# 1 Introduction and background

Growth in productivity is a key determinant of long-term economic growth and hence household income growth and living standards. Given this relationship, recent significant declines in multifactor productivity (MFP) growth in Australia are of concern.

Close analysis of industry productivity is key to understanding what underlies aggregate productivity performance and to providing policy-relevant insights. The Commission has previously identified Mining, Electricity, gas and water, Agriculture and Manufacturing as four industries with particularly large declines in MFP growth over the period 2003-04 to 2007-08 compared with the period 1998-99 to 2003-04 (PC 2009). More recent work by Parham (2012), based on revised ABS MFP estimates, identified Manufacturing as the largest contributor to the decline in market sector[[1]](#footnote-1) MFP growth between these two periods.

Manufacturing has been the subject of frequent studies and inquiries (including by the House of Representatives Standing Committee on Economics 2007; Victorian Competition and Efficiency Commission 2011; and the Prime Minister’s Taskforce on Manufacturing 2012). However, these studies generally did not focus on Manufacturing MFP, or have been limited in their ability to examine MFP in different parts of Manufacturing by lack of data.

Manufacturing MFP declined over the period 2003-04 to 2010-11 at an average of ‑1.1 per cent a year, which was a faster decline than for market sector MFP (‑0.5 per cent a year) (figure 1.1). This is the longest sustained decline in Manufacturing MFP recorded since 1985-86 (the period for which ABS Manufacturing MFP estimates are comparable).

The Commission has previously identified the factors which have been important in the interpretation of declining MFP growth in Mining (Topp et al. 2008), Electricity, gas and water (Topp and Kulys 2012), and Agriculture (PC 2009). This paper examines Manufacturing MFP growth in detail.

Figure 1.1 MFP in Manufacturing and the market sector**a**

Index 2009-10 = 100

|  |
| --- |
| This figure shows Manufacturing and market sector MFP from 1985-86 to 2010-11. Manufacturing MFP declined from 2003-04 to 2010-11, at a faster rate than Market sector MFP. |

a The market sector includes 12 industry sectors (table 2.1).

*Data source*: ABS (*Experimental Estimates of Industry Multifactor Productivity, 2010-11,* Cat. no. 5260.0.55.002).

A previous Commission study of Manufacturing (PC 2003) included an examination of productivity up to 2000-01, which pre-dated the more recent downward trend in Manufacturing MFP. That study noted a slowing in productivity growth in the late 1990s, but found that the reason for this was not clear. It also noted considerable heterogeneity in the productivity performance of industries within the sector.

Since 2001, there have been a range of structural pressures and other influences on Manufacturing (including the appreciation of the Australian dollar, and adjustment pressures relating to the mining boom). It is likely that the impact of these factors on MFP has differed across parts of Manufacturing, but there are no official measures with which to examine this hypothesis.

## 1.1 Heterogeneous nature of the sector

Manufacturing covers a diverse and changing range of activities, but is often divided into eight subsectors:[[2]](#footnote-2)

* Food, beverages and tobacco products
* Textile, clothing and other manufacturing
* Wood and paper products
* Printing and recorded media
* Petroleum, coal, chemical and rubber products
* Non-metallic mineral products
* Metal products
* Machinery and equipment manufacturing.

Figure 1.2 shows the distribution of value added and employment across subsectors within Manufacturing in 2009-10. Four of the subsectors (Food, beverages and tobacco products, Metal products, Machinery and equipment manufacturing, and Petroleum, coal, chemical and rubber products) account for 77 per cent of the sector’s value added (in fairly equal shares). The other four subsectors contribute the remaining 23 per cent (ranging from 4 to 7 percentage points each). Food, beverages and tobacco products, Machinery and equipment manufacturing and Metal products account for the bulk of Manufacturing employment (63 per cent), with the other five subsectors ranging from 4 to 11 percentage points each.

Figure 1.2 Subsector**a** shares of Manufacturing value added**b** and employment, 2009-10

|  |  |
| --- | --- |
| *Value added* | *Employment (persons)* |
| This figure includes two pie charts, showing the distribution of value added and employment across subsectors within Manufacturing in 2009-10. Four of the subsectors (FBT, MP, ME and PCCR) account for 77 per cent of the sector’s value added (in fairly equal shares), with the other four subsectors contributing the remaining 23 per cent (ranging from 4 to 7 percentage points each). FBT, ME and MP account for the bulk of Manufacturing employment (63 per cent), with the other five subsectors ranging from 4 to 11 percentage points each. |  |

a FBT is Food, beverage and tobacco products; TCO is Textile, clothing and other manufacturing; WP is Wood and paper products; PRM is Printing and recorded media; PCCR is Petroleum, coal, chemical and rubber products; NM is Non-metallic mineral products; MP is Metal products; ME is Machinery and equipment manufacturing. b Value added measure is gross value added at current basic prices.

*Data sources*: ABS (*Australian System of National Accounts, 2010-11*, Cat. no. 5204.0); ABS (*Labour Force, Australia, Detailed, Quarterly*, *August 2011*, Cat. no. 6291.0.55.003).

## 1.2 Objectives

The overall objective of this study is to examine recent productivity performance in Manufacturing, with particular focus on the causes of its decline.

In particular, this paper:

* analyses MFP change and its proximate causes (value added, labour and capital inputs) for Manufacturing as a whole
* estimates MFP change and its components at the subsector level within Manufacturing
* examines factors influencing the productivity performance of Manufacturing and three of its largest constituent subsectors (as they have contributed most to recent trends in aggregate performance).

The focus of this study is on productivity in Manufacturing, rather than on being a comprehensive industry study — the influences examined are those that shed light on productivity trends. Also, the main period examined is the decline in Manufacturing MFP since 2003-04 — with particular emphasis on the extent of the decline over the 2003-04 to 2007-08 productivity cycle, compared with the previous cycle (1998-99 to 2003-04).[[3]](#footnote-3)

An improved understanding of productivity trends within Manufacturing should assist further analysis and interpretation of movements in official productivity statistics for Manufacturing and for the market sector more broadly. It should also inform the ongoing public debate and discussion on productivity outcomes and objectives.

This study is a continuation of the Commission’s stream of research into measured MFP growth, including the program of detailed industry productivity studies. To date, Mining (Topp et al. 2008) and Electricity, gas and water (Topp and Kulys 2012) have been examined in detail.

## 1.3 Structure of the paper

The remainder of this paper is organised as follows.

* Chapter 2 outlines developments in productivity in Manufacturing in aggregate. Related appendixes examine: the data sources underlying these aggregate productivity estimates (appendix A); and the input-output linkages between Manufacturing and other sectors of the economy (appendix B).
* Chapter 3 presents estimates for productivity in the subsectors within Manufacturing. Related appendixes provide: details of the data sources and methodology used to construct these estimates (appendix A); an examination of productivity cycles at the subsector level (appendix C); further analysis of the subsector estimates (appendix D); and sensitivity testing of the estimates (appendix E).
* Chapters 4 to 6 examine productivity in the three selected subsectors that have contributed most to the overall decline in Manufacturing productivity: Petroleum, coal, chemical and rubber products; Food, beverage and tobacco products; and Metal products. Additional details about these subsectors are provided in appendixes F to H.

1. In this paper, the term market sector refers to the 12 industry sectors of the economy for which a long time series of MFP estimates is available (see table 2.1 for a list of these sectors). The ABS has recently expanded its market sector to cover 16 industry sectors (but only from 1994-95). [↑](#footnote-ref-1)
2. These are the subsectors used by the ABS in its National Accounts and for which it reports the volume of value added. Table A.1 shows how these subsectors relate to the subdivisions in the ABS *Australian and New Zealand Standard Industrial Classification 2006* (ANZSIC06). [↑](#footnote-ref-2)
3. It should be noted that this paper examines Manufacturing MFP up to 2010-11, based on the 2010-11 ABS National Accounts (the latest available when the MFP estimates for the Manufacturing subsectors were derived for this study). [↑](#footnote-ref-3)