

Embargoed until 10:45am – 08 March 2010

## Economic Survey of Manufacturing: December 2009 quarter

### Highlights

Sales (seasonally adjusted) for the December 2009 quarter compared with the September 2009 quarter:

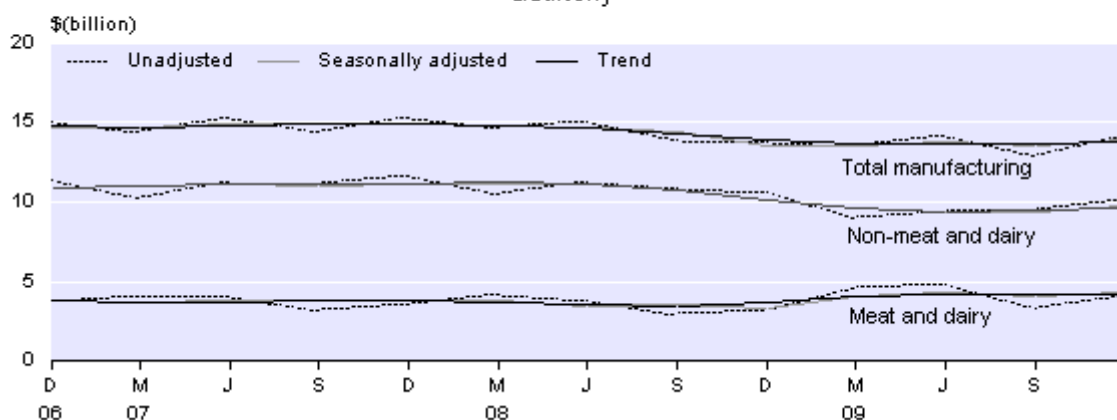
#### Volumes

- Manufacturing rose 3.1 percent.
- Excluding meat and dairy product manufacturing, sales rose 3.6 percent.
- Meat and dairy product manufacturing rose 4.6 percent.

#### Values

- Manufacturing rose 0.7 percent.
- Excluding meat and dairy product manufacturing, sales rose 3.1 percent.
- Meat and dairy product manufacturing fell 2.1 percent.

**Manufacturing Sales Volumes**  
*At December 1997 quarter prices*  
Quarterly



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## Commentary

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

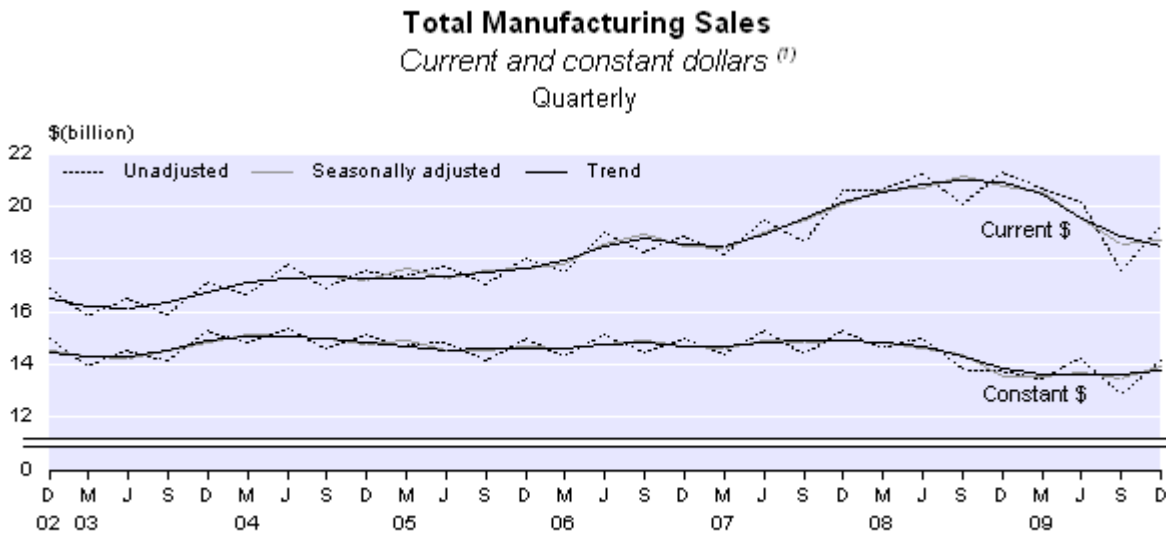
### All manufacturing industries

The volume of manufacturing sales rose 3.1 percent in the December 2009 quarter, following a fall of 1.7 percent in the September 2009 quarter, when a nine-year low was reached. Eleven industries, including the influential meat and dairy product manufacturing industry, showed rises for the latest quarter, while four showed falls.

The main changes were:

- meat and dairy product manufacturing, up 4.6 percent
- other food manufacturing, up 5.8 percent
- basic metal manufacturing, down 18.5 percent
- structural, sheet, and fabricated metal product manufacturing, up 7.9 percent.

Volumes are calculated by removing the effect of price changes from values. Indirect seasonal adjustment (whereby component industries are individually adjusted before being summed) is used at the total manufacturing level, while direct seasonal adjustment is used for the meat and dairy product manufacturing industry and for all manufacturing excluding meat and dairy product manufacturing. Volume movements for these sub-totals are therefore not additive at the total manufacturing level.



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

The value of sales rose 0.7 percent (\$139 million) in the December 2009 quarter, following four consecutive quarterly falls. The rise for the latest quarter is smaller than that for the volume because of price decreases.

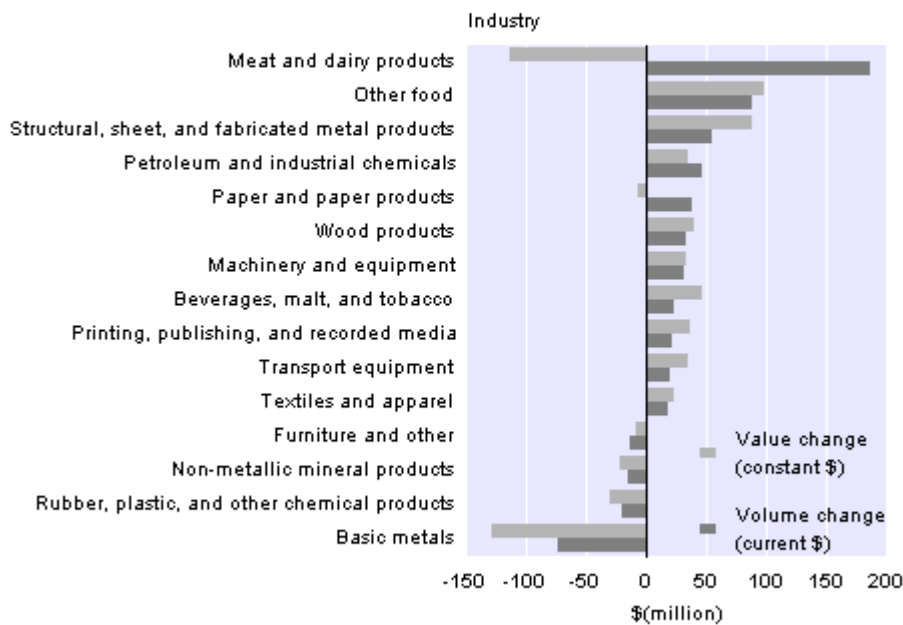
Nine industries showed rises for the latest quarter, while six showed falls. The main industry movements were:

- basic metal manufacturing, down 19.1 percent (\$128 million)
- meat and dairy product manufacturing, down 2.1 percent (\$113 million)
- other food manufacturing, up 4.4 percent (\$99 million)
- structural, sheet, and fabricated metal product manufacturing, up 7.8 percent (\$89 million)

### Changes in Seasonally Adjusted Manufacturing Sales

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

September 2009 quarter to December 2009 quarter

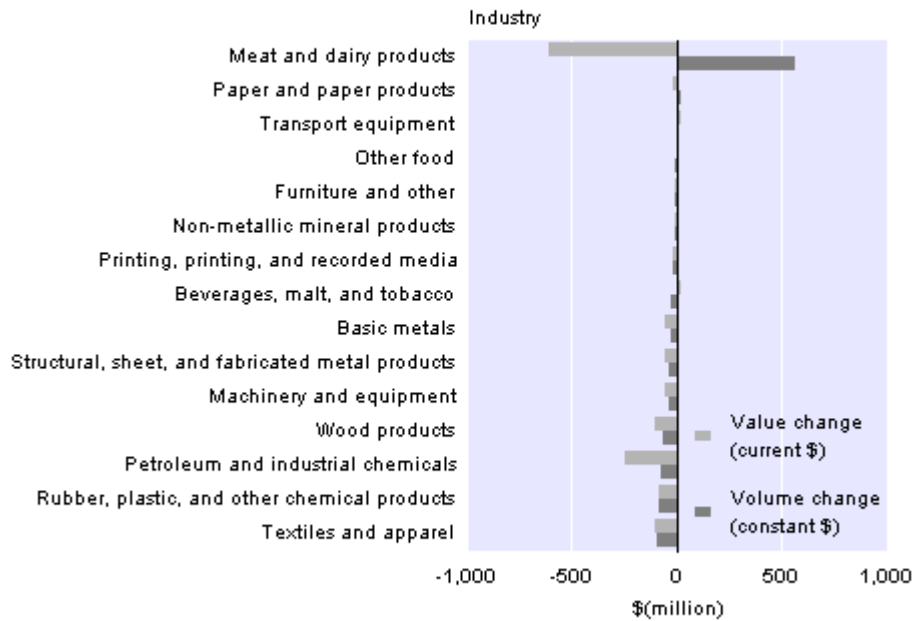


(1) Constant dollar series (volumes) are at December 1997 quarter prices.

The trend for the sales volume, revised from the previous release, is up for the latest two quarters after seven quarters of decline, while the trend for the sales value is down for the fifth consecutive quarter.

Stocks of finished goods, which are not seasonally adjusted, are up 2.0 percent in volume for the December 2009 quarter compared with the December 2008 quarter. Stock values, at \$7.9 billion, are down 14.2 percent (\$1.3 billion) from the December 2008 quarter, with meat and dairy product manufacturing (because of lower prices overall) being the main cause of the fall.

**Changes in Manufacturing Stocks<sup>(1)</sup>**  
*In current and constant dollars<sup>(2)</sup>*  
 December 2008 quarter to December 2009 quarter



(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**

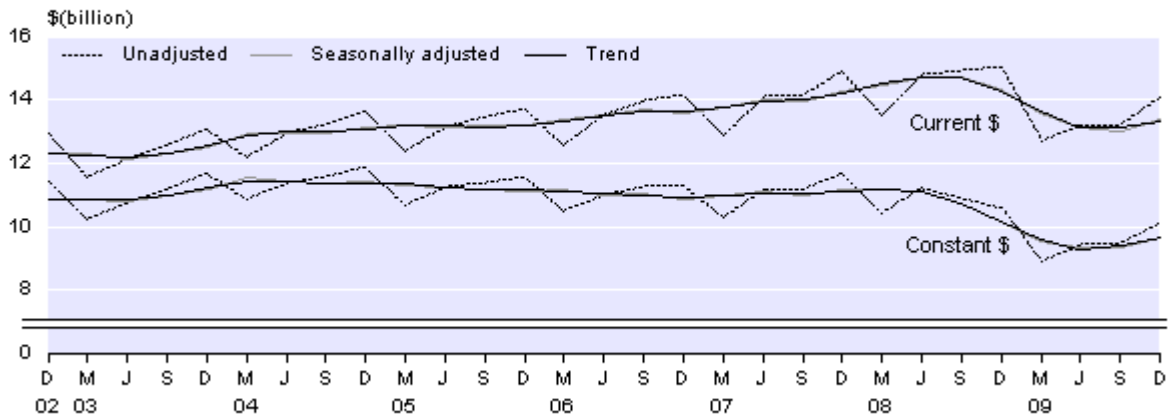
The volume of sales, excluding meat and dairy product manufacturing, rose 3.6 percent in the December 2009 quarter. This follows a rise of 0.5 percent in the September 2009 quarter and falls totalling 16.6 percent for the previous six quarters.

As detailed in the previous section, most industries showed rises for the latest quarter. Other food manufacturing, and structural, sheet, and fabricated metal product manufacturing were the main contributors to the latest rise, while basic metal manufacturing showed the largest fall.

**Manufacturing Sales Excluding Meat and Dairy Product Manufacturing**

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

Quarterly



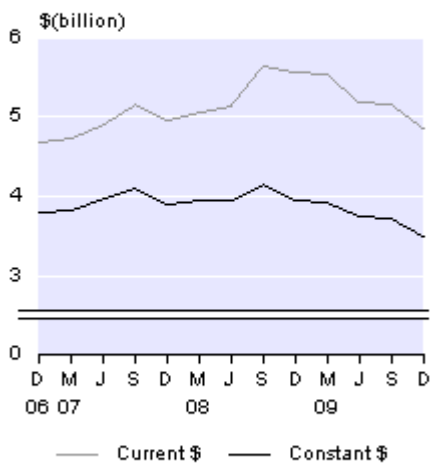
(1) Constant dollar series (volumes) are at December 1997 quarter prices.

The value of sales rose 3.1 percent (\$404 million) in the December 2009 quarter. This follows five consecutive quarterly falls totalling 11.5 percent. As detailed in the previous section, the largest rises in sales value for the latest quarter were for other food manufacturing, and structural, sheet, and fabricated metal product manufacturing, while the largest fall was for basic metal manufacturing. These are the same industries that had the largest changes in sales volume.

The trend for the sales volume, revised from the previous release, shows rises for the latest two quarters, while the trend for the sales value is up after five quarters of decline.

The volume of finished goods stocks, which is not seasonally adjusted, is down 11.4 percent for the December 2009 quarter compared with the December 2008 quarter. The value, at \$4.9 billion, is down 12.7 percent.

**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

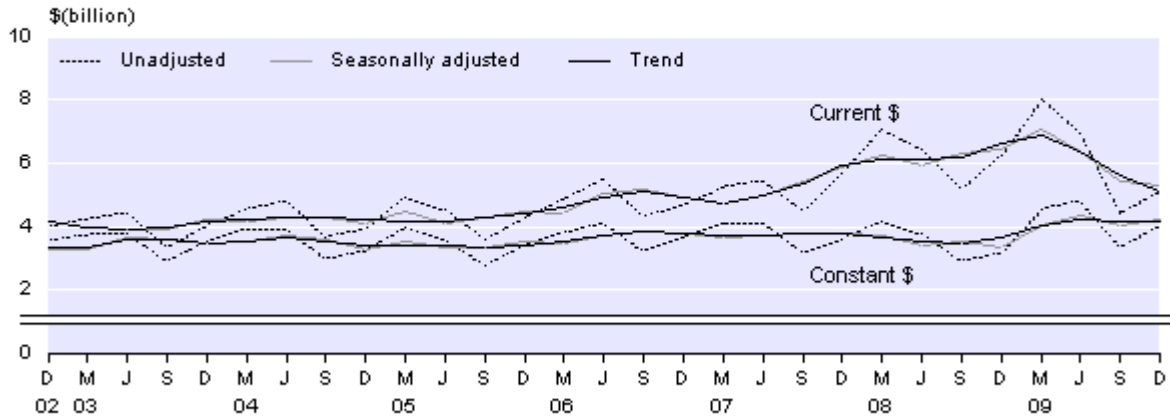
Most dairy industry values in this survey are compiled on a non-standard quarter. The data has a one-month lag which means, for example, that the December quarter includes values for the months of September, October, and November. Monthly data is now available, and when there is a substantial time series and a new seasonal pattern can be established, dairy industry data (combined with the meat industry) will be published on a standard quarter (such as October–December).

The volume of sales for the meat and dairy product manufacturing industry rose 4.6 percent in the December 2009 quarter, following a fall of 6.1 percent in the previous quarter. Milk powder, butter, and cheese export quantities fell 6.1 percent in the December 2009 quarter, while meat and edible offal export quantities rose 14.5 percent, as published in the Overseas Merchandise Trade: December 2009 release. Over half of meat and dairy production is exported but timing and valuation differences between sales volumes and export quantities can impact on comparisons of movements.

## 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.

Despite the 4.6 percent rise in volume, the value of sales fell 2.1 percent in the December 2009 quarter because of overall price decreases. This follows a fall in value of 15.4 percent in the September 2009 quarter.

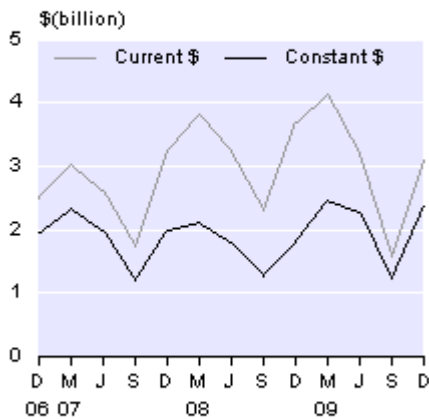
The trend for the sales volume, revised from the previous release, shows falls for the latest two quarters. The trend for the sales value, which includes the impact of price falls, shows a decline in each of the latest three quarters.

The volume of finished goods stocks, which is not seasonally adjusted, is up 31.2 percent for the December 2009 quarter compared with the December 2008 quarter. The value, at \$3.1 billion, is down 16.5 percent.

## Meat and Dairy Product Manufacturing Stocks <sup>(1)</sup>

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

Quarterly



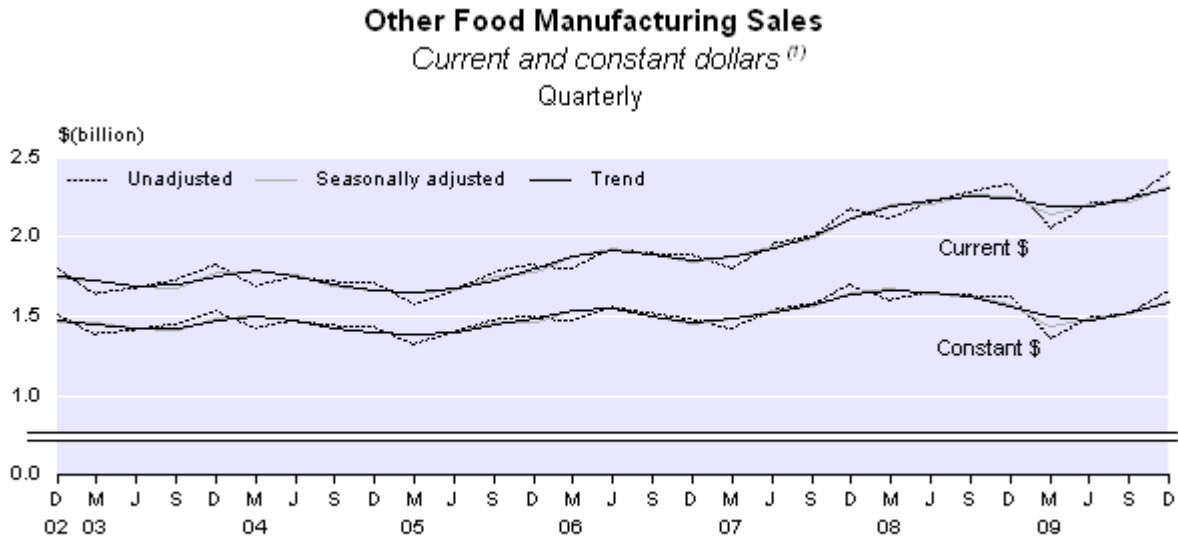
(1) Closing stocks of finished goods.

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

## Other food manufacturing

This industry includes the processing or production of seafood, fruit and vegetables, animal and bird feed, bread, cereals and baking mixes, cakes and pastry, oils and fats, flour, confectionery, biscuits and sugar.

The volume of sales for this industry rose 5.8 percent in the December 2009 quarter, following smaller rises in the previous two quarters.



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

The value of sales rose 4.4 percent in the December 2009 quarter, following a rise of 1.1 percent in the September 2009 quarter. The latest rise in value is less than that recorded for the volume, implying that the rise was volume-driven while prices decreased.

The trend series for both the sales volume and the sales value show rises for the latest two quarters.

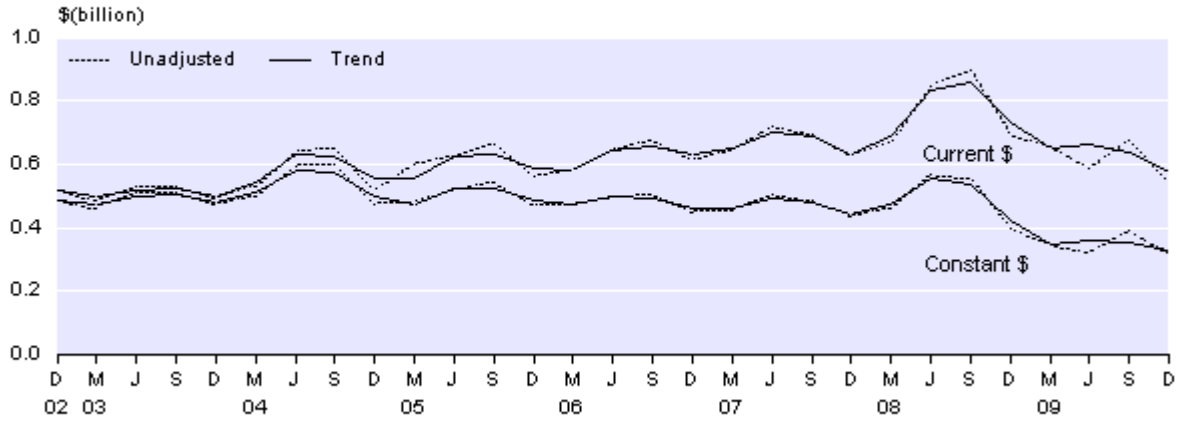
The volume of finished goods stocks, which is not seasonally adjusted, is down 1.5 percent for the December 2009 quarter compared with the December 2008 quarter. The value, at \$730 million, is flat.

## Basic metal manufacturing

The basic metal manufacturing industry includes the manufacture of iron and steel, basic non-ferrous metals, and non-ferrous basic metal products. Sales for this industry have an unstable seasonal pattern, so are not seasonally adjusted.

The (unadjusted) volume of sales fell 18.5 percent in the December 2009 quarter, reversing the rise of 21.5 percent in the September 2009 quarter. The series is at a historically low level.

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



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

The (unadjusted) value of sales fell 19.1 percent in the December 2009 quarter, providing the largest negative contribution to the change in total manufacturing sales. This follows a rise of 14.6 percent in the September 2009 quarter. Both these quarterly changes were volume-driven.

The trend series for both the sales volume and sales value show falls in the latest two quarters.

The volume of finished goods stocks, which is not seasonally adjusted, is down 22.5 percent for the December 2009 quarter compared with the December 2008 quarter. The value, at \$168 million, is down 24.0 percent.

## Revisions

Amended data received from respondents has resulted in revisions for the following industries for the September 2009 quarter:

- other food manufacturing
- petroleum and industrial chemical manufacturing
- transport equipment manufacturing
- machinery and equipment manufacturing.

The main changes to unadjusted sales values are in the following table.

<b>Changes to sales, purchases, and stocks of finished goods</b>					
<b>Manufacturing industry</b>	<b>Variable</b>	<b>Series MANQ.</b>	<b>Period (quarter)</b>	<b>Published 8 Dec 2009</b>	<b>Published 8 Mar 2010</b>
				\$(million)	\$(million)
All manufacturing	Sales	SNMCZZA	Sep 2009	17,680	17,596
All manufacturing excluding meat and dairy	Sales	SNMCZ3A	Sep 2009	13,252	13,168
Petroleum and industrial chemicals	Sales	SNMC10A	Sep 2009	662	599
Other food	Sales	SNMC03A	Sep 2009	2,243	2,228
Machinery and equipment	Sales	SNMC16A	Sep 2009	1,667	1,660

## 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:

value added = sales – purchases + 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, at the 95 percent confidence interval limit, are calculated each quarter for absolute values and for changes in value from the previous quarter.

<b>Sample errors for sales in the December 2009 quarter</b>		
<b>Industry</b>	<b>Sample error for sales value</b>	<b>Sample error for change in sales</b>
	Percent	
Meat and dairy product manufacturing	0.0	0.0
Other food manufacturing	11.9	6.5
Beverage, malt, and tobacco manufacturing	0.0	0.0
Textile and apparel manufacturing	6.2	3.6
Wood product manufacturing	8.1	4.5
Paper and paper product manufacturing	0.0	0.0
Printing, publishing, and recorded media	6.8	4.7
Petroleum and industrial chemical manufacturing	0.0	0.0
Rubber, plastic, and other chemical product manufacturing	13.2	2.7
Non-metallic mineral product manufacturing	4.4	1.4
Basic metal manufacturing	0.0	0.0
Structural, sheet, and fabricated metal product manufacturing	4.8	1.8
Transport equipment manufacturing	5.5	3.3
Machinery and equipment manufacturing	4.1	2.3
Furniture and other manufacturing	5.1	8.8
<b>Total manufacturing</b>	<b>1.9</b>	<b>1.0</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.

<b>Imputed values as a percentage of sales in the December 2009 quarter</b>		
<b>Industry</b>	<b>Non-response</b>	<b>Tax modelled</b>
	Percentage of sales	
Meat and dairy product manufacturing	0.6	3.0
Other food manufacturing	8.0	4.6
Beverage, malt, and tobacco manufacturing	2.0	4.5
Textile and apparel manufacturing	15.7	17.3
Wood product manufacturing	18.9	8.4
Paper and paper product manufacturing	0.5	0.7
Printing, publishing, and recorded media	11.9	10.4
Petroleum and industrial chemical manufacturing	8.6	5.1
Rubber, plastic, and other chemical product manufacturing	13.3	7.5
Non-metallic mineral product manufacturing	7.9	7.6
Basic metal manufacturing	6.2	5.4
Structural, sheet, and fabricated metal product manufacturing	18.4	10.7
Transport equipment manufacturing	13.0	9.3
Machinery and equipment manufacturing	17.6	11.3
Furniture and other manufacturing	14.4	23.1
<b>Total manufacturing</b>	<b>8.5</b>	<b>6.8</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 December 2009 quarter was 91 percent.

For technical information contact:  
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### **Next release ...**

*Economic Survey of Manufacturing: March 2010 quarter* will be released on 8 June 2010.

## **Technical notes**

For explanation of terms, see the definitions section below.

### **Background to the survey**

The Economic Survey of Manufacturing (ESM) provides short-term economic indicators for the manufacturing sector. The data is also used to compile the manufacturing sector component of the quarterly national accounts. Published values exclude GST.

### **Population**

The target population for this survey is all manufacturing businesses operating in New Zealand. This is as specified on Statistics New Zealand's Business Frame using the 1996 Australian and New Zealand Standard Industrial Classification (ANZSIC) for Division C at the kind-of-activity business unit.

### **Sample design**

The survey population is split into ANZIND working industries and stratified according to size (based on GST sales and rolling mean employment numbers). All units that are large enough to be in the top strata are included in the postal survey, together with sampled units from the middle strata. All manufacturing units belonging to a selected enterprise are included. For units in the bottom strata, data is obtained via modelling of administrative data (GST and Employee Monthly Survey) from Inland Revenue.

About 1,500 units are selected each quarter for the postal survey while about 17,500 units have their data modelled from administrative data.

### **Sample maintenance**

Sample maintenance is the process that keeps the sample up to date by taking account of business start-ups, close-downs, and other structural changes recorded on the Business Frame. Information for the Business Frame comes from a variety of sources, including GST registrations and respondent contact.

New enterprises are identified from GST registrations and may be selected into the postal sample. When an enterprise ceases trading, its manufacturing units are removed from the survey.

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

## **Sample reselection**

The survey sample is reselected each quarter to ensure that it reflects changes in the manufacturing population.

## **Industry classification**

From the September 2001 quarter, ESM values are published on an ANZIND working industry basis. ANZIND industries are defined groupings of ANZSIC industries. The 1996 version of ANZSIC is currently used but in 2011 will be superseded by the 2006 version.

## **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 magnitude of these errors is difficult to quantify. Statistics are subject to revision when errors are corrected.

### ***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**

### ***ANZIND***

An ANZSIC-based classification that groups industries for publication.

### ***ANZSIC***

Australian and New Zealand Standard Industrial Classification.

### ***Business Frame***

A register of all economically significant businesses that operate in New Zealand. The population of the ESM 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***

A 12-month moving average of the monthly employee count.

### ***Sales / operating income***

Current sales may include goods or services produced or supplied in other quarters.

Included:

- sales of goods (whether manufactured, processed, or traded)
- sales of services (including repair services)
- manufacturing, processing, and management fees
- rental and leasing income
- royalties and patent fees.

Excluded:

- interest, dividends, donations, bad debts, and insurance claims
- excise duty, government grants, and subsidies
- extraordinary items (eg exchange rate gains, gains on sales of fixed assets).

### ***Purchases and operating expenditure***

Current payments may include goods or services obtained in other quarters.

Included:

- purchases of goods, fuels and materials (whether for production or resale)
- general expenses (eg advertising, freight, insurance, motor vehicle, rates, rent, repairs, utilities)
- management fees and payments to other businesses or divisions
- payments to welfare and superannuation schemes (eg ACC, KiwiSaver)
- royalties and patent fees.

Excluded:

- interest, dividends, donations, and bad debts
- excise duty, fringe benefit tax, and road user charges
- extraordinary items (eg exchange rate losses, losses on sales of fixed assets)
- depreciation.

## ***Salaries and wages***

Included:

- gross salary, wage, bonus, and redundancy payments to employees.

Excluded:

- drawings
- salaries and wages paid to working proprietors
- payments to welfare and superannuation schemes (eg ACC, KiwiSaver).

## ***Stocks of raw materials***

Closing stocks of raw materials for use in production. Includes materials, fuels, and livestock.

## ***Stocks of finished goods***

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

## ***Additions to fixed assets***

Purchases of fixed assets (including land) plus capital works by own employees. Revaluations are excluded.

## ***Disposals of fixed assets***

Sales of fixed assets (including land) at selling prices. Devaluations are excluded.

## **Volume series**

These are value series that have been adjusted (divided by price indexes) to remove the effect of price changes. They provide a measure of quantity change and are currently expressed in December 1997 quarter dollars. The price indexes used are from the Producers Price Index and are available on Infoshare.

## **Seasonally adjusted and trend series**

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. This reveals turning points and the underlying direction of quarterly movement.

Seasonally adjusted and trend values are re-estimated quarterly when each new quarter's data becomes available. Figures are therefore subject to revision, with the largest changes normally occurring in the latest quarters. Estimates are produced by the X-12-ARIMA seasonal adjustment program, developed at the U.S. Census Bureau.

Further information about seasonal adjustment and trend estimation is on the Statistics New Zealand website ([www.stats.govt.nz](http://www.stats.govt.nz)).

## ***Seasonally adjusted series***

Seasonal adjustment removes the estimated impact of regular seasonal events, such as annual cycles in agricultural production, pre-Christmas shopping, and summer holidays, from statistical series. This makes figures for adjacent periods more comparable.

For the ESM, the removal of the purchasing monopoly in the dairy industry in mid-2002 caused an abrupt change to seasonal variation in the meat and dairy industry. In response, the calculation method for total sales was changed from direct to indirect (whereby component industries are individually adjusted before being summed). Direct and indirect adjustment methods are both used, according to appropriateness.

## ***Trend series***

Trend estimation removes the estimated impact of regular seasonal events and irregular short-term variation from statistical series. 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.

## **Use in national accounts**

A key use of the ESM is in the quarterly Gross Domestic Product (GDP) for calculating manufacturing 'value added' (value of output after the cost of input materials and services has been deducted). GDP base-year manufacturing value added is moved forward using volume indexes that are calculated from ESM sales and finished good stock changes (deflated by sub-indexes of the Producers Price Index).

ESM volumes are supplemented with quantity production data for the following industries:

- meat and dairy product manufacturing
- petroleum and industrial chemical manufacturing
- basic metal manufacturing.

The ESM is also used in the expenditure measure of GDP for compiling stock change values at current and constant prices.

## **More information**

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

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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

As previously announced on [Infoshare](#), the tables which accompany this release have been updated. These changes are designed to make the tables both more user-friendly and more closely aligned with the text of the release. Tables also now include trend data for sales volumes. No series identifiers have been altered and all previously available data is still included. If you would like a copy of the tables in the previous format please email [info@stats.govt.nz](mailto:info@stats.govt.nz).

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.

### List of tables

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. Purchases and operating expenditure, by industry
19. Salaries and wages, by industry
20. Additions and disposals of fixed assets, by industry

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