THE $5,000 CHALLENGE: "Debt to GDP Can Never Exceed One in Real Terms"

In the spirit of education, I will award a $5,000 (escalating to $50,000 and $500,000, assuming no successful contests) qualifying scholarship or charity contribution in the name of the first person who submits a successful challenge to the logic contained within the article below. The successful contestant may either credibly debunk the logic via similar argument(s), or generate a case that empirically demonstrates in any historical period where a sovereign nation whose collective citizenry and its government with an aggregate net real debt greater than its GDP repaid the debt down to a level equal to its GDP in real terms (net of inflation) without affecting real value of any existing debt.

Note: Exceptions and further qualifications are listed at the end of this article. See http://www.austrianenginomics.com/id7.html for contest terms and deadline.

Debt to GDP Can Never Exceed One in Real Terms

Simple Physical Principles:
- On average… One cannot be indebted to repay more Goods and Services than one can produce in a lifetime.
- On average… One cannot consume more Goods and Services than one produces in a lifetime.

We will develop this concept into three successively complex models:
1. The first model will describe a simple "island" environment that includes division of labor and no money.
2. The second model will expand to an agrarian community; again enjoying division of labor, but no money.
3. The third model will further expand to include a hierarchy of labor and productivity improvement, but still no money.

In every case there will be no money, as it does not represent real wealth[1] in this context. Thus, the metric utilized for Goods and Services (G&S) produced and consumed will be recognized by various methods. In all cases the motivation (profit, interest, or value preference) for production and eventual distribution or exchange of G&S will be assumed, thus excluded. Also, in the third model, the relative valuation of all Goods and Services exchanged is assumed to be at market pricing.

There is a very specific maximum "cap" of debt relative to G&S produced in real terms that will be developed. So, let's begin with Model #1…

First Model; "Tom and Jerry on an Island"

Imagine an island with two inhabitants, Tom and Jerry. In this simplified environment money is not a necessity. Only goods and services (G&S) are voluntarily exchanged between the two. Tom has the skill sets to produce Tomatoes and Jerry has the skill sets to produce Juicy oranges. Tom can only consume Jerry's Juicy oranges due to a severe allergic condition, and Jerry can only consume Tom's tomatoes for a similar reason. This division-of-labor also exists in our modern society albeit for different reasons. i.e. Jerry consumes that which is produced by someone else (Tom), and Tom consumes that which is produced by others (Jerry). Virtually nothing we produce in our jobs today is consumed by ourselves individually. We're always

working to provide G&S for others. Since there is no money, all debt and GDP are in terms of G&S produced and rendered utilizing their labor and skill sets during their respective lifetimes. Whether Tom produces one thousand or one million tomatoes, it will represent one "man-life" of GDP, and likewise for Jerry. Assume Tom and Jerry are surviving OK and enjoying a satisfactory standard of living, as they would know nothing else.

The Debt-to-GDP ratio on this island scenario is one, and will never be higher as they can neither **consume** nor **owe** more than is produced. G&S produced (GDP) and rendered by Tom represent debt to be paid by Jerry via a corresponding amount of G&S. Timing of the debt redemptions will vary, but the total G&S produced is consumed in a lifetime in any event. In another context, if you envisage Tom's entire lifetime of production (which Jerry consumes), it would represent one "man-life" of debt for Jerry, and likewise for Tom. Thus, the total island Debt-to-GDP would both be exactly one; two total "man-lives" of Debt relative to two total "man-lives" of GDP.

Regardless of their respective productivity levels, the relative "value" of the goods or services produced, quantity of tomatoes and juicy oranges produced, hours worked, spoilage generated, skill levels, or any alternate quantification attempt at measuring G&S, the Debt to GDP is still ONE in the context of "man-lives" of labor time. The ultimate lifetime supply of tomatoes that Tom delivers to Jerry may vary dramatically for various reasons and motivations. In any event, the maximum debt that Tom could oblige to Jerry is one "man-life" of G&S delivered.

The obvious question is: Can there be a mid-stream modification to the agreed production levels or debt? For example Tom wants to *and is able to* produce twice the number to tomatoes Jerry has been consuming to make him stronger and happier. Does Jerry now owe more Juicy oranges to Tom? Yes, if Jerry agrees and produced them, and no, if he doesn't! Of course, there can be numerous modifications for various reasons, but ultimately Jerry can commit no more than one "man-life" of debt.

Another context is to envisage a completely predetermined lifetime of consumption and production on the island. Regardless of any verbal, written, or contractual agreements that vary the production levels for any reasons whatsoever, the end result will be "x" number of Tomatoes and "y" number of Juicy oranges produced in their respective lifetimes. That actual number will represent the recorded GDP for their lives. Any alternative agreements that might have surfaced will be illusory, if they represent anything other than that which is actually produced and consumed. There will be no redeemable debts once their lives have expired! Debt-to-GDP is a ratio, not an absolute constraint on either party.

Second Model; "An Agrarian Community"

Now let's progress to modeling a community, and offer a broader perspective…

Assumptions for the Amish 200+ years ago (a "traditionally debt-balanced community")…!
- Non-Capitalistic community
- No Money. Only **Goods and Services** were produced and exchanged for all communal and individual needs.
- Division of labor existed to enable specialization, not productivity improvement. Let's assume they reached this level of specialization centuries ago…
- Constant population age and lifespan profile

- "0" Productivity improvement
- "0" Economic standard of living change
- "0" Goods and Services produced and consumed by the same individual. (Not actually true in an agrarian society, but let's assume this condition, which models our society today.
- 100% of all Goods produced depreciate; i.e. Goods of value are not passed on to the next generation

Remember… NO MONEY..!

Since the Amish community functioned without money, goods and services received were repaid in-kind. For example: Jack entered into his working life by building a house with the help of the community. In Jack's first year all of the working Amish in the community helped build his house dedicating ½ of their working day to this task. The remaining working time was dedicated to the other required tasks to sustain their lives at a constant economic level. Each year another person entered into his (or her) working life and the same task routine applied all over again. "Dependency Overhead" represents support required for all non-working persons in the community.
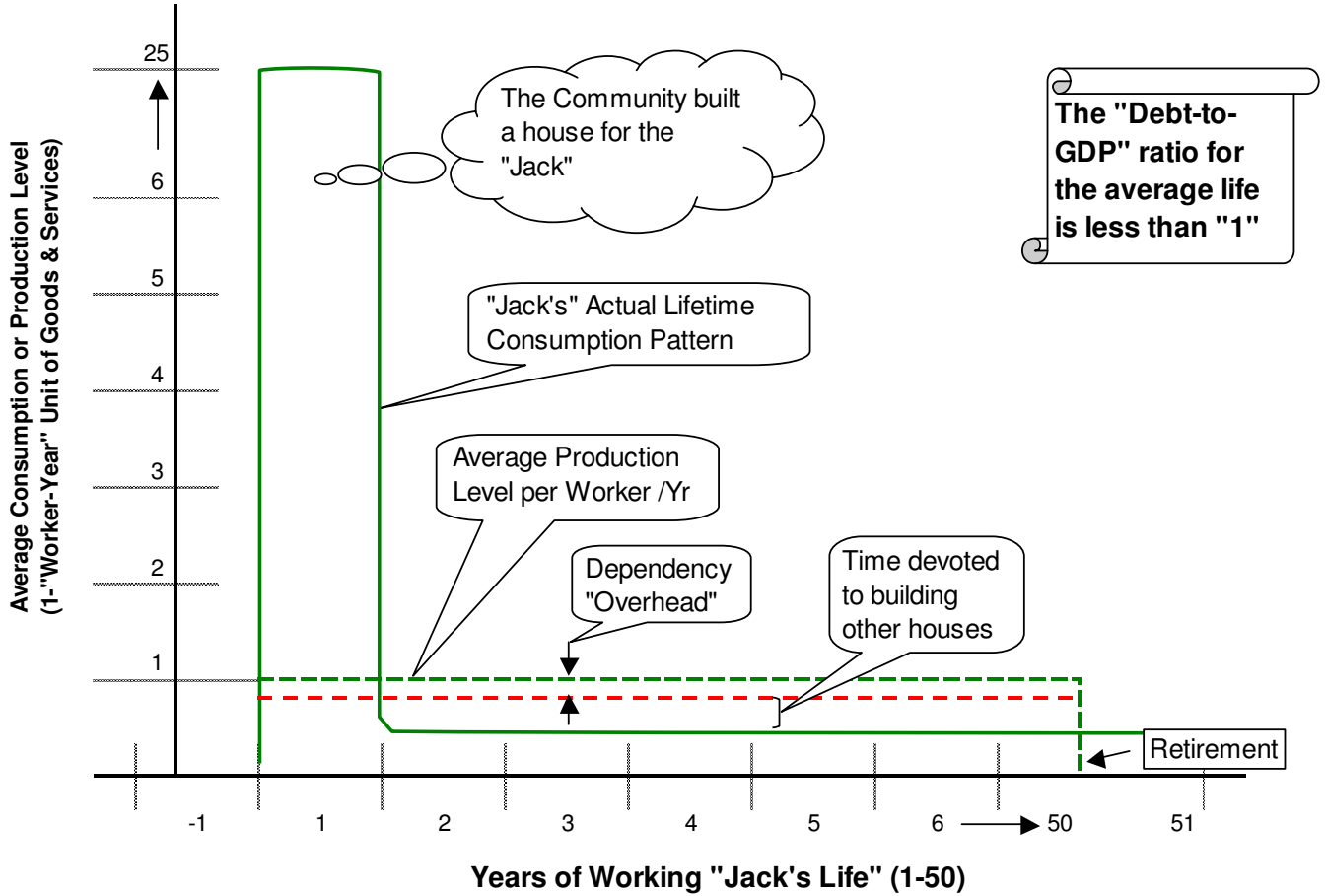
Results:
- The debt of goods and services is exactly equal to the GDP of the community less the Overhead. I.e. a Debt-to-GDP ratio of less than "1".
- All goods and services produced and rendered would have various time periods of repayment. We assume the goods or services were not exchanged at precisely the same time. I.e. A delay (anywhere from one second up to the end of his working life) in repayment of the debt in equivalent goods or services will give him time to produce and repay exactly what he receives during his lifetime.
- An hour of one person's time was no more valuable than an hour of another. For example, Jack would repay the house by working 4 hours per day for the rest of his working life building another person's house. A buggy wheel produced and distributed in a week might be repaid with a bushel of corn in a season's time. Timing of redemption is not relevant as long as the needs of the community were satisfied to maintain the same steady-state standard of economic living.
- The skill sets and labor efficiency would never change. All would pass from generation to generation.
- Since there is no money, a debt would be repaid in production-time-equivalent goods and services.
- All would enjoy the same consumption level of goods and services for their entire lives.
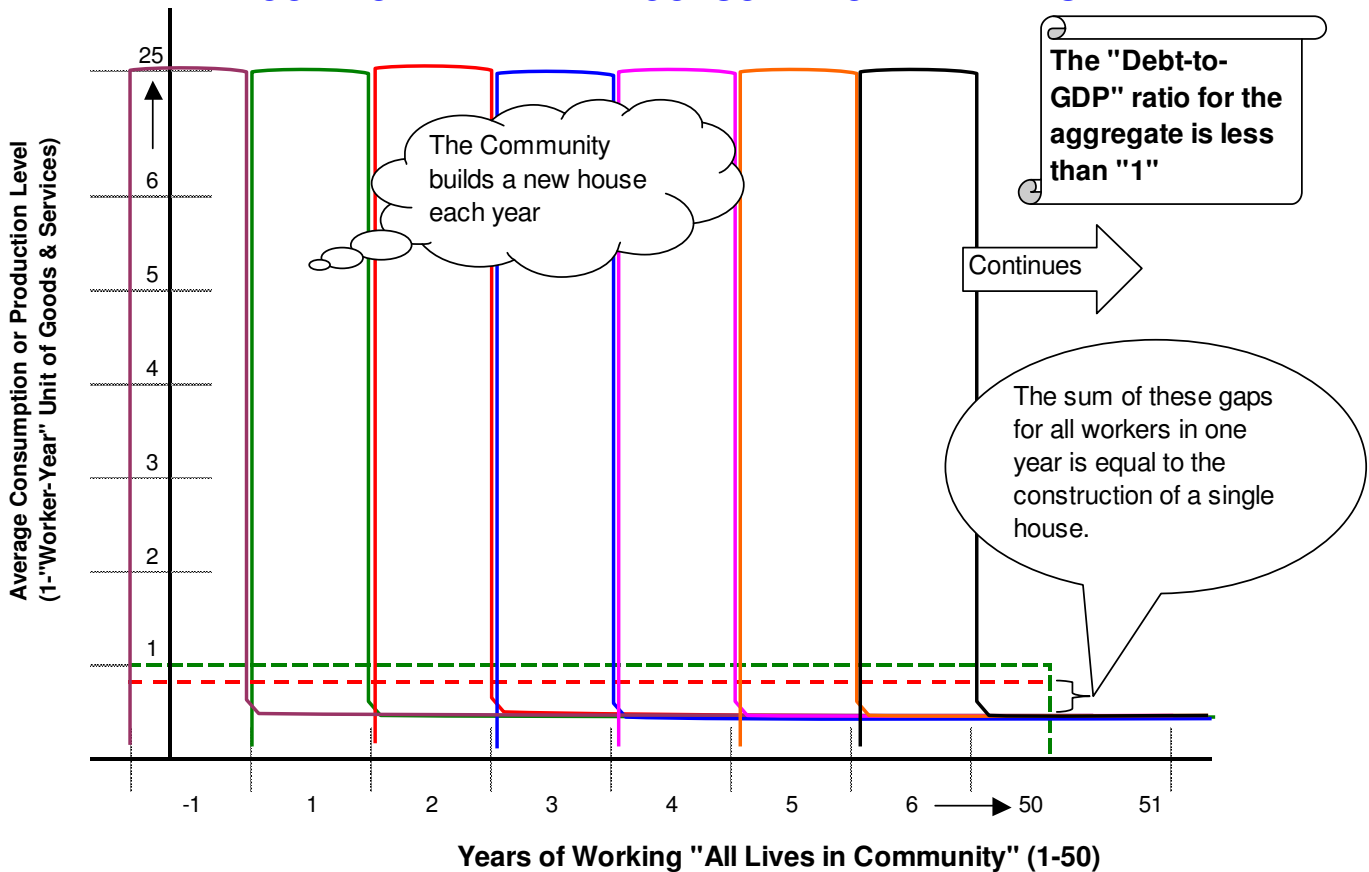
Graphically:
- The first graph below ("Lifetime Consumption Pattern") illustrates the consumption and production pattern for Jack during his working life.
- The second graph below ("Community Lifetime Consumption Patterns") illustrates numerous consumption and production patterns for a group of succeeding persons in the community.

LIFETIME CONSUMPTION PATTERN

Average Consumption or Production Level
(1-"Worker-Year" Unit of Goods & Services)

25
6
5
4
3
2
1

The Community built a house for the "Jack"

The "Debt-to-GDP" ratio for the average life is less than "1"

"Jack's" Actual Lifetime Consumption Pattern

Average Production Level per Worker /Yr

Dependency "Overhead"

Time devoted to building other houses

Retirement

-1   1   2   3   4   5   6 → 50   51

Years of Working "Jack's Life" (1-50)

COMMUNITY LIFETIME CONSUMPTION PATTERNS

Average Consumption or Production Level
(1-"Worker-Year" Unit of Goods & Services)

25
6
5
4
3
2
1

The Community builds a new house each year

The "Debt-to-GDP" ratio for the aggregate is less than "1"

Continues

The sum of these gaps for all workers in one year is equal to the construction of a single house.

-1   1   2   3   4   5   6 → 50   51
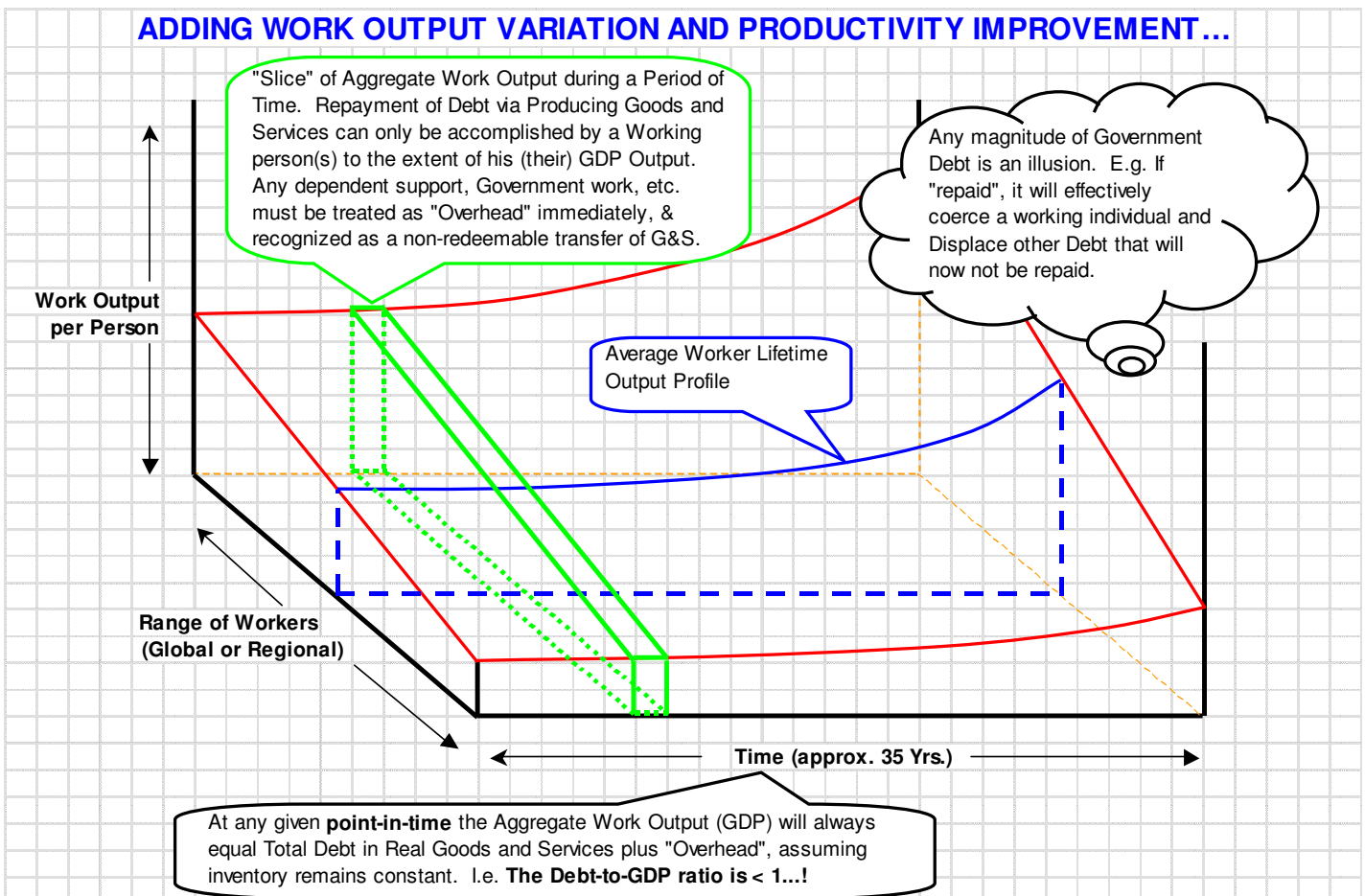
Years of Working "All Lives in Community" (1-50)

Third Model; "Adding Work Output Variation and Productivity Improvement"

This model recognizes the variation of Work Output within the community. E.g. a doctor's time may have more value than a janitor's time, which is represented in the graph below by the "Range of Workers (Global or Regional)" scale. The green colored "slice" of aggregate work output during a period of time recognizes a real-time condition where Goods and Services are continually produced and exchanged to create as well as satisfy debts. For example a doctor may treat a patient for one hour, and receive ten hours of landscaping work as payment in-kind considering time valuation differences. Assuming there is no aggregate change in G&S inventory levels, the noted exchange of services will be equal.

The model also recognizes a productivity improvement over a period of 35 years. View the blue lines representing the output profile of an average worker lifetime with the gradual increase in output rising over time. In any event the increasing production output will become the increasing debt of another person directly or indirectly acquiring the G&S.

Thus, the aggregate Debt-to-GDP in the real time (green "slice") dimension as well as the "lifetime" (blue "slice") dimension are less than one assuming some level of Overhead (not shown).

ADDING WORK OUTPUT VARIATION AND PRODUCTIVITY IMPROVEMENT…

"Slice" of Aggregate Work Output during a Period of Time. Repayment of Debt via Producing Goods and Services can only be accomplished by a Working person(s) to the extent of his (their) GDP Output. Any dependent support, Government work, etc. must be treated as "Overhead" immediately, & recognized as a non-redeemable transfer of G&S.

Any magnitude of Government Debt is an illusion. E.g. If "repaid", it will effectively coerce a working individual and Displace other Debt that will now not be repaid.

Work Output per Person

Average Worker Lifetime Output Profile

Range of Workers (Global or Regional)

Time (approx. 35 Yrs.)

At any given **point-in-time** the Aggregate Work Output (GDP) will always equal Total Debt in Real Goods and Services plus "Overhead", assuming inventory remains constant. I.e. **The Debt-to-GDP ratio is < 1…!**

Can legitimate Aggregate *Financial Debt* be Greater than GDP?

Yes, but how can this happen?
- There is significant duplicity in legitimate financial debt in the market. For example, if Fred owned a bond worth $100,000 and a mortgage obligation of $200,000, and $500,000 in stock whose company owed debt equal to its equity, then Fred's total debt would be $700,000. However, when we reconcile the difference between the Real Economy debt vs the Financial Economy debt, we must develop a net debt by individual. In Fred's case it would be $600,000 ($100K - $500K - $200K). In this manner we can understand the legitimate financial debt relative to real "net" debt.

Can We Calculate Legitimate Financial Debt vs Total Market Debt to Understand the Magnitude of the Illusion?

Yes, but it can be a cumbersome calculation. Repeating one of our "Simple Physical Principles": On average… One cannot be indebted to repay more Goods and Services than one can produce in a lifetime. Modifying this principle to fit Model #2 (above) one can say: "In aggregate, a community in isolation (e.g. the world) cannot incur greater debt than its GDP generation. Thus, any debt accumulated greater than the GDP is an illusion. Following is an initial attempt at the calculation logic:
- Step #1: First, all debt (total credit market debt) excluding government debt must be allocated and calculated at an individual level to avoid double counting. In Fred's example above he owned a bond worth $100,000 and a mortgage obligation of $200,000, and $500,000 in stock whose company owed debt equal to its equity, then Fred's net debt would be $600,000 ($100K - $500K - $200K). Defined as **ND**.
- Step #2: Second, the magnitude of Federal Government debt is pure illusion. See article on "Our Federal Debt is Pure Bubble"[2]. Therefore, it is not a legitimate Financial Debt component. Defined as **FD.**
- Step #3: Third, the ongoing expense of all government entities must be reduced from the calculation as they represent resource consumption that will never be redeemed. Defined as **GE.**
- Step #4: Fourth, all other government debt (city, municipal, state, district, international, etc.) at any level for any purpose, would be included in the financial calculation, thus competing for redemption within the limit of one GDP. Defined as **OGD** (Other Government Debt).

To calculate the magnitude of the Debt Illusion (i.e. How much debt exists today that is impossible to recover?):

ND + FD + GE + OGD – GDP (Gross Domestic Product) = Total Debt Illusion

CONCLUSION:

We have proven logically and demonstrated in three modeled conditions that Real Aggregate Debt can never exceed Gross Domestic Product (GDP) for any time period, either in short term context or a life-time context. We also recognize the task to fully reconcile the familiar Financial Economic Debt with the Real Debt would be a formidable, but worthwhile task.

Historically, the US has maintained a Total Credit Market Debt level nearly equal to its GDP for extended periods of time; not surprisingly, when our monetary system was based upon a gold standard. Currently (Aug 2005) our Total Credit Market Debt accumulation in excess of the annual GDP is approx. $24 Trillion, since the ratio was near balance in 1957. It is estimated that once adjustments noted above have been calculated the total debt illusion is between $12 and $18 Trillion. The discovery of this illusion will likely occur when critical masses of Baby Boomers in Asia, Europe, and the US begin to retire (approx. 2008-2010) and start attempting to cash in their spoils. Last year (2004) the debt quagmire rapidly deteriorated. Our Total Credit Market Debt increased more than $2.7 Trillion while our GDP increased $0.73 Trillion. We expect very serious consequences will result.

References:
1. "Houses Do Not Appreciate, They Inflate", Page #1; Sept 9, 2005 by Russell Randall,
2. "Our Federal Debt is Pure Bubble", Sept 8, 2005 by Russell Randall

by Russell Randall; 8-31-2005