

The GH-Method

Viscoelastic or Viscoplastic Glucose Theory (VGT #154): An Economic Comparison Study of GDP versus Housing Price and Stock Price with a Biomedical Study of Longevity versus Body Weight and Glucose Over 10 Years from Y2012 to Y2021, Focusing on the Data and Waveform Similarity of Housing Price Against Body Weight and Stock Price Against Glucose Using 3 Different Energy Analysis Models of Time Domain, Space Domain, and Frequency Domain Based on the GH-Method: Math-Physical Medicine (No. 747)

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Keywords: Viscoelastic; Viscoplastic; Body weight; Postprandial plasma glucose; Fasting plasma glucose; Type 2 diabetes; Fast Fourier transform

Abbreviations: FFT: fast Fourier transform; T2D: type 2 diabetes; PPG: postprandial plasma glucose; FPG: fasting plasma glucose; FD: frequency domain; SD: space domain; TD: time domain; MPM: math-physical medicine

1. INTRODUCTION

The author has recently noticed a similarity of data waveform patterns existing between certain biomedical variables and certain economic variables. For example, there is a mild amplitude fluctuation of body weight wave (with single digit percent of changes) which is quite similar to the waves of the US real estate sales and housing rental prices. On the other hand, there is a more violent amplitude fluctuation of the glucose wave (with double-digit percent of changes) which is similar to the highly fluctuated stock price wave.

Secondly, both the biomedical variables and economic variables are time-dependent. Biomedical variables, such as body weight and glucose based on people's lifestyles and medical intervention, are associated with body cells that change every second in real time. The economic variables, such as real estate and stock transaction prices, are based

on the brain functions of people's emotional reactions to the situation and some rational decisions which are also rapidly changing from time to time. Because of this time-dependent dynamic characteristic, the viscoelastic/plastic behavior analysis tools can then be applied to these two chosen studies.

Third, the single output of the medical situation, such as longevity (via health age), has multiple causes, such as body weight and glucose (there may be hundreds other causes with examples such as blood pressure, lipids, etc.). The single output of the economic situation, such as Gross Domestic Product (GDP), also has multiple inputs, such as real estate transactions, the stock price (there may be hundreds other inputs with examples such as import/export amounts, manufacturing capacities, etc.). To reduce the data processing workload and simplify his analysis efforts, the author decides to use

these two selected inputs only for each output of this research work.

Fourth, the biomedical data were collected by himself during the past 10 years (Y 2012-2021) from 1/1/2012 to 12/31/2021, while the economic data were generated from publicly available graphic figures. Then, they went through his visual judgment for him to produce the estimated digits within the same time duration of Y2012 to Y2021. Although the economic data are not precise, nevertheless, the general pattern of waves and the data moving trend can still be trusted and used in his analysis. In addition, there is one fundamental difference between economics and medicine. Generally speaking, in medicine, the lower number of health age, weight, and glucose is better for the patient (not HDL cholesterol). While in general economics practice, the higher GDP, pricing of real estate, and stock transaction (which are better for the seller and worse for the buyer), is better for the common people or general investors. The above statements explain why the correlation coefficient of health age versus GDP is -70%.

There are two main purposes of this study: (1) comparison of waveforms of original data of both outputs and inputs; and (2) comparison of energy associated with these selected outputs and inputs.

This article particularly focuses on investigating the patient's longevity perspective via health age versus body weight and glucose. It also examines the US economic health perspective via GDP versus US real estate transaction price (house \$) and US stock transaction price (Dow Jones Index \$ or DJI \$).

The author has spent most of his research time on searching, viewing, and selecting the appropriate economic data for this study from a wide search of overcrowded public data sources. After completing this data preparation task, the actual data processing work itself is 100% dependent on his recently developed VGT software tool on the iPhone which has reduced his data processing time from a normal 5-6 hours to less than 1 minute. Therefore, he can spend this saved amount of extra time to conduct a deeper investigation and/or explore a better interpretation of his observed phenomena and findings.

Regarding the energy associated with both single output and multiple inputs, the author has decided to use the following three original energy models described in some detailed manner in the section of methods.

The first time-domain (TD) model uses a rudimentary physics definition of energy associated with a wave that is directly proportional to the square of wave amplitude. The second space-domain (SD) model utilizes the hysteresis loop area of the time-dependent strain-stress curve with viscoelastic and viscoplastic engineering material behaviors. The third frequency-domain (FD) model uses his defined new variable of strain (output) multiplying with stress (stress input is the strain change rate multiplying with the normalized viscosity input) and the fast Fourier transform (FFT) operation of wave theory in physics.

Furthermore, he has developed a simple mathematical equation for estimated health ages as listed below:

$$\text{Health Age} = \text{Chronological real Age} * (1 + ((\text{MI} - 0.735) / 0.735) / 2)$$

$$\text{Age difference} = \text{estimated health age} - \text{chronological real age}$$

The MI mentioned above is the Metabolism Index (MI) model which was developed in Y2014 by the author using the topology concept, nonlinear algebra, geometric algebra, and engineering finite element method. This MI model includes the root causes from 6 inputs of major lifestyle categories and 4 output symptoms of rudimentary chronic diseases, i.e. obesity, diabetes, hypertension, and hyperlipidemia. Therefore, the metabolism index model can then be used as the foundation and building block for his additional and expanded research work that can expand into various complications associated with human organs, including longevity.

In summary, there are 5 noticeable findings from this multiple energy studies, i.e. output observations, input observations, wave fluctuations, SD-VGT energies, and time-zone analysis:

(1) Output observations: The output data overview of both the economic case and biomedical case are: The economic output of USA GDP was climbing continuously from \$16.2T (trillion) in Y2012 to \$21.5T in 2019, then suffered a minor drop to \$21.0T in Y2020, and then finally climbed up again to \$23.1T in Y2021. Over these 10 years, the US GDP has increased by \$6.9T or 43% linear gain. The biomedical output of longevity (his health age) was at 73 in Y2012 (his real age was 65, i.e. +8 years), climbing to 76 in 2013 (his real age was 66, i.e. +10 years), and then continuously decreasing to 64 in Y2021 (his real age was 74, i.e. -10 years). If using only the beginning year data in Y2012 and the ending year data in Y2021, his health age has changed by 18 years or a 26% linear improvement over the 10-year period. Actually, just through his lifestyle control without medication intervention, he has gained 18 years of life from God's hand.

(2) Input observations: The input data overview of both the economic case and biomedical case are: Both of the two economic inputs of house \$ and stock \$ are rising continuously with an average house price of 223 per unit of house area and an average stock DJI index of 20,700. These continuously increasing house prices \$ and DJI \$ indicate a "booming economy" over the past decade. However, both of his two biomedical inputs of body weight and glucose are decreasing continuously with an average weight of 175 lbs. and average glucose of 149 mg/dL. Through his lifestyle control alone, without any medication intervention, he has successfully decreased his body weight and glucoses which have further reduced the risks of developing many varieties of deadly diseases or complications; therefore, at least from the scientific perspective, he firmly believes that his longevity is "almost guaranteed" if he continuous do the right things.

(3) Wave fluctuations: From the attached data waveform diagrams in Figures 2 and 3, we can see that the wave fluctuation degree of house \$ (even with some minor adjustments) is not as obvious or violent as the wave fluctuation degree of stock \$ (DJI numbers). On the other hand, the body weight wave also has some minor corrections and fluctuations (usually in a single digit %, like 1.4% for his case), but they are not as obvious and violent as the glucose wave

(usually in a double-digit %, like 45% for his case). The above observations have offered the author an impression that "the housing price is similar to body weight while the stock price is similar to glucose".

(4) SD-VGT Energies: From the results of the energy analysis of the economic case, the SD-VGT energy ratios from using the average numbers as the normalization factor are: house \$ = 48%, stock \$ = 52%, and the same SD-VGT energy ratios from using the maximum numbers as the normalization factor are: house \$ = 54%, stock \$ = 46%. These two energy findings indicate that house \$ and stock \$ have offered almost equal influence on the total US GDP. However, from the results of SD-VGT energy analysis of the biomedical case using the dividing numbers between healthy versus unhealthy as the normalization factors (i.e. 170 lbs. for weight and 120 mg/dL for glucose) are weight = 49%, glucose = 51%. Again, this finding indicates that weight and glucose have offered an almost equal amount of influences on his health age, or longevity.

(5) Time-zone analysis: A more interesting analysis is the time-zone analysis results. The author has defined the 5 years from Y2012 to Y2016 as the "Obama era" and the 4 years from Y2017 to Y2020 as the "Trump era". The "Biden era" has one year of Y2021 only, and therefore it is omitted in this time-zone analysis. For the economic case, the SD-VGT energy ratios based on the average model are: Obama era = 2.3 (31%); Trump era = 5.0 (69%). But, for the economic case, the SD-VGT energy ratios based on maximum model are: Obama era = 4.0 (46%); Trump era = 4.6 (54%). The two sets of observations have shown the importance of normalization factor selection in SD-VGT analysis. But the above energy ratios have also proved one undeniable truth that the US economy was indeed better during the Trump era than the Obama era. The same time-zone analysis results have also been done on his biomedical case. Again, the author has defined the 5 years from Y2012 to Y2016 as the "Obama era" and the 4 years from Y2017 to Y2020 as the "Trump era". The "Biden era" has one year of Y2021 only, and therefore it is omitted in this time-zone analysis. For the biomedical case, the SD-VGT energy ratios based on the traditional definition of healthy versus unhealthy are: Obama era = 111 (95%); Trump era = 6 (5%). This interesting

observation has not only shown that the personal health condition and longevity perspective have no direct link with any politics, government policies, or market values (except for a person's stress resulting from the market changes). A more proper interpretation from this biomedical energy analysis is that the author's hope for longevity has been largely achieved through his earlier efforts on lifestyle control and health improvements during the Obama era, and also being maintained stringently through the Trump era.

2. METHODS

2.1 The author's case of diabetes and complications

The author has been a severe T2D patient since 1996. He weighed 220 lb. (100 kg, BMI 32.5) at that time with a one-time glucose reading of 380 mg/dL. By 2010, he still weighed 198 lb. (BMI 29.2) with average daily glucose of 250 mg/dL (HbA1C of 10%). During that year, his triglycerides reached 1161b (hyperlipidemia) and albumin-creatinine ratio (ACR) at 116 (kidney issues). He also suffered from five cardiac episodes within a decade from 1993 through 2003 caused by work stress and diabetes. In 2010, three independent physicians warned him about his urgent need for kidney dialysis treatment and the risk of his life-threatening health situation such as dying from his severe diabetic complications. Other than the cerebrovascular disease (stroke), he has suffered most of the known diabetic complications, including both macro-vascular & micro-vascular complications, nerve damage as in retinopathy and foot ulcer, as well as a hormonal disturbance, e.g. hypothyroidism.

In 2010, he decided to launch his self-study on endocrinology, diabetes, and food nutrition to save his own life. After developing the metabolism model in 2024, during 2015 and 2016, he developed four prediction models related to diabetes conditions: weight, PPG, fasting plasma glucose (FPG), and A1C. As a result, from using his developed mathematical metabolism index (MI) model in 2014 and the 4 prediction tools, by end of 2016, his weight was reduced from 220 lbs. (100 kg, BMI 32.5) to 176 lbs. (89 kg, BMI 26.0), waistline from 44 inches (112 cm) to 33 inches (84 cm), average finger glucose

reading from 250 mg/dL to 120 mg/dL, and lab-tested A1C from 10% to ~6.5%. One of his major accomplishments is that he no longer takes any diabetes medications as of 12/8/2015.

Around that time (2014-2017), he started to focus on preventive medicine instead of blindly trusting and depending on medication treatments only. He also gambled on his belief that most human organs have strong inherent abilities to self-repair themselves through lifestyle improvements by taking good care of them - even though it can only accomplish a certain degree of repairing or healing dependent on certain organ cells and their status of damage, such as pancreatic beta cells.

In 2017, he has achieved excellent results on all fronts, especially glucose control. However, during the pre-COVID period of 2018 and 2019, he traveled to approximately 50+ international cities to attend 65+ medical conferences and made ~120 oral presentations. This hectic schedule inflicted damage to his diabetes control, through dining out frequently, post-meal exercise disruption, jet lag, and along with the overall metabolic impact due to his irregular life patterns through a busy travel schedule; therefore, his glucose control and overall metabolism state were somewhat affected during this two-year heavy traveling period.

Since 1/19/2020, living in a COVID-19 quarantined lifestyle, not only has he written and published ~500 medical papers in 100+ journals, but he has also reached his best health conditions in the past 26 years. By the beginning of 2022, his weight was further reduced to 168 lbs. (BMI 24.8) along with a 5.8% A1C value (beginning level of pre-diabetes), without having any medication interventions or insulin injections. During the period from 1/1/2022 to 8/20/2022, his average FPG is 93 mg/dL, PPG is 113 mg/dL, and daily glucose is 106 mg/dL. These good results are due to his non-traveling, low-stress, and regular daily life routines. Of course, the accumulated knowledge of chronic diseases, various complications, practical lifestyle management experiences, and development of many high-tech tools along with his medical research academic findings have contributed to his excellent health status since 1/19/2020, the beginning date of his self-quarantined life.

On 5/5/2018, he applied a continuous glucose monitoring (CGM) sensor device on his upper arm and checks his glucose measurements every 5 minutes for a total of ~288 times each day. He has maintained the same measurement pattern to the present day. In his research work, he uses his CGM sensor glucose at a time interval of 15 minutes (96 data per day). Incidentally, the average sensor glucoses between 5-minute intervals and 15-minute intervals has only a 0.6% difference (average glucose of 111.86 mg/dL for 5 minutes and average glucose of 111.18 mg/dL for 15 minutes with a correlation of 94% between these two sensor glucose curves) during the period from 2/19/20 to 7/22/22.

Therefore, over the past 13 years, he could study and analyze his collected 3+ million data regarding his health status, medical conditions, and lifestyle details. He applies his knowledge, models, and tools from mathematics, physics, engineering, and computer science to conduct his medical research work. His research work has a goal of achieving both “high precision” and “quantitative proof” in the medical findings for the ultimate objectives of “preventive medicine”.

The following timetable provides a rough sketch of the emphasis in his medical research during each stage:

2000-2013: Self-study diabetes and food nutrition, developing a data collection and analysis software.

2014: Develop a mathematical model of metabolism, using engineering modeling and advanced mathematics.

2015: Weight & FPG prediction models, using neuroscience.

2016: PPG & HbA1C prediction models, using optical physics, artificial intelligence (AI), and neuroscience.

2017: Complications due to macro-vascular research, such as cardiovascular disease (CVD), coronary heart diseases (CHD), and stroke, using pattern analysis and segmentation analysis.

2018: Complications due to micro-vascular research such as kidney (CKD), bladder, foot, and eye issues (DR).

2019: CGM big data analysis, using wave theory, energy theory, frequency domain analysis, quantum mechanics, and AI.

2020: Cancer, dementia, longevity, geriatrics, DR, hypothyroidism, diabetic foot, diabetic fungal infection, and linkage between metabolism and immunity, learning about certain infectious diseases, such as COVID-19.

2021: Applications of linear elastic glucose theory (LEGT) and perturbation theory from quantum mechanics on medical research subjects, such as chronic diseases and their complications, cancer, and dementia.

2022: Applications of viscoelastic/viscoplastic glucose theory (LEGT) on 142 biomedical research cases and 5 economics research cases.

Again, to date, he has spent ~40,000 hours self-studying and researching medicine and he has read 4,000+ published medical papers online. He has collected and calculated more than 3+ million pieces of data regarding his own medical conditions and lifestyle details. In addition, he has written and published 700+ medical research papers in 100+ various medicine, physics, mathematics, and engineering journals. Moreover, he has also given 120+ presentations at 70+ international medical conferences. He has continuously dedicated his time (11-12 hours per day and work each day of a year, without rest during the past 13 years) and efforts to his medical research work and shared his findings and learnings with other patients worldwide. In addition, he has also spent the past 12 years developing and maintaining a medicine and health software APP on his iPhone which functions as his private numerical laboratory to process the various experimental datasets of his medical conditions and lifestyle details.

2.2 Brief introduction of math-physical medicine (MPM) research

The author has collected 3+ million data regarding his health condition and lifestyle details over the past 13 years. He spent the entire year of 2014 developing a metabolism

index (MI) model using a topology concept, nonlinear algebra, algebraic geometry, and finite element method. This MI model contains various measured biomarkers and recorded lifestyle details along with their induced new biomedical variables for an additional ~1.5 million data. Detailed data of his body weight, glucose, blood pressure, heart rate, blood lipids, body temperature, and blood oxygen level, along with important lifestyle details, including diet, exercise, sleep, stress, water intake, and daily life routines are included in the MI database. In addition, these lifestyle details also include some lifetime bad habits and certain environmental exposures. Fortunately, the author has none of these lifetime bad habits and an extremely low degree of exposure to environmental factors. The developed MI model has a total of 10 categories covering approximately 500 detailed elements that constitute his defined “metabolism index model” which are the building blocks or root causes for diabetes and other chronic disease-induced complications, including but not limited to CVD, CHD, stroke, CKD, DR, neuropathy, foot ulcer, hypothyroidism, dementia, and various cancers. The end result of the MI development work is a combined MI value within any selected period with 73.5% as its dividing line between a healthy and unhealthy state. The MI serves as the foundation for many of his follow-up medical research work.

During the period from 2015 to 2017, he focused his research on type 2 diabetes (T2D), especially glucose, including fasting plasma glucose (FPG), PPG, estimated average glucose (eAG), and hemoglobin A1C (HbA1C). During the following period from 2018 to 2022, he concentrated on researching medical complications resulting from diabetes, chronic diseases, and metabolic disorders which include heart problems, stroke, kidney problems, retinopathy, neuropathy, foot ulcer, diabetic skin fungal infection, hypothyroidism, diabetic constipation, dementia, and various cancers. He also developed a few mathematical risk models to calculate the probability percentages of developing various diabetic complications based on this MI model. From his previous medical research work with 700+ published papers, he has identified and learned that the associated energy of hyperglycemic conditions is the primary source of causing many diabetic complications which lead to

death. Therefore, a thorough knowledge of these energies is important for achieving a better understanding of the dangerous complications.

2.3 TD, SD, and FD analysis tools

This section has brief descriptions of TD correlation analysis with other observational results, SD VGT analysis with hysteresis loop area's energy results, and FD analysis with frequency curve area's energy results.

First of all, by using a TD analysis tool, we can examine the curves' moving trend and pattern visually along with their correlation numerically. We can also study the extremely high or low data values in the dataset. The visual observation or calculation-derived interpretations are a part of statistical analysis results which can indeed provide some useful hints or even derive some accurate conclusions. However, we must be aware of the limitations of the selected data size and time window and also be cautious of the appropriate statistics tool we choose.

Regarding the TD energy, we can apply the rudimentary definition of physics that “the wave carried energy is directly proportional to the square of wave's amplitude”. However, the data quantity % of each wave category should be considered and included to obtain a more accurate TD energy value.

The author would like to describe the essence of his developed “hybrid model” that combines both the SD viscoelastic/plastic VGT analysis method and FD fast Fourier transform (FFT) analysis method together with a comparison against the traditional time-domain statistical correlation analysis.

It is described in 10 steps in the English language instead of using mathematical equations to explain it. In this article, he has applied both the SD-VGT operations (steps 1-7) and the FD-FFT operations (steps 8-10). As a result, it is aimed at readers who do not have an extensive background in the academic subjects of engineering, physics & mathematics.

The first step is to collect the output data or symptom (strain or ϵ) on a time scale. The second step is to calculate the output change rate with time ($d\epsilon/dt$), i.e. the change rate of strain or symptom over each period. The

third step is to gather the input data or cause (viscosity or η) on a time scale. The fourth step is to calculate the time-dependent input or cause (time-dependent stress or σ) by multiplying $d\varepsilon/dt$ and η together. The “time-dependent input or cause equation” of “stress $\sigma = \text{strain change rate of } d\varepsilon/dt * \text{viscosity } \eta$ ” is the essential part of this “time dependency”. The fifth step is to plot the input-output (i.e. stress-strain or cause-symptom) curve in a two-dimensional space-domain or SD (x-axis versus y-axis) with strain (output or symptom) on the x-axis and stresses (time-dependent inputs, causes, or stresses) on the y-axis.

The sixth step is to calculate the total enclosed area within these stress-strain curves or input-output curves (i.e. the hysteresis loops), which is also an indicator of associated energies (either created energy or dissipated energy) of this input and output dataset. These energy values can also be considered as the degrees of influence on output by inputs. The seventh step is the assembly of the area values of the selected periods to compare the “historical progression and contribution of medical condition” over certain periods. For the frequency domain, the eighth step is to define a “hybrid input variable” by using “strain*stress” which yields another accurate estimation of the energy ratio similar to the SD-VGT energy ratio associated with the hysteresis loop. The ninth step is to present these hybrid models’ results of (strain*stress) in TD and then perform the FFT operation to convert them into FD. The enclosed area of the frequency curve (where the x-axis is the frequency and the y-axis is the amplitude of energy) can be used to estimate the total FD-FFT energy. The tenth step is to compare these FD energy results against the SD-VGT energy results, or even TD energy results.

After providing the above 10-step description, the author would still like to use the following set of VGT stress-strain mathematical equations in a two-dimensional SD to address the selected medical variables:

Strain
 $= \varepsilon$ (time-dependency characteristics of individual strain value at the present time duration)

Stress
 $= \sigma$ (based on the change rate of strain multiplying with a chosen viscosity factor η)
 $= \eta * (d\varepsilon/dt)$
 $= \eta * (d\text{-strain}/d\text{-time})$
 $= (\text{viscosity factor } \eta \text{ using individual viscosity factor at present time duration}) * (\text{strain at present quarter} - \text{strain at previous time duration})$

Some of these inputs (causes or viscosity factors) are further normalized by dividing them or being divided by a normalization factor using certain established health standards or medical pieces of knowledge. Some examples of normalization factors are 6.0 for HbA1C, 120 mg/dL for glucose, 25 for body mass index (BMI), 4,000 steps after each meal, 10,000 or 12,000 steps for daily walking exercise depending on time-period selection, 13 grams to 20 grams of carbs/sugar intake amount per meal depends on time-period selection. If using the originally collected data, i.e. the non-normalized data, it would distort the numerical comparison of the hysteresis loop areas. Using this “normalization process”, we can remove the dependency of the individual unit or certain unique characteristics associated with each viscosity factor. This process allows us to convert the originally collected variables into a set of “dimensionless variables” for easier numerical comparison and result interpretation.

Note: For a more detailed description, please refer to the “consolidated method” section which is given at the beginning of the special issue.

3. RESULTS

Figure 1 displays comparisons of 2 output curves and 4 input curves.

Figure 2 shows economic data and waveforms.

Figure 3 reflects biomedical data and waveforms.

Figure 4 depicts the analysis results of the economic case.

Figure 5 reveals the analysis results of the biomedical case.

Figure 6 demonstrates 3 time-zone analysis results.

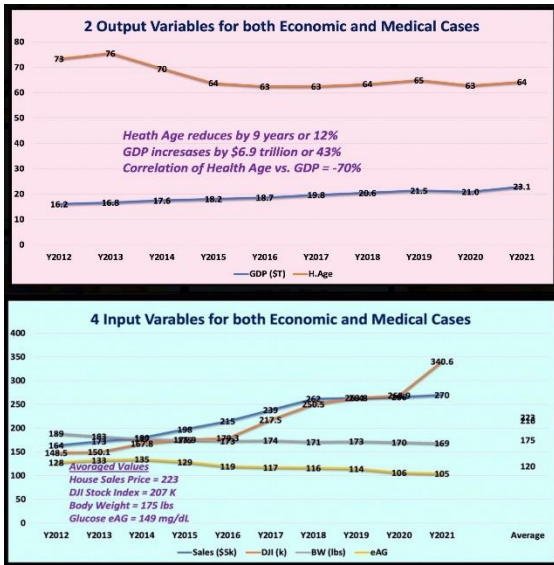


Figure 1: Comparisons of 2 output curves and 4 input curves.

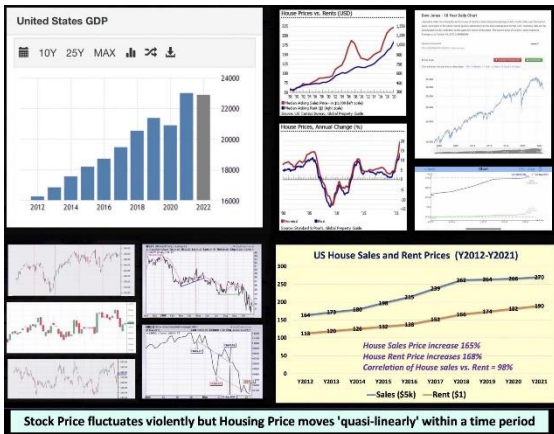


Figure 2: Economic data and waveforms.

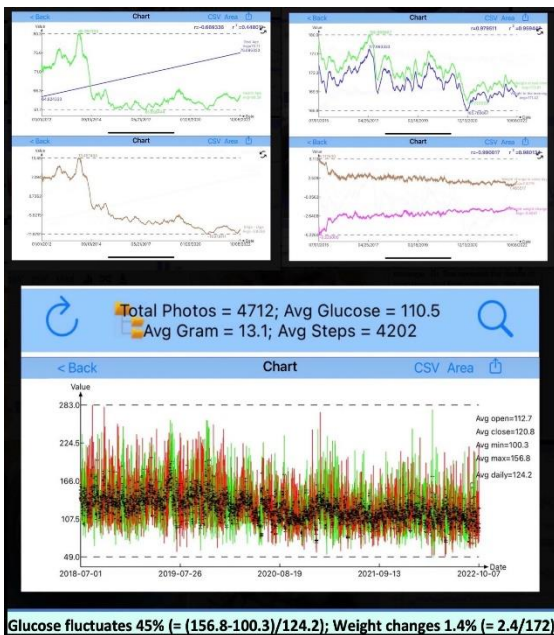


Figure 3: Biomedical data and waveforms.

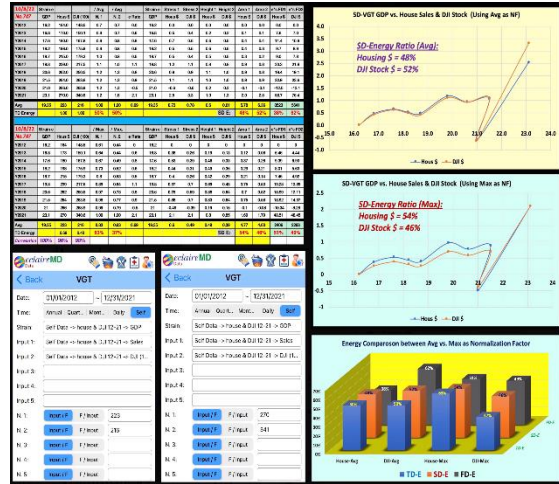


Figure 4: Analysis results of economic case.

10/9/22	Strain e	/ Max.	/ Max.	Strain e	Stress 1	Stress 2	Height 1	Height 2	Area 1	Area 2	e% FDI	e% FDI			
Y2012	73.46	189.03	127.73	1.11	1.06	0.00	73.46	0.00	0.00	0.00	0.0	0.0			
Y2013	75.99	182.57	132.56	1.07	1.10	2.13	75.99	2.29	2.35	1.14	1.18	2.44	2.51	173	178
Y2014	69.50	177.23	134.65	1.04	1.12	-6.09	69.50	-6.35	-6.83	-2.03	-2.24	12.37	13.64	441	475
Y2015	83.86	175.40	128.66	1.03	1.07	-5.64	83.86	-5.82	-6.05	-6.68	-6.44	34.31	38.32	372	386
Y2016	62.52	172.24	119.42	1.02	1.05	-1.24	62.52	-1.38	-1.33	-3.89	-3.89	4.91	4.94	46	48
Y2017	62.58	174.29	117.36	1.03	0.96	0.06	62.58	0.06	0.06	-0.63	-0.64	-0.54	-0.54	4	4
Y2018	63.51	171.09	116.39	1.01	0.97	0.93	63.51	0.94	0.90	0.50	0.48	0.46	0.45	99	97
Y2019	68.04	172.57	114.38	1.02	0.95	1.53	68.04	1.55	1.46	1.24	1.18	1.90	1.81	101	85
Y2020	62.91	170.02	108.24	1.00	0.99	-2.13	62.91	-2.13	-1.89	-0.29	-0.21	0.61	0.46	134	119
Y2021	64.32	168.08	104.63	0.99	0.87	1.42	64.32	1.41	1.24	-0.36	-0.32	-0.51	-0.46	91	80
Avg	68.33	173.27	125.20	1.03	1.00	-0.91	68.33	-0.94	-1.01	-1.01	-1.07	56.35	59.63	414989	448032
TD-Energy	1.00	0.96	0.87	0.92%	48%							49%	51%	48%	52%
Correlation	1.00	0.96	0.87												

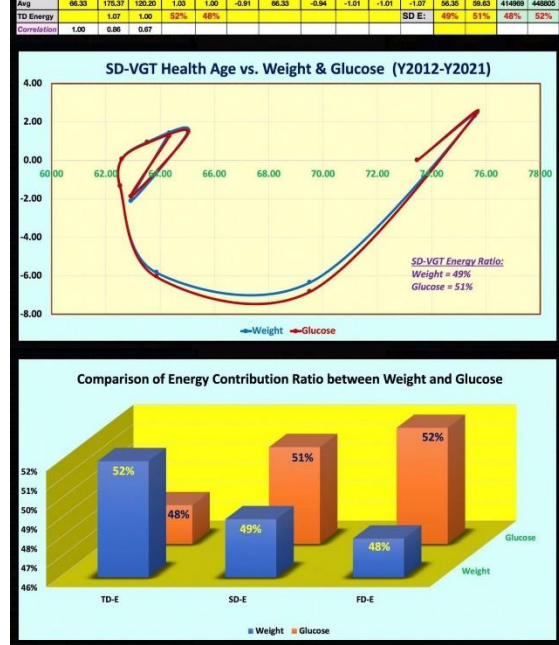


Figure 5: Analysis results of biomedical case.



Figure 6: Time-zone analysis.

4. CONCLUSION

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(4) SD-VGT Energies: From the results of the energy analysis of the economic case, the SD-VGT energy ratios from using the average numbers as the normalization factor are: house \$ = 48%, stock \$ = 52%, and the same SD-VGT energy ratios from using the maximum numbers as the normalization factor are: house \$ = 54%, stock \$ = 46%. These two energy findings indicate that house \$ and stock \$ have offered almost equal influence on the total US GDP. However, from the results of SD-VGT energy analysis of the biomedical case using the dividing numbers between healthy versus unhealthy as the normalization factors (i.e. 170 lbs. for weight and 120 mg/dL for glucose) are: weight = 49%, glucose = 51%. Again, this

finding indicates that weight and glucose have offered an almost equal amount of influences on his health age, or longevity.

(5) Time-zone analysis: A more interesting analysis is the time-zone analysis results. The author has defined the 5 years from Y2012 to Y2016 as the “Obama era” and the 4 years from Y2017 to Y2020 as the “Trump era”. The “Biden era” has one year of Y2021 only, and therefore it is omitted in this time-zone analysis. For the economic case, the SD-VGT energy ratios based on the average model are: Obama era = 2.3 (31%); Trump era = 5.0 (69%). But, for the economic case, the SD-VGT energy ratios based on maximum model are: Obama era = 4.0 (46%); Trump era = 4.6 (54%). The two sets of observations have shown the importance of normalization factor selection in SD-VGT analysis. But the above energy ratios have also proved one undeniable truth that the US economy was indeed better during the Trump era than the Obama era. The same time-zone analysis results have also been done on his biomedical case. Again, the author has defined the 5 years from Y2012 to Y2016 as the “Obama era” and the 4 years from Y2017 to Y2020 as the “Trump era”. The “Biden era” has one year of Y2021 only, and therefore it is omitted in this time-zone analysis. For the biomedical case, the SD-VGT energy ratios based on the traditional definition of healthy versus unhealthy are: Obama era = 111 (95%); Trump era = 6 (5%). This interesting observation has not only shown that the personal health condition and longevity perspective have no direct link with any politics, government policies, or market values (except for a person’s stress resulting

from the market changes). A more proper interpretation from this biomedical energy analysis is that the author’s hope for longevity has been largely achieved through his earlier efforts on lifestyle control and health improvements during the Obama era, and also being maintained stringently through the Trump era.

5. REFERENCES

For editing purposes, the majority of the references in this paper, which are self-references, have been removed. Only references from other authors' published sources remain. The bibliography of the author’s original self-references can be viewed at www.eclaircmd.com.

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For reading more of the author’s published VGT or FD analysis results on medical applications, please locate them through three published special editions from the following three specific journals:

- (1) Special Issue. The GH-Method. (<https://www.theghmethod.com>).
- (2) Journal of Applied Material Science & Engineering Research (contact: Catherine).
- (3) Advances in Bioengineering and Biomedical Science Research (contact: Sony Hazi).

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