THE “OUTPUT GAP” AND EXCESS LABOR EMPLOYMENT: AN EMPIRICAL LOOK AT THE EVIDENCE FROM A SMALL FIRM PERSPECTIVE

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Introduction

The debate surrounding the current status of monetary policy and future inflation has, to varying degrees (depending on the speaker and the date), appealed to the existence of an output gap that will prevent the resurgence of substantial inflation even with a federal funds interest rate that many observers view as too low for too long. Politicians and political commentators frequently refer to the high levels of employment (and low unemployment rates) reached in 2000 as the benchmark for measuring economic progress. The implicit assumption here is that the best jobs economy in history (measured by the number employed, the unemployment rate or the employment/population ratio) represents a sustainable high employment – low inflation state of the economy. Some policy makers as well have referred to 2000 statistics when discussing the

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1 For example, in the July 5, 2004 Business Week (page 32), Robert Kuttner in his “Economic Viewpoint” observes “The economy still has about 1.9 million fewer jobs than when Bush took office. So many discouraged workers have left the labor market that the participation rate remains well below what it was in 2001”.

2 “More broadly, however, although the recent data suggest that the worrisome trend of disinflation presumably has come to an end, still-significant productivity growth and a sizable margin of underutilized resources, to date, have checked any sustained acceleration of the general price level and should continue to do so for a time.” Chairman Alan Greenspan, Joint Economic Committee, U.S. Senate, April 21, 2004.
current state of the economy, the potential inflation threat and the appropriateness of monetary policy.³

These arguments all hinge on the size of the “output gap”, the difference between potential and actual GDP or, perhaps more precisely, the difference between current output and employment levels and the non-accelerating inflation levels of output and employment. Orphanides et.al. observe “..we find that measurement error [of the output gap] has important effects for the appropriate conduct of the monetary authority as well as for policy performance.”⁴ Larry Kudlow observed “Fed Chairman Alan Greenspan has suggested that full employment would today equate to a 4 percent unemployment rate. The current rates is 5.7%. That ‘unemployment gap’ of 1.6 percentage points represents underutilized labor resources.”⁵ Having a good sense of the size of the output gap is important to policy makers and private enterprise whose decisions depend on an understanding of the possible course of real output and inflation and likely monetary and fiscal policy responses. The recent high-employment low-inflation experience may have colored the perspective of decision-makers in the economy.

³ For example, in the July 5, 2004 Business Week (page 39), Rich Miller reports on his interviews with a number of Fed officials and observes: “But surplus workers and unused factory capacity still seem to abound, so inflation should be contained…..”And with unemployment still stuck at 5.6% - even without including the people who have left the labor force since 2000 and stopped actively looking for jobs – there’s enough spare labor to head off pressure for higher wages.” The context of these comments usually includes a reference to “the last decade” or “recent experience” as the time frame for reference, a frame of reference that would begin with 1995 and include the subsequent expansion.

⁴ Orphanides et. al., page 4

⁵ Kudlow, Larry, “Bridging the Gap”, National Review Online, April 21, 2004
This paper presents evidence that the expansion in the late 1990s was unusual and should not be used as a basis for benchmarking the output gap at zero. Counting on the economy’s ability to repeat the employment performance of the late 1990s and 2000 may lead to incorrect assessments of the future of the economy and inflation as there may be far less slack in labor markets than our experience in the late 1990s suggests. The unusual psychology of the period and the misguided perception that growth would continue indefinitely led to an abnormal expansion of employment and labor force participation that would not likely reoccur in a more normal business cycle.

The first section of the paper estimates the magnitude of excess employment that existed in 2000 and relates the measure of excess employment to the productivity measure. The second section of the paper documents the unusual psychology that prevailed in the late 1990s and 2000 that led to excessive capital spending and hiring using data from Small Business Economic Trends published by the National Federation of Independent Business. Small business optimism reached 103.6 in the first quarter of 2000, its highest value in two years and just months before economic growth plunged to under 1% at an annual rate. Consumer optimism reached an all-time record high in 2000 just months before economic growth slowed to under one percent. It appears that

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6 NFIB has surveyed a random sample of its membership (now over 600,000 firms) since 1973:4 to collect basic economic and expectations data. Small firms produce an estimated 50% of private sector GDP and employ over 60% of the private workforce (see www.sba.gov). Sample sizes range from 1,300 to 2,400 each quarter. See Dunkelberg et al Small Business Indicators of Economic Activity for a copy of the questionnaire.

7 The University of Michigan’s Consumer Sentiment Index, started in 1953 reached a record high level of 110.1 in the first quarter of 2000, just ahead of the start of the recession.
capital spending and employment decisions (to supply labor and to demand labor) were based on a highly over-optimistic view of future growth in the economy. This exuberance produced substantial over-employment and a misleading signal as to what the non-accelerating inflation level of employment or unemployment might in fact be under more normal conditions.

**Excess Employment Over the Last Cycle**

The number of employees typically used to produce a given level of GDP can be estimated with a simple regression of employment on GDP over the decade of the 1990s [Equation 1]. The residual in this equation is a measure of “excess employment”, the number of people with a job not justified by the current level of output. Exhibit 1 plots excess employment against labor force growth and suggests that in mid-2000, just before the economy slowed significantly, firms employed roughly 2.5 million more workers than would be typically employed to produce the peak level of GDP reached in 2000. As owners attempted to acquire more workers, offering higher compensation and more favorable working arrangements, the labor force responded and the labor force participation rate rose well above historical levels. Workers were being hired that were not needed to produce the current level of output. Instead, they were

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8 The equation uses nominal GDP for 1990-2003. Real GDP produces similar results, but nominal GDP is used to avoid issues of whether or not GDP growth was exaggerated due to the growing importance of the tech sector in the late 1990s and the associated deflators. The employment measure is taken from the household survey which includes self employed, 1099 employees, and the agriculture sector, all important producers of GDP.

9 Recent empirical evidence suggests that the major source of the income elasticity of labor supply is women from one worker families. Women from poor families always work, but women from higher income families do not unless it is an attractive option – wages are high, hours are flexible for managing children, more jobs are available closer to home etc. These conditions clearly existed in the latter stage of the 1990s expansion.
hired in anticipation of future growth as shown in the second section of this paper. The economy resumed growth in 2001:4Q, but owners continued to shed excess workers who became officially unemployed or left the labor force, reducing the participation rate. This process gave the productivity measure (output per hour) a substantial boost.

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\text{(1) \ EMPLOYMENT} = 92745.6 + 4.3^*\text{GDP}, \quad \text{ADJ R}^2 = .97
\]

Many firms employed labor (with IPO capital etc.) but never produced output. In a perhaps oversimplified sense, there were many people who were employed and earning a salary who were producing little or nothing (in the dot com/telecom case), a proposition supported by the record high difference between measured income and measured output in 2000 (the GDP “statistical discrepancy”). Productivity, measured in real terms, moved inversely with the measure of excess employment [Exhibit 2]. The stunning productivity numbers recorded in 2002 and 2003 are associated with major reductions in excess employment. As firms dealt with excess employment by releasing workers and slowing compensation gains, labor supply responded (the participation rate fell and labor force growth slowed) and the productivity numbers improved (e.g. the numerator, output, declined modestly while the denominator, hours, declined more dramatically). Nominal final sales per private sector worker were thirty

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10 The statistical discrepancy in the National Income Accounts became exceptionally large in 2000 and 2001:1, indicating that measured income substantially exceeded measured output. The income measure grew faster than the output measure from 1997 to 2001:1. Some argue that it was the under-measurement of output that caused this gap, but there is no solid evidence that this occurred. Other argue that the growth in real output was overstated by the rapid growth of technology spending and the deflators used to convert this spending to constant dollar figures.
percent higher in the 3 year period prior to the start of the 1990-91 recession than in the three years preceding the start of the 2001 recession period because too many workers were hired in anticipation of even stronger growth beyond 2000. Employment grew 2.3% in the 12 months prior to the 2000 slowdown, compared to 1.6% prior to the 1990 recession, and the labor force grew 2.1% compared to 1.6% prior to 1990. Once the recession started, reductions in employment (relative to the level of GDP) became substantial and productivity soared. Thus, the measured gains in productivity may have been due to the relative rates of reduction in employment and output rather than a fundamental secular change in potential output per hour.

EXHIBIT 1
“EXCESS” EMPLOYMENT & LABOR FORCE GROWTH

Final sales is defined in current dollars and is divided by the number of employees from the household survey less the number of government workers from the payroll survey. Household survey employment is used to include the self employed and agricultural workers who produce a substantial amount of GDP. The results are similar using constant dollar final sales. Real output is used to measure productivity, perhaps overstating gains in real output and output per hour in the late 1990s when spending on technology made significant contributions to the growth in GDP.
Expectations in the Atypical Expansion of the 1990s

The small business sector of the economy is the major producer of jobs in the economy and their views about the future drive their spending and hiring decisions. Many competitive industries are plagued by “micro myopia”, a condition in which firms in a highly fragmented, competitive industry or a newly developing industry see a high-growth market and expand aggressively to take advantage. In these industries, companies fail to take account of the actions of other players, resulting in over-production and over-investment and subsequent sharp price and capacity adjustments in the industry. Historically, the
construction industry has exhibited this type of behavior. More recently, the dot-com and the telecommunications sectors have as well. Overly optimistic business owners raised massive amounts of capital, leased large amounts of office space, spent large amounts on industry specific capital investments, and hired large numbers of employees, often without producing one dollar of sales (output).

In a more general context, as optimism about the future rises, firms will employ resources in anticipation of higher sales in future periods and the need to be able to produce output and services to meet those expected increases in demand. Inevitably, this leads to a point when, as the economy slows or turns, firms have excess labor capacity. As owners revise expectations, the desired stock of labor is revised downward. How quickly firms shed this excess labor depends on (1) how hard it was to accumulate the current stock of labor\textsuperscript{12} and (2) how long and deep the decline is expected to be.

In 2000, the shift in economic activity was quite abrupt, with growth dropping from a 3.6% real rate for GDP in the first half of 2000 to .8% in the second half. Apparently, few saw it coming. Small business optimism reached near-record levels just months before the economy suddenly slowed. More typically, peaks in optimism measures have been reached well before the real economy actually slowed down. Many forecasters early in the decade predicted that after a short period of slow growth, the economy would take off again. For many owners, this appears to have translated into a strategy of labor retention in

\textsuperscript{12} See Barron, Bishop, and Dunkelberg (1985)
anticipation of a near-term pickup in the economy, reinforced by the great difficulty in obtaining labor in the 1990s boom period.

The growth in the employment/population ratio during the 1990s expansion was similar to that experienced in the 1980s (which was followed by the first jobless recovery) [Exhibit 3]. The 1990s expansion led to the highest employment/population ratio in history, 64.6% in 2000. In each episode, there was an employment overshoot – firms were employing more workers than they needed when the economy turned. But the scale of the overshoot in 2000 appears to have been much larger, perhaps due to the dot.com and telecommunications bubble that colored the economic outlook. Certainly small business owners reacted differently in the late 1990s than in earlier expansions. The NFIB job creation plans rose to a record 19 percent just months before GDP declined in 2000:3. In the 1980s expansion, job creation plans peaked at a much lower 13 percent in 1988:1 (and again in 1989:1), 12 quarters ahead of the first decline in GDP in 1990:4.

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13 The survey question for job creation reads: "In the next three months, do you expect to increase or decrease the total number of people working for you?" The survey question for job openings reads: "Do you have any job openings that you are not able to fill right now?"
But much of the small firm employment energy in the 1990s expansion was unsuccessful at creating new jobs. Instead, the percent of firms with unfilled job openings rose to a record 34 percent of all firms in 2000 (Exhibit 4), just months ahead of the downturn. In contrast, in the 1980s expansion, the percent of owners reporting hard-to-fill job openings peaked in the first quarter of 1988 at 25 percent, 9 points lower and two years ahead of the recession. If a recession were anticipated in the late 1990s, labor demand should have started cooling but did not.
Having hired workers faster than GDP growth required through mid-2000, the onset of the slowdown triggered a prolonged period of adjustments (similar to the jobless recovery observed in the early 1990s, but much larger), both to employment and to the labor force, which, following the law of supply, had expanded at abnormal rates in response to strong growth in compensation. Exhibit 5 illustrates the surge in the frequency of owners reporting higher labor compensation, peaking in 2000 at 32 percent, and the growth in labor force participation, also peaking in 2000, as the promise of higher wages and other gains and the widespread availability of jobs attracted new labor force participants. Planned hiring activity and participation rates both peaked at the end of the expansion, reflecting a strong belief that the expansion would continue. The high cost (compensation and search costs) of acquiring labor would, after the slowdown started, make owners reluctant to quickly reduce
employment to match the decline in sales as many believed that the economy would quickly resume its growth. Equation 3 quantifies the relationship between labor force participation and the percent of owners raising employee compensation. As the percent of owners reporting higher worker compensation rose, labor supply responded and the participation rate rose.\textsuperscript{14} Similarly, labor force growth responded to improved compensation (Exhibit 6)\textsuperscript{15}. As the percent of owners reporting higher employee compensation rose, the supply of labor expanded, peaking in 2000 with the percent of firms raising compensation. This relationship is quantified in Equation 4.

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\textbf{EXHIBIT 5}

\textbf{LABOR COMPENSATION CHANGES and LABOR FORCE PARTICIPATION}
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\hline
\textbf{INCREASED COMP} & \textbf{PARTICIPATION RATE} \\
\hline
\textbf{84} & \textbf{63} \\
\textbf{87} & \textbf{63.5} \\
\textbf{90} & \textbf{64} \\
\textbf{93} & \textbf{64.5} \\
\textbf{96} & \textbf{65} \\
\textbf{99} & \textbf{65.5} \\
\textbf{'02} & \textbf{66} \\
\textbf{'05} & \textbf{66.5} \\
\hline
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\begin{center}
\textbf{(3) PARTICIPATION RATE} = 65.2 + .058 \%RAISING COMP \hspace{1cm} \textbf{ADJ R}^2 = .67
\end{center}

\begin{center}
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\hline
\textbf{84} & \textbf{87} & \textbf{90} & \textbf{93} & \textbf{96} & \textbf{99} & \textbf{'02} & \textbf{'05} \\
\hline
\textbf{0} & \textbf{5} & \textbf{10} & \textbf{15} & \textbf{20} & \textbf{25} & \textbf{30} & \textbf{35} \\
\textbf{63} & \textbf{63.5} & \textbf{64} & \textbf{64.5} & \textbf{65} & \textbf{65.5} & \textbf{66} & \textbf{66.5} \\
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\textsuperscript{14} Four quarter average of year over year changes in output per hour.

\textsuperscript{15} The survey question reads: “Over the past three months, did you change average employee compensation (wages and benefits but NOT Social Security, U.I. taxes, etc.)?”
This excessive optimism spilled into capital spending as well [Exhibit 7]. In the 1980s expansion, the percent of owners citing the current period as a good time to expand facilities peaked in 1986 at 27% of all firms and fell to 15% just prior to the onset of the recession [Exhibit 8]. In the 1990s expansion, a puzzling reversal occurred. Instead of being most optimistic about capacity investment at the beginning of the expansion, owner assessments were muted, rising to a peak just before the onset of the 2001 recession, not the reverse as

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16 The survey question reads: Looking ahead to the next three to six months, do you expect to make any capital expenditures for plant and/or physical equipment?"

17 The question asked is: "Do you think the next three months will be a good time for small business to expand substantially?"
was historically the case. The psychology of the expansion seemed to become more optimistic as the expansion aged, encouraging more capital spending and hiring where in other expansions, the economic outlook flattens and spending slows as the end of the expansion approaches. Thus, at the end of the expansion in 2000, the percent of firms planning to create jobs and planning and making capital outlays were at record high levels, showing no sign of slowing down. Undoubtedly, a significant amount of the this surge in capital spending late in the expansion was Y2K related, but spending levels remained strong after January 1, not slowing until the third quarter of 2001. And, planning to expand facilities is not a Y2K activity and this peaked near the end of the expansion (and not the beginning) as well.

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**EXHIBIT 7**

**PLANNED and ACTUAL CAPITAL OUTLAYS**

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18 Using a sample of firms from the D&B list, an estimated 75% of all small firms reported Y2K outlays as of November, 1999. “Small Business and the Y2K Problem”, NFIB Foundation, November, 1999, Washington D.C.
This unusual psychology and the associated expectations for the economy produced the tightest labor market in 30 years, with a record percent of small business owners citing the availability of “qualified” labor (not necessarily “skilled”) as their #1 problem reaching record high levels.\(^{19}\) It is clear from Exhibit 9 that hiring was frenetic late in the expansion and firms could not get the workers they desired.

\(^{19}\) The survey question is “What’s the single most important problem facing your business today?”
Conclusion

The NFIB data clearly illustrate that a psychology supporting increasingly optimistic views of future economic growth became pervasive in the late 1990s expansion, resulting in record levels of capital spending (some related to Y2K) and record levels of hiring. Rising compensation and job availability produced unusually strong labor force growth and employment rose to a level that was not justified by the current level of output. When the economy suddenly stopped growing and the bubble burst, firms began to adjust employment and the labor force began to adjust as well. The decline in output was modest compared to the employment adjustments, producing unusually good productivity numbers. As a result, neither the labor force participation rate nor the productivity numbers from
that period are likely to persist in the longer term as the economy returns to a more normal business cycle pattern.

These results warn against the use of the performance in the last expansion as a benchmark for assessing the potential performance of the economy in a more normal business cycle. The employment/population ratio and the unemployment rate reached in 2000 are arguably not good estimates of full employment and thus do not provide good estimates of the output gap. It was an unusual period in which expectations of owners and workers and investors were of tulip bulb quality, producing a substantial overshoot of what would be a NAIRU-type full employment level. Strong demand for the dollar to finance foreign investment in the U.S. and to support the growing volume of world trade helped prevent the re-emergence of inflation (some argue this occurred in asset markets rather than goods markets). Instead, the U.S. developed a record trade deficit. If policymakers are overestimating the magnitude of the output gap by overestimating excess labor supply, they run the risk of making timing errors in the implementation of economic policy.

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20 Governor Donald Kohn of the Board of Governors of the Federal Reserve System observed in a Jun 4, 2004 speech: “.. most indicators we have suggest that the economy continues to operate with an appreciable – albeit diminishing – margin of slack. For about the past 6 months, the unemployment rate has averaged a little less than 5 ¼ percent. This rate is down from its peak of about 6 ¼ percent in the middle of last year, but it is still somewhat above a level that, on the basis of the experience of the last decade or so (emphasis added), appears to be consistent with stable inflation”

21 Productivity also increased at a somewhat faster pace in the last year of the 1990s expansion, up 2.8% in the year prior to the start of the 2001 recession compared to 2.4% in the year prior to the start of the 1990 recession. Rising productivity reduces unit labor costs and reduces the pressure on selling prices and undoubtedly explains some of the labor reduction that occurred post 2001. The slow period following 2000 gave mangers time to integrate new technologies purchased prior to 2000 and to learn to better manage labor resources in an environment with no pricing power.
Bibliography


Kudlow, Larry, “Bridging the Gap”, National Review Online, April 21, 2004