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## Macroeconomics of speculation

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**Working Paper No. 424**

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**Macroeconomics of Speculation**

by

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I would like to thank Amit Bhaduri for his helpful comments on an earlier draft of this paper.

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Minsky's (1975) seminal contribution was to underscore the importance of speculation in economic activity. Emphasizing that a firm's investment decision is inherently a speculative one, he reintroduced asset prices back into Keynesian theory of investment. Any decision to acquire real capital assets, as he was keen to emphasize, bequeaths the firm with a certain liability structure that shapes its balance sheet for a long time to come. The market price of financial assets the firm issues to finance its expenditures reflects the future profit expectations at that time, but these expected returns might never realize as expected. Thus, any particular liability structure the firm puts in place on the basis of a set of future earnings expectations is either validated or contradicted by future events, with possibly dire consequences for its balance sheet. Since future earnings associated with real assets are uncertain, while the cash flow obligations of the firm stemming from its liabilities are not, all investment decisions inevitably involve a significant degree of speculation.

Yet, despite his emphasis on the speculative character of investment decisions, Minsky paid little attention to asset price speculation *per se*, ignoring asset price bubbles and their macroeconomic effects. That is perhaps because his views were formed during the era of financial regulation, when speculation "could do no harm as bubbles on a steady stream of enterprise." Clearly, times have since changed. Especially, in the 1990s, the world has seen the rise and burst of the high tech stock market bubble in the US, the persistence of liquidity trap in Japan and one currency crisis after another in emerging markets, all attesting to the growing importance of financial speculation in asset prices in economic life. Keynes's old warning that the situation "...is serious when enterprise becomes the bubble on a whirlpool of speculation" has begun to ring true again. But, now, having paid little attention to the possibility of asset price bubbles for so long, economists seem to lack a clear idea as to how to conceptualize, let alone study, the macroeconomics of asset price bubbles. Especially damaging has been the pervasive influence of the efficient market hypothesis among economists since its rise in the 1960s, which had the effect of bolstering Friedman's (1953) contention that profitable speculation has to be by its very nature stabilizing. Most mainstream economists still subscribe to the view that asset price bubbles cannot possibly exist.

By contrast, heterodox economists have all along recognized that financial markets could function like a "casino." But, it is hard to say that they have successfully developed a theory of asset price speculation and its macroeconomic effects on the basis of Keynes's perceptive insights in the *General Theory* on the stock exchange. Of course, the task was not

made any easier by Keynes himself who had shied away from weaving back his insights on the “beauty contest” nature of the asset price determination into his theory of investment and output in the GT, other than to suggest that the marginal efficiency of capital schedule could be subject to abrupt shifts. By contrast, in his earlier work, *A Treatise on Money*, asset price expectations and speculation, and what he then called financial circulation, played an integral part in his macroeconomic analysis of the trade cycle. Keynes on occasion remarked that his two works, the GT and the *Treatise*, complemented each other on monetary and financial matters, but among the following generations of his readers few had the benefit of any in depth knowledge of his earlier work.

The objective of this paper is to revisit the *Treatise* for the fresh insights it can give in developing our understanding of financial macroeconomics that can also be of interest in enriching modern heterodox macroeconomic theory. This is made timely an exercise not only by the rising frequency of financial crises around the world, but also because the *behavioral* theory of finance, which has recently emerged in reaction to the efficient market hypothesis in the modern finance literature, seem to corroborate many of Keynes’s forgotten arguments in the *Treatise* along with his “beauty contest” analogy in the GT.

The following discussion is organized in four sections. First section gives an overview of Keynes’s treatment of asset price speculation in the *Treatise* in the context of his business cycle analysis. The second section discusses the conditions under which speculation can be destabilizing. The third section develops a generic macroeconomic model with diagrams to highlight how output determination might work with self-sustained biases in asset price expectations in financial markets, which also captures the gist of the macroeconomic argument that is implicit in the *Treatise*. This is then contrasted with the argument in the GT. The last section includes a few concluding comments.

## **I. ASSET PRICE SPECULATION IN THE *TREATISE***

In the *Treatise*, monetary circulation has two components, industrial and financial, that are associated, respectively, with the circulation of goods and services and that of titles to financial wealth. The amount of money in industrial circulation is closely related to the level of output and expenditures. Financial circulation, by contrast, primarily reflects the size of what Keynes called the bear position, referring to those who choose to keep their resources in liquid form

having sold securities short. Keynes took the volume of *cash* deposits as a rough measure of the size of industrial circulation and *savings* deposits as that of the financial circulation.<sup>1</sup>

The desire to remain more, or less, liquid is of course not independent of the actual changes in security prices. The fall (rise) in security prices in relation to the short term rate of interest can partially offset the bearish (bullish) sentiment, thus the actual increase (decrease) in the volume of savings deposits also depends on the extent of the fall in securities prices. This implies that, “[t]here will be a level of security prices which on the average opinion just balances the bullishness [or bearishness], so that the volume of savings deposits is unchanged.” (CW, V, p. 224). If security prices fall (rise) beyond this point, then the savings deposits might actually decrease (increase). Keynes’s GT assumption that security price changes just balance the movements in bearish sentiment is here only a remote possibility.

In the *Treatise*, Keynes defines four types of speculative markets in connection with different configurations of the bear position (CW, V, p. 226). These typically correspond to different phases of the business cycle. The first involves a decreasing bear position, i.e., a decreasing volume of saving deposits, at a time of rising security prices. Keynes calls this a “bull market with a consensus of opinion” and distinguishes it from a “bull market with a difference of opinion” where the bear position is increasing at a time when security prices are also rising. In the former case, which typically holds during early expansion, the preponderance of market opinion holds that security prices have not risen sufficiently, while in the latter case, corresponding normally to late expansion, an ever rising segment of the market thinks that security prices have risen more than sufficiently. The third case, which corresponds to early recession, is a “bear market with a consensus,” and again Keynes distinguishes this from a “bear market with a division of opinion.” The former involves a rising bear position, i.e., increasing volume of saving deposits, at a time of falling security prices and the latter a decreasing bear position when security prices are still falling. In the former, the predominant market opinion is that security prices have not fallen sufficiently and that they have fallen more than sufficiently in the latter.

From the point of view of orthodox theory of finance, it does not make any sense to say that security prices have increased or decreased more, or less, than *sufficiently* if no new information has emerged at a given point in time. For, if securities are thought to be undervalued, then arbitrageurs would continue to buy them until their prices are bid up to a level that is no longer considered low. Likewise, if securities are thought to be overvalued, again,

arbitrage would bring their value down to a level consistent with what is considered to be their “true” value. Thus, at a given point in time, with a given information set, the prevailing asset prices must be the best estimates of fundamental values.<sup>2</sup>

However, Keynes’s approach in the *Treatise* is consistent with the modern “noise trader” (or the so-called *behavioral*) approach to finance, which holds that *riskless* arbitrage is not effective in relation to the prices of shares or bonds as a whole and severely limited even when it comes to the relative prices of individual assets (Shleifer and Summers 1990, Shleifer and Vishny 1997). According to this view, even when it is assumed that arbitrageurs know what fundamental values are, they face no *riskless* arbitrage opportunities when actual prices deviate from their true values. For with a finite time horizon, an arbitrageur faces two kinds of risk: when s/he, say, sells overvalued assets short it is possible that by the time s/he is supposed to liquidate his/her position (i). the economy can grow so rapidly that the true values increase, or, more importantly, (ii). the asset prices might be even more overpriced. In both cases, the arbitrageur would be experiencing heavy losses. Thus, the fear of loss would limit the initial positions the arbitrageurs take and thus prevent them from driving prices down in any significant way. Moreover, if we drop the assumption that arbitrageurs know what the true values are, the risk of loss they face is higher, and the compensatory shift in demand for the undervalued securities smaller.

In a vein very similar to the modern behavioral approach, in the *Treatise*, Keynes remarks that when prices deviate from their “true” values no automatic mechanism exists in the short run to check their deviation. *Opinion*, or what we would today call, *noise* (Black 1986) moves prices. “If everyone agrees that securities are worth more, and if everyone is a “bull” in the sense of preferring securities at a rising price to increasing his savings deposits, there is no limit to the rise in price of securities and no effective check arises from a shortage of money” (CW, V, p. 229). However, as prices continue to rise, a “bear” position begins to develop, and that is what can eventually check the rise in prices. “...[I]n proportion as the prevailing opinion comes to seem unreasonable to more cautious people, the “other view” will tend to develop, with the result of an increase in the “bear” position...” (CW, V, p. 228-9).

In Keynes’s discussion in the *Treatise*, the rise of the bear position at a time when security prices are rising plays an important role in explaining the turning point of a business cycle expansion. In his view, “it is astonishing ... how large a change in the earnings bill can be looked after by the banking system without an apparent breach in its principles and traditions”

(CW, V, p. 272). Yet, the banking system's ability to accommodate a rising level of production is typically impaired at some point during a business cycle expansion. That happens typically not because the banking sector is held back by the central bank or faces some intrinsic difficulty, but because the financial sentiment falters. The trigger can have a myriad of immediate causes but the underlying reason is almost invariably the fact that the actual performance of profits, though they might still be rising, falls short of the high expectations that underlie asset prices. As the view that the market might be overvalued begins to take hold, the bear position develops, and "...the tendency of the financial circulation to increase, on the top of the increase in the industrial circulation ...break[s] the back of the banking system and cause it at long last to impose a rate of interest, which is not only fully equal to the natural rate but, very likely in the changed circumstances, well above it" (CW, V, p. 272).

In a similar manner, a declining bear position during a business upswing prevents the interest rate from rising with increasing levels of activity. Again, *stock* decisions dominate *flow* decisions. It can, stylistically, be thought that in a given accounting period the amount by which the net increase in new securities issued by firms (investment) exceeds the net increase in demand for such securities by savers (savings) are purchased by those speculators who, expecting securities' prices to rise, draw down saving deposits in the aggregate. In fact, if the bullish sentiment is strong enough the prices of securities can even rise, implying that the bond rate might actually decrease rather than increase. Thus, independently of the policy of the banking system, an increase in investment in excess of saving need not put any downward pressure on asset prices.

## II. "BEAUTY CONTEST" AND ASSET PRICE BUBBLES

Ever since Friedman (1953) argued that destabilizing speculation would be unprofitable, and, thus, unsustainable in the long run, the mainstream view among economists has assumed that speculation as a rule could not be destabilizing. Asset price bubbles were considered highly unlikely if not impossible in a "normally" functioning market.

The intuition behind Friedman's argument rested on a simple view of arbitrage, in which the market comprises smart traders who know the true values and misinformed noise-traders. If securities are undervalued, as the argument goes, then the smart traders would continue to buy them until their prices are bid up to their true value. Likewise, if securities are overvalued, smart

traders would sell them, bringing their price down to their true value. Indeed, under these conditions, speculation is always stabilizing and profitable. Misinformed noise traders create riskless arbitrage opportunities that smart traders profit from, while making losses themselves. In other words, this implies that the rate of current price change is a function of the difference between the current price and the expected future price, which is by assumption equal to *true* value. In simple terms:

$$\frac{dP}{dt} = j(P^e - P), \quad (1)$$

where,  $P^e$ , the future expected price, is assumed to be constant ( $P^e = \bar{P}$ ) and equal to the *true* value, and  $j$  is the adjustment coefficient indicating the speed with which traders respond to changes in current price. When

$$P > P^e \quad \text{then} \quad \frac{dP}{dt} < 0$$

and  $P < P^e$  then  $\frac{dP}{dt} > 0$ .

The time path of price is given by,

$$P(t) = P(0)e^{-jt} + P^e,$$

which clearly cannot be unstable, since the stability condition  $j > 0$  is always satisfied because the speed of adjustment is positive by definition.

Undoubtedly, the assumption that smart traders or speculators know with certainty what the true value is, is exceedingly unrealistic. But, even under this strong assumption, it does not necessarily follow that the deviation of the current price of an asset from its true value creates a riskless arbitrage opportunity. As mentioned above, the speculator who sells overvalued assets short can find that by the time s/he is supposed to close his/her position, the true value has increased, or, that the assets in question have become even more overpriced.<sup>3</sup> In both situations,



the speculators who have sold securities short would be making losses. Even if the true value is known, it does not follow that it would be equal to the expected future price. Thus, because the fear of making losses would cause smart traders to limit the initial positions they take, in an over or undervalued asset, current price might not smoothly adjust to its true value. Needless to say, if we drop the assumption that speculators know what the true value is, the risk of loss they perceive is likely to be higher, and the compensatory shift in demand for undervalued assets smaller. That is why the modern *behavioral* approach to finance holds that the effect of arbitrage can be severely limited.

This also takes us very close to a world described in Keynes's (1936, Ch. 12) famous beauty contest analogy, where speculators base their expectations of future asset prices not only on what they think the true value is, but, more importantly, on what they think the average opinion about the average opinion is. In other words, *noise* (Black 1986) is at least as important as information about true values in causing asset price changes, rendering the resale price uncertain. Uncertainty about the future resale price means that traders lack a terminal value from which to backwardize, which in turn implies that they must not only form higher order expectations (i.e., on what others think others think) but also decide how much weight to assign them relative to what they themselves think the true value is (Hirota and Sunder 2003). Since no direct information exists on others's higher order expectations, traders have to infer that from market trends, i.e., the magnitude and direction of changes in current price.

For instance, if a trader observes that the price of an asset (or an asset group) which s/he thinks is already overvalued is still rising in price, s/he is led to surmise that either her/his opinion about the true value is wrong or that the price increase indicates a bubble, i.e., a self-sustained rise in price on account of noise trading driven by the average opinion thinking that the average opinion thinks the price will keep on rising. In either case, the current price changes are likely to gain in importance in how the trader forms his/her expectation about the future price. The current change in price becomes either a proxy for the higher order expectations or a corrective on opinions about the true value, or, some combination of both.

If so, the crucial variable that determines whether speculation is stabilizing or not very much depends on the relative weight traders assign to their higher order expectations (i.e., what they think others think others think) relative to their own assessment of what the true value is. To the extent that they do, they become more responsive to the current price change in forming their expectations about the future price. In Kaldor's (1939) formulation, whether speculation is

stabilizing or not in this setting depends on the elasticity of future price expectations with respect to present price changes.<sup>4</sup>

If indeed the expected future price can be thought to comprise two parts, then we can write:

$$P^e = \bar{P} + \sigma \frac{dP}{dt}, \quad (2)$$

where  $\bar{P}$  is what the true value is believed to be (and is assumed constant for simplicity), and  $\sigma$  is the coefficient of elasticity of expectation of the future price with respect to the current change in price.

Plugging (2) in (1) gives:

$$\frac{dP}{dt} = j[\bar{P} + \sigma \frac{dP}{dt} - P],$$

and rearranging we get;

$$\frac{dP}{dt} + \frac{j}{1-\sigma j} P = \frac{j}{1-\sigma j} \bar{P}$$

which, in turn yields the following time path of price;

$$P(t) = [P(0) - \bar{P}]e^{\frac{-j}{1-\sigma j}t} + \bar{P}$$

The stability condition,  $\sigma < \frac{1}{j}$ , shows that stability depends on both the elasticity of expectations and the reaction speed. If the reaction speed is assumed instantaneous ( $j = 1$ ), a less than unitary elasticity of expectations ( $\sigma < 1$ ) ensures stability, as Kaldor argued. In other words, destabilizing speculation—and an asset price bubble—requires that traders revise their

expected future price proportionally more than the change in current price. However, the lower is the reaction speed ( $j < 1$ ), the greater is the extent to which the threshold value of  $\sigma$  exceeds unity.

It is highly plausible that both the reaction speed ( $j$ ) and the elasticity of expectations ( $\sigma$ ) might respond to changes in market opinion as to the degree to which asset prices are overvalued. As remarked above, if a trader observes that the actual price is well above what s/he thinks the true value is and still rising, s/he either begins to lose confidence in his/her own opinion on what is reasonable or think that asset price increases have acquired the character of a bubble. In either case, an increasing number of traders who might think alike will either leave the market or become much more responsive to current price movements in forming expectations about the future price—either *naively* as noise traders or *smartly* as speculators are presumed to do. In this setting, unlike what Friedman foresaw, successful (*read* rational) speculators are those who engage in “trend” speculation, where they act like noise traders themselves in the short run, trying to feed the bubble rather than help deflate it (DeLong et al 1990).<sup>5</sup> Because the successful speculative strategy entails jumping on the bandwagon of noise traders and knowing when to get off while the rest rides on, this might also imply a rising reaction speed. Thus, any sustained trend of a current price increase from what the market opinion generally holds to be the true value, whatever the cause, is likely to raise both the elasticity of expectations and the reaction speed. While this does not explain how prices initially become misaligned, it suggests speculation can become destabilizing once price deviations exceed in size and duration a certain threshold.

In a similar manner, Keynes’s discussion on how asset prices behave over the business cycle, in his *Treatise*, seems to presuppose that speculation can both be stabilizing and destabilizing, depending on the phase of the cycle. As discussed in the previous section, Keynes argues that agents form expectations about the trend value of asset prices and the weighted average of these opinions tend to shift over the course of a business cycle expansion, which are then reflected in the changing size of the bear position in the economy. He stylistically divides the expansion phase of a business cycle into two parts, where the preponderance of market opinion holds that asset prices are alternately undervalued and overvalued during the early and late periods of the cycle. The latter period owes its existence, and is prolonged in duration, to the extent that the banking system transfers the *bear* funds (bank deposits of those who have sold securities short) to those who still have a *bullish* sentiment that asset prices will continue to

rise. In other words, while asset prices are rising in both periods, in the former their increase is driven by *fundamentals* and in the latter by *speculation*. By implication, while speculation is stabilizing in the former period it becomes destabilizing during late expansion, giving rise to a bubble.

Thus, Keynes's argument in the *Treatise*, implies that the elasticity of expectations can vary endogenously over the business cycle. When traders observe that the actual price is well above what they think the true value is and still rising, they not only infer that higher order expectations are at work but also in increasing numbers assign greater weight to them (what they think others think others think) over their own opinion. They begin to either lose confidence in their own judgment of what is reasonable or think that asset price increases have acquired the character of a bubble. In either case, they become much more responsive to changes in current price in forming expectations about the future price. That, in other words, implies a *regime* shift from inelastic to elastic expectations as traders begin to discount their own opinions in forming expectations about the future price.

Keynes's discussion of the trade cycle in the *Treatise* presupposes of a regime shift of this sort, though he does not explicitly address the question of transition from one regime to the other. However, his argument seems to assume that during the upswing, actual profits cannot increase at an increasing rate, while asset prices often will. Thus, sooner or later, optimistic expectations, and thus the asset prices that they underlie, outstrip the actual performance of profits. The latter, though still rising, eventually falls short of the former, but the bullish sentiment tends to persist.

The next section outlines a macroeconomic framework that highlights Keynes's views on the macroeconomics of asset price speculation in the *Treatise*. The same setup is then used to contrast these views with the structure of the argument in the GT. The discussion adheres to the GT notion of the "short period," defined in terms of a given set of "long period expectations," but now assumes that these expectations can just as well refer to market opinion about *trends*, according to which changes in asset prices can be excessively or insufficiently high.

### **III. OUTPUT DETERMINATION AND SPECULATION**

Unlike the GT where the prices of debts and equities are determined separately, all securities are lumped together as Keynes did in the *Treatise*. Consistent with this, two interest rates are

assumed: a short term rate that is the price of credit determined in industrial circulation and a longer term bond rate in financial circulation. Money supply as was the case in both Keynes's works is defined co-extensively with bank money.

In line with Keynes's stylized simplification in the *Treatise*, it will be convenient to assume that bulls predominate over bears during the early expansion, while bears predominate over bulls during the late expansion. In the former period, the weighted average of opinion holds that asset prices will continue to increase, while in the latter period, it holds that they will fall.

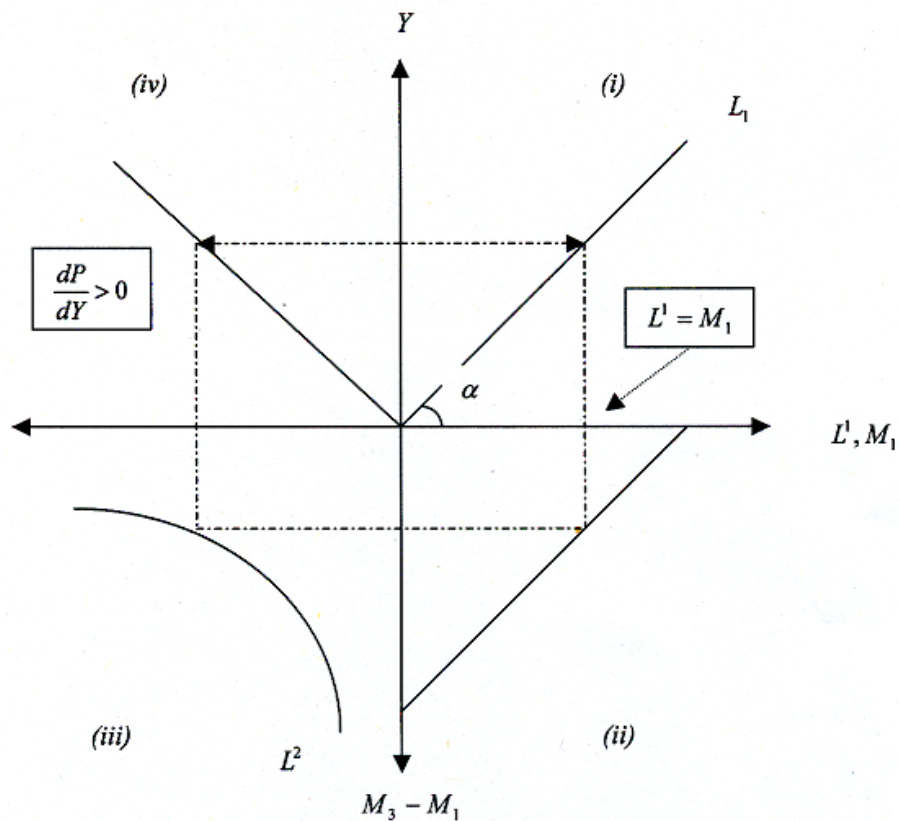
In Figure 1, the transaction demand for money is depicted in the first quadrant, where it is related positively to income and negatively to the interest rate,  $L^1 = L^1(Y, i)$ , with  $L^1_Y > 0$  and  $L^1_i < 0$ . This implies that the income velocity of money, given by the angle  $\alpha$ , is a positive function of the interest rate. Going counterclockwise, the fourth quadrant indicates the regime of speculation that is exogenously given. A positive slope ( $\frac{dY}{dP} > 0$ ), as depicted in Fig 1, implies that expected future asset prices are expected to increase ( $dP > 0$ ), when output is also rising ( $dY > 0$ ). This corresponds to what Keynes called the "bull market with a consensus of opinion" which associated with "early expansion" in the *Treatise*. The "bull market with a division of opinion" in "late expansion" is in turn described by a negatively sloped line (Figure 1.4), where future asset prices are expected to decrease ( $dP < 0$ ) while output is still rising ( $dY > 0$ ). In both periods, changes in the price of credit, i.e., the short interest rate, can change the intercept of this line to the extent that they affect expectations about the future short rates, and thus the bond rate.

The third quadrant depicts the speculative demand for money as a negative function of the expected future asset prices,  $L^2 = L^2(P)$ , where  $L^2_P < 0$ .<sup>6</sup> For simplicity, the interest rate on saving deposits ( $M_3 - M_1$ ) is ignored. Continuing to move counterclockwise, the second quadrant indicates the distribution of total money supply between active ( $M_1$ ) and inactive balances ( $M_3 - M_1$ ) with a given base money and speculative money demand ( $L^2$ ). The magnitude of inactive balances measures the extent of the bear position referred to above.

For ease of exposition, Figure 1 is drawn in such a way that the demand for active money is exactly equal to its supply. In Figures 1.1 and 1.2, by contrast, the demand for narrow money exceeds the available supply, to indicate the two different ways in which adjustment can take place. One mechanism (fig 1.1) involves rising income velocity of money, and possibly a

higher short term interest rate, which increases the slope of the transactions demand for money schedule,  $\alpha$ , indicating a move from A to B.<sup>7</sup>

Figure 1



The other mechanism, depicted in (fig 1.2), involves an outward shift in the total money supply schedule in the second quadrant. The different views about what brings about this shift need not be important for the argument at this point. The outward shift signifies an endogenous increase that can result from either a change in the base money or the money multiplier, or some combination of the two.

Figure 1.1

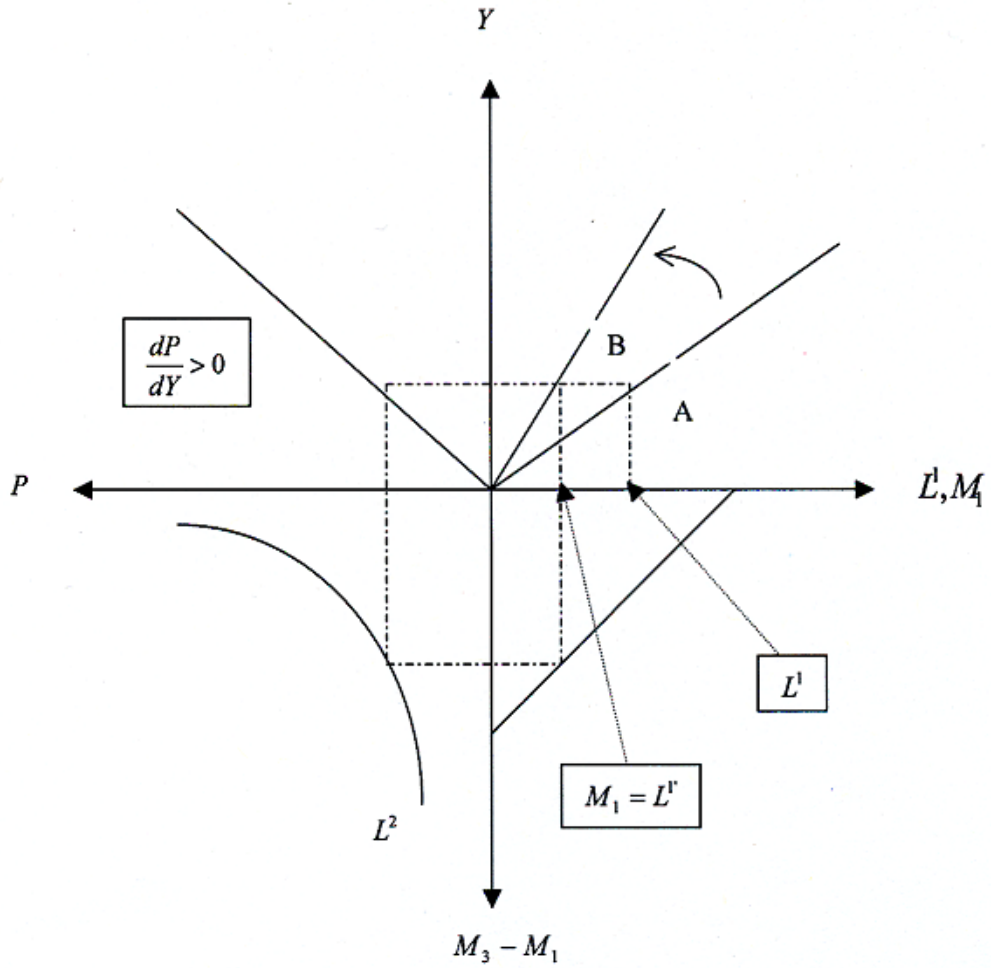
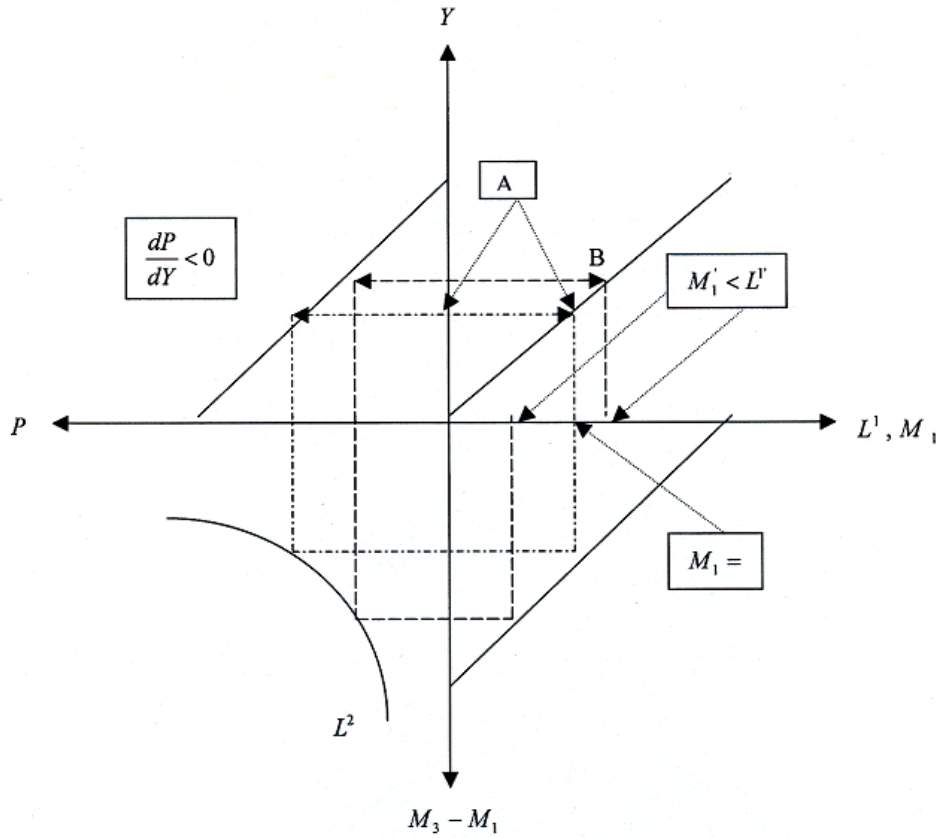








Figure 1.4



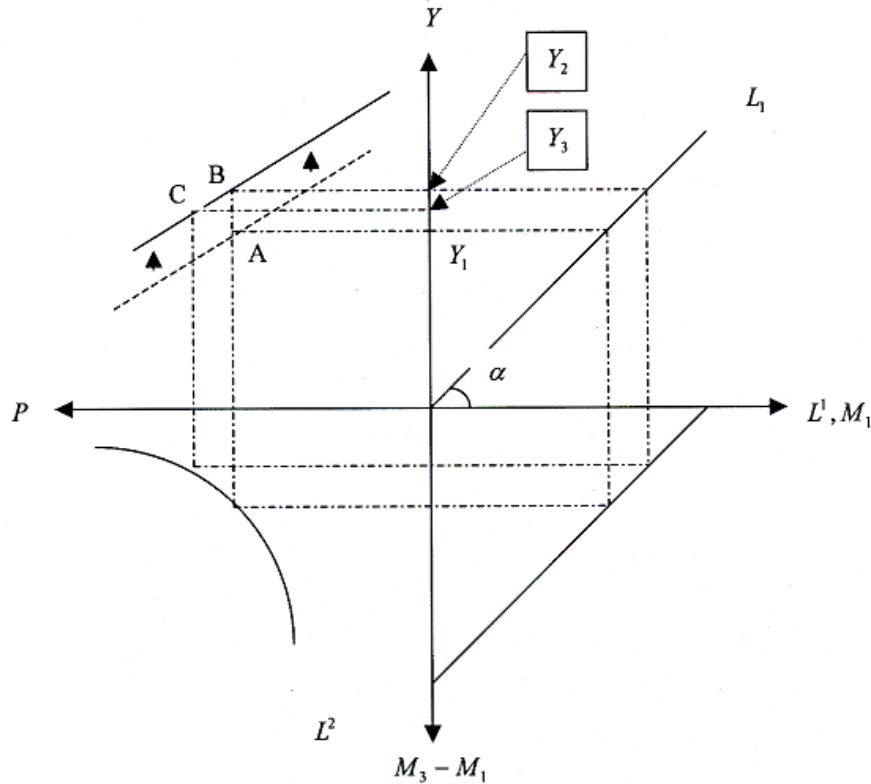
We can also use the same set of diagrams to discuss the structure of the argument in the GT. In the GT, Keynes not only separated the determination of prices of assets from that of debts, but also assumed that the expectations about the former adjusted to the latter. Whether actual return on investment turns out to be less than or equal to what was expected, Keynes assumes that the expected rate of return on capital adjusts to the interest rate in equilibrium through variations in the scale of investment.<sup>9</sup> Speculative activity in the stock exchange does not influence the level at which the two rates equalize. “Long term expectations” refer to the future profit expectations that are reflected in equity prices with a given discount rate and are assumed given within his short period. This enables him to focus on asset price changes that would be brought about by changes in the interest rate resulting from shifts in the portfolio

choice between bonds and money alone. While this approach had the advantage of highlighting the potential of economic policy—to the extent interest rates could be controlled—in influencing asset prices, it at the same made it harder to conceptualize the macroeconomic effects of asset prices the market opinion held to be misaligned.

The very structure of the marginal efficiency of capital, which as Keynes stresses is *fixed* by market valuation, implicitly precluded the notion of an asset price bubble. Note that if the marginal efficiency of capital shifts up on account of higher expectations of future profitability that are *justified*, then the initial increase in asset prices will cease to be excessive when actual investment and profits increase. Yet it is not clear how this case would be distinguished from a situation where the higher profit expectations are somehow *unjustified* or that the increase in asset prices are “excessive” in relation to these expectations, all other things again being equal. If investment rises with the higher marginal efficiency of capital as it should and the multiplier is what it is in both cases, then it is unclear how one could define market overvaluation, barring capacity or employment constraints.

In the context of our diagrams, all this means that, in contrast to Fig 1, the direction of the argument now runs clockwise (Fig. 2). With a given exogenous increase in the expected asset prices (at the same bond rate), shown in Quadrant 4, investment and then output is increased (where the intermediate steps are ignored). The higher output and income requires a higher quantity of transaction balances of money (Quadrant 1). With a fixed supply of money and the higher transaction balances, Quadrant 2 indicates the quantity of money that is left over for portfolio purposes. Quadrant 3 shows the amount by which the bond rate has to increase to balance the decrease in the amount of money left available for speculative demand. In turn, a higher bond rate reduces the present value of expected earnings and thus lowers the expected future asset prices.<sup>10</sup>

Figure 2



In the horizontal axis of Quadrant 4, note that we now have the current bond rate rather than the expected future price of securities as a whole. If “long term expectations” remain constant, it is assumed that the change in the bond rate raises the rate at which the expected future returns are discounted, lowering their present value and thus asset prices. As a result, the level of investment decreases, causing output to fall as well. Thus, unless the monetary policy of the central bank is accommodating, any expansion in output is self-limiting as it leads to a higher interest rate.

Figure 1 and 2, do not depict fundamentally different conceptions of the macroeconomy, however, they emphasize different things. The former shows that if and when asset price expectations exhibit a strong trend component, their influence can be very significant, while the latter underscores how desired macroeconomic outcomes can be affected by controlling asset prices through changes in the interest rate. While the latter framework might be more applicable

to a world characterized by financial regulation and tranquility, the former appears to have become once again—just as it had been during the interwar era—more relevant today.

#### **IV. CONCLUSION**

The rising frequency of financial crises around the world, and the rise of the *behavioral* theory of finance have made revisiting Keynes's emphasis on asset price speculation in his analysis of the trade cycle in *Treatise* a timely exercise once again. The objective of this paper has been to develop these ideas of Keynes that had been eclipsed by his much better-known analysis in the GT. Implicit in Keynes's analysis in the *Treatise* is a theory of output determination that presupposes self-sustained biases in asset price expectations in financial markets. This provides a convenient setting for analyzing the macroeconomic effects of asset prices the preponderance of market opinion holds to be misaligned. The analytical structure of the GT, by contrast, does not lend itself as easily to analyzing the macroeconomic effects of asset price misalignments, as the very construction of the marginal efficiency of capital schedule arguably precludes asset price bubbles.

Notes:

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<sup>1</sup> Keynes maintained that saving deposits would typically be held in the form of “deposit accounts” (which corresponds to time deposits in the US) and while cash deposits would take the form of “current accounts” (checking or demand deposits in the US).

<sup>2</sup> The more elaborate justification of this position is based on “the efficient market hypothesis,” which has gained currency among economists after Samuelson’s (1965) “proof” that in a market that is *efficient* in appropriating all available information stock prices should exhibit a random walk and Fama’s (1965) demonstration that they almost actually do. But, neither proposition is considered valid any longer in the contemporary finance literature. Empirically, it is shown that stock prices do not exhibit random walk, and theoretically it is shown that *unforeseeable* prices are neither necessary nor sufficient for *rational* determined stock prices. See, among others, Lo and MacKinlay (1999), Bossaerts (2002), and Shleifer (2000).

<sup>3</sup> Shleifer and Summers (1990) call these, respectively, the *fundamental value* and *noise trader* risk,

<sup>4</sup> See also Hicks (1946, pp. 205-6).

<sup>5</sup> In the modern finance literature on asset price bubbles the emphasis, until recently, was on rational traders’s risk aversion which was thought to prevent them from eliminating noise driven price movements. However, the focus has been shifting to “trend” speculation as the winning strategy for speculators, a fact well known to market participants all along (Soros 1987, and Temin and Voth 2004).

<sup>6</sup> Note that this differs from the usual interpretation where the speculative demand for money is made a function of the current interest rate. In the GT, the speculative money demand was a function of the difference between the current bond rate and what Keynes called the “safe” rate, which was a proxy for the expected changes in, and thus future value of, asset prices. Here, speculative demand is made directly a function of the expected future asset prices. If it is assumed that the safe rate is expected to remain unchanged, as it is usually done, every decrease (increase) in the current interest rate increases the expectation that bond prices will fall (rise) in the future, and thus raising (lowering) “the risk of illiquidity.” Under this assumption, the focus of the argument moves away from shifts in the liquidity preference function as a whole to variations in the demand for liquidity when the said function remains unchanged. Thus, the speculative demand for money, when expressed as a function solely of the interest rate, refers to the quantity of liquidity demanded, holding liquidity preference (i.e., the whole schedule) and expectations about the long rate constant. This is in contrast to Keynes’s original view of the effects of “bull and bear” sentiment on the demand for liquidity, which emphasized shifts in liquidity preference, i.e., shifts in the whole schedule and presumably a change in what is considered a safe rate as well.

<sup>7</sup> A higher short rate of interest can also affect the bond rate and thus cause the expected asset price line in quadrant four to shift right. For ease of exposition, we will ignore this effect.

<sup>8</sup> This can also set off a downward spiral, depending on which of the two effects it has on transactions and speculative balances is stronger. On the one hand, the higher short rate—to the extent it raises the bond rate by shifting in the expected in asset price line in quadrant 4—can lower the expected future asset prices and thereby exert a negative influence on expenditures and thus the demand for active balances. However, at the same time, the fall in the expected future asset prices causes speculative balances to rise as well.

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<sup>9</sup> Keynes writes, “Put shortly, orthodox theory maintains that the force which determine the common value of the marginal efficiency of various assets are independent of money, which has, so to speak no autonomous influence, and that prices move until the marginal efficiency of money, i.e., rate of interest, falls into line with the common value of the marginal efficiency of other assets as determined by other forces. My theory, on the other hand, maintains that this is a special case and that over a wide range of possible cases almost the opposite is true, namely, that the marginal efficiency of money is determined by forces partly appropriate to itself; and that prices move until the marginal efficiency of other assets fall into line with the rate of interest” (Keynes 1936, p. 178).

<sup>10</sup> To the extent that the velocity of transaction balances rises with the higher interest rate the short fall in idle balances available for speculative purposes and thus the resultant increase in the bond rate will be less.

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