Collected papers of

Lord Soumadeep Ghosh

Volume 28

A generalization of the uniform probability density function

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a generalization of the uniform probability density function. The paper ends with "The End"

Introduction

Generalizing the uniform probability density function is possible in many ways.
In this paper, I describe a generalization of the uniform probability density function.

A generalization of the uniform probability density function

A generalization of the uniform probability density function is

$$f(H,h,x) = \begin{cases} \frac{4}{9}x^2(h-H)(h+2H)^2 + H & -\frac{3}{2h+4H} \leq x \leq \frac{3}{2h+4H} \\ 0 & x < -\frac{3}{2h+4H} \vee x > \frac{3}{2h+4H} \end{cases}$$

where

$$0 \leq h \leq 1$$

$$0 \leq H \leq 1$$

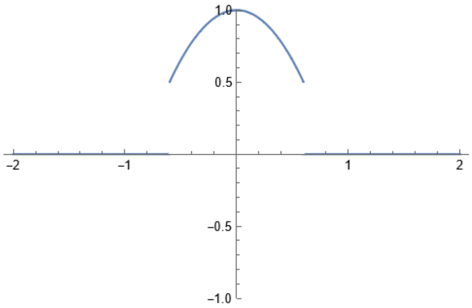
$$h + 2H > 0$$

Then

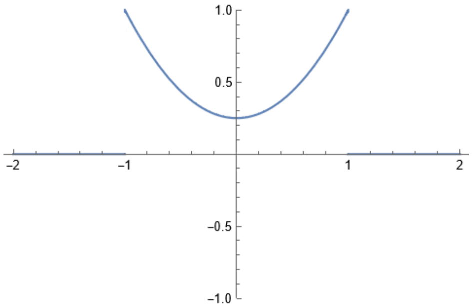
1. $0 \leq f(H,h,x) \leq 1$ for all real x
2. $\int_{-\infty}^{\infty} f(H,h,x)dx = 1$

Thus $f(H,h,x)$ is a probability density function.

Plot of my generalization of the uniform probability density function



$H = 1, h = \frac{1}{2}$



$H = \frac{1}{4}, h = 1$

The End

13 small solutions to the Z score

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe 13 small solutions to the Z score.
The paper ends with "The End"

Introduction

Recall the Z score is given by

$$Z = \alpha logM + \beta logW + \gamma logP$$

Unknown to most economists, there exist 13 small solutions to the Z score.
In this paper, I describe 13 small solutions to the Z score.

13 small solutions to the Z score

13 small solutions to the Z score in decreasing order of Z are

1. $\alpha = 5, \beta = \frac{93}{26}, \gamma = 5, M = 94, W = 94, P = 94$
2. $\alpha = \frac{109}{26}, \beta = 5, \gamma = 5, M = 65, W = 105, P = 65$
3. $\alpha = 3, \beta = 5, \gamma = 5, M = 41, W = 92, P = 92$
4. $\alpha = 5, \beta = 3, \gamma = 5, M = 38, W = 85, P = 85$
5. $\alpha = 5, \beta = 5, \gamma = \frac{17}{13}, M = 83, W = 93, P = 93$
6. $\alpha = \frac{35}{13}, \beta = \frac{101}{26}, \gamma = 5, M = 25, W = 95, P = 95$
7. $\alpha = 5, \beta = \frac{61}{26}, \gamma = 5, M = 21, W = 87, P = 87$
8. $\alpha = \frac{33}{26}, \beta = 5, \gamma = 5, M = 63, W = 63, P = 63$
9. $\alpha = 5, \beta = \frac{85}{26}, \gamma = \frac{31}{26}, M = 88, W = 175, P = 88$
10. $\alpha = 5, \beta = 5, \gamma = \frac{53}{13}, M = 5, W = 55, P = 55$
11. $\alpha = \frac{5}{2}, \beta = \frac{53}{26}, \gamma = 5, M = 87, W = 87, P = 87$
12. $\alpha = \frac{47}{26}, \beta = 5, \gamma = \frac{20}{13}, M = 71, W = 71, P = 71$
13. $\alpha = \frac{41}{26}, \beta = 5, \gamma = \frac{29}{13}, M = 9, W = 84, P = 9$

The End

13 alternative small solutions to the Z score

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe 13 alternative small solutions to the Z score. The paper ends with "The End"

Introduction

Recall the Z score is given by

$$Z = \alpha logM + \beta logW + \gamma logP$$

In a previous paper, I've described 13 small solutions to the Z score. In this paper, I describe 13 alternative small solutions to the Z score.

13 alternative small solutions to the Z score

13 alternative small solutions to the Z score in decreasing order of Z are

1. $\alpha = 5, \beta = 5, \gamma = 5, M = 26, W = 92, P = 26$
2. $\alpha = 5, \beta = 5, \gamma = 5, M = 9, W = 66, P = 66$
3. $\alpha = 5, \beta = 5, \gamma = \frac{53}{13}, M = 12, W = 76, P = 76$
4. $\alpha = 5, \beta = \frac{103}{26}, \gamma = 5, M = 14, W = 98, P = 54$
5. $\alpha = 5, \beta = 5, \gamma = \frac{85}{26}, M = 33, W = 52, P = 52$
6. $\alpha = 5, \beta = 5, \gamma = 5, M = 9, W = 48, P = 48$
7. $\alpha = 5, \beta = 5, \gamma = 5, M = 9, W = 46, P = 46$
8. $\alpha = 5, \beta = 5, \gamma = 5, M = 9, W = 74, P = 16$
9. $\alpha = 5, \beta = 5, \gamma = 5, M = 9, W = 34, P = 34$
10. $\alpha = \frac{53}{26}, \beta = 5, \gamma = \frac{21}{13}, M = 78, W = 179, P = 179$
11. $\alpha = 5, \beta = 2, \gamma = \frac{123}{26}, M = 9, W = 95, P = 95$
12. $\alpha = 5, \beta = \frac{57}{13}, \gamma = 5, M = 9, W = 24, P = 24$
13. $\alpha = \frac{61}{13}, \beta = \frac{35}{26}, \gamma = 5, M = 9, W = 109, P = 109$

The End

The closed-form real solution to $r^3 - 2r^2 - 4r - 8 = 0$

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the closed-form real solution to $r^3 - 2r^2 - 4r - 8 = 0$.
The paper ends with "The End"

Introduction

In a previous paper, I've described the closed-form formula for the roots of the cubic equation.
In this paper, I describe the closed-form real solution to $r^3 - 2r^2 - 4r - 8 = 0$.

The closed-form real solution to $r^3 - 2r^2 - 4r - 8 = 0$

The equation

$$r^3 - 2r^2 - 4r - 8 = 0$$

comes up in the study of the logistic map.
Using the cubic formula, the closed-form real solution to

$$r^3 - 2r^2 - 4r - 8 = 0$$

is

$$r = \frac{2}{3}\left(\sqrt[3]{3\sqrt{33}+19} + \frac{4}{\sqrt[3]{3\sqrt{33}+19}} + 1\right)$$

The End

A simple but effective approximation to e correct to 6 figures

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe a simple but effective approximation to e. The paper ends with "The End"

Introduction

Unknown to most mathematicians and computer scientists, there exists a simple but effective approximation to e correct to 6 figures.
In this paper, I describe that simple but effective approximation to e correct to 6 figures.

A simple but effective approximation to e correct to 6 figures

The approximation

$$\bar{e} = \frac{3}{2} + \frac{\sqrt{5}}{2} + \frac{1}{10} + \frac{1}{4000}$$

truncated at the 6^{th} figure
is a simple but effective approximation to e correct to 6 figures.

The End

14 rational solutions to a useful system of matrix equations

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe 14 rational solutions to a useful system of matrix equations. The paper ends with "The End"

Introduction

The system of matrix equations given by

$$\begin{pmatrix} a & b \\ c & d \end{pmatrix}^2 = \begin{pmatrix} e & f \\ g & h \end{pmatrix} \begin{pmatrix} d & c \\ b & a \end{pmatrix} = \begin{pmatrix} d & c \\ b & a \end{pmatrix} \begin{pmatrix} e & f \\ g & h \end{pmatrix}$$

is useful in many fields.

In this paper, I describe 14 rational solutions to this useful system of matrix equations.

14 rational solutions to this useful system of matrix equations

1. $$\begin{pmatrix} 1276 & 30 \\ 1356 & \frac{43}{4} \end{pmatrix}^2 = \begin{pmatrix} \frac{6512704}{43} & \frac{75}{113} \\ \frac{306456}{5} & \frac{1849}{20416} \end{pmatrix} * \begin{pmatrix} \frac{43}{4} & 1356 \\ 30 & 1276 \end{pmatrix} = \begin{pmatrix} \frac{43}{4} & 1356 \\ 30 & 1276 \end{pmatrix} * \begin{pmatrix} \frac{6512704}{43} & \frac{75}{113} \\ \frac{306456}{5} & \frac{1849}{20416} \end{pmatrix}$$

2. $$\begin{pmatrix} 1244 & -84 \\ -169 & 92 \end{pmatrix}^2 = \begin{pmatrix} \frac{386884}{23} & -\frac{7056}{169} \\ -\frac{28561}{84} & \frac{2116}{311} \end{pmatrix} * \begin{pmatrix} 92 & -169 \\ -84 & 1244 \end{pmatrix} = \begin{pmatrix} 92 & -169 \\ -84 & 1244 \end{pmatrix} * \begin{pmatrix} \frac{386884}{23} & -\frac{7056}{169} \\ -\frac{28561}{84} & \frac{2116}{311} \end{pmatrix}$$

3. $$\begin{pmatrix} 1064 & 93 \\ 139 & \frac{59}{2} \end{pmatrix}^2 = \begin{pmatrix} \frac{2264192}{59} & \frac{8649}{139} \\ \frac{19321}{93} & \frac{3481}{4256} \end{pmatrix} * \begin{pmatrix} \frac{59}{2} & 139 \\ 93 & 1064 \end{pmatrix} = \begin{pmatrix} \frac{59}{2} & 139 \\ 93 & 1064 \end{pmatrix} * \begin{pmatrix} \frac{2264192}{59} & \frac{8649}{139} \\ \frac{19321}{93} & \frac{3481}{4256} \end{pmatrix}$$

4. $$\begin{pmatrix} 1052 & 18 \\ -100 & 1144 \end{pmatrix}^2 = \begin{pmatrix} \frac{138338}{143} & -\frac{81}{25} \\ \frac{5000}{9} & \frac{327184}{263} \end{pmatrix} * \begin{pmatrix} 1144 & -100 \\ 18 & 1052 \end{pmatrix} = \begin{pmatrix} 1144 & -100 \\ 18 & 1052 \end{pmatrix} * \begin{pmatrix} \frac{138338}{143} & -\frac{81}{25} \\ \frac{5000}{9} & \frac{327184}{263} \end{pmatrix}$$

5. $$\begin{pmatrix} 702 & -92 \\ 72 & -72 \end{pmatrix}^2 = \begin{pmatrix} -\frac{13689}{2} & \frac{1058}{9} \\ -\frac{1296}{23} & \frac{96}{13} \end{pmatrix} * \begin{pmatrix} -72 & 72 \\ -92 & 702 \end{pmatrix} = \begin{pmatrix} -72 & 72 \\ -92 & 702 \end{pmatrix} * \begin{pmatrix} -\frac{13689}{2} & \frac{1058}{9} \\ -\frac{1296}{23} & \frac{96}{13} \end{pmatrix}$$

6. $$\begin{pmatrix} 684 & 777 \\ 853 & 922 \end{pmatrix}^2 = \begin{pmatrix} \frac{233928}{461} & \frac{603729}{853} \\ \frac{727609}{777} & \frac{212521}{171} \end{pmatrix} * \begin{pmatrix} 922 & 853 \\ 777 & 684 \end{pmatrix} = \begin{pmatrix} 922 & 853 \\ 777 & 684 \end{pmatrix} * \begin{pmatrix} \frac{233928}{461} & \frac{603729}{853} \\ \frac{727609}{777} & \frac{212521}{171} \end{pmatrix}$$

7. $$\begin{pmatrix} 677 & 730 \\ 785 & 848 \end{pmatrix}^2 = \begin{pmatrix} \frac{458329}{848} & \frac{106580}{157} \\ \frac{123245}{146} & \frac{719104}{677} \end{pmatrix} * \begin{pmatrix} 848 & 785 \\ 730 & 677 \end{pmatrix} = \begin{pmatrix} 848 & 785 \\ 730 & 677 \end{pmatrix} * \begin{pmatrix} \frac{458329}{848} & \frac{106580}{157} \\ \frac{123245}{146} & \frac{719104}{677} \end{pmatrix}$$

8. $\begin{pmatrix} 606 & -75 \\ 682 & 633 \end{pmatrix}^2 = \begin{pmatrix} \frac{122412}{211} & \frac{5625}{682} \\ -\frac{465124}{75} & \frac{133563}{202} \end{pmatrix} * \begin{pmatrix} 633 & 682 \\ -75 & 606 \end{pmatrix} = \begin{pmatrix} 633 & 682 \\ -75 & 606 \end{pmatrix} * \begin{pmatrix} \frac{122412}{211} & \frac{5625}{682} \\ -\frac{465124}{75} & \frac{133563}{202} \end{pmatrix}$

9. $\begin{pmatrix} 567 & -63 \\ 101 & -24 \end{pmatrix}^2 = \begin{pmatrix} -\frac{107163}{8} & \frac{3969}{101} \\ -\frac{10201}{63} & \frac{64}{63} \end{pmatrix} * \begin{pmatrix} -24 & 101 \\ -63 & 567 \end{pmatrix} = \begin{pmatrix} -24 & 101 \\ -63 & 567 \end{pmatrix} * \begin{pmatrix} -\frac{107163}{8} & \frac{3969}{101} \\ -\frac{10201}{63} & \frac{64}{63} \end{pmatrix}$

10. $\begin{pmatrix} 539 & -42 \\ 553 & 36 \end{pmatrix}^2 = \begin{pmatrix} \frac{290521}{36} & \frac{252}{79} \\ -\frac{43687}{6} & \frac{1296}{539} \end{pmatrix} * \begin{pmatrix} 36 & 553 \\ -42 & 539 \end{pmatrix} = \begin{pmatrix} 36 & 553 \\ -42 & 539 \end{pmatrix} * \begin{pmatrix} \frac{290521}{36} & \frac{252}{79} \\ -\frac{43687}{6} & \frac{1296}{539} \end{pmatrix}$

11. $\begin{pmatrix} 385 & -67 \\ 97 & -51 \end{pmatrix}^2 \begin{pmatrix} -\frac{148225}{51} & \frac{4489}{97} \\ -\frac{9409}{67} & \frac{2601}{385} \end{pmatrix} \begin{pmatrix} -51 & 97 \\ -67 & 385 \end{pmatrix} \begin{pmatrix} -\frac{148225}{51} & \frac{4489}{97} \\ -\frac{9409}{67} & \frac{2601}{385} \end{pmatrix} \left(* \begin{pmatrix} -51 & 97 \\ -67 & 385 \end{pmatrix} \right)$

12. $\begin{pmatrix} 334 & 52 \\ -70 & -154 \end{pmatrix}^2 = \begin{pmatrix} -\frac{55778}{77} & -\frac{1352}{35} \\ \frac{1225}{13} & \frac{11858}{167} \end{pmatrix} * \begin{pmatrix} -154 & -70 \\ 52 & 334 \end{pmatrix} = \begin{pmatrix} -154 & -70 \\ 52 & 334 \end{pmatrix} * \begin{pmatrix} -\frac{55778}{77} & -\frac{1352}{35} \\ \frac{1225}{13} & \frac{11858}{167} \end{pmatrix}$

13. $\begin{pmatrix} 293 & 95 \\ 139 & 371 \end{pmatrix}^2 = \begin{pmatrix} \frac{85849}{371} & \frac{9025}{139} \\ \frac{19321}{95} & \frac{137641}{293} \end{pmatrix} * \begin{pmatrix} 371 & 139 \\ 95 & 293 \end{pmatrix} = \begin{pmatrix} 371 & 139 \\ 95 & 293 \end{pmatrix} * \begin{pmatrix} \frac{85849}{371} & \frac{9025}{139} \\ \frac{19321}{95} & \frac{137641}{293} \end{pmatrix}$

14. $\begin{pmatrix} 69 & 101 \\ \frac{9}{2} & -95 \end{pmatrix}^2 = \begin{pmatrix} -\frac{4761}{95} & \frac{20402}{9} \\ \frac{81}{404} & \frac{9025}{69} \end{pmatrix} * \begin{pmatrix} -95 & \frac{9}{2} \\ 101 & 69 \end{pmatrix} = \begin{pmatrix} -95 & \frac{9}{2} \\ 101 & 69 \end{pmatrix} * \begin{pmatrix} -\frac{4761}{95} & \frac{20402}{9} \\ \frac{81}{404} & \frac{9025}{69} \end{pmatrix}$

The End

The Imperative of the Commonwealth

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the Imperative of the Commonwealth.
The paper ends with "The End"

Introduction

As of this writing, the Commonwealth has been rocked with two difficult events:

1. The COVID-19 pandemic across the world has affected the health of many in various nations of the Commonwealth.

2. The peaceful death of the Queen of the United Kingdom has caused a flutter of passion in the hearts of her loyal subjects across the Commonwealth.

I believe the worst is now behind us and the Commonwealth needs to roll its proverbial sleeves and begin the process of recovery, rejuvenation and revival.

The Imperative of the Commonwealth

The Imperative of the Commonwealth lays crystal clear before us:

1. Determine if these two events are disparate or if they have a thread that runs in common.

2. In either case, determine the cause of these two tragic events.

3. Take necessary action to deliver justice to the perpetrators of these two events.

4. Take punitive action if the perpetrators of these two events are an external nation-state.

We owe it to ourselves to rise above our anger, recompose ourselves, join our collective strength and hunt down the culpable nation-state that has committed this transgression against us.

The End

The Ghosh measure of solvency of a nation

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the Ghosh measure of solvency of a nation.
The paper ends with "The End"

Introduction

Knowledge has been demanded of me of a measure of solvency of a nation.
In this paper, I describe the Ghosh measure of solvency of a nation.

The Ghosh measure of solvency of a nation

Suppose we have a collection of n nations each with credit default swap price CDS_i where $1 \leq i \leq n$

We calculate

$$\mu_{CDS} = \frac{\sum_{i=1}^{n} CDS_i}{n} \text{ and } \sigma_{CDS} = \sqrt{\sum_{i=1}^{n} \frac{(CDS_i - \mu_{CDS})^2}{n}}$$

whence

$$CDS_i^{standardized} = \frac{CDS_i - \mu_{CDS}}{\sigma_{CDS}}$$

We then calculate

$$T_i = -\ln\left(1 + CDS_i^{standardized}\right)$$

and

$$\mu_T = \frac{\sum_{i=1}^{n} T_i}{n} \text{ and } \sigma_T = \sqrt{\sum_{i=1}^{n} \frac{(T_i - \mu_T)^2}{n}}$$

to obtain the Ghosh measure of solvency of nation i

$$G_i = \frac{T_i - \mu_T}{\sigma_T}$$

The Ghosh criterion of solvency of a nation

Nation i is solvent iff the Ghosh measure of solvency of the nation $G_i \geq 0$.

The End

Is USA real estate data reliable?

Soumadeep Ghosh

Kolkata, India

Abstract

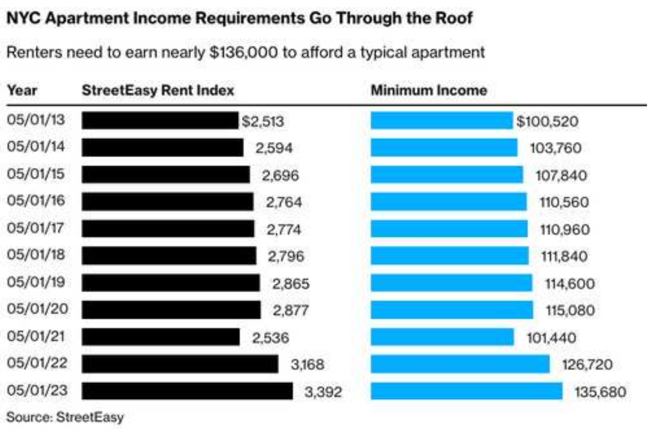
In this paper, I show that, at least in one instance, USA real estate data is unreliable.
The paper ends with "The End"

Introduction

Exploratory data analysis of publicly available USA real estate data reveals a suspicious pattern. In this paper, I show that, at least in one instance, USA real estate data is unreliable.

Data from StreetEasy

`"StreetEasy is a real estate listing and technology company, launched in 2006, that operates in the New York metropolitan area."` - Wikipedia[1]



Exploratory Data Analysis

Expressing the StreetEasy Rent Index as a fraction of Minimum Income yields a suspicious pattern:

Year	Fraction
2014	0.02524...
2015	0.025
2016	0.025
2017	0.025
2018	0.025
2019	0.025
2020	0.025
2021	0.025
2022	0.025
2023	0.025

The pattern is a value of 0.025 that repeats 9 times which is too perfect to be observed in a real estate index.

References

1. https://en.wikipedia.org/wiki/StreetEasy

The End

The mathematics of currency

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the mathematics of currency. The paper ends with "The End"

Introduction

Knowledge has been demanded of me of the mathematics of currency.
In this paper, I the mathematics of currency.

The mathematics of currency

The First Law of currency:

$$C(t) = R(t) + \sum_{i=1}^{D(t)} c_i(t)$$

The Second Law of currency:

$$\frac{C(t+1)}{C(t)} = 1 + r_f(t) + p_C(t)$$

The Third Law of currency:

$$c_i(t) = s_i(t)\,(1 + b(t) + p_s(t)) + \sum_{j=1}^{n_i(t)} \frac{F_j(t)}{1 + b(t) + p_{F_j}(t)}$$

where

$C(t)$ is currency at time t
$R(t)$ is reserve at time t
$D(t)$ is number of divisions of currency at time t
$c_i(t)$ is the i^{th} division of currency at time t
r_f is risk-free rate at time t
$p_C(t)$ is the currency risk premium at time t
$s_i(t)$ is savings in the i^{th} division of currency at time t
$n_i(t)$ is the number of face values of the i^{th} division of currency at time t
$F_j(t)$ is j^{th} face value of the i^{th} division of currency at time t
$b(t)$ is bank rate at time t
$p_s(t)$ is the savings risk premium at time t
$p_{F_j}(t)$ is the j^{th} face value risk premium at time t

The End

The asset premium

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the asset premium. The paper ends with "The End"

Introduction

Even in regulated markets with spot, forwards, futures and options trading, there sometimes exists the asset premium for a specific asset.
In this paper, I describe the asset premium.

The asset premium

The asset premium is defined as the premium needed to hold an asset above the risk-free rate plus the expected inflation plus the inflation risk premium. Mathematically, we have

$$r_A(t) = r_f(t) + E[i(t)] + p_i(t) + p_a(t)$$

and

$$r_A(t) = \frac{r_A(t) - p_a(t)}{1 + r_f(t) + p_a(t)}$$

with

$$1 + r_f(t) + p_a(t) \neq 0$$

where
$r_A(t)$ is the return on the asset as a function of time.
$r_f(t)$ is the risk-free rate as a function of time.
$E[i(t)]$ is the expected inflation as a function of time.
$p_i(t)$ is the inflation risk premium as a function of time.
$p_a(t)$ is the asset premium as a function of time.

The End

Dual nature of the asset premium

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the dual nature of the asset premium.
The paper ends with "The End"

Introduction

In a previous paper, I've described the asset premium.
In this paper, I describe the dual nature of the asset premium.

The dual nature of the asset premium

Eliminating $r_A(t)$ from the two equations that define the asset premium give us

$$p_a(t) = \frac{1}{2}\left(\sqrt{4r_f(t) + (p_i(t) + E[i(t)] + 1)^2} - 2r_f(t) - p_i(t) - E[i(t)] - 1\right)$$

or

$$p_a(t) = -\frac{1}{2}\left(\sqrt{4r_f(t) + (p_i(t) + E[i(t)] + 1)^2} + 2r_f(t) + p_i(t) + E[i(t)] + 1\right)$$

where
$p_a(t)$ is the asset premium as a function of time.
$r_f(t)$ is the risk-free rate as a function of time.
$E[i(t)]$ is the expected inflation as a function of time.
$p_i(t)$ is the inflation risk premium as a function of time.

Thus the asset premium has a dual nature.

The End

Exponential money

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper I describe exponential money and provide 14 solutions to exponential money.

Introduction

An economy is said to have exponential money when

$$\frac{2+\bar{e}}{2-\bar{c}} = e^{rt}$$

where
$\bar{e}$ is expansionary market forces in equilibrium
$\bar{c}$ is contractionary market forces in equilibrium
r is the bank rate
t is time

14 solutions to exponential money

14 solutions to exponential money in increasing order of t are

$\bar{e}$	$\bar{c}$	r	t
782	0	$\frac{92}{1011}$	$\frac{1011\log(392)}{92}$
1062	0	$\frac{31}{337}$	$\frac{337\log(532)}{31}$
603	0	$\frac{59}{1011}$	$\frac{1011}{59}\log\left(\frac{605}{2}\right)$
549	0	$\frac{56}{1011}$	$\frac{1011}{56}\log\left(\frac{551}{2}\right)$
390	$\frac{10}{51}$	$\frac{43}{1011}$	$\frac{1011}{43}\log\left(\frac{4998}{23}\right)$
48	0	$\frac{20}{1011}$	$\frac{1011\log(25)}{20}$
360	0	$\frac{32}{1011}$	$\frac{1011\log(181)}{32}$
977	0	$\frac{35}{1011}$	$\frac{1011}{35}\log\left(\frac{979}{2}\right)$
1007	$\frac{12}{17}$	$\frac{11}{337}$	$\frac{337}{11}\log\left(\frac{17153}{22}\right)$
1007	0	$\frac{7}{337}$	$\frac{337}{7}\log\left(\frac{1009}{2}\right)$
1062	$\frac{91}{102}$	$\frac{7}{337}$	$\frac{337}{7}\log\left(\frac{108528}{113}\right)$
1039	0	$\frac{6}{337}$	$\frac{337}{6}\log\left(\frac{1041}{2}\right)$
930	0	$\frac{3}{337}$	$\frac{337\log(466)}{3}$
1247	$\frac{10}{51}$	$\frac{1}{337}$	$337\log\left(\frac{63699}{92}\right)$

The End

The correct definition of deflation

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the correct definition of deflation. The paper ends with "The End"

Introduction

Contrary to popular belief, deflation is not simply the negative of inflation.
In this paper, I describe the correct definition of deflation.

The correct definition of deflation

The correct definition of deflation is

$$d(t) = \{ \begin{array}{cc} 0 & i(t) \geq 0 \\ -i(t) & i(t) < 0 \end{array}$$

where
$d(t)$ is deflation as a function of time
$i(t)$ is inflation as a function of time

The End

When does deflation occur?

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe when does deflation occur. The paper ends with "The End"

Introduction

In a previous paper, I've described inflation when the inflation risk premium is zero at all points in time.
In a previous paper, I've described the correct definition of deflation.
A natural question that arises now is "When does deflation occur?"
In this paper, I describe when does deflation occur.

When does deflation occur?

We use the same functional form of inflation and deflation as used in the previous papers where I've described inflation when the inflation risk premium is zero at all points in time and the correct definition of deflation, i.e.,

$$i(t) = \{ \begin{array}{cc} \lambda e^{-\lambda t} & t \geq 0 \\ 0 & t < 0 \end{array}$$

$$d(t) = \{ \begin{array}{cc} 0 & i(t) \geq 0 \\ -i(t) & i(t) < 0 \end{array}$$

Then

$$d(t) = D \wedge D > 0$$

$$\iff$$

$$t \geq 0 \wedge \lambda < 0 \wedge D = -\lambda e^{-\lambda t}$$

The End