

Cusack U.S Economy Equation

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Abstract

Here is a paper that uses 11 variables in an equation that describes the US economy. It can be used to predict the peaks to crash and where it is in the economic cycle.

Keywords: Macroeconomics; Key economic indicators

Introduction

GDP= e^x

Dow Jones Industrial Average= \sin

Standard and Poor's 500 Index= \sin/e^x

CPI= e^x

Unemployment= \sin

Commodities Index

Oil linear

Gold Production= constant

New Residential Construction= linear

Personal Income= linear

US Trade Balance= \sin

Global Stock Market= $e^x \sin$

Each one of these indicates is a \sin , \cos or exponential function.

SO,

$y=y'$

$y=e^x$

$y=y'$

$y=\sin x+C1=\cos x+C2$

$x=1, Y=0.8415$ cf 0.86

$0.8415+C3=e^x$

Boundary condition

$x=1$

$C3=c=1.8768$

$Y=e^x-1.8768$

Now for the Fourier series:

$y=e^x-1.8768$

$y=asin x+bcos x$

$asin x+b \cos x=e^x-1.8768$

$a(0.86)+b(0.86)=0.8415$

$(a+b)=1$

$a=1-b$

$(1-b)\sin x+b \cos x=e^x-1.8768$

$0.86-b(0.86)-b(0.86)=e^1-1.8768$

$y=e^1-1.8768$

$Y=0.8415$

For a full cycle:

$1/2\pi=0.1592$

$0.1592x=6.28$

$x=39.467$

So from peak to trough= $39.4627(2)=78.93$ years

October 29, 1929+78.93=2007.9

November 4, 2007 Peak to crash

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S&P500=-(GDP*CPI) e^x+0.8415(sin TDJIA*sin T UnEmploy*sin T US Trade Balance) sin x+x(oil production+mean house price +Personal Incxme)

For Annum 1990 X=1 Maximum:

$$400=(7113*391.4)e^Y * 0.7460+ (30,000+92,000+4878.6)X/1000$$

$$e^Y=0.1315 \quad x=0.202=Y \text{ Output Energy}$$

S&P500=-(GDP*CPI) e^Y+0.8415(sin TDJIA*sin T UnEmploy*sin T US Trade Balance) sin X+x (oil production+mean house price +Personal Incxme)

$$400=(7113*391.4)e^Y * 0.7460+ (30,000+92,000+4878.6)X/1000$$

$$e^Y=0.1315 \quad x=0.202=Y \text{ Output Energy}$$

Since $Y=e^{1-1.8768}$

$$Y=2.71828-1.8768$$

$$0.202=2.71828 -1.8768 \quad (\pi/2)=e^Y$$

$$\pi/2 * Y=e^Y =\pi$$

$$Y=\ln \pi$$

$Y=e^{1-1.8768}$ Refer to Figure 1.

$$Y=0.8415$$

But $Y=0.202$ (dampened sine wave)

So,

$$Y=e^{0.1315}=1.1405$$

$$y=1/y$$

$$\ln x=1/x$$

Conclusion

$y=y'$ for the economy.

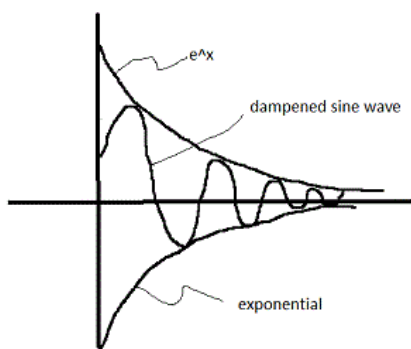


Figure 1: Dampened cosine curve.