



**Bank
Financial
Group**

Observation

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TD Economics

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HIGHLIGHTS

- Based on the strength of recent indicators, our present forecast for the growth of Canada's real GDP in Q3/2009 (to be released on Monday) is 1.0% annualized.
- This view stands despite the latest monthly GDP data that point to a contraction for the quarter.
- A divergence in monthly GDP and quarterly GDP is not unusual, given that monthly GDP measures industry-level output at "basic prices" and quarterly GDP measures the economy-wide expenditures at "market prices".
- Differences in what each series counts and how each treats prices result in differences in measured real growth rates. Moreover, monthly GDP is regularly revised as new data is incorporated and assumptions are updated.
- Therefore, while monthly industrial GDP is a useful high frequency indicator, one must be mindful of how much weight to give it in predicting the quarterly growth rate – particularly around turning points.

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WHY MONTHLY AND QUARTERLY GDP CAN DIFFER (OR "HOW I LEARNED TO STOP WORRYING AND LOVE NATIONAL ACCOUNTS")

We are forecasting that economic growth will re-emerge in the third quarter of 2009. We project a roughly annualized 1% gain on the quarter – certainly not a break-neck pace coming out of a recession. However, the recent stream of monthly industry-level real GDP data would appear to make even such a forecasted advance for the quarter difficult to achieve. Our quarterly real GDP forecast is based on Statistics Canada's income-expenditure accounts (IEA), while monthly GDP data is based on an aggregation of industry-level output.

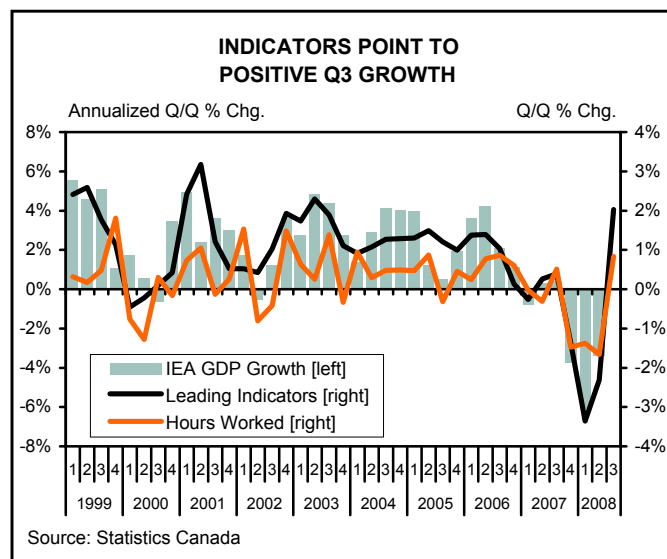
If one just examines the monthly GDP data, the math cannot be denied: given flat monthly GDP in July and a 0.1% M/M decline in August, GDP would need to advance by 1.3% M/M in September to yield a 1% annualized advance in industry-level GDP during the third quarter (assuming the earlier data remains unchanged). Although the data are tracking a strong monthly gain in GDP during September, these do not point to a 1.3% M/M improvement and such an advance would be an outlier against history.

However, we remain comfortable with our quarterly forecast of 1% given improvements in hours worked and broad-based sales during the third quarter (see text-box, p.2).

Moreover, it is not unusual for the respective quarterly growth rates of the monthly industry GDP and that of the quarterly IEA GDP to diverge – particularly for the initial release of monthly GDP. For instance, the annualized quarterly change in industry GDP was 1.1 percentage points below that of IEA GDP for Q1/2009 and 0.7 percentage points below in Q2/2009.

There are three issues that result in differences in measured output between the two series: first, methodological differences between income-expenditure accounting and tallying industrial output; second, differences in the treatment of prices between the two accounts; and, third, ongoing revisions to the industry-level output accounts.

While these may seem somewhat esoteric and overly technical issues, statistics are less meaningful if one does not understand what goes into the pot. In deciding how much to emphasize the movements in the monthly series when projecting the quarterly series, it is key to recognize how and why these two series may differ slightly in the longer-run and significantly in the short-run.



The Forecast for Q3/2009

We estimate that Canada's real GDP grew by an annualized 1.0% during the third quarter of 2009. A variety of indicators have now been released for September 2009. The tracking of the expenditure components of GDP with these indicators confirms our view for positive GDP growth of this magnitude.

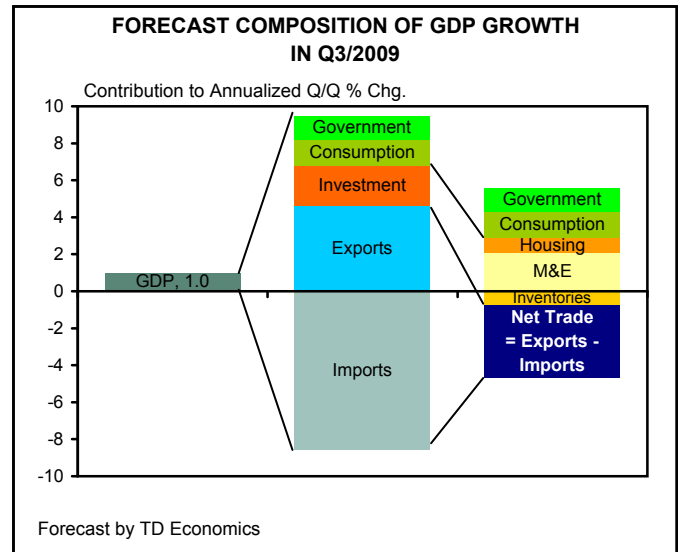
For consumption, robust increases in retail sales and hours worked in the service-sector both point to growth in personal consumption expenditures on goods and services, respectively.

For investment, a boost in imports of M&E during the quarter points to much stronger business investment in M&E. Although the pace of non-residential building permits slowed during the quarter, indicating a slowing in non-residential investment, the permit data are volatile. However, a lift in housing starts and continuing increase in residential building permits point to improving residential investment.

However, business investment in inventories will likely remain a drag. Inventories were being still being liquidated by wholesalers, and manufacturers were drawing down their stock at a quickening pace during the quarter.

For net trade, exports rebounded strongly but imports surged well ahead of this export gain. This means that the trade balance will be an overall drag on growth.

For government expenditures, stimulus spending does seem to be flowing from government coffers. While federal fiscal data is only available to August, it so far shows a decrease in non-transfer-related program spending during the



third quarter.¹ However, if provinces have indeed pushed the money out the door, strengthened transfers to provinces during the second quarter would have boosted spending in the latest quarter.

¹ Transfers to persons (such as through heightened EI benefits) has been a key area of fiscal stimulus. However, from the perspective of the national accounts, heightened transfers to persons boost GDP through the "personal consumption" channel; not through the "government" channel.

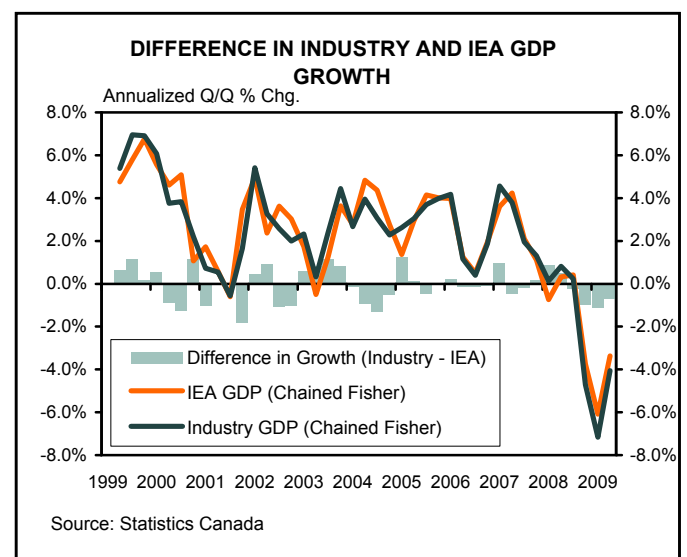
Three ways to count

Gross Domestic Product reflects all three of 1) the value of output produced, 2) the expenditures on new sales and unsold products, and 3) the income received for making products. The monthly industry-level GDP attempts to value the output based on what producers make, while the quarterly expenditure account tallies all sales and the value of unsold inventories. The income account component complements the latter, since anything sold means that someone receives the income from that sale - specifically, workers receive wages, owners of firms receive accounting profits, and government receives taxes.¹ In theory, the three measures should all yield the same value, but the reality of measuring output across an economy makes this extremely difficult.

Functionally, the monthly industry accounts keep track of production across all industries derived from surveys of Canadian businesses.² Defined quantities of specific goods are tracked (e.g. number of autos produced, amount of nickel mined, number of tickets to sporting events); but, where a quantity of output is difficult to identify (e.g. engineering or advertising services) labour inputs are used as a proxy.

For industry-level output, Statistics Canada tallies the net

value of output, which must take into account the inputs used in production. That is, when calculating the value-added within steel production, one must deduct the value of iron that went into the steel. Across an economy, this is necessary to avoid double-counting. However, these inputs are not measured on a real-time basis, and, therefore, assumptions must be made about how much of output is value-added.



For tallying most recent value-added, these assumptions are based on the latest vintage of StatCan's input-output (I/O) accounts³, which provide the amount of output for a given amount of inputs for industries and commodities.

For the quarterly IEA, the accounting method aggregates estimated expenditures across the economy, and the process is much more expansive.⁴ All expenditures can be classified as consumption, investment (either in fixed capital or in inventories), government purchases, exports or imports.⁵ In the IEA, measuring each of these expenditure components requires survey data to which estimators are applied. For instance, estimators (the historical relationship between data and the expenditure component) are applied to estimate household consumption of a particular good using data from the retail sales survey or to estimate building investment by business from non-residential building permits. These estimators are derived from other statistical programs. A similar estimator-based approach applies to the estimation of income.

Whether by aggregation of income-expenditure categories or of industry-level production, each method involves assumptions about the structure of the economy. While appropriate to their respective approach for "output", the working assumptions result in differences in measured output between the quarterly IEA and monthly industry output approaches.

What price is right?

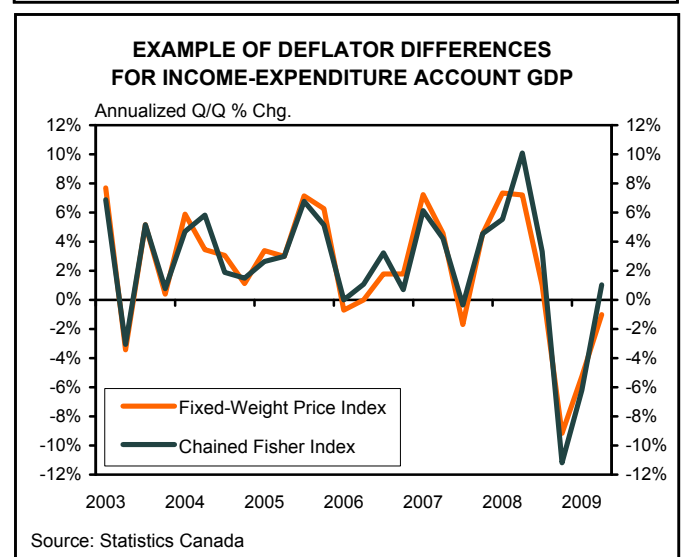
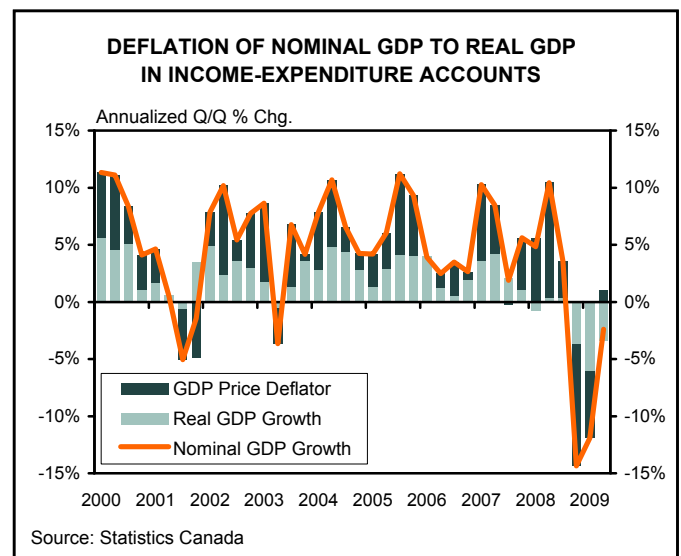
Differences in how prices are treated can impact the measured growth rate of real GDP, and the measured prices of output differ between the IEA and the industry-level accounts in two material ways: first, the method through which prices are "deflated" to "constant dollars"; and, second, the concept underlying which prices are measured.

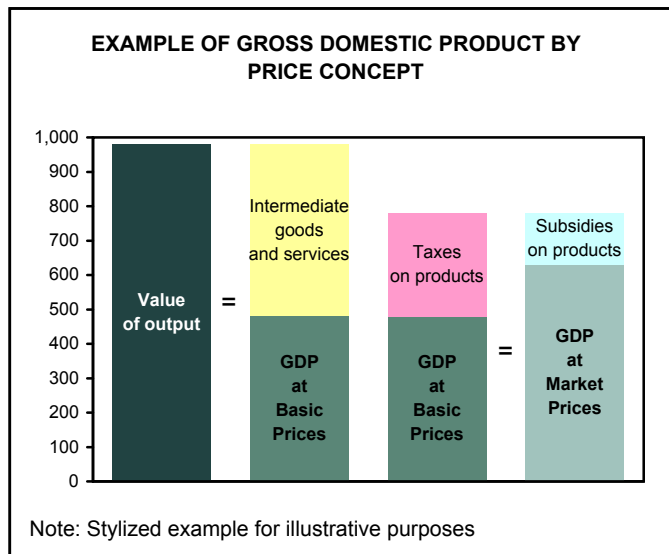
Constant dollars provide a way to express change in the volume of goods and services, stripping away the impact of inflation. To compute comparable volumes, the measured current dollar sales are deflated to the equivalent dollars in a base year. For example, if the same model of a particular new car now costs 10% more than in 2002, but the same number of vehicles were produced, the "real" output has not changed. The constant dollar volumes (in 2002 dollars) will be equal but the current dollar value (in 2009 dollars) will be 10% higher.

But aggregating prices across an economy, or even a sector, is inherently difficult. For instance, consumption involves many goods and services, and the manufacturing sector produces a variety of goods. Even if one has an

account of the number of all goods and services sold in a period, simply multiplying the number of goods and services by their 2002 prices would bias the computed volumes. For instance, many more computers are produced today than in 2002, but computer prices have markedly decreased (notwithstanding the impact of quality improvements and new products). Applying 2002 computer prices would overstate the output, since the price decline of computers relative to the aggregate price level would be ignored.

Because of this, computed deflators, which capture the price change of a representative basket of goods and services, are used to deflate expenditure categories or a sector's output. However, there are different ways of creating a representative basket and the choice of deflator matters to what price change is measured. Specifically, as relative prices shift, consumers and firms shift purchases towards the relatively lower-priced goods and services. A fixed basket,





which weights goods and services constantly over time, will obscure this substitution effect. However, weighting by the current sales alone would dampen the economy-wide increases in prices. One solution to the substitution issue is to meet halfway, averaging the changes between these two types of baskets.⁶

The real quarterly IEA GDP uses this latter approach to deflation for the entire series. In contrast, industry GDP is deflated according to a fixed basket after 2006.⁷

Along with the deflator issue, the price concept also differs between the industry accounts and quarterly income-expenditure accounts. Specifically, the industry accounts uses “basic prices” which exclude final taxes and subsidies on goods and services, while the IEA uses “market prices” which include all taxes and subsidies. The difference in price concept follows from the approach to measurement: the IEA measures what is sold, while the industry accounts measures what is produced, not incorporating the final ticket price.

In combination with the different deflators used in the IEA and industry accounts, the measurement of market prices versus basic prices difference results in divergence

of the growth rates between the two series. However, the differences behave somewhat cyclically and average out to zero over a sufficiently long horizon.

Don't look back in anger

The third factor that makes a near-term wedge between the industry and IEA GDP growth acceptable is the regular revision to the industry GDP figures. Monthly GDP is desirable as a timely and relatively high frequency indicator. But, the timeliness means that the indicator must be revised regularly as the assumptions used to impute value-added are revised. Specifically, the industrial output measures are subject to both monthly and annual revisions.

When a new month of data is released, several past months of data are revised. Monthly revisions incorporate additional data about the volume of production that were not available at the time of original release, but the input-output assumptions are not revised. Notably, as the quarterly IEA GDP is completed, the industrial GDP is revised in line with data, so as to achieve correspondence with the IEA within an acceptable range.

On an annual basis, revisions incorporate the latest changes to the input-output accounts, adjusting the share of a month's production that is value-added.⁸

Why 1 + 1 can equal 3

Our broad point is that, despite the softness in recent monthly GDP data, other near-term indicators point to third quarter GDP growth in the income-expenditure accounts in the range of 1.0% annualized. We expect differences between the quarterly growth of IEA GDP and the industry-level GDP. Such a divergence in monthly and quarterly GDP is not unusual, and follows from the differences between what is measured and how prices are treated. As well, earlier months of data in the monthly industry series could be revised upwards, bringing its Q3/2009 growth rate closer to that for quarterly IEA series.



Endnotes

- 1 Notably, the income accounts are published only as a nominal series; not as a real series, as are the expenditure accounts and the industry output accounts.
- 2 See “Gross Domestic Product: Sources and Methods.” Statistics Canada, 15-547-XIE, 2002. Available at: <http://www.statcan.gc.ca/pub/15-547-x/15-547-x2002001-eng.pdf>
- 3 Presently, the latest published I/O accounts are from 2006.
- 4 See “Guide to the Income and Expenditure Accounts.” Statistics Canada, 13-017, 2008. Available at: <http://www.statcan.gc.ca/pub/13-017-x/13-017-x2008001-eng.pdf>
- 5 Indeed, our forecast of GDP is the aggregation of our projections for each of these components, according to the identity:
- $$GDP = C + I + G + X - M$$
- 6 As further background, we are describing the two broad approaches to deflating a particular set of goods: first, set fixed weights for each type of goods in a basket (a Laspeyres-type index); or, second, weight goods according to their share of the basket (a Paasche-type index). As noted, each index is skewed against reality because of the effects from substitution. The chain Fisher deflator, computed as the geometric mean of the chained Paasche and chained Laspeyres indices, attempts to address these drawbacks. The “chained” aspect is that, rather than relative to a base year, the chained indices use the prices (Laspeyres) or volumes (Paasche) in the preceding period. Chaining is necessary to strip away some of the volatility in the price or composition of baskets, by “chainlinking” back to the base year rather than deflating in one fell-swoop.
- 7 This difference owes to the lag in data to compute a sales-weighted basket for industry sales by sector. The deflators applied to industrial GDP are therefore revised from chained Laspeyres to chained Fisher as the new I/O accounts become available, allowing the Paasche component to be computed.
- 8 I/O tables provide the share of final production that is value-added for a given industry and commodity. Since the I/O accounts lag the current year by three years, annual revisions to a given year’s industry-level GDP continue for at least three years after its initial release.

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