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**US Business Cycles from 1971-2010: A Post
Keynesian Explanation**

John T. Harvey

*Department of Economics
Texas Christian University*

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US Business Cycles from 1971-2010: A Post Keynesian Explanation

Abstract: Curiously and in spite of its name, very few business cycle theories actually treat it as a cycle. Mainstream economics, for example, models all macroeconomic fluctuations as a function of exogenous forces. In their view, the economy remains at full employment indefinitely unless impacted by some external event. Post Keynesian economists disagree strongly with this characterization, arguing instead that business-cycle fluctuations are endogenously generated. The goal of this paper is to compare the explanatory power of four business cycle models—three mainstream and one Post Keynesian—for the US economy since 1971. While the test employed is a simple one, the results are very clear: no model's performance comes even close to that of the one based on Keynes' seventy-year old analysis.

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John T. Harvey
Professor of Economics
Department of Economics
Box 298510
Texas Christian University
Fort Worth, Texas 76129
(817)257-7230
j.harvey@tcu.edu

Particularly after having just witnessed the worst recession since the Great Depression, no one needs to be convinced that it is vital to understand fluctuations in output and employment. Why the market economy moves through periods of expansion and recession is not only a key theoretical issue, it is also one in which the lay public is keenly interested—and with good reason. In the US, for example, every increase of one percentage point in the unemployment rate represents over a million people put out of work.

Curiously and in spite of its name, very few business cycle theories actually treat it as a cycle. Mainstream economics, for example, models all macroeconomic fluctuations as a function of exogenous forces. In their view, the economy remains at full employment indefinitely unless impacted by some external event. Post Keynesian economists disagree strongly with this characterization, arguing instead that business-cycle fluctuations are endogenously generated. They believe that during expansions there is an inevitable and systematic deterioration in the conditions that generate economic growth. Policy errors and white noise can contribute, but they are unnecessary and typically secondary in importance. Knowing which of these views is correct is critical to designing appropriate policy responses.

The goal of this paper is to compare the explanatory power of four business cycle models—three mainstream and one Post Keynesian—for the US economy since 1971. While the test employed is a simple one, the results are very clear: no model's performance comes even close to that of the one based on Keynes' seventy-year old analysis. The paper will proceed as follows. In the next section, each of the models is outlined. A simple test is then designed and implemented. Discussion follows.

Business Cycle Theories

As suggested above, in the mainstream view, business cycles are not really cycles at all. Christina Romer, Chair of the Council of Economic Advisors for President Barack Obama, writes

Just as there is no regularity in the timing of business cycles, there is no reason why cycles have to occur at all. The prevailing view among economists is that there is a level of economic activity, often referred to as full employment, at which the economy could stay forever (Romer 2008).

There are two basic varieties of these non-systemic cycle models within the mainstream, those allowing for the existence of involuntary unemployment and those wherein all unemployment is modeled as voluntary.

With respect to the former, the most popular are the Neoclassical Keynesian and New Keynesian approaches (as their only difference is related to microfoundations issues, they are treated together here). The key to each is the belief that, while there is an automatic tendency toward maximum growth and full employment, the economy is handicapped by the existence of rigidities. One of the most important of these is that associated with the wage rate, which limits the labor market's ability to respond to shocks (particularly negative ones). In the event of a fall in demand, for example, wages are unable to decline and so employment must do so instead. It is the combination of downwardly-rigid wages and negative demand shocks that creates recessions.

Proponents of the Neoclassical and New Keynesian approaches often attribute the disturbances that create the business cycle with policy. As they see it, the sequence of events

typically starts with a fiscal or monetary stimulus designed to lower unemployment by shifting the labor demand curve to the right. This effort is generally successful, but governments are unable to gauge when to stop. As a consequence, the expansionary policies eventually cause demand-pull inflation. Once the costs of the latter outweigh the benefits of full employment, government policies shift toward contraction. Again, they achieve their goal, but overdo it in the sense that eventually the problems created by the rising unemployment are greater than the gains from the diminished inflation. This leads to a new round of expansionary policies, and so on. The shift back and forth between stop and go fiscal and monetary policy creates the business cycle.

Other mainstream theories do not agree that the rigidities described by the New and Neoclassical Keynesians exist and therefore model unemployment as entirely voluntary. The Monetarist approach, for example, assumes that markets clear, but that confusions may arise as households are unable to track price changes as closely as firms (i.e., they suffer from “money illusion”). As a consequence, a change in the rate of inflation can go unnoticed by workers, causing the line between real and nominal wages to become blurred. This means, for example, that if there is an acceleration in inflation and firms therefore want to hire more workers to take advantage of the higher output prices, they need only offer slightly higher nominal wages—workers will believe this is a rise in real wages and rush back to work, even though it is really a decline. Hence, when inflation accelerates, unemployment (all voluntary, of course) falls. And when inflation decelerates, this sets up the opposite situation: firms lower wages (due to the fall in revenue) and workers quit, even if the decline in the nominal wage was less than the fall in prices. In this way, confusion over the actual rate of inflation leads to fluctuations in

employment. This is the reason the Monetarists argue for predictable (i.e., consistent) monetary policy.

Real-business cycle theory, too, assumes all unemployment to be voluntary and sees fluctuations as a consequence of external shocks. The unique feature of the model is the idea that short-term fluctuations are simply a rational reaction to long-term adjustments, usually described as changes in productivity. As one proponent writes:

For example, one percent permanent (once and for all) change in labor productivity in the long run leads to a one percent permanent increase in the level of capital stock, consumption, output and investment once the transitory dynamics have been dissipated. These transitory dynamics are important for understanding fluctuations. They are initiated by the requirement that the economy must move to a permanently higher capital stock...While wealth has increased, which discourages current work effort, productivity is also higher which encourages work effort. Productivity is higher because the desired or steady capital stock has risen. Thus in the near term real interest rates rise, which induces intertemporal substitution of current for future work effort. The responses, and thus the fluctuations that are present in the model, are the result of the same factors that generate economic growth (Plosser 1989: 60).

The bottom line is that employment surges when there is a jump in productivity (because this will boost wages, making it rational to work now) and it falls when there is a decline (because this will lower wages, making leisure more attractive). These exogenous shocks lead to the adjustments we view as expansions and recession.

In contrast to mainstream models, the Post Keynesian one assumes that endogenous forces were responsible for the existence of a trade cycle. Their approach is, of course, based on the economics of John Maynard Keynes, which explains fluctuations in output and employment using a particular characterization of the investment decision that included the operation of a number of negative feedback loops (see in particular Keynes 1964). In the real world, agents operate in an environment of uncertainty. By this, Keynes means that we have no “scientific basis” on which to base the forecasts that drive all meaningful economic decisions (Keynes, 1937, pp.214). In that case, one may wonder why an individual would accept the financial risks associated with physical investment. A coldly rational person would not, says Keynes, and so we rely on the existence of animal spirits, or our urge to action rather than inaction. Only when spontaneous optimism overcomes uncertainty will investment—the driving force in the macroeconomy—take place. The interaction between the two is one of the keys to explaining the business cycle. Take a situation in which buoyed animal spirits have led to a jump in investment. This creates GDP growth and a fall in unemployment. However, as investment rises, this increases the cost of producing new capital goods (as bottlenecks arise in construction and materials), makes financing more expensive (due to the fact that near the end of the expansion, borrowers are carrying heavier debt loads and lenders find it more expensive to create credit), and saturates the market for new capital goods (as more factories are built, for example, lowering the likelihood that an additional one will be profitable). This makes further additions to the stock of capital less and less attractive. For some time, agents’ animal spirits cause them to ignore or downplay these negatives by creating unrealistic expectations of future profit. Eventually, however, it will become obvious that realized results are not matching forecasts

(even if they are otherwise acceptable) and disappointment and collapse result. The latter can be particularly severe due to the general lack of confidence engendered by the environment of uncertainty. The economy remains in its slump until the existing stock of capital shrinks sufficiently to convince agents that new investments would be profitable. The lesson from Keynes and, of course, the Post Keynesians, is that the completion of the very investment projects that caused the expansion leads to the saturation of the market for capital goods, the collapse of investment, and the onset of recession. When the economy has stagnated long enough for the memory of disappointed expectations to fade and for the capital stock to depreciate, a new expansion begins. Expansions cause recessions which cause expansions.

The Keynes/Post Keynesian labor market does not, incidentally, rely on rigidities to account for the fact that the fall in demand over the recession leads to a rise in involuntary unemployment (Chick 1983). In the Post Keynesian view, while labor demand acts in the same manner as in mainstream models, the labor supply curve does not. Instead, it is simply a reference that shows how many people would *like* to have a job at each wage rate—nothing more. The difference is that those people lack the ability to alter the circumstances when they are disappointed. At points below the intersection, this is not an issue since workers are satisfied; it is firms who are off their curve. The excess demand for labor will lead the latter to offer higher wages until we come to rest where labor supply and labor demand cross and both groups are satisfied. Above that point, however, employers are perfectly happy as they have all the laborers they want. Those working, too, are pleased; it is the involuntarily unemployed who are not. Many of them might well be willing to offer to work for less, but to whom? Firms are not hiring. One could argue that there is always some turnover from firings, retirements, and job quitters,

and that these would be replaced by cheaper alternatives (thus lowering the average wage). However, the existence of long and significant periods of involuntary unemployment in the real world suggests that this must be a very weak force, at best. If Keynes' and the Post Keynesians' are correct, a free-market economy with no price rigidities can remain at less-than-full-employment equilibrium indefinitely. Combined with the endogenous fluctuations in the level of economic activity already described, this is what Post Keynesians believe creates the business cycle.

Evidence

To evaluate the empirical relevance of the theories outlined above, this paper adopts a very simple method: the average values of key variables in the final year of an expansionary period are compared to their values prior to that point to see if the difference is consistent with the theory in question. For example, Keynes argued that the cost of producing capital would rise over the expansion. If the Post Keynesian view is correct, then over the course of a five-year upturn, those costs should be higher over the final twelve months than over the first forty eight. The theories were tested using quarterly data from the US over the period 1971:1 to 2007:4. Though this period covered six recessions, the gap between the two in the 1980s was too small for the test to be administered and so had to be omitted. This left five over which to evaluate the models. Sources, units of measure, and transformations can be found in the data appendix at the end of the paper.

Table 1 shows the results for the mainstream models. Beginning with the Neoclassical and New Keynesian, as that approach views the business cycle as a function of fiscal and

monetary policy, the variables selected were the full-employment federal budget balance (deflated by the GDP deflator) and the federal funds rate of interest. This latter was measured in both nominal and real terms so as to give the model a fair chance of succeeding (particularly in light of the fact that we cannot actually know real interest rates since we do not know expected inflation). If the theory holds, then recessions should be preceded by contractionary policy: a rise in the budget balance and/or a rise in interest rates. Table 1 shows what happened over the five US expansions since 1971. From 1971:1 to 1972:3, for example, the full-employment budget balance was -\$80 billion. Over the last year of the expansion, however, the budget fell further into deficit (-\$96 billion), which is inconsistent with the theory. Bearing in mind that a random time series would support the theory 50% of the time, fiscal policy beats this (as shown at the bottom of the column), but not by a great deal. Nominal interest rates work extremely well, however, though the results for the real ones suggest that this may simply be a reflection of the fact that inflation tended to accelerate near the end of expansions (thus raising nominal interest). This leaves the judgement on the Neoclassical/New Keynesian model as mixed, but not entirely negative.

Rates of change of nonfarm business productivity were used to test the Real Business Cycle Theory. Because it assumes that a rise in productivity leads to an increase in wages and therefore labor supply, Table 1 should show that the opposite occurred before recessions. It does so only two of five times. Real Business Cycle theorists argue that the phenomena they describe tend to show up over longer time horizons, so perhaps this is an unfair test. On the other hand, it is possible, as the data here suggest, that adjustments to changing rates of productivity simply are not responsible for the business cycle.

Table 1: Mainstream Theories of the Business Cycle.

	Neoclassical/New Keynesian			Real Bus Cycle	Monetarist
	(+)	(+)	(+)	(-)	(-)
Dates of US Expansions	Full Emp Budget	Fed Fund Interest	Deflated Fed Fund	Productivity	CPI Inflation
1971:1 to 1972:3 (7 qtrs)	-\$80	4.46%	1.13%	4.35%	3.33%
final year of expansion	-\$94	7.51%	0.66%	2.35%	6.85%
1975:2 to 1978:4 (15 qtrs)	-\$128	6.07%	-0.84%	2.44%	6.91%
final year of expansion	-\$114	11.19%	-1.45%	-1.51%	12.65%
1983:1 to 1989:2 (26 qtrs)	-\$258	8.19%	4.53%	1.99%	3.66%
final year of expansion	-\$274	8.55%	3.95%	2.30%	4.59%
1991:2 to 1999:4 (35 qtrs)	-\$147	4.77%	2.19%	2.27%	2.58%
final year of expansion	\$93	6.24%	2.79%	2.98%	3.44%
2002:1 to 2006:3 (19 qtrs)	-\$274	2.32%	-0.58%	2.43%	2.89%
final year of expansion	-\$151	5.21%	2.83%	2.91%	2.38%
Percent as Predicted	60%	100%	40%	40%	20%

(+) = variable expected to rise before recession

(-) = variable expected to fall before recession

Bold = consistent with theory in question.

The Monetarist approach suggests that unemployment occurs when workers mistakenly quit their jobs during decreases in inflation. Hence, rates of change of CPI inflation should drop at the end of expansions. It does exactly the opposite throughout the entire time period save for the very last cycle. In fact, the contrary evidence is quite remarkable in two of the periods. As with the Real Business Cycle theory, it is possible that the design of this test is masking the operation of those factors Monetarists count as most important—or it could be that recessions are not a result of workers becoming confused about their wages and quitting their jobs. In any event, none of the three mainstream models performed particularly well, though it is safe to say that the one that allowed for the existence of involuntary unemployment showed best.

Table 2 shows the calculations for the Post Keynesian approach (plus some descriptive statistics). As suggested above, Keynes argued that investment was the central variable in both expansions and recessions, and the evidence is strongly supportive. The other variables listed are secondary in the sense that they are meant to show whether or not investment declined for the reasons claimed by Post Keynesians. Again, there appears to be widespread support. For instance, capital cost (measured as PPI inflation for capital equipment) does, indeed, appear to rise as the upturn matures, and animal spirits (proxied by both a business sentiment index and the deflated S&P 500 index) seemed to, with one exception each, wane. Note that the same interest rates as under the Neoclassical Keynesian test were included, but without the implicit premise that these represent a monetary policy stance, per se. As in the former case, the support for them is mixed, but then this is consistent with Keynes' view of the interest rate as a secondary factor. Overall, the Post Keynesian view is far more successful in explaining the post-1971 US economy than any from the mainstream.

Table 2: Post Keynesian Theory of the Business Cycle and Descriptive Statistics.

	Post Keynesian						Descriptive Stats	
	(-)	(+)	(-)	(-)	(+)	(+)		
Dates of US Expansions	Invest	Capital Cost	Bus Sent	Real S&P	Fed Fund Interest	Deflated Fed Fund	%ΔGDP	Unemployment
1971:1 to 1972:3 (7 qtrs)	19.1%	2.7%	56.7	13.5%	4.46%	1.13%	5.60	5.83
final year of expansion	8.8%	3.8%	66.7	-9.3%	7.51%	0.66%	4.99	5.01
1975:2 to 1978:4 (15 qtrs)	15.8%	7.1%	55.9	1.3%	6.07%	-0.84%	5.35	7.26
final year of expansion	-3.9%	8.9%	52.5	-3.9%	11.19%	-1.45%	1.26	5.85
1983:1 to 1989:2 (26 qtrs)	9.6%	2.5%	54.6	13.3%	8.19%	4.53%	4.62	7.01
final year of expansion	-1.1%	3.0%	47.7	8.6%	8.55%	3.95%	2.48	5.31
1991:2 to 1999:4 (35 qtrs)	9.6%	1.06%	52.5	15.5%	4.77%	2.19%	3.81	5.76
final year of expansion	4.8%	1.09%	51.7	-2.6%	6.24%	2.79%	2.95	3.97
2002:1 to 2006:3 (19 qtrs)	5.7%	1.2%	54.0	2.6%	2.32%	-0.58%	2.80	5.45
final year of expansion	-2.6%	1.7%	51.4	14.1%	5.21%	2.83%	2.74	4.52
Percent as Predicted	100%	100%	80%	80%	100%	40%	NA	NA

(+) = variable expected to rise before recession

(-) = variable expected to fall before recession

Bold = consistent with theory in question.

Conclusions

While the test shown here is obviously very simple and can only be considered suggestive, it is hard to ignore the fact that a) theories that denied the existence of involuntary unemployment performed extremely poorly and b) the Post Keynesian view garnered much more support than any other. Appropriate policy design depends on determining which view is correct. If the mainstream is right that the economy largely takes care of itself and that problems arise only from shocks and policy errors, then a hands-off approach is best. But, if they are wrong and the Post Keynesian conception is closer to the truth, then such a policy stance represents a surrender to vagaries of a system that generates regular and significant periods of involuntary unemployment.

DATA APPENDIX

Data are quarterly and from Federal Reserve Bank of St. Louis unless otherwise noted.

% Δ GDP: Percentage change (quarter-to-quarter, annual rates) of real GDP.

Bus Sent: Business Sentiment as proxied by Purchasing Managers' Index survey (source: Institute for Supply Management).

Capital Cost: PPI inflation for capital equipment, percentage change from last period at annual rates.

CPI Inflation: Percentage change from last period at annual rates of consumer price index (seasonally adjusted) for all urban consumers, all items.

Deflated Fed Fund: Federal funds interest rate minus CPI inflation (percentage change from last period, annual rates).

Fed Fund Interest: Federal funds interest rate.

Full Emp Budget: Federal budget balance assuming full employment, measured in billions of dollars and deflated by GDP deflator (source: Congressional Budget Office 2009).

Invest: Real gross private domestic investment (chained 2005 dollars), percentage change from last period at annual rate.

Productivity: Compounded annual rate of change of nonfarm business sector output per hour of all persons, seasonally adjusted (source: Bureau of Labor Statistics).

Real S&P: Average S&P 500 daily close, minus CPI inflation (percentage change from last period, annual rates).

Unemployment: Unemployment rate.

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