

SAVINGS: BUBBLES AND FUNDAMENTALS

A Review of Laurence J. Kotlikoff, *What Determines Savings?* The MIT Press, Cambridge, MA, 1989, pp. xvii-533 Index and Bibliography, ISBN 0-262-11137-3 and Robert J. Shiller, *Market Volatility*, The MIT Press, Cambridge, MA, 1989, 1990, pp. xiv-464 Indexes and Bibliographies, ISBN 0-262-19290-X.

INTRODUCTION

These two volumes consider fundamental determinants of savings and "bubbles" in stock, bond and real estate prices, i.e., differences between market prices and those which would exist if "fundamentals" were all that mattered.

Two basically different views of the rationality of markets are illustrated by these two excellent studies, both of which have inspired and will inspire much research. One view says that savings are determined *fundamentally* by individuals engaged in rationally constrained choice among intertemporal consumption streams unaffected by conventional collectivities beyond the extended family, such as firms and governments. The other view says that the value of stocks, bonds, and houses, is determined not only by such fundamentals but also by popular theories, fads, animal spirits, conventions or bubbles. What are we to make of these basic ideas?

In an excellent collection of nineteen papers (eight co-authored), Kotlikoff presents a substantial range of findings:

(1) "... intergenerational transfers rather than life-cycle motives play the predominant role in U.S. wealth accumulation;" (2) extensive linking of generations implies that government distribution schemes may or may not affect savings; (3), a government deficit as measured in the SNA (even as emended by Robert Eisner¹) is "... a noneconomic arbitrary accounting construct that bears no necessary relationship to the fundamental stance of fiscal policy;" and (4) offsetting concern generated by conventionally measured U.S. saving rates, American households do not significantly undersave. Kotlikoff investigates other fascinating topics, such as the extent to which families are insurance against old age, i.e. substitutes for annuities. There are a wealth of other topics covered in this book, but the major findings reported reveal its extremely challenging nature. (His empirical studies of savings are accompanied by full descriptions of the data on which his findings are based.)

In Kotlikoff's view, if individuals act as extended families, any arbitrary extension to the state will see that collectivity having little if any real effects on the overall rate of savings generated by the extended individuals. The convention

Note: I am indebted to Colin Rogers of the University of Adelaide for stimulating discussions on the topics covered in this review and to Lars Osberg for his very helpful comments on earlier drafts. I retain all responsibility for error and confusion.

¹Robert Eisner, *How Real is the U.S. Deficit?* Free Press, New York, 1986.

known as the state can only marginally, if at all, affect the “fundamentals,” the preferences of the individuals and their extended families and technology, which together determine the rates of savings of the individuals.

In Shiller’s work,² market prices of assets with uncertain income such as stocks, bonds and real estate are driven by two forces: “fundamentals” such as tastes, technology and endowments (i.e. stock prices reflect the present value of the stream of dividends³ and the real and stochastic processes generating such streams) and expectations, animal spirits, conventions, fads or “bubbles.” Shiller asks (p. 1)

“Can we trace the sources of movements (in asset prices) back in a logical manner to fundamental shocks affecting the economy, the shocks to technology, to consumer preferences, to demographics, to natural resources, to monetary policy or other instruments of government control? Or are price movements due to changes in opinion or psychology, that is, changes in confidence, speculative enthusiasm, or other aspects of the world view of investors, shocks that are best thought of as coming from people’s minds?”

Shiller’s book examines prices for stocks, bonds and residential real estate. He provides extensive tests of the hypothesis that stock markets are efficient, and that there is no excessive (i.e. beyond that associated with fundamentals) volatility in prices, hypotheses which are *not* strongly supported by the data. In contrast, the confidence one can have in efficient term structure and Fisherian premia hypotheses in the bond market can be said to be somewhat supported and Keynes’s explanation for the so-called Gibson paradox that high (low) interest rates are associated with high (low) price levels on account of the expectations with respect to monetary policy, also gets some support—which leads to the conclusion that efficient markets hypotheses for the bond markets seem stronger than for the stock markets. The behaviour of residential real estate prices is harder to examine because of data problems and those connected with survey methods (which Shiller fully states), hence any findings with respect to the efficiency of the real estate markets are far less persuasive. Finally, there are observations on the aggregate economy in which Shiller suggests that consumption may not be satisfactorily explained by the intertemporal maximization hypothesis. He argues that intertemporal consumption theory needs supplementation with “popular” models and that aggregate variability may offer some support for Pigou’s swings of optimism and pessimism. Shiller concludes by arguing that asset prices seem driven by both “fundamentals” and “conventions” and that economists should be more willing to embrace popular models as revealed (say) through survey research methods—as many social psychologists do.⁴

²A brief exposition of his work is Shiller, R. J., *Speculative Prices and Popular Models*, Stiglitz, J. (ed.) *Symposium on Bubbles, Journal of Economic Perspectives*, IV, 55–65, 1990.

³In general, asset prices reflect the present value of the streams of rents expected to accrue to them.

⁴Shiller’s basic argument with respect to the stock market hinges critically on the hypothesis that the variability of observed stock market prices exceeds significantly that which would be associated with efficient prices. For some econometric tests of the hypothesis, the excessive variance hypothesis cannot be rejected, for some it can. See Flood, R. P. and Hodrick, R. J., *On Testing for Speculative Bubbles*, Stiglitz, J. (ed.), *op. cit.* and Leroy, S. F., *Efficient Capital Markets and Martingales, Journal of Economic Literature*, XXVII, 1583–1621, 1989.

These two basic viewpoints by Kotlikoff and Shiller can usefully be considered in the context of Samuelson's⁵ model of the contrivance of collective or state fiat⁶ money with overlapping generations in an economy "... in which money has a positive value in spite of the fact that it is intrinsically useless (i.e. its market fundamental is zero). In other words there can exist a *bubble* on money where a bubble is defined as the difference between the market price (of an asset) and the market fundamental."⁷

Ever since Lerner⁸ pointed out that Samuelson's contrivance, which earns a positive biological rate of interest equal to the rate of growth of the population, was a chain letter swindle, it has been realized that (i) any number of rational expectations equilibria price paths can be conjured up for such economies,⁹ and that (ii) more importantly, once the chain letter swindle is understood, fiat money becomes worthless, i.e. the bubble bursts and it reverts back to its fundamental zero value.¹⁰ The money in overlapping generations models is not money in any transactions use sense. It is a pension plan where the selfish young generation agrees to tithe themselves or to make consumption transfers to the elderly not out of any love for the elderly but on the understanding that the next young cohort will do exactly the same.

Is this pension plan "real" valued? It would appear to be open exactly the same objection as Samuelson's contrivance, namely, if some young generation could be expected not to tithe themselves then neither would the preceding young generation and again by induction the pension plan bubble would burst just like the money. So the collective convention of a pay-as-you-go pension plan would have no intrinsic or fundamental value and money and/or the pension plan would be as equally good, if you place any credence in overlapping generations models, or equally useless if you do not.

The distinction between "fundamentals" and "bubbles" can be usefully considered by a comparison of fiat money and a pension plan.

Suppose collective positively valued fiat money was used to effect the distribution of the National Product across generations "today" and the collectivity then introduced a pension plan, i.e. it taxed the young and transferred the receipts to the elderly "today" on the unenforceable promise that "tomorrow's" collectivity would impose the same redistribution pension scheme. On the assumption that

⁵Samuelson, P. A., An Exact Consumption-loan Model of Interest With or Without the Social Contrivance of Money, *Journal of Political Economy*, LXVI, 467-482, 1958.

⁶The significance of fiat or intrinsically worthless money is stressed in Friedman, M. and Schwartz, A., Has Government Any Role in Money? *Journal of Monetary Economics*, XVII, 37-62, 1986.

⁷Tirole, J., Asset Bubbles and Overlapping Generations, *Econometrica*, LIII, 1071, 1985. Emphasis in the original.

⁸Lerner, A. P., Consumption-loan Interest and Money, *Journal of Political Economy*, LXVII, 512-518, 1959.

⁹See, for example, Geanakoplos, J. D. and Polemarchakis, H. M., Walrasian Indeterminacy and Keynesian Macroeconomics, *Review of Economic Studies*, LIII, 755-779, 1986.

¹⁰At some time in the future, T, the world evaporates. The young generation immediately preceding the evaporation will not save, i.e. will not purchase with goods any money offered by the old generation alive at that time and so the fiat money would be zero-valued at the end of the world (i.e. the money price of goods would be infinite.) The penultimate young generation would know, however, that they would be the elderly immediately preceding the evaporation and so they would not save and so the money price of goods in the penultimate moment would also be infinite and the fiat money worthless and so forth by induction to the present when the fiat money would be fundamentally zero-valued.

the rate of deflation associated with the money contrivance and the rate of return associated with the pension plan (and Lerner's charge of a swindle applies to them both) would be the same, would the introduction of the pension plan result in the younger generation saving more? Evidently not. The young generation paying the pension plan contributions would immediately stop purchasing the old generation's money, and the money bubble would burst. The imposition of a set of taxes and transfers under the pension plan would not affect the rate of saving and the real intertemporal income of the young and the old. One would conclude that the imposition of a government distribution scheme in the form of a pension plan, which would be identical to the money contrivance, would not affect savings since the savings of the young through the pension plan would be offset by the dissavings associated with the bursting of the money bubble. On the contrary, one could argue that, with the pension plan in existence, the introduction of the money contrivance would immediately explode the pension bubble. One bubble bursts the other but no "fundamental" reason has been given for the existence of either the pension plan or the money contrivance.

If there were no other ways in which consumption could *efficiently* be intertemporally transformed (say the rate of return to capital is *less* than the growth rate),¹¹ then the bubbles, as Samuelson¹² protested to Lerner, do seem to make each member of the community, young or old, better off intertemporally. A rationale for intrinsically worthless money or pension plans would seem to exist. Money and pension plans would be priced above their "fundamentals." Productive capital and bubbles would co-exist. As Lerner¹³ insisted, though, there is no "system" to beat the dynamically inefficient capital accumulation path on which the economy is postulated to be, unless the money and the pension plans are interpreted as collective devices to overcome the uncertainty associated with accumulation and are instruments which reflect the trust that agents have that such bubbles will not burst.¹⁴

If the young generation were not entirely selfish and saved today partly out of concern for the elderly (and the elderly made bequests) then the overlapping selfish generations can be modeled as dynastic individuals with intra- and inter-generational connections. With efficient capital accumulation, real fiat money could only exist if it provided (for some reason) real transactions services (so its positive value would seem to be based upon "fundamentals") and government pension plans would be "real" if (again for some reason) they were a more efficient means for effecting transfers than would arrangements undertaken themselves by the inter- and intra-generationally connected individuals. If the connected agents were engaged in transfers (unconstrained by boundary conditions) then if no reason is provided as to why the agents would then impose upon themselves an additional transfer scheme (e.g. social security or fiat money) the agents will neutralize the imposed tax-transfer schemes and savings will be

¹¹See Blanchard, O. J. and Fischer, S., *Lectures on Macroeconomics*, The MIT Press, Cambridge, MA, 1989, Chapter Five.

¹²Samuelson, P. A., Reply, *ibid.*, 518-522.

¹³Lerner, A. P., Rejoinder, *ibid.*, 523-525.

¹⁴See Weil, P., Confidence and the Real Value of Money in an Overlapping Generations Economy, *Quarterly Journal of Economics*, CII, 1-22, 1987.

unaffected by the collective fiscal position. The costs associated with alternative means of effecting intertemporal and intergenerational consumption transfer streams (capital accumulation; intra and intergenerational transfers; collective pension schemes and contrivances such as money) are not specified and we cannot tell which ones will be used. What seems possible to say, however, is that if, for whatever reason, we specify one as being in use, it would appear that the imposition of any other would see its effects on savings and the “real” distribution of income among the individual agents completely neutralized.¹⁵

Here then is a basic problem with Kotlikoff. If the reasons why money or a pension plan is a less costly mode for the intergenerational transfers of “real” incomes among connected agents which the individuals are themselves undertaking are not specified, the imposition of that mode upon individuals will not affect their rates of saving and the distribution of “real” income among them. If, however, I am able to specify why individuals have formed governments and why they use the instrumentalities such as money and pension plans of wider collectivities such as governments in addition to the families and even the extended families of Bernheim and Bagwell then it follows I shall have specified “real” or “fundamental” determinants of savings. The “bubble-like” quality of the money and pension plans, i.e. the bubble-like quality of the seemingly extraneous collective arrangements, will then have vanished. I cannot therefore accept one of his major findings, namely that government distribution schemes may have little effect on savings.

This problem impacts on the Shiller study as well. He notes that, in his examination of the efficiency of the single-house asset market in the U.S.A., owing to the non-existence of market rentals and the questionable nature of the imputed rents which National Accountants concoct for owner-occupied housing, his tests of efficient asset prices for this market may not be appropriate. Indeed, it can be argued that individuals find that, rather than renting, it is less costly for them to obtain the services of single-family homes by means of purchasing the assets and then producing such services jointly within the collectivity of the family. It is precisely because it is more efficient for the family to produce the services of housing when the asset is itself collectively owned and operated that it is impossible for Shiller to find the market rentals which would permit him to test the efficiency of the market price of the assets. Collective arrangements are not bubbles nor unreal conventions. Until one knows why the households have made the decision to have the services of their houses not priced in the price system one cannot even ask the question: Are single-family houses efficiently priced?

Can we make the separation between “fundamentals” and “bubbles” which is the foundation stone of the Shiller study? It would appear that as soon as money has some transactions cost savings characteristics, it becomes “real” and

¹⁵An extreme and illuminating version of this argument appears in Bernheim, B. D., and Bagwell, K., Is Everything Neutral? *Journal of Political Economy*, XCVI, 308-337, 1, 1988. In this article, if the agents are connected, they will be effecting among themselves a distribution of their endowments such that each agent is as well off as possible, taking into account the transfers being effected by each and all agents. Any other mode of rearranging the endowments, including government pension schemes or the introduction of a price system, will be neutralized by the agents themselves. In our context, not even the introduction of a price system would affect rates of saving and the “real” consumption of the individuals.

is no longer the “bubble” introduced into the overlapping generations model by Samuelson and so exposed by Lerner. Yet is this so?

In modern monetary literature, banks are said to be involved in liquidity transformations of intertemporal consumption streams which lead to equilibria in which all agents are better off but which have an ephemeral quality in that the bubbles may burst, i.e. the equilibria are bank run equilibria.¹⁶ Yet if the equilibria can be maintained by such collective conventions as deposit insurance and central banks reliably providing the collective act of lender of last resort and if the moral hazard problems associated with such collective acts can be overcome then the monetary equilibria are “real.” Although they do result in improvements in the transactions services produced by modern monetary economies, they are “bubbles” in the sense that all that stands behind them is the confidence and trust that private agents have in the discretionary conduct of the lender of last resort function of the Monetary Authorities. As Keynes argued, money is a convention,¹⁷ it is a bubble, there is nothing “real” behind it but the confidence that the convention will be maintained.

A fundamental problem confronting Shiller’s tests is the assumption that in any asset’s price, there may be two separable components: one a “fundamental” and the other a fad, a bubble, a convention. Yet if my interpretation of Keynes is correct, human knowledge is such that the separation cannot be made.¹⁸ The convention of money, more precisely the “real” value of the convention of the services of the Monetary Authorities, is as real as endowments, technology and tastes. Shiller does include monetary policy as a “fundamental,” but if the value of the services of fiat money, which is intrinsically useless, is really the value of the services of the Monetary Authorities then what precisely are the rents generated by the Authorities?

Since banks are one of the biggest consumers of the services of the Monetary Authorities, then the problem spills over into the questions: What are the rentals generated by banks? Are they independent of the conventional beliefs in the efficacy of the discretionary behaviour of that instrumentality of the collectivity, the Central Bank? If not, then what exactly are the fundamentals which lie behind the determinants of the market prices of stocks in banks? If the consumption of the services of banks entails the indirect consumption of the services of Central Banks, that is, of the convention called money, then since most industries consume such services and such services are as conventional as they are “real,” what

¹⁶See Diamong, D. W. and Dybvig, P. H., Bank Runs, Deposit Insurance, and Liquidity, *Journal of Political Economy*, XCI, 401–419, 1983.

¹⁷See Lawson, T., Keynes and Conventions, Faculty of Economics and Politics, Cambridge, mimeo, no date; Littleboy, B., *On Interpreting Keynes: A Study in Reconciliation* Routledge, London, 1990, Chapter 9 Conventions and O’Donnell, R. M., *Keynes: Philosophy, Economics and Politics: The Philosophical Foundations of Keynes’s Thought and Their Influence on His Economics and Politics*, Macmillan, London, 1989, especially Part I.

¹⁸Fischer Black seems to have a concept of “noise” which is similar to the concept of uncertain knowledge Keynes employed in his *Treatise on Probability*. To Black, noise trading in the stock market makes it virtually impossible to distinguish between efficient prices, i.e., prices based on “fundamentals” and those which are not, i.e. those based on conventions. In order for markets to be liquid in Black’s sense, which seems similar to that concept in Keynes, there must be more noise trading and the less efficient will prices be. See Black, F., “Noise”, *Journal of Finance*, XLI, July 1986, reprinted in his *Business Cycles and Equilibrium*, Blackwell’s Oxford, 1987.

exactly are the real rentals, the fundamentals, determining the efficient market prices of the assets of the firms whose stocks are used in Shiller's excessive variability hypothesis?

If one rejects bubbles and argues that collectivities must be founded upon the preferences of individuals, then there is no room for collective conventions in the determination of economic variables. One would side with Kotlikoff's view of savings and against Shiller in insisting that prices in all markets, not just capital markets, are efficient and are explained by fundamentals. The conventions arise among humans, however, because there is no way in which the fundamentals of tastes, technology and endowments can be assessed independently of the disparate theories about them held by the individuals. Fundamentals are themselves conceived of and measured by conventions.

Kotlikoff argues that savings are determined by "fundamentals" perceived by individuals in their intertemporal maximizing choices while Shiller argues that efficient markets are those in which the price of assets and therefore the wealth of the agents is determined solely by "fundamentals." Kotlikoff suggests that the role of conventions such as the state have been overemphasized in the determination of the rates of saving and accumulation in modern economies while Shiller reports what he considers to be convincing evidence that, in fact, asset prices reflect more than "fundamentals," they reflect "bubbles" as well. The two studies are magisterial in their scope, demanding in their scholarship and superb in their technique. I suggest the basic foundation which support them both, that a separation can be drawn between "fundamentals" and "conventions," is wrong.¹⁹

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¹⁹Authorities differ on whether bubbles are "popular" or "fundamental." For a view that the famous South Sea Bubble was really misnamed and was based upon fundamentals, see Garber, P. M., "Famous First Bubbles", ed. Stiglitz, *op cit*. For a view that the South Sea was simultaneously "fundamental," was a rational bubble and an irrational bubble, see Neal, L., *The Rise of Financial Capitalism: International Capital Markets in the Age of Reason*, Cambridge University Press, Cambridge, 1990.