

Wages and Unemployment

1. Pre-Keynesian economics

- Equilibrium in all markets,
- FE of labor in labor market equilibrium

2. Keynes' revolution

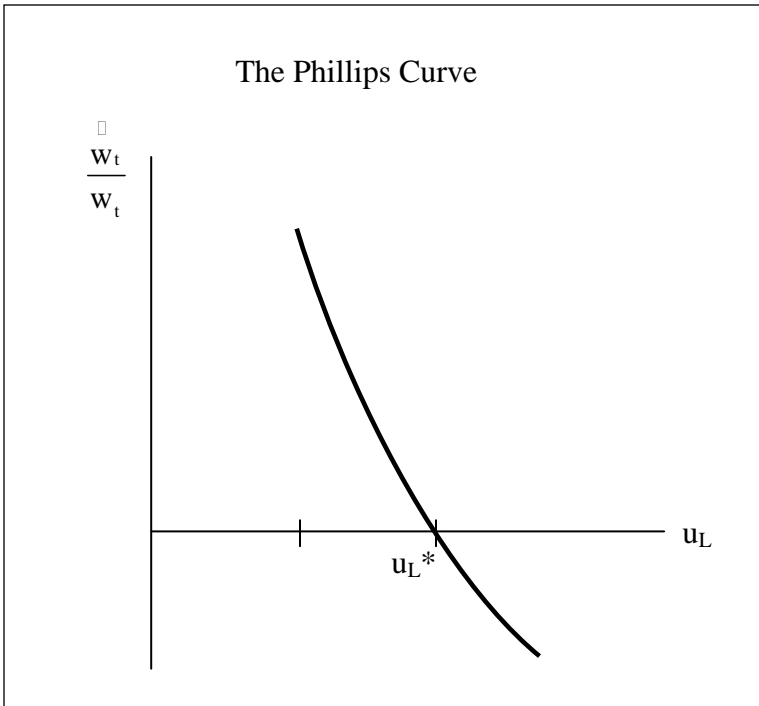
- His ideas developed in the historical context of post-WWI devastation in Europe, persistent unemployment and poverty in 1920s
- Already recommending deficit financed spending in 1920s long before *GT* in 1936
- **Key arguments in GT**
 - System is subject to turbulent fluctuations due to dependence of investment on expected net rate of profit ($r^e - i$)
 - Unemployment does not lead to a fall in real wages or at least not fast enough to make an *effective* move to FE
 - Interest rate does not fall in the face of unemployment, so this cannot serve to raise net rate of profit and hence investment (which fluctuates anyway)
 - *Hence in periods of persistent unemployment, government deficits are appropriate to pump up output and employment*

3. Inflation

- In NC theory the system is normally at effective FE, so an increase in aggregate demand fueled by an increase in money supply will lead *only* to an increase in prices.
- In Keynesian theory the system is normally below effective FE, so an increase in aggregate demand will first increase in output and employment up to the point of effective FE, and then increase prices afterward
- In both theories, "effective FE" implies a certain amount of "frictional unemployment":
 - always a certain number of people who are on the way from one job to another.

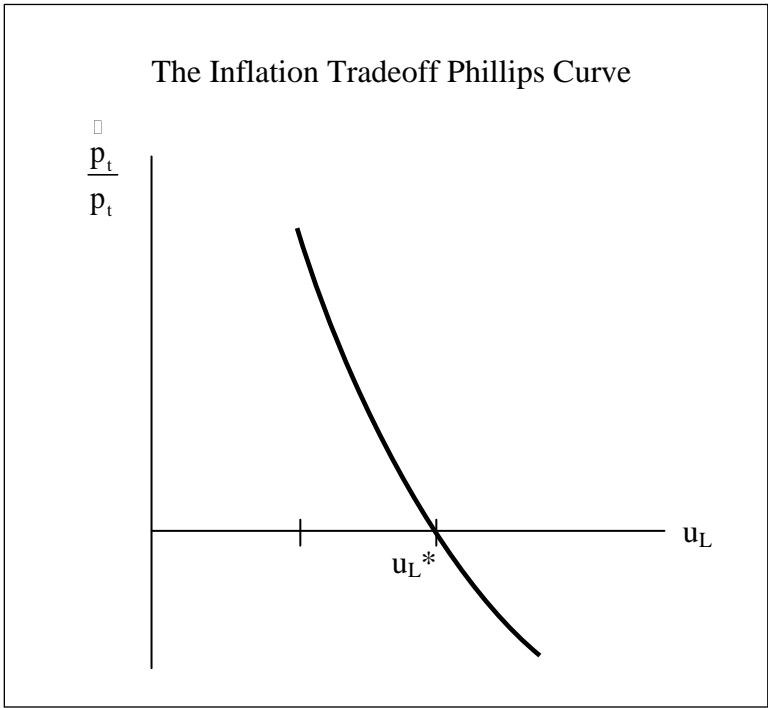
4. Phillips *money-wage* curve

- Phillips (1958) showed that at empirical level from 1861-1957 the *cyclically-adjusted* rate of change of money wages in the UK rose when unemployment was below a certain level, and fell when unemployment was higher than this critical level.
 - Note that this was a proposition about the trends, i.e. cyclically adjusted levels
 - It implies a curve of the shape below



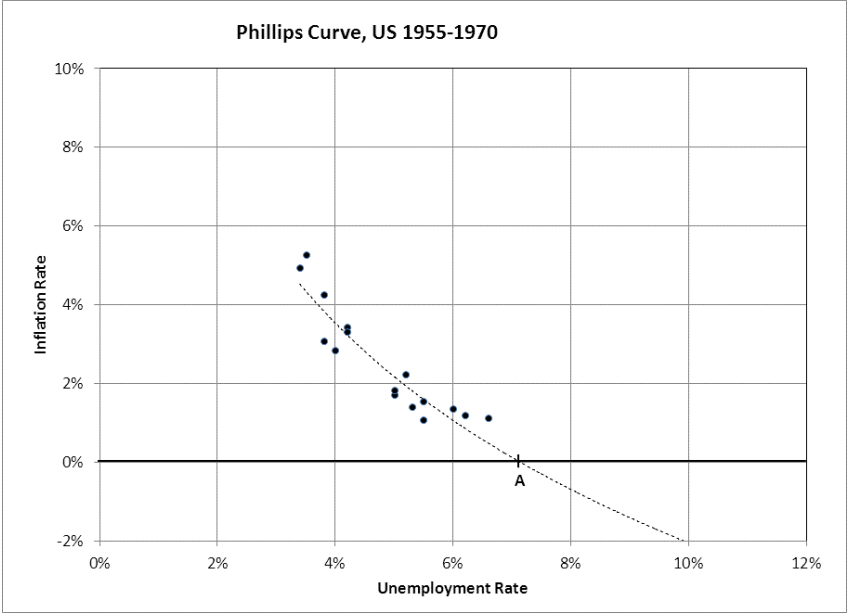
5. The Keynesian price Phillips curve

- Keynesian policies in force from the 1950s onward did not have a concrete way to express the relation between inflation and unemployment
- A transformed version of the Phillips curve seemed to provide the perfect tool for Keynesian policy
 - By assuming that prices were formed as markups on money wages, one could transform the original Phillips curve in terms of the rate of change in money wages into one of the rate of change of prices, i.e. *inflation versus unemployment*.
 - This meant that policy makers could think of reducing employment below the critical level in return for accepting some tolerably higher rate of inflation.

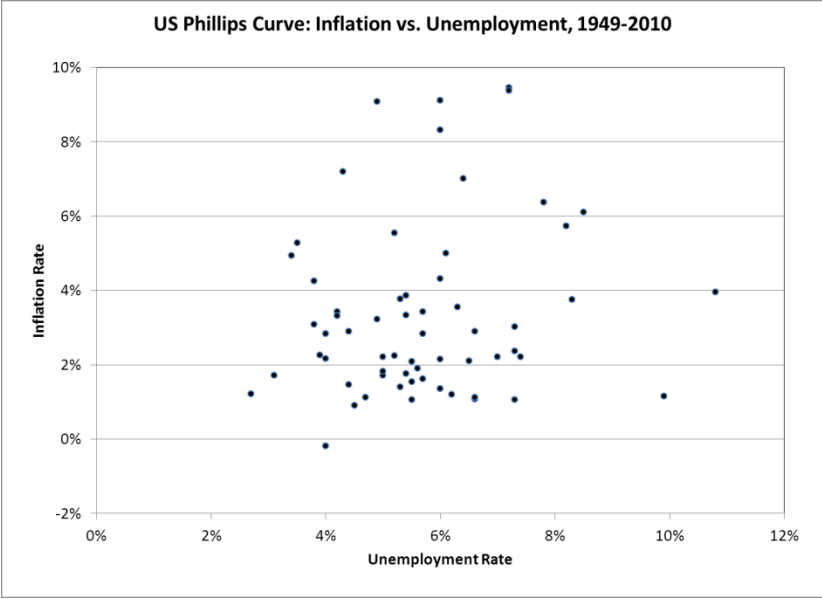


6. Postwar Phillips curves

- Phillips' original data covered 1861-1957 in the UK
- Early postwar data in other countries seemed to confirm Phillips' "law", e.g. US



But then soon the Phillips curve fell apart



Worse yet, unemployment rose, yet inflation *also rose* instead of falling, which directly contradicted the Phillips curve and Keynesian theory



7. Revenge of the Empire: The Neoclassical "Solution"

- Keynesian theorists were trapped by the contradiction between their theory and the facts
 - According to their theory, inflation should *fall* when unemployment rises
 - According to the facts, inflation *rose* when unemployment rose
- Friedman and Phelps stepped into the breach by proposing two things:
 - *First*, that the *true* Phillips curve was in terms of the rate of change of *real* wages, not the rate of change of nominal wages
 - *Second*, that in the long run any observed unemployment is *voluntary or induced by workers themselves: it is a "natural" rate of unemployment*
 - What appears like involuntary unemployment is really voluntary in two different senses
 - Some workers choose not to work at the going wage because they prefer the options of unemployment benefits, welfare payments, etc.
 - Other workers use unions and the state to raise their real wages *above* the market rate, which means that the real wage is above the labor market clearing rate so that labor demand is below labor supply: the voluntary raising of the wages of some employed workers leads to involuntary unemployment of other workers.
 - Dynamics of adaptive adjustment
 - Since the real wage = nominal wage/price level, the rate of change nominal wages = the rate of change of real wages + inflation (rate of change of prices)
 - From this point of view, the Phillips curve *shifts* when inflation is higher
 - Friedman/Phelps proposed that in the case of a "surprise" increase in aggregate demand we will get a surprise increase in inflation and output would initially rise and real wages would not adjust adequately because it takes time for workers and firms to catch on to a new unexpected rise in inflation.
 - So when firms see that their own price has risen they expand output and employment because they fail to realize that their costs will soon rise. Hence unemployment falls. This induces workers to demand a higher rate of change of money wages in correspondence to the new lower unemployment rate, but since they have not yet realized that prices have also risen, this nominal new wage demand is too low.
 - As firms catch on that their costs have also risen, i.e. that their real profits are actually not any different, they drift back to the original level of output and rate of unemployment. At the same time, as workers catch on to the fact that prices have risen, their rate of change of money wages catches up to the new inflation rate.

- In the end, the system returns to the original "natural" rate of employment with a higher rate of increase of money wages equal to the higher inflation rate – i.e. to the same real wage as before.
- Lucas accepted the natural rate of unemployment thesis, but rejected the Friedman/Phelps slow (adaptive) adjustment of inflation expectations in favor of "rational expectations".
 - Then after brief period due to the initial surprise, firms and workers *jump* to the correct expectations of the new objective rate of inflation.
- In all approaches, the system returns to a natural rate of unemployment after any attempt to pump it up, so the only effect will be a higher rate of inflation

8. The classical approach to the relation between wages and unemployment

- Marx's theory of the reproduction and maintenance of a persistent rate of unemployment depends crucially on the negative feedback between wages and unemployment
 - RAL story
- Goodwin's formalization
 - Real wage Phillips curve
 - Constant rate of productivity growth and labor supply growth
- Alternate formalization: wage struggle and corresponding wage curve
 - At the individual level, workers and firms struggle over the division of value added
 - This leads to a particular relation between the average real wage rate and productivity
 - 1) $w_t = \beta_t y_t$ where β_t is a measure of the relative strength of labor
 - But relative labor strength itself depends on the unemployment rate

$$2) \frac{\dot{\beta}_t}{\beta_t} = f \left(u_{L_t} \right) + \varepsilon_t$$

- Equation 1 can be expressed in rates of growth, $\frac{\dot{w}_t}{w_t} = \frac{\dot{\beta}_t}{\beta_t} + \frac{\dot{y}_t}{y_t}$ so if we define the wage share as $\omega = w/y$ then equation 2 implies that the rate of change of the wage share is a negative function of the unemployment rate.

$$3) \frac{\dot{\omega}_t}{\omega_t} = f \left(u_{L_t} \right) + \varepsilon_t$$

- This *Classical Curve* appears as one of the two dynamic relations in Goodwin's elegant formalization of Marx's Reserve Army argument (1967, p. 55)

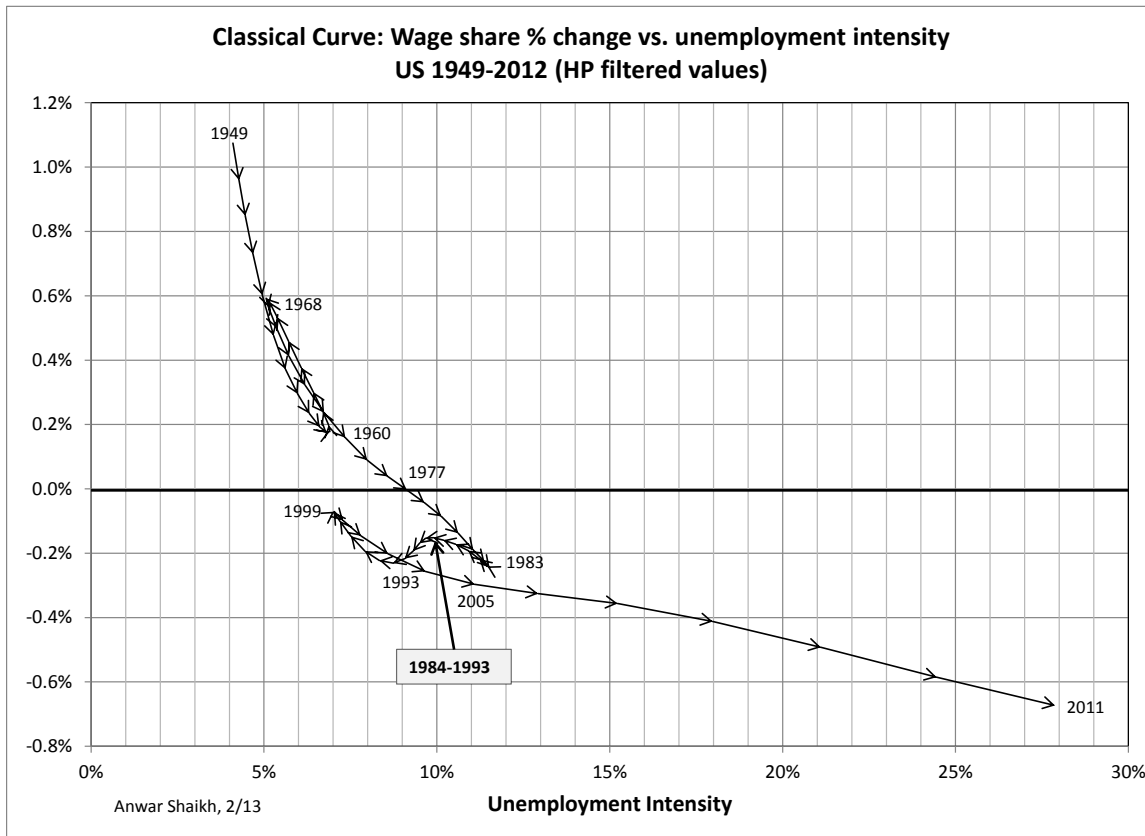
9. Phillips' question vs. Phillips's answer: a tale of three Phillips' curves

- Phillips' original *question* has to be distinguished from his *answer*
- Phillips' question: what is the effect of unemployment on wage rates?
- Phillips answer is a Keynesian one posed in terms the rate of change of *money* wages
- But as Friedman and Phelps point out, workers struggle for a standard of living, i.e. for a real wage, not a money wage.
 - Hence from their point of view, the correct "Phillips-type" relation should be in terms of the rate of change of *real* wages
- However, in the classical tradition it has always been recognized that the real wage itself is related to the general level of development of society, i.e. to *the level of productivity*
 - Thus from the classical point of view, the correct "Phillips-type" relation curve would be in terms of the rate of change of real wages *relative* to productivity, i.e. in terms of the rate of change of the *wage share*.
- So we end up with three answers to Phillips's question
 - Phillips' Keynesian answer in terms of the rate of change of money wages
 - Friedman/Phelps/Lucas' answer in terms of the rate of change of real wages
 - The classical answer in terms of the rate of change of the wage share
 - Note that any classical version of a Phillips-type curve will *shift down* and may also *change shape* when relative labor strength is reduced, since a real wages will change at a lower rate relative to productivity when labor is weaker.

10. Empirical evidence (SEE POWERPOINT ANIMATION)

- Vertical axis = rate of change of the wage share
- Horizontal axis = (unemployment rate) x (unemployment duration index to 1952-1954)

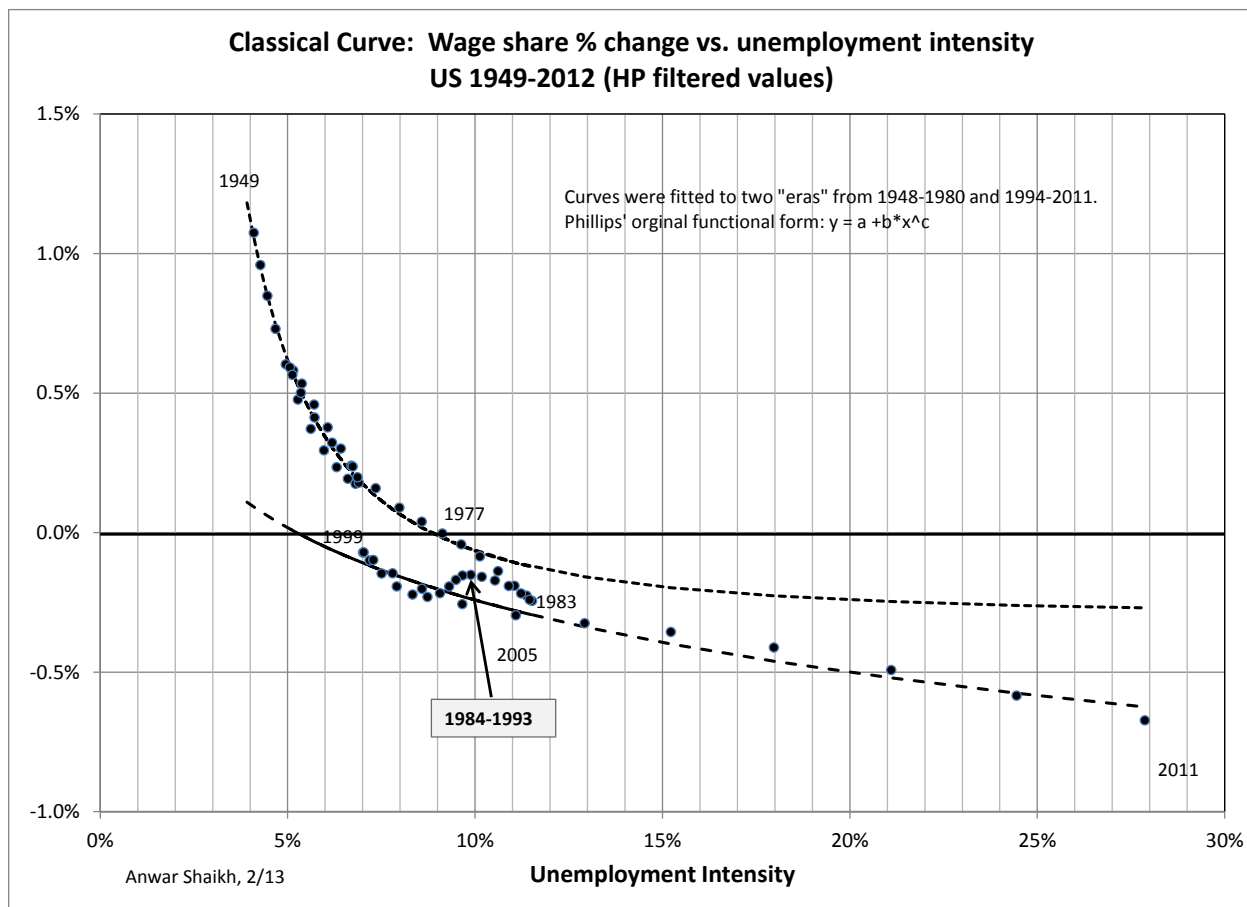
- Following Phillips' original procedure, *all data is cyclically adjusted*, in the present case by using HP-filtered values of the variables



- Note the long duration of a stable postwar classical curve from 1948-1983, corresponding to a stable (albeit deteriorating) balance of power between labor and capital.
- Note the *reverse movement* along this stable curve from 1960-1968 during the Vietnam War boom.
- Note that the curve continues to hold during the infamous Stagflation Crisis of the 1970s and early 1980s
- Note the subsequent clear downward shift in the curve from 1984-1993 after labor is dramatically weakened during the Reagan-Bush era, into an region of *falling* wage shares.
- Note the *reverse movement* along the new lower curve during the Dot.com credit bubble from 1993-1999.

11. Implications of the classical approach for the Phillips curve debate

- Had Phillips posed his question in classical rather than Keynesian terms, there would not have been a theoretical crisis during the Stagflation era of the 1970s and 1980s
- Hence there would not have been the same opening for the neoclassical *theoretical* attack on Keynesian policy
- This of course need not have changed the *political* attack, which was after all to weaken labor and raise the rate of change of the profit share by reducing the rate of change of the wage share
- Since the stable relation is between the rate of change of the wage share and the unemployment intensity, we can explain the shifts of the original (Keynesian) Phillips curve in a simple way
 - At an empirical level
 - 1) rate of change of the wage share = f(unemployment intensity)
 - Algebraically
 - 2) wage share = (the money wage/the price level)/productivity
 - Combining these two gives
 - 3) rate of change of money wages = f(unemployment intensity) + inflation + productivity growth**
 - The first two terms (in boldface) in equation 3 represent the original Phillips curve, while the other two parts represent "shift" factors predicted by the classical approach.
 - From this point of view, we can estimate the impact of the shift factors by regressing the *excess* of the rate of growth of money wages over fitted functions in unemployment intensity against inflation and productivity growth
 - 4) [rate of change of money wages - f(unemployment intensity)]**
= c₁ + c₂·inflation + c₃·productivity growth
 - It is then possible to estimate the responsiveness of the rate of change of money wages at any given level of unemployment intensity, i.e. the responsiveness of the original Phillips curve, by fitting functional forms to the two stable segments of the classical curve in equation 1 for 1948-1982 and 1994-2011 using the fitted functions in a regression equation 4 to estimate the parameters on inflation and productivity growth
 - The fitted functions are of the form used by Phillips himself :
$$y = a + bx^c$$
 - The fitted curves are displayed below
 - The corresponding regressions results are summarized in the corresponding table. All three variables are highly significant.



[money wage growth - f(unemployment intensity)] = c₁ + c₂·inflation + c₃·productivity growth		
	1948-1982	1994-2011
Constant	0.004173	0.008677
Inflation	0.963465	0.832633
Productivity Growth	0.836600	0.714580

What is particularly striking is the coefficient on inflation in the first period which includes the period of Stagflation is only slightly below one. This implies that nominal wages were essentially able to keep up with inflation but lost ground with respect to productivity growth in the face of steadily rising unemployment intensity.

But in the second era of a weakened labor force, nominal wages lost ground relative to both inflation and productivity in the face of a long *cumulative* rise in unemployment intensity.

Dependent Variable: GMWAGEHPXCESSA
Method: Least Squares
Date: 03/12/13 Time: 22:56
Sample (adjusted): 1949 1982
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.004173	0.001236	3.375543	0.0020
INFLRATEHP100	0.963465	0.011863	81.21266	0.0000
GPRODVTYHP100	0.836600	0.046259	18.08521	0.0000
R-squared	0.999682	Mean dependent var		0.055066
Adjusted R-squared	0.999661	S.D. dependent var		0.015812
S.E. of regression	0.000291	Akaike info criterion		-13.36148
Sum squared resid	2.63E-06	Schwarz criterion		-13.22681
Log likelihood	230.1452	Hannan-Quinn criter.		-13.31556
F-statistic	48658.91	Durbin-Watson stat		0.237619
Prob(F-statistic)	0.000000			

Dependent Variable: GMWAGEHPXCESSB
Method: Least Squares
Date: 03/12/13 Time: 22:58
Sample (adjusted): 1994 2011
Included observations: 18 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.008677	0.001771	4.900422	0.0002
INFLRATEHP100	0.832633	0.074193	11.22255	0.0000
GPRODVTYHP100	0.714580	0.042579	16.78262	0.0000
R-squared	0.961225	Mean dependent var		0.038011
Adjusted R-squared	0.956055	S.D. dependent var		0.002067
S.E. of regression	0.000433	Akaike info criterion		-12.49946
Sum squared resid	2.82E-06	Schwarz criterion		-12.35106
Log likelihood	115.4951	Hannan-Quinn criter.		-12.47900
F-statistic	185.9255	Durbin-Watson stat		0.242132
Prob(F-statistic)	0.000000			

References

- Goodwin, Richard M. 1967. "A Growth Cycle," In *Socialism, Capitalism and Economic Growth*, ed. C. H. Feinstein. London: Cambridge University Press.
- Phillips, A. W. 1958. "The Relation between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861-1957." *Economica*, 25(100), pp. 283-299.