

Embargoed until 10:45am – 15 June 2009

## Economic Survey of Manufacturing: March 2009 quarter

### Highlights

For the March 2009 quarter compared with the December 2008 quarter on a seasonally adjusted basis:

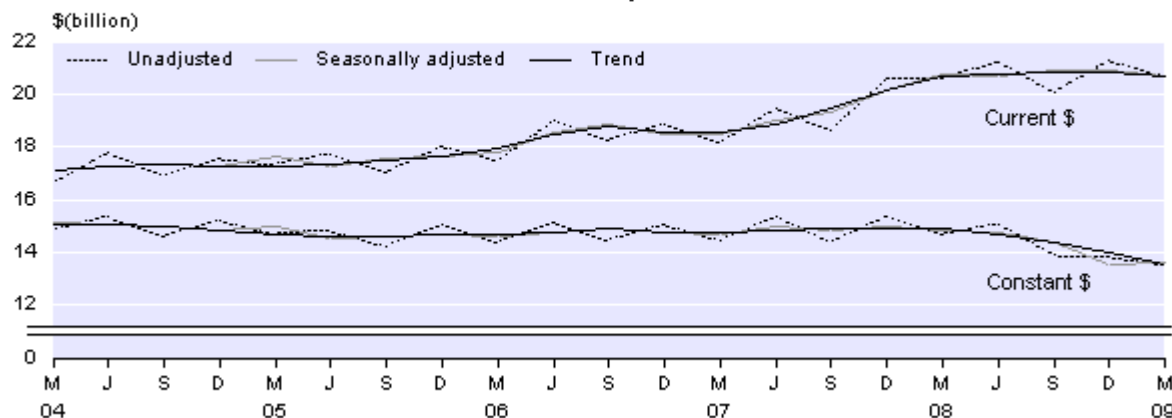
#### Sales volumes

- Manufacturing rose 0.2 percent.
- Excluding meat and dairy product manufacturing, sales fell 6.5 percent.
- Transport and equipment fell 32.7 percent.

#### Sales values

- Manufacturing fell 0.9 percent.
- Excluding meat and dairy product manufacturing, sales fell 5.5 percent.
- Transport equipment manufacturing fell 23.6 percent.

**Total Manufacturing Sales**  
Current and constant dollars <sup>(1)</sup>  
Quarterly



(1) Constant dollar series (volumes) are at December 1997 quarter prices.

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Government Statistician

See also [Economic Survey of Manufacturing: March 2009 quarter – Media release](#)

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# Commentary

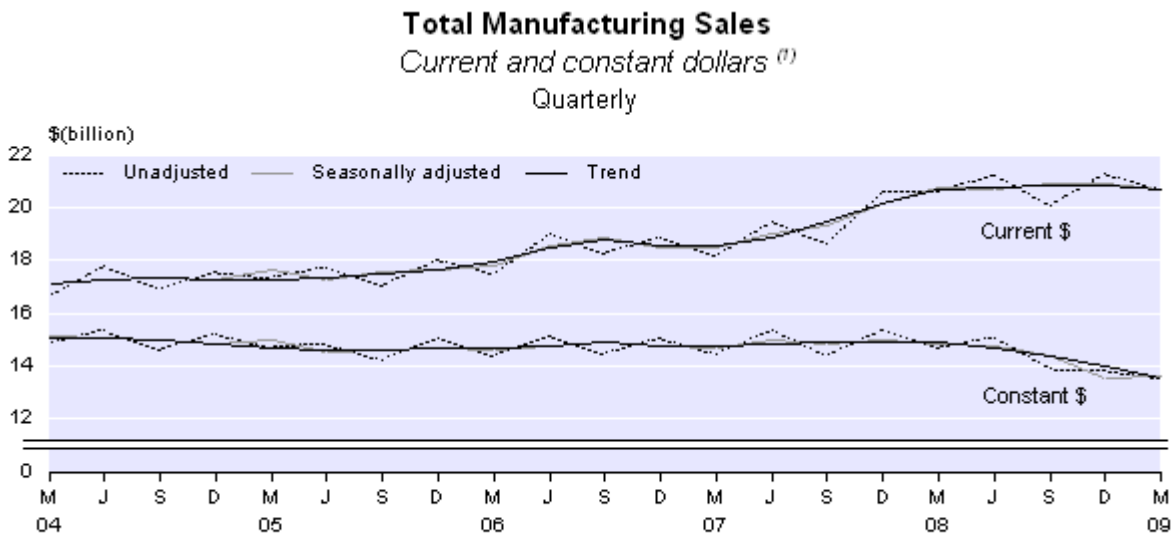
All references to sales movements are seasonally adjusted unless otherwise stated.

## All manufacturing industries

Total manufacturing sales volumes were flat in the March 2009 quarter, up only 0.2 percent, but reached positive territory for the first time since December 2007. The increase was due to the 23.1 percent rise in sales volumes for the meat and dairy product manufacturing industry, highlighting the impact this sector has on the total manufacturing results.

Only two other industries recorded increases in sales volumes: petroleum and industrial chemical manufacturing (up 6.5 percent), and beverages, malt and tobacco manufacturing (up 1.6 percent).

Volumes are calculated by removing the effect of price changes from values.



(1) Constant dollar series (volumes) are at December 1997 quarter prices.

Of the 12 industries to record sales volume falls in the March 2009 quarter, nine recorded their second (or more) consecutive quarterly decrease. In the March 2009 quarter, the largest decrease was in the transport equipment manufacturing industry (down 32.7 percent), followed by the other food manufacturing industry (down 9.1 percent). Completing the top volume movers was the structural, sheet and fabricated metal product manufacturing industry (down 12.7 percent).

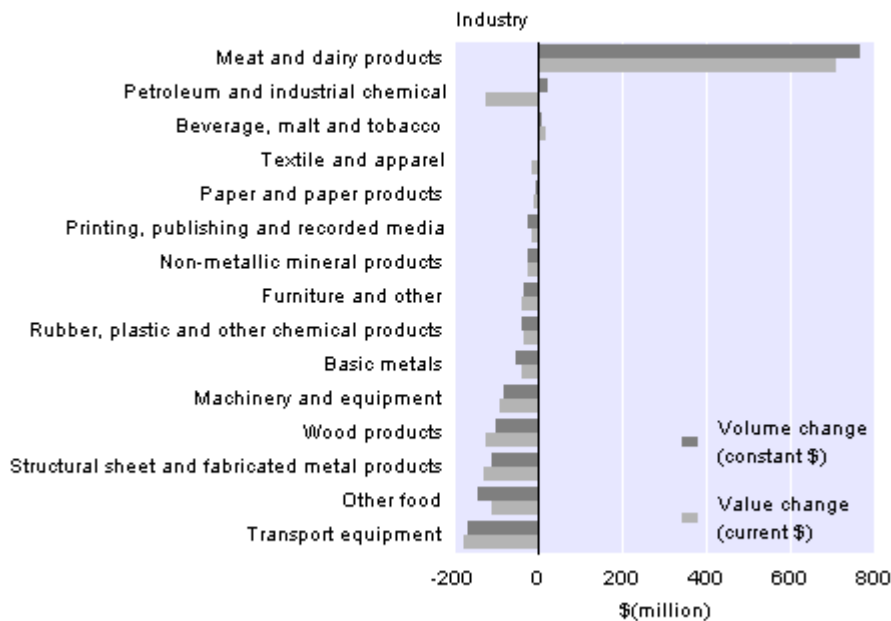
Although volumes were slightly up, the value of manufacturing sales fell 0.9 percent (\$179 million), the third quarterly decline since March 2008. Decreases in sales occurred in all but two of the 15 published industries, with five recording sales decreases of more than \$100 million, led by transport equipment manufacturing (down 23.6 percent or \$175 million). Structural, sheet and fabricated metal product manufacturing was next (down 9.7 percent or \$129 million) followed by wood product manufacturing (down 11.3 percent or \$125 million).

Offsetting the decreases was the meat and dairy product manufacturing industry with a rise of 10.9 percent (\$709 million) in the March 2009 quarter.

## Changes in Seasonally Adjusted Manufacturing Sales

Current and constant dollars <sup>(1)</sup>

December 2008 quarter to March 2009 quarter



(1) Constant dollar series (volumes) are at December 1997 quarter prices.

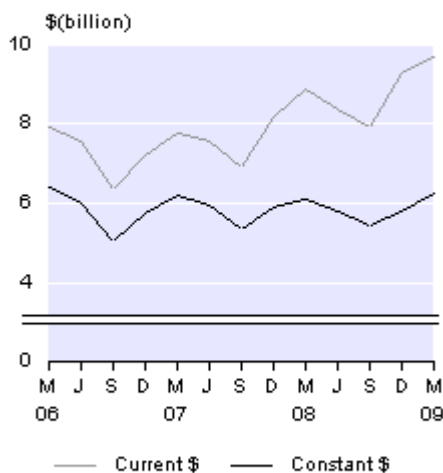
The trend for manufacturing volumes showed a decline of 9.2 percent since the September 2007 quarter, an average quarterly fall of 1.6 percent. However, the rate of decrease has strengthened since March 2008 to 2.4 percent. The sales value trend has eased in the past year after a period of high growth in the preceding year.

Stocks of finished goods, which are not seasonally adjusted, were up 2.8 percent in volume for the March 2009 quarter compared with the March 2008 quarter. Stock values were up 9.3 percent (\$822 million) from the March 2008 quarter.

## Total Manufacturing Stocks <sup>(1)</sup>

Current and constant dollars <sup>(2)</sup>

Quarterly



(1) Closing stocks of finished goods.

(2) Constant dollar series (volumes) are at December 1997 quarter prices.

## All manufacturing excluding meat and dairy product manufacturing

Sales volumes (excluding those for meat and dairy product manufacturing) fell by 6.5 percent in the March 2009 quarter, exceeding the previous record fall of 5.4 percent in the December 2008 quarter. In the past three quarters, volumes have fallen by 14.7 percent. The decrease in the March 2009 quarter was led primarily by the transport equipment manufacturing industry (down 32.7 percent) and the other food manufacturing industry (down 9.1 percent).

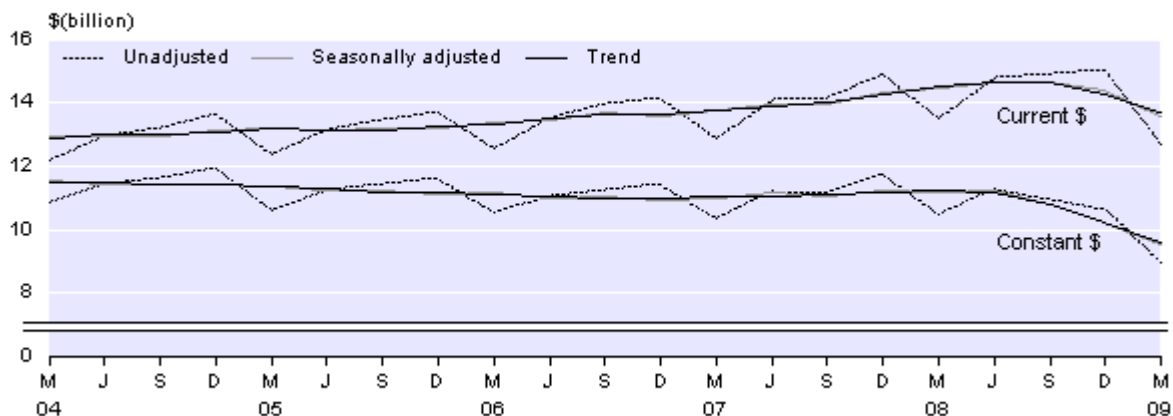
The value of sales also fell by 5.5 percent (\$798 million), the largest recorded fall since the current series began in December 1992. This fall follows decreases of 0.2 percent (\$25 million) in the September 2008 quarter and 1.7 percent (\$245 million) in the December 2008 quarter. The latest quarter's fall is the first time since June 1998 that sales values have fallen for three consecutive quarters.

Five industries recorded sales value falls of over \$100 million, led by transport equipment manufacturing (down 23.6 percent or \$175 million), structural, sheet and fabricated metal product manufacturing (down 9.7 percent or \$129 million), and wood product manufacturing (down 11.3 percent or \$125 million).

### Manufacturing Sales Excluding Meat and Dairy Product Manufacturing

*Current and constant dollars <sup>(1)</sup>*

Quarterly

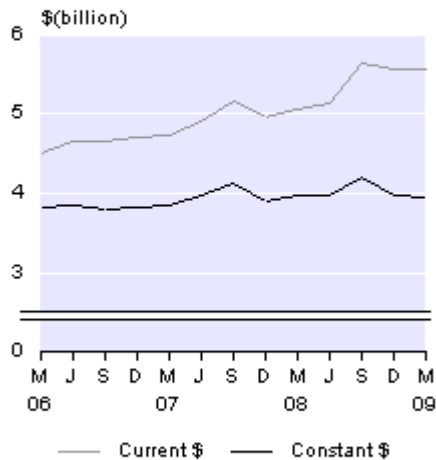


(1) Constant dollar series (volumes) are at December 1997 quarter prices.

The trend for sales volumes showed a decline of 14.8 percent in the past year, following a period of increase of 2.4 percent between the December 2006 and March 2008 quarters.

Stock volumes of finished goods, which are not seasonally adjusted, fell 0.3 percent for the March 2009 quarter compared with the March 2008 quarter. Stock values were up 10.1 percent to reach \$5.6 billion for the March 2009 quarter.

**Manufacturing Stocks<sup>(1)</sup>**  
**Excluding Meat and Dairy**  
*Current and constant dollars<sup>(2)</sup>*  
 Quarterly



(1) Closing stocks of finished goods.  
 (2) Constant dollar series (volumes) are at December 1997 quarter prices.

## Meat and dairy product manufacturing

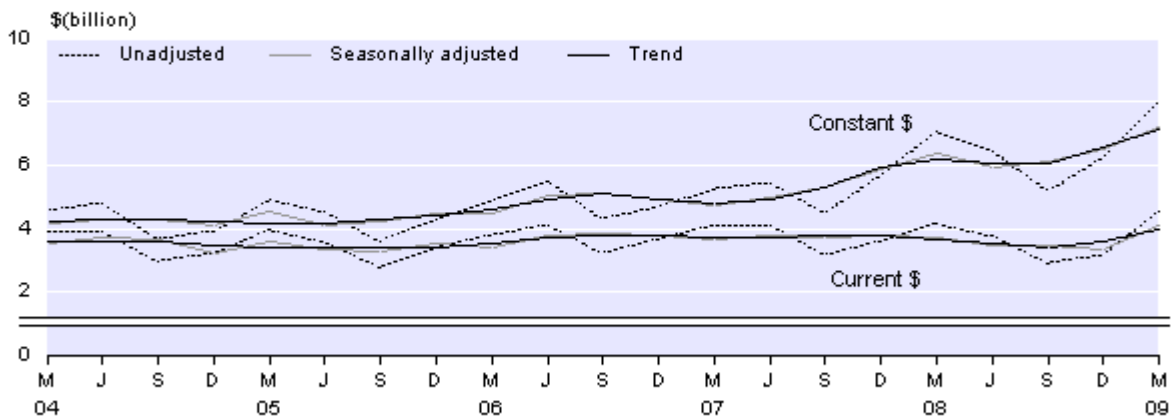
Sales volumes for the meat and dairy product manufacturing industry increased 23.1 percent in the March 2009 quarter. This rise follows four quarters of volume decreases during 2008, which was the only time that this has occurred since the current series began. The increase in volumes was primarily due to increased dairy product export volumes which rose 14.0 percent, while meat exports fell 0.9 percent as measured in the Overseas Trade Indexes.

Although prices for dairy product manufacturing fell sharply in the March 2009 quarter, the large volumes increase resulted in sales values increasing 10.9 percent (\$709 million). This followed an increase of 5.9 percent (\$365 million) for the December 2008 quarter. Prices for dairy products as measured by the Producers Price Index fell 24.3 percent in the March 2009 quarter, while prices for meat and meat products were reasonably stable, down 0.5 percent.

## Meat and Dairy Product Manufacturing Sales

*Current and constant dollars<sup>(1)</sup>*

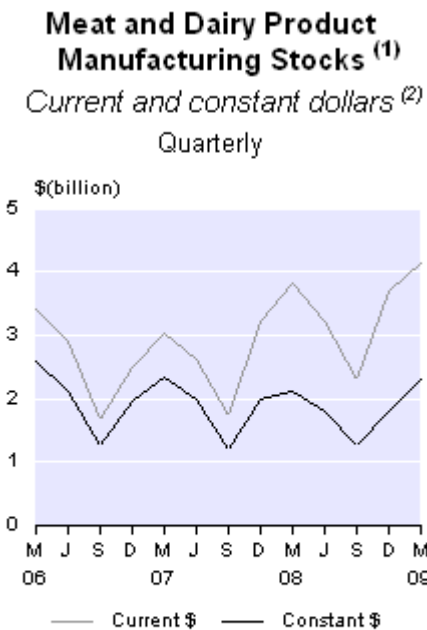
Quarterly



(1) Constant dollar series (volumes) are at December 1997 quarter prices.

Both the sales volumes and value trends for the meat and dairy manufacturing industry have increased substantially since the September 2008 quarter (up 16.5 percent and 17.4 percent, respectively).

Stocks of finished goods, which are not seasonally adjusted, were up 8.4 percent in volume for the March 2009 quarter compared with the March 2008 quarter. In the March 2009 quarter, stock values were also up, by 8.1 percent or \$311 million.



(1) Closing stocks of finished goods.

(2) Constant dollar series (volumes) are at December 1997 quarter prices.

Note: The Economic Survey of Manufacturing (QMS) dairy industry statistics are compiled on a non-standard quarter, meaning that there is a one-month lag in the data. For example, the March quarter includes the December, January and February months. Traditionally, the dairy industry peaks in the months of November and December. Monthly data is now being supplied and once there is a substantial time series and a new seasonal pattern can be established, the dairy industry (combined with the meat industry) will be published on a standard quarter.

Timing is one difference between the volume data published in the QMS release, and the value-added estimate for dairy manufacturing in the quarterly gross domestic product (QGDP) release. In addition, the QGDP estimate uses production volumes of dairy products sourced elsewhere to derive value-added, rather than volumes sourced from QMS. These differences in methods can result in significantly different movements when comparing output volumes from the QMS with value-added from QGDP as occurred in the December 2008 quarter.

## Transport equipment manufacturing

The transport equipment manufacturing industry includes the manufacture and repair of a variety of transport equipment including ships, locomotives, and aircraft. Sales by this industry do not have a stable seasonal pattern, so are not seasonally adjusted.

Sales volumes for this industry have fallen by a record of 32.7 percent for the March 2009 quarter, exceeding the previous record fall of 24.5 percent in the December 1998 quarter. Coupled with the decrease of 18.0 percent in the December 2008 quarter, the transport equipment industry manufacturing volumes have fallen 44.8 percent since the September 2008 quarter.

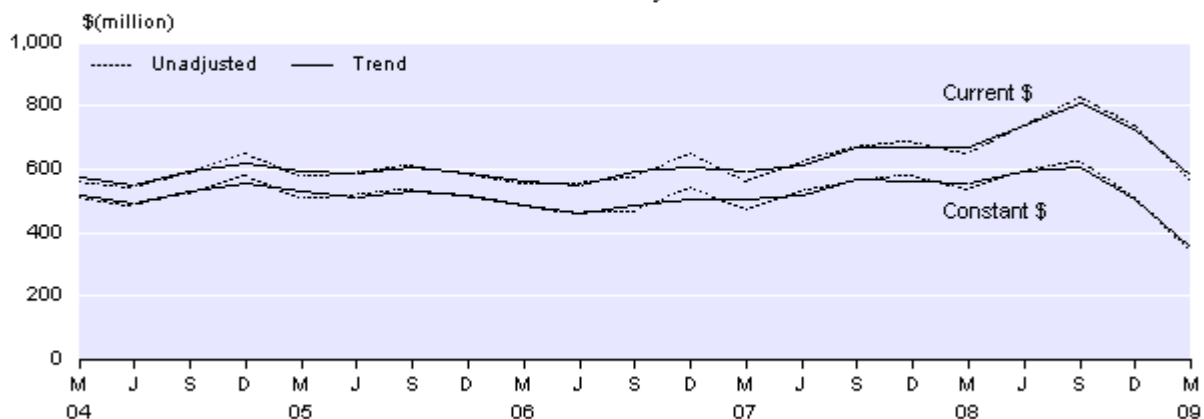
Price increases over the last two quarters have done little to offset the fall in volumes, with sales values down by a record of 23.6 percent (\$175 million) for the March 2009 quarter. Combined with the previous quarter's decrease of 10.5 percent (\$87 million), the latest quarter's fall is the first time that a sales value decrease has exceeded more than \$250 million, (31.6 percent) for any two-quarter period.

As measured by the Producers Price Index, transport equipment manufacturing prices rose 10.7 percent and 15.0 percent for the December 2008 and March 2009 quarters, respectively.

### Transport Equipment Manufacturing Sales

*Current and constant dollars <sup>(1)</sup>*

Quarterly

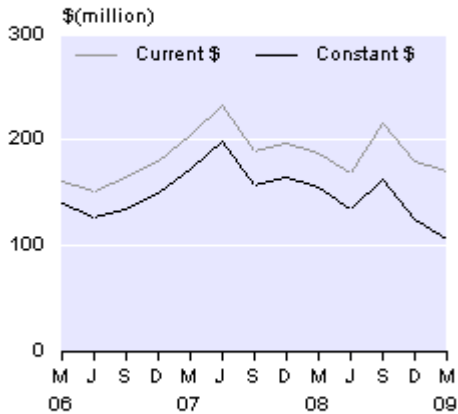


(1) Constant dollar series (volumes) are at December 1997 quarter prices.

Both the sales volumes and value trends showed a decline since the September 2008 quarter.

Stocks of finished goods, which are not seasonally adjusted, have fallen both in terms of volume and value from the March 2008 quarter, down 31.5 percent and 9.0 percent, respectively.

**Transport Equipment  
Manufacturing Stocks<sup>(1)</sup>**  
*Current and constant dollars<sup>(2)</sup>*  
 Quarterly



(1) Closing stocks of finished goods.

(2) Constant dollar series (volumes) are at December 1997 quarter prices.

## Structural, sheet and fabricated metal product manufacturing

The structural, sheet and fabricated metal product manufacturing industry primarily involves the manufacture of structural steel, architectural aluminium, sheet metal, and fabricated metal products.

Sales volumes for the structural, sheet and fabricated metal product manufacturing industry fell 12.7 percent in the March 2009 quarter, following consecutive falls of 7.4 percent and 5.4 percent for the September and December 2008 quarters, respectively. The volumes trend for this industry has been in general decline since March 2004, with an average quarterly fall of 1.9 percent. However, the pace of this decline has strengthened since the March 2008 quarter, falling at an average of 6.0 percent per quarter.

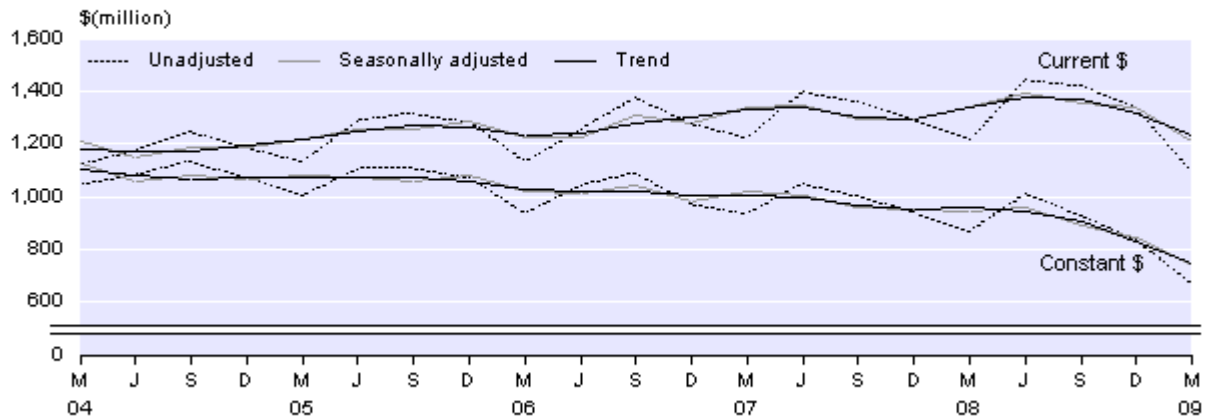
Sales values decreased 9.7 percent (\$129 million) in the March 2009 quarter, showing continuing decline from the June 2008 quarter (down 2.5 percent or \$34 million in the September 2008 quarter, and down 1.2 percent or \$16 million in the December 2008 quarter). The latest quarterly decrease is the first time that decreases in sales values have stretched to three quarters.

Prices for this industry as measured by the Producers Price Index have risen by 2.3 percent.

## Structural Sheet and Fabricated Metal Product Sales

Current and constant dollars <sup>(1)</sup>

Quarterly



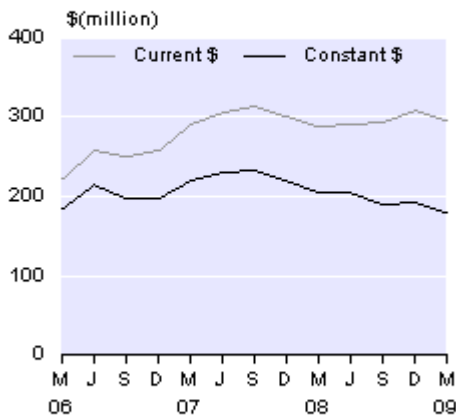
(1) Constant dollar series (volumes) are at December 1997 quarter prices.

Stocks of finished goods, which are not seasonally adjusted, fell 12.4 percent in volume terms compared with the same quarter of the previous year. This latest quarter's fall is the fifth consecutive fall since the December 2007 quarter. However, with price changes included, the value of stocks of finished goods was up 2.3 percent in the March 2009 quarter.

## Structural Sheet & Fabricated Metal Product Manufacturing Stocks <sup>(1)</sup>

Current and constant dollars <sup>(2)</sup>

Quarterly



(1) Closing stocks of finished goods.

(2) Constant dollar series (volumes) are at December 1997 quarter prices.

## Wood product manufacturing

During the March 2009 quarter, sales volumes for the wood product manufacturing industry decreased 10.9 percent, the first time volumes have fallen by more than 10.0 percent. The industry involves all facets of wood manufacturing, from log sawmilling and timber resawing to wooden structural component manufacturing, with exports accounting for over half of the industry's sales value. Export volumes of forestry products as measured in the Overseas Trade Indexes fell 5.1 percent this quarter.

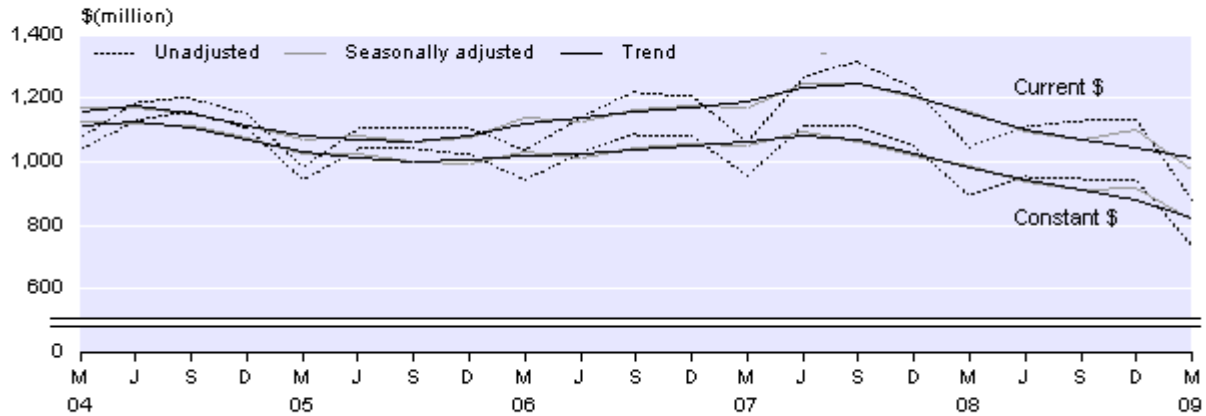
In the March 2009 quarter, sales values for this industry decreased 11.3 percent (\$125 million), following an increase of 3.1 percent (\$33 million) in the previous quarter. The latest quarter's fall in value is the highest on record.

Prices for the wood industry have dipped 0.7 percent this quarter following two quarters of increase as measured in the Producers Price Index.

### Wood Product Manufacturing Sales

*Current and constant dollars<sup>(1)</sup>*

Quarterly



(1) Constant dollar series (volumes) are at December 1997 quarter prices.

The trend for sales volume for wood product manufacturing has been declining since June 2007 at a rate of 3.8 percent per quarter, its longest and steepest decline since the current series began. The trend for the sales value has also been in decline, falling at an average of 3.4 percent per quarter since the September 2007 quarter.

## Revisions

Amended data received from respondents has resulted in revisions for the following industries:

- Paper and paper product manufacturing, raw materials and finished goods (December 2007)
- Transport equipment manufacturing sales, purchases, raw materials and finished goods for all quarters of 2008. Salaries and wages, additions and disposals of fixed assets for March, June and September 2008 quarters.

The main changes are in the following table.

<b>Industry</b>	<b>Variable</b>	<b>Series (MANQ)</b>	<b>Quarter</b>	<b>Published 16Mar09 \$(million)</b>	<b>Published 15Jun09 \$(million)</b>
Transport equipment	Sales	<i>SNMC15A</i>	Dec 2008	791	739
Transport equipment	Purchases	<i>SNMC15B</i>	Dec 2008	505	442
Transport equipment	Raw materials	<i>SNMC15D</i>	Dec 2008	254	237
Transport equipment	Finished goods	<i>SNMC15E</i>	Dec 2008	216	179
All manufacturing	Sales	<i>SNMCZZA</i>	Dec 2008	21,355	21,304
All manufacturing	Purchases	<i>SNMCZZB</i>	Dec 2008	15,234	15,170
All manufacturing	Raw materials	<i>SNMCZZD</i>	Dec 2008	3,444	3,427
All manufacturing	Finished goods	<i>SNMCZZE</i>	Dec 2008	9,298	9,262
Transport equipment	Sales	<i>SNMC15A</i>	Sep 2008	884	826
Transport equipment	Purchases	<i>SNMC15B</i>	Sep 2008	607	533
Transport equipment	Raw materials	<i>SNMC15D</i>	Sep 2008	260	243
Transport equipment	Finished goods	<i>SNMC15E</i>	Sep 2008	252	216
All manufacturing	Sales	<i>SNMCZZA</i>	Sep 2008	20,106	20,048
All manufacturing	Purchases	<i>SNMCZZB</i>	Sep 2008	14,802	14,728
All manufacturing	Raw materials	<i>SNMCZZD</i>	Sep 2008	3,304	3,287
All manufacturing	Finished goods	<i>SNMCZZE</i>	Sep 2008	7,969	7,933
Transport equipment	Sales	<i>SNMC15A</i>	Jun 2008	749	739
Transport equipment	Purchases	<i>SNMC15B</i>	Jun 2008	519	506
Transport equipment	Raw materials	<i>SNMC15D</i>	Jun 2008	224	221
Transport equipment	Finished goods	<i>SNMC15E</i>	Jun 2008	173	168
All manufacturing	Sales	<i>SNMCZZA</i>	Jun 2008	21,224	21,214
All manufacturing	Purchases	<i>SNMCZZB</i>	Jun 2008	16,208	16,194
All manufacturing	Raw materials	<i>SNMCZZD</i>	Jun 2008	3,156	3,153
All manufacturing	Finished goods	<i>SNMCZZE</i>	Jun 2008	8,343	8,338
Transport equipment	Sales	<i>SNMC15A</i>	Mar 2008	655	648
Transport equipment	Purchases	<i>SNMC15B</i>	Mar 2008	412	400
Transport equipment	Raw materials	<i>SNMC15D</i>	Mar 2008	197	195
Transport equipment	Finished goods	<i>SNMC15E</i>	Mar 2008	194	188
All manufacturing	Sales	<i>SNMCZZA</i>	Mar 2008	20,580	20,573
All manufacturing	Purchases	<i>SNMCZZB</i>	Mar 2008	15,700	15,688
All manufacturing	Raw materials	<i>SNMCZZD</i>	Mar 2008	3,027	3,025
All manufacturing	Finished goods	<i>SNMCZZE</i>	Mar 2008	8,873	8,868
Paper products	Raw materials	<i>SNMC08D</i>	Dec 2007	139	148
Paper products	Finished goods	<i>SNMC08E</i>	Dec 2007	230	252
All manufacturing	Raw materials	<i>SNMCZZD</i>	Dec 2007	2,905	2,914
All manufacturing	Finished goods	<i>SNMCZZE</i>	Dec 2007	8,151	8,173

## **Measurement errors**

The Economic Survey of Manufacturing applies imputation methods for estimating values for small firms and non-response, and, like all statistical surveys, is subject to measurement errors, including sample errors and non-sample errors. These measurement errors affect the accuracy of the published statistics. For more information on measurement errors, please refer to the technical notes of this release.

## **Sample errors**

The postal survey was designed to give statistics at the following levels of accuracy (at the 95 percent confidence interval limit):

- 5 percent for sales, salaries and wages, and value added at the total manufacturing level
- 10 percent for sales, salaries and wages, and value added at the published industry level, where value added is calculated as follows:

$$\text{value added} = \text{sales} - \text{purchases} + \text{stock change}$$

This means, for example, that there is a 95 percent chance that the true value of total manufacturing sales lies within 5 percent of the published estimate.

Sample errors are calculated each quarter for absolute values and for changes in value from the previous quarter.

The sample errors for the March 2009 quarter, at the 95 percent confidence interval limit, are:

<b>Industry</b>	<b>Sample error for sales</b>	<b>Sample error for change in sales</b>
	Percent	
Meat and dairy product manufacturing	0.0	0.0
Other food manufacturing	9.4	8.7
Beverage, malt and tobacco manufacturing	0.0	0.0
Textile and apparel manufacturing	7.0	1.3
Wood product manufacturing	5.1	2.7
Paper and paper product manufacturing	0.0	0.0
Printing, publishing and recorded media	5.7	4.1
Petroleum and industrial chemical manufacturing	0.0	0.0
Rubber, plastic and other chemical product manufacturing	11.1	4.0
Non-metallic mineral product manufacturing	4.9	2.1
Basic metal manufacturing	0.0	0.0
Structural, sheet and fabricated metal product manufacturing	4.0	2.6
Transport equipment manufacturing	4.7	2.4
Machinery and equipment manufacturing	3.6	3.8
Furniture and other manufacturing	5.5	3.4
<b>Total manufacturing</b>	<b>1.2</b>	<b>1.1</b>

Industries with zero sample error are full-coverage industries. In these industries all large firms are surveyed and all small- to medium-sized firms are modelled using administrative data from Inland Revenue.

## **Imputation**

### **Small firms**

Small- to medium-sized firms are generally not surveyed. Their variables are instead modelled from administrative data from Inland Revenue. Ratios calculated from the postal sample responses are applied to the administrative data to provide estimated values.

### **Non-response imputation**

Although attempts are made to achieve a 100 percent response rate, in practice this does not occur. Values for non-responding businesses are estimated using a range of methods, including:

- regression imputation
- historic imputation
- mean imputation.

Regression imputation involves estimating the variable of interest from the unit's administrative data (GST sales), based on the relationship shown by similar businesses. Historic imputation involves multiplying their response in the previous period by a non-response factor. The non-response factor is the average movement over the quarter of similar businesses. Mean imputation involves estimating a value for a unit by using the average value for a set of similar businesses.

The table below shows percentages of sales imputed in the March 2009 quarter:

<b>Industry</b>	<b>Non-response</b>	<b>Tax modelled</b>
	Percentage of sales	
Meat and dairy product manufacturing	2.6	2.1
Other food manufacturing	13.8	5.1
Beverage, malt and tobacco manufacturing	13.7	5.4
Textile and apparel manufacturing	25.3	16.2
Wood product manufacturing	14.7	8.7
Paper and paper product manufacturing	3.4	0.7
Printing, publishing and recorded media	16.5	11.4
Petroleum and industrial chemical manufacturing	1.5	4.7
Rubber, plastic and other chemical product manufacturing	16.1	6.8
Non-metallic mineral product manufacturing	13.0	6.8
Basic metal manufacturing	5.3	3.7
Structural, sheet and fabricated metal product manufacturing	26.8	10.4
Transport equipment manufacturing	28.4	11.1
Machinery and equipment manufacturing	23.6	11.8
Furniture and other manufacturing	19.5	24.7
<b>Total manufacturing</b>	<b>11.0</b>	<b>5.9</b>

## Response rate

The response rate applies to the postal sample and gives the proportion of sales obtained from survey responses (compared with being imputed). The Economic Survey of Manufacturing has a target response rate of 85 percent. The response rate achieved for the March 2009 quarter was 88 percent.

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## Next release ...

*Economic Survey of Manufacturing: June 2009* will be released on 15 September 2009.

# Technical notes

## Background to the survey

The Economic Survey of Manufacturing (QMS) is designed to provide short-term economic indicators for the manufacturing sector. In addition, the data is used to compile the manufacturing sector component of quarterly national accounts. The survey was last redesigned in the June 2001 quarter.

## Population

The target population for this survey is all kind-of-activity units (KAUs) operating in New Zealand that are classified as Manufacturing (Australian and New Zealand Standard Industrial Classification Division C) on Statistics New Zealand's Business Frame.

## Sample design

The survey population is stratified according to:

- industries defined by the ANZSIC-based ANZIND classification at the working industry level
- size (in terms of rolling mean employment)
- turnover (annualised GST sales).

Each ANZIND working industry division contains between two and four substrata. Because of the contribution large units make to the economic activity within each industry group, they are all included in the sample. A portion of the remaining medium to large units is also included in the sample. In addition, small- to medium-sized businesses have their data modelled from administrative data (GST and employee monthly schedules) sourced from Inland Revenue. All manufacturing KAUs belonging to a selected 'enterprise' are included.

About 1,600 units have been selected in the postal sample from the entire population, and approximately 17,000 units have their data modelled from tax data.

## Sample maintenance

Sample maintenance is the process that maintains the sample over time, to reflect births, deaths and other structural changes identified on the Business Frame. The information for Business Frame changes comes from a variety of sources, including GST registrations and respondent contact.

New enterprises are identified when they register for GST. Once a quarter, the new enterprises are selected into the sample using the same criteria as for the original sample. These are referred to as births. When an enterprise ceases trading, its manufacturing KAUs are removed from the survey. These are referred to as deaths.

Enterprises can also enter or leave the survey sample if they are reclassified from another industry to manufacturing. Reclassifications occur when an enterprise changes its main form of activity (eg from wholesale trade to manufacturing). These are usually identified in the Annual Frame Update Survey conducted in February each year.

## **Sample reselection**

The sample for the QMS is reselected each quarter to ensure that the sample reflects changes occurring in the manufacturing population.

## **Industry classifications**

From the September 2001 quarter, QMS estimates have been published using industries defined by the ANZSIC-based ANZIND classification. The ANZSIC series are the official QMS statistics.

The introduction of ANZSIC ensures the industry classification used by Statistics NZ better reflects contemporary economic activity. It also improves the comparability of statistics produced in New Zealand and Australia.

## **Measurement errors**

Errors in the survey are divided into two classes:

### **Non-sampling error**

Non-sampling error includes errors arising from biases in the patterns of response and non-response, inaccuracies in reporting by respondents, and errors in the recording and coding of data. The size of these errors is difficult to quantify. Data is subject to revision if significant errors are detected in subsequent quarters.

### **Sampling error**

Sampling error is a measure of the variability that occurs by chance because a sample, rather than an entire population, is surveyed.

## **Definitions**

### **ANZSIC**

Australian and New Zealand Standard Industrial Classification.

### **ANZIND**

An ANZSIC-based classification that groups industries for publication.

### **Business Frame**

A register of all economically significant businesses operating in New Zealand. The population of the QMS is drawn from the Business Frame.

### **Enterprise**

A business entity operating in New Zealand either as a legally constituted body such as a company, partnership, trust, local or central government trading organisation, or as a self-employed individual.

### **Kind-of-activity unit**

A subdivision of an enterprise engaged in predominantly one activity and for which a single set of accounting records is available.

### **Rolling mean employment (RME)**

RME is a 12-month moving average of the monthly employee count (EC) figure which replaces the numbers of full-time and part-time employees.

## **Operating income**

### **Income from total sales. This includes:**

- sales of processed goods
- sales of goods purchased for resale
- sales of services
- repair services
- manufacturing and processing fees
- management fees
- rental income
- leasing income
- royalties
- patent fees.

Operating income may contain end-of-year payouts that relate to production from earlier quarters.

### **Operating income excludes:**

- donations
- insurance claims
- subsidies/government grants
- exchange rate gains
- extraordinary items
- gains on sales of fixed assets
- excise duties
- bad debts.

## **Purchases and operating expenditure**

### **This includes:**

- purchases of goods for resale
- purchases of goods and materials for production
- motor vehicle expenses
- electricity and fuels
- management fees
- telecommunication expenses
- charges and fees paid to other businesses/divisions
- general operating expenditure (eg freight, rent)
- royalties
- patent fees.

Purchases and operating expenditure may incorporate payments for materials or services that may relate to quarters other than those in which they are recorded.

## **Purchases and operating expenditure excludes:**

- interest/dividend payments
- sales tax
- excise duties
- fringe benefit tax
- donations
- bad debts
- extraordinary items
- exchange rate losses
- losses on sales of fixed assets
- depreciation.

## **Salaries and wages**

Gross salaries and wages paid to employees during the quarter, excluding salaries and wages to working proprietors, and drawings.

## **Stocks of raw materials**

Closing stocks of raw materials for use in production.

## **Stocks of finished goods**

Closing stocks of finished goods, work in progress and trading stocks.

## **Additions to fixed assets**

This includes purchases of land, and other fixed assets and capital works by own employees. It excludes any revaluation of fixed assets.

## **Disposals of fixed assets**

This includes sales of land or other fixed assets (reported at sale price). It excludes any devaluation of fixed assets.

## **Use of manufacturing data in quarterly national accounts**

A key use of the QMS is in the calculation of manufacturing value added for the compilation of quarterly Gross Domestic Product (GDP).

Base year manufacturing value added is extrapolated using volume indexes. For each ANZSIC division, volume indexes are calculated from deflated sales and the deflated finished goods stock change. Sub-indexes from the Producers Price Index (PPI) are used for deflating QMS sales and finished goods stocks.

QMS data is supplemented with production data for the following industries:

- Meat and dairy product
- Petroleum and industrial chemical
- Basic metal.

## Seasonally adjusted series

The X-12-ARIMA package has been used to produce the seasonally adjusted estimates and trend estimates for sales in all subdivisions. Seasonal adjustment aims to eliminate the impact of regular seasonal events (such as annual cycles in agricultural production, winter or annual holidays) on time series. This makes the data for adjacent quarters more comparable.

All seasonally adjusted figures are subject to revision each quarter. This enables the seasonal component to be better estimated and removed from the series.

The X-12-ARIMA seasonal adjustment package is a very robust procedure; however, it has problems when there has been an abrupt change in the seasonal variation, as do other seasonal adjustment packages.

As a result of the restructuring within the dairy industry, there has been a discontinuity in the meat and dairy product and total manufacturing series. The seasonal pattern of the dairy series may have become less closely tied to production cycles due to the removal of the monopsony in the industry. Should this occur, it is likely that the seasonality of the total sales series will also change, as it has been strongly influenced by the seasonality of the meat and dairy series. Therefore, a seasonal movement of a given magnitude in the meat and dairy product and total manufacturing series before June 2002 may not have the same meaning as a seasonal movement of a similar magnitude after June 2002.

Since September 2002 the dairy series have been adjusted to take some account of this expected change in behaviour. There may be further revisions to the meat and dairy, and the total manufacturing series, as further information becomes available which enables Statistics NZ to better quantify the effect of the changes in the dairy industry.

Due to the changes in the meat and dairy series, it has been decided to change the seasonal adjustment method for total sales from direct to indirect. This will allow the series to better respond to changes in the seasonality of the components, and was considered preferable to our usual selection criteria. More information on direct and indirect adjustment is available on our website [www.stats.govt.nz](http://www.stats.govt.nz) in the [seasonal adjustment FAQ pages](#).

For further information contact [seasonaladjustment@stats.govt.nz](mailto:seasonaladjustment@stats.govt.nz).

The trend series are calculated using the X-12-ARIMA seasonal adjustment package. They are based on a five- or seven-term moving average of the seasonally adjusted series, with an adjustment for outlying values.

Trend estimates towards the end of the series incorporate new data as they become available and can therefore change as more observations are added to the series. Revisions can be particularly large if an observation is treated as an outlier in one quarter, but is found to be part of the underlying trend as further observations are added to the series. Typically, only the estimates for the most recent quarter will be subject to substantial revisions.

## **Volume series**

These are value series that have been adjusted by a price index to remove the effect of price changes. They can then be used for measuring quantity change. The volume series, at present, are expressed in December 1997 quarter dollars.

Values are adjusted using sub-indexes from the PPI. These sub-indexes measure price movements in each of the 15 published manufacturing industries, as well as total manufacturing. When the value series are divided by the respective sub-indexes, price effects are removed and a volume measure remains. The PPI sub-indexes are available on [Infoshare](#).

## **More information**

For more information, follow the [link](#) from the technical notes of this release on the Statistics NZ website.

## **Estimated trend**

For any series, the survey estimates can be broken down into three components: trend, seasonal and irregular. While seasonally adjusted series have had the seasonal component removed, trend series have had both the seasonal and irregular components removed. Trend estimates reveal the underlying direction of movement in a series, and are likely to indicate turning points more accurately than are seasonally adjusted estimates.

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## **Timing**

Timed statistical releases are delivered using postal and electronic services provided by third parties. Delivery of these releases may be delayed by circumstances outside the control of Statistics NZ. Statistics NZ accepts no responsibility for any such delays.

## Tables

The following tables are printed with this Hot Off The Press and can also be downloaded from the Statistics New Zealand website in Excel format. If you do not have access to Excel, you may use the [Excel file viewer](#) to view, print and export the contents of the file.

1. All manufacturing, ANZSIC division C
2. All manufacturing excluding meat and dairy product manufacturing, ANZSIC division C (excluding ANZSIC C211–C212)
3. Meat and dairy product manufacturing, ANZSIC C211–C212
4. Other food manufacturing, ANZSIC C213–C217
5. Beverage, malt and tobacco manufacturing, ANZSIC C218–C219
6. Textile and apparel manufacturing, ANZSIC C22
7. Wood product manufacturing, ANZSIC C231–C232
8. Paper and paper product manufacturing, ANZSIC C233
9. Printing, publishing, and recorded media manufacturing, ANZSIC C24
10. Petroleum and industrial chemical manufacturing, ANZSIC C251–C253
11. Rubber, plastic and other chemical product manufacturing, ANZSIC C254–C256
12. Non-metallic mineral product manufacturing, ANZSIC C26
13. Basic metal manufacturing, ANZSIC C271–C273
14. Structural, sheet and fabricated metal product manufacturing, ANZSIC C274–C276
15. Transport equipment manufacturing, ANZSIC C281–C282
16. Machinery and equipment manufacturing, ANZSIC C283–C286
17. Furniture and other manufacturing, ANZSIC C29
18. Sales – unadjusted, at December 1997 quarter prices
19. Sales – seasonally adjusted, at December 1997 quarter prices
20. Closing stocks of finished goods, at December 1997 quarter prices

Statistics for the Economic Survey of Manufacturing are also available from our online database [Infoshare](#).