Problem 1

(a). In the final lecture of the course, we saw a long list of so-called *anomalies* that have been found to be more or less robust. Some of these we can argue are caused by completely rational phenomena (such as higher average returns to small firms due to a liquidity effect). But others seem better explained by *behavioral* theories (such as the disposition effect which would be 'explained' by prospect theory). A naive intuition would say that traders 'suffering' from behavioral biases would obtain substandard profits, and therefore be driven out of the market. What factors could limit the validity of this argument?

Solution: (There are many ways to answer the question – the following are some of the observations that a good solution *could* make). A fundamental force going against the argument outlined in the question, is that there are limits to arbitrage, as seen in chapter 9.4.2. and exercise 5 in chapter 9. If arbitrageurs have only limited capital to allocate and face a liquidation risk if they perform poorly, they may not be able to speculate sufficiently against a mispricing to completely eliminate it. Furthermore, as the exercise makes clear, their incentive is not always to intervene as early as possible as mispricings may increase over time, making it cheaper and less risky (in terms of the risk of being forced to liquidate) to intervene later.

Therefore, it is far from clear that mispricings should be eliminated in the short run. Adding to this is the observation that, if a mispricing is known to exist, other traders may seek to speculate in this. We saw in lecture 13 how traders could rationally maintain their investment in a stock even after they were sure that all traders in the market had realized that it was overvalued. The key to this result was lack of common knowledge in the market. Furthermore, traders may also pursue 'manipulative' strategies that seek to increase the price of the overvalued stock in order to augment their own profits when they exit. Such strategies will not only not eliminate mispricings, but will actually exacerbate them. And when the stock price eventually crashes, this will cause losses both to traders with behavioral biases, but also to rational traders who mis-timed the market.

In conclusion, there seems to be ample reason why the process of driving out non-rational traders should at the very least be slow. Furthermore, the fact that rational traders can also end up losing from their speculation against non-rational traders

together with a constant influx of new traders could imply that behavioral trading remains a substantial component of the market.

(b). Figure 5.2 on page 165 of the book shows that the bid-ask spread of a stock increases when it is dropped by analysts, i.e. when it is no longer being covered by financial analysts. The explanation is straightforward: financial analysts disseminate information to the market and thus eliminate or reduce informational asymmetries, and this leads to less adverse selection and thus lower spreads.

However, the story might not always be so clear-cut. Discuss why analysts might also be a source of uncertainty. Do you think it would be possible to have the opposite situation to that depicted in Figure 5.2? I.e., do you think it would be possible for bid-ask spreads to become lower (on average) after analyst coverage stopped?

Solution: (There are many ways to answer the question – the following are some of the observations that a good solution *could* make). Analysts might be a source of uncertainty in that there might be uncertainty about (i) their motives or honesty, (ii) their ability, and (iii) their influence on the market which may lead to self-fulfilling prophecies.

The uncertainty about analyst motives takes many forms. Some analysts are also speculators themselves, and might want to manipulate prices to their own advantage. A similar situation arises with investment banks that often employ analysts who are supposedly independent of the investment arm, but may not be so. Analysts are also employed by banks who, although they may not have investment motives for manipulating prices, have incentives to induce trade because they earn fees every time a trader trades. This problem is referred to as sell-side analysts. Finally, one can imagine that there might be a problem of outright fraud, in that traders or companies might bribe analysts to give certain recommendations.

Uncertainty about ability is straightforward. Analysts may be good or bad, as in any other profession. However, there might be reasons why it is hard to detect bad analysts. First of all, analysts can copy each other. We saw in the lecture on herding that there might be reputational reasons to herd for traders, and this is the

same for analysts. Therefore, a set of recommendations that looks like independent observations, might in fact be a highly correlated and therefore much less informative. It is also a problem that analysts by giving advice also affect the price, which makes it hard to evaluate (at least in the short term) whether the analyst was right or not. Thus, bad analysts may survive for a long time in the market.

Analysts may also more generally contribute to information symmetry, in that they provide information only to the people who pay for it. Such asymmetry might contribute to larger spreads.

The endogeneity of outcomes with respect to analyst recommendations can of course be seen in that they affect prices, as mentioned above. But they may also affect real outcomes. Consider for instance a credit-rating agency. By giving bad ratings to a firm, they increase the cost of borrowing for the firm, and by doing this they make it more likely that the firm fails. Thus, ratings become self-fulfilling prophecies and this might give lopsided incentives to the analysts. Sometimes, they may prefer to induce a firm to fail because this would vindicate their earlier ratings. Or vice versa, they may wish a firm to succeed to justify backing it earlier.

In conclusion, analysts provide information but the bias and quality of this information may be substantial and act as another source of uncertainty. Herding and speculation may serve to amplify this uncertainty, and therefore it is conceivable that markets are actually *more* illiquid under the presence of financial analysts, although this seems like an unlikely case.

(c). Explain why we assume noise traders, private value or uncertain supply in our models of financial markets. For instance, what would happen to prices and trading in one of our standard dealer models if we did not make this assumption? Do you find it realistic to make these assumptions?

Solution: If we did not include these factors in our models, then we would be facing a *pure adverse selection* situation, in which the dealer would be sure to face a better-informed trader. This would result in a 'lemons' result of 'no trade', in that the dealer would set prices such that the trader would not want to trade. The

reason is that the dealer knows that any trade that the trader would accept would lead to negative profits for the dealer. Effectively, the lack of traders who trade for non-informational motives converts the market into a zero-sum game, and it thus breaks down in the sense that no trading takes place.

The fact that trading takes place in real markets suggest that either (i) markets function in a different way than what we imagine, or (ii) the assumptions we make are perhaps not too far off. Thus, if we believe that markets are mainly rational with profit-maximizing dealers and traders, then the explanation for the occurrence of trades must imply the existence of some sort of non-informational trading. This could come from any of the sources we have mentioned above, and be rational or irrational. Looking at the wide array of trader types that exist in real life, the presence of noise or liquidity traders does not seem far-fetched. There are large institutional investors that need to maintain certain portfolios, there are small traders that may be trading more or less rationally, and there are agency effects that cause investment managers to behave differently than standard profit maximization would suggest.

Problem 2

In the course we generally assumed that market makers were uninformed and hence that the adverse selection came from informed traders. In this question, we will consider the reverse situation, where market makers may be informed and traders are always uninformed (liquidity) traders.

Suppose we are at a market for an asset that has value $V \in \{0, 1\}$, and takes each value with equal probability. There are two market makers (MMs), the *informed MM*, denoted I, and the *uninformed MM*, denoted U. The value V is known to I, but not to U. We assume that traders are always *liquidity traders* who either buy or sell a unit of the asset with equal probability by using a market order. The MMs simultaneously set bid and ask prices a_n and b_n, where $n = I, U$. There is price priority, so if $a_n < a_{n'}$ then an incoming buy market order will be executed against a_n. Similarly if $b_n > b_{n'}$. If $a_n = a_{n'}$, then the trader buys from I with probability q. Suppose throughout that $q = 1$. Similarly for $b_n = b_{n'}$.

We now analyze price-setting behavior in this market.

(a). We first look for an equilibrium in pure strategies, where the uninformed market maker sets prices a_U and b_U, and the informed market maker sets prices $\overline{a}_I$ and $\overline{b}_I$ when $V = 1$, and $\underline{a}_I$ and $\underline{b}_I$ when $V = 0$. Suppose that $a_U, b_U \in (0, 1)$. Find I's best response, and calculate U's expected profits.

Solution: Suppose $a_U, b_U \in (0, 1)$. If $V = 1$, I will want to buy the asset, but not sell it. Therefore, he will set $\underline{a}_I > a_U$ and $\underline{b}_I = b_U$. This will give him an expected profit of $\frac{1}{2}(1 - b_U) > 0$. If $V = 0$, I will want to sell the asset, but not buy it. Therefore, he will set $\underline{b}_I < b_U$ and $\underline{a}_I = a_U$. This will give him an expected profit of $\frac{1}{2}(a_U - 0) > 0$.

U will have an expected profit of

$$\frac{1}{2}\frac{1}{2}(0) + \frac{1}{2}\frac{1}{2}(a_U - 1) + \frac{1}{2}\frac{1}{2}(0) + \frac{1}{2}\frac{1}{2}(0 - b_U) < 0. \tag{1}$$

(b). We continue looking at pure strategies. Now, analyze the case where $a_U = 1$ and $b_U = 0$. Find I's best response and calculate U's expected profits.

Solution: If $V = 1$, I will want to buy the asset, but not sell it. Therefore, he will set $\underline{a}_I \geq a_U = 1$ (weak inequality since he is indifferent between selling or not at price 1) and $\underline{b}_I = b_U = 0$. This will give him an expected profit of $\frac{1}{2}(1-0) > 0$. If $V = 0$, I will want to sell the asset, but not buy it. Therefore, he will set $\underline{b}_I \leq b_U = 0$ and $\underline{a}_I = a_U = 1$. This will give him an expected profit of $\frac{1}{2}(1-0) > 0$.

U will have an expected profit of 0, since he never gets to trade (recall that $q = 1$).

(c). Assume that U's equilibrium prices must be either the prices in (a) or in (b). Use your previous answers to show that there cannot be a pure-strategy equilibrium.

Solution: Let us check if U has a profitable deviation. In (a) U could do better from quoting $a_U = 1$ and $b_U = 0$. Thus, he has a profitable deviation. In (b), U could undercut I slightly and get positive profits, and therefore he has a profitable deviation. Therefore, there cannot be a pure-strategy equilibrium with $q = 1$.

(d). Now we allow for mixed strategies. Suppose that I sets $\overline{a}_I = 1$ and $\underline{b}_I = 0$. Furthermore, suppose that U plays such that $\mathbb{P}(a_U < 1) = 1$ and $\mathbb{P}(b_U > 0) = 1$.

Show that I's expected profits when $V = 1$ (denoted $\overline{\Pi}_I$) and $V = 0$ (denoted $\underline{\Pi}_I$) are

$$\mathbb{E}[\overline{\Pi}_I] = \frac{1}{2} \cdot (1 - \overline{b}_I) \cdot \mathbb{P}(b_U \leq \overline{b}_I),$$
$$\mathbb{E}[\underline{\Pi}_I] = \frac{1}{2} \cdot \underline{a}_I \cdot \mathbb{P}(a_U \geq \underline{a}_I).$$

Solution: Expected profits can be written as

$$\mathbb{E}[\overline{\Pi}_I] = \frac{1}{2}(\overline{a}_I - 1)[\mathbb{P}(a_U > \overline{a}_I) + q\mathbb{P}(a_U = \overline{a}_I)] + \frac{1}{2}(1 - \overline{b}_I)[\mathbb{P}(b_U < \overline{b}_I) + q\mathbb{P}(b_U = \overline{b}_I)]$$

Since $\mathbb{P}(a_U < 1) = 1$ and $\overline{a}_I = 1$ then $\mathbb{P}(a_U > \overline{a}_I) = 0$. Furthermore, substituting $q = 1$ we get $\mathbb{P}(b_U < \overline{b}_I) + q\mathbb{P}(b_U = \overline{b}_I) = \mathbb{P}(b_U \leq \overline{b}_I)$. This then gives the above expression. Similarly for $\mathbb{E}[\underline{\Pi}_I]$.

(e). Focus on the bid side. We now look for a mixed strategy for U such that it is optimal for I to play a mixed strategy for $\overline{b}_I$ over the interval $[0, 1/2]$.

Denote U's strategy by $\sigma_U(b) = \mathbb{P}(b_U < b)$ for $b \in [0, 1/2]$. Recall that for it to be optimal for I to mix between two values of $\overline{b}_I$, he must be indifferent between these two value, i.e. they must yield the same expected payoff. Hence, for I to mix over $\overline{b}_I$ in $[0, 1/2]$, a necessary condition is that $\mathbb{E}[\overline{\Pi}_I]$ is constant for $\overline{b}_I$ in $[0, 1/2]$.

Suppose $\sigma_U(0) = y > 0$ and $\sigma_U(1/2) = 1$.[1] Find $\sigma_U(b)$ such that $\mathbb{E}[\overline{\Pi}_I]$ is constant for $\overline{b}_I$ in $[0, 1/2]$.

Solution: If $\mathbb{E}[\overline{\Pi}_I]$ is constant for $b, b' \in [0, 1/2]$, then

$$(1 - b)\sigma_U(b) = (1 - b')\sigma_U(b').$$

This yields

$$\frac{\sigma_U(b')}{\sigma_U(b)} = \frac{1 - b}{1 - b'}. \tag{2}$$

Let $b' = 0$ and $b = 1/2$ and use that $\sigma_U(0) = y$ and $\sigma_U(1/2) = 1$:

$$\frac{y}{1} = \frac{1 - \frac{1}{2}}{1 - 0} \Leftrightarrow y = \frac{1}{2}.$$

Now, let $b' = 0$ in (2) and substitute for y to get

$$\frac{\frac{1}{2}}{\sigma_U(b)} = \frac{1 - b}{1 - 0} \Leftrightarrow \sigma_U(b) = \frac{1}{2(1 - b)},$$

for $b \in [0, 1/2]$.

(f). Still, focus on the bid side. Notice that given $\underline{b}_I = 0$, then U's expected profits conditional on b_U and conditional on an incoming sell order is

$$\mathbb{E}[\Pi_U|\text{sell order}] = \frac{1}{2}(0 - b_U) + \frac{1}{2}\mathbb{P}(\overline{b}_I < b_U)(1 - b_U).$$

In equilibrium this will be equal to zero.

[1] Notice, this implies that U's strategy has a mass point at 0.

Suppose I's strategy when $V = \overline{V}$ is such that $\overline{\sigma}_I(b) = \mathbb{P}(\overline{b}_I < b)$ for $b \in [0, 1/2]$. Find a strategy for I with $\overline{\sigma}_I(0) = 0$ and $\overline{\sigma}_I(1/2) = 1$, such that U obtains zero profits for all $b_U \in [0, 1/2]$.

Solution: Now, we need

$$-\frac{b}{2} + \frac{1}{2}\overline{\sigma}_I(b)(1-b) = 0,$$

for $b \in [0, 1/2]$. Hence, for $b \in [0, 1/2]$,

$$\overline{\sigma}_I(b) = \frac{b}{1-b}.$$

(g). Finally, argue that the strategies you have found constitute an equilibrium on the bid side.

Solution: When I observes $V = 0$ then since $b_U \geq 0$, he will never sell if he sets $\underline{b}_I < 0$, and he will get negative expected profits if he sets $\underline{b}_I > 0$. His best response is thus to set any $\underline{b}_I \leq 0$. When I observes $V = 1$ then since $b_U \geq 0$, he will still get zero profits if he sets $\overline{b}_I < 0$. But now, if he sets any $\overline{b}_I \in [0, 1/2]$ he gets positive profits of $1/2$ (also at $\overline{b}_I = 0$, since $b_U = 0$ with positive probability mass and $q = 1$). For any $\overline{b}_I > 1/2$ he could profitably deviate to $\overline{b}_I = 1/2$. Finally, U will prefer to play the given strategy since he will obtain zero expected profits for any $b_U \leq 1/2$, and negative profits for $b_U > 1/2$.

(h). Suppose the equilibrium in (g) is played. Answer the following questions:

- Does the informed market maker reveal his information?
- Suppose the model has two periods and the market makers observe the period-1 prices before they set period-2 prices. Suppose an analyst observes only the realized prices and **not** the offered bid/ask prices. Can she use the period-1 price to predict the period-2 price? (Give an intuitive answer, you do not need to set the model up.)

- Do any of the market makers earn positive expected profits?

Solution: (i) Yes, I always reveals his information with probability 1, since $\underline{b}_I = 0$ and $\overline{b}_I > 0$ with probability 1. (ii) No. Suppose $V = 0$, with probability 1 this is revealed by I's bid price. But the actual trading price is greater than 0 with positive probability, because of the mixing. If period-2 prices are set rationally, they must be equal to 0. Thus, they can be predicted using today's price. (iii) Yes, I earns positive expected profit.

Problem 3

On the next pages, you will find an article from The Guardian on stock market volatility in the beginning of 2016. Summarize the issues raised in the article, then analyze the issues using theory learned in the course. Evaluate the theory and give your opinion as to whether it explains well the observed events. Do you agree with the conclusions of the author about the state of the world economy? You are welcome to bring in theories and models from outside the course, if these seem to better explain the events.

Solution: Below I outline a list of points that a good answer should touch upon. This is not a complete list, and the discussion of these issues is as important as mentioning them. The conclusion does not have to be the same as the one I have given, but should be well-argued.

Summary of the article. Three issues are raised by Anatole Kaletsky in his article:

1. The development of the Chinese stock market and, in particular, of the renmibi.
    - A fall in the Chinese stock market in January of this year caused financial turmoil on a global scale, which is unusual given the January effect. This is also surprising given the size of the Chinese stock market, relative to the world economy.
    - The Chinese government may react to these news by devaluation or other actions that affect the currency, and therefore affect the global economy more directly.
    - Currently, the market expects stability in China, but a drop in foreign-exchange reserves may alter this.
2. Collapsing oil prices.
    - Recent volatility in oil prices has been followed by corresponding movements in stock markets.

- This seems counterintuitive, as falling oil prices would normally be a positive growth indicator, and should therefore boost stock markets in the medium and long run.
- In the short run, however, falling prices may have adverse effects due to the effect on liquidity: investors may face margin calls and this can spread through the financial system.
- Markets, though, seem to believe that the recent fall in oil prices is a lead predictor for a new recession, although past experience does not favor this view.

3. 'Reflexivity' in stock markets.

   - This point refers to the effect of the stock market on the real economy, and also the effect of the stock market on itself.
   - The process could work by depressing consumer and business confidence. It is argued that this is not so likely, since falling oil prices should work in the opposite direction (although, as mentioned above, this may not be so clear cut.)
   - The process could also work through the financial system itself, by creating bankruptcies and financial strain on companies, and affect the supply of credit.

Theory. The fact that the plunge in the Chinese stock market caused a wider financial turmoil is perhaps not so surprising after all.

- We have seen that higher-order beliefs are important for prices, and in particular the article by Abreu and Brunnermeier argued that 'sunspots', i.e. events without or with little economic implication, could serve to coordinate the market's beliefs and thereby cause dramatic price changes. Therefore, the Chinese market collapse could simply be seen as an indicator of a wider problem, and serve to coordinate beliefs about this problem and therefore a general change in prices.
- Herding theories and Kondor's theory about public news events causing a dispersion in second-order beliefs which may lead to trade are other theories that could also be used to interpret this event.

- Part of the price movements in global markets following the Chinese stock market plunge change may also have been driven by expectations of the Chinese government's response, which as the article outlines may have real economic implications. Such implications would be incorporated into investor beliefs and lead to price changes.

- Finally, the crash in the Chinese stock market could lead some investors to face margin calls, which could lead them to engage in fire sales on other markets, thus depressing prices, as we have seen in chapter 9 of the book.

The 'wrong direction' of the stock-market effect of falling oil prices could be due to similar effects.

- Since standard economic theory would suggest that falling oil prices will boost the economy and also stock markets, the fact that the opposite movement was observed could perhaps be an expression of scattered beliefs about an economic slowdown that were confirmed by falling oil prices.

- In chapter 9, we also saw that liquidity concerns could put a limit on arbitrage. Thus, even if the stock market is reacting 'in the wrong direction', arbitrageurs may be restricted in their ability to 'lean against' this development.

Finally, we have seen several channels through which the stock market can affect the real economy and itself.

- Market liquidity can affect corporate governance and also investment, as seen in Chapter 10 of the book. However, although it could be argued that the fall in stock markets might have had an adverse effect on liquidity and therefore on corporate governance and investment, it seems unlikely that this will be an very important channel, relative to other things occurring in the markets.

- More important seems to be what the article calls reflexivity within the financial system itself. The theories of herding that we have seen tell us that it may be hard to stop a wrong trend due to informational cascades that impede the market's ability to learn new information. Thus, the stock market may in some sense cause itself to enter a 'bad spiral' in which it exacerbates a mispricing rather than correct it.

- Again, the theories of chapter 9 on the limits to arbitrage also suggest that even if the market is wrong and this is widely recognized, then it may continue to be so for a long time if arbitrageurs are constrained by liquidity concerns. Therefore, if market turmoil causes uncertainty about future liquidity, this may lead to a lack of arbitrage and the possibility of prolonged mispricings.

theguardian

What volatile markets say about the world economy

Anatole Kaletsky

A process known as 'reflexivity' is a powerful force in financial markets, especially during periods of instability or crisis

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January is usually expected to be a good month for stock markets, with new money gushing into investment funds, while tax-related selling abates at the end of the year. Although the data on investment returns in the United States actually show that January profits have historically been on only slightly better than the monthly norm, the widespread belief in a bullish "January effect" has made the weakness of stock markets around the world this year all the more shocking.

But the pessimists have a point, even if they sometimes overstate the January magic. According to statisticians at Reuters, this year started with Wall Street's biggest first-week fall in more than a century, and the 8% monthly decline in the MSCI world index made January's performance worse than 96% of the months on record. So, just how worried about the world economy should we be?

Three fears now seem to be influencing market psychology: China, oil and the fear of a US or global recession.

China is surely a big enough problem to throw the world economy and equity markets off the rails for the rest of this decade. We saw this in the first four days of the year, when the sudden fall in the Chinese stock market triggered January's global financial mayhem. But the Chinese stock market is of little consequence for the rest of the world. The real fear is that the Chinese authorities will either act aggressively to devalue the renminbi or, more likely, lose control of it through accidental mismanagement, resulting in devastating capital flight.

Such a scenario seemed quite plausible for a few weeks last summer, and it reemerged as a threat in the first two weeks of this year. By the end of January, however, market sentiment had moved back in favour of stability in China. This calm could be disrupted again if China's foreign-exchange reserves show another huge monthly loss, and the authorities' efforts to manage an orderly economic slowdown will remain the biggest source of legitimate concern for financial markets for many years ahead. But, judging by market behaviour in the second half of January, the fear about China has subsided, at least for now.

That cannot be said about the market's second great worry: collapsing oil prices. From

the moment investors stopped panicking about China, in the second week of January, stock markets around the world started falling (and occasionally rebounding) in lockstep with the price of oil. Unlike the reasonable concern about China, market sentiment seems simply to have gotten the relationship between oil and the world economy wrong. In anything but the very short term, the correlation between oil prices and stock markets should be negative, not positive - and will almost certainly turn out that way in the years ahead.

When oil prices plunge by 10% daily, this is obviously disruptive in the short term: credit spreads in resources and related sectors explode, and leveraged investors are forced into asset fire sales to meet margin calls. Fortunately, market panic now seems to be subsiding, as oil prices reach the lower part of the $25-50 trading range that always seemed appropriate in today's political and economic conditions. Now that oil prices are stabilising at a reasonable long-term level, the world economy and non-commodity businesses should benefit. Low oil prices increase real incomes, stimulate spending on non-resource goods and services, and boost profits for energy using businesses.

Yet, despite these obvious benefits, most investors now seem to believe that falling oil prices point to a collapse in economic activity, which brings us to the third fear haunting financial markets this winter: a recession in the global economy or the US.
Past experience suggests that oil prices are not a useful leading indicator of economic activity. In fact, if oil-price movements have any relevance at all in economic forecasting, it is as a contrary indicator.

Every global recession since 1970 has been preceded by a big increase in oil prices, while almost every decline greater than 30% has been followed by accelerating growth and higher equity prices. The widespread view that plunging oil prices augur recession is a clear case of the belief that this time is different - a belief that typically takes hold in financial markets at the peaks and troughs of boom-bust cycles.

Finally, what about the falling stock market itself as an indicator of recession risks? One could quote the great economist Paul Samuelson, who famously quipped in the 1960s that the stock market had "predicted nine of the last five recessions". There is, however, a less reassuring answer. While markets are often wrong in predicting economic events, financial expectations can sometimes influence those events. As a result, reality can sometimes be forced to converge towards market expectations, not vice versa.

This process, known as "reflexivity," is a powerful force in financial markets, especially during periods of instability or crisis. To the extent that reflexivity works through consumer and business confidence, it should not be a problem now, because the oil price collapse is a powerful antidote to the stock-market decline. Consumers are gaining more from cheap oil than they are losing from falling stock prices, so the net effect of recent financial turmoil on consumption should be positive - and stronger consumption should feed through to business revenues.

A greater worry is the workings of reflexivity within the financial system itself. Bankruptcies among small energy-sector companies, which are of limited economic importance themselves, are creating pressures in global banking and reducing the availability of credit to healthy businesses and households that would otherwise be beneficiaries of cheaper oil. Fears of a Chinese devaluation that has not happened (and

probably never will) are having the same chilling effect on credit in emerging markets. Meanwhile, banking regulators are continuing to tighten lending standards, even though economic conditions suggest they should be easing up.

In short, nothing about the condition of the world economy suggests that a major slowdown or recession is inevitable or even likely. But a lethal combination of self-fulfilling expectations and policy errors could cause economic reality to bend to the dismal mood prevailing in financial markets.

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