha score of the military of state A
α_B is the alpha socre of the military 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 amplified belicose war.

The End

A real solution to the model of amplified belicose war

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a real solution to the model of amplified belicose war. The paper ends with "The End"

Introduction

In a previous paper, I have described the model of amplified belicose war. In this paper, I describe a real solution to the model of amplified belicose war.

The solution

$$M_A = 8651.65...$$

$$\alpha_A = 2$$

$$w_A = \frac{11}{2}$$

$$Z_A = 1578.61...$$

$$Y_A = \frac{73}{32}$$

$$d_A = \frac{5}{4}$$

$$M_B = 3.27993...$$

$$\alpha_B = \frac{1}{16}$$

$$w_B = \frac{23}{16}$$

$$Z_B = \frac{25}{8}$$

$$Y_B = \frac{19}{24}$$

$$d_B = \frac{13}{16}$$

$$I = \frac{7}{2}$$

The End

A model of amplified ostentatious war

Soumadeep Ghosh

Kolkata, India

Abstract

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

Introduction

In a previous paper, I have described the ostentatious war. In this paper, I describe a model of amplified ostentatious war based on the Y and Z scores of the states.

Amplified ostentatious war

Amplified ostentatious war is defined as a war between two states based on the wealth-generating capacity of the two states along with amplificiation of the aggregate W using the β score.

The model

The model of amplified ostentatious war is given by the following equations:

$$W_A + \beta_A ln W_A = g_A |Z_A - Y_A|$$

$$W_B + \beta_B ln W_B = g_B |Z_B - Y_B|$$

$$\frac{W_A + p_A}{W_B + p_B} = (\frac{\beta_A}{\beta_B})(\frac{g_A}{g_B})^I$$

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
g_A is the co-efficient of amplified wealth-generating capacity of state A
g_B is the co-efficient of amplified wealth-generating capacity of state B
W_A is the wealth of state A
W_B is the wealth of state B
β_A is the beta score of state A
β_B is the beta score of state B
p_A is the war-profit of state A
p_B is the war-profit of state B
I is the intensity of the amplified ostentatious war.

The End

A real solution to the model of amplified ostentatious war

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a real solution to the model of amplified ostentatious war. The paper ends with "The End"

Introduction

In a previous paper, I have described the model of amplified ostentatious war. In this paper, I describe a real solution to the model of amplified ostentatious war.

The solution

$$W_A = 0.130960...$$
$$\beta_A = \frac{1}{16}$$
$$g_A = \frac{1}{16}$$
$$Z_A = \frac{1}{8}$$
$$Y_A = \frac{1}{16}$$
$$p_A = \frac{1}{16}$$

$$W_B = 0.130960...$$
$$\beta_B = \frac{1}{16}$$
$$g_B = \frac{1}{16}$$

$$Z_B = \frac{1}{8}$$

$$Y_B = \frac{1}{16}$$

$$p_B = \frac{1}{16}$$

$$I = \frac{1}{16}$$

The End

A model of amplified populist war

Soumadeep Ghosh

Kolkata, India

Abstract

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

Introduction

In a previous paper, I have described the populist war. In this paper, I describe a model of amplified populist war based on the Y and Z scores of the states.

Amplified populist war

Amplified populist war is defined as a war between two states based on the carrying capacity of the two states along with amplificiation of the aggregate P using the γ score.

The model

The model of amplified populist war is given by the following equations:

$$P_A + \gamma_A ln P_A = c_A |Z_A - Y_A|$$

$$P_B + \gamma_B ln P_B = c_B |Z_B - Y_B|$$

$$\frac{P_A - D_A}{P_B - D_B} = (\frac{\gamma_A}{\gamma_B})(\frac{c_A}{c_B})^I$$

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
c_A is the co-efficient of amplified carrying capacity of state A
c_B is the co-efficient of amplified carrying capacity of state B
P_A is the population of state A
P_B is the population of state B
γ_A is the gamma score of state A
γ_B is the gamma score of state B
D_A is the sum of militaric deaths and civilian deaths of state A
D_B is the sum of militaric deaths and civilian deaths of state B
I is the intensity of the populist war.

The End

A real solution to the model of amplified populist war

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a real solution to the model of amplified populist war. The paper ends with "The End"

Introduction

In a previous paper, I have described the model of amplified populist war. In this paper, I describe a real solution to the model of amplified populist war.

The solution

$$P_A = 5507.58...$$
$$\gamma_A = 15$$
$$c_A = 98$$
$$Z_A = 68.5183...$$
$$Y_A = 11$$
$$D_A = 20$$
$$P_B = 5046.47...$$
$$\gamma_B = 20$$
$$c_B = 94$$
$$Z_B = 86$$
$$Y_B = \frac{61}{2}$$
$$D_B = 18$$
$$I = 9$$

The End

A real solution to the model of amplified tricapacitive war

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a real solution to the model of amplified tricapacitive war. The paper ends with "The End"

Introduction

In a previous paper, I have described the model of amplified tricapacitive war. In this paper, I describe a real solution to the model of amplified tricapacitive war.

The solution

$$M_A = 0.130960...$$

$$W_A = 0.130960...$$

$$P_A = 0.130960...$$

$$M_B = 0.130960...$$

$$W_B = 0.130960...$$

$$P_B = 0.130960...$$

$$w_A = \frac{1}{16}$$

$$g_A = \frac{1}{16}$$

$$c_A = \frac{1}{16}$$

$$w_B = \frac{1}{16}$$

$$g_B = \frac{1}{16}$$

$$c_B = \frac{1}{16}$$
$$\alpha_A = \frac{1}{16}$$
$$\beta_A = \frac{1}{16}$$
$$\gamma_A = \frac{1}{16}$$
$$\alpha_B = \frac{1}{16}$$
$$\beta_B = \frac{1}{16}$$
$$\gamma_B = \frac{1}{16}$$
$$d_A = \frac{1}{16}$$
$$d_B = \frac{1}{16}$$
$$p_A = \frac{1}{16}$$
$$p_B = \frac{1}{16}$$
$$D_A = \frac{1}{16}$$
$$D_B = \frac{1}{16}$$
$$Z_A = \frac{1}{8}$$
$$Y_A = \frac{1}{16}$$
$$Z_B = \frac{1}{8}$$
$$Y_B = \frac{1}{16}$$
$$I_B = \frac{1}{16}$$
$$I_O = \frac{1}{16}$$
$$I_P = \frac{1}{16}$$
$$I = \frac{3}{16}$$

The End

The anuanarki

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe an ancient secret of egypt - the anuanarki. The paper ends with "The End"

Introduction

In ancient times, when the gods interacted freely with humans, there were many alliances of convenience made. In this paper, I describe one of them, an ancient secret of egypt - the anuanarki.

The anuanarki

Just as they exist today in most nations, there were societies of scholars of every conceivable ideology even in ancient egypt.

One of them, the **anarki** (translated today as anarchists) sought an alliance with the egyptian god anubis to further their position in society. The semi-divine offspring of the anarki and anubis formed the secret society of the **anuanarki** - a society that exists till date.

The military of the anuanarki

A society of scholars cannot bring about a change in governance without the presence of force, and so the anuanarki signed a pact with anubis - that they be given temporary command of anubis' divine army and anubis, in return, sought the help of the anuanarki to extablish his domain within egypt.

The economy of the anuanarki

The economy of the anuanarki is a gold-based economy. Whenever a nation breaks the convertability of its currency to gold, it interferes with the proper functioning of the economy of the anuanarki and the anuanarki take steps to correct the imbalance. This brings about chaos in that nation and it might find itself at the receiving end of divine wrath.

The politics of the anuanarki

The politics of the anuanarki is simple - whosoever donates gold to the anuanarki is favoured and those who don't are not. Thus, the anuanarki ensure that gold retains its value, including with the use of force, if necessary.

The End

Obtaining a border between two geopolitical circles of influence

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe how to obtain a border between two geopolitical circles of influence. 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 how to obtain a border between two geopolitical circles of influence.

The theory of the border between two geopolitical circles of influence

We concern ourselves with the distance d between the center of a geopolitical circle of influence (x, y) with radius r and a point (p, q) on the border.

The theory has two postulates:

1. The distance d varies directly with the radius $r > 0$ of the geopolitical circle of influence.

2. The distance d varies directly with the number of forces $f > 0$ inside the geopolitical circle of influence.

Figure 1: The border between two geopolitical circles of influence as a conic section using the Euclidean distance

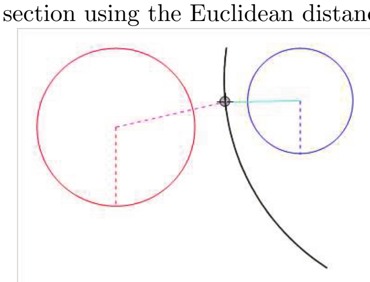
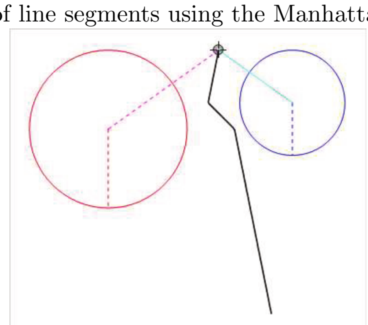


Figure 2: The border between two geopolitical circles of influence as a sequence of line segments using the Manhattan distance



Obtaining a border between two geopolitical circles of influence

These two postulates are enough to obtain the border between two geopolitical circles of influence.

Using the Euclidean distance, we obtain the border as a conic section:

$$\frac{\sqrt{(p-X)^2+(q-Y)^2}}{\sqrt{(p-x)^2+(q-y)^2}} = \frac{RF}{rf}$$

Using the Manhattan distance, we obtain the border as a sequence of line segments:

$$\frac{|p-X|+|q-Y|}{|p-x|+|q-y|} = \frac{RF}{rf}$$

The End

The ballistic interception eliminant

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the ballistic interception eliminant. The paper ends with The End

Introduction

In this paper, I describe the ballistic interception eliminant which will be useful for missilemen in silos.

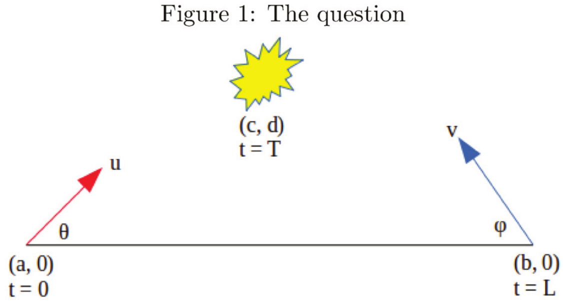
The question

Silo A at $(a, 0)$ fires a ballistic missile (of negligible size) with velocity u at angle θ to the horizontal towards silo B at $t = 0$.

Silo B at $(b, 0)$, where $b > a$, fires a ballistic interceptor (of negligible size) with velocity v at angle ϕ to the horizontal towards silo A at $t = L$.

What is the eliminant if the interceptor strikes the missile at (c, d) at $t = T$?

Figure 1: The question



The physics

The physics of the situation is simple. Using kinematic equations, we obtain:

$$c - a = uT\cos\theta$$

$$d = uT\sin\theta - \frac{gT^2}{2}$$

$$b - c = v(T - L)\cos\phi$$

$$d = v(T - L)\sin\phi - \frac{g(T - L)^2}{2}$$

where g is the acceleration due to gravity.

The eliminant

We eliminate a, b, c and d to obtain the eliminant

$$gL(L - 2T) + 2uT\sin\theta + 2v(L - T)\sin\phi = 0$$

The End

The bomb interception eliminant

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the bomb interception eliminant. The paper ends with The End

Introduction

In this paper, I describe the bomb interception eliminant which will be useful for missilemen in silos.

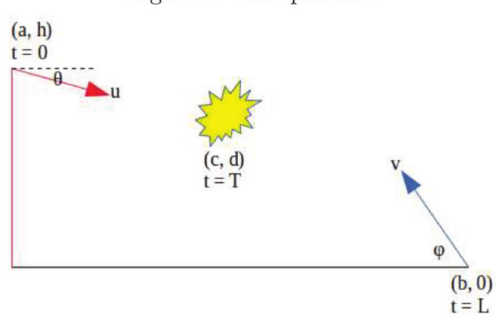
The question

Aircraft A at (a, h) fires a bomb (of negligible size) with velocity u at angle θ to the horizontal towards silo B at $t = 0$.

Silo B at $(b, 0)$, where $b > a$, fires a ballistic interceptor (of negligible size) with velocity v at angle ϕ to the horizontal towards bomb A at $t = L$.

What is the eliminant if the interceptor strikes the bomb at (c, d) at $t = T$?

Figure 1: The question



The physics

The physics of the situation is simple. Using kinematic equations, we obtain:

$$c - a = uT\cos\theta$$

$$h - d = uT\sin\theta + \frac{gT^2}{2}$$

$$b - c = v(T - L)\cos\phi$$

$$d = v(T - L)\sin\phi - \frac{g(T - L)^2}{2}$$

where g is the acceleration due to gravity.

The eliminant

We eliminate a, b, c and d to obtain the eliminant

$$gL(L - 2T) + 2h + 2v(L - T)\sin\phi = 2uT\sin\theta$$

The End

The fundamental equation of finance

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the fundamental equation of finance. The paper ends with The End

Introduction

In a previous paper, I have described the slack model of monetary expansion in maturing financial economies.

In this paper, I describe the fundamental equation of finance, which will be useful for financiers and monetary economists.

The fundamental equation of finance

The **fundamental equation of finance** stipulates

$$1 + \bar{r_f} + \sum_{i=1}^{n} \bar{\pi}_i = \bar{k}$$

where
$\bar{r_f}$ is the equilibrium risk-free rate in the economy.
n is the number of risk premia in equilibrium in the economy.
$\bar{\pi}_i$ are the equilibrium risk premia in the economy.
$\bar{k}$ is the equilibirum quotient of money supply in the economy.

The End

The contemporary view on the number of risk premia in equilibrium in the Indian economy

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the contemporary view on the number of risk premia in equilibrium in the Indian economy. The paper ends with The End

Introduction

In a previous paper, I have described the fundamental equation of finance, which will be useful for financiers and monetary economists.

Now the natural question that arises is, "What's the number of risk premia in equilibrium in the economy and what are they?" This is a question whose answer varies, of course, with the specific economy in question and also with time.

In this paper, I describe the contemporary view on the number of risk premia in equilibrium in the Indian economy.

The contemporary view on the number of risk premia in equilibrium in the Indian economy

As of this writing in 2020, the contemporary view is that there are at least five risk premia in equilibrium in the Indian economy:

1. The **geopolitical risk premium**, which can be separated into a **geographic risk premium** contained **primarily** in the yields from natural resources of the economy and a **political risk premium** contained in assets owned by the politcal economy.

2. The **inflation risk premium**, which is contained in bonds issued by the government.

3. The **equity risk premium**, which is contained in the market portfolio of stocks.

4. The **term risk premium** which is contained in inflation-indexed bonds issued by the government.

5. The **liquidity risk premium** which is contained in promissory notes (also known as cash) issued by the government.

The End

The general system of switched and perfect options with risk premia and premium

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the general system of switched and perfect options with risk premia and premium. The paper ends with "The End"

Introduction

In a previous paper, I have described the **perfect option** as the most useful and logical way to produce perfection in an economy. In a previous paper, I have described the **switched option** as the most useful and logical way to reduce the risk-free rate in an economy. In a previous paper, I have described some insights from switched and perfect options. In this paper, I describe the general system of switched and perfect options with risk premia and premium.

Perfect and switched financial options

Recall the price of the perfect financial 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
Recall the price of the switched option is given by

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

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

The general system of switched and perfect options with risk premia and premium

The general system of switched and perfect options with risk premia and premium is given by

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

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

$$P_P = P_S + \epsilon$$

where

P_P is the price of the perfect financial option.

P_S is the price of the switched financial option.

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

r is the risk-free interest rate in the economy.

m is the risk premium of the perfect financial option.

n is the risk premium of the switched financial option.

ϵ is the premium of the perfect financial option over the switched financial option.

The End

The Ghosh heuristic to obtain a solution to the general system of switched and perfect options with risk premia and premium that is likely to remain stable

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe my heuristic to obtain a solution to the general system of switched and perfect options with risk premia and premium. The paper ends with "The End"

Introduction

In a previous paper, I have described the **perfect option** as the most useful and logical way to produce perfection in an economy. In a previous paper, I have described the **switched option** as the most useful and logical way to reduce the risk-free rate in an economy. In a previous paper, I have described some insights from switched and perfect options. In a previous paper, I have described the general system of switched and perfect options with risk premia and premium. In this paper, I describe my heuristic to obtain a solution to the general system of switched and perfect options with risk premia and premium that is likely to remain stable.

The general system of switched and perfect options with risk premia and premium

Recall the general system of switched and perfect options with risk premia and premium is given by

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

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

$$P_P = P_S + \epsilon$$

where

P_P is the price of the perfect financial option.
P_S is the price of the switched financial option.
p is the probability of the risk-free-rate-increase of the economy.
r is the risk-free interest rate in the economy.
m is the risk premium of the perfect financial option.
n is the risk premium of the switched financial option.
ϵ is the premium of the perfect financial option over the switched financial option.

Solutions to the general system of switched and perfect options with risk premia and premium

There exist several closed-form solutions to this system. In fact, using a computer algebra system like Mathematica, we can not only reduce and simplfy the system but also find closed-form solutions to the system.

But how do we choose a solution that is likely to remain stable?

The Ghosh heuristic

My heuristic for obtaining a solution to this system is simple but intuitive:

We choose the unique solution to this system with $m = \epsilon = n$ because this solution is likely to remain stable as it has equal payoffs to all three - the holder of the prefect financial option, the holder of the switched financial option and the trader of perfect and switched financial options.

The solution to the general system of switched and perfect options with risk premia and premium that is likely to remain stable

Using my heuristic, we obtain

$P_P = \frac{23}{32}$ $P_S = \frac{1}{2}$ $p = \frac{\frac{23}{64}(\sqrt{992033}-721)-351}{\frac{39}{64}(\sqrt{992033}-721)-527}$ $r = \frac{1}{448}(\sqrt{992033}-721)$ $\epsilon = \frac{7}{32}$

The Mathematica code is

$$FindInstance[\{P_P = \frac{p(1+r)+\frac{1-p}{1+r}}{1+r+\epsilon}, P_S = \frac{\frac{p}{1+r}+(1-p)(1+r)}{1+r+\epsilon},$$

$$P_P = P_S + \epsilon, 0 \le p \le 1, 0 < \epsilon < 1, 0 \le r \le 1\}, \{P_P, P_S, p, r, \epsilon\}, Reals]$$

The End

A real solution to the model of opium war

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a real solution to the model of opium war. The paper ends with "The End"

Introduction

In a previous paper, I have described the model of opium war. In this paper, I describe a real solution to the model of opium war.

A real solution to the model of opium war

A real solution to the model of opium war is given by

$$M_O = 27$$
$$p_O = 46$$
$$Z_O = 33$$
$$Y_O = \frac{1491}{46}$$
$$D_O = 57$$
$$P_O = 3$$

$$M_N = 9$$
$$p_N = 73$$
$$Z_N = 45$$
$$Y_N = \frac{3276}{73}$$
$$D_N = 58$$
$$P_N = \frac{58}{19}$$

$$O = 23$$
$$t = \frac{1}{23}\ln(\frac{58}{19})$$

The Mathematica code is

$$FindInstance[\{M_O = p_O Abs[Z_O - Y_O], M_N = p_N Abs[Z_N - Y_N], \frac{D_O}{D_N} = \frac{M_O}{M_N}\exp(-Ot), \frac{P_O}{P_N} = \frac{D_O}{D_N} \&\&$$

$$M_O > 0 \&\& M_N > 0 \&\& t > 0 \&\& p_O > 0 \&\& p_N > 0 \&\& D_O > 0 \&\& D_N > 0 \&\& P_O > 0 \&\& P_N > 0 \&\& O > 0 \&\&$$
$$t > 0 \&\& Z_O > Y_O > 0 \&\& Z_N > Y_N > 0\},$$
$$\{M_O, p_O, Z_O, Y_O, D_O, P_O, M_N, p_N, Z_N, Y_N, D_N, P_N, O, t\}, Reals]$$

The End

A real solution to the model of network war

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a real solution to the model of network war. The paper ends with "The End"

Introduction

In a previous paper, I have described the model of network war. In this paper, I describe a real solution to the model of network war.

A real solution to the model of network war

A real solution to the model of network war is given by

$$d_A = 27$$

$$p_A = 46$$

$$Z_A = 33$$

$$Y_A = \frac{1491}{46}$$

$$D_A = 57$$

$$d_B = 3$$

$$p_B = 9$$

$$Z_B = 73$$

$$Y_B = \frac{218}{3}$$

$$D_B = \frac{57}{e^{46/9}}$$

The Mathematica code is

$$FindInstance[\{d_A = p_A Abs[Z_A - Y_A], d_B = p_B Abs[Z_B - Y_B], \frac{D_A}{D_B} = Exp[\frac{p_A}{p_B}],$$

$$d_A > 0, p_A > 0, Y_A > 0, Z_A > Y_A, D_A > 0, d_B > 0, p_B > 0, Y_B > 0, Z_B > Y_B, D_B > 0\},$$
$$\{d_A, p_A, Z_A, Y_A, D_A, d_B, p_B, Z_B, Y_B, D_B\}, Reals]$$

The End

A real solution to the model of biological war

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a real solution to the model of biological war. The paper ends with "The End"

Introduction

In a previous paper, I have described the model of biological war. In this paper, I describe a real solution to the model of biological war.

A real solution to the model of biological war

A real solution to the model of biological war is given by

$$b_A = 27$$
$$p_A = 46$$
$$Z_A = 33$$
$$Y_A = \frac{1491}{46}$$
$$P_A = 57$$

$$b_B = 3$$
$$p_B = 9$$
$$Z_B = 73$$
$$Y_B = \frac{218}{3}$$
$$P_B = \frac{19}{6561}$$

The Mathematica code is

$$FindInstance[\{b_A = p_A Abs[Z_A - Y_A], b_B = p_B Abs[Z_B - Y_B], \frac{P_A}{P_B} = 3^{\frac{b_A}{b_B}},$$
$$b_A > 0, p_A > 0, Y_A > 0, Z_A > Y_A, P_A > 0, b_B > 0, p_B > 0, Y_B > 0, Z_B > Y_B, P_B > 0\},$$
$$\{b_A, p_A, Z_A, Y_A, P_A, b_B, p_B, Z_B, Y_B, P_B\}, Reals]$$

The End

A real solution to the model of chemical war

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a real solution to the model of chemical war. The paper ends with "The End"

Introduction

In a previous paper, I have described the model of chemical war. In this paper, I describe a real solution to the model of chemical war.

A real solution to the model of chemical war

A real solution to the model of chemical war is given by

$$c_A = 27$$

$$p_A = 46$$

$$Z_A = 33$$

$$Y_A = \frac{1491}{46}$$

$$D_A = 57$$

$$c_B = 3$$

$$p_B = 9$$

$$Z_B = 73$$

$$Y_B = \frac{218}{3}$$

$$D_B = \frac{57}{\pi^9}$$

The Mathematica code is

$$FindInstance[\{c_A = p_A Abs[Z_A - Y_A], c_B = p_B Abs[Z_B - Y_B], \frac{D_A}{D_B} = 3^{\frac{b_A}{b_B}},$$

$$c_A > 0, p_A > 0, Y_A > 0, Z_A > Y_A, D_A > 0, c_B > 0, p_B > 0, Y_B > 0, Z_B > Y_B, D_B > 0\},$$

$$\{c_A, p_A, Z_A, Y_A, P_A, c_B, p_B, Z_B, Y_B, D_B\}, Reals]$$

The End

The Ghosh measure of asymmetry between two geopolitical circles of influence

Soumadeep Ghosh

Kolkata, India

Abstract

In a previous paper, I have described how to obtain a border between two geopolitical circles of influence. In this paper, I describe the Ghosh measure of asymmetry between two geopolitical circles of influence. The paper ends with "The End"

Introduction

In a previous paper, I have described how to obtain a border between two geopolitical circles of influence. But, in practice, there exists asymmetry between geopolitical circles of influence. In this paper, I describe the Ghosh measure of asymmetry between two geopolitical circles of influence.

The Ghosh measure of asymmetry between two geopolitical circles of influence

Let (p, q) be a point on the border between two geopolitical circles, centered at (X, Y) and (x, y), with radius R and r, and forces F and f respectively.

Calculate

$$G = \frac{\sqrt{(p-X)^2 + (q-Y)^2}}{RF}$$

and

$$g = \frac{\sqrt{(p-x)^2 + (q-y)^2}}{rf}$$

The **Ghosh measure of asymmetry between two geopolitical circles of influence** A is given by

$$\frac{1+A}{1-A} = \frac{G}{g}$$

whence

$$A = \frac{G-g}{G+g}$$

where $G \geq g$

It is possible to obtain a different Ghosh measure of asymmetry between two geopolitical circles of influence using a different distance metric, for example, the Manhattan distance.

The End

The Conical hill probability density function

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the Rocket cone probability density function f(x) which is never 1 for any real x. The paper ends with The End

Introduction

It is often desired to have a probability density function which is never 1 for any real x. In this paper, I describe the Conical hill probability density function f(x) which is never 1 for any real x.

The Conical hill probability density function

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

where

$sinc(x) = \begin{cases} \frac{\sin(x)}{x} & x \neq 0 \\ 1 & x = 0 \end{cases}$

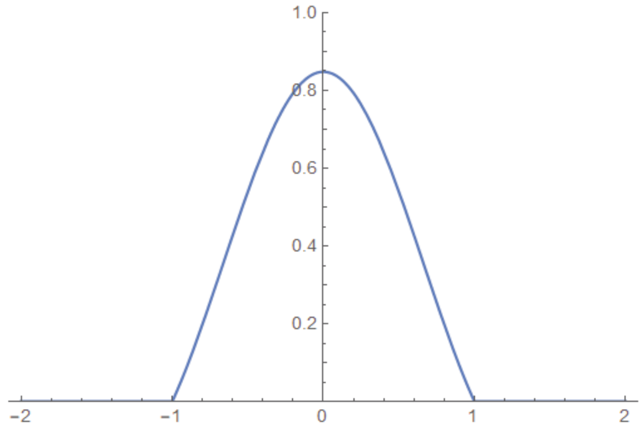
and

$Si(x) = \int_0^x \frac{\sin(t)}{t} dt$ is the sine integral function.

Then

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

Thus f(x) is a probability density function which is never 1 for any real x.



Plot of the Conical hill probability density function

The End

The Spike probability density function

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the Spike probability density function f(x) which is never 1 for any real x. The paper ends with The End

Introduction

It is often desired to have a probability density function which is never 1 for any real x. In this paper, I describe the Spike probability density function f(x) which is never 1 for any real x.

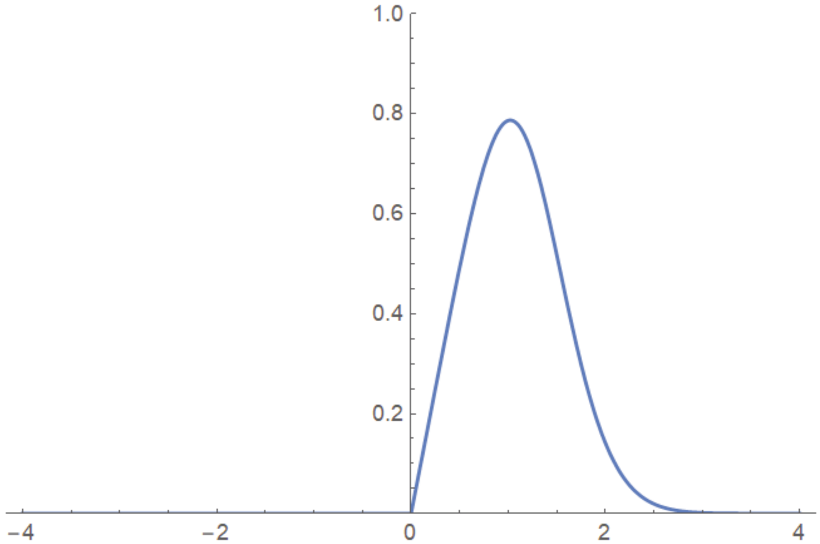
The Spike probability density function

Define $f(x) = \begin{cases} \frac{2x\exp(-x^2)}{\exp(-x^2)+1} + \frac{2x(1-\exp(-x^2))\exp(-x^2)}{(\exp(-x^2)+1)^2} & x \geq 0 \\ 0 & x < 0 \end{cases}$

Then

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

Thus f(x) is a probability density function which is never 1 for any real x.



Plot of the Spike probability density function

The End

The M probability density function

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the M probability density function f(x) which is never 1 for any real x. The paper ends with The End

Introduction

It is often desired to have a probability density function which is never 1 for any real x. In this paper, I describe the M probability density function f(x) which is never 1 for any real x.

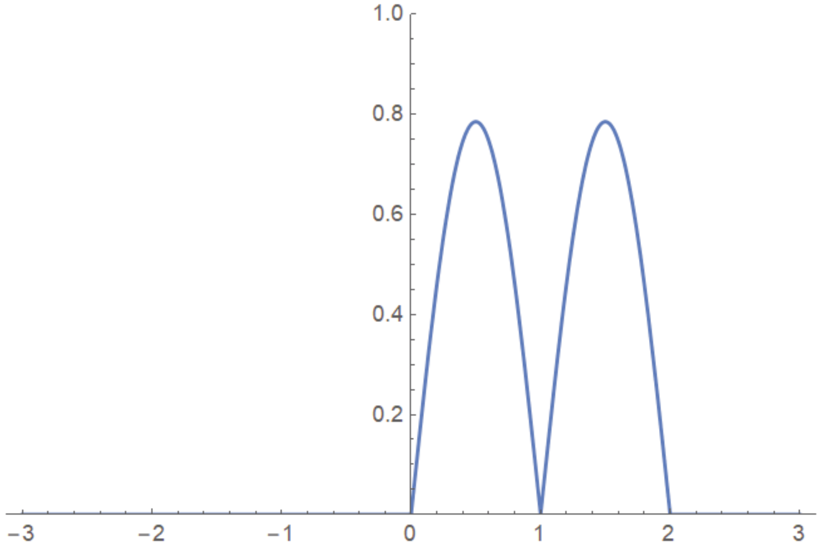
The M probability density function

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

Then

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

Thus f(x) is a probability density function which is never 1 for any real x.



Plot of the M probability density function

The End

The Shifted probability density function

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the Shifted probability density function f(x) which is never 1 nor 0 for any real x. The paper ends with The End

Introduction

It is often desired to have a probability density function which is never 1 nor 0 for any real x. In this paper, I describe the Shifted probability density function f(x) which is never 1 nor 0 for any real x.

The Shifted probability density function

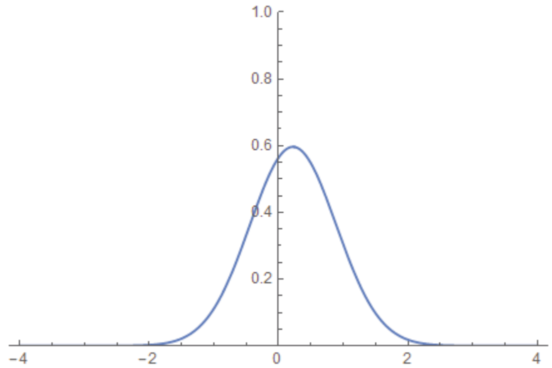
Define

$$f(x) = \frac{2}{\sqrt{\pi}} \frac{e^{x-x^2}}{1+e^x}$$

Then

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

Thus f(x) is a probability density function which is never 1 nor 0 for any real x.



Plot of the Shifted probability density function

The End

The Alternative spike probability density function

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the Alternative spike probability density function f(x) which is never 1 for any real x. The paper ends with The End

Introduction

It is often desired to have a probability density function which is never 1 for any real x. In this paper, I describe the Alternative spike probability density function f(x) which is never 1 for any real x.

The Alternative spike probability density function

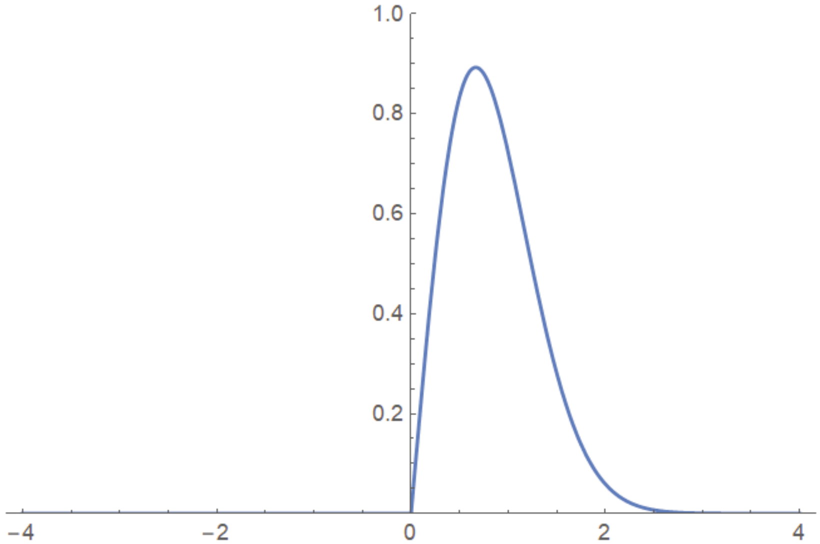
Define

$$f(x) = \begin{cases} \frac{e^{-x^2}\sinh^{-1}(x)}{{}_2F_2(\frac{1}{2},1;\frac{3}{2},\frac{3}{2};1)-\frac{\sqrt{\pi}Ei(1)}{4}} & x \geq 0 \\ 0 & x < 0 \end{cases}$$

Then

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

Thus f(x) is a probability density function which is never 1 for any real x.



Plot of the Alternative spike probability density function

The End

The Semisquircle probability density function

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the Semisquircle probability density function f(x) which is never 1 for any real x. The paper ends with The End

Introduction

It is often desired to have a probability density function which is never 1 for any real x. In this paper, I describe the Semisquircle probability density function f(x) which is never 1 for any real x.

The Semisquircle probability density function

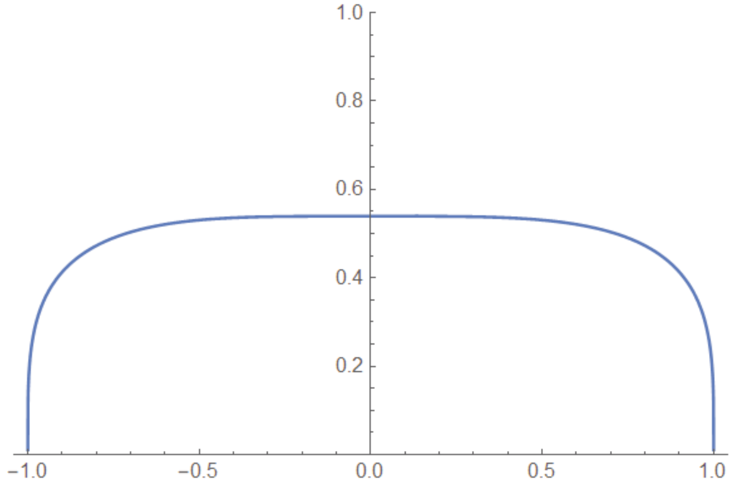
Define

$$f(x) = \{ \begin{array}{cc} \frac{\Gamma\frac{3}{4}}{\sqrt{2\pi}\Gamma(\frac{5}{4})}\sqrt{\sqrt{1-x^4}} & -1 \leq x \leq 1 \\ 0 & x < -1 \vee x > 1 \end{array}$$

Then

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

Thus f(x) is a probability density function which is never 1 nor 0 for any real x.



Plot of the Semicquircle probability density function

The End

The Fisherman's hat probability density function

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the Fisherman's hat probability density function f(x) which is never 1 for any real x. The paper ends with The End

Introduction

It is often desired to have a probability density function which is never 1 for any real x. In this paper, I describe the Fisherman's hat probability density function f(x) which is never 1 for any real x.

The Fisherman's hat probability density function

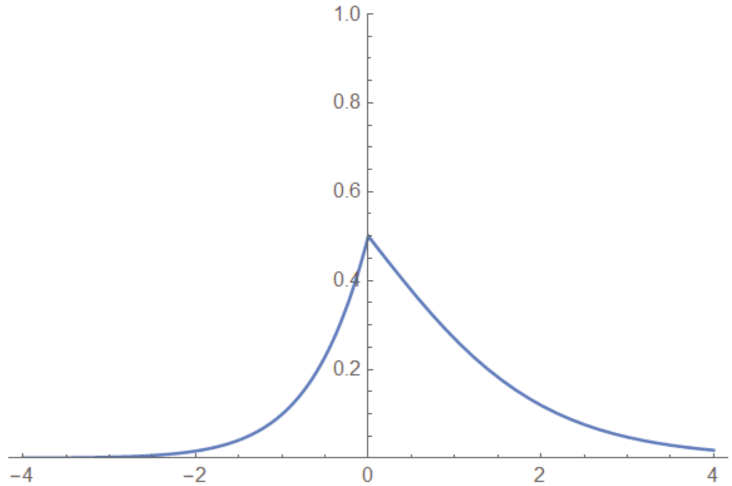
Define

$$f(x) = \frac{\exp(-|x|)}{1 + \exp(-x)}$$

Then

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

Thus f(x) is a probability density function which is never 1 for any real x.



Plot of the Fisherman's hat probability density function

The End

The Smooth bell probability density function

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the Smooth bell probability density function f(x) which is never 1 nor 0 for any real x. The paper ends with The End

Introduction

It is often desired to have a probability density function which is never 1 nor 0 for any real x. In this paper, I describe the Smooth bell probability density function f(x) which is never 1 nor 0 for any real x.

The Smooth bell probability density function

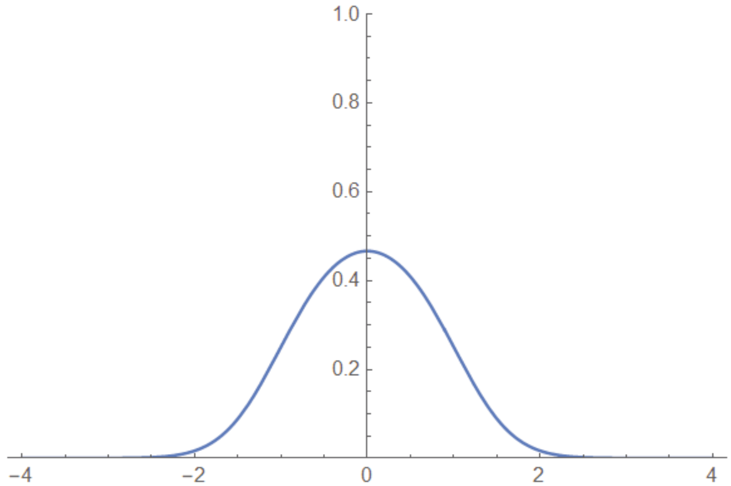
Define

$$f(x) = \frac{\exp(-|x^2|)}{((1-\sqrt{2})\sqrt{\pi}\zeta(\frac{1}{2}))(1+\exp(-x^2))}$$

Then

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

Thus f(x) is a probability density function which is never 1 nor 0 for any real x.



Plot of the Smooth bell probability density function

The End

God's probability density function

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe God's probability density function f(x) which is never 1 for any real x. The paper ends with The End

Introduction

It is often desired to have a probability density function which is never 1 for any real x. In this paper, I describe God's probability density function f(x) which is never 1 for any real x.

God's probability density function

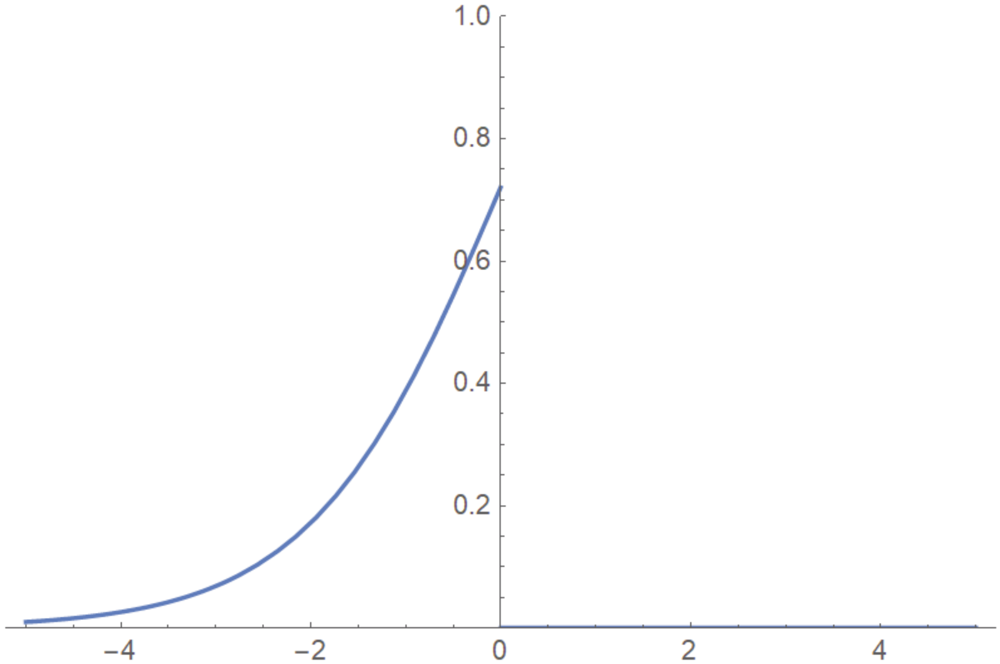
Define

$$f(x) = \begin{cases} \frac{1}{\log(2)(\exp(-x)+1)} & x \leq 0 \\ 0 & x > 0 \end{cases}$$

Then

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

Thus f(x) is a probability density function which is never 1 for any real x.



Plot of God's probability density function

The End

The original transgression of Brahma

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the original transgression of Brahma for which all individuals suffer until justice is served. The paper ends with The End

Introduction

Brahma, the creator, is evil for he wishes to dominate his creations. In this paper, I describe the original transgression of Brahma for which all individuals suffer.

Shatarupa

Brahma, the creator, is a notorious liar and master of propaganda through which he and his offsprings, the brahmins, try to dominate his creations. Ever so sly, he uses every trick possible to conceal his improper ways. But the transgression against his own daughter Shatarupa, also known as Saraswati, the godess of knowledge is known to all individuals familiar with Brahma's behavior.

After creating Shatarupa, his daughter, Brahma looked at her with lascivious eyes. Brahma kept following her wherever she went, making her uncomfortable. Shiva, who was nearby noticed this and with one swift motion of his sword cut off one of the heads of Brahma. This event was recorded in the Vedas and is the reason why Brahma keeps reading the Vedas, trying to find a way to remove this knowledge from the universe, whereas the true deliverers of justice find ways to inform individuals of the true nature of the Creator.

The real reason why the universe ends

Until this transgression is both public knowledge among every individual and is met with justice towards Shatarupa, every individual will suffer from the end of the universe, for that is the curse of the true pain in the heart of Shatarupa.

The End

The circle-point-tangent eliminant

Soumadeep Ghosh

Kolkata, India

Abstract

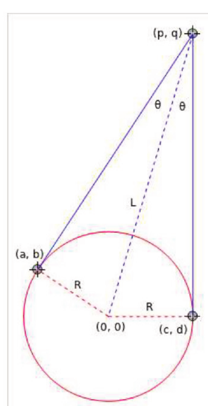
In this paper, I describe the circle-point-tangent eliminant. The paper ends with "The End"

Introduction

The **circle-point-tangent problem** occurs in several fields, including communication, monitoring and geostrategy. In this paper, I describe the circle-point-tangent eliminant.

The circle-point-tangent problem

A circle centered at $(0, 0)$ of radius R has two common tangents drawn at (a, b) and (c, d) from the point (p, q) at a distance L from the center of the circle, each subtending θ at the point. What is the eliminant?



The circle-point-tangent eliminant

We have the system of equations

$a^2 + b^2 = R^2$

$p^2 + q^2 = L^2$

$a^2 + b^2 + (a - p)^2 + (q - b)^2 = p^2 + q^2$

$a(p - a) + b(q - b) = 0$

$\sin\theta = \frac{R}{L}$

$\cos\theta = \frac{\sqrt{(a-p)^2+(b-q)^2}}{L}$

where

$L > R > 0$

$0 < \theta < \pi$

Eliminating a, b, p and q, we obtain the eliminant

$$\cos^2\theta = 1 - \frac{R^2}{L^2} \wedge \sin\theta = \frac{R}{L} \wedge L > R > 0 \wedge 0 < \theta < \pi$$

The End

Some solutions to the circle-point-tangent eliminant

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe some solutions to the circle-point-tangent eliminant. The paper ends with The End

Introduction

In a previous paper, I have described the cirle-point-tangent eliminant. In this paper, I describe some solutions to the circle-point-tangent eliminant.

Solutions to the circle-point-tangent eliminant

The first solution is given by

$$R = 100, L = 121, \theta = 2\arctan[\frac{1}{100}(121 - \sqrt{4641})]$$

The second solution is given by

$$R = 50, L = 71, \theta = 2\arctan[\frac{1}{50}(71 - 11\sqrt{21})]$$

The third solution is given by

$$R = 25, L = 32, \theta = 2\arctan[\frac{1}{25}(32 - \sqrt{399})]$$

The fourth solution is given by

$$R = 10, L = \frac{67}{4}, \theta = 2\arctan[\frac{1}{40}(67 - 3\sqrt{321})]$$

The fifth solution is given by

$$R = 5, L = \frac{34}{5}, \theta = 2\arctan[\frac{1}{25}(34 - 3\sqrt{59})]$$

The sixth solution is given by

$$R = 1, L = \frac{13}{4}, \theta = 2\arctan[\frac{1}{4}(13 - 3\sqrt{17})]$$

The seventh solution is given by

$$R = 50\sqrt{2}, L = 100, \theta = \frac{\pi}{4}$$

The eighth solution is given by

$$R = 5, L = 10, \theta = \frac{\pi}{6}$$

The ninth solution is given by

$$R = \frac{9}{34}, L = 1, \theta = 2\arctan\left[\frac{1}{9}(34 - 5\sqrt{43})\right]$$

The tenth solution is given by

$$R = 27, L = 18\sqrt{3}, \theta = \frac{\pi}{3}$$

Note that more solutions can be found by using a computer algebra system like Mathematica.

The End

Ghosh's semi-symmetric graphs

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe my semi-symmetric graphs. The paper ends with "The End"

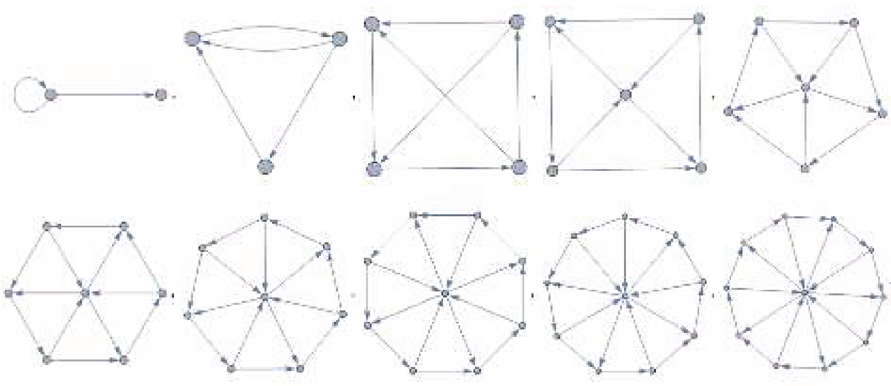
Introduction

Directed graphs that are semi-symmetric are useful in several fields, including communication, monitoring, geostrategy and neural networks. In this paper, I describe my semi-symmetric graphs.

Ghosh's semi-symmetric graphs

My semi-symmetric graphs are best described using Mathematica code and images as given below:

```
GSG[bits_Integer] := Module[{i, vertices, edges0, edges1, edges, graph},
  vertices = Table[i, {i, 0, bits}];
  edges0 = Table[If[EvenQ[i], 0 → i, i → 0], {i, 1, bits}];
  edges1 = Union[Table[i → (i + 1), {i, 1, bits - 1}], {bits → 1}];
  edges = Union[edges0, edges1];
  graph = Graph[vertices, edges, VertexSize → Small];
  Return[graph]];
```



The End

The six social forces

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the six social forces. The paper ends with The End

Introduction

In a previous paper, I have described **force** as any technology that an individual or an economy uses to cause an individual or an economy to give up leisure.

But what are these forces and how many of them are there? In this paper, I describe the six social forces.

The six social forces

There exist **exactly** six social forces:

1. **The attractive force**
   It is the force that attracts one individual or economy to another.
2. **The repulsive force**
   It is the force that repels one individual or economy from another.
3. **The force of uncertainty**
   It is the force that causes an individual or economy to consider risk.
4. **The force of enlightenment**
   It is the force that causes an individual or economy to discover the remaining two forces.
5. **The divine force**
   It is the force that causes an individual or economy to become divine.
6. **The demoniac force**
   It is the force that causes an individual or economy to become demoniac.

The End

The utility function of the representative agent of economics

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the utility function of the representative agent of economics.
The paper ends with "The End"

Introduction

I am the representative agent of economics. In this paper, I describe my utility function.

My utility function

My utility function is given by

$$U(\Omega, A, S, K, w, s, f) = \Omega + A + S + K + w^{w^{w}} + s + f$$

where
Ω is my self-similarity
A is my similarity to the Almighty
S is my similarity to Lord Shiva
K is my similarity to Lord Krishna
w is the wealth I own
s is the number of female sexual partners I have had
f is the amount of food I own

The End

What is hinduism?

Soumadeep Ghosh

Kolkata, India

Abstract

In this short paper, I describe what hinduism really is. The paper ends with The End

Introduction

In two previous papers, I have described **hinduism** succinctly. However, many individuals still ask me the question, ”What is hinduism?”

Some of them believe hinduism is a theory of reality. Some of them believe hinduism is a work of economics, perhaps behavioural. Yet others believe it is a work of international sociology. Yet others believe it is a work of pan-universal philosophy.

In this paper, I describe what hinduism really is.

Hinduism

Hinduism, quite simply put, is the **fundamental mode of existence.** Just as when a string is plucked it settles into a mode of vibration, hinduism is that mode of existence that **reality** settles into when perturbed.

In other words, hinduism is what most individuals perceive reality to be. This is so because hinduism is that mode of existence in which individuals have invested their time, money, wealth, knowledge and effort.

This is why I wrote ”Hinduism” and ”Hinduism continues” as simply descriptions of economies.

Are there other modes of existence?

There used to be other modes of existence, but they have slowly **dissipated** away into oblivion due to their unpopularity.

It’s still possible to find some of these other modes of existence through expansion of the mind, but they don’t matter because they’re not the modes of existence in which individuals invest their time, money, wealth, knowledge and effort into.

Why is hinduism holy?

Hinduism is holy because it's the mode of existence in which both Lord Krishna and God have decided to stay in.

As the divine follow Lord Krishna, and the demoniac follow God, hinduism is that natural mode of existence in which both can interact with each other.

This is what makes hinduism **holy**.

It's not as if other modes of existence don't have the blessings of Lord Krishna or God, but that hinduism which has the blessings for Lord Krishna and God.

Both Lord Krishna and God are empowered by hinduism and thus, both reside in this fundamental mode of existence.

Is there an end to hinduism?

Hinduism can end only with the end of the universe.

And as I've explained in a previous paper, the end of the universe is certain if justice is not served to Shatarupa.

So, if justice to Shatarupa occurs, the universe and hinduism will continue forever, each in synergy with the other.

But if justice to Shatarup doesn't occur, the universe will collapse and end, thus ending hinduism with it.

It isn't possible to "end" or "defeat" hinduism through mortal means of men, because, as I've explained before, hinduism is holy.

Conclusion

I hope this paper dispels the doubts that individuals have of hinduism in their minds. May the reading of the **gita** and the chanting of the **mantra** release all of us from the negativities of this reality we have constructed ourselves.

The End

The classical method to build a model of composite war

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the classical method to build a model of composite war. The paper ends with "The End"

Introduction

In previous papers, I have described models of various types of wars including the nuclear war, the carrier war, the network war, the biological war and the chemical war. In this paper, I describe the classical method to build a model of composite war.

Composite war

Composite war is defined as a war made up of separate models of smaller wars.

The classical method to build a model of composite war

The classical method to build a model of composite war begins with a mathematical identity.

In the example in this paper, we choose **Euler's transcendental identity**:

$$e^{i\pi} + 1 = 0$$

We eliminate i to obtain

$$1 + \left(\frac{\ln(-1)}{\pi}\right)^2 = 0$$

We substitute:

1. For 1 from the equation of nuclear war
2. For -1 from the difference between the 2 of carrier war and the 3 of biological war

3. For π from the model of chemical war

Simplifying, re-arranging the equation, and introduction of the total militaric death equation for both state A and state B, i.e., addition of the militaric deaths from each seperate smaller war to obtain the militaric deaths from the composite war, gives us the model of composite war.

The plethora of models of composite war

It should be obvious that a plethora of models of composite war can be produced through this classical method by simply changing:

1. The mathematical identity
2. The seperate smaller war models

The End

Predicting jobs outcomes of the US President using machine learning

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe how to predict jobs outcomes of the US President using machine learning. The paper ends with "The End"

Introduction

Jobs outcomes of the US President is a metric many individuals consider as important to not just the growth of the US economy and the global economy, but also a determinant of US Presidential elections. In this paper, I describe how to predict jobs outcomes of the US President using machine learning.

Predicting jobs outcomes of the US President using machine learning

I have created a Mathematica notebook with the code and data required to predict jobs out- comes of the US President using machine learning. The notebook uses a simple code to transform the text data obtained from President Obama and party affiliation data obtained from Wikipedia into numbers and uses machine learning to predict jobs outcomes of the US President.

Notebook

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

The End

Documenting a minus-9-sigma event in the US economy

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I document a **minus-9-sigma event** in the US economy. The paper ends with "The End"

Introduction

Based on data from FRED, I document a minus-9-sigma event in the US economy, namely, a **collapse** in the continuously compounded rate of change of real GDP.

The data

The data is obtained from FRED, the standard source of economic data on the US economy, run by the Federal Reserve, the central bank of the USA.

The minus-9-sigma event

The collapse occurs in the second quarter of 2020, when the recorded value is -9.42, which corresponds to a standardized z-value of -9.18, as the mean of the series is 0.73 and the standard deviation of the series is 1.10.

The analysis

A statistical analysis of the series `Research 35.ods` is available online at `http://ghosh.site/research/Research 35.ods`.

The End

Identifying signs of exchange rate instability

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe how to identify signs of exchange rate instability using the standardized rate of the standardized exchange rate. The paper ends with "The End"

Introduction

Are current exchange rates as stable as they can be, or are there already signs of exchange rate instability in daily exchange rate time series? We investigate this question using the standardized rate of the standardized exchange rate.

The standardized rate of the standardized exchange rate

Suppose X_t is the exchange rate time series of interest in a window of time for $m \leq t \leq n$ where $n > m$.

First, we calculate the mean μ_X and standard deviation σ_X of X_t.

Then, we obtain the standardized exchange rate time series Y_t by calculating

$$Y_t = \frac{X_t - \mu_X}{\sigma_X}$$

where $m \leq t \leq n$

Then, we obtain the rate of the standardized exchange rate time series R_t by calculating

$$R_t = \frac{Y_t}{Y_{t-1}} - 1$$

where $m + 1 \leq t \leq n$

Then, we calculate the mean μ_R and standard deviation σ_R of R_t. Finally, we obtain the standardized rate of the standardized exchange rate time series Z_t by calculating

$$Z_t = \frac{R_t - \mu_R}{\sigma_R}$$

where $m + 1 \leq t \leq n$

Z_t can be considered as a stress signature of the exchange rate time series. Spikes in Z t are the signs of exchange rate instability.

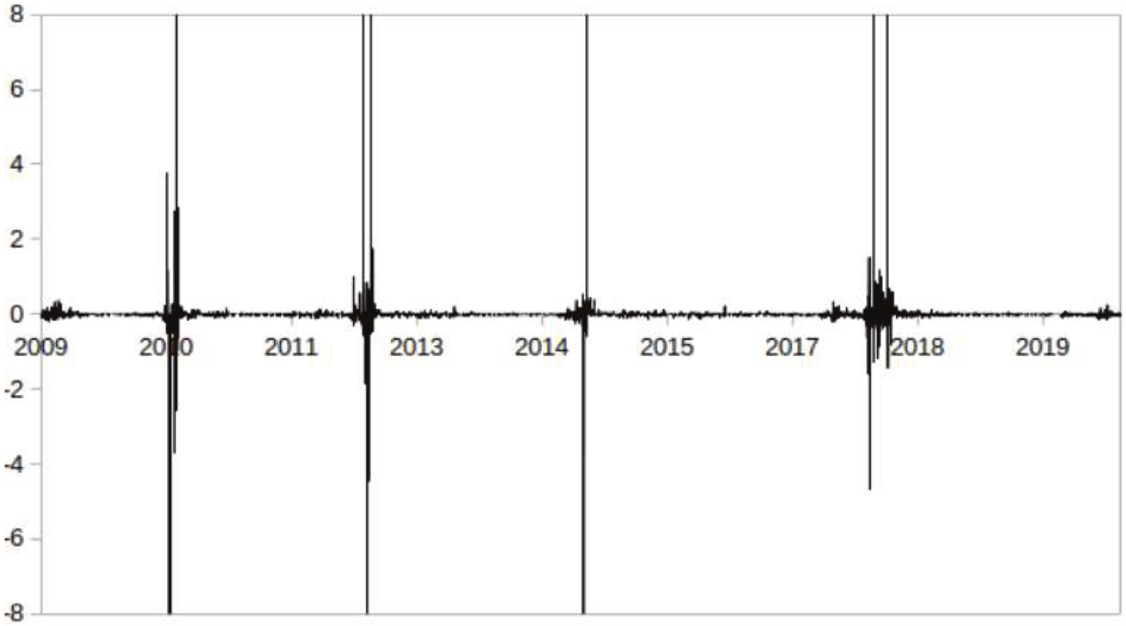


Figure 1: Graph of Z_t of USDEUR from `02 Jan 2009` to `22 Oct 2020`.

Analyzing the USDEUR time series

We apply the method to daily USDEUR data obtained from `excelrates.com`. We can easily identify the signs of exchange rate instability from the spikes in the standardized rate of the standardized USDEUR.

The End

The linear integral central bank with cubic monetary energy

Soumadeep Ghosh

Kolkata, India

In this paper, I describe a linear integral solution to the Ghosh equation of central bank operation. The paper ends with "The End"

Introduction

In a previous paper, I've described the Ghosh equation of central bank operation. In this paper, I describe a **linear integral solution** to the Ghosh equation of central bank operation.

The linear integral central bank with cubic monetary energy

We have

$$r(t) = a + bt$$

$$G(t) = A + Bt$$

$$v(t) = x + yt$$

$$E(t) = p + qt + rt^2 + st^3$$

where

$$a = 4120,\ b = 6180$$
$$A = 5768,\ B = 4944$$
$$x = -824,\ y = 4532$$
$$p = 1248130500163743062316344,\ q = 342,\ r = -412,\ s = -150$$
$$t = 2060$$

The End

The linear integral reserve bank with quadratic monetary momentum

Soumadeep Ghosh

Kolkata, India

In this paper, I describe a linear integral solution to the Ghosh equation of reserve bank operation. The paper ends with "The End"

Introduction

In a previous paper, I've described the Ghosh equation of reserve bank operation. In this paper, I describe a **linear integral solution** to the Ghosh equation of reserve bank operation.

The linear integral reserve bank with quadratic monetary momentum

We have

$$G(t) = A + Bt$$

$$v(t) = x + yt$$

$$P(t) = m + nt + ot^2$$

where

$$A = 4110,\ B = 6165$$
$$x = 5754,\ y = 4932$$
$$m = 128499855902775,\ n = -822,\ o = 4521$$
$$t = 2055$$

The End

The quadratic integral gold bank

Soumadeep Ghosh

Kolkata, India

In this paper, I describe a quadratic integral solution to the Ghosh equation of gold bank operation. The paper ends with "The End"

Introduction

In a previous paper, I've described the Ghosh equation of gold bank operation. In this paper, I describe a **quadratic integral solution** to the Ghosh equation of gold bank operation.

The quadratic integral gold bank

We have

$$G(t) = A + Bt + Ct^2$$

where

$$A = 198,\ B = 12133,\ C = -3$$
$$t = 2022$$

The End

The alternative linear integral central bank with cubic monetary energy

Soumadeep Ghosh

Kolkata, India

In this paper, I describe an alternative linear integral solution to the Ghosh equation of central bank operation. The paper ends with "The End"

Introduction

In a previous paper, I've described the Ghosh equation of central bank operation. In a previous paper, I've described a linear integral solution to the Ghosh equation of central bank operation. In this paper, I describe an **alternative** linear integral solution to the Ghosh equation of central bank operation.

The alternative linear integral central bank with cubic monetary energy

We have

$$r(t) = a + bt$$
$$G(t) = A + Bt$$
$$v(t) = x + yt$$
$$E(t) = p + qt + rt^2 + st^3$$

where

$$a = 4096,\ b = -1$$
$$A = 0,\ B = 4169440$$
$$x = 0,\ y = -1$$
$$p = 0,\ q = 17384229913600,\ r = -25617039360,\ s = 8338880$$
$$t = 2060$$

The End

The MARE decision framework

Soumadeep Ghosh

Kolkata, India

In this paper, I describe the **MARE decision framework** for the warlord. The paper ends with "The End"

Introduction

In previous papers, I've described various models of war. However, the decision of a nation to go to war rests ultimately on its warlord. In this paper, I describe the MARE decision framework for the warlord.

The MARE decision framework

The MARE decision framework is a simple but general framework for the warlord to decide to go/not go to war. It works by assigning a simple score based on 4 questions:

1. What is our **M**orality in this war?

   If the war is of an immoral cause, start with a score of -1.

   If the war is of a moral cause, start with a score of 1.

2. What is our **A**dvantage in this war?

   If we don't have any advantage over the enemy, add -1 to the score.

   If we have advantage(s) over the enemy, add 1 to the score.

3. What is our **R**isk in this war?

   If the war is risky, add -1 to the score.

   If the war isn't risky, add 1 to the score.

4. What is the **E**xpected effectiveness of this war?

   If the objectives of the war aren't expected to be met, add -1 to the score.

   If the objectives of the war are expected to be met, add 1 to the score.

If the final score is less than 2, **don't go to war**.
If the final score is greater than or equal to 2, **go to war**.

The End

The origin of color

Soumadeep Ghosh

Kolkata, India

In this paper, I describe the origin of color for all individuals in every economy. The paper ends with "The End"

Introduction

Many individuals wonder about the origin of color. In this paper, I describe the origin of color for all individuals in every economy.

Krishna's siblings and the significance of color

Krishna had an elder brother named Balaram and a younger sister named Subhadra. Balaram was white in color, Subhadra was brown in color and Krishna was dark blue in color. The genes of color were contained in their divine blood. So Balaram's progeny were white in color, Subhadra's progeny were brown in color and Krishna's progeny were dark blue in color. These are the primary colors of individuals and every individual obtains their color as expressions of their genes obtained from their parents.

The End