



# TD Economics

## Topic Paper

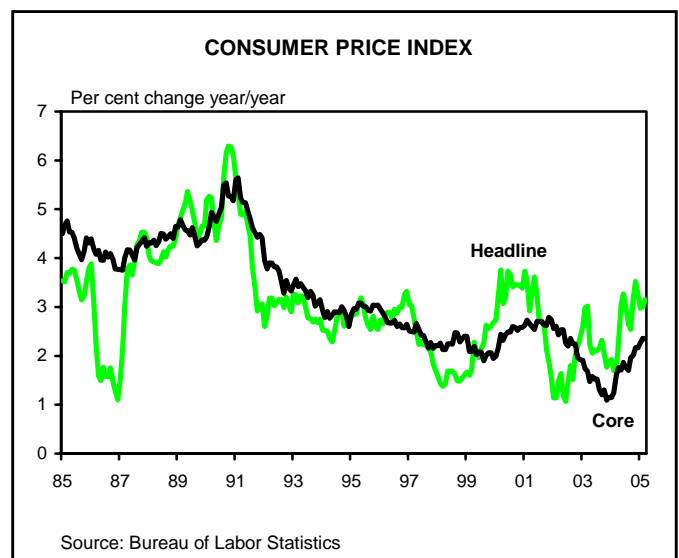
May 2, 2005

### IS U.S. CPI UNDER-ESTIMATING INFLATION?

Lately, there seems to be far more chatter circulating as to whether the U.S. consumer price index (CPI) is under-representing the true state of inflation. After all, producers are reporting greater ease in passing along higher prices to consumers, while house prices and energy costs have been riding high for quite some time. And yet, the annual rate of headline CPI is running at a reasonable 3 per cent clip, while the core measure, which excludes food and energy, sits at an even lower 2.3 per cent. While the measurement of CPI does have some shortcomings, the rate of change in prices is consistent with other indicators of inflation and productive capacity, lending credence to the view that the Fed has not fallen behind the inflation curve. However, these indicators also share one important attribute - a decidedly upward trend. And, even an economic slow patch may not be sufficient to deter the Fed from reducing monetary stimulus, as the risks to being caught behind the eight ball on inflationary pressures are too great.

#### An old grudge

Part of the skepticism surrounding the CPI measure is related to the exclusion of food and energy prices in the assessment of inflationary pressures. Clearly, both are vital components in household budgets - comprising about 22 per cent of expenditures - and individuals do not have the option to exclude these payments from household expense sheets. However, food and energy prices are highly volatile by nature and do not necessarily mirror broader price movements in the economy. So, while we do not want to ignore movements in the overall CPI index, we also do not want to mistake a transitory price change in a volatile component as being indicative of economy-wide price pressures. A poor or favourable growing season is all that it takes to cause a swing in agriculture prices.



Obviously, the impact of a one-time climate swing on agriculture prices would not be representative of the price pressures that are feeding through the broader economy. Since inflation is the *overall general* upward trend in prices of goods and services in an economy, high energy or food prices become relevant only when they are sustained long enough to impact the pricing of other products, which means it would show up in the core CPI measure. Indeed, the above graph does indicate that changes in core prices track that of headline CPI over time, but with far less variability.

#### Quality adjustment matters

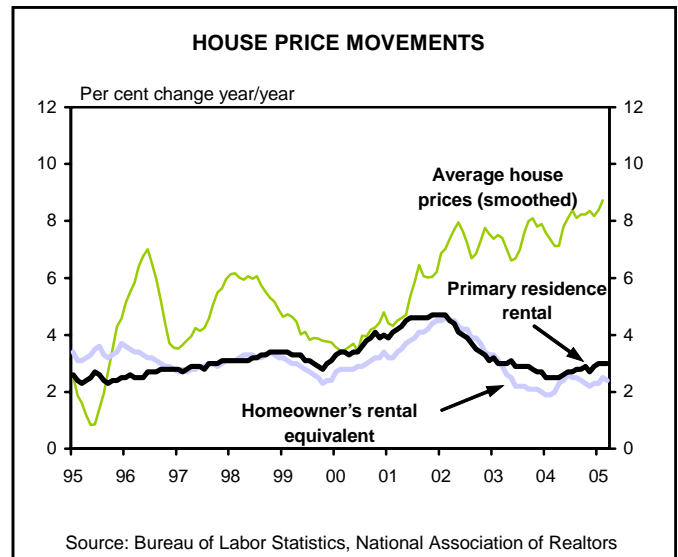
More recently, the accuracy of CPI measurement has come into question, especially with regard to what is known as "hedonic pricing" and the incorporation of house prices. There's often the feeling that the change in prices is higher than what is being conveyed in the CPI index. In other words, there appears to be a discrepancy in what a buyer

observes as the face-value change in prices for a particular product or service versus what is actually reported in the CPI index. That observation is, in fact, valid. But, at the same time, it doesn't mean that the CPI index is understating price movements. With an increasingly wide range of product variants available to consumers, the so-called hedonic technique is designed to capture quality differences by pricing the underlying characteristics of products. Basically, it allows for quality comparison when products with improved characteristics are introduced. This is a particularly useful pricing mechanism for goods and services that are subject to rapid technological change. As an example, the change in automobile prices from one year to the next must take into account the fact that the same car model may incorporate engine and body improvements, better gas mileage, higher quality and more complex audio equipment, enhanced safety features such as multiple air bags etc. Of course, hedonic pricing is not a panacea and like any measurement device, it has its shortcomings. Nevertheless, the technique is a more accurate representation of price changes, evident by the fact that hedonic pricing models are used by statistical agencies all over the world.

### Is CPI missing the housing boom?

There has also been some question as to whether the CPI index is under-representing house price inflation. Resale house prices have risen at an average annual rate of 11.3 per cent over the past year, but the increase in shelter costs in the CPI index is averaging just 2.8 per cent. House prices in the CPI index are captured through an implicit rent component known as "homeowner's equivalent" (HOE). This is the amount a homeowner would pay to rent, or would earn from renting their home in a competitive market. Why is this process used? Homeownership has two elements: the consumption of shelter and ownership of an asset (the latter is just like holding equities and bonds in an investment portfolio). As a result, the CPI index attempts to remove the price changes that are reflective of asset value and only account for the consumption aspect. In economic jargon, the implicit rent component derived through HOE is a reflection of the user cost of capital. This is why growth in the HOE component is far more stable over time than movements in house prices.

In fact, the above graph shows that the HOE component more closely tracks rental prices than actual home price movements and, because of this, some analysts believe that it's missing the mark - especially since the diver-



gence has widened considerably in recent years. In the current low interest rate environment, rental vacancy rates have risen as renters shift into homeownership. By extension, rental rates were constrained when house prices took flight. Indeed, since the HOE component relies on informal estimation judgements and requires some quality adjustments related to location and size, it is particularly prone to estimation errors. But, contrary to conventional wisdom, a 2001 Federal Reserve study to this effect found that the bias is actually on the upside, meaning that the HOE component in CPI overestimates actual shelter inflation conditions by about 0.3 percentage points per year.<sup>1</sup> Another study by Federal Reserve staff in 2004 found a similar estimation bias.<sup>2</sup>

### A closer look at upward bias

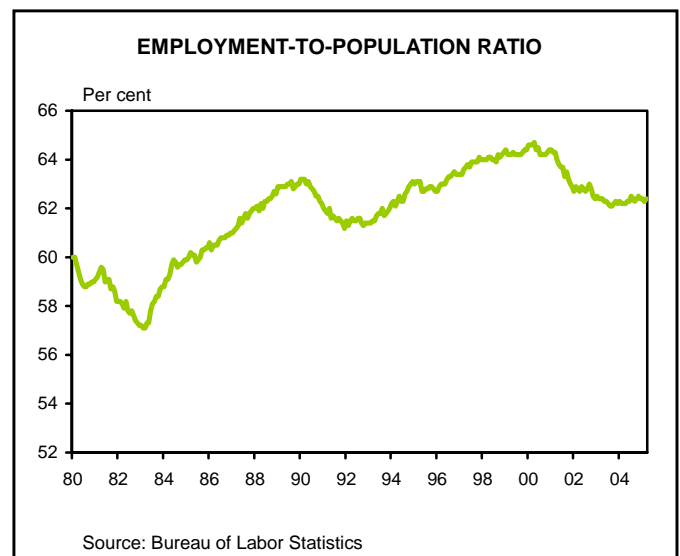
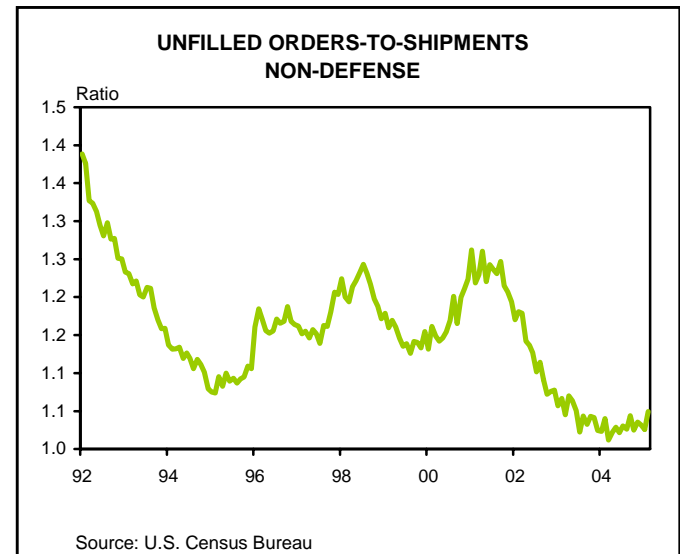
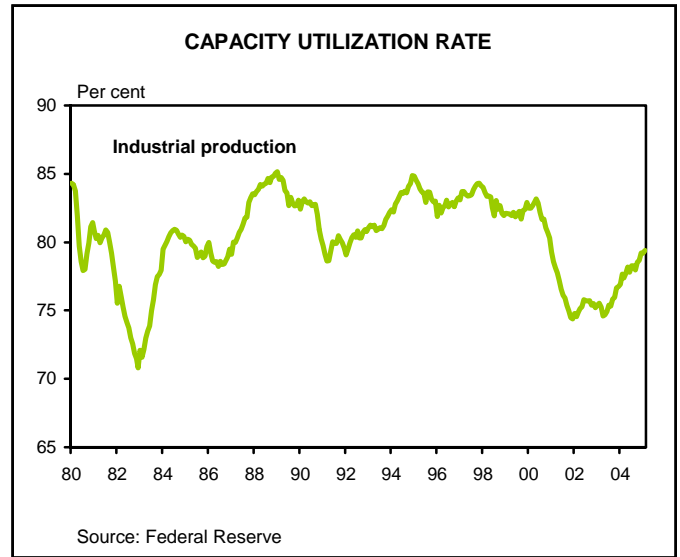
In fact, analysis by various groups has found that, on aggregate, the total CPI index over-estimates actual inflation by 0.6-to-1 percentage points per year. Readers are reminded that it wasn't long ago (late 2003) that some market participants cited these figures as reason to believe that the U.S. economy was already dangerously close to deflation when core CPI was hovering around 1 per cent. There are several sources of perceived upward bias in the CPI index but the largest single source is attributed to its inadequate accounting for quality improvements (which hedonic pricing attempts to bridge for some products) and the slow introduction of new items into the index. New-outlet bias is another source of discrepancy, which refers to the rotation of retail outlets in and out of the CPI sample to reflect shifts in household buying patterns. In addition, there's "upper-level bias", which refers to the inaccu-

racy of the CPI index to capture reduced purchases of products that have been increasing rapidly in price, or increased purchases of products that are on sale. As an example of the difficulty in adjusting for these and other biases, consider a scenario highlighted in The Boskin Commission report on CPI reporting errors back in 1996. A wave of technological improvements over past decades has greatly increased the variety of fresh fruits and vegetables available in typical supermarkets during winter months. At the same time, the trend toward more service provided supermarkets has eliminated the need to travel to small specialty shops, especially fresh fish markets and deli counters preparing fresh-cooked food. Now, quantify how much a consumer is willing to pay for the privilege of choosing a greater variety of items from a single shopping source. In brief, it is difficult to measure welfare effects.

### All roads lead to the same conclusion

Irrespective of whether the CPI index is biased upwards or downwards, other gauges of inflationary pressures can, and should, be used to substantiate its trend and level. While the timeliness of the CPI index makes it the most popular measure among financial markets in assessing inflationary risks, it is but one of many measures that the Fed considers in determining monetary policy. In fact, the Fed prefers the personal consumption expenditures (PCE) price index to the CPI index, due to its wider survey reach. Roughly one-quarter of the PCE index consists of expenditures that are outside the scope of the CPI index. In particular, the PCE index includes expenses that are not just "out-of-pocket" to a consumer, such as medical costs covered by employers, Medicare and Medicaid.

The core PCE measure of prices conveys a sanguine inflationary environment, with the annual rate largely holding within a narrow 1.5-to-1.7 per cent range over the past year. But, for the skeptics out there, other measures confirm that the U.S. economy is not pressing up against its productive capacity. For instance, capacity utilization rates are running about 3 percentage points below historical norms. Meanwhile, producers are having no trouble getting product out the door in a timely fashion, as indicated by an extremely low ratio of unfilled orders-to-shipments. The employment-to-population ratio suggests that there is still slack in labour markets, thereby limiting the threat of accelerated wage-push inflation. And, even though unit labour costs are rising, the pace of growth has yet to break above 2 per cent on an annual basis. Likewise, growth in average hourly earnings is trending below long-run aver-

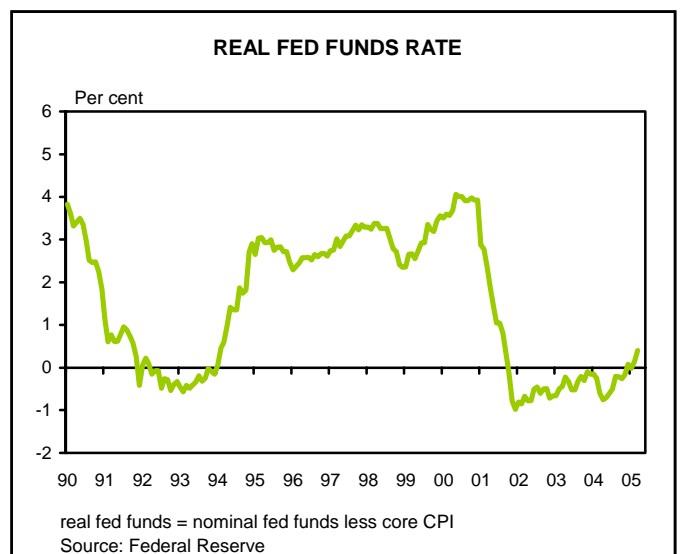
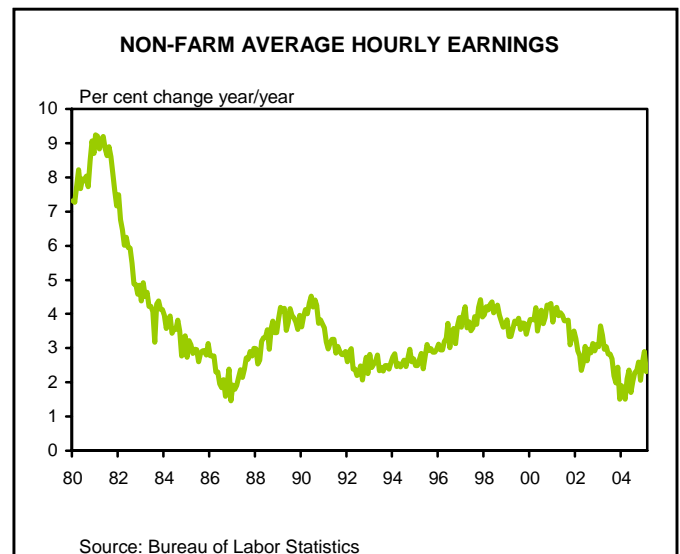
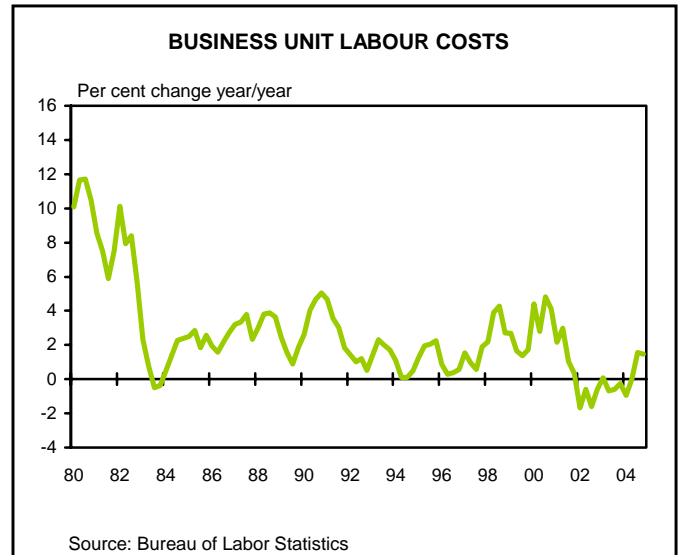


ages, while strong productivity growth is providing another cap to wage-push inflationary pressures. As a final stamp, market inflation expectations remain contained within a 2.5-to-2.8 per cent range.

### Risks abound

Could all these measurements of capacity and inflation be in the wrong? Not likely. But, while the Fed does not appear to be running behind the inflationary curve, there is no doubt that the risks are decidedly to the upside on the inflation front. For one, all indicators of inflation are trending up, particularly at the production level, where firms are feeling the squeeze from high energy and building material costs alongside a lower U.S. dollar. It's no coincidence that the annual rate in core producer prices (PPI) is hovering near a decade-high at 2.6 per cent. This presents a significant degree of upside risk to core CPI, since historically, about 80 per cent of the increase in core PPI is passed into consumer prices. Indeed, the six-month annualized trend in core PPI prices is running at a hot 3.2 per cent, while that of core CPI is at 2.7 per cent, suggesting that feed-through from the producer level is, in fact, well underway. Likewise, the 6-month trend in the core PCE index is running at 2.3 per cent. And, the FOMC Beige book in mid-April indicated that manufacturers, retailers, or services firms were all able to pass at least a portion of cost increases along to their customers. The one consolation in the case of manufacturers was that there were also "several cited instances of firms having to rescind price increases and accept lower [profit] margins". But, the willingness to continue to do so is uncertain. All this makes for a slim margin of error on the inflation front, especially since monetary conditions remain highly stimulative, as indicated by a real fed funds rate hovering around 0.4 per cent. As a result, the Fed will remain determined in returning interest rates to a more neutral level of 4 per cent over the next twelve months. And, even though the U.S. economy appears to have entered a soft patch, this may not be sufficient to deter the Fed from tightening monetary settings, especially if it proves to be fleeting.

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**Endnotes**

- <sup>1</sup> Lebow, David and Jeremy Rudd, Board of Governors of the Federal Reserve System, “Measurement Error in the Consumer Price Index: where do we stand?”, December, 2001.
- <sup>2</sup> Nakamura, Leonard, Theodore Crone and Richard Voith, “Hedonic Estimates of the Cost of Housing Services: Rental and Owner-Occupied Units”, October 2004.

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