Animal Spirits and the Future of the Macroeconomy: Lessons from the Past

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ABSTRACT

Behavioral Economics is growing in popularity and has recently been used under the auspices of Animal Spirits to develop new insights into the workings of the macroeconomy. Having discovered the concept in the Economics of Keynes, recent proponents have lost sight of the context in which the idea was introduced. It is not irrational behavior, but rather an "irrational" choice framework that creates macroeconomic difficulties. As a result, Animal Spirits comprise part of the solution rather than functioning as the source of the problem. To more fully understand the difficulties that reside in the choice framework itself, we begin with the work of Henry George whose ideas serve both as the foundation for understanding the problem as well as the source for a potential solution.

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Using Keynes as the source of their intellectual inspiration, Ackerloff and Shiller (2009) seek to apply Behavioral Economics to develop a better understanding of the Macroeconomy. Their focus is directed toward identifying noneconomic motives and irrational behavior under the guise of “Animal Spirits.” Their hope is that by developing a deeper understanding of the concept of Animal Spirits, they will be able to design more effective policies designed to assist the economy in recovery. A careful reading of Keynes however suggests that Animal Spirits are not necessarily the cause of business cycles, but rather offer a solution to the systemic problem of underinvestment that may prevent the economy from reaching a full employment equilibrium. As a result, one is left wondering: Are Animal Spirits the bane of human existence or the savior of the modern macroeconomy? More importantly, it seems that how one answers this question affects the choice of policy designed to guide the current economy out of crisis.

Rather than beginning with the much discussed Economics of Keynes, we instead turn to the work of Henry George. The rationale for starting with George is to illustrate that certain foundational ideas were “in the air” at the time and not unique to the work of Keynes. From George we then turn to Keynes in order to gain a more complete understanding of how Speculation and Enterprise influence the development of real capital assets. We then trace Keynes’ different conceptions of psychological influences and show that speculative behavior does not emerge with an unfettering of Animal Spirits. Instead, the point is made that Keynes viewed Animal Spirits as the savior of Enterprise and therefore an essential component for future expansions in the economy. The conclusion reached therefore is that rather than looking for policy options designed to dampen down these Animal Spirits, we should instead use tax policy to alter the structure of rewards in a way that rationalizes what appears to be an irrational choice problem.

Henry George and the Challenges of Land Speculation

Henry George wrote the most popular economics book of the nineteenth century. His book *Progress and Poverty* went on to sell over three million copies and in doing so, influenced an entire generation who were concerned that growing prosperity was becoming concentrated in the hands of a few. He was a self-taught economist steeped in the classical tradition dominated by the work of Smith, Ricardo and Mill (Blaug, 2000). In contrast to Marx who saw a growing inequality in the distribution of income as the result of industrialization, George wrote from his own personal experience where he observed that a growing inequality appeared to be connected to a growing concentration in land ownership.

Having spent most of his adult life in California (Cord 1965; Thomas 1983), George as a newspaper journalist observed firsthand how large tracts of land were becoming concentrated in a small number of hands and how this was accompanied by a growing gap in the distribution of income. Observing urbanization as it was occurring in real time gave George a front row seat from which he could see the rise of new opportunities associated with a massive population migration from small rural towns to the large centralized city. What George had a hard time reconciling with his personal sense of morality was how land, which he believed was given to the community as a whole, could become a tool for redistributing income from the many to the few (George 1948).

George believed that land forms a portion of the common stock given to humanity as a whole. As a result, he believed that the public should be entitled to the raw value associated with a plot of land. George however, understood very well that economic progress is a function of the division of labor and land development was necessary for any subsequent expansion. However, development relies on strong individual incentives and the challenge for George was how to ensure that the public was compensated for the use of their common resource without destroying the incentives for promoting economic growth and development. George dedicated his intellectual life trying to forge a balance between the desire for individual wealth creation and the preservation of social wealth in the hands of the community.

For George, the central problem became the high rents that individual landowners were able to command within the boundaries of a city. The city plays an important role as a platform that brings together a variety of resources capable of supporting an expansion in the division of labor. However, these gains in productivity are not the result of an effort by the landowner, but rather results from the efforts of others who build upon the advantage of close proximity to achieve otherwise unobtainable productivity gains. Thus the landowner is able to command a portion of this expanded productivity through no apparent effort, but rather from nothing more than merely being in the right place and time. As a result, gains which accrue to the public at large are appropriated by landowners resulting in a redistribution of wealth from those who are active producers to those who are passive recipients of the efforts of others.

To preserve individual incentives while ensuring that society as a whole receives its fair share, George advocated a single tax to be levied against the raw value of the land while leaving untouched the additional value that is created from any and all improvements made on top of the land. This unique approach to land value taxation forms the foundation for his subsequent conception of wealth.[1] Wealth becomes embodied in those things that are created by human labor. This is distinct from what he terms as "value from obligation." "Value from obligation, on the other hand, though a most important element of value, does not result in increased in the common stock, or in the production of wealth. It has nothing whatever to do with the production of wealth, but only with the distribution of wealth, and its proper place is under that heading (1948, p. 272)."

Therefore human labor adds to the common stock and as such, creates an increase in wealth as defined by the number of goods and services that exist in the economy. Value from obligation merely creates titles to tangible objects or services and therefore redistributes but does not add to the stock of goods and services in the economy. This distinction is important because the purchase and sale of obligations can make some better off, but only at the expense of others. Buying and selling obligations become nothing more than the equivalent of rearranging chairs on the deck of a ship. No more chairs are created; they merely change hands depending on who chooses to sit.[2]

This distinction between wealth and value from obligation becomes important because it forms the foundation for speculation. Once a set of property rights are established and title to a particular plot of land becomes vested in a deed, the title to that plot of land can be bought and sold. Optimism about the future may cause the value of the title to a plot of land to rise despite the fact that no improvements may have been made to the raw piece of land. It may merely be the belief that a city will grow and hence what appeared to be a valueless plot may find its value soar as it becomes incorporated within expanding city limits.

George's approach to land valuation can be understood with the following equation:

$$R_j = R_{uv} + S(R_{dv} - R_{uv})$$

Where:

- R_j = Rent on an individual piece of property
- R_{uv} = Property's unimproved value
- R_{dv} = Property's developed value
- S = Social value associated with the growth of the city

An undeveloped parcel of land has a certain inherent value that is determined by the resources it contains or its ability to be used in an unimproved state. Grazing cattle, open space, or serving as a buffer are just some examples of value that exists without improvements. The value of a developed parcel is what exists after building housing unit(s), factory, or some other improvements. However, an additional social benefit is created when land is developed. In so far as the construction of a new factory leads to the development of similar industrial enterprises in close proximity, the corresponding agglomeration effects will lead to an expansion in the division of labor and hence the wealth of the community as a whole. This social value that is created depends on what George would call the "growth of the city."[3]

The value of a particular parcel of land is then nothing more than the capitalized value of future rents.

$$P_j = R_t/(1+i)^t$$

Where:

- P_i = Price of an individual piece of property
- R_i = Property's rental value
- i = interest rate
- t = Time

However, once a market develops for the sale of land, the market price may deviate from the capitalized value. This may occur because of differences in the views held about the developed value of a parcel, the contribution that parcel makes toward the division of labor, or the length of time until current market values reach their developed values. Therefore:

$$E(P_j) = P_{uv} + S(E(P_{dv}) - P_{uv})$$

Where:

P_j = Capitalized rent on an individual piece of property
P_{uv} = Property's unimproved value
P_{dv} = Property's developed value
S = Social value associated with the growth of the city

Differing expectations about the price of a parcel of land can create opportunities for speculators who are betting that the development potential or the social benefits associated with a parcel are greater than the current discounted stream of rents. Speculation is thought to be bad because George believed that if the extra-normal rents associated with land in possession of a superior location were not taxed away, then economic activity would become more focused on the generation of rents on existing activities rather than focusing efforts on the production of new value. The net result would be that less value is created because the profits associated with land speculation exceed the potential returns associated with the production of goods and services.[4]

George's concern emanates from that belief that speculation has the effect of pushing land values beyond their marginal revenue product; thereby driving up costs and reducing profits. [5] Firms respond to lower profits by reducing production. The reduction in production reduces employment which subsequently negatively impacts demand. Since firms produce for inventory rather than necessarily an individual order, the corresponding reduction in effective demand has firms holding too many inventories. This unanticipated buildup in inventories leads to a glut of goods on the market. "The period of depression thus ensuing would continue until (1) the speculative advance in rents had been lost; or (2) the increase in the efficiency of labor, owing to the growth of population and the progress of improvement; had enabled the normal rent line to overtake the speculative rent line; or (3) labor and capital had become reconciled to engaging in production for smaller returns. (1948, p. 265)"

Animal Spirits

By the time Keynes pens his *General Theory*, an important shift has occurred in the development of the business enterprise. Economies of scale and scope shifted the balance of activity from the family owned and controlled business to that of the modern corporation where ownership and control are not necessarily vested in the same hands (Chandler, 1977). The rise of the joint-stock corporation where certificates represent shares in ownership of the underlying capital assets that comprise the firm becomes the dominant form of enterprise. As a result, these stock certificates become what George characterized as value in obligation and the real assets of the firm can be characterized in what George would have described as wealth.

The real assets of a company are utilized in the production of goods and services while the shares of stock represent nothing more than an obligation on the part of the enterprise to vest a portion of ownership of these real assets in the hands of the holder of the paper certificate.

It is the separation of ownership and control that gives rise to financial markets enabling one to revise their commitments on an hourly or in fact, minute by minute basis, thereby dramatically changing the incentives for engaging in enterprise.[6] On the one hand, an entrepreneur no longer need consider the long-term ramifications of a capital investment because once a new factory is built or machinery acquired, a financial asset representing that piece of capital could be created and sold. Thus value is no longer necessarily tied to the ability of that asset to generate a future stream of earnings within a specific production process, but rather may be influenced by the perceptions of the larger investment community. As Keynes describes it:

> …Americans are apt to be unduly interested in discovering what average opinion believes average opinion to be; and this national weakness finds its nemesis in the stock market. It is rare, one is told, for an American to invest, as many Englishmen still do, "for income"; and he will not readily purchase an investment except in the hope of capital appreciation. This is only another way of saying that, when he purchases an investment, the American is attaching his hopes, not so much to its prospective yield, as to a favourable change in the conventional basis of valuation, i.e. that he is, in the above sense, a speculator (1936, p. 159).

Just as for George a divergence between the market price and the underlying rental value of a piece of property can have real adverse effects on the economy, the same is true for Keynes. Keynes draws a distinction between the buying and selling of financial assets under the guise of Speculation as being something distinct from Enterprise: the production of real capital assets. As Keynes tells us, "Speculators may do no harm as bubbles on a steady stream of enterprise. But the position is serious when enterprise becomes the bubble on a whirlpool of speculation. When the capital development of a country becomes a by-product of the activities of a casino, the job is likely to be ill-done (1936, p. 159)." Here speculation can cause the price of financial assets to deviate from their underlying real value and as a result, affect the amount of investment spending in the economy. If the expected stream of earnings (dividend value) from the production of real capital assets becomes significantly less than the return one can obtain from buying and selling financial titles to existing capital assets, this would adversely affect the level of effective demand and hence the amount of employment in the economy.[7]

Perhaps more importantly, Keynes recognized the existence of a potentially more destructive effect on long-term Aggregate Output: an endemic lack of investment spending in real capital assets. As noted by Brockway (1983, p. 520) "Not only does speculation survive in conditions that dampens enterprise, it actually thrives in such conditions for whatever money there is has to go somewhere." If it is easier to buy and sell financial obligations for a profit than it is to invest in real capital assets and actually produce something, then the level of investment expenditure in the economy may not be sufficiently large to generate a full employment equilibrium in both the short and the long runs. This leads to what we might call

The Fundamental Reversal. The Fundamental Reversal refers to the point where it becomes rational to buy and sell securities and potentially irrational to actually produce things of value.

This reversal between the rational and irrational has a chilling effect on the future of the macroeconomy. When it no longer is rational to invest in plant and equipment, any hope of maintaining, let alone increasing the level of economic activity becomes a far remoter possibility. To counter this prospective macroeconomic disaster, Keynes introduces the concept of Animal Spirits. Animal Spirits take on the form of a spontaneous optimism designed to get the rational maximizing individual to dispense with the traditional choice framework and invest in real assets. Thus Animal Spirits are not the embodiment of irrational behavior that creates speculative bubbles, but rather take on the form of a mitigating influence that inspires individuals to choose a losing proposition for what becomes the good of society as a whole (Koppl, 1991).[8]

When addressing the question of psychology and its effect on macroeconomics, it is important to note that there is not one single conception that pervades the entire *General Theory*. In the index to the *General Theory*, there are three distinct entries related to the word: Psychology. These entries are noted in the following way:

1. Psychological factors –
   the ultimate, 246-7
      and stability, 250-54
2. Psychology of enterprise, 150-51, 161-3
3. Psychology, mass, of investors, 154-155, 159, 317

In the first grouping, Keynes makes reference to the "ultimate independent variables" that include three fundamental psychological factors: 1] the psychological propensity to consume; 2] the psychological attitude to liquidity; and, 3] the psychological expectation of future yield from capital-assets. The importance of these psychological factors is that they determine the size and impact of the multiplier effect, the interest rate, and the level of investment. More importantly, they are all the result of a cognitive thought process that is consistent with a rational choice framework.

The third category has conventional valuation as a product of mass psychology. This mass psychology creates the basis for conventions that form the foundation for valuations and the corresponding "beauty contests" held to evaluate public opinion. In the modern parlance of Behavioral Economics, we might speak instead of heuristics, anchors, focal points and status quo bias (Pech and Milan, 2009).

However, the discussion of Animal Spirits does not emerge with category 1 or category 3, but rests firmly in what Keynes refers to as the Psychology of Enterprise. What is at issue here is not the speculative behavior of investors in financial markets, but the decision making by managers who use scientific reasoning rather than the instincts and the "seat of the pants" calculations employed by entrepreneurs of old. What is at issue here is not a mass psychology that is required of everyone, but rather one that is needed by a certain class of individual with a specific role to play.[9]

What Keynes required was a description that incorporated a non-cognitive psychological function that could defy a rational cognitive thought process. As a result, the subject of animal spirits appears under the index heading of psychology of enterprise. This psychology of enterprise first appears in reference to a discussion about "former times, when enterprises were mainly owned by those who undertook them or by their friends and associates, investment depended on a sufficient supply of individuals of sanguine temperament and constructive impulses who embarked on business as a way of life, not really relying on a precise calculation of prospective profit. The affair was partly a lottery, though with the ultimate result largely governed by whether the abilities and character of the managers were above or below average (1936, p. 150)." [10]

After describing enterprise as mixed game of skill and chance, Keynes goes on to say "If human nature felt no temptation to take a chance, no satisfaction (profit apart) in constructing a factory, a railway, a mine or a farm, there might not be much investment merely as the result of cold calculation (1936, p. 150)." This is required because Keynes believed that "it is probable that the actual average results of investments, even during periods of progress and prosperity, have disappointed the hopes which prompted them (1936, p. 150)." Hence if one could determine the likely outcome (something Keynes believed was highly unlikely), there is not much of a rational basis for engaging in enterprise.

Keynes goes on to discuss the instability caused by speculation, but then wishes to discuss a different source of instability. This instability is "due to the characteristic of human nature that a large proportion of our positive activities depend on spontaneous optimism rather than on a mathematical expectation… (1936, p. 161)." He goes on to reinforce this point by writing: "Most, probably, of our decisions to do something positive, the full consequences of which will be drawn out over many days to come, can only be taken as a result of animal spirits- of a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities (1936, p. 161)." This is augmented by his remark that: "…individual initiative will only be adequate when reasonable calculation is supplemented and supported by animal spirits, so that the thought of ultimate loss which often overtakes pioneers, as experience undoubtedly tells us and them, is put aside as a healthy man puts aside the expectation of death (1936, p. 162)." In describing this spontaneous optimism, Keynes refers to an urge to action resulting from the existence of "animal spirits."

The modern use of the concept of animal spirits is to evoke some notion of irrationality (Koppl 1991, Akerlof and Shiller 2009). However, Animal Spirits are generally attributed to a noncognitive thought process. For example, Akerlof and Shiller (2009) describe them in the following manner:

> The term animal spirits originated in ancient times, and the works of the ancient physician Galen (ca. 30-ca. 200) have been widely quoted ever since as a source for it. The term was commonly used in medicine through medieval times and up until Robert Burton's The Anatomy of Melancholy (1635) and Rene Descartes' Traite de l'Homme (1972[1664]). There were said to be three spirits: the spiritus

> vitalis that originated in the heart, the spiritus naturalis that originated in the liver, and the spiritus animalis that originated in the brain. The philosopher George Santayana (1955[1923], p. 245) built a system of philosophy around the centrality of "animal faith," which he defined as "a pure and absolute spirit, an imperceptible cognitive energy, whose essence is intuition (2009, pp. 177 – 178).

Controversy over whether Keynes derived the concept from Descartes, Hume or even Marx was the topic of correspondence in the Summer 2002 issue of the *Journal of Economic Perspectives*.[11] In response to the controversy, Koppl wrote:

> In Descartes' theory, animal spirits explain error. For him, animal spirits can lead to nothing but regret and repentance. In Keynes's theory, too, animal spirits lead to error. They make us invest. …If Keynes intended to allude to Descartes, then we may take his use of the term to be both a joke and a lesson. The joke is that socially beneficial investment in commercial society is a mistake from a Benthamite perspective. The lesson is that in a non-Cartesian world, Cartesian reason may not promote the social good (1992, p. 212).

From our perspective here, it is not a question of whether Cartesian or non-Cartesian reasoning is at work. The point we wish to emphasize is that it is not reason at all that promotes the social good when it comes to Enterprise. From Keynes' perspective, thought leads to inaction while Spirits go where no rational mind would venture. Thus a non-thoughtful urge to action becomes the voice of reason while thoughtful enterprise remains the vehicle for fools.

Policy Discussion

The institutional transition to an economy where financial markets, rather than entrepreneurs, have the power to determine to what extent investment in new capital assets will take place leads Keynes back to wistfully remember the 'good old days' when new investment had a greater degree of permanence as it did in those days prior to the separation of ownership and control of corporate enterprises. Barring what he characterizes as a "radical cure" which would give an individual no choice but require that she place an order for a specific capital investment, then an economy is left to the vagaries of "spontaneous optimism" to ensure that sufficient investment takes place.

Just as the separation of ownership and control gave rise to the modern corporation and with it, the ability to increase individual income without an expansion in social wealth, a similar revolution that has further separated real capital assets from the tradable securities that establish the market value of those same assets, has further expanded the opportunities to acquire additional income without a corresponding expansion in social wealth. The process of securitization has expanded the reach of local markets, thereby enabling trade in financial assets to expand beyond traditional geographical boundaries. The bundling of financial instruments such as collateralized debt obligations into larger packages that can be sold to international investors has increased the scale and scope in the trade of assets known as derivatives that are one step further removed from the real assets that they represent.

Derivatives by definition are financial assets that derive their value from something else. Just as Keynes spoke of the challenge of trying to guess what the average opinion of the average opinion of public opinion really is, we have an even more vexing problem of valuing paper assets whose value depends on other pieces of paper. Yet the problem remains that if it is still easier to make money buying and selling derivatives than to create the underlying assets that serve as the source of value of the derivative, then Enterprise will come to a halt. As a result*, investors rather than entrepreneurs* end up setting the pace for growth in the economy. The effect of securitization is therefore to further expand an imbalance that gives rise to the need for animal spirits.

The tension between Speculation and Enterprise found in Keynes was not something unfamiliar to Henry George. George was concerned that if individuals were allowed to speculate on land values without actually building anything on the land itself, poverty would continue to exist amidst plenty. Unless property is actively used, the division of labor cannot expand and hence wealth cannot grow. Thus George reached the conclusion that the only way to abolish poverty is to tax away the gains from speculation in order to keep land prices low, and in turn, provide an inexpensive platform for an expansion in the division of labor.

If the landowner is also the entrepreneur, then there are two forms of private benefit associated with an expansion in economic activity. The first are those gains attributable to improvements made on the land. The construction of a factory and the corresponding expansion of the division of labor create a future stream of earnings that captures the gains associated with the increase in productivity. The second set of gains is associated with the location decision made by others. If enough factories are located next to each other the corresponding gains from agglomeration will increase land prices and hence doubly reward the entrepreneur for her initial location decision.

What we see is that George is challenged by the same separation of ownership and control issues that confronted Keynes. For George, ownership of land and the construction of structures on that parcel are two distinct activities. Each has its own reward. The former creates a value of obligation and is subject to speculation while the latter creates wealth. A similar distinction is found in Keynes where financial assets create a corresponding value of obligation whose relative returns becomes the subject of speculation and the construction of real capital assets leading to the creation of additional wealth.

This split between ownership and control not only opens the door for speculation to emerge, but creates the corresponding problem where the gains from speculation are easier to obtain than from those rewards associated with hard work. As a result, wealth creation becomes the step child of speculative behavior. The obvious solution would therefore seem to be to create policies designed to curb speculation. By limiting the gains from speculation, wealth creating activities will be in a stronger position to compete in the arena of rewards versus effort. If however, the gains from speculation are eliminated, will the rewards from production via an expanded division of labor be large enough to justify the investment in time and effort along with the risk associated with the creation and construction of Enterprise in the first place?

If the price of a financial asset merely represented a stream of discounted future earnings, then investing in financial assets would not be more attractive than engaging in Enterprise. Keynes realized this when he casually wishes that one could force an investor to hold an asset until death. However, the ability to realize capital gains makes the potential return from investing in financial assets greater than the return from Enterprise and this forms the crux of the problem. While the gains from speculation reward title holders, they do not find their way back to Enterprisers and hence do not increase the incentives for investing in real plant and equipment. In fact they have the opposite effect by increasing the potential rewards to finance, and as a result, create a more attractive alternative to Enterprise.

One might therefore conclude that imposing the George tax solution may only partially solve the problem. By taxing away capital gains, the rewards from buying and selling financial assets would no longer dominate the decision to invest in real plant and equipment. At that point, individuals should be indifferent between owning a real capital asset or a title to that same asset. Hence the choice to engage in Enterprise is no longer one which depends on a spontaneous urge because a rational choice problem would lead one to conclude that the reward from finance no longer dominates the reward from engaging in real economic activity.

However, if capital gains are fully taxed, there might not be sufficient incentive to buy the financial asset. In a world of uncertainty , there is a risk to buying a financial asset. If there is nothing to reward that element of risk, then there might not be any interest in purchasing financial assets. Without interest in owning titles, there are no funds to invest in real capital assets. However, if investors are allowed to retain all potential gains, there exists more incentive to invest in titles than in the assets themselves. Hence we reach a paradox. To reward investors for assuming a certain amount of risk and therefore provide them with sufficient incentive to purchase financial assets, there must be a reward equivalent to capital gains. However, the more capital gains that accrue to the financial investor, the greater the incentive there is to just buy and sell financial titles rather than purchase capital assets for the purpose of engaging in Enterprise.

There is however a solution. Investors can only earn a reward if there are financial titles to purchase. Therefore they should be willing to give up some of their gains to subsidize real investment so that the pool of titles expands. An expansion in the number of financial titles would increase the amount of financial activity and hence expand prospects for future gains. One way for accomplishing this is to have the government tax a portion of the capital gains, but instead of using those revenues to fund general government expenditures, return those funds to enterprisers in the form of tax credits. Conceptually this is no different from how the government subsidizes research in the hopes of spurring commercial innovation. The result of implementing such a policy would be that Enterprise no longer depends on spontaneous urges, but instead depends on taking a portion of the rewards from Speculation and using it to fund additional Enterprise.

Concluding Remarks

When prices no longer represent the underlying value of a real capital asset, there is a tendency to blame the "irrational" behavior of investors. If these foolish individuals would just in some sense "get with the program," financial bubbles or other irregularities would disappear like a cloud of dust. More importantly, the adverse economic consequences of rapid swings in financial markets would become a thing of the past. Economists like George Akerlof and Robert Schiller are advocating policies designed to "fix" the problem by eradicating irrational behavior from human consciousness. In doing so, they are missing the main point raised by Keynes that in certain circumstances, what appears to be irrational is actually a good thing. Animal Spirits are willing to go where no rational mind travels and therefore is something to nurture rather than destroy.

It is difficult to imagine how the government may go about enhancing a spontaneous urge toward optimism. Nudging (Thaler and Sunstein, 2008) individuals to go where rational calculation fears to tread would require a greater understanding of the human psyche than currently exists today. That being said, the policy position reached here is not to focus on human behavior, but rather to look more closely at the structural elements that influence how these particular markets work for understanding both the source of the problem and potential solutions. By returning to the work of Henry George, it becomes possible to see how it is not a reprogramming of mental processes that is needed, but rather a change in the structure of rewards.

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NOTES

[1] Land is so important because production cannot take place without it. “Land is the source of all wealth (1948, p. 272).”

[2] “The reason why, in spite of the increase of productive power, wages constantly tend to a minimum which will give but a bare living, is that, with increase in productive power, rent tend to even greater increase, thus producing a constant tendency to the forcing down of wages (1948, p. 282).”

[3] The relationship between the division of labor and social capital is discussed in more detail in Niman (2011).

[4] To curb speculation, George wants to create a single tax (T) where $T = S(R_{dv} – R_{rv})$. Hence if the fully realized returns would always be completely taxed away, there is nothing for a speculator to gain.

[5] “Therefore, if speculation be the cause of these industrial depressions, it must be speculation in things not the production of labor, but yet necessary to the exertion of labor in the production of wealth – of things of fixed quantity; that is to say, it must be speculation in land (1948, p. 268).”

[6] The emergence and subsequent growth of financial markets shares similarities with George's conception of the growth of the city. Many investors are risk averse and to reduce the amount of risk they must bear, look to construct diversified portfolios containing a mix of financial assets. While the value of each financial asset is dependent on the underlying value of the real assets it represents, the existence of multiple assets confers a "social" benefit in so far that it can be used to create a hedge against risk when part of a portfolio of assets.

[7] This point relates to Keynes' own investment experience. See Mini (1995) and more recently Fantacci, Marcuzzo and Sanfilippo (2010).

[8] While George and Keynes share the notion that public interests exist independently from private ones, there is no analogous concept to Animal Spirits in George's work. For George, what differentiates human beings from animals is the ability to reason in a thoughtful way rather than being driven exclusively by instinct (1941, pp. 16 – 17). This reasoning becomes embodied in the fundamental principle underlying all of economics that men seek to satisfy their desires with the least amount of exertion (1941, p. 86). Hence George does not entertain the idea of spontaneous urges or behavior that does not conform to this fundamental law.

[9] The importance of a particular type of individual can be found in Marshall's *Industry and Trade*.

[10] Keynes' discussion of the managerial function within the firm associated with the separation of ownership and control is very Marshallian. A more detailed discussion of Marshall's conception of the managerial function within the firm is discussed in Niman (2008).

[11] Contributors to this exchange (*Journal of Economic Perspectives* 6(3): 207 – 212) included Don Moggridge, Hans Visser, Terutomo Ozawa, and Roger Koppl.