The Economic Vector Space and the Economic Cycle

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Abstract
A vector space is a series of vectors of different magnitudes and direction which are connected head to tail. There is a vector space that applies to the US economy, for example. My previous paper on the Cusack US Economy Equation contains the 11 variables with the 12th one being t

Keywords: Vector space; Macroeconomics; Physical economics

Introduction
I illustrate here the vector space for the economy as opposed to the physical universe. I've written yet another paper on Cusack's Physical Economics (Figure 1) [1,2].

![Figure 1: Illustrate 1 on Cusack's Physical Economics.](image-url)

1/81=0.012345679  
81=c⁴=speed of light⁴

Each successive digit is adding 1 less power of 10. So, from logic, a binomial tree yields:

(1+t)¹¹=e⁰+e¹+e²...
=(1/7+7e²)
=1/81
0.01234567-1/7=7e²

1/E^2=396
1/c^2=1
1/2
1/2
1/2
1/2

![Figure 2: Balance for maximum sustainable.](image-url)

1-1584=0.8416
This is the ideal balance for maximum sustainable output Y.
Sin and cos are a two pole problem since Y=1 at full output and Y=0 at no output (Figure 2).

Now,
The cross product is:
||E|||t||cos 60°=|G,ec|
E=t
E^2×1/2=G =0.
So there is a gravitational equivalent in the economy (Figure 3).
Why is it?

Figure 3: Gravitational equivalent in the economy.

From Newton, we know:
F=GM1M2/R^2
2.667=8/2=2[D]/c=[Gec](Infinity)/R^2
Gec=0.251~0.253=Period T (seconds)
R=0.3068
1/R=3.25=13/4

The economy is like a pendulum ranging between high and low outputs.

x=1/[x-1]
x^2-x-1=0
x=1.618 =Golden mean
Eigen value=c=3
Eigenvector=√3=1.73
Eigen vector^2=eigenvalue
Continuing,
y'=y'' is telescopic
y=e^x=y'=y''....
y=1/7e^t
y'=7e^t=1/c^2=0.111
e^x=0.111/7=0.1586
sin1=cos1

This is where sin meets cos or the settling point between Y=0 and Y=1 (NO output, Full output)
So,
F=Gec × M1M2/R^2

0.253 × (Infinity)(0)/13/4)^2
0.86=8/3=2[D]/c=E × [D]/eigenvalue=0.778
x=0.1111=1/c^2=1/eigenvalue^2
from above
y'=1/7 +7e^t
0.86=Y Max sustainable
QED

If you didn't understand that, try this:
Assumption: Money is stored energy. Energy cannot be created nor destroyed. Money cannot be created nor destroyed. Governments cannot create money. The simply devalue their currency by printing money.

From the vector space, we know the economy has a resistance r which is the costs of producing output.

when:
R=dR/dt NPV=0 Y=y' R=r' integrate R^2/2=R
R=0, ½dR/dt=π
E/τπ/2τπ=1/2=R
When E=π
A=πR^2; A'=2πτ
Circle=2πτ A'=Circle R^2=A/π R=√A/√π
R=1/2=√A/1.7725
A=π/4=45 degrees which is the minimum energy level.
The economy seeks the minimum energy to produce maximum sustainable possible output.

So y=y'
E=1/t
Work W=F × d; d=s
=1/s=E/s
W=E/t=E=1/t
E/t=E^2
E=0; 1/t=Wt=1/t
Y=W Y'=[F × d]'
Y'=F × (ds/dt Y'=Fv=(Ma)(P/v)
P=Mv
Y'=MP; Y'=M(Mv)
M^2=1M=√1=-1 M=1
Now, Wt^2=1 W=1
W=J/s; W=y/1
W=y=1; W=1; y=1; M=1
t=1
y=F; y''=F
Recall Money is stored work. So Economics follows the same laws as the universe.

\[ Y' = F(ds/dt) \]
\[ Y' = ds/dt \]
\[ Y = \text{Integral} \ ds/dt \]
\[ Y^2/2 = s + C_1 \]
\[ Y = \sin 1 \]
\[ Y' = -\cos 1 \]
\[ Y = -y' = \sin 1 = \cos 1 \]

Vector spaces components:

- Period: \( T = 1/t = E = W \times t; 1/t = Wt \)
- \( T^2W = 1; T(F \times d) = 1 \)
- \( T^2 \times y \times s = 1 \)
- \( (1)(y(1)) = 1 \)
- \( Y = 1 \)

Speed of light: \( C^2 - c - 1 = 2c - 1 \)
\[ C = 1 \]

Force
\[ Y = F \]
\[ W = F \times d \]
\[ 1 = (\sin 1)(d) \]
\[ 0.84 = F; F = y \]
\[ Y = \sin 1 \]

\[ (\pi - e) = m = E/cuz \]
\[ Y = mx + b; Y = 0.4233x + 0 \]
\[ Y = cux \times x \]
\[ Y = R \times x; A = \pi \times R^2; A' = 2\pi \times R; C = 2\pi R; A' = C \]
\[ 2\pi R = 2\pi u; R = r; X = 2\pi; T = 2\pi; \]

The economic cycle:

- Boom = 2.09 years
- Stagnation = 4.18 years
- Decline = 2.09 years
- Economic cycle = 8.36 years (Figures 4 and 5).

So, we had a decline starting in 2007.9. Add a cycle we get 2014.17 = March 2014.
Profits go toward zero. So \( e^{-x} = 0 \) \( x = \ln 0 \) \( x = t = 1 \) \( Y = e^{1 \cos[2\pi(1)]} \)
\[ Y = 2.71828 \]
\[ y = y' \]
And,
9.44 cycles from depression to depression
\[ Y = e^{-9.44 \times \cos(2\pi \times 9.44)} \]
\[ Y = 7.5 \]
\[ 1/Y = 0.1334 = s \]
\[ C = 2\pi r \]
\[ C = 0.0178 \]
\[ C = 2\pi r \]
\[ C = 2.8323 \]

Conclusion

The mathematics models of physics can be used to solve outstanding economic problems.

References