Behind this Structural Boom:
The Role of Asset Valuations

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We are in the midst of a structural boom the force of which has not been

seen in this country since the 1920s. After the U.S. unemployment rate hit

6 per cent in late 1994, following its two-year recovery, many experts

assumed that unemployment had regained its natural-rate path.[1] The

natural unemployment rate in the second half of the 1980s had been put at

around 6.5 per cent in several estimates, and if the trend reduction in the

natural rate brought about by the continuing relative decline of high

school drop-outs in the labor force and those whose education stopped at

the diploma is placed at .07 per annum, it would have declined on that

account to around 6 per cent by 1995.[2] (Phelps and Zoega, 1997)

Furthermore, we saw in 1995 the end of money-wage deceleration and in

the next year a whiff of wage acceleration. Yet the unemployment rate

went on falling: 5.6 per cent in 1995, 5.4 per cent in 1996, 4.9 per cent in

1997, 4.6 per cent in 1998. And the wage acceleration that had reared its

head in 1996 went away and has reappeared only in 1998.

There seems, therefore, to have been a steep decline, temporary or

permanent as the case may be, of the natural rate. (By definition, the so-

called NAIRU was reduced over this period.) I would say that the fall was

as much as 1½ points, which exceeds the dip that may have occurred in the second half of the 1960s and that in the early 1950s. However, since the natural rate concept means the unemployment rate when *equilibrium* is prevailing in all markets (where equilibrium means correct expectations), it may well be that not all of this structural boom represents a genuine drop of the natural rate – a possibility that I will recognize later on.

As critics of the natural rate see it, this uncommon decline of joblessness unaccompanied by any appreciable rise in wage inflation comes as a revelation confirming their long-held belief in the inutility and invalidity of the natural rate idea. They say that if the natural rate moves unpredictably or mysteriously, that renders it useless for predicting and understanding the determination of the level of economic activity and its fluctuation. The irony of this complaint coming from Keynesians is that Keynes himself centered his model around the marginal efficiency of capital, which was a purely subjective entity reflecting the animal spirits of entrepreneurs. Precisely because of its unpredictability, Keynes was not optimistic that either wage setters operating in decentralized markets or monetary-policy makers operating from the governmental center could succeed very well at stabilizing the level of activity around its equilibrium path.

The critics' complaint betrays an odd philosophy of science. In physics there is no insistence on explaining a particle's every quantum jump, or indeed any jump (as Einstein famously complained). We in the

social sciences are accustomed to have to cope with knowing only a part of the behavior of the systems we study. In any case, the critics are premature: it remains to be seen whether the surprising development can be interpreted as a structural boom in a way that will satisfy most scholars.

As I see it, though, this uncommon development is grist for the mill of those of us who have been making endogenous natural rate models over the past ten years – both the recent intertemporal models (e.g., Phelps, 1994) and the latest static models (from Salop, 1979, and Calvo, 1979, to Layard, Nickell and Jackman, 1991). In fact, it invites a new focus that promises to be exciting. In my 1994 book, for example, with its models of the equilibrium path of unemployment, the focus was on how some presumably *secular* parametric changes shift the equilibrium path (generally the entire path) and the emphasis was on the end-point of that path – the steady-state unemployment rate – or at least on the medium-term stretch of the path, since the background to that research was the *secular* rise of joblessness in the OECD nations between the early 1970s and the mid-1980s. The same framework can be used, however, to show how some presumably *cyclical* forces can perturb the equilibrium unemployment rate over the near term while not necessarily lowering the end-point of the equilibrium path. (This second focus in natural-rate research would draw it closer in spirit to the neoclassical RBC models though major contrasts in their view of information would remain.) This paper is an effort to assemble my preliminary thoughts on this new focus,

the *cyclical fluctuations* in the natural rate (defined as the unemployment

rate over the near term given by the current equilibrium path).

Part I sets out my thesis that the inflationless expansion since early

1995 is, in large part, a genuine structural boom – one driven by possibly

cyclical, though apparently nonmonetary, forces – and it presents some

supporting empirical results, graphical and statistical. Part II concludes.

I. The Role of Enterprise Asset Valuations

The overarching theme of my structuralist models (Phelps, 1994) is that the

valuation of firms' assets – human investments in employees and in

customers as well as investments in tangible capital – is the proximate force

driving the demand for labor; and the income from workers' wealth drives

the "wage curve," which governs the cost of labor; the development of these

two sets of forces shapes the equilibrium path of unemployment. The asset

valuations are the net resultant of the stream of expected future returns on

the assets on the one hand and the discount on future returns entailed by real

interest rates *net* of productivity growth rates. The income from workers'

wealth includes the pecuniary and imputed returns on the (foreign and

domestic) assets they own, both their private wealth and their social wealth,

notably their entitlements from the state.

My collaborators and I have obtained positive results in testing the

latter hypothesis against Italian and U.K. data on private wealth (Phelps,

1997; Phelps and Zoega, 1998) and have found social wealth to be

significant in those countries and also in the U.S. (Phelps and Zoega, 1997). On the former hypothesis, we have consistently found a significant and not unimportant role for the world real rate of interest (Phelps and Zoega, 1997, 1998). See also the findings of Blanchard (1997). To date, though, no one has confronted the record of unemployment rates *directly* with time series on the valuation of the assets enterprises invest in, human and other, as inferred from stockmarket (and capital-good industry) prices.

The recent period provides observations of corporate asset valuations far above normal experience. And fortunately it comes only two decades after the observations in the 1970s of prices and earnings far below normal experience. In the interim, if previous research is right, the structure of the economy has changed in some respects: Among adverse developments, private wealth is up relative to productivity and social wealth too; world real interest rates rose to a new plateau in 1981. Perhaps the most dire shift is one hard to quantify, the burden that learning to use the new information technologies must put on workers with little basic education. Among the positive developments is the sensational shrinkage in the number of workers without a high-school diploma and the number without any college, both as proportions of the labor force. In this short exploratory paper, in order to focus on the role of the prices of enterprise assets, I will take the risk of abstracting from these shifts with one exception: Since the educational composition of the labor force has changed so much, I will look only at the unemployment rate of the bottom educational group, high school

dropouts, or at the index of unemployment constructed by averaging the within-education-group unemployment rates using fixed weights from the base year (Phelps and Zoega, 1997). The unemployment rate series for the four education groups are shown in Figure 1.

Let us first consider a single asset market indicator, market capitalization per unit of fixed capital. It captures to a degree both of the attributes that make assets desirable to invest in: the profit rate, as measured by corporate profit per unit of corporate fixed capital, and the price that investors are willing for current earnings, as measured by the price-earnings ratio, the reciprocal of the earnings yield. (In fact, market capitalization, Q, as a ratio to the capital stock, K, is the product of the earnings rate, E/K, and the price earnings ratio, Q/E.)

There are several reasons why this capitalization variable (Q/K) enters positively into the aggregate labor demand function. First, if expenditure by firms on employee training and customer acquisition were unnecessary for maximum profit, this capitalization variable (that is, would be equivalent to Tobin's q; its excess over one indicates the profit to be obtained by acquiring fixed capital assets at a real price of one when their real worth (in present value terms) is q, so it indicates the attractiveness of additional fixed investment. Increased fixed investment tends to raise the real demand wage at given employment, since some capital-goods industries, notably construction, are conspicuously more labor-intensive than production as a whole and since, even if all industries had the same

factor intensiveness, capital is not instantaneously shiftable, so that the real

prices of capital-goods output are driven up, thus raising the marginal value

productivity of labor in the capital-goods industries. Second, in my

theoretical system, firms have to invest in their workforce to create

functioning employees and have to invest to obtain customers. When

capitalization increases, it may indicate that the profits on these human

assets or their market value (or both) have increased. So firms will then hire

more workers and trim mark-ups, thus raising their demand wage in terms of

product. So employment is increased through these channels as well.

Is there evidence that the capitalization variable is a driver of

employment? Figure 2 records (on the right-hand vertical axis) the quarterly

value, *lagged* two years, of the market capitalization on a large set of stocks

traded on organized exchanges provided by Datastream expressed as a ratio

to the fixed capital stock in the corporate sector. By 1973 this indicator is

already down to a moderate level (from the stock market peak around 1968)

and falls at a generally slow rate until the early 1980s, whereupon the

indicator regains this ground by the time of the 1987 crash and then goes on

to reach a value in 1996 that is double its 1973 value. Figure 2 also records

the *current* value of the unemployment rate of the high school dropout

group (measured on the inverted left-hand scale, so a rise means a rise of

employment); thus year 1998 relates 1998 dropout employment to

capitalizations in 1996. To my eye, it is striking that in the 1970s, when the

asset value indicator was depressed, the employment variable was mostly

falling, and that by the early1990s, when the value indicator was setting record highs, the employment variable was strongly rising.

Let us now examine how each of the two forces lying behind the valuation of enterprise assets, the price-earnings ratio and the profit rate, appear to influence the motion of employment. Clearly, asset valuation can go up because profitability has gone up or because investors are willing to pay more for the same earnings, either because real interest rates have gone down or future expected earnings have gone up. And not all models of the capital and credit markets imply that these two events, if they happened to exert the same pull on asset valuation, would be equivalent in their stimulus to employment.

Figure 3 records the profit rate, π, defined as the ratio of corporate profits per unit of corporate fixed capital as reported in the BEA data of the Commerce Department. This series declined from about 13 per cent in the early 1970s to about half that level, then got back to as far as 12 per cent in 1997. Figure 4 records the price-earnings ratio, *p/e*, derived from the S&P 500 composite index of stock prices. From its neighborhood of 18 in the early 1970s that series fell proportionately farther, then nearly quadrupled to around 30 in 1998. Since the unemployment rate of high school dropouts and the index of unemployment rates in the four education groups did not come close to regaining their levels in the early 1970s, one wonders whether

the price-earnings ratio has a role to play. A strand of radical thought has always held that the stock market is merely a sideshow.

A regression was run with the fixed-weight index of unemployment rates exhibited in Figure 1. The left-hand side variable is the employment increase from the previous year expressed as a ratio to the current-year labor force. The right-hand side is a quadratic expression in the discrepancy between the steady-state employment rate predicted by the two independent variables and the previous year's employment rate. The second term, the squared discrepancy, permits the discrepancy to show diminishing returns in its contribution to employment growth.

$$\frac{\hat{N}_t - \hat{N}_{t-1}}{L_t} = 1.43 \left[0.97 + 0.048 \log(\pi) + 0.033 \log(p/e) - \frac{\hat{N}_{t-1}}{L_t} \right]$$

$$(3.96)\ (31.16)\ (4.97) \qquad (3.42)$$

$$- 18.33 \left[0.97 + 0.048 \log(\pi) + 0.033 \log(p/e) - \frac{\hat{N}_{t-1}}{L_t} \right]^2$$

$$(-2.10)\ (31.16)\ (4.97) \qquad (3.42)$$

Both explanatory variables are highly significant (the *t* ratios are shown below the coefficients) and the coefficient of the log of the price-earnings ratio is not far below that of the profit rate.[3] According to these coefficients, a doubling of the price-earnings ratio or of the profit rate, in increasing the log by 1.0 and thus the discrepancy by about 0.4, would raise the steady-state *N/L* by 0.4 – an impressive fall of the unemployment rate by 4 points.

To strengthen the argument it would help to show that those categories of enterprise assets whose prices are directly observable and

reliably measured have shown a decline and subsequent rise (in real terms) that mirrors at least roughly the profile exhibited by the stockmarket valuation of the enterprises themselves (as a ratio to their fixed capital). Since there are no off-the-shelf data on the prices that firms pay for performance-ready employees and for customers we are left with the categories of tangible capital. The price indexes available for construction are generally thought to be relatively unproblematic. One can examine the construction goods price index (WPSSOP2200) of the BLS, labeled materials and components for construction, which starts in 1974, expressed as a ratio to the BLS price index for finished goods (WPSSOP3000). Very broadly speaking, this relative price series does exhibit a decline to a trough in the early 1980s and a recovery finally to new highs. The main difference is that the strong surge to new heights comes early – in 1993 and again in 1994, while the strongest rises in profit rate are a little later and those in stock market value per unit of capital later still.[4] The ensuing construction boom accounts for nearly 23 per cent of the decline of unemployment between 1994 and 1998. The parallel boom in the equipment sector, which is larger and has been aided by productivity gains and growth of overseas customers, surely accounts for an even larger share.

II. Concluding Thoughts

The thesis here is that the natural rate does not shift only with changes in demographics, institutions, taxes, the global economic climate and so forth. Forces apt to be cyclical also drive the natural rate. In my framework, the real valuations of the sorts of assets that enterprises invest in are a key force and

they may exhibit cyclical fluctuations. The preliminary findings here sustain my thesis that share prices are a powerful driver of the employment rate. Apparently they are a good proxy for the valuations of the underlying assets – functional employees, loyal customers, and tangible capital. And Keynes-Tobin arbitrage between stocks and assets may go on as well.

Much more research will be needed before we can feel assured about these results. It is possible that my findings are no more than a spurious correlation. Yet my regression is no mere ex post rationalization. It is grounded in a theory I developed in the early 1990s, when stocks were far below their recent highs.

Conceivably, recent asset price rises correlate with near-future employment gains because the former anticipate near-future rises in the labor demand function or declines in the wage curve attributable to recent changes in state variables and parameters. If so, the stock market's estimated power may shrink if the other causal forces behind the wage curve and demand curve are readmitted to the equation – wealth, domestic capital, productivity, etc. (On productivity growth see Pissarides, 1990, Hoon and Phelps, 1997.)

Another question that hangs over this paper is whether the recent fall of the structural volume of unemployment is a genuine fall of the natural rate or instead the attainment of an *unnatural* unemployment rate borne of mis-forecasts about future real interest rates or future real returns. I have merely argued that structural forces involving the real prices of assets are at work.

REFERENCES

Blanchard, Olivier J. "The Medium Term," *Brookings Papers on Economic Activity*, no. 2, Autumn 1997, 000-000.

Calvo, Guillermo A., "Quasi-Walrasian Models of Unemployment," *American Economic Review*, May 1979 (*Papers and Proceedings*), 69 (2), 102-7.

Hoon, Hian Teck and Phelps, Edmund S., 'Macroeconomic shocks in a dynamized model of the natural rate of unemployment.' *American Economic Review*, September 1992, 82 (4), 889-900.

_____ (1997), 'Growth, wealth and the natural rate: is the European job crisis a growth crisis?' *European Economic Review*, May 1997.

Layard, R., Nickell, S. and Jackman, R. (1991), *Unemployment - Macroeconomic Performance and the Labour Market*. Oxford: Oxford University Press.

Lindbeck, A., and Snower, D. J. (1988), *The Insider-Outsider Theory of Employment and Unemployment*. Cambridge: MIT Press.

Phelps, Edmund S., "Enterprise and Inclusion in the Formal Economy of Italy," Report, Consiglio Nazionale delle Ricerche, Rome, November 1997.

_____ *Structural Slumps: The Modern Equilibrium Theory of Unemployment, Interest and Assets*. Cambridge MA: Harvard University Press, 1994.

Phelps, Edmund S. and Zoega, Gylfi. "Natural Rate Theory and OECD Unemployment." *Economic Journal*, May 1998, 108 (3), 782-801.

_____. "The Rise and Downward Trend of the Natural Rate." *American Economic Review*, May 1997 (*Papers and Proceedings*), 87 (2), 283-289.

Pissarides, C. A. (1990), *Equilibrium Unemployment Theory*. Oxford: Blackwell.

Salop, S. C. (1979), 'A model of the natural rate of unemployment.' *American Economic Review*, vol. 69, pp. 117-125.
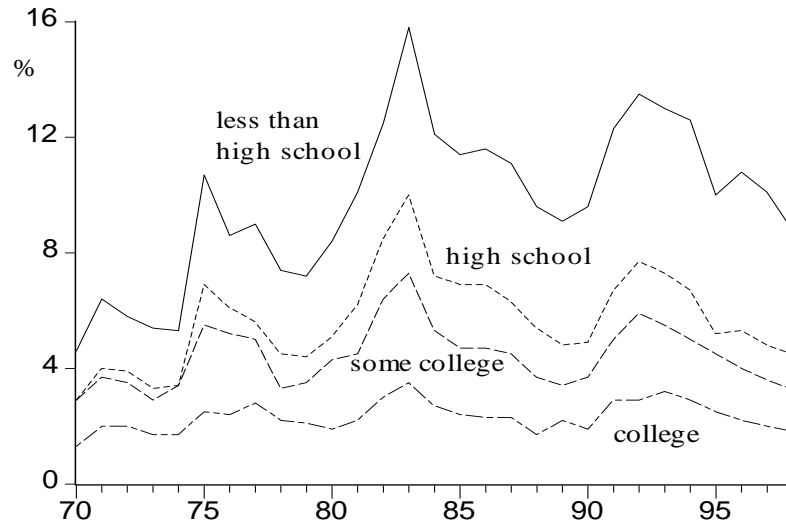
FIGURE 1. THE UNEMPLOYMENT RATE FOR
FOUR EDUCATION GROUPS

FIGURE 2. EMPLOYMENT RATE OF HIGH-SCHOOL DROPOUT GROUP
(LEFT-HAND SCALE) AND LAGGED MARKET CAPITALIZATION
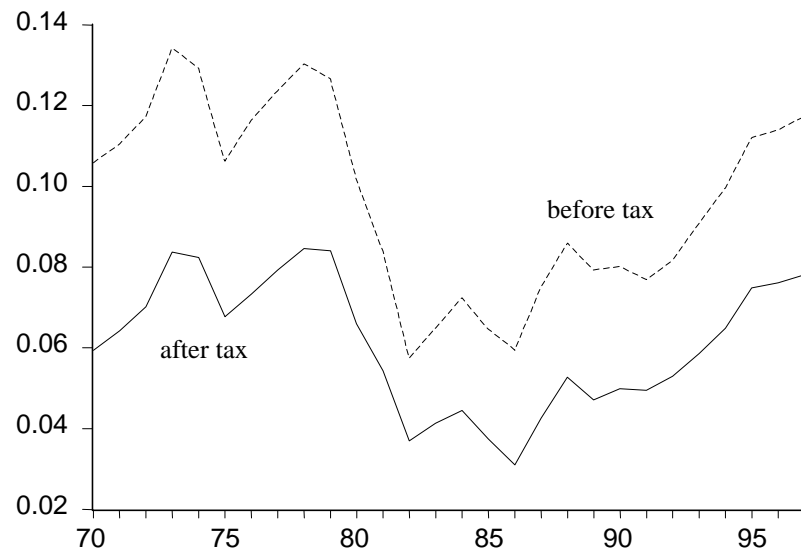AS A RATIO TO CORPORATE CAPITAL (RIGHT-HAND SCALE)

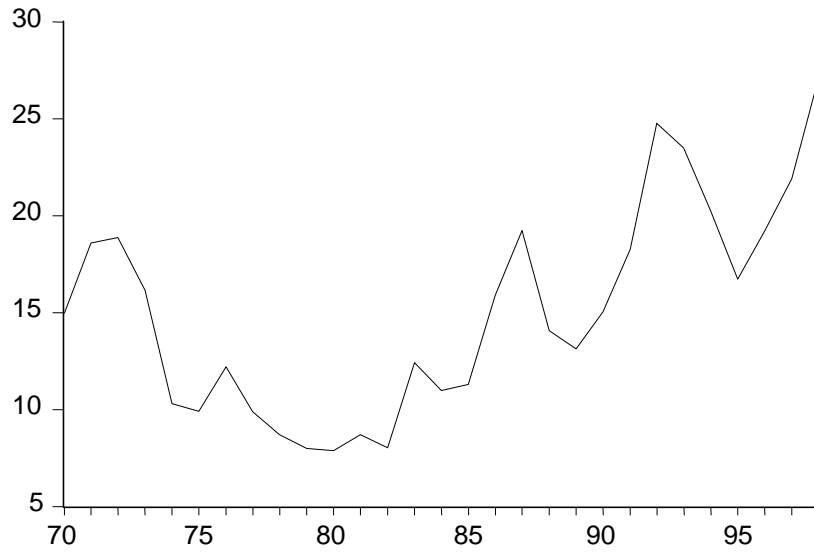FIGURE 3. CORPORATE PROFITS BEFORE AND AFTER TAX
PER UNIT OF CAPITAL

FIGURE 4. PRICE-EARNINGS RATIO OF THE S&P 500
COMPOSITE FIRMS

ENDNOTES

[1]   In the theoretical framework here, there is an equilibrium path of the unemployment rate corresponding to the economy's present (initial) state. In this paper and my latest papers generally, I take the present natural rate to be the unemployment rate on this path at the present time. If there are hiring-cost frictions slowing the adjustment of employment to current condition, we may think of the present natural rate as its value on the equilibrium path a year or so ahead, when most of the adjustment to present conditions will have been made.

[2]   I would add that, beginning sometime in the mid-1980s if not earlier – after 15 years of tax hikes on labor and some 10 years under the great productivity slowdown – workers must have found their assets at a level relative to post-tax paycheck that was higher than they wanted to sustain. As they sought to slow their accumulation of assets, their real assets as a ratio to their after-tax pay ought to have been declining. The corresponding decline in the imputed and pecuniary income from these assets would reduce quitting, shirking etc and thus add another downward pull on the natural rate. We do indeed see households trying to save less in this period, although the rise in real asset prices has prevented any fall in the *value* of their assets – their real wealth. But it is not clear that asset prices have the same significance for employee behavior as the services of houses, cars, and other consumer durables.

[3]   The adjusted R-squared is 0.48 and the Durbin-Watson statistic 1.61. Incidentally, if we constrain the coefficients to be equal, on the premise that it does not matter whether it is profitability or the price-earnings ratio that drives valuation up or down, we have an equation with log $[(p/e)\pi]$ as the sole independent variable in place of the two. (In concept, this gives market valuation per share. However, this derived series based on the S&P 500 p/e is not identical to the series in Figure 2 from Datastream.) This constrained regression also gives good results, of course. (The Datastream valuation series does not deliver a statistically significant coefficient. For me, though, Figure 2 is amply persuasive, as is the regression result in the text.)

[4] The corresponding relative price index for capital equipment does not hit new highs, undoubtedly because of downward adjustments made as an effort to adjust for quality change.