Housing and the Business Cycle[1]

Note: Previously, I have covered this topic in class. For the Fall 2015, however, I wish to have more time to spend discussing current issues in Europe and Japan. I am thus making this topic the subject of a homework assignment. You should read the following paper (or at least the first 30 pages or so):

Students should read: Leamer, Ed. 2007. "Housing is the Business Cycle," *Proceedings, Federal Reserve Bank of Kansas City*, 149-233.

as well as the two comments which are posted on the class website. You may also find these class notes helpful.

Most of these notes follow this paper which explores the historical relationship between housing cycles and overall business cycles, as well as a commentary and some discussion of the paper (both of which are also available on the course website). Before turning to the Leamer paper, however, we will briefly discuss the historical relationship among consumption, housing, and the business cycle.

GDP Accounting

Recall the GDP accounting identity from Econ 103 and 270: $Y \equiv C + I + G + NX$. It is common to hear commentators mention that the U.S. economy is primarily driven by private consumption. At first glance, this appears correct. Consider the following data from the St. Louis Fed showing GDP, investment, and consumption from peak to trough of the recent downturn (data in $ billion):

|	GDP	C	I
July 2008	14484.9	10202	2140.8
% of GDP		70.4%	14.8%
April 2009	14034.5	9920.1	1709.8
Δ	-450.4	-281.9	-431

It is clearly true that consumption (70.4% in July 2008) is a much larger component of GDP than investment (14.8%), which includes new housing. This, however, does not imply that consumption drives the business cycle. Consumption is much more stable than investment. During the recession, GDP fell by $450 billion. Investment, though relatively small, fell by $431 billion, almost as much

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[1]These are undergraduate lecture notes. They do not represent academic work. Expect typos, sloppy formatting, and occasional (possibly stupefying) errors.

as GDP. Consumption fell by much less, $282 billion. [Note: The combined declines of consumption and investment exceeds that of GDP. Increased government spending and net exports offset this difference.] Most macroeconomists believe that investment does in fact drive business cycles.

The previous analysis is far from conclusive. It is hypothetically possible, for example, that declines in consumption cause declines in investment so that consumption does in fact drive the business cycle. In reality, however, the converse is more likely to be true, changes to investment cause changes to consumption.

Investment has long been a major component of business cycles. The following figure graphs nominal GDP, consumption, and investment. Note that downturns in GDP usually correspond to declines in investment. Consumption, however, adheres much more closely to its trend (as seen by it being the smoothest of the three lines).

Nominal GDP, Consumption, and Investment

Source: St. Louis Fed
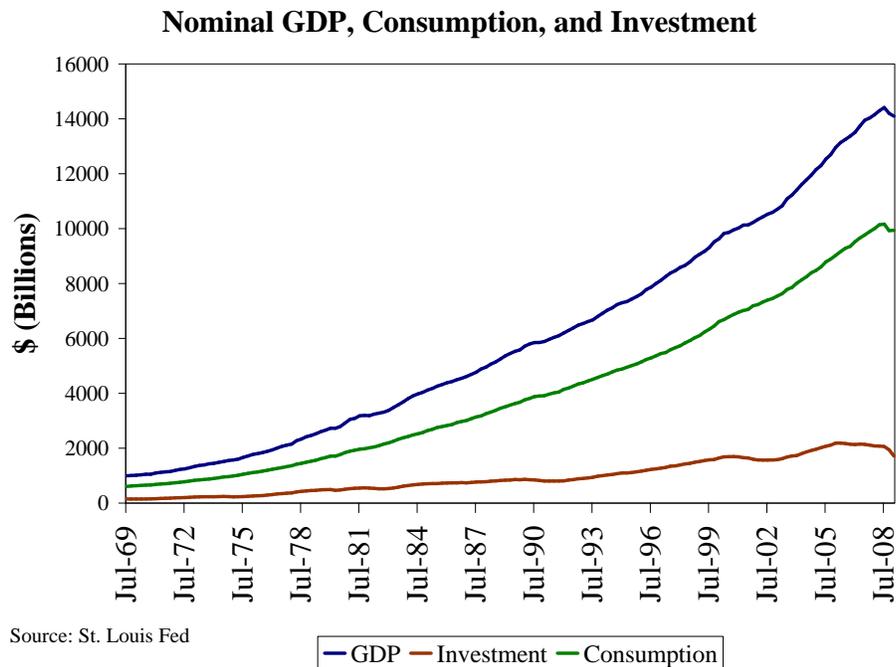
Past Recessions and Housing

In his paper, Edward Leamer takes this argument one step further. He argues that new housing, one component of investment, is the driving force behind most business cycles. If correct, this argument helps explain how the bursting of the housing bubble led to such a severe recession. Much of the paper is an example of *casual empiricism*. [Note: Leamer warns his readers in boldface on page 3.]

Whereas formal empirical work tends to control for other factors through techniques like regression analysis and often formalizes its arguments through hypothesis testing, casual empiricism tends to simply present the data and rely on simple devices such as unconditional correlations and temporal orderings. Casual empiricism can be persuasive, but it requires that the reader believe that causality is straightforward and that more sophisticated econometric analysis is unlikely to change the underlying results. Later sections of Leamer's paper do formalize Leamer's casual results. Many economists, however, have found his casual results persuasive because the economic intuition behind them is plausible.

Leamer begins by presenting some data on historic U.S. GDP growth. He notes that real GDP growth rarely strays far from a 3% annual trend (See Chart 3 on page 157). He infers from this result that reasonable policies are unlikely to have an important effect on long term growth and that policy makers should thus focus on stabilization.[2] We should not uncritically accept this argument. It is quite possible that individual policies have affected the trend but that cumulative changes to policies and other factors have had little effect.

Table 1 on page 159 examines the contributions of various sectors to U.S. GDP growth. From 1985Q1 through 2006Q4, the average rate of GDP growth was 3.10%. Residential investment (housing) contributed only 0.13% on average, or only 4.2% of total growth. While small, the contribution of residential investment to growth, however, has been quite volatile.

Chart 6 on page 152 shows the abnormal contribution of housing prior to the past 11 recessions. A value of 1 implies that housing has contributed a cumulative extra 1% of GDP, above its average value of 0.13%. A value of one would thus occur if, in a single year, new housing was sufficiently voluminous to cause GDP to grow by 1.13% instead of just 0.13%. It could also occur if, for two straight years, housing contributed 0.63% to GDP growth. A downward slope thus implies that this sector is in decline.[3] In 9 out of 11 recessions[4], housing results in significant excess GDP growth prior to the recession. Leamer argues that housing seems to lead the way into recession, because in most cases, the economic downturn is immediately preceded by a slowdown of residential investment. During the recession, the abnormal contribution of housing is initially negative, followed by a recovery.

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[2]"Reasonable" is important here. Obviously, blowing up the 20 largest cities in the U.S. with nuclear weapons would have an effect. Leamer means that the policy differences that are ordinary debated such as spending and tax policy seem to have little effect on long term growth.

[3]For example, the nearly 1% decline in housing prior to the 1980 recession implies a nearly 1% reduction in GDP growth.

[4]Leamer says 8 out of 10. I am including the recent recession which begin after he wrote this paper.

Note that Leamer wrote this paper in September 2007, prior to the recession. Also note that housing's abnormal contribution to GDP prior to 2007 is larger than at any other time in the dataset (literally off the charts). Leamer is unable to include the recent recession in the second panel of Figure 6. But his argument clearly predicts that housing's abnormal contribution would turn sharply negative after the time of writing. This did turn out to be the case, a result that gained his argument credibility.

Leamer then notes that another important type of investment, software and equipment, follows a very different pattern. Te top panel of Chart 7 on page 163 shows that this type of investment does not ordinarily decline by nearly as much as housing prior to a recession. As shown in the bottom panel, however, this type of investment declines substantially after the recession starts. Leamer infers that housing declines before software and equipment. From this, he concludes that not only does investment drive the business cycle, but that one kind of investment, housing, is the main culprit.

Leamer's conclusion (as stated explicitly in the title) is that the business cycle is really just a housing cycle. He reaches this conclusion based on the observation that housing usually declines right before the recession starts. We should, however, be cautious in assigning causality based only on temporal orderings like this. You should read the following critique of Leamer:

Smets, Frank."Commentary: Housing is the Business Cycle." *Proceedings, Federal Reserve Bank of Kansas City*, 235-242.

I will discuss two concerns (Smets raises others):

1. The decline in housing prior and during the first part of recessions is much smaller than the total decline in output. If housing is really the business cycle, then it is important to explain how the decline in housing can cause additional decreases in other elements of output (such as consumption and other types of investment). This is doable and we will discuss this issue in greater detail when examining the macroeconomic theory behind financial crises.

2. Every December in the United States, millions of Christmas cards are mailed out. *Or so I am told, I don't know anyone who actually does this. Wait, ... maybe that is because nobody likes me. Sigh.* A few weeks later, Christmas occurs. Based on this temporal ordering, we might conclude that Christmas cards cause Christmas. In reality, however, the expectation of Christmas causes Christmas cards. When expectations matter like this, the future can cause the present. It is thus risky (as Leamer acknowledges) to base causal inferences on temporal orderings.

It is also possible that another factor causes both the decline in housing and the recession. Smets suggests that interest rate cycles may be such a factor. Suppose for example that interest rates unex-

pectedly rise. Such a policy could possibly reduce housing (due to higher mortgage rates) while also inducing a recession by reducing other types of investment and consumption.

This example illustrates why establishing causality at a high, by less than 100%, level of confidence is difficult. It requires that empirical evidence be supported by convincing economic intuition and theory. I believe that Leamer's basic argument, however, will hold up well as we develop this theory later in the semester.

False Negatives and False Positives

Excluding the current downturn, the recession of 1981 is considered the last severe recession. Note that housing's abnormal contribution was close to 1% prior to the downturn.

Note that the abnormal contribution of housing for the recent recession is significantly larger than for any past recession. If one accepts Leamer's thesis, then the recent recession's severity is less surprising. During the housing bubble, suppliers overbuilt housing, and the resulting abundance of housing is dampening the construction industry.

Leamer's relationship is not perfect. In two cases, 1953 and 2001, a recession occurs that is not preceded by a decline in housing (See Chart 12 on page 172). Leamer argues that the 1953 recession is an outlier that was caused by rapid demobilization following the end of the Korean War. Likewise, Leamer argues that the bursting of the technology stock bubble explains the 2001 recession. Leamer refers to these cases as *false negatives*.

"False positives" describe the opposite scenario, where the housing sector declines but the economy does not fall into a recession. Too many false positives or false negatives, especially if they cannot easily be explained, would cast doubt on Leamer's thesis. Chart 12 illustrates two false positives, in 1951 and 1966. Leamer argues that large increases in defense spending, used to finance the Korean and Vietnam Wars, offset the decline in housing and prevented recessions. These represent cases where accidental fiscal stimuli were successful (success being measured only in terms of GDP).

The latter part of this paper formalizes this discussion. Regression analysis controls for other factors but does not change the underlying story.

Economic Intuition

Leamer's argument has gained traction because it is supported by simple macroeconomic intuition. Recall from your previous coursework that the lifecycle hypothesis is a widely accepted explanation

for household consumption. It maintains that consumption is an increasing function of households' expected discounted lifetime wealth. This includes assets such as housing.

The last three topics have, of course, provided a crystal clear explanation for the recent housing bubble. Consider the bursting of that bubble. This has direct effects on the aggregate economy by reducing activity in industries such as construction. This direct effect is an important part, perhaps half, of the lost GDP and employment of the past several years.

Reducing housing prices, also substantially reduce household lifetime wealth. This reduces consumption. This further reduction in aggregate demand reduces the incentive for firms to invest in equipment and software. In Leamer's characterization of the data: "first homes, then cars, and last business equipment."

This is not intended to be the full story. Later in the class we will see how reductions in asset prices can combine with inefficiencies in financial markets to make business cycles longer and more severe.

Monetary Policy Implications

If we accept Leamer's hypothesis, then Central banks may have an incentive to stabilize the housing market in order to stabilize the business cycle. Because higher interest rates suppress housing demand, the Fed could increase rates when the housing market is booming (*e.g.* increased construction or housing prices). Likewise, when the housing market is slumping, the Fed could lower interest rates.

The Fed appears to pay little direct attention to housing prices. Rents, which did not move with prices during the housing boom, are included in many measures of the CPI, but housing prices are not. The Fed instead seems to focus primarily on stabilizing inflation (at around 2%), with unemployment and GDP growth affecting policy to a lesser extent.

Leamer argues that this presents a conflict. The upper-left quadrant of Chart 27 on page 196 includes cases where relatively high U.S. inflation suggested higher interest rates, but relatively few housing starts suggested lower interest rates. Leamer maintains that the Fed erred in these cases (as well as those in the lower-right quadrant). According to his argument, the Fed made things worse by moving interest rates in the wrong direction.

Prior to his writing, the Fed was faced with such a conflict. Prompted by inflation concerns, the Fed raised its target Federal Funds rate to 6.25%. Leamer argues that this was the wrong policy given that the housing market was clearly slowing at the time.

After publication, this conflict disappeared as a worsening economy and looming deflation induced the Fed to lower interest rates. As of August 2015, housing starts have been about 1.2 million, still below average. According to Leamer's argument this calls for continued low interest rates and suggests that the Fed would be wrong to raise rates as they are expected to do at some point in late 2015.