"Appraisals for Higher-Risk Mortgage Loans"

Agency Name: Docket No. R-1443 or RIN 7100-AD90

And

OCC Docket ID OCC-2012-0008; Comment to the Federal Reserve Board on "Regulatory Capital Rules: Regulatory Capital, Implementation of Basel III, Minimum Regulatory Capital Ratios, Capital Adequacy, Transition Provisions, and Prompt Corrective Action" by Hugh Ching, Post-Science Institute, PO BOX 2663, Fremont, CA 94536 USA (With Comment to National Science Board)

[General Remark]

Just as the down payment of a real estate investment depends on the riskiness of the investment, the capital reserve requirement of a bank should depend on the riskiness of the bank or of the investments funded by the bank. The Federal Reserve should not try to avoid the necessary knowledge, namely, the solution of value, which is needed to determine the riskiness of investments. The solution of value will replace two of the most damaging decision-making processes, namely, the market comparison method in real estates and the peer review process in determining research priorities, both of which share the same defect—the comparison to the past. The solution of value is based on the future consequences.

Post-Science Economics

Based on Non-Violable Laws of Nature and Orderly Transition to Full Employment

Post-science extends the concept of non-violable laws of nature in science, such as gravitation, from science to social science to form a new post-science economics. The two most important examples of non-violable laws in economics are (1) The Quantity Theory of Money PQ = VM (Price x Quantity = Velocity of Circulation of Money x Money Supply) and (2) The solution of value (Quantitative Supply and Demand Model Based on the Infinite Spreadsheet). These laws are more stringent than man-made laws.

The equation PQ = VM describes how to stabilize the economy (roughly represented by PQ) by changing V and/or M. The equation is also known as the Fisher Identity, indicating that it could be considered an identity and, thus, is a non-violable law of nature. The solution of value is based on the problem posed by Kenneth Arrow and Gerard Debreu in Debreu's book ***Theory of Value*** and produces a quantitative solution of the price, replacing the qualitative utility. The Infinite Spreadsheet establishes a rigorous mathematical relationship between the price and the rate of return in a time space extending to infinity. The Infinite Spreadsheet is accepted based on mathematical rigor. Post-science economics is beyond science and is based on mathematical rigor, not just empirical verification, which is the rigor of science and is no longer possible when the calculation is taken to infinity in time, such as for the price.

Full employment should be one of the major goals of the economy because full employment will increase both V and M and money is more valuable in the hands of the poor than that of the rich. The incorrectly generated Q with P will not only create inflation, but also cause financial crises, such as the Savings and Loan Crisis and the Subprime Woe, both of which are caused by the incorrect Q with P, namely, the overproduction and the overvaluation of real estates. The correct allocation of resources, such as real estate construction, depends on the determination of the price by the solution of value.

The most important sector of resource allocation is that of the available jobs. As technology progresses, machines gradually take over human labors or employment. Post-science economics proposes a policy of orderly transition to full employment, as the available work for people decreases. The available employment depends on the amount of Q with P satisfying the rate of return. With 21th century technology, most advanced nations should be able to provide the basic needs of food, clothing, shelter, transportation, and health care for all their citizens. Providing the basic needs for all the citizens can be achieved by orderly distributing the available employment among all the citizens to achieve full employment. Full employment can be created by simply shortening the weekly working hours by regions and sectors. The full-employment strategy will reduce economic inequality and eliminate greed.

From a long-term point of view, the reduction of working hour is inevitable when machines gradually take over human labors. Today, most people are working on jobs which will someday be done by robots. As leisure time increases, innovation time will also increase. The full-employment economy might lower the average earning of employees, but will encourage people to be innovators rather than be innovators' employees. The net result of switching to a full-employment economy will be an increase in innovations and in the wealth of the nation as a whole because there will be more innovators, who, in turn, will produce more jobs.

Post-Science Economics with the Infinite Spreadsheet detects economic disequilibria. The financial authorities should use fiscal and monetary policies to balance these disequilibria, which cause financial crises. **Market Surveyed of Acceptable Rate of Return for Q under Economic Equilibriums:** Real Estate: 10% +/- 5%; Small Business: 40% +/- 10%; Real Estate Development: 100% +/- 50%; Stocks: 10% +/- 5% Innovative Research Projects: over 1000%; Mars Exploration: 0% +/- 10%.

[Subject: Non-Violable Laws of Nature vs. Man-Made Laws]

Capital Reserve Requirement will affect the money supply in the economy and could be an important tool to regulate the economy. The relevant equation is PQ=VM (Price x Quantity = Velocity of Circulation of Money x Money Supply), which could be a non-violable law of nature. In the future all man-made regulations should be based on non-violable laws of nature in both physical and social sciences. The solution of the problem of value posed by Gerard Debreu in his book Theory of Value is another important non-violable law of nature discovered by Post-Science Institute. The solution of value, being the foundation of decision-making, should be considered the beginning of rationality.

Most of the economic factors, of which capital requirement is just one, have mutual dependence. Capital requirement, thus, depends on other factors. In fact, it does not make much sense to just discuss one of the factors or making laws to regulate just one factor. In particular, capital requirement depends on the stability of the economy, which involves around 50 factors, corresponding to the numbers of inputs to the solution of value. Most importantly, all man-made laws should be based on non-violable laws of nature, the most relevant of which for setting the capital requirement are PQ = VM and the solution of value. The economy should move from the Pre-Friedman economy of man-made regulations to deregulated Free Market of Milton Freidman to the Post-Friedman economy regulated by non-violable laws of nature. In conclusion, the capital requirement policy should be replaced by policies based on PQ=VM and on valuation, which might make fixed policy for capital requirement unnecessary.

I predicted the Subprime Woe in June 2006 to the Federal Reserve Board based on the solution of value. Subsequently, I have made the following suggestions, of which only the first one checks with Fed action:

1. "Lowering the interest rate as much and as rapidly as possible" a public comment to US Treasury,

2. Implementing the solution of value (the Infinite Spreadsheet) to permanently set the price correctly to avoid future financial crises due to overvaluation,

3. Implementing the solution of value as the basis for calculating mortgage insurance premium and the capital reserve, replacing the current mortgage insurance premium and capital reserve calculations based on actuarial analyses (the estimation of the probability of random accidents),

4. Distributing resources correctly based on the solution of value, particularly, the distribution of employment or work in regions with different unemployment problems around the world.

On Item 1 above, lowering the interest rate will increase M and V in PQ = VM to stabilize PQ. From the solution of value, the lowering of the interest rate by 1% will increase the appraised price by about 10%. In fact, the Subprime Woe could be caused in large part by the rapid increase of the Fed fund rate from 1% to 5.25%, which could have lowered the price of subprime properties by about 40%, if the mortgage rate of subprime properties increases proportionally to the Fed fund rate. The effect of the interest rate on the price can be calculated by the Infinite Spreadsheet, which is a very seasoned commercial valuation software system developed by the Post-Science Institute and authored by me available at: http://www.infinitespreadsheet.com

On Item 2 above, value is calculated from the sum total of all the benefits and losses extending to infinity in time. Value can be expressed in terms of the price or the rate of return on investment. In the calculation of value, all the inputs must be expressed to infinity in time in order to have a deterministic solution, where the number of equations equals the number of unknowns. All the inputs extending to infinity are expressed as approximate time-invariants and obtained from market comparison, where the output is the price.

The solution of value is a departure from solutions in science, where deterministic sets of data are collected within a finite time. Empirical verification is the standard of rigor of science, but when infinity

in time is involved, such as in the solution of value, empirical verification becomes impossible, because infinity, by definition, never arrives so that the deterministic set of data can never be collected. The formulation of the solution of value has to be based on mathematical rigor, and the accuracy of the inputs has to be relaxed in order to express them to infinity in time and space. Generally, time-varying inputs are used for a finite time, after which approximate time-invariant inputs are used for the future time extending to infinity. An approximated stable economy extending to infinity provides the last equation for a deterministic set of equations and unknowns. The real practical significance of the calculation to infinity simply indicates a short-term economic trend, which starts at the future time when all the inputs are represented by approximate time-invariant inputs. When the quantities at a given price are summed, the supply and the demand curves can be constructed. The intersection of the supply and the demand curve gives the price of commodities of similar functionality. The solution of value can easily detect over-valuation and under-valuation. Over-valuation of the real estate price was the primary cause of both the Savings and Loan Crisis and the Subprime Woe.

On Item 3 above, the mortgage insurance premium should be an inverse function of the percentage of the equity or of the down payment on the property. Real estate mortgages have individualities, which vary with the changes of the prices of the real estates. Real estate foreclosures, thus, are not like automobile accidents, which can be estimated using actuarial analyses. Similarly, the capital reserve of each and every bank should be determined individually by, for example, how the bank invests its funds and the quality of its mortgages or the percentage equity on its loans.

I am completely against the fixed capital reserve rates. Milton Friedman also wrote me about the ill effects of fixed regulations. From the point of view of the solution of value, the capital reserve rate for each bank should be reconsidered, say, quarterly to be adjusted according to the changes in the quality of the bank loans. Accordingly, the price of a real estate or any business should be recalculated anytime there is a significant change in factors affecting the price due to a change in the condition of the financial situation. Yes, there will be an enormous amount of recalculations in order to catch up to the changes in the economic condition, before economic crises occur.

The solution of value is a departure from solutions in science. As a time-variant, the price, the decision, or the plan needs to be reconsidered anytime there is significant change in the future expectation. The capital reserve for a bank is similar to the down payment on a real estate or on a business. The percentage down payment on a single family house is very different from that on a commercial property or on a business. The capital reserve should be proportional to the riskiness of the loans. In the past and currently, most banks will try to invest their fund in high-risk and high-return loans because they are risking mostly other people's money, which they can get because of the money is guaranteed by the government. As the riskiness of the loans increases, the down payment and the capital reserve should increase. Since the riskiness of the loans changes continually, the capital reserve should not be a fixed amount for all banks, but should be individually and timely determined.

On Item 4 above, the concrete suggestion is simply to reduce working hours due to increasing productivity world-wide. The correct distribution of employment is the immediate solution to the current global financial crisis. With the continuing increase in productivity, the world should gradually

switch from a work-oriented economy to a leisure-oriented economy. After all, the goal of increasing productivity is to increase leisure time. The final goal is that all the work be taken over by machines.

The production-distribution-consumption chain is an alternative description of the supply and demand model. The current scientific and technological age is preoccupied with the production of goods and services. The solutions of distribution and consumption should be based on the solution of value, which can only be found in post-science in the form of a quantitative supply and demand model based on an infinite spreadsheet. The infinite spreadsheet calculates the price of one commodity, which, when summed over multiple commodities of similar functionality, quantifies the supply and demand model.

Today the productivity of the world is nearly high enough to supply all the basic needs to all the people, but the problems of distribution and consumption are not solved. The solution of distribution and consumption should be based on the solution of value. The current chronicle financial crises are due to over-productivity, which is caused by over-valuation. In Africa or even in Russia, freely distributed goods and services often have difficulty in reaching their consumers. The right or efficient method of distribution is through the correct price, which can only be determined by the correct solution of value.

Also, the consumer must have the money to buy the product. Employment will provide the money to the consumer. The solution to consumption is full employment or the proper distribution of work and money. Fed Chairman Ben Bernanke is solving the current financial crisis based on the equation PQ=VM (Price x Quantity = Velocity of Circulation of Money x Money Supply). The current Great Recession is caused by the small V. To keep PQ stable, Bernanke greatly increases M, but he distributes the money mostly to big banks and big companies with good credit. The permanent solution to increase V is to have full employment, which means the proper distribution of work and money. In this regard, it can be speculated that the Great Depression was saved by the greatly increased available work due to WWII.

The ultimate reason for increasing productivity is to increase the leisure time, not just to increase the profit. Unemployment is forced leisure and causes a drastic reduction in the circulation of money. Gradually the current work-oriented economy should be transformed into a leisure-oriented economy with a growing leisure industry. The available work should be properly distributed and is gradually reduced by productivity, when machines take over human labors. In order to make everyone an effective consumer, the average working hours of each labor must be reduced according the unemployment rate. For example, in USA the 10% unemployment can be reduced by reducing the weekly working days from 5 to 4, starting with government employees with corresponding reduction in wages. The social benefit of full employment, which remains to be debated, should take priority over company profits. The current Universal Health Coverage should be accompanied by Full-Employment. Taking care of the necessity of life of every citizen should be one of the first responsibilities of a society.

In the not so distant future, as the current Age of Science advances into the coming Age of Social Science, all people will have work to earn enough money to satisfy their basic needs of food, clothing, housing, transportation, and health. The wages in a full-employment economy will keep the money circulating. The current fad of accumulating wealth based on extraordinary profits will become an unnecessary goal of life for most people, who will have the freedom in a leisure economy to do whatever they think is

best for themselves as individuals and for the society as a whole. The leisure time will greatly increase creativity. The current natural employment system should be replaced by a Planned Full-Employment System, where the total available work will be distributed among all the people willing to work by reducing (or increasing) the average working hours with the goal of achieving full-employment.

Encl.

[Subject: Establishment of Organizations for Knowledge: Case Studies of National Science Foundation, Federal Reserve Board, and Post-Science Institute]

An Open Comment to National Science Board (which directs the goals and function of the National Science Foundation) June 25, 2012 by Hugh Ching, Founder of Post-Science Institute:

[Topic of Discussion I: Innovation Crisis vs. Financial Crisis]

Our society is facing two countering currents. On one hand, the establishment has acquired such a tight grip on society that it would only allow changes inside the box of established ideas and can prevent any anti-establishment idea which threatens the foundation of the establishment, and on the other hand, the society is being incessantly punished by chronicle financial crises, which are starting to threaten the very foundation of the global economy. Interestingly, the two countering currents share the same remedy: the solution of value. The problem of financial crises must be solved. The human race must become rational. The next stage of human progress is to solve the problem of value or decision-making.

Nature teaches us through pain and suffering. Currently, society is being punished by a financial crisis for its ignorance of the solution of value, a non-violable law of nature. Putting it simply, the solution of value defines a mathematically rigorous relationship between the price and the rate of return, and arbitrary naming the price without knowing the rate of return causes the financial crisis. Furthermore, the solution of value is needed to introduce other fundamental changes to the establishment.

Society will surely continue to progress. It must have knowledge organizations to accept innovations. Standing in its way of progress, in my opinion, is an incorrect solution of value, where value should be the foundation of valuation, decision-making, and planning. A similar innovation crisis today is caused by the same mechanism as that caused the financial crisis. The mechanism is the comparison to the past, while a rational decision should be based on the expected future consequences. The incorrect mechanism in the real estate crisis is the market comparison method, and the incorrect method in the innovation crisis is the peer review process. As a simple logic, truly original ideas should have no peers.

My solution to the problem of value posed by Gerard Debreu in his book Theory of Value has publicly predicted both the Savings and Loan Crisis in 1984 and the recent Subprime Woe in June 2006. Kenneth

Arrow asked me about the temporal solution of value on page 34 of Debreu's book with the question: "What's wrong with the discounted cash flow method?" My solution of value is the correct temporal solution. Value, in the quantitative form of the price or the rate of return, is calculated from the sum total of all the future benefits and losses to infinity in time. The solution is a non-violable law of nature.

Both Fed Chairmen Alan Greenspan and Ben Bernanke, due to my correct predictions of the Savings and Loan Crisis and the Subprime Woe, respectively, contrary to theirs, have changed their mind about my public comments from negative to positive. Please feel free to contact, if possible, Dr. Kenneth Arrow, Dr. Alan Greenspan, and Dr. Ben Bernanke to verify my above statements related to them.

[Topic II: Knowledge vs. Politics]

What I see today is a world increasingly being engulfed in politics, which prevents any fundamental change, and, at the same time, being punished by financial crises for the lack of the fundamental knowledge of valuation. Politicians fight for the economic pie, and knowledge expands the pie. Politics serves special interests, and knowledge serves the interest of all the people. Politics should be kept out of knowledge organizations, such as NSF, NSB, and the Federal Reserve. In the past few decades, my personal observation is that NSF seems to follow a trend of turning from a knowledge organization into a political organization, one serving, instead of the interest of knowledge, the special interests of its employees and the established scientific community, whose decisions are more politically-motivated than knowledge-motivated with the goal of minimizing responsibility and risks. With NSF leading the world knowledge organizations away from knowledge and toward politics, the world is facing, in addition to the very visible financial crisis, a nearly invisible innovation crisis, both of which have their root cause in politics and the absence of the knowledge of valuation or decision-making.

[Topic III: Valuation vs. Peer Review]

The main knowledge involved in this and my past communications with NSF and NSB is the solution of value, the foundation of rational decision–making and the solution to the current global financial crisis. One of my main objections to NSF is the anonymous or open peer review process, which is causing an innovation crisis, as the market comparison method is causing our chronicle financial crises.

My public communications with the National Science Foundation started in the early 1980s, when I exchanged letters with Dr. Mary Clutter, an Assistant Director of NSF, warning her of the pending Savings and Loan Crisis. In the 1990s and 2000s, I contacted the National Science Board directly. In my latest communication with the Board, I was advised to contact the Director of NSF, but had never received a reply from the Director. However, since 2008 I have been submitting research proposals to NSF and have learned about NSF from actual experiences dealing with NSF.

In one of my communications with the US Patent Office, the Commissioner of Patent expressed interest in my idea of replacing the qualitative concept of utility with a quantitative concept of value, which can

be represented by the price or the rate of return. I would like to further advance this idea by proposing an "Open Valuation" by each NSF proposer for a proposed research. The Open Valuation will allow anyone to execute the business plan based on the Open Valuation commercially, not necessarily by the author of the Open Valuation. The Open Valuation must conclude with a quantitative value, which is calculated by the solution of value, to determine the desirability of the proposed research project.

[Topic IV: Research vs. Education]

I would like to have a chance to communicate closely with members of the Board or any of the staff members of the Board to make concrete suggestions of fundamental reforms at NSF. Among my suggestions, the most important is the replacement of the anonymous peer review process of research proposals with a process based on the solution of value with full disclosure and full accountability. In this regard, I believe that the NSF proposal review process should be completely open to the public, instead of being secretive, as it is now. Also, NSF should deal solely with research, which would correspond to new knowledge, not with education, which promotes establishment knowledge. Funding research is far more difficult than funding education. Thus, specifically, the wording of "research and education" in NSF policy statement should be replaced by "research and the education of the research."

[Topic V: Valuation vs. Market Comparison Method]

Interestingly, the peer review process for knowledge is similar to the market comparison method for real estate valuation. The former is causing the innovation crisis today by keeping knowledge unchanged, as the later has caused both the Savings and Loan Crisis and the recent Subprime Woe by keeping price unchanged when the economic conditions have changed. Moreover, knowledge is more fundamental than finance, and a reform in knowledge valuation is needed to fundamentally change the solution of price from the market comparison method to the solution of value based on future cash flows. Similarly, the solution of value can calculate the value of the proposed project, but the future cash flows do not necessarily need to be generated personally by the proposer of the research project.

[Topic VI: Post-Science vs. Science]

Post-science is based mainly on the three solutions of touch (solved in 1968), value (1972), and software (1986), with the goal of achieving complete automation, which characterizes life. The solution to the problem of value posed by Kenneth Arrow and Gerard Debreu is needed to make rational decisions, such as what prices to pay and what robots to construct, and has publicly predicted both the Savings and Loan Crisis and the Subprime Woe (http://www.postscience.com; http://www.non-violable.com; http://www.infinitespreadsheet.com). Rational decision-making is the behavior separating humans from other animals. The completely automated software has the capabilities of self-generation, auto-update, and auto-documentation (http://www.humanlanguageprogramming.com). The software will be

needed to program a proposed Self-Manufactured General Purpose Robot with the ability of touch (http://www.jumpulse.com). Ultimately, the Robot will become the human and the software, DNA.

The standard of rigor of science is empirical verification, which is possible only when a deterministic set of data can be collected. The solution of value must consider all the future consequences of a decision to infinity in time. Completely automated software is designed to satisfy the requirement of permanence. The solutions of both value and software involve infinity, which, by definition, will never arrive (Kant said infinity only exists in the mind), making empirical verification of the correctness of the price or the decision impossible. Acceptance of science is based on empirical verification. Acceptance of the solutions of value and software must be based on mathematical and logic rigor, respectively, in their formulations. However, the accuracy of the inputs and outputs of the solution of value must be relaxed when dealing with an uncertain future involving infinity. In general, only time-invariant quantities can be empirically verified. Prices and decisions are time-variant quantities, which change continually with time to infinity and, thus, cannot be empirically verified. In my solution of value, all the inputs extending to infinity have been expressed as approximate time-invariant quantities, which are obtained by the market comparison method.

In the past 40 years, Post-Science Institute has contributed the solutions of value, software, and touch with its own funding of around just $2 million. While most problems in science involve about 5 variables, the problem of touch involves around 25 variables, that of value, 50 variables, and that of software, 500 variables. The current society of 5-variable intelligence is having difficulty coping with the real world of social and life sciences, which are orders of magnitude more complex than the materialistic world of science. The scientific establishment must loosen its hold on knowledge by recognizing the limitation of empirical verification, and by looking forward into the uncertain future rather than just looking backward into the certain past. Post-science will no longer have the luxury of empirical verification.

I would like to suggest holding public debates between the scientific community and the post-science members on the solutions of value, software, and touch. In particular, the solution of value should be publicly discussed immediately to be led and sponsored by Federal Reserve Board, National Science Foundation, and Post-Science Institute. All people or organizations, which claim to have the solutions of value, should come forward with their solutions of value. The public discussion will not be futile because there will at least one concrete solution from Post-Science Institute to be challenged by all.

I appreciate the timely guidance from the National Science Board in the past and hope that this time we might actually get something done in the wake of a global financial crisis with the magnitude equaling the world Gross Product of about 60 trillion dollars. For your interest, enclosed please find my draft of a prepared comment to the Federal Reserve Board on how to set policies to solve the current global financial crisis. In any case, after nearly 30 years communicating with government knowledge agencies, I could be one of the very few people, politically independent enough and with sufficient training in engineering (MIT), physics (Ta-You Wu), mathematics (grand, grand student of Hilbert), and philosophy (8 yrs. with Paul Feyerabend) and business experiences, to make this fundamental change in knowledge.

Sincerely,

Hugh Ching

Founder and President, Post-Science Institute, http://www.jumpulse.com/ching.pdf