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Debts, Taxation, their Cost, and Social Welfare

Dr. Ioannis N. Kallianiotis
Economics/Finance Department
The Arthur J. Kania School of Management
University of Scranton, Scranton, PA 18510-4602. U.S.A.
ioannis.kallianiotis@scranton.edu

ABSTRACT[1]

The current paper discusses the enormous debts, the current tax system, and the ultimate objective of a nation, which is the social welfare of its citizens. The high taxes reduce the disposable income and make savings negative (dissaving or borrowing). This increases further the debt of individuals and the low taxes on businesses have magnified the budget deficits and the national debt. People are borrowing the present value of their uncertain future wealth and their high debt and low income raise the risk and this high risk premium heighten the interest rate on loans, especially on the usurious credit cards. Government has to increase corporate taxes and reduce the national debt by lowering government expenditures (military expenditures and national defense). The current tax system needs to be changed and an interest rate floor on deposits (savings) and an interest rate ceiling on individuals' loans (borrowings) is necessary to improve social welfare, fairness, and justice in our society. The middle class cannot work only to pay taxes and interest on its debt (redistribution of their wealth to government and banks), due to low disposable income. The disappearing of the middle class will affect negatively the entire socio-economic structure of the nation and after losing its power, it will start declining, as history has shown to us with so many empires that do not exist anymore. We hope the leaders to regain their lost power and lead the abandoned people to their ultimate objective, which is their perfection and the nation to its highest social welfare.

Key Words: Estimation, Time-Series Models, Consumption-Saving, Taxation, Government Expenditures, Interest Rates

INTRODUCTION

The latest excessive debts, consumption, and taxes had exceeded any historic measures. People were spending the largest proportion of their expected life income and wealth by borrowing the present value of their uncertain future income. Banks were offering without any restrictions or inspections any amount of money that individuals wanted to borrow by increasing only the risk-premium for a high debt customer. As a result of this irrational behavior individuals and households ended up with loans, which might exceed their life-cycle income and their interest payment had become the largest component of their total expenses. Banks with their enormous risk premia and their collateral on loans are the only winners, but they cannot avoid completely their risk. The same behavior was followed by nations and their treasuries; so their debts and deficits have reached the enormous amounts that are impossible to be paid back even with any austerities (enormous taxes and reductions in salaries, wages, and pensions) imposed on the citizens or with any privatizations (sale offs) of the public

[1] Economics/Finance Department, The Arthur J. Kania School of Management, University of Scranton, Scranton, PA 18510, U.S.A. I would like to acknowledge the assistance provided by Christos Diamantidis. Financial support (professional travel expenses, submission fees, etc.) was provided by Provost's Office (Faculty Travel Funds, Henry George Fund, and FRAP Funds). The usual disclaimer applies. Then, all remaining errors are mine.

wealth of the nations. What a delusion that we were living for so many years! And what an anti-social policy that governments were and are still pursuing! This is actually the social cost of the passion of greediness!.

So far all the benefits of this universal indebtedness have gone to the banks, which are making tremendous revenues from interest income and are threatening individuals (with foreclosures) and nations (with sale offs and confiscations) that are unable to pay off their loans. With this irrational behavior of people and governments, banks are in control of them; the socio-economic system (the free market) is in a social cliff, which restricts the hope from humans. This recent crisis is unique in human history; thus, this could not have happened by mistake. Responsible for any social problem are the powerless governments that did not regulate the corrupted markets and institutions and of course, the ignorant people, who did not prevent the current crisis of waste and of global catastrophe with their voting power.

The U.S. economy had long been characterized by international imbalances in its current and capital accounts. Large current account surpluses earned by Japan in the 1980s and by China in the 1990s and 2000s were recycled to the U.S. in the form of purchasing of U.S. government and private sector securities (debt instruments) by offering U.S. dollars (Fed liabilities). It allows the U.S. to continue to run its twin deficits (current account[2] and budget deficit or national debt[3]). The low price of Chinese products kept inflation low in the U.S. and because of this low inflation premium, an unexpected risk (low risk premium), and a quantitative easing by the Fed,[4] the U.S. interest rate remained low (it was kept low to improve the financial market). With this low cost of capital, consumers were encouraged to finance their consumption and investment by increasing their indebtedness. It also caused many bubbles in all the assets (financial and real). When these bubbles burst, the losses were enormous, following by recessions and high unemployment in the U.S. and in 2007 a global financial crisis began and continues up to now (2014), which destroyed the Euro-zone economies, due to their enormous debts, the needless and detrimental common currency,[5] the loss of their independence, and other socio-political problems that European governments did not prevent them, due to their corruption and direct control from Brussels (actually, Germany and IMF).

The deregulation, the housing market, and the financial innovations helped to build up this enormous debt that eventually collapsed and changed the entire global financial system.[6] Loan officers tried to maximize their fees, their salaries, and their bonuses by avoiding the consideration of any prudent underwriting standard. At the same time, a lot of fraud, corruption, greed, and fear increase the risk even further.[7] Of course, authorities and regulatory agents and above all the U.S. government and the Fed are responsible for these crises, too. Now, we know that even small events (mistakes) can have an enormous impact on

[2] See, *BEA*, U.S. Department of Commerce, http://www.bea.gov/international/index.htm
[3] See, *Treasury Direct*, http://www.treasurydirect.gov/govt/reports/pd/mspd/2012/2012.htm
[4] See, Kallianiotis [12]. Federal Reserve officials agreed at June's 2014 FOMC meeting to end their bond-buying program in October 2014, putting an explicit end date on the experiment for the first time and closing a controversial chapter in central banking. (*The Wall Street Journal*, July 10, 2014, pp. A1 and A2).
[5] See, Kallianiotis [15].
[6] The total debt in the U.S. (government +private) was $183.1 trillion (December 31, 2011) and the real GDP was $13.638 trillion (2012:Q3); which is 1,342.56% of the GDP. See, http://grandfather-economic-report.com/debt-summary-table.htm . In July 2014, it was $185.49 trillion and the real GDP was $15.824 trillion (3/31/2014), which is 1,172.21% of the GDP. The ND is 111.37% of the GDP and the total public debt is 896.11% of the GDP. The question is here: Is this debt sustainable? And if the answer is "Yes"; for how long?
[7] This is the feeling that the conscience creates censuring humans, who do not know the True objective in life. Unfortunately, this shows exactly how "the market" is working, today.

the international financial system. The world could not become the same anymore. These latest crises were a new phenomenon for the average naïve person, but not for the well informed individuals,[8] who were expected all these events.

Further, countries, due to their spending and borrowing have accumulated enormous debts and their revenues are very limited because of the low taxes[9] and exemptions and deductions that businesses have according to the Internal Revenue Code.[10] Also, wealthy individuals are paying less and less taxes and the middle class is paying more as the time is passing.[11] Then, the countries pay interest on these loans and this interest is in a huge proportion of the total government payments. The U.S. debt exceeded $17.6 trillion and the interest paid in the 12 months ended on December 31, 2013, was $415.7 billion. In the 2011 fiscal year, the interest payment was $454.4 billion and in fiscal year 2005, it was $352.4 billion. The reduction in interest rates has reduced the interest cost for the U.S. government and for individuals (through refinancing).[12]

[8] The well informed individual has full informations ($\Pi\lambda\eta\rho\varepsilon\iota\varsigma\ \ \Pi\lambda\eta\rho o\phi o\rho\iota\alpha\varsigma$ or Πληροφορίαι, *piliroforiai,* Π); information I is a proper subset of Π ($I \subset \Pi$). The public information provided by the media are only at the level I; thus, the public is misinformed. This is too bad for our educational system; students have incomplete knowledge, too.

[9] Taxes have a high social cost and no one is in favor of high taxes, as we see, today, in the Euro-zone. In 1776, the anger of the American colonies over British taxes sparked the American Revolution. In 1980, Ronald Reagan was elected president on a platform of large cuts in taxes (Reaganomics), but he created an enormous debt. In 1992, Bill Clinton was elected in part because president George Bush had broken his 1988 campaign promise, "Read my lips: No new taxes". The younger George W. Bush promised a tax cut, and as president, he deliver it. President Obama increased taxes for the high income people.

[10] Actually, corporations and wealthy people are paying relatively less taxes compared to the middle class and their tax evasion is very high, too. This is a large proportion of deposits in offshore centers and tax havens. Also, GE paid no taxes; Goldman Sachs paid $14 million in 2010. The GAO reported in 2008 that "two out of every three United States corporations paid no federal income taxes from 1998 through 2005." Companies have become all too astute at paying for loopholes which allow them to shift profits abroad, or move their gains (on paper) to foreign low-tax/no-tax nations. As the data below shows, the change in corporate taxes — not merely rates, but what they actually paid — over the past half century is astounding. (1) Corporate Taxes as a Percentage of Federal Revenue: in 1955: 27.3% and in 2010: 8.9%. (2) Corporate Taxes as a Percentage of GDP; in 1955: 4.3% and in 2010: 1.3%. (3) Individual Income/Payrolls Taxes as a Percentage of Federal Revenue; in 1955: 58.0% and in 2010: 81.5%. See, http://www.ritholtz.com/blog/2011/04/corporate-tax-rates-then-and-now/ . In early 2013, U.S. lawmakers grilled Apple over its tax structure after Senate investigators found that the company paid no corporate income tax to any nation on tens of billions of dollars in overseas income over four years. Irish-based Apple units escaped U.S. taxation because they were not headquartered in the U.S., while Ireland did not tax them because they were managed from another country, the U.S. (*The Wall Street Journal*, October 16, 2013, pp. A1 and A14). Caterpillar has deferred or avoided paying $2.4 billion in taxes under a restructuring, a Senate panel report said. (*The Wall Street Journal*, April 1, 2014, pp. A1 and B3). Credit Suisse is expected to pay $2.5 billion to settle allegations that it helped Americans evade taxes. (*The Wall Street Journal*, May 16, 2014, pp. A1 and C1). The EU opened probes into tax practices used by Apple, Starbucks, and Fiat; a new front in its efforts to focus on tax avoidance by big firms. (*The Wall Street Journal*, June 12, 2014, pp. A1, B1, and B2). President Obama urged Congress to pass legislation to block U.S. companies from relocating overseas for tax reasons. (*The Wall Street Journal*, July 25, 2014, pp. A1 and A4).

[11] In 1960, the average tax rate (ATR) for the Top 0.1% was 51%, for the Top 1% it was 43%, and for the Middle 20% it was 14%. In 2013, the ATR for the Top 0.1% and the Top 1% was 31% and for the Middle 20% it was 19%. See, *Economic Report of the President 2013*, Figure 1-7.

[12] See, *Bloomberg.com*, October 4, 2012. http://www.bloomberg.com/news/2012-10-04/u-s-interest-cost-falls-to-lowest-since-2005-as-debt-soars-1-.html. Also, https://www.treasurydirect.gov/govt/reports/ir/ir_expense.htm.

All societies from the ancient times had some form of taxation[13] because governments needed revenue to provide the necessary public services, public goods, and public buildings. Also, to build roads, parks, to do public investment, to provide police services and the national defense. But, the correct and efficient management of these tax revenues is important to keep taxes low, growth and employment high, to prevent recessions and keep deficits and national debts closed to zero.[14] In ten years, from 2005 to 2013, Federal taxes have increased by 47.02% (4.7% p.a.). In 2004, individuals were paying 90% and corporations 10% of the total tax receipts and in 2013, individuals were paying 89% and corporations 11%. These numbers prove how unfair is our tax system. The government spending in ten years (2004-2013) has increased by 63.87% (6.4% p.a.). The spending of the Federal Government in 2004 generated a budget deficit of $412 billion and in 2013 of $992 billion.[15] An exaggerated increase in individuals' taxes, beyond the optimal level, can deteriorate the budget deficit instead of decreasing it, as follows:

$$t \uparrow \Rightarrow T \uparrow \Rightarrow Y^D \downarrow \Rightarrow S \downarrow \text{ and } C \downarrow \Rightarrow AD \downarrow \Rightarrow Q \downarrow, u \uparrow, Y \downarrow \Rightarrow T \downarrow \Rightarrow BD \uparrow$$

where, *t = tax rate, T = taxes, Y^D = disposable income, S = saving, C = consumption, AD = aggregate demand, Q = output, u = unemployment, Y = income, and BD = budget deficit.*

The national defense is the "defense" of the country from foreign aggressors (that so far do not exit) and it is one of the most expensive public goods. In 2004, the U.S. federal government spent a total of $456 billion on national defense, more than $1,500 per person. In 2013, the cost was $676 billion, more than $2,100 per person.[16] The government revenue (including federal, state, and local) as a percentage of total income for the U.S. economy has grown substantially over the past century. In 1902, the government collected 7% of total income; in recent years, government has collected about 30% of the income.[17] Also, state and local governments collect about 40% of all taxes paid. The receipts and spending of the U.S. state and local governments in 2002 show a deficit of $50 billion and in 2010 it fell to $41 billion.[18]

[13] The tax burden for several major countries, as measured by the government's tax revenue as a percentage of the nation's total income is:

France	39%
U.K.	34%
U.S.A.	30%
Germany	29%
Brazil	20%
Canada	18%
Russia	17%
Pakistan	15%
Indonesia	15%
Mexico	13%
India	10%

Source: *World Development Report 1998/99.*

[14] See, Kallianiotis [11].

[15] See also, Kallianiotis [11].

[16] The total military cost of the major U.S. wars (1775-2010) is over $7 trillion in constant 2011 dollars, without any foreign invasion. See, *Congressional Research Service*, http://fas.org/sgp/crs/natsec/RS22926.pdf . Other sources give $4.4 trillion as the cost of war in Iraq, Afghanistan, and Pakistan between 2001 and 2014. See, *Costs of War*, http://costsofwar.org/article/economic-cost-summary .

[17] See, Historical Statistics of the United States; *Bureau of Economic Analysis.*

[18] See Kallianiotis [11].

The national debt had reached 122% of the GDP,[19] the highest percentage since World War II. The debt seems that will continue to grow because the budget deficits are increasing (it is over $1 trillion every year since 2009), due to the policy-makers decisions about low taxes for businesses and wealthy individuals and high spending, for the wars, bail-outs of private corporations, and other government inefficiencies. Also, the aging of the baby-boom generation is increasing the share of the population receiving benefits from Social Security, Medicare, and Medicaid, which are unfunded contingent liabilities.[20] The Social Security is an "off-budget" item, but by introducing it as an "on-budget" one, as it must be correctly treated (and the other entitlements, too), would have enormous implications for the size of the national debt, which becomes $138.75 trillion (870.45% of the GDP), and its risk for the government.

Interest charges[21] are like a strongly "regressive tax" that the poor pay to the rich (banks and usurers). The poorer pays higher "tax rates" (high risk premium) because of his higher credit risk. The risk premium in the U.S. on credit cards is up to the unfair and unethical rate of 40%.[22] Thus, there is a redistribution of wealth from the poor (Main Street) to banks (Wall Street). Governments have to intervene and put a cup on the interest rate (i.e., 5% above the prime rate) and to regulate the greediness of the market. With our current interest payments on debts, the majority of the people will declare bankruptcy at least once.

Lately, there is a dollar crisis in the world,[23] due to the enormous level of the U.S. deficits and debt:[24] [Federal Debt=$17.623 trillion, Social Security Liability=$20.5 trillion, Medicare and

[19] The U.S. national debt was $16.359 trillion and the real GDP $13.653 trillion at the end of the 3rd quarter of 2012 (120% of the GDP). (*Economagic.com*). In July 2014, the ND was $17.623 trillion and the GDP $15.824 (2014Q1), which is 111.37% of the GDP.

[20] Un-funded Social Security contingent liabilities (estimated) = $20.5 trillion, Un-funded Medicare contingent liabilities = $85.6 trillion, and Un-funded Medicaid contingent liabilities = $8.4 trillion. A total of $114.5 trillion (838.6% of the GDP) in 2011. See, http://grandfather-economic-report.com/debt-summary-table.htm

[21] Interest is an old cost of capital; even, it is mentioned in the Bible. "Then you ought to have invested my money with the bankers, and on my return I would have received what was my own with interest." (Matthew 25: 27).

[22] Asking the following question: **Is the Risk Premium on our credit cards justifiable?** To my MBA students, I received the next answer from one of the students: "This is my ethical perspective on Risk Premium on credit cards. While pursuing my undergraduate degree, I worked for one of the most corrupt credit card companies. It is a sub-prime credit card company that preyed on vulnerable people with bad or no credit. The card would be sent out to consumers with $198 in processing fees with a $250 credit line. People did not read the small printed brochures and people would just activate these cards. People would use these credit cards and not realize that they only had $52 to spend. At that point the card would be maxed out and the company began charging over limit fees of $30 and an interest rate of 29.99%. Soon this was followed by $35 late fees. I do not believe that a high Risk Premium is **morally** justifiable. I was the representative on the other end of the phone who listened to story after story. For example, an elderly person who purchased a prescription because he/she needed it; a young mother who put gas in her car; a disabled person who did not understand how the credit card worked. These were vulnerable people who were taken advantage of by a greedy, avaricious company. This credit card company did more than mitigate their risks. The company preyed on poor, uneducated people. As a side note, the owner of this company last year received an award for philanthropist of the year. This puts a real spin on what Americans views as value. This is an ethical/moral perspective on the horrors of unchecked free market capitalism." [K. L. (FIN 508) Summer 2013]. The corruption in the unregulated financial markets and institutions (banks) is beyond any imagination. They do not destroy only individuals, but entire nations, as the following article reveals. http://www.hellasontheweb.org/2010-04-05-22-45-08/2010-04-06-18-59-32/12657-2012-09-30-18-43-50

[23] Even U.S. firms are conducting a record amount of business in Chinese yuan, looking to benefit from cost advantages over dollar transactions. The U.S. recently passed Taiwan to become the fourth-largest hub for trade in the yuan outside mainland China, after Hong Kong, Singapore, and the U.K., according to SWIFT. (*The Wall Street Journal*, July 10, 2014, pp. A1 and A6).

[24] These global debt crises and bubbles in almost every market are becoming cleverly and skilfully "political crises", like Iraq, Afghanistan, Syria, Ukraine, etc. "The Ukraine crisis sparked a global stock selloff and drove up oil, gold and wheat prices. U.S. stocks fell. The DJIA slid 153.68 to 16,168.03 on March 3, 2014". (*The Wall Street*

Medicaid Contingent Liabilities=$98 trillion, State and Local Governments=$5.71 trillion, Business Sector Debt=$11.63 trillion, Financial Sector Debt=$13.6 trillion, Total Personal Debt=$13.22 trillion, Financial Sector Bail-out=$2.5 trillion, Other Debts=$2.74 trillion: Total Debt (Public and Private)= $185.523 trillion].[25] The GDP (2014Q1) was $15.824 trillion. Then, the total debt is 1,172.24% of the GDP.[26] The Federal Reserve Bank tries to keep the interest rate low (quantitative easing) to affect positively the financial markets, but this policy did not help so much the real economy because we have reached a liquidity trap. This Fed's policy is only pro-market and not pro-social. Thus, the social benefits of this zero target rate monetary policy, are insignificant. Also, this policy of enormous liquidity caused new bubbles in the financial market and in the housing market and finally, it will induce inflation,[27] when the unemployment will reach the natural level. The U.S. dollar has declined from its pick point USXRI=138 (1985:M03) until now USXRI=76 (2014:M07) by more than -45% with respect the major currencies. With respect to the euro, the dollar has declined from 0.8530 $/€ (2001:M06) to 1.6001 $/€ (2008:M04), which was -87.76%. Now (7/28/2014), it is 1.3437 $/€, a loss of -57.53% since its pick value. Except the ineffectiveness of the monetary, fiscal, and trade policy, the foreign policy is even less effective and without any benefit for the Americans.

The literature on this subject is extensive, but a small representation is the following. Allen and Gale [1] are analyzing the financial crises. Ramsey [26] and Mirrlees and Diamond [23, 24] discuss the optimal tax policy. Mankiw, Weinzierl, and Yagan [21] explore the interplay between tax theory and tax policy. Krugman [18] recommends high taxes for the rich. Given [8] gives four principles of optimal taxation to facilitate prosperity. McGranahan and Nohel [22] examine the reaction of corporations and individuals to minimize the tax burden of the ATRA of 2012. Saving [27] says that the deficit has declined, but the debt is going up and it will fall on the future generations. Kallianiotis [11] discusses the optimal taxation and compares it with the current tax system. Kallianiotis [12] shows that reduction in taxes and increase in government spending are necessary policies for the U.S. and the Euro-zone to improve currently their economies. Heathcote, Storesletten, and Violante [9] develop a model and discuss the parameters that influence the degree of optimal tax progressivity. Stiglitz [29] gives an excellent presentation of the economics of the entire public sector.

A THEORETICAL MODEL

Historically, consumption was always a function of income, which is a risk-free prudent human behavior, as follows,

$$C_t = f(Y_t) \qquad (1)$$ *where,* C_t *= consumption and* Y_t *= income.*

Journal, March 4, 2014, pp. A1 and C1). The West tries to externalize its domestic crises by going against the other nations and especially, against the Orthodox ones (Yugoslavia, Greece, Cyprus, Russia, etc.) because these Orthodox nations do not accept the delusion of the apostate West. Now, Iraq is again back in the picture. (*The Wall Street Journal*, June 12, 2014, p. A1).

[25] Source: U.S. National Debt Clock (7/28/2014) and Grandfather Debt Summary (1/1/2012).

[26] Thus, for the beginning of 2012, the Social Distress Index (SDI) for the U.S. was: $SDI = u + \pi + d = 8.3\% + 3.58\% + 1{,}350.03\% = 1{,}361.91\%$; for the end of March 2013, the SDI was: $SDI = u + \pi + d = 7.6\% + 3.12\% + 1{,}343.1\% = 1{,}353.82\%$; and for the March of 2014 became: $SDI = u + \pi + d = 6.6\% + 1.6\% + 1{,}163.5\% = 1{,}171.7\%$, which show that the country was improving a little, but now (July 2014), it became: $SDI = u + \pi + d = 6.10\% + 4.30\% + 1{,}172.24\% = 1{,}182.64\%$, which show that we are going backwards again. The global economy is still extremely distressful (risky). See, Kallianiotis [14] for this index. The U.S. needs 12 years to pay off its debt, if all the other spending would be zero. Then, it is impossible! Thus, the U.S. debt is unsustainable.

[27] The inflation rate in the month of July 2011 was, $\pi = 6.22\%$ per annum. (*Economagic.com*). Now (May 2014), it is 4.30% p.a. But, many independent researchers assess inflation and unemployment rates as double digit figures.

But, the last years of delusion and pseudo-prosperity, the current consumption has become a function of the present value of the expected life wealth; a very risky process, which has increased the risk premium and the interest rate (cost of borrowing money), because this consumption depends on the present value (PV) of unearned income. Actually, the consumption is taking place by borrowing. Of course, an increase in the current wealth (value of real estate + value of financial assets + value of other assets) affects consumption and we can see the "wealth effect" in our economy. But this wealth belongs mostly to the rich people and does not have any effect on their consumption and on our aggregate demand, production, growth, and employment because already it is their maximum consumption. The rich are becoming richer and the middle class poorer and the economy has no benefits from this wealth effect of the wealthy.[28] Thus,

$$C_t = f[E(W_t)] \qquad (2)$$

where, $E(W_t)$ = present value of the expected wealth in period t.

Our current consumption exceeds the current income ($C_t > Y_t$) and we borrow an amount from financial institutions, which is equal or less than the present value of our life wealth (the future income). The consumption of individuals can be functions of the variables,

$$\begin{aligned} &C_t = f[Y_t, u_t, E(W_t), L_t, \pi_t, DP_t, i_t, I_t, T_t, t_{MCI}, \sigma_t] \\ &f_Y > 0, f_u < 0, f_{E(W)} > 0, f_L > 0, f_\pi < 0, f_{DP} < 0, f_i < 0, f_I < 0, f_T < 0, f_{t_{MCI}} < 0, f_\sigma < 0 \end{aligned} \qquad (3)$$

where, L_t = loans, u_t = unemployment rate, σ_t = uncertainty, π_t = inflation or prices (CPI) and t_{MCI} = tax rate on middle class individuals, T_t = taxes, DP_t = debt payment (of annuities), i_t = interest (loan's) rate, and I_t = interest payment.

Nations, also, are spending (G) beyond their revenue (T). The budget deficit ($T - G < 0$) is the difference between government revenue (taxes) and government spending. The accumulation of budget deficits makes up the national debt of the country. The higher the debt of a nation, the higher its risk (and the higher the risk premium), the higher its interest rate, the higher its interest payments, the higher the government spending, and the effects of all these are its accumulation of more debt, which cause a true vicious cycle and increase the probability of the bankruptcy of the nation.

$$D \uparrow \Rightarrow Risk \uparrow \Rightarrow RP \uparrow \Rightarrow i \uparrow \Rightarrow I \uparrow \Rightarrow G \uparrow \Rightarrow D \uparrow \Rightarrow \text{"vicious cycle"} \Rightarrow p_{Bankruptcy} \uparrow$$

where, *D = debt, RP = risk premium, i = interest rate, I = interest cost, G = government spending, and p = probability.*

Today's relatively lower interest rates have lessened the pressure debt service places on the budget, despite the recent increase in the debt held by the public. Of course, interest rate will increase as the economy will recover and the interest payment on debt will increase the budget deficit. Debt accumulation is necessary in some cases, like recessions, where the government

[28] Americans' wealth hit a record $81.8 trillion in the first quarter of 2014 amid a rise in home values and stock prices. See, *The Wall Street Journal*, June 6, 2014, pp. A1 and A2.

rely on public debt to finance infrastructure (roads, bridges, etc.) and promote growth and employment. These public capital (investment) contribute to private sector investment, productivity, output, employment, and economic recovery.

These effects of public capital on the economic recovery can be tested by the equations,

$$PI_t = f(PK_t, ADF_t) \quad (4)$$

or

$$\Pr_t = f(PK_t, ADF_t) \quad (5)$$

or

$$Q_t = f(PK_t, ADF_t) \quad (6)$$

where, PI_t = *private investment,* PK_t = *public capital,* $\Pr_t$ = *productivity,* Q_t = *output (production), and* ADF_t = *aggregate demand factors.*

Further, taxes are the sums of a variety of different components of direct and indirect taxes (i.e., sale tax, etc.),[29]

$$T_t = T_{FG_t} + T_{SG_t} + T_{LG_t} + T_{P_t} + T_{M\&SS_t} + T_{PPC_t} \quad (7)$$

where, T_t = *total taxes,* T_{FG_t} = *federal government tax,* T_{SG_t} = *state government tax,* T_{LG_t} = *local government tax,* T_{P_t} = *property tax,* $T_{M\&SS_t}$ = *Medicare and social security "tax" contribution, and* T_{PPC_t} = *private pension contribution.*

The tax (government revenue) function can be written as follows,

$$T_t = f(Y_{MCI_t}, Y_{WI_t}, Y_{C_t}, t_{MCI}, t_{WI}, t_C, t, GS_t, G_t, BD_t, ND_t)$$
$$f_{Y_{MCI}} > 0, f_{Y_{WI}} > 0, f_{Y_C} > 0, f_{t_{MCI}} > 0, f_{t_{WI}} > 0, f_{t_C} > 0, f_t > 0, f_{GS} < 0, f_G > 0, f_{BD} > 0, f_{ND} > 0 \quad (8)$$

where, Y_{MCI_t} = income of middle class individuals ($30,000-$150,000 per annum), Y_{WI_t} = income of wealthy individuals (over $150,000 per annum), Y_{C_t} = income of corporations (businesses), t_{MCI} = tax rate of middle class individuals, t_{WI} = tax rate of wealthy individuals, t_C = tax rate of corporations, t = tariff (import tax), GS_t = government subsidies (tax exemptions, tax savings, tax reductions, and bail outs), G_t = government spending, BD_t = budget deficit, and ND_t = national debt.[30]

Undoubtedly, the optimal tax is the tax that balances the government budget or generates a surplus during periods of growth and generates a deficit during periods of recession. But, in

[29] Taxes are reducing the welfare, due to losses to buyers and sellers from a tax that exceeds the revenue raised by the government; the deadweight loss (reduction in consumer and producer surplus). The greater the elasticities of supply and demand, the greater the deadweight loss of a tax. Consequently, our demand for any product or service must be relatively elastic ($|\varepsilon| > 1$). See, Mankiw [20].

[30] See, http://en.wikipedia.org/wiki/National_debt_of_the_United_States and http://www.treasurydirect.gov/govt/reports/pd/mspd/mspd.htm

both economic conditions the social welfare is maximized. The bliss point is reached, as it is shown in Kallianiotis [11].

Boom: $GB_t = T_t - G_t \geq 0$

$$\Rightarrow \quad \max \quad U_t = f(u_t^A, u_t^B, \ldots u_t^N) \tag{9}$$

Recession: $GB_t = T_t - G_t < 0$

where, GB_t = *government budget,* U_t = *social welfare function, and* $u_t^A, u_t^B, \ldots u_t^N$ = *utility of individual A, B, and N.*

Furthermore, interest payments comprise the following components,

$$I_t = I_{SL_t} + I_{AL_t} + I_{M_t} + I_{CC_t} + I_{HEL_t} \tag{10}$$

where, I_t = *total interest payment,* I_{SL_t} = *interest on student loan,* I_{AL_t} = *interest on auto loan,* I_{M_t} = *interest on mortgage,* I_{CC_t} = *interest on credit cards, and* I_{HEL_t} = *interest on home equity loans.*

The loans of individuals can be functions of the following variables:

$$\begin{aligned} &L_t = f(Y_t, u_t, C_t, T_t, i_t, \sigma_t) \\ &f_Y < 0, f_u > 0, f_C > 0, f_T > 0, f_i < 0, f_\sigma < 0 \end{aligned} \tag{11}$$

where, L_t = loans, u_t = unemployment rate, and σ_t = uncertainty.

In addition, the interest rate on loans (i_L) depends on the followings:

$$\begin{aligned} &i_{L_t} = f(i_{FF_t}, i_{P_t}, i_{L_t}^*, Y_{B_t}, \pi_t^e, \sigma_t) \\ &f_{i_{FF}} > 0, f_{i_P} > 0, f_{i_L^*} > 0, f_{Y_B} < 0, f_{\pi^e} > 0, f_\sigma > 0 \end{aligned} \tag{12}$$

where, i_{FF_t} = *federal funds rate (monetary policy instrument),* i_{P_t} = *prime rate,* $i_{L_t}^*$ = *interest rate ceiling (*$i_{P_t} + 5\%$*),* Y_{B_t} = *income of borrower,* π_t^e = *expected inflation, and* σ_t = *risk (uncertainty) of the borrower.*

Finally, the interest on deposits (i_D) depends on the variables:

$$\begin{aligned} &i_{D_t} = f(i_{FF_t}, i_{P_t}, i_{D_t}^*, \pi_t^e, \sigma_t) \\ &f_{i_{FF}} > 0, f_{i_P} > 0, f_{i_D^*} > 0, f_{\pi^e} > 0, f_\sigma > 0 \end{aligned} \tag{13}$$

where, $i_{D_t}^*$ = *interest rate floor (*$\pi_t^e + 1\%$*).*

EMPERICAL RESULTS

It is important to test the above equations by applying data from the U.S. economy. The data, taken from *economagic.com*, *Yahoo.com*, and *Bloomberg.com* are monthly from 1959:01 to 2013:12. They comprise, consumption (USPCE), personal income (USPI), money supply (USM2), Dow Jones Industrial Average (USDJIA), wealth (USW=M2+USDJIA), U.S. wages and salaries (USWS), corporate income-profit (USCYP), U.S. personal current taxes (USPCTR), taxes on corporations-on production and imports (USTPI), custom duties on production and imports (USCDTPI), government subsidies (USGS), government spending-current expenditures (USGCE), budget deficit (USBD), national debt (USND), loans or consumer credit outstanding (USCCO), unemployment rate (USU), taxes or U.S. government current tax receipts (USGCTR), federal funds rate (USFFR), prime rate (USPR), interest rate or corporate bonds rate (BAA), LIBOR 3-month rate (LIBOR3M), 3-monthe U.S. T-Bill rate (STT3M), TED rate for measuring the uncertainty (=LIBOR3M-STT3M), gold prices (GOLD) for measuring again uncertainty, consumer price index (USCPI), private investment (USIM), public capital (USPK), labor productivity (USLPR), and Gross Domestic Product-output (USGDP).

First, the correlation coefficients and a Granger causality test between all these variables are presented in Tables 1 and 2. We see a very high positive correlation between personal consumption expenditure and wealth, money supply, personal income, borrowing (loans), taxes, national debt, investment, public capital, GDP, wages and salaries, corporate taxes, government spending, CPI, government subsidies, custom duties, corporate income, price of gold (risk), and DJIA. Also, a negative correlation between personal consumption and interest rates (BAA, LIBOR3M, STT3M, USFFR, USPR) and budget deficit. This consumption expenditures are caused by wealth ($+16.420^{***}$), money supply ($+3.014^{**}$), DJIA ($+16.850^{***}$), personal income ($+29.477^{***}$), borrowing ($+2.405^{*}$), tax receipts ($+15.868^{***}$), bonds' rate-BAA (-11.957^{***}), 3-month T-bill rate (-11.104^{***}), TED rate ($+8.118^{***}$), national debt ($+23.643^{***}$), prime rate (-8.286^{***}), private investment ($+13.400^{***}$), public capital ($+11.018^{***}$), labor productivity (-4.089^{**}), GDP ($+27.211^{***}$), federal funds rate (-10.174^{***}), wages and salaries ($+21.770^{***}$), corporate income ($+4.134^{**}$), personal current taxes ($+9.709^{***}$), custom duties ($+17.692^{***}$), government current expenditures ($+15.270^{***}$), and consumer price index ($+10.348^{***}$). Tables 3 and 4 present the results from the regressions of eqs. (1), (2), and (3).

Then, we examine the public capital (government investment) on the different variables. It has a high positive correlation with personal consumption, investment, wealth, money supply, personal income, borrowing, current taxes, price of gold (risk), national debt, GDP, wages and salaries, corporate income, taxes on production and imports, custom duties, government subsidies, government spending, and consumer price index. It has a negative correlation with interest rates and budget deficit. The public capital causes personal consumption ($+11.018^{***}$), money supply ($+29.420^{***}$), DJIA ($+2.389^{*}$), personal income ($+8.865^{***}$), borrowing ($+2.661^{*}$), price of gold-uncertainty ($+5.023^{***}$), national debt ($+14.050^{***}$), GDP ($+7.662^{***}$), and government subsidies ($+6.229^{***}$). Table 5 shows that public capital affects positively output (production) and labor productivity, but the effect on private investment is negative (competition between public and private investment).

Further, taxes (U.S. government current tax receipts) are highly and positively correlated with price of gold, national debt, private investment, public capital, GDP, wages and salaries, corporate income, personal current taxes, taxes on production and income, custom duties, government subsidies, government consumption expenditures, and CPI. Also, negatively correlated with interest rates, labor productivity, and budget deficit. Taxes are caused by personal consumption expenditures ($+15.868^{***}$), wealth ($+2.669^{*}$), money supply ($+40.965^{***}$), personal income ($+9.067^{***}$), borrowing ($+6.311^{***}$), unemployment rate ($+8.094^{***}$), BAA (-

3.268**), 3-month T-bill rate (-6.459***), national debt (+3.840***), DJIA (+3.502***), LIBOR-3 month (-2.489*), TED rate (+7.814***), prime rate (-3.621**), investment (+3.183**), federal funds rate (-4.441**), corporate income (+3.614**), personal current taxes (+7.720***), custom duties (+4.926***), government consumption expenditures (+10.162***), and budget deficit (-10.163***). Table 6 shows the estimation of eq. (8). Wages and salaries have a significant positive effect on taxes; also, corporate income, personal income taxes, tariffs, government expenditures, and national debt. Corporate taxes have a significant negative effect on taxes.

Furthermore, loans (consumer credit outstanding) are highly correlated with personal consumption, wealth, money supply, DJIA, personal income taxes, price of gold (uncertainty), national debt, private investment, public capital, GDP, wages and salaries, corporate income, personal income taxes, corporate taxes, custom duties, government subsidies, government consumption expenditures, and consumer price index. Loans are negatively correlated with interest rates (BAA, LIBOR3M, STT3M, USFFR, USPR), and budget deficit. Loans are caused by personal consumption (+3.845**), personal income (+3.273**), unemployment rate (+3.163**), taxes (+6.311***), private investment (+8.967***), public capital (+2.661*), GDP (+4.678***), wages and salaries (+3.932**), corporate income (+11.245***), personal income taxes (+4.524**), corporate taxes (+2.782*), custom duties (+3.573**), government subsidies (+5.877***), and budget deficit (+6.370***). Table 7 gives the results from the estimation of eq. (11). Income and consumption have significant positive effect on loans. Unemployment rate and uncertainty have negative effect on loans.

Lastly, the interest rate on loans (BAA) is positively correlated with LIBOR3M, STT3M, TED, USFFR, USPR, and U.S. budget deficit. The interest rate on loans in negatively correlated with personal consumption, wealth, money supply, DJIA, personal income, borrowing, unemployment rate, government tax receipts, price of gold (risk), national debt, investment, public capital, GDP, wages and salaries, corporate income, personal taxes, corporate taxes, custom duties, government subsidies, government consumption expenditures, and CPI. The interest rate on loans is caused by personal consumption (-4.400**), wealth (-5.358***), DJIA (-6.540***), unemployment rate (-4.632**), current tax receipts (-3.268**), LIBOR3M (+7.809***), TED (+6.597***), price of gold (-2.673*), prime rate (+8.254***), federal funds rate (+11.606***), budget deficit (+6.518***), and consumer price index (-15.928***). Table 8 presents the results from the estimation of eq. (12). Risk (TED) has a significant positive effect on interest rate (BAA) and price (CPI) has a significant negative effect (a paradox; something suspicious is going on with the measurement of CPI).

SOCIAL IMPLICATIONS OF HIGH DEBT, INTEREST PAYMENTS, AND TAXES

High debts, which are encouraged by a wrong tax system, enormous spending, inefficiencies, and a pseudo-affluent society, increase the interest payments on them, increase the risk and consequently the risk premium and contribute to further increase on debts. Then, taxes have to go up to cover the deficits and reduce the debts. But these high taxes (redistribution of wealth from the private sector to the government) reduce the disposable income and then, consumption, saving, and aggregate demand, are falling, which affect negatively production, growth, income, employment, and social welfare. Thus, debts are disastrous for individuals and nations, but are relatively good for businesses because their interest payments on debts are tax deductible [tax payers, citizens subsidize businesses' interest payments (cost of debt)], which is unfair and unethical. The Appendix gives some hypothetical examples of three different levels of income, taxes, interest payments, consumption, and saving. In U.S., due to high taxes, debts, and cost of capital, the middle class is in extinction. Households with annual income less than $150,000 are just surviving with enormous anxiety because of this uncertain future that

they face and it is becoming worse daily. The bad thing for them is that they cannot protest this way of life, which has been imposed on them.

Thus, high government debt increases the interest expenses,[31] the risk, the risk premium, and the probability of default of the government, and then, taxes[32] have to go up to cover this enormous debt.[33] Of course, the government can smooth the negative effects of a bad economic shock by borrowing in bad times and paying back during good times, rather than having to increase taxes in an already depressed economy and make the recession deeper.[34] But, Congress and IMF have different view, the anti-social (neoliberal) one.

A budget deficit just pushes the cost of government spending onto a future generation of taxpayers, who will inherit a government with greater debts. But, by reducing the unwanted national defense expenditures the budget deficit will decline drastically and this spending can go for Social Security, Medicare, Medicaid, Health, and Education. People during their working years must save a relatively large proportion of their disposable income, but the interest rate (the incentive to save) must be higher than the expected inflation rate ($i_S > \pi^e$) and the real saving rate positive ($r_S > 0$). Taxes on individuals must be lower, which will increase disposable income, consumption, and saving. Taxes must increase for businesses and monetary policy with zero federal funds rate ($i_{FF} \cong 0$) must be abandoned because affect positively businesses and markets; people are paying interest on their savings instead of receiving interest. The current monetary policy is against people's interest and their future well-being.

Debt for individuals and households is also bad because they have high risk and pay high interest payments on these debts (which are a large proportion of their income). High debt means high monthly payments on this debt and lower available income for consumption and saving. This reduces the demand for goods and services, reduces the production, output and growth of the GDP, which causes high unemployment and lower social welfare for the country.

In addition, equity is determined by assessing an individual's ability-to-pay (his income and his necessary expenditures). Horizontal equity consists of the idea that two individuals with the same ability-to-pay (income) should be taxed equally. But, one of these individuals is single and the other is married with many children and thus, charging these two people with the same tax does not correctly reflect their ability-to-pay. Different societies are applying different tax principles for the same situation, based on their value systems, their objectives, and their philosophy in life. Vertical equity states that the government should implement higher taxes on those, who have higher ability-to-pay than those who have a lower ability-to-pay (income). Governments have to determine an appropriate increase in taxation for those with a greater ability-to-pay. But, because of the complexity of the current tax policies, those who have greater income and greater ability-to-pay are also able to avoid paying taxes in ways

[31] Now, due to the low interest rates, the interest burden of the debt is only 1.3% of the GDP. See, http://www.cepr.net/index.php/blogs/cepr-blog/the-devasting-interest-burden-of-the-debt/print. Also, for the debts and their costs overtime, see, http://www.usgovernmentspending.com/usgs_brief_print.php?type=d&brief=past

[32] See, http://www.nber.org/papers/w13745.pdf

[33] See, Richard Rubin, "Obama Seeks $100 Billion in New Taxes on Multinationals", *Bloomberg.com,* March 4, 2014. http://www.bloomberg.com/news/2014-03-04/obama-seeks-100-billion-in-new-taxes-on-multinationals.html

[34] This was exactly the policy of the Troika in Euro-zone; it increased taxes and reduced spending (austerities) and the countries experienced a 60% unemployment, loss of the citizens homes, and thousands of suicides. This policy is very suspicious and it is a big surprise its acceptance by the leaders (followers) of these nations, who signed the memoranda. See, Kallianiotis [12].

that those in the lower brackets cannot do it. What is needed is the creation and the implementation of a fair tax code, with which those of higher income should pay more in taxes.

Also, it is unethical to have low corporate income taxes today, and therefore low government revenue and high debts now, because it inevitably puts the burden of responsibility to pay for the current expenditures on future generations. The questions are, here. How should the burden of taxes be divided among the population (physical persons) and corporations (legal persons)? How do we evaluate whether a tax system is fair? A nation's productive capability is determined by the disposable income of the middle class and by how much it saves and invests for the future. Corporations have been established to improve the social welfare and not to exploit the citizens of the country. Policymakers should reform the tax laws to increase disposable income and to encourage greater saving and investment.

Consequently, the current economic system has created a Vicious Cycle and it is impossible from a middle class individual to recover. The taxes and the interest (cost of the enormous debt) are very high, the real wages and salaries are low; then, disposable income is low, consumption and savings are low, aggregate demand is low and affects the aggregate supply (low production), which reduces the revenue of our firms. In this case, they have to reduce the labor cost (reduction in wages and layoffs) to increase their profit (firms' objective). Then, income is falling and unemployment is increasing. The government revenue (taxes) are falling and the government has to increase the tax rates to cover the government expenditures and the national debt is going up and the cycle continuous. Also, the interest rate will increase and will crowd out private investment and consumption.[35] Higher marginal tax rates discourage work effort, reduces disposable income, and affect negatively private savings and reduces output. All these affect negatively the social welfare of the nation. Thus, the sovereign nation and the democratic system is in trouble from this extreme (anti-American) capitalism.

CONCLUDING REMARKS

The conclusion is that debts are disastrous for the entire society (individuals, businesses, banks, and governments) and their cost (interest) is enormous for the borrower. Then, the question is: why we have so high debt and who is encouraging it? The optimal amount of debt is zero, if the tax system is right and fair. Fiscal crises can occur when debt levels become so large relative to the economy's output that the government has difficulty selling it in the financial market. The same must hold for business, too. Then, interest on business debt cannot be tax deductible because this is a wrong incentive for debt financing. Individuals (poor tax payers) cannot finance businesses' interest payments and at the same time, they operate, produce, and generate employment in other countries (MNCs operate abroad, "outsourcing") because it is unfair and unethical. The government has to put some import restrictions (quantitative and qualitative) to protect the domestic industries and their workers. The tax system has to change. Government efficiency has to increase, which will reduce the cost (government spending) and curtail the need for high taxes and high deficits and debts. Governments cannot consume future generations' income and wealth. Households have to spend their current income and not their uncertain future income. The risk is very high, especially, during periods of recessions and high unemployment, where the individual is unemployed and cannot pay his monthly payments on debt; he will go bankrupt and his house will be foreclosed. His family will be destroyed. Banks, the financial markets, and all

[35] When the government runs persistent deficits and taxes are increasing, disposable income is falling, so consumption and savings are falling, too; a growing portion of this low consumers' savings is devoted to purchase government securities rather than private sector's goods and securities ("crowding out" of investment).

businesses have to be regulated for their own benefits and the benefits of the entire nation. Countries have to protect their individuals, businesses, and markets. The objective and priority of every nation must be its independence (self-sufficiency) and sovereignty and then, the social welfare and the interest of its citizens.

The tax system must satisfy two objectives: Efficiency and equity. The deadweight loss of a tax is the reduction in economic well-being of taxpayers in excess of the amount of revenue raised by the government. The deadweight loss is the inefficiency that a tax creates as people allocate resources according to the tax incentive rather than the true costs and benefits of the goods and services that they buy and sell. Income taxes are fair for people, but consumption tax is very unfair, it falls on poor people. Wealthy people hire tax lawyers and accountants to help them with their taxes. These experts in the complex tax laws fill out the tax forms for their clients and help clients arrange their affairs in a way that reduces the amount of taxes owed. This unethical and unfair behavior is legal tax avoidance, which is similar to the illegal tax evasion. This help by advisers to their clients to avoid taxes is a criminal act against the poor tax payers; the debt is going up and it is unfair for the future generations that will have to pay the taxes. These loopholes have to be corrected. Property taxes is another proof that capitalism is also against private ownership, as it was communism, but people get rid of it. The complexity of the tax law results from the political process, as various taxpayers with their own special interests lobby for their causes. The system is completely unfair because the average tax rate (ATR) of these wealthy people is very low, today, compared to the past, but the ATR for the middle class is increasing.[36] We may see higher taxes, crowding out private investment, and lower growth of the economy, higher unemployment, and lower standard of living for the future generations. Deficits can be corrected by cutting spending (military expenditures) and raising taxes (corporate taxes). The U.S. growth for the first quarter of 2014 was -2.93%,[37] which means that the economy has not recovered yet and tax revenue will be relatively low. We hope that the tax rates for the middle class will stay the same.

Finally, in the short run, deficits are beneficial because governments can lessen the effects of recessions or negative shocks (wars and natural disasters). But, these benefits can be reversed in the long run, due to the cost associated with persistent deficits and high level of debt that increase the risk and the interest rate. The government can run a deficit in recessions, but must have surpluses (saving) during booms. Some policymakers and legislators have proposed fiscal rules and balanced budget amendments to overcome the negative effects of long run deficits; but, these rules imposed constitutional restrictions on the levels of spending, deficits, and debt of governments, which reduces its ability to use fiscal policy to correct the business cycle.[38] Politicians, due to political frictions, prefer to finance their additional spending in part by deficits, which are less politically costly than increasing taxes. We hope, all these past mistakes to teach us one important lesson: Moderation, social welfare, and perfection must be the ultimate objectives of any democratic nation.

[36] The average tax rate measures the fraction of income paid in taxes. Average tax rate: Total taxes paid divided by total income. Marginal tax rate: The extra taxes paid on an additional dollar of income. See, http://en.wikipedia.org/wiki/Income_tax_in_the_United_States

[37] See, *Economagic.com*. Also, Kliesen [17].

[38] The United States Constitution does not require Congress to pass a balanced budget every year. This implies that projected government revenue (T) does not need to be equal with the amount proposed to be spent (G). Under federal law, the amount that the government can borrow is limited by a debt ceiling, which can only be increased with a vote by a super-majority in Congress.

References

[1] Allen, Franklin and Douglas Gale (2009), *Understanding Financial Crises*, Clarendon Lecture in Finance, New York, N.Y.: Oxford University Press.

[2] Aschauer, David (1989), "Is Public Spending Productive", *Journal of Monetary Economics*, 23, pp. 177-200.

[3] Azzimonti, Marina (2013), "The Political Economy of Balance Budget Amendments", *Business Review*, Federal Reserve Bank of Philadelphia, First Quarter, pp. 11-20.

[4] Caron, Paul (2014), "Krugman and Mankiw Optimal Tax Theory, Economic Models, and Civility", *TaxProfBlog*, March 29, 2014. http://taxprof.typepad.com/taxprof_blog/2014/03/krugman-mankiw.html

[5] Cheremukhin, Anton (2014), "Middle-Skill Jobs Lost in U.S. Labor Market Polarization", *Economic Letter*, Dallas Fed, Vol. 9, No. 5, May, pp. 1-4.

[6] Feldstein, Martin (2008), "Effects of Taxes on Economic Behavior", *NBER* (13745).

[7] Gentry, William M. "Optimal taxation", http://www.urban.org/uploadedPDF/1000539.pdf

[8] Given, Casey (2013), "AFP's Four Principles of Optimal Taxation", March 5, 2013.

http://americansforprosperity.org/legislativealerts/afps-four-principles-of-optimal-taxation

[9] Healhcote, Jonathan, Kjetil Storesletten, Giovanni L. Violante (1014), "Optimal Tax Progressivity: An Analytical Framework", Research Department Staff Report 496, Federal Reserve Bank of Minneapolis, January, pp. 1-75.

[10] Holcombe, Randall (2006), *Public Sector Economics: The Role of Government in the American Economy*, New Jersey: Pearson.

[11] Kallianiotis, I.N. (2014a), "The Optimal Taxation and the Current Tax System", Unpublished manuscript, *University of Scranton*, July, pages 24.

[12] Kallianiotis, I.N. (2014b), "Fed and ECB with Dollar and Euro as International Currency Reserves: Some Socio-Politico-Economic Considerations", *Journal of Business and Economics*, Vol. 5, No. 5, May 2014, pp. 605-625.

[13] Kallianiotis, I.N. (2014c), "The Future of the Undervalued U.S. Dollar as an International Currency Reserve", *International Research Journal of Applied Finance,* Vol. V, Issue 3, March 2014, pp. 224-252.

https://irjaf.com/uploads/IRJAF_Vol_V_Issue_3__March_2014_Final.pdf

[14] Kallianiotis, I.N. (2011), "Is the Imposed Global 'Laissez-faire' Socio-economic System Responsible for the Latest Financial Crisis", *Journal of Business and Economics*, Vol. 2, No. 5, May, pp. 325-353.

[15] Kallianiotis, I.N. (1999), "Global Business and Economic Interdependence between the United States and the European Union", in *Interlocking Global Business Systems: The Restructuring of Industries, Economies and Capital Markets*, edited by Edward B. Flowers, Thomas P. Chen, and Jonchi Shyu, Westport, Connecticut and London: Quorum Books, pp. 37-59.

[16] Keynes, John Maynard (1964), *The General Theory of Employment, Interest, and Money*, New York and London: A Harvest/HBJ Book.

[17] Kliesen, Kevin L. (2014), "How Negative Is Negative Real GDP Growth?", *Economic Synopses*, No. 17, Economic Research, Federal Reserve Bank of St. Louis, July, p. 1.

http://research.stlouisfed.org/publications/es/article/10157

[18] Krugman, Paul (2013), "The Simple Analysis of Soaking the Rich (Wonkish)", *The New York Times*, April 3, 2013. http://krugman.blogs.nytimes.com/2012/04/03/the-simple-analytics-of-soaking-the-rich-wonkish/

[19] Krugman, Paul (2014), "Wealth Over Work", *The New York Times*, March 23, 2014.

http://www.nytimes.com/2014/03/24/opinion/krugman-wealth-over-work.html?_r=1

[20] Mankiw, N. Gregory (2007), *Principles of Economics*, Fourth Edition, Mason, OH: Thomson/South-Western.

[21] Mankiw, Gregory, Matthew Weinzierl, and Danny Yagan (2009), "Optimal Taxation in Theory", *NBER* (15071). Also, *Journal of Economic Perspectives*, 23(4), pp. 147-74. http://scholar.harvard.edu/files/mankiw/files/optimal_taxation_in_theory.pdf

[22] McGranahan, Leslie Tom Nohel (2014), "The Fiscal Cliff and the Dynamics of Income", *Chicago Fed Letter*, The Federal Reserve Bank of Chicago, No. 321, April, pp. 1-4.

[23] Mirrlees, James and Peter Diamond (1971), "Optimal Taxation and Public Production I: Production fficiency", *American Economic Review,* 61, pp. 8–27.

[24] Mirrlees, James; Peter Diamond (1971), "Optimal Taxation and Public Production II: Tax Rules", *American Economic Review*, 61, pp. 261–278.

[25] Musgrave, R.A and P.B. Musgrave (1989), *Public Finance in Theory and Practice*, Fifth Edition, New York: McGraw-Hill Book Company.

[26] Ramsey, Frank (1927), "A Contribution to the Theory of Taxation", *Economic Journal*, 37, March, pp. 47-61.

[27] Saving, Jason (2014), "U.S. Budget Deficits Shrink, but Long-Run Issues Remain", *Economic Letter*, Dallas Fed, Vol. 9, No. 3, March, pp. 1-4.

[28] Slemrod, J. (1990), "Optimal taxation and optimal tax systems", *Journal of Economic Perspectives*, 4(1), p. 158.

[29] Stiglitz, J.E. (2000), *Economics of the Public Sector*, Third Edition, New York/London: W.W. Norton & Company.

URL: http://dx.doi.org/10.14738/abr.24.377

Table 1
Correlation Coefficients

	LUSPCE	LUSW	LUSM2	LUSDJIA	LUSPI	LUSCCO	USU	LUSGCTR	BAA	LIBOR3M	STT3M	TED	LGOLD	LUSND
LUSPCE	1.000													
LUSW	0.913	1.000												
LUSM2	0.991	0.873	1.000											
LUSDJIA	0.742	0.948	0.674	1.000										
LUSPI	0.998	0.919	0.988	0.753	1.000									
LUSCCO	0.995	0.912	0.986	0.745	0.993	1.000								
USU	0.414	0.153	0.524	-0.115	0.402	0.394	1.000							
LUSGCTR	0.964	0.942	0.928	0.825	0.972	0.952	0.223	1.000						
BAA	-0.628	-0.588	-0.609	-0.517	-0.606	-0.615	-0.223	-0.586	1.000					
LIBOR3M	-0.600	-0.433	-0.677	-0.221	-0.577	-0.628	-0.745	-0.385	0.426	1.000				
STT3M	-0.660	-0.492	-0.734	-0.270	-0.643	-0.686	-0.740	-0.461	0.398	0.983	1.000			
TED	0.225	0.240	0.194	0.223	0.259	0.211	-0.142	0.345	0.215	0.248	0.067	1.000		
LGOLD	0.741	0.497	0.777	0.249	0.742	0.701	0.678	0.682	-0.472	-0.457	-0.523	0.278	1.000	
LUSND	0.937	0.810	0.966	0.593	0.939	0.903	0.748	0.876	-0.689	-0.716	-0.757	0.072	0.918	1.000
LUSIM	0.936	0.939	0.894	0.845	0.944	0.931	0.286	0.974	-0.608	-0.440	-0.516	0.341	0.660	0.826
LUSPK	0.990	0.876	0.990	0.682	0.988	0.982	0.598	0.943	-0.651	-0.689	-0.742	0.151	0.822	0.951
LUSLPR	-0.099	-0.035	-0.079	-0.006	-0.103	-0.073	0.016	-0.137	0.097	-0.077	-0.062	-0.102	-0.200	-0.122
LUSGDP	0.998	0.920	0.990	0.752	0.999	0.989	0.541	0.970	-0.690	-0.655	-0.707	0.151	0.799	0.945
LUSWS	0.994	0.949	0.975	0.807	0.996	0.992	0.465	0.980	-0.655	-0.621	-0.676	0.174	0.730	0.909
LUSCYP	0.810	0.714	0.805	0.569	0.797	0.781	0.494	0.775	-0.885	-0.524	-0.519	-0.145	0.760	0.816
USFFR	-0.687	-0.528	-0.759	-0.299	-0.672	-0.697	-0.804	-0.499	0.497	0.988	0.993	0.193	-0.616	-0.739
USPR	-0.682	-0.524	-0.754	-0.296	-0.666	-0.693	-0.800	-0.492	0.504	0.991	0.992	0.213	-0.608	-0.731
LUSPCTR	0.827	0.916	0.769	0.897	0.846	0.823	0.115	0.922	-0.462	-0.257	-0.329	0.352	0.508	0.694
LUSTPI	0.994	0.903	0.984	0.730	0.993	0.985	0.533	0.965	-0.703	-0.643	-0.692	0.137	0.804	0.940
LUSCDTPI	0.887	0.784	0.874	0.626	0.891	0.850	0.474	0.890	-0.709	-0.467	-0.521	0.199	0.864	0.891
LUSGS	0.873	0.844	0.859	0.719	0.871	0.870	0.409	0.863	-0.564	-0.563	-0.595	0.058	0.580	0.794
LUSGCE	0.976	0.848	0.990	0.638	0.976	0.957	0.679	0.919	-0.690	-0.714	-0.760	0.099	0.883	0.981
LUSBD	-0.639	-0.378	-0.726	-0.086	-0.626	-0.611	-0.947	-0.456	0.515	0.844	0.845	0.183	-0.832	-0.797
LUSCPI	0.990	0.887	0.993	0.699	0.991	0.976	0.611	0.949	-0.682	-0.682	-0.734	0.142	0.850	0.967

Table 1 (continued)

	LUSIM	LUSPK	USLPR	LUSGDP	LUSWS	LUSCYP	USFFR	USPR	LUSPCTR	LUSTPI
LUSIM	1.000									
LUSPK	0.908	1.000								
USLPR	-0.132	-0.091	1.000							
LUSGDP	0.941	0.991	-0.106	1.000						
LUSWS	0.958	0.977	-0.092	0.992	1.000					
LUSCYP	0.727	0.795	-0.152	0.817	0.771	1.000				
USFFR	-0.476	-0.715	-0.061	-0.679	-0.643	-0.517	1.000			
USPR	-0.469	-0.709	-0.069	-0.673	-0.637	-0.520	0.999	1.000		
LUSPCTR	0.913	0.775	-0.136	0.828	0.872	0.555	-0.281	-0.271	1.000	
LUSTPI	0.933	0.989	-0.122	0.996	0.985	0.837	-0.665	-0.660	0.816	1.000
LUSCDTPI	0.853	0.880	-0.295	0.898	0.868	0.823	-0.492	-0.483	0.770	0.909
LUSGS	0.819	0.845	-0.015	0.863	0.881	0.618	-0.567	-0.563	0.800	0.857
LUSGCE	0.875	0.989	-0.109	0.981	0.954	0.825	-0.736	-0.730	0.736	0.980
LUSBD	-0.397	-0.706	0.024	-0.645	-0.566	-0.609	0.855	0.853	-0.169	-0.650
LUSCPI	0.914	0.993	-0.118	0.993	0.976	0.813	-0.706	-0.699	0.795	0.989

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Table 1 (continued)

	LUSCDTPI	LUSGS	LUSGCE	LUSBD	LUSCPI
LUSCDTPI	1.000				
LUSGS	0.724	1.000			
LUSGCE	0.900	0.826	1.000		
LUSBD	-0.590	-0.469	-0.770	1.000	
LUSCPI	0.907	0.847	0.994	-0.706	1.000

Note: LUSPCE = ln of personal consumption expenditure, LUSW = ln of wealth (M2+USDJIA), LUSM2 = ln of money supply (M2), LUSDJIA = ln of Dow Jones Industrial Average index, LUSPI = ln of personal income, LUSCCO = loans or consumer credit outstanding, USU = unemployment rate, LUSGCTR = ln of taxes or U.S. government current tax receipts, BAA = interest rate or corporate bonds rate, LIBOR3M = LIBOR 3-month rate, STT3M = 3-monthe U.S. T-Bill rate, TED = TED rate for measuring the uncertainty (=LIBOR3M-STT3M), LGOLD = gold prices (GOLD) for measuring again uncertainty, LUSIM = ln of private investment, LUSPK = ln of public capital, USLPR = labor productivity, LUSGDP = ln of U.S. Gross Domestic Product (output), USFFR = U.S. federal funds rate, LUSWS = ln of U.S. wages and salaries, LUSCYP = ln of corporate income (profit), LUSPCTR = ln of personal current taxes, LUSTPI = ln of taxes on production and imports, LUSCDTPI = ln of custom duties, LUSGS = ln of U.S. government subsidies, LUSGCE = ln of U.S. government current expenditures, LUSBD = ln of U.S. budget deficit, LUSND = ln of U.S. national debt, USPR = U.S. prime rate, and LUSCPI = ln of U.S. consumer price index.
Source: *Economagic.com*

Table 2
Granger Causality Test

	LUSPCE	LUSW	LUSM2	LUSDJIA	LUSPI	LUSCCO	USU	LUSGCTR	BAA	LIBOR3M	STT3M	TED	LGOLD	LUSND	USPR
LUSPCE ⇒	-	2.267**	-	-	9.027***	3.845**	7.564***	11.612***	4.400**	4.835***	4.844***	-	3.757**	7.772***	3.411**
LUSW ⇒	16.420***	-	-	-	8.154***	-	-	-	5.358***	-	4.414**	-	-	-	-
LUSM2 ⇒	3.014**	2.819*	-	-	54.215***	-	-	14.265***	-	6.023***	3.238**	-	3.480**	17.617***	-
LUSDJIA ⇒	16.850***	-	-	-	6.448***	-	-	3.502**	6.540***	-	4.527***	2.897*	-	7.277***	-
LUSPI ⇒	29.477***	-	77.018***	2.899*	-	3.273**	-	-	-	-	4.374**	-	5.871***	18.972***	-
LUSCCO ⇒	2.405*	-	-	-	6.383***	-	14.529***	-	-	-	3.548**	-	3.529**	6.509***	4.483**
USU ⇒	-	3.461**	4.920***	2.836*	2.710*	3.163**	-	8.094***	4.632**	8.503***	9.933***	3.229**	-	6.801***	14.102***
LUSGCTR ⇒	15.868***	2.669*	40.965***	-	9.067***	6.311***	7.822***	-	3.268**	-	6.459***	-	-	9.029***	-
BAA ⇒	11.957***	3.006**	6.312***	3.503**	8.040***	-	6.561***	-	-	3.103**	-	-	-	10.650***	23.340***
LIBOR3M ⇒	-	-	5.167***	-	-	-	5.727***	2.489*	7.809***	-	11.714***	-	2.664*	-	15.011***
STT3M ⇒	11.104***	3.334**	5.469***	3.741**	10.659***	-	4.718***	-	11.820***	41.234***	-	-	-	5.962***	154.535***
TED ⇒	8.118***	2.665*	5.203***	2.857*	2.998*	-	15.101***	7.814***	6.597***	41.234***	11.714***	-	-	-	4.712***
LGOLD ⇒	-	2.712*	-	-	-	-	-	-	2.673*	-	-	-	-	-	-
LUSND ⇒	23.643***	11.661***	39.962***	6.037***	16.127***	-	2.774*	3.840**	-	-	-	-	3.140**	-	-
USPR ⇒	8.286***	2.486*	12.393***	-	9.846***	-	9.816***	3.621**	8.254***	33.156***	22.005***	3.259**	-	5.550***	-

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Table 2 (continued)

	LUSIM	LUSPK	USLPR	LUSGDP	USFFR	LUSWS	LUSCYP	LUSPCTR	LUSTPI	LUSCDTPI	LUSGS	LUSGCE	LUSBD	LUSCPI
LUSPCE ⇒	8.208***	5.470***	-	10.637***	3.307**	14.719***	2.901*	9.863***	19.993***	7.129***	6.284***	3.660**	4.954***	8.611***
LUSW ⇒	3.007**	-	-	7.172***	-	-	2.860*	-	2.481*	-	-	6.699***	5.404***	6.452***
LUSM2 ⇒	4.941***	16.200***	2.482*	58.392***	-	6.680***	9.763***	5.041***	15.402***	3.333**	7.108***	52.607***	-	3.800**
LUSDJIA ⇒	-	-	-	5.347***	-	-	-	-	-	-	-	6.653***	5.514***	10.073***
LUSPI ⇒	6.403***	14.838***	-	5.017***	-	28.348***	4.226**	8.283***	28.242***	4.329**	7.138***	9.777***	4.785***	3.721**
LUSCCO ⇒	9.058***	3.715**	2.507*	5.052***	6.250***	2.932*	2.817*	8.682***	3.855**	-	3.118**	2.728*	7.368***	-
USU ⇒	16.135***	-	-	7.698***	12.859***	-	11.320***	4.198**	-	-	2.386*	5.801***	15.531***	-
LUSGCTR ⇒	4.156**	8.145***	-	-	-	16.798***	-	16.306***	10.851***	3.002**	5.986***	4.441**	-	9.310***
BAA ⇒	-	4.270**	2.839*	3.926**	7.867***	-	9.971***	-	-	-	-	10.341***	2.944*	12.410***
LIBOR3M ⇒	5.172***	3.614**	-	-	4.534**	-	8.921***	-	-	2.638*	-	-	2.518*	2.685*
STT3M ⇒	4.941***	5.880***	2.562*	5.147***	47.626***	-	4.828***	-	-	-	-	9.990***	-	23.402***
TED ⇒	-	3.898**	-	4.723***	3.604**	-	-	-	-	6.113***	-	2.377*	6.753***	8.149***
LGOLD ⇒	-	4.623***	3.526**	2.493*	-	-	-	-	-	6.252***	-	4.199**	-	2.973*
LUSND ⇒	-	4.747***	-	12.380***	2.820*	-	5.255***	-	-	-	3.615**	14.827***	-	16.620***
USPR ⇒	10.161***	5.834***	3.425**	6.030***	4.275**	-	5.534***	4.448**	4.442**	-	-	10.722***	4.397**	25.042***

Table 2 (continued)

	LUSPCE	LUSW	LUSM2	LUSDJIA	LUSPI	LUSCCO	USU	LUSGCTR	BAA	LIBOR3M	STT3M	TED	LGOLD	LUSND	USPR
LUSIM ⇒	13.400***	-	8.514***	-	8.967***	22.108***	8.871***	3.183**	-	4.100**	3.118**	3.233**	-	6.630***	2.877*
LUSPK ⇒	11.018***	-	29.420***	2.389*	8.865***	2.661*	-	-	-	-	-	-	5.023***	14.050***	-
USLPR ⇒	4.089**	-	-	-	-	-	2.645*	-	-	-	-	-	-	-	-
LUSGDP ⇒	27.211***	5.216***	77.237***	2.860*	3.246**	4.678***	-	-	-	3.193**	4.467**	-	6.399***	16.948***	
USFFR ⇒	10.174***	-	8.445***	-	12.629***	-	8.512***	4.441**	11.606***	59.003***	-	3.122**	-	5.969***	150.157***
LUSWS ⇒	21.770***	-	5.978***	-	3.211**	3.932**	-	-	-	4.928***	-	-	3.997**	7.629***	-
LUSCYP ⇒	4.134**	4.150**	4.600***	2.661*	-	11.245***	-	3.614**	-	14.408***	6.333***	-	-	-	4.969***
LUSPCTR ⇒	9.709***	-	22.087***	-	3.220**	4.524**	-	7.720***	-	-	-	-	-	6.032***	-
LUSTPI ⇒	-	3.101**	35.412***	-	-	2.782*	-	-	-	-	-	-	3.682**	9.542***	-
LUSCDTPI ⇒	17.692***	-	11.809***	-	7.527***	3.573**	-	4.926***	-	-	-	-	2.652*	7.154***	-
LUSGS ⇒	-	-	7.047***	2.574*	-	5.877***	-	-	-	-	-	-	2.937*	-	-
LUSGCE ⇒	15.270***	6.113***	86.694***	2.837*	7.214***	-	-	10.162***	-	-	-	-	7.700***	18.251***	-
LUSBD ⇒	-	-	-	-	-	6.370***	16.093***	10.163***	6.518***	-	5.889***	-	3.029**	5.363***	4.624**
LUSCPI ⇒	10.348***	4.995***	2.619*	4.789***	10.362***	-	3.325**	-	15.928***	3.941**	3.395**	-	5.899***	9.108***	3.948**

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Table 2 (continued)

	LUSIM	LUSPK	USLPR	LUSGDP	USFFR	LUSWS	LUSCYP	LUSPCTR	LUSTPI	LUSCDTPI	LUSGS	LUSGCE	LUSBD	LUSCPI
LUSIM ⇒	-	9.436***	2.464*	6.690***	4.271**	7.037***	-	9.397***	-	2.713*	3.443**	2.857*	2.569*	11.384***
LUSPK ⇒	-	-	-	7.662***	-	-	-	-	-	-	6.229***	-	-	-
USLPR ⇒	-	-	-	-	-	-	-	-	2.380*	-	2.504*	-	-	3.696**
LUSGDP ⇒	6.768***	12.864***	-	-	-	20.482***	3.929**	8.408***	21.944***	4.119**	6.696***	9.774***	4.508**	4.306**
USFFR ⇒	5.356***	5.817***	3.139**	6.747***	-	-	5.931***	-	-	-	-	11.453***	4.336**	31.855***
LUSWS ⇒	2.892*	6.857***	-	-	-	-	-	5.817***	16.526***	-	5.403***	-	2.481*	5.078***
LUSCYP ⇒	4.686***	-	-	-	5.801***	-	-	6.894***	-	-	-	5.352***	-	-
LUSPCTR ⇒	-	5.803***	-	-	-	5.137***	-	-	-	-	4.091**	-	11.523***	14.711***
LUSTPI ⇒	2.852*	3.785**	-	-	-	4.649***	3.263**	-	-	-	3.655**	2.993**	2.346*	3.745**
LUSCDTPI ⇒	-	4.971***	-	5.643***	-	2.869*	-	-	-	-	3.451**	-	3.746**	18.790***
LUSGS ⇒	3.805**	-	-	-	-	-	2.851*	-	-	-	-	-	-	-
LUSGCE ⇒	7.527***	10.109***	-	11.743***	-	5.187***	5.422***	7.618***	16.925***	5.773***	7.274***	-	-	8.165***
LUSBD ⇒	-	-	-	-	4.209**	-	10.818***	-	-	-	-	4.441**	-	-
LUSCPI ⇒	-	8.257***	4.059**	6.711**	3.521**	-	4.591**	-	5.377***	-	10.529***	11.099***	-	-

Note: See, Table 1, ⇒ = causes, ***= significant at the 1% level, ** = significant at the 5% level, and * = significant at the 10% level.
Source: See Table 1.

Table 3
Estimates of Consumption: Eqs. (1) and (2)

Variables	C_t	C_t	$\ln C_t$	$\ln C_t$	C_t	C_t	C_t
C	-95.621***	-91.840***	-0.389***	-0.388***	1335.979***	211.978***	436.526***
	(5.621)	(10.421)	(0.006)	(0.011)	(96.616)	(66.728)	(45.718)
Y_t	0.819***	0.818***	-	-	-	-	-
	(0.001)	(0.002)					
$\ln Y_t$	-	-	1.018***	1.018***	-	-	-
			(0.001)	(0.001)			
$USDJIA_t$	-	-	-	-	0.608***	-	-
					(0.015)		
$M2_t$	-	-	-	-	-	1.167***	-
						(0.015)	
USW_t	-	-	-	-	-	-	0.467***
							(0.004)
$MA(1)$	-	0.764***	-	0.728***	1.505***	1.392***	1.391***
		(0.036)		(0.035)	(0.036)	(0.037)	(0.034)
$MA(2)$	-	0.641***	-	0.635***	1.681***	1.862***	1.151***
		(0.046)		(0.043)	(0.059)	(0.062)	(0.046)
$MA(3)$	-	0.819***	-	0.943***	1.513***	2.371***	0.530***
		(0.050)		(0.045)	(0.067)	(0.085)	(0.034)
$MA(4)$	-	0.390***	-	0.500***	1.064***	2.716***	-
		(0.050)		(0.045)	(0.059)	(0.108)	
$MA(5)$	-	0.319***	-	0.358***	0.509***	2.775***	-
		(0.046)		(0.043)	(0.037)	(0.126)	
$MA(6)$	-	0.368***	-	0.430***	-	2.800***	-
		(0.037)		(0.035)		(0.135)	
$MA(12)$	-	-	-	-	-	0.382***	-
						(0.037)	
R^2	0.999	0.999	0.999	0.999	0.995	0.999	0.997
SSR	5209024	1068210	0.314	0.051	39220664	1483989	25767651
F	1024024	707221.2	1843554	1592434	22400.71	271580.7	51385.96
$D-W$	0.239	1.853	0.240	1.831	1.627	1.828	1.502
N	660	660	660	660	660	660	660

Note: See, Tables 1 and 2. Y_t = USPI = U.S. personal income, $USDJIA_t$ = U.S. Dow Jones Industrial Average, $M2_t$ = money supply, USW_t = U.S. wealth ($M_2 + DJIA$), and C_t = personal consumption expenditure.

Source: See, Table 1.

Table 4
Estimates of Consumption: Eq. (3)

Variables	$\ln C_t$	$\ln C_t$	$\ln C_t$	$\ln C_t$	$\ln C_t$	$\ln C_t$
C	-1.287***	-1.732***	-0.856***	-0.845***	-1.163***	-0.836***
	(0.094)	(0.105)	(0.049)	(0.065)	(0.090)	(0.049)
$\ln Y_t$	0.600***	0.242***	0.766***	0.970***	0.437***	0.714***
	(0.070)	(0.061)	(0.028)	(0.052)	(0.064)	(0.020)
u_t	0.002	0.002	-	-0.003***	-0.001	-
	(0.001)	(0.001)		(0.001)	(0.001)	
$\ln W_t$	-0.021*	0.017	-0.016**	-0.051***	-0.008	-
	(0.011)	(0.012)	(0.006)	(0.009)	(0.012)	
$\ln P_t$	0.289***	0.630***	0.235***	0.174**	0.609***	0.242***
	(0.104)	(0.117)	(0.014)	(0.069)	(0.090)	(0.014)
$\ln L_t$	0.222***	0.316***	0.139***	0.079***	0.206***	0.140***
	(0.029)	(0.032)	(0.013)	(0.017)	(0.023)	(0.012)
i_{Baa_t}	-0.009***	-0.007***	-0.006***	-0.006***	-0.006***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$\ln T_t$	0.042	0.067**	-0.034**	-0.073**	0.010	-
	(0.033)	(0.031)	(0.014)	(0.032)	(0.034)	
$\ln P_{Gold_t}$	-0.011**	-0.010	-	-	-	-
	(0.006)	(0.006)				
TED_t	-	-	-	-0.011***	-0.003	-
				(0.002)	(0.002)	
$MA(1)$	-	0.830***	0.728***	-	0.964***	0.759***
		(0.068)	(0.042)		(0.063)	(0.041)
$MA(2)$	-	0.332***	0.090**	-	0.359***	0.115***
		(0.072)	(0.043)		(0.067)	(0.042)
R^2	0.999	0.999	0.999	0.999	0.999	0.999
SSR	0.015	0.006	0.009	0.010	0.007	0.009
F	19325.68	31148.98	1389855	39061.46	58148.04	1823247
$D-W$	0.515	1.764	1.939	0.730	1.714	1.922
N	204	204	636	268	268	636

Note: See, Tables 1, 2, and 3. u_t =USU = U.S. unemployment rate, W_t = wealth, P_t = USCPI, L_t = USCCO = loans (consumer credit outstanding), $i_{Baa\ t}$ = interest rate (corporate bonds rate), T_t = USGCTR = U.S. government current tax receipts, P_{Gold_t} = price of gold (uncertainty), TED_t = (LIBOR3M-STT3M) measurement of uncertainty.
Source: See, Table 1.

Table 5
Estimates of Private Investment [eq. (4)], Labor Productivity [eq. (5)], and Output (Production) [eq. (6)]

Variables	PI_t	$\Pr_t$	Q_t
C	-2.622***	10.342*	8.053***
	(0.221)	(5.682)	(0.902)
PK_t	-0.268***	5.130*	0.172***
	(0.061)	(3.102)	(0.015)
Q_t	1.812***	9.480** -	
	(0.094)	(4.812)	
$\Pr_t$	-	-	0.001
			(0.001)
M_t^s	-0.589***	-14.843***	0.155***
	(0.084)	(4.622)	(0.036)
i_{FF_t}	0.002	-0.249***	0.001
	(0.002)	(0.082)	(0.001)
u_t	-	0.319	-0.001
		(0.196)	(0.001)
PI_t	-	-	0.166***
			(0.009)
$AR(1)$	0.967***	0.669***	0.999***
	(0.010)	(0.029)	(0.001)
$MA(1)$	-	-	-0.431***
			(0.036)
R^2	0.999	0.480	0.999
SSR	0.291	3728.653	0.024
F	367850.8	100.629	2795742
$D-W$	2.024	1.739	2.024
N	662	662	662

Note: See, Tables 1 and 2. PI_t = LUSIM = ln of private investment, $\Pr_t$ =USLPR= labor productivity, Q_t = LUSGDP= ln of GDP (output), PK_t =LUSPK= ln of public capital (investment), M_t^s =LUSM2= ln of U.S. money supply ($M2$), i_{FF_t} = USFFR= federal funds rate, and u_t = USU= U.S. unemployment rate.

Source: See Table 1.

Table 6
Estimates of Taxes: Eq. (8)

Variables	$\ln T_t$	$\ln T_t$	$\ln T_t$
C	0.551***	0.528***	-141.014
	(0.060)	(0.065)	(16533.62)
$\ln WS_t$	0.412***	0.188***	0.058***
	(0.031)	(0.025)	(0.019)
$\ln CP_t$	0.032***	0.081***	0.102***
	(0.006)	(0.011)	(0.013)
$\ln PT_t$	0.387***	0.421***	0.185***
	(0.015)	(0.020)	(0.023)
$\ln CT_t$	0.074***	-0.085**	-0.035
	(0.028)	(0.038)	(0.041)
$\ln TI_t$	0.096***	0.030**	-0.012
	(0.008)	(0.013)	(0.015)
$\ln GS_t$	0.015***	0.022***	-0.004
	(0.005)	(0.008)	(0.009)
$\ln GE_t$	0.008	0.320***	0.305***
	(0.020)	(0.030)	(0.055)
$\ln ND_t$	0.017***	0.022**	0.084***
	(0.006)	(0.011)	(0.032)
$AR(1)$	-	-	1.000***
			(0.001)
$MA(1)$	-	0.848***	-0.122***
		(0.039)	(0.040)
$MA(2)$	-	0.694***	-
		(0.045)	
$MA(3)$		0.359***	-
		(0.040)	
R^2	0.999	0.999	0.999
SSR	0.366	0.017	0.086
F	168465.5	262613.4	566267.1
$D-W$	0.624	1.796	1.992
N	636	636	635

Note: See, Tables 1 and 2. T_t = USGCTR = U.S. government current tax receipts, WS_t = USWS = U.S. wages and salaries, CP_t = USCYP = corporate income (profit), PT_t = USPCTR = personal current taxes, CT_t = USTPI = corporate taxes (taxes on production and imports), TI_t = USCDTPI = U.S. custom duties, GS_t = USGS = U.S. government subsidies, GE_t = USGCE = U.S. government current expenditures, ND_t = USND = U.S. national debt.
Source: See, Table 1.

Table 7
Estimates of Loans: Eq. (11)

Variables	$\ln L_t$	$\ln L_t$	$\ln L_t$	$\ln L_t$	$\ln L_t$	$\ln L_t$
C	2.892***	3.437***	1.463***	2.660***	0.140***	0.124***
	(0.113)	(0.180)	(0.181)	(0.146)	(0.029)	(0.021)
Y_t	0.324**	0.363***	1.098***	0.382***	-0.012	-
	(0.140)	(0.065)	(0.222)	(0.062)	(0.033)	
u_t	-0.011***	-0.005**	-0.036***	-0.010***	-0.002***	-0.002***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
C_t	1.376***	0.857***	0.977***	0.874***	0.060**	0.052***
	(0.112)	(0.061)	(0.178)	(0.058)	(0.027)	(0.009)
T_t	-0.424***	0.007	-0.714***	0.062**	-0.001	-
	(0.537)	(0.033)	(0.085)	(0.033)	(0.014)	
$i_{Baa\ t}$	0.008***	0.003	0.026***	0.003	-0.001	-
	(0.002)	(0.002)	(0.004)	(0.002)	(0.001)	
$\ln P_{Gold\ t}$	-0.045***	-0.003	-	-	-	-
	(0.006)	(0.008)				
TED_t	-	-	-0.028***	-0.001	-0.002*	-0.003***
			(0.008)	(0.002)	(0.001)	(0.001)
$\ln L_{t-1}$	-	-	-	-	0.962***	0.961***
					(0.009)	(0.007)
$MA(1) - MA(7)$	-	1.110***	-	1.346***	0.175***	0.173***
		(0.061)		(0.052)	(0.059)	(0.059)
R^2	0.996	0.999	0.994	0.999	0.999	0.999
SSR	0.089	0.011	0.358	0.017	0.006	0.004
F	9104.328	33537.71	7959.708	74711.02	370426.1	597468.7
$D-W$	0.266	1.778	0.185	1.754	1.922	1.923
N	228	228	292	292	292	292

Note: See, Tables 1, 2, 3, and 4. Y_t = USPI, u_t = USU, C_t = USPCE, T_t = USGCTR, i_{Baa_t} = BAA bonds rate, TED_t = TED rate (LIBOR3M-STT3M), P_{Gold_t} = price of gold (uncertainty).

Source: See, Table 1.

Table 8
Estimates of Interest Rate: Eq. (12)

Variables	i_{BAA_t}	i_{BAA_t}	i_{BAA_t}
C	42.143***	25.138***	43.080***
	(2.100)	(6.757)	(7.982)
i_{FF_t}	0.540***	-1.903***	-0.074
	(0.156)	(0.601)	(0.137)
i_{P_t}	-0.591***	1.872***	0.016
	(0.162)	(0.613)	(0.140)
$\ln WS_t$	-0.590	-3.146	0.028
	(0.726)	(2.190)	(0.263)
$\ln P_t$	-5.459***	1.383	-6.909***
	(1.434)	(5.024)	(1.571)
TED_t	1.111***	0.861***	0.131**
	(0.119)	(0.142)	(0.053)
$\ln P_{Gold_t}$	-	-0.697**	-
		(0.328)	
$AR(1)$	-	-	0.934***
			(0.024)
$MA(1)$	-	-	0.311***
			(0.062)
R^2	0.782	0.644	0.976
SSR	92.040	61.175	0.196
F	187.580	59.401	1505.425
$D-W$	0.226	0.273	2.009
N	268	204	267

Note: See, Tables 1, 2, 3, 4, 5, 6, and 7. i_{FF_t} = USFFR, and i_{P_t} = USPR= U.S. Prime rate.

Source: See, Table 1.

APPENDIX

Some Hypothetical Examples

(A) An individual has an income of Y_{MCI_t} = \$30,000 per annum (\$2,500 per month), a student loan of L_{SL} = \$100,000, a car loan of L_{AL} = \$20,000, a mortgage of L_M = \$200,000, a credit card loan of L_{CC} = \$10,000, and a home equity loan of L_{HEL} = \$20,000.

His (monthly) taxes will be: (1) federal government tax (t_{FG_t} =12.6%) = \$3,780/12 = \$315, (2) state government tax (t_{SG_t} = 6%) = \$1,800/12 = \$150, (3) local government tax (t_{LG_t} = 3%) = \$900/12= \$75, (4) property tax (T_{P_t}) = \$5,000/12 = \$417, (5) Medicare and social security "tax" contribution ($t_{M\&SS_t}$ = 7.5%) = \$2,250/12 = \$187.5, and (6) private pension contribution (T_{PPC_t}) = \$300; thus, total taxes (T_t) = \$1,444.50. (Total taxes as a percentage of income are 45.78%).

His Insurance is: (1) Health insurance (C_{HI}) = \$300, (2) home (property) insurance (C_{PI}) = \$800/12 = \$66.70, and (3) car (auto) insurance (C_{AI}) = \$700/12 = \$58.34; thus, total insurance (C_I) = \$425.04. (Total insurance cost as a percentage of income is 17.00%).

His interest payment will be: (1) interest (i_{SL} = 3.5%) on student loan I_{SL} = \$291.67, (2) interest ($i_{AL} = 4\%$) on auto loan I_{AL} = \$66.67, (3) interest ($i_M = 4\%$) on mortgage I_M = \$666.67, (4) interest (i_{CC} = 29.9%) on credit cards I_{CC} = \$249.92, and (5) interest ($i_{HEL} = 5\%$) on home equity loan I_{HEL} = \$83.33; thus, total monthly interest cost (I_t) = \$1,358.26. (Total interest as a percentage of income is 54.33%).

His monthly total payments will be: (1) taxes (T_t) = \$1,444.50, (2) insurance (C_I) = \$425.04, (3) debt payment on student loan (DP_{SL}) = \$449.04, (4) debt payment on car loan (DP_{AL}) \$368.33, (5) debt payment on mortgage loan (DP_M) \$954.83, (6) debt payment on credit cards (DP_{CC}) \$249.95,[39] and (7) debt payment on home equity loan (DP_{HEL}) = \$377.42; thus, the total monthly payments (E_t) for this individual is: \$4,269.11. (Total monthly payments as a percentage of income are 170.76%).

His monthly income is (Y_t) = \$2,500.00 minus his expenses (E_t) = \$4,269.11and minus his consumption (C_t) = \$1,700.00 (food: \$800 + gas, etc.: \$400 + utilities \$500); then, $Y_t - E_t - C_t$ = \$2,500.00 - \$4,269.11 - \$1,700.00 = -\$3,469.11 (negative saving or new loans, borrowing every month). This individual is already bankrupt.

His total monthly expenditures are: \$5,969.1; then, his monthly income must be over \$6,000.00 that he can have some monthly savings of \$30.89. $Y_t - E_t - C_t = S_t$ (\$6,000.00-\$4,269.11-\$1,700.00= \$30.89). Consequently, this individual to survive needs an annual income of \$72,000.00 (\$6,000.00 x 12).

(B) An individual has an income of Y_{MCI_t} = \$150,000 per annum (\$12,500 per month), a student loan of L_{SL} = \$200,000, a car loan of L_{AL} = \$40,000, a mortgage of L_M = \$300,000, a credit card loan of L_{CC} = \$20,000, and a home equity loan of L_{HEL} = \$30,000.

His (monthly) taxes will be: (1) federal government tax (t_{FG_t} =28%) = \$42,000/12 = \$3,500, (2) state government tax (t_{SG_t} = 8%) = \$12,000/12 = \$1,000, (3) local government tax (t_{LG_t} = 3%) = \$4,500/12= \$375, (4) property tax (T_{P_t}) = \$8,000/12 = \$666.67, (5) Medicare and social security "tax" contribution (

[39] The total minimum monthly payment on credit cards is \$249.95 and the monthly interest is \$249.92; actually the borrower is paying \$0.03 principal. Thus, his debt will continue to be unpaid, it has become a perpetual debt.

$t_{M\&SS_t}$ = 7.5%) = \$11,250/12 = \$937.5, and (6) private pension contribution (T_{PPC_t}) = \$500; thus, total taxes (T_t) = \$6,979.17. (Total taxes as a percentage of income are 51.83%).

His Insurance is: (1) Health insurance (C_{HI}) = \$400, (2) home (property) insurance (C_{PI}) = \$1,000/12 = \$83.33, and (3) car (auto) insurance (C_{AI}) = \$800/12 = \$66.67; thus, total insurance (C_I) = \$550.00. (Total insurance cost as a percentage of income is 4.4%).

His interest payment will be: (1) interest (i_{SL} = 3.5%) on student loan I_{SL} = \$583.33, (2) interest ($i_{AL} = 4\%$) on auto loan I_{AL} = \$133.33, (3) interest ($i_M = 4\%$) on mortgage I_M = \$1,000.00, (4) interest (i_{CC} = 29.9%) on credit cards I_{CC} = \$331.67, and (5) interest ($i_{HEL} = 5\%$) on home equity loan I_{HEL} = \$125.00; thus, total monthly interest cost (I_t) = \$2,173.33. (Total interest as a percentage of income is 17.39%).

His monthly total payments will be: (1) taxes (T_t) = \$6,979.17, (2) insurance (C_I) = \$550.00, (3) debt payment on student loan (DP_{SL}) = \$898.09, (4) debt payment on car loan (DP_{AL}) \$736.66, (5) debt payment on mortgage loan (DP_M) \$1,432.25, (6) debt payment on credit cards (DP_{CC}) \$332.56,[40] and (7) debt payment on home equity loan (DP_{HEL}) = \$566.14; thus, the total monthly payments (E_t) for this individual is: \$11,494.87. (Total monthly payments as a percentage of income are 91.96%).

His monthly income is (Y_t) = \$12,500.00 minus his expenses (E_t) = \$11,494.87and minus his consumption (C_t) = \$2,000.00 (food: \$900 + gas, etc.: \$500 + utilities \$600); then, $Y_t - E_t - C_t$ = \$12,500.00 - \$11,494.87 - \$2,000.00 = -\$994.87 (negative saving or new loans, borrowing every month). This individual is also bankrupt.

His total monthly expenditures are: \$13,494.87; then, his monthly income must be over \$14,000.00 that he can have some monthly savings of \$505.13. $Y_t - E_t - C_t = S_t$ (\$14,000.00-\$11,494.87-\$2,000.00= \$505.13). Consequently, this individual to survive needs an annual income of \$168,000.00 (\$14,000.00 x 12).

(C) An individual has an income of Y_{MCI_t} = \$1,000,000 per annum (\$83,333.33 per month), a student loan of L_{SL} = \$200,000, a car loan of L_{AL} = \$80,000, a mortgage of L_M = \$1,000,000, a credit card loan of L_{CC} = \$50,000, and a home equity loan of L_{HEL} = \$50,000.

- His (monthly) taxes will be: (1) federal government tax (t_{FG_t} =35%) = \$350,000/12 = \$29,166.67, (2) state government tax (t_{SG_t} = 8%) = \$80,000/12 = \$6,666.67, (3) local government tax (t_{LG_t} = 3%) = \$30,000/12= \$2,500, (4) property tax (T_{P_t}) = \$15,000/12 = \$1,250.00, (5) Medicare and social security "tax" contribution ($t_{M\&SS_t}$ = 7.5%) = \$75,000/12 = \$6,250.00, and (6) private pension contribution (T_{PPC_t}) = \$1,000; thus, total taxes (T_t) = \$46,833.34. (Total taxes as a percentage of income are 55.00%).

- His Insurance is: (1) Health insurance (C_{HI}) = \$500, (2) home (property) insurance (C_{PI}) = \$3,000/12 = \$250.00, and (3) car (auto) insurance (C_{AI}) = \$1,500/12 = \$125.00; thus, total insurance (C_I) = \$875.00. (Total insurance cost as a percentage of income is 1.05%).

[40] The total minimum monthly payment on credit cards is \$332.56 and the monthly interest is \$331.67; actually the borrower is paying \$0.89 principal. Thus, his debt will continue to be unpaid, it has become a perpetual debt, except if he will pay more than \$500 per month.

His interest payment will be: (1) interest (i_{SL} = 3.5%) on student loan I_{SL} = \$583.33, (2) interest ($i_{AL} = 4\%$) on auto loan I_{AL} = \$266.67, (3) interest ($i_M = 4\%$) on mortgage I_M = \$3,333.33, (4) interest (i_{CC} = 12.9%) on credit cards I_{CC} = \$537.50, and (5) interest ($i_{HEL} = 5\%$) on home equity loan I_{HEL} = \$208.33; thus, total monthly interest cost (I_t) = \$4,929.16. (Total interest as a percentage of income is 5.91%).

His monthly total payments will be: (1) taxes (T_t) = \$46,833.34, (2) insurance (C_I) = \$875.00, (3) debt payment on student loan (DP_{SL}) = \$898.09, (4) debt payment on car loan (DP_{AL}) \$1,473.32, (5) debt payment on mortgage loan (DP_M) \$4,774.15, (6) debt payment on credit cards (DP_{CC}) \$549.19,[41] and (7) debt payment on home equity loan (DP_{HEL}) = \$943.56; thus, the total monthly payments (E_t) for this individual is: \$56,346.65. (Total monthly payments as a percentage of income are 67.62%).

His monthly income is (Y_t) = \$83,333.33 minus his expenses (E_t) = \$56,346.65 and minus his consumption (C_t) = \$4,000.00 (food: \$2,000 + gas, etc.: \$1,000 + utilities \$1,000); then, $Y_t - E_t - C_t$ = \$83,333.33 - \$56,346.65 - \$4,000.00 = \$22,986.68 (savings every month). This individual is really wealthy.

His total monthly expenditures are: \$60,346.65 and his monthly income is \$83,333.33 then he has monthly savings of \$22,986.68. $Y_t - E_t - C_t = S_t$ (\$83,333.33-\$56,346.65-\$4,000.00= \$22,986.68). Consequently, this individual is very wealthy.

[41] The total minimum monthly payment on credit cards is \$549.19 and the monthly interest is \$537.50; actually the borrower is paying \$11.69 principal. Thus, his debt will continue to be unpaid, it has become a perpetual debt, except if he will pay more than \$1,000 per month.