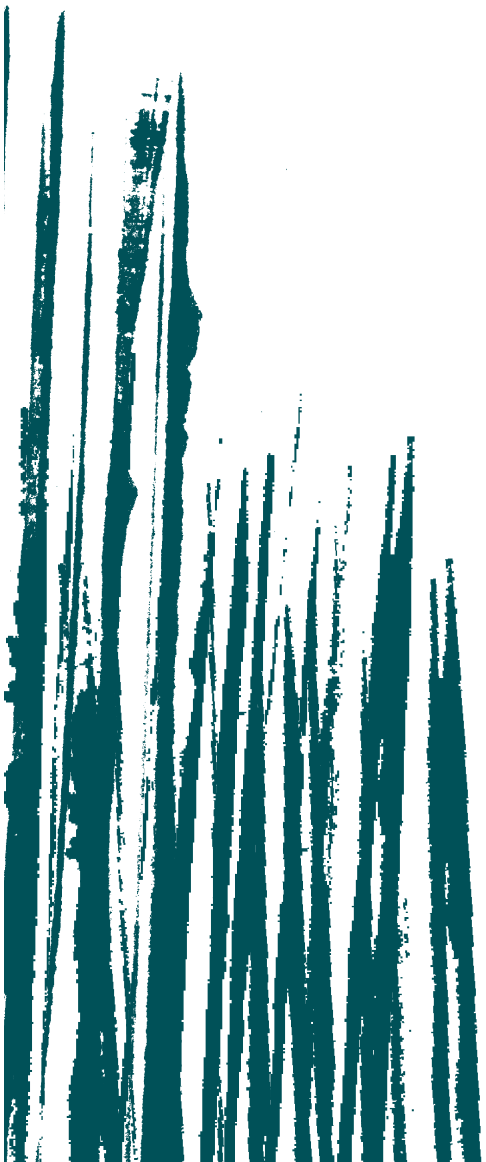
6 *Forest Industries*



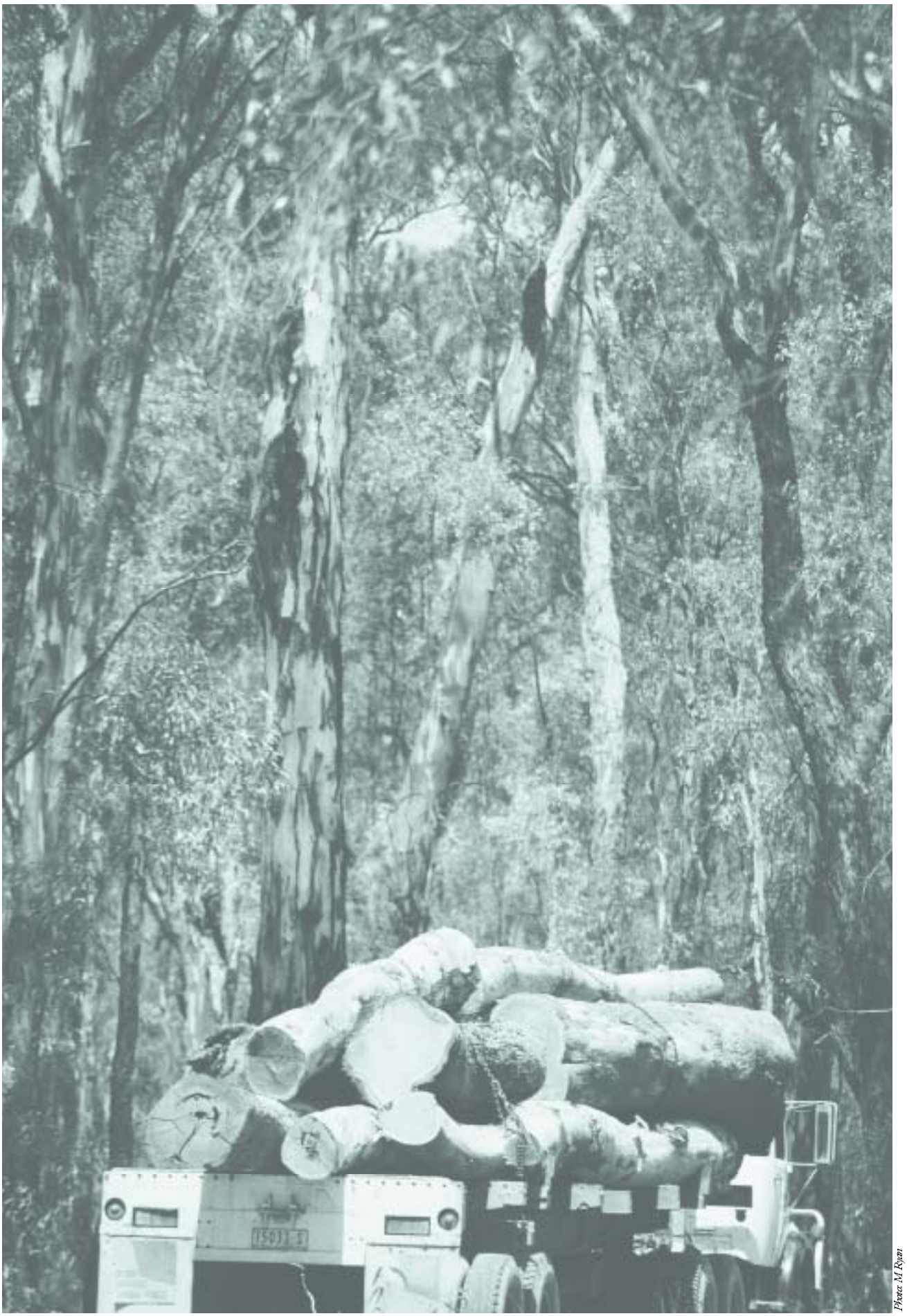


Photo: M Ryan

Forest Industries

Society expects forests to deliver a wide range of products and services, from timber and grazing to the conservation of biological diversity and water quality. The emphasis placed on any one or several of such products and services in forest management regimes will influence the state of the forests. The perceived economic value of forests to any given sector and to the wider community will, in turn, influence decisions on forest policy and management. Illuminating the nature of economic activities in forests will provide the community with an opportunity to weigh the benefits of such activities against their costs. For these reasons, it is important to quantify the economic role of forest industries in Australian society.

Value of non-wood products

Only a small amount of information on the economic role of sectors such as tourism and recreation, grazing and minor forest product extraction is presented in this report. There are two main reasons for this: first, data collection for some such products and services is ad hoc and difficult to coordinate at a national level; and, second, it is difficult to disaggregate the role of forests for those products and services – such as grazing, honey and tourism – that are produced or conducted in both forest and non-forest areas. The quantity and quality of information available for regions with major wood-producing forests are significantly better than for the forests in the agricultural and pastoral zones.

For this report, State and Territory agencies were asked to report on the revenue generated by non-wood forest products for which they were responsible. Table 50 presents the data obtained.

Wood-based forest industries

Most of the information contained in this chapter relates only to the three principal wood-based forest industries: forestry and logging (and related services); wood manufacturing; and paper production (see Box 15 for a description of each).

Table 50: Revenue from non-wood forest products, as reported by various State and Territory agencies

	($)							
Financial year	ACT	NSW[1]	NT	Qld	SA[4]	Tas	Vic	WA
1990/91	N/A	14 281	N/A	N/A	180 000		N/A	N/A
1991/92	N/A	14 438	N/A	N/A	139 000		N/A	N/A
1992/93	N/A	16 597	N/A	N/A	134 000		N/A	N/A
1993/94	N/A	17 696	N/A	N/A	117 000	1 351 654[2]	N/A	N/A
1994/95	N/A	17 959	N/A	N/A	96 000	1 630 653[3]	N/A	N/A
1995/96	N/A	18 737	N/A	N/A			N/A	N/A

N/A –Not available
[1] Revenue from licences, permits, leases, rentals, entry and camping fees, and other miscellaneous forest uses.
[2] Revenue from apiary site rent and national park user fees.
[3] Revenue from apiary site rent, national park user fees, plus lease and licence fees.
[4] Revenue from recreation and grazing/agistment.
Source: National Forest Inventory (1997).

Box 15: The three wood-based forest industries

The definitions of the wood-based forest industries used here are based on those of the Australian Bureau of Statistics:

- Forestry and logging (and related services) – businesses engaged in setting up, maintaining and harvesting native and plantation forests and producing roughly cut timbers such as mine shaft supports, posts, railway sleepers and the like.
- Wood manufacturing – businesses engaged in all types of manufacture from milling rough and dressed timbers (for such uses as housing frames, floorboards, weatherboards and mouldings); to manufacturing wooden packaging, plywood, veneers, particleboard, chip board, soft and medium density fibreboard, laminated timbers, wooden doors and wooden structural fittings (such as prefabricated components); to producing hardwood chips. A notable exclusion from this category is timber furniture, which cannot be separated from furniture manufacturers using raw materials other than wood, particularly plastic and metal.
- Paper production – businesses engaged in manufacturing wood pulp, paper, paperboard, cardboard sheets and boxes, personal care products and miscellaneous other paper products such as paper dressmaking patterns, drinking straws and cellulose fibre insulation.

The national account

There are several indicators of an industry's value to the national economy, including:

- share of the economy (measured as a percentage of gross domestic product);
- profit;
- the amount of wages and salaries paid within it; and
- the value it adds to the raw materials it consumes (value adding).

Share of the economy

Collectively, the wood-based forest industries contributed more than $4.3 billion to the gross domestic product (GDP): this represented just over 1 per cent of GDP. In total, this contribution ranged between 0.7 per cent (net indirect taxes) and 1.3 per cent (wages and salaries). GDP (total value added to the economy) represents the total market value of goods and services produced in Australia over a given period after deducting the costs of goods and services used up in the process of production but before deducting consumption of fixed capital (depreciation).

In 1989–90, GDP was estimated at $376 billion, and comprised 109 industries, each contributing between $100 million and $31.5 billion (or 0.03–8.4 per cent) to it.

Industry gross product (IGP) refers to industry value added. The sum of the IGPs or value added by industry gives total GDP. Table 52 shows the IGP of various wood-based forest industries, and a range of others for comparison.

Three economically important industries – construction, residential and non-residential building and housing rental – are, directly or indirectly, large users of wood-based forest products: Table 52 shows the IGP of these industries. Timber is also used extensively in furniture, but the available information on furniture does not distinguish between that made from timber and that made from other materials such as plastics and metals.

Profit

An industry's profit is known as its gross operating surplus, which is the difference between the cost of producing a product, including buying the raw materials, and the price received for it. Forest industries contributed 1.1 per cent to the nation's profit in 1989–90 (Table 51).

Table 51: The contribution of the forestry and wood and paper-based industries to the national economy, as indicated by various economic measures, 1989–90

Category	Forestry ($m)	Wood and paper ($m)	Total forest industries ($m)	Total economy ($m)	Forest industries' share of category (%)
Wages, salaries	449	1 770	2 219	172 528	1.3
Gross operating surplus (GOS)	308	1 476	1 784	158 551	1.1
Industry gross product (IGP) at factor cost	757	3 246	4 003	331 079	1.2
Indirect taxes (net)	27	75	102	14 361	0.7
Commodity taxes (net)	–	228	228	18 844	1.2
Industry gross product (IGP) at market value	785	3 549	4 334	364 284	1.2
Gross domestic product (GDP)	N/A	N/A	N/A	375 507	N/A

N/A – Not applicable.
Source: Australian Bureau of Statistics (1995a).

Table 52: Industry gross product for various sectors of the wood-based forest industry and some non-forest-related industries, 1989–90

Industry	Rank[(1)]	Share of economy (%)	Value ($m)
Forest industries			
Sawmilling	61	0.24	909.5
Joinery and wood products (miscellaneous)	66	0.22	811.3
Pulp, paper and paperboard	67	0.21	802.9
Forestry and logging	68	0.21	784.7
Bags and containers	79	0.14	534.4
Veneers, manufactured wood boards	99	0.07	248.5
Paper products (miscellaneous)	101	0.06	242.3
All forest wood-based industries		*1.15*	*4 333.6*
Other industries			
Housing rental	2	7.95	29 860.6
Construction	6	4.63	17 393.3
Coal, oil and gas	9	2.76	10 369.2
Residential building	10	2.30	8 656.3
Non-ferrous metal ores	21	1.07	4 060.2
Sheep	22	1.07	4 035.3
Cereal grains	35	0.59	2 232.0
Meat cattle	43	0.46	1 731.4

(1) Position on the list of 109 industries in the Australian economy, from largest to smallest.
Source: Australian Bureau of Statistics (1995b).

Wages and salaries

The wood-based forest industry's wages and salary bill is not collated nationally by the Australian Bureau of Statistics. However, national account figures prepared by the Bureau for the 1989–90 financial year (Table 51) indicate that the forestry and wood and paper-based industries spent just over $2.2 billion on wages and salaries in that year. The public sector is involved only in what the Bureau calls forestry and logging; this sector's component of the total wages and salaries for the period 1983–84 to 1993–94 is shown in Figure 21.

While not directly comparable with Australian Bureau of Statistics data, the Australian Taxation Office has data on the wages and salaries paid by employers engaged in both

public and private wood-based forest industries. Table 53 shows that the three wood-based forest industries paid about $1.1 billion in wages and salaries in 1994, largely in the paper-making sector. This reflects the fact that the paper industry consists mainly of a few large, geographically isolated operations, with a workforce that has traditionally consisted largely of in-house employees rather than contractors. By contrast, there are many more operators in forestry and logging, most of whom are sole traders and partnerships that do not, for tax purposes, pay themselves wages or salaries. In the sawmill industry, only about 25 per cent of sawmill operators paid wages and salaries in 1994.

Value adding

An industry's contribution to the economy can be expressed as value adding, the value that an industry adds to its raw materials. This figure for the wood-based forest industry is shown as part of Table 51, expressed as industry gross product at factor cost.

Value adding can be viewed as the difference between the cost of raw materials and wages involved in manufacturing a product and the price received for it. Figure 22 presents value adding data for wood and paper products over the period 1984–85 to 1995–96.

Turnover

Figure 23 shows turnover in the wood and paper products industries for the 12 years for which figures are available (1985–96).

Employment

Table 54 shows the direct employment generated by the forest sector from 1988 to 1995. The total number of employees in the sector declined slightly over the period, from 86 300 in 1988 to 84 200 in 1995. An increase in the number of employees in log sawmilling and timber dressing (16 100 in 1988 to 19 900 in 1995) was offset by a decline in employment in paper and paper product manufacturing (28 000 in 1988 to 23 300 in 1995). The total number of people employed in Australia increased over the period; thus, the number of employees in the forest sector declined as a proportion of all employees nationally, from 1.17 per cent in 1988 to 1.02 per cent in 1995.

No national-level data are available for the role of the forest sector in generating indirect employment.

Average wages

Table 55 shows the average annual wages in the wood-based forest industries, and compares these with wages in agriculture and with the national average.

Industry structure

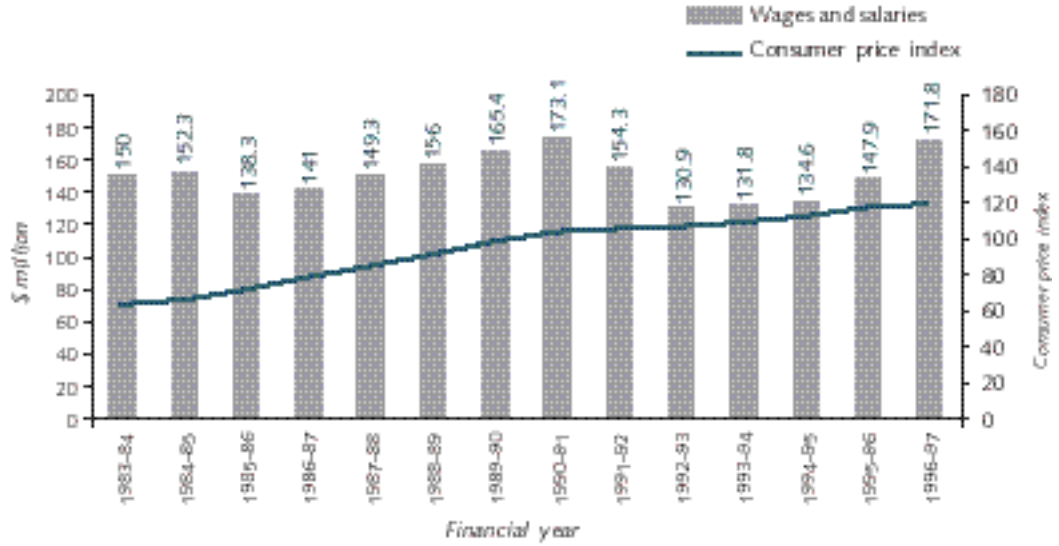
There is little information available at a national level on the economic structure of the wood-based forest industries. Being mostly private commercial enterprises, much information is considered commercially sensitive and, therefore, confidential, making

Table 53: Wages and salaries paid by the wood-based forest industries, 1992–93 and 1993–94

State/ Territory	Forestry and logging ($m)		Sawmilling ($m)		Paper ($m)		Totals ($m)	
	1992–93	1993–94	1992–93	1993–94	1992–93	1993–94	1992–93	1993–94
ACT	7.2	7.5	12.1	3.8	2.7	1.1	22.0	12.4
NSW	11.2	28.6	60.4	94.8	220.1	206.2	291.8	329.6
Qld	8.8	10.8	73.6	76.3	33.5	33.7	115.9	120.8
SA	24.2	27.9	10.1	5.9	9.9	6.8	44.2	40.6
Tas	19.1	18.5	26.9	33.9	52.1	51.3	98.1	103.7
Vic	36.4	39.0	47.4	51.3	347.0	327.6	430.8	417.9
WA	4.2	7.2	52.9	53.1	5.1	4.8	62.2	65.1
Total	**111.1**	**139.5**	**283.4**	**319.2**	**670.4**	**631.5**	**1065.0**	**1090.0**

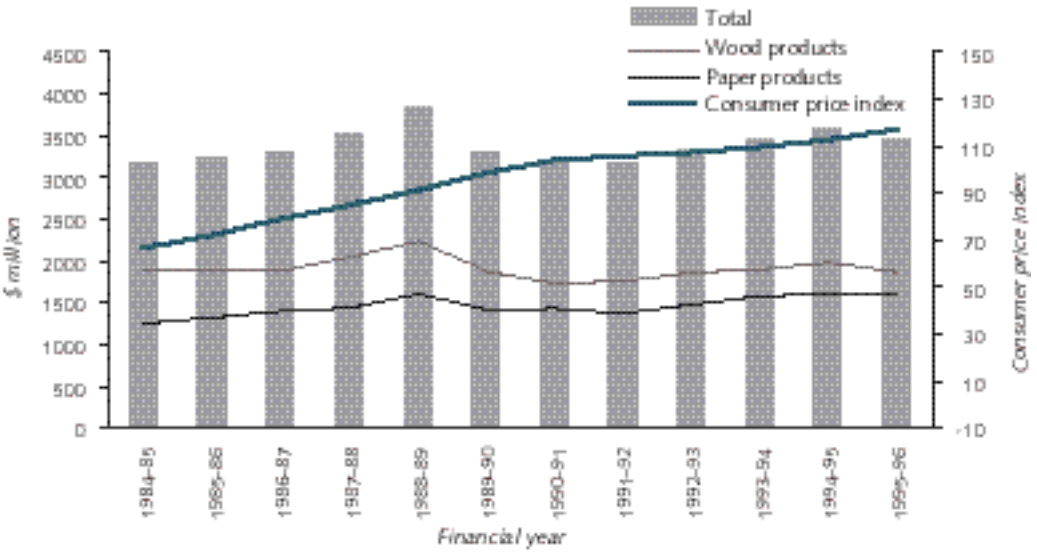
Note: Column or row total may not add up due to rounding.
Source: Australian Taxation Office (1994a).

Figure 21: Wages and salaries (public sector only) for the forestry and logging industry



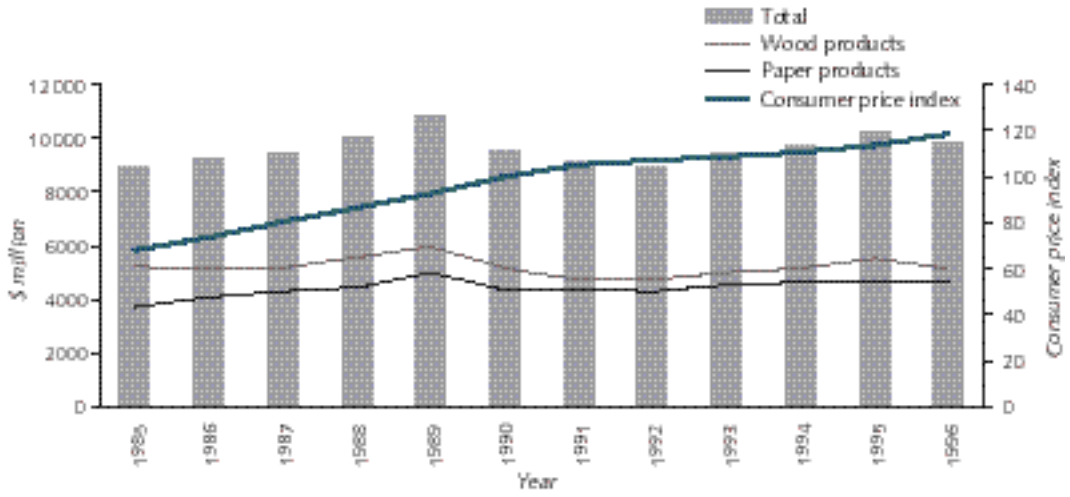
Source: Australian Bureau of Statistics (1998h).

Figure 22: Value adding for wood and paper products, 1984–85 to 1995–96



Note: Data points for 1985–86 are estimated.
Source: Australian Bureau of Statistics (1998c).

Figure 23: Turnover for wood and paper products, 1985 to 1996



Note: Data points for 1986 are estimated.
Source: Australian Bureau of Statistics (1998d).

Table 54: Direct employment in the forest sector

	('000 employees)							
	1988	1989	1990	1991	1992	1993	1994	1995
Forestry and logging	11.8	12.4	10.9	10.9	11.0	10.8	12.4	11.0
Log sawmilling and timber dressing	16.1	19.8	18.1	16.5	16.9	19.2	19.8	19.9
Other wood product manufacturing	30.4	37.3	34.2	31.0	31.8	36.1	30.7	30.0
Paper and paper product manufacturing	28.0	24.5	23.3	22.1	20.7	18.4	20.2	23.3
Total forestry and wood products sectors	86.3	94.0	86.5	80.4	80.4	84.5	83.1	84.2
Total employees	**7 366**	**7 716**	**7 837**	**7 668**	**7 612**	**7 645**	**7 885**	**8 217**
Forest and wood products as a proportion of total employees (%)	**1.17**	**1.22**	**1.10**	**1.05**	**1.06**	**1.11**	**1.05**	**1.02**

Source: Australian Bureau of Statistics (1995c).

Table 55: National summary of average annual wages in the forestry sector, compared with agriculture and the national average, 1993–94

Sector	Average wage ($)
Forestry, logging	34 249
Log sawmilling and timber dressing	24 805
Other wood manufacturing	23 927
Paper and paper manufacturing	41 071
Agriculture	17 854
All industry	31 720

Source: Australian Bureau of Statistics (1996).

collection and collation difficult. The pulp and paper sector is an exception: the Pulp and Paper Manufacturers Federation of Australia, representing five major companies that claim to make up 98 per cent of the sector, produces annual statistics concerning its sector.

Large organisations

In the public sector, there is an agency or quasi-government organisation in each State and the Australian Capital Territory responsible for selling timber from publicly owned multiple-use native forests and plantations. In the private sector, more than 30 major participants in the forest wood-based industries (listed in Table 56) and numerous small enterprises (mostly regional sawmills) participate in the industry.

Business establishments

Table 57 shows that there was a total of 6853 business establishments engaged in wood-based forest industries in 1996. (The term 'business establishment' covers places of business, not legal entities such as a partnership or company.)

Of the 423 paper and paper product facilities in1995, 53 were large facilities (listed in Table 58) devoted either to pulp and paper-making or to the conversion of bulk products into a form used by consumers (such as individual tissues from bulk tissue and cartons from bulk cardboard).

The sawmilling sector currently comprises about 1200 sawmills of varying sizes, widely dispersed. About 10 per cent of mills produce about 90 per cent of all sawn timber. More than half – 58 per cent – employ between 5 and 50 people. Another 37 per cent are smaller than this, with fewer than five employees each.

Traditionally, sawmills have processed either softwood or hardwood, but not both. The smaller operations mostly use native forest hardwoods, while the larger sawmills, including most of the 29 mills dedicated to the production of woodchips, rely more on plantation-grown softwoods. The biggest sawmills are more capital-intensive and technologically advanced than the smaller mills.

Capital investment

The processing of wood is dependent on machinery. If an industry is economically viable in the long term, it must either continually purchase new equipment or invest in the repair and maintenance of existing equipment. Over time, trends in capital investment, taken together with trends in the amount of money spent on repairs and maintenance, may provide an indicator of the state of a forest-based industry, which, in turn, will affect the state of the forests more generally.

There are few national statistics available concerning capital investment in the wood-based forest industries. There is also a grey area between capital investment and repairs and maintenance, as it may be a matter of judgment whether an expense is within one category or another. For example, the purchase of a new piece of plant could be considered either a repair or a capital investment.

Depreciable assets

The Australian Taxation Office figure for depreciation in an industry is likely to reflect investment, depending on the depreciation schedule chosen. Hence 'depreciation' is a crude proxy for 'recent investment'. Low depreciation would indicate either very old or very small plant, and vice versa.

The figures in Table 59, obtained from the Australian Taxation Office, suggest that, of the three wood-based forest industries, the paper manufacturers have the most plant. The table also shows that the paper manufacturers increased their investments in the early 1990s. Industry figures support this: Table 60 shows that fixed capital investment (or current book value of land, forests, buildings and plant) on the part of the five major participants increased in the early to mid-1990s.

Repairs and maintenance

Table 61 presents data on the amount of money the three wood-based forest industries spent on repairs and maintenance in 1992–93 and 1993–94.

Table 56: Major participants in the wood-based forest industries, and their commercial activities

	a	b	c	d	e	f	g	h	i	j	k	l	m
Amcor		✓		✓[1]								✓	✓
Associated Kiln Driers		✓		✓		✓[2]							
Auspine		✓		✓		✓							
ANM	✓	✓										✓	✓
Boral	✓		✓	✓	✓			✓	✓				
Brims D G								✓	✓	✓			
BTR (Laminex)				✓						✓	✓		
CHH	✓[3]			✓		✓[4]			✓			✓	✓
CSR		✓		✓		✓	✓	✓	✓	✓	✓		
Fenning Timbers			✓										
Ford Timbers			✓										
French Enterprises		✓		✓									
Gunnersen Companies			✓	✓				✓	✓				
Gunns			✓		✓			✓					
Hansol Australia	✓												
Harris Diashowa	✓[5]				✓								
Henderson D&R				✓						✓			
Hyne & Sons			✓	✓									
Kimberley-Clark Aust												✓	✓
Midway Wood Prods	✓	✓	✓		✓	✓							
Mitsui	✓												
North Forest Products	✓	✓			✓	✓	✓						
Pacific Forest Corp	✓[6]	✓		✓									
QLD Commodity Exports						✓							
Smith N Industries			✓										
Starwood		✓[7]									✓[8]		
Tasmanian Wood Panels										✓			
Timbercorp	✓[9]												
Wesfarmers (Bunnings)	✓	✓	✓	✓	✓			✓					
Wesfi		✓		✓[10]				✓	✓	✓	✓		
Whittakers			✓		✓								
J Wright & Sons	✓	✓		✓		✓[11]							
Xylem Investments		✓[12]		✓[12]		✓[12]							

Column heading codes:

a. Hardwood plantations
g. Softwood log exports
b. Softwood plantations
h. Decorative veneer
c. Sawn hardwood
i. Plywood/LVL
d. Sawn softwood
j. Particle board
e. Hardwood pulpwood exports
k. Medium density fibreboard
f. Softwood pulpwood exports
l. Pulp
m. Paper and particle board

Note: Organisations that are engaged solely in the ownership of forests are excluded.

[1] Brown & Dureau.
[2] Joint venture with Vic Plantations Corporation and J Wright & Sons.
[3] Establishment and maintenance, but not ownership.
[4] Joint venture with PISA.
[5] Limited involvement.
[6] Managed for investors
[7] Joint venture with Forestry Tasmania.
[8] Plant under construction.
[9] Managed only.
[10] Joint venture with Wesfarmers.
[11] Joint venture with Vic Plantations Corporation and AKD in the development stage.
[12] Involvement is through equity investment in Auspine.

Source: Australian Forest Products Industry Review (1996).

Table 57: The number of establishments engaged in the wood-based forest industries

Industry	March '94	June '95	June '96	Sept '97
Forestry	50	77	96	146
Services to forestry	490	512	566	608
Logging	883	1 028	1 235	1234
Log sawmilling	717	695	764	723
Timber resawing and dressing	159	141	156	145
Wood chipping	29	43	47	42
Other wood products[1]	ND	ND	3 565	ND
Paper and paper product manufacturing	423	424	424	399
Total	**2751**	**2920**	**6853**	**3297**

Note: Business register data are not collected regularly, hence the irregular time intervals.
ND – No data.
[1] Plywood, fabricated wood, structural components.
Source: Australian Bureau of Statistics (1998a).

Table 58: Location of pulp and paper-making facilities

State/town or suburb	Type of plant	Company	Main fibre source
New South Wales			
Shoalhaven	Pulp, paper, recycling	Australian Paper	Recycled paper
Botany	Packing paper	Australian Paper	Recycled paper
Albury	Pulp, newsprint, recycling	ANM	Plantation softwood, recycled paper
Smithfield	Paper	Pratt Industries	Recycled paper
Warwick Farm	Conversion	Pratt Industries	N/A
Warwick Farm	Conversion	Kimberley-Clark	N/A
Ingleburn	Disposable nappies	Kimberley-Clark	N/A
Wetherill Park [1]	Conversion	ABC Tissue	N/A
Albury	Non-woven materials	Kimberley-Clark	N/A
Rutherford	Conversion	Pratt Industries	N/A
Seven Hills	Conversion	Pratt Industries	N/A
Chullora	Conversion	Pratt Industries	N/A
Alexandria	Conversion	The Paper House[4]	N/A
Location unknown	Conversion	Envelope Manufacturers and Celpac[4]	N/A
Northern Territory			
Berrimah	Conversion	Pratt Industries	N/A
Queensland			
Petrie	Pulp, coated boards	Australian paper	Recycled paper, plantation softwood
Carole Park, Inala	Tissue, conversion	Cosco Holdings	Imported pulp
Crestmead	Tissue, conversion	Paper converters	Recycled paper, softwood pulp
Carole Park	Conversion	Pratt Industries	N/A
Bulimba	Paper	Pratt Industries	Recycled paper
Sumner Park	Conversion	Pratt Industires	N/A
Darra	Conversion	Celpac [1]	N/A
South Australia			
Millicent waste,	Pulp, tissue	Australian Paper	Plantation softwood, hardwood mill
Millicent	Pulp, paper	Kimberley-Clark	Plantation softwood

Table 58 (continued): Location of pulp and paper-making facilities

State/town or suburb	Type of plant	Company	Main fibre source
Lonsdale	Conversion	Kimberley-Clark	N/A
Berri	Making and conversion of corrugated boxes	Pratt Industries	Recycled paper
Gepps Cross	Conversion	Pratt Industries	N/A
Dry Creek	Conversion	Pratt Industries	N/A
Tasmania			
Wesley Vale	Pulp, paper	Australian Paper	Plantation softwood and hardwood, native forest
Burnie	Pulp, paper	Australian Paper	Plantation softwood and hardwood, native forest
Boyer	Pulp, newsprint, paper	ANM	Plantation softwood, regrowth, native forest
Devonport	Conversion	Pratt Industries	N/A
Victoria			
Fairfield	Paper	Australian Paper	Recycled paper, plantation pulp, native forest
Morwell	Pulp, paper	Australian Paper	Plantation softwood and hardwood, native forest
Broadford	Paper	Australian Paper	Recycled paper imported pulp,
Box Hill	Tissues	Carter Holt Harvey	plantation hardwood and softwood, pulp, hardwood mill waste
Myrtleford	Pulp	Carter Holt Harvey	Plantation softwood, hardwood forest residues, recycled paper
Reservoir	Paper	Pratt Industries	Recycled paper
Coolaroo	Paper	Pratt Industries	Recycled paper
Dandenong	Conversion	Pratt Industries	N/A
Westall	Conversion	Carter Holt Harvey	N/A
Keon Park	Conversion	Carter Holt Harvey	N/A
Noble Park	Conversion	Pratt Industries	N/A
Swan Hill	Conversion	Pratt Industries	N/A
Shepparton	Conversion	Pratt Industries	N/A
Epping	Conversion	Pratt Industries	N/A
Mulgrave	Conversion	pratt Industries	N/A
Bayswater	Conversion	Pratt Industries	N/A
South Oakleigh	Conversion	The Paper House[1]	N/A
Hallam	Conversion	Tomasetti Paper[1]	N/A
Western Australia			
Spearwood	Paper	Australian Paper	Recycled paper
Canning Vale	Tissue, conversion	Austissue	Recycled paper
O'Connor	Conversion	Pratt Industries	N/A

[1] Owned by Australian Paper.
N/A – Not applicable.
Source: Pulp and Paper Manufacturers Federation of Australia (1995).

Table 59: Depreciation of wood-based forest industry assets

State/ Territory	Forestry and logging ($m)		Sawmilling ($m)		Paper ($m)		Totals ($m)	
	1992–93	1993–94	1992–93	1993–94	1992–93	1993–94	1992–93	1993–94
ACT	1.5	3.7	1.6	0.5	0.2	0.3	3.3	4.5
NSW	7.6	11.4	5.6	24.6	198.4	67.8	211.6	103.8
Qld	3.5	7.2	10.4	14.9	13.9	7.2	27.8	29.3
SA	8.8	8.7	2.4	1.4	1.3	5.3	12.4	15.4
Tas	10.0	4.3	1.2	8.8	13.2	123.7	24.5	136.8
Vic	11.7	21.2	9.8	12.9	78.5	177.7	99.9	211.8
WA	4.1	9.3	3.1	19.9	0.8	0.6	8.0	29.8
Total	47.2	65.8	34.1	82.9	306.3	382.6	387.6	531.3

Note: Column total may not add up due to rounding.
Source: Australian Taxation Office (1994b).

Table 60: Capital investment in the pulp and paper industry

Year	Investment ($m)	Increase on previous year (%)
June 1991	2706	–
June 1992	2742	1.3
June 1993	2872	4.7
June 1994	2817	–1.9
June 1995	2981	5.5
June 1996	3681	19.0
June 1997	3779	2.6

Source: Pulp and Paper Manufacturers Federation of Australia (1998).

Table 61: Amount spent on repairs and maintenance for the three wood-based forest industries, 1992–93 and 1993–94

State	Forestry and logging ($m)		Sawmilling ($m)		Paper ($m)		Totals ($m)	
	1992–93	1993–94	1992–93	1993–94	1992–93	1993–94	1992–93	1993–94
ACT	3.9	8.0	9.9	10.7	37.3	36.8	51.0	55.5
NSW	9.8	12.0	9.8	10.8	86.8	30.4	106.4	53.2
Qld	2.7	3.2	12.3	10.3	4.5	3.8	19.5	17.2
SA	1.5	2.2	1.5	3.8	0.7	0.5	3.7	6.5
Tas	6.0	6.6	1.7	1.3	1.0	0.8	8.8	8.7
Vic	3.9	6.6	4.2	6.0	33.1	34.3	41.1	46.9
WA	1.9	2.1	3.4	1.9	0.2	0.2	5.5	4.2
Total	**29.7**	**40.7**	**42.8**	**44.8**	**163.6**	**106.8**	**236.0**	**192.3**

Note: Column total may not add up due to rounding.
Source: Australian Taxation Office (1994c).

Foreign ownership

Some of Australia's pulp and paper companies have become multinational, while offshore investors, particularly those in Asia, are increasingly becoming involved in Australian wood-based forest industries.

A variety of arrangements constitute foreign involvement: Australian companies that are subsidiaries of foreign companies, joint ventures between Australian and overseas partners, major foreign shareholdings in Australian businesses, and overseas funds managers investing in Australian operations. Examples of all these can be found in the wood-based forest industries.

Shareholdings in companies listed on stock exchanges change constantly, making it difficult to identify the level of foreign investment in publicly listed Australian companies. The Foreign Investment Review Board intervenes only in transactions where control of companies worth more than $3 million may be at stake.

Resource ownership

About one-third of plantations are privately owned. Table 56 lists 20 major private organisations with plantation interests. Of these, two are subsidiaries of overseas companies, two are foreign-owned, one is an overseas funds manager with equity investments in an Australian company, and one has joint venture arrangements with foreign partners. There are no comprehensive national data on the size or ownership of private native forests used for timber production.

Wood product manufacturers

At least 6 of the 24 major private organisations listed in Table 56 as producers of sawnwood, veneers or reconstituted wood panels have foreign connections. One is part of an overseas-based conglomerate, one has a foreign partner, one has foreign partners in some of its operations, one is an overseas funds manager with equity investments in an Australian company, one has significant foreign shareholders, and one has a foreign company as a major shareholder.

Pulp and paper manufacturers

Table 56 lists 14 pulpwood exporters. Of these, four have foreign connections: one is foreign-owned, one is a joint venture with foreign partners, one has significant foreign shareholders, and one is an overseas funds manager with equity investments in an Australian company.

Of the major pulp and paper manufacturers, Amcor and Pratt Industries are Australian-owned, Carter Holt Harvey and ANM are New Zealand-owned, and Kimberley-Clark Australia is 50 per cent Australian-owned, with a 50 per cent foreign partner.

Raw material mix

Annual harvest

In 1993–94 the supply of wood fibre was obtained from three basic sources: Australian forests (native and plantation), imported wood fibre (in the form of unprocessed logs, sawnwood, plywood or veneer) and recycled paper. If the total supply of wood fibre from these sources is converted to a standard measure (such as cubic metres of sawlogs, as done here), then the proportional contribution, by volume, can be calculated for each source. Thus, the annual Australian timber harvest provided 76 per cent of the raw materials needed by the wood manufacturing and paper industries, imports provided 4 per cent and recycled paper provided 20 per cent.

Figure 24 shows the uses to which that part of the wood fibre supply obtained from the annual harvest from Australian native forests and plantations are put. The apparent consumption of wood-based products in Australia (calculated by adding production and import volumes and subtracting export volumes) is shown in Figure 25.

Markets for manufactured goods

Australia exported about 7 per cent of domestically manufactured wood-based products in 1993–94; the rest (93 per cent) were sold domestically and represented 73 per cent of the domestic market. The remaining 27 per cent of wood-based forest products for this market were imported.

Box 16: Recycled paper

The percentage of recycled paper used in paper-manufacturing in Australia has increased steadily in recent years. For example, it was 45 per cent in 1992–93, 48 per cent in 1993–94, 52 per cent in 1994–95, 56 per cent in 1995–96 and 61 per cent in 1996–97.

In 1995–96 Australia:

- collected 1.5 million tonnes of paper for recycling;
- exported about 132 000 tonnes of that collection (10 per cent), mostly to Asia; and
- imported about 26 000 tonnes of paper for recycling, equivalent to under 2 per cent of the quantity collected in Australia.

Production mix trends

Figure 26 shows trends in the production by volume of wood products in the period 1971–72 to 1996–97. The production of paper has increased steadily in this period, while sawnwood production has fluctuated around a steady mean. The production of particleboard has shown a slow increase over time, while medium density fibreboard, a product made from reconstituted waste or virgin fibre, is a latecomer that shows good growth prospects.

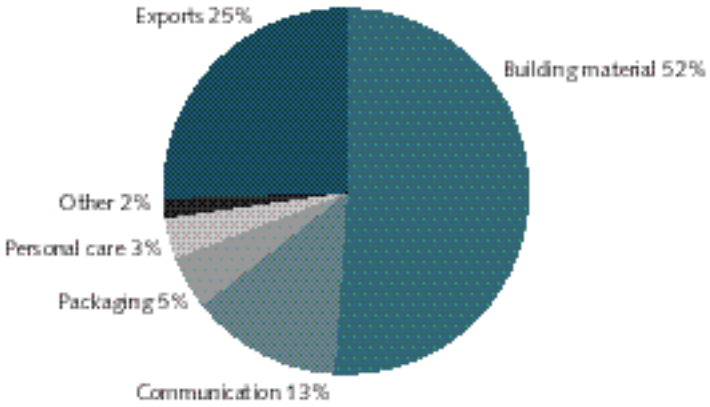
Railway sleeper production is dropping as concrete sleepers that last longer – 50 years against 20 years – replace timber sleepers. The closure of railway lines has also contributed to this decline: about 9000 kilometres of track were closed between the 1950s and the 1980s. Yet another cause of the decline is reported in Western Australia: the proportion of sawn *Eucalyptus marginata* (jarrah) timber used for value added purposes such as joinery has increased significantly in the last two decades, reducing the supply of that species for sleeper production.

Sawnwood

Australia imports 25 per cent of all sawnwood used domestically; sawnwood exports are currently negligible. Figure 27 shows trends over time in the production, import, export and apparent consumption of sawnwood, by State and nationally.

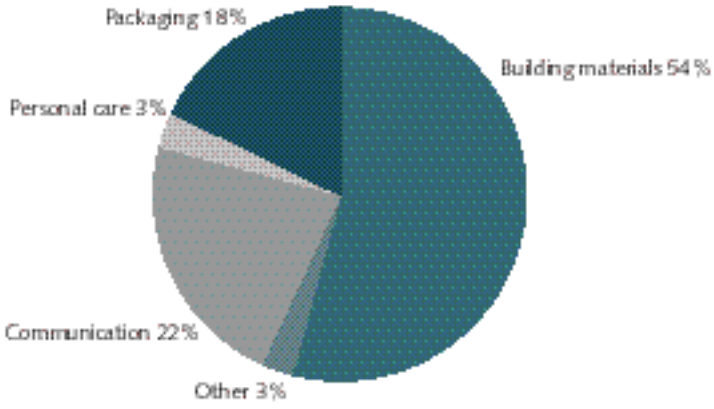
Sawnwood consumption has remained relatively constant at around 4 million cubic metres a year for 25 years. In 1996–97 consumption was about 4.0 million cubic metres, consisting of about 1.3 million cubic metres of native forest hardwood, 2.1 million cubic metres of local plantation softwood and 0.6 million cubic metres of imported timber (657 000 cubic metres of softwood, 99 700 cubic metres of hardwood).

Figure 24: Proportion of the annual harvest of wood fibre from Australian forests assigned to each end use category



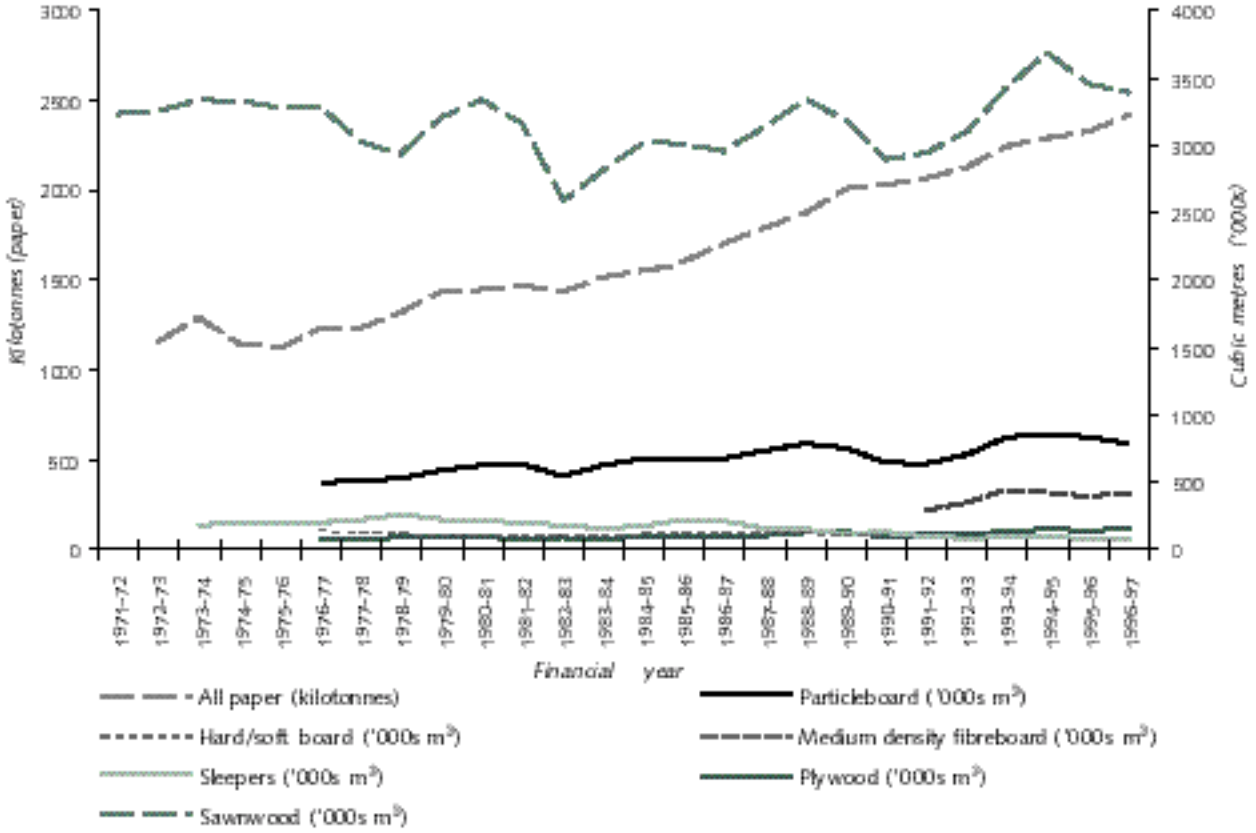
Source:
derived from Quarterly Forest Products Statistics (1993–94).

Figure 25: Apparent consumption of imported and locally manufactured wood-based products in Australia



Source:
derived from Quarterly Forest Products Statistics (1993–94).

Figure 26: National production of wood-based products



Source:
Quarterly Forest Products Statistics and equivalents.

Figure 28 shows sawnwood consumption and housing starts. Historically, the two have been closely correlated: when houses were being built, the demand for sawnwood increased, and vice versa. A divergence between the two appears to have occurred since the early 1990s, suggesting that other materials may be replacing timber in the housing construction industry.

New South Wales consistently accounts for almost half of Australia's annual sawnwood imports – close to 0.3 million cubic metres in 1996–97. Victoria, Queensland and South Australia collectively account for the other half, while the Northern Territory, Tasmania and Western Australia import negligible quantities (less than 4 per cent combined).

About 88 per cent of sawnwood imports are softwoods; the remaining 12 per cent are hardwood. In 1996–97 Australia spent $374 million on sawnwood imports.

Almost all of Australia's sawnwood suppliers are Pacific Rim nations; of these, four countries accounted for 94 per cent of the trade in 1996–97. They were:

- New Zealand (44 per cent);
- Canada (23 per cent);
- United States (19 per cent); and
- Malaysia (9 per cent).

Australia also imports minor quantities of sawnwood from Brazil, Fiji, Finland, Indonesia, Papua New Guinea, the Philippines, Singapore and the Solomon Islands.

Other wood-based products

Figure 29 presents national data for the production, import, export and apparent consumption of railway sleepers, plywood, particleboard and medium density fibreboard. Figure 30 presents the same information for paper products.

Australia is a net importer of plywood (Figure 29) and paper products (Figure 30). While domestic production of paper and paperboard is increasing strongly, demand is increasing at a higher rate.

Figure 27: Production, import, export and apparent consumption of sawnwood, by State and nationally

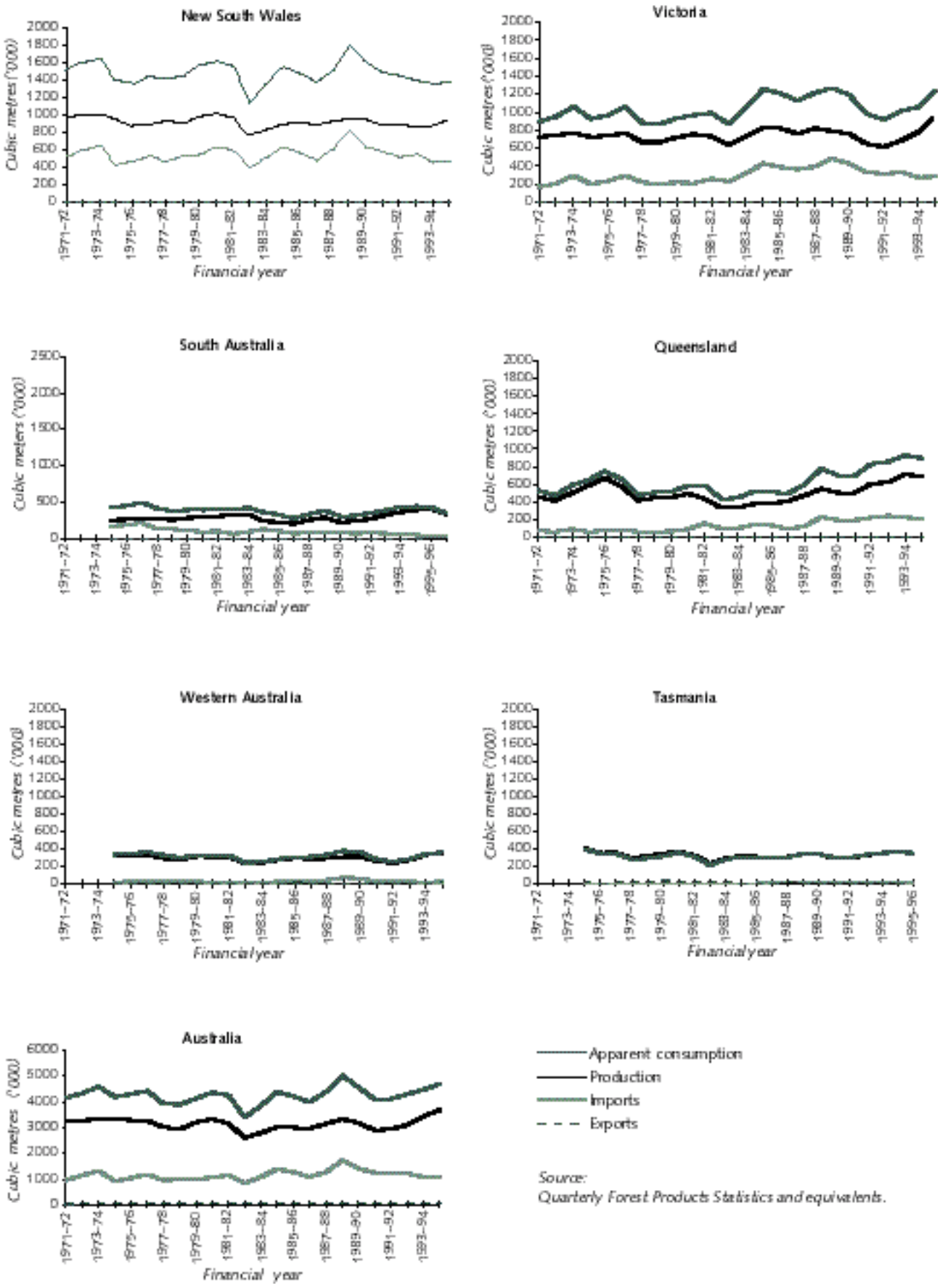
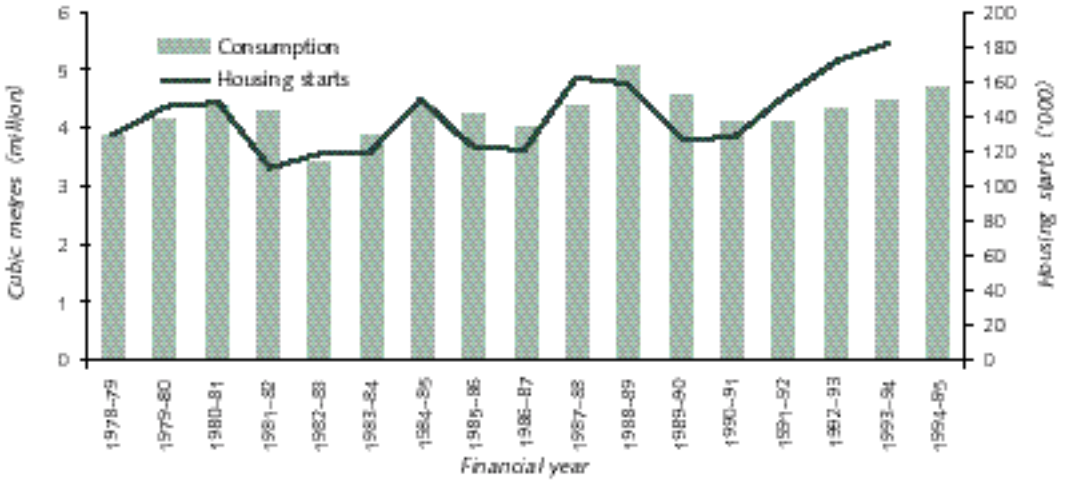
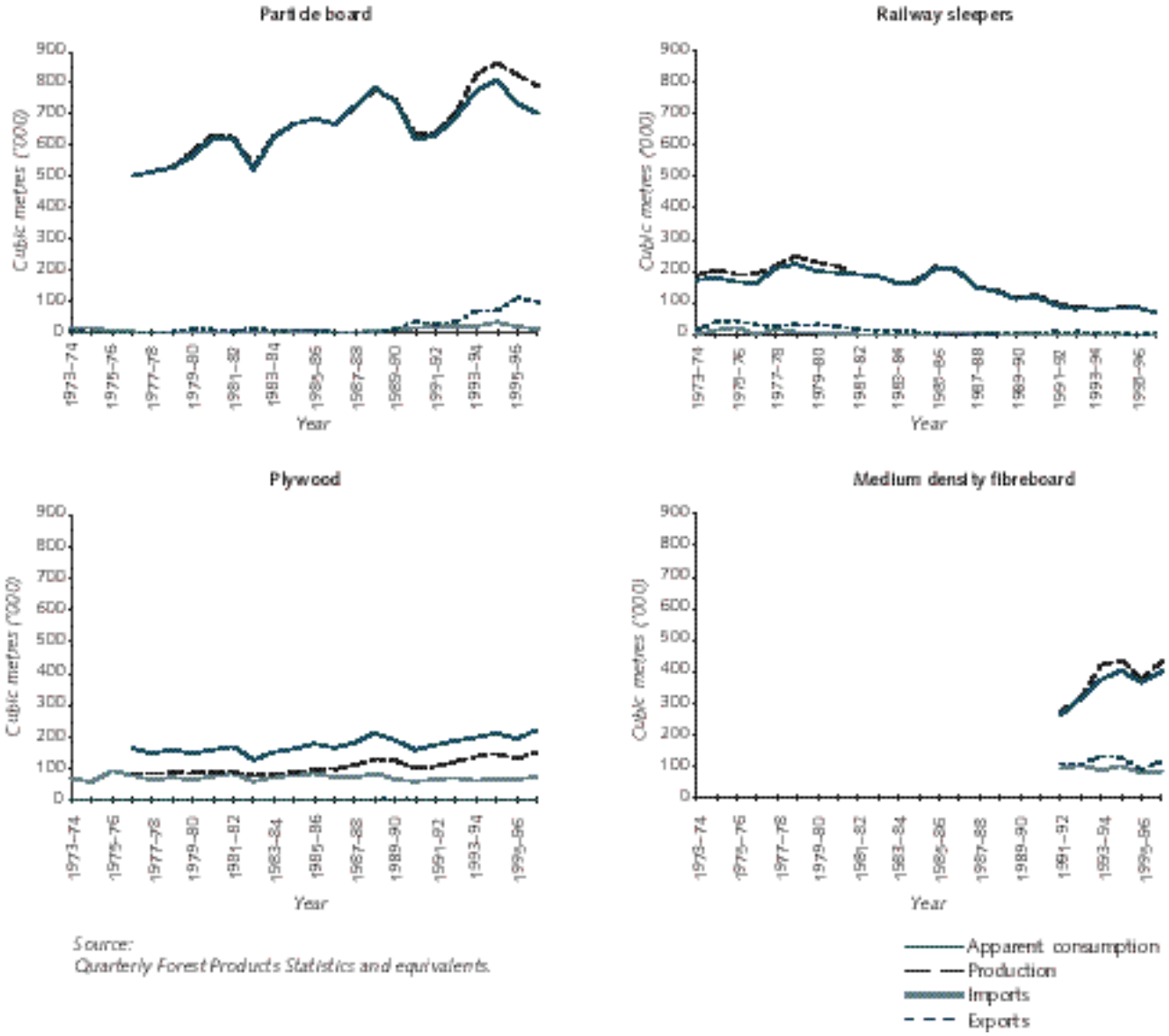


Figure 28: Sawnwood consumption and housing starts



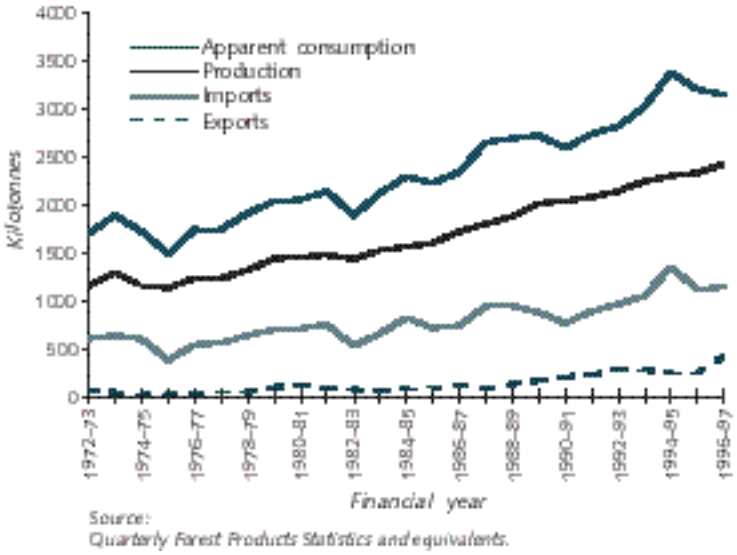
Sources:
Australian Bureau of Statistics (1995d).
Quarterly Forest Products Statistics and equivalents.

Figure 29: National production, import, export and apparent consumption of railway sleepers, plywood, particleboard and medium density fibreboard



Source:
Quarterly Forest Products Statistics and equivalents.

Figure 30: National production, import, export and apparent consumption of newsprint and all paper and paperboard products



Source:
Quarterly Forest Products Statistics and equivalents.

Terms of trade

Australia is a net importer of forest-based products, both in volume and value. The annual deficit in the terms of trade in this sector was $1.4 billion in 1996–97. In volume terms, both imports and exports have grown in the period 1973–74 to 1996–97, but exports have grown more strongly.

To calculate the balance of trade in forest products by volume, the import and export volumes of the different forest products must be converted to the equivalent volume of roundwood needed to produce them, referred to as roundwood equivalent. Figure 31 shows import and export volumes for various products, and Figure 32 gives the balance of trade in both volume and value.

The growth in export volume is in raw materials, almost solely woodchips. Although exports of value added timber and paper products have grown substantially this decade, this growth is coming off an extremely low base and therefore has little effect on total export volume. Figure 32 suggests that the disparity in the volume versus value terms of trade is due to the fact that Australia exports mainly raw materials and imports mainly finished products. Table 62 shows that woodchip exports made up 66 per cent of all wood-based exports by volume in 1996–97and earned 48 per cent of total wood product export income.

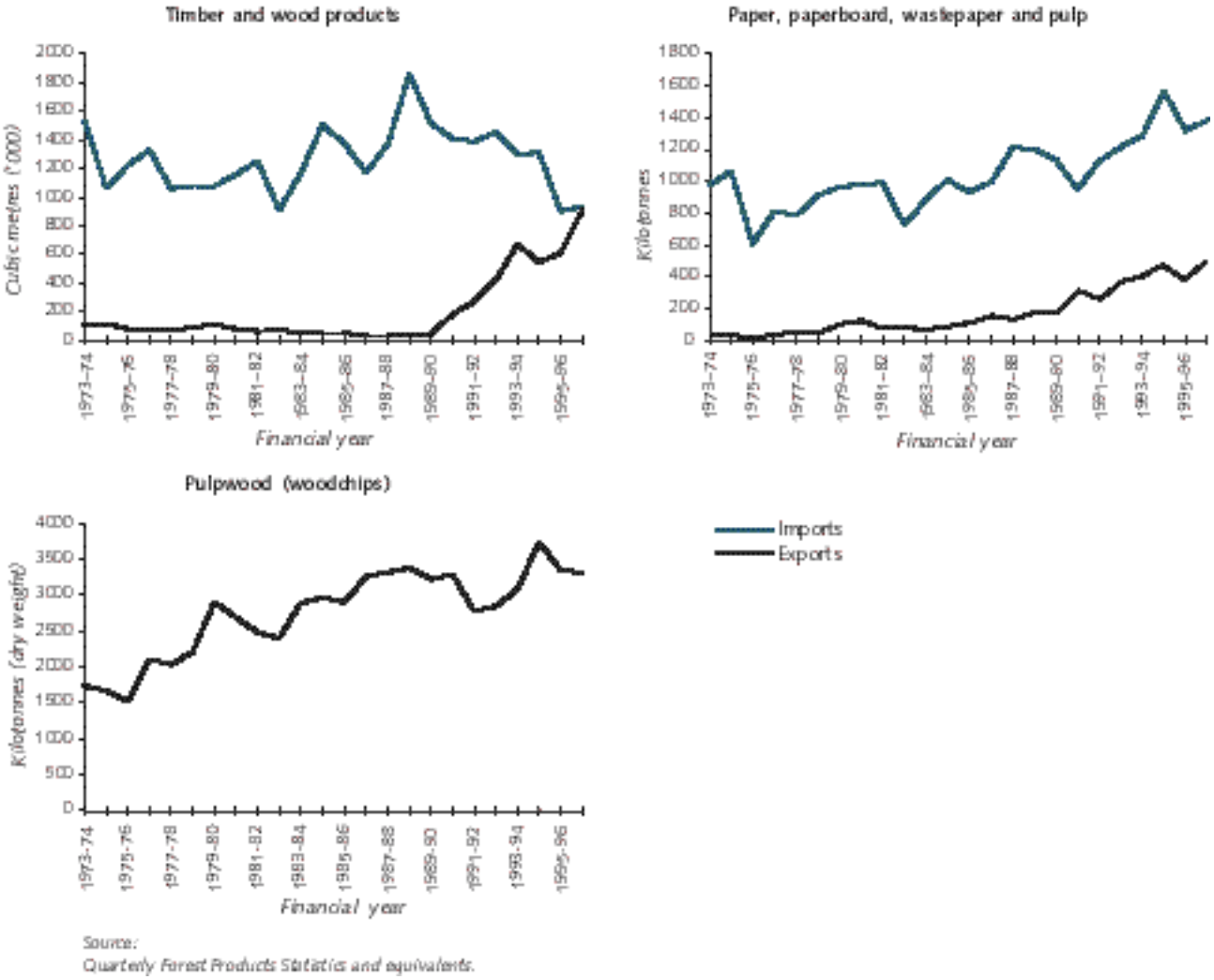
In 1993–94 imports of forest-based products cost four times as much as was earned from exports of forest-based products. Figure 33 shows that the trade deficit in wood-based products grew in the period 1973–74 to 1993–94.

Productivity

There are too few data sets available to enable a comprehensive discussion of productivity trends nationally. Employment figures from the Australian Bureau of Statistics' Labour Force Estimates and production volume figures collected by the Australian Bureau of Agricultural and Resource Economics from State agencies have been used as a basis for productivity estimates in the three forest-based wood industries over the past 10 years.

Figure 34 shows that productivity in the forestry and logging sector (measured in thousands of cubic metres of logs delivered to the mill door annually per employee) increased by 47 per cent between 1985 and 1994. The same figure shows no clear trend in productivity in the wood manufacturing sector (measured in thousands of cubic metres

Figure 31: Import and export volumes for various wood products, 1973–74 to 1996–97



Source:
Quarterly Forest Products Statistics and equivalents.

processed per employee) over the 10 years between 1985 and 1994, although it was 8 per cent higher in 1994 than in 1985. The biggest increase in productivity (measured in thousands of tonnes processed per employee) over the period occurred in the paper production industry: job shedding, new technology and better waste management practices led to increases in productivity of nearly 100 per cent.

Price indices

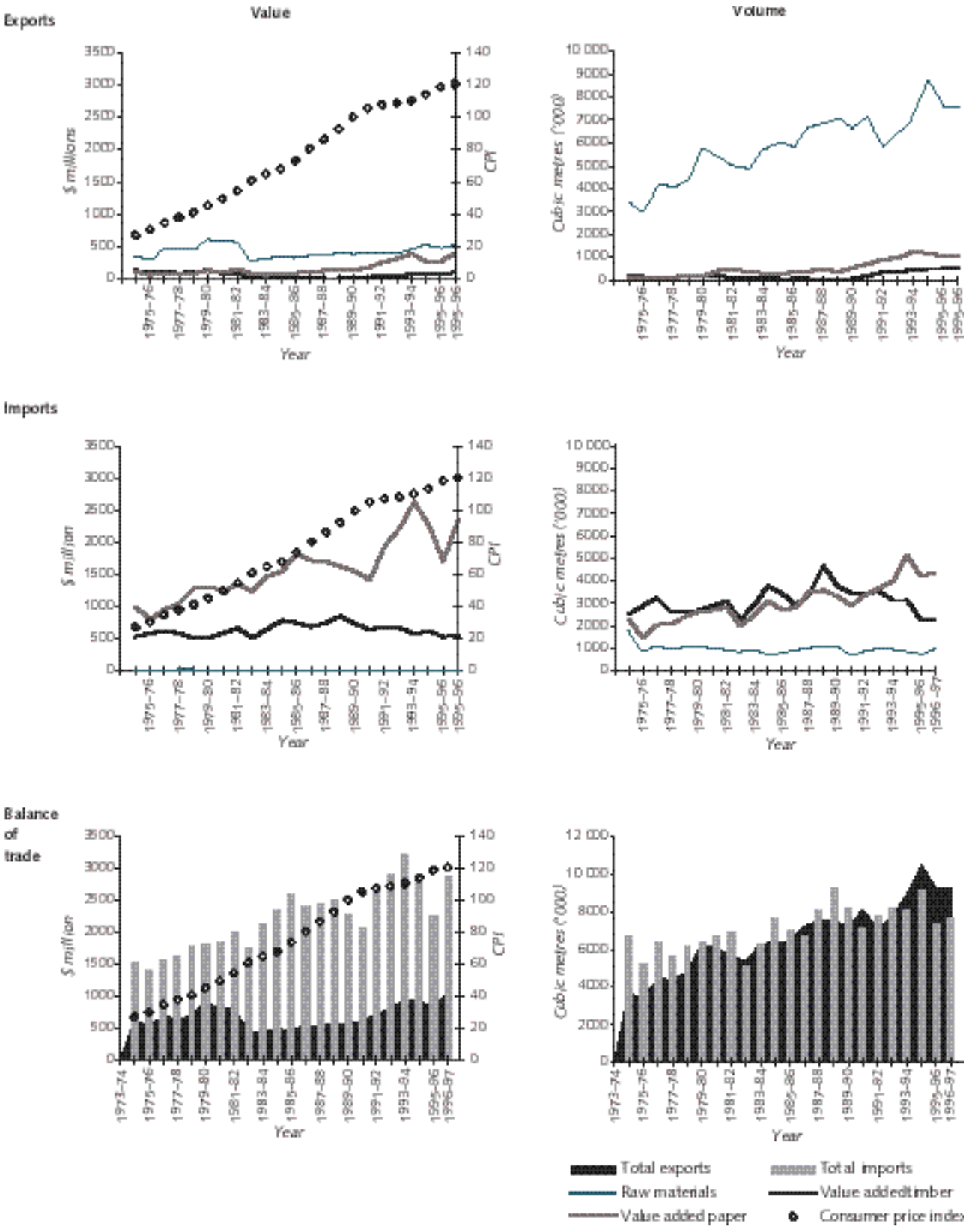
Many price indices are calculated for the wood-based forest industries. Some measure the prices of the materials used in the manufacture of particular products (the 'inputs' to production) and others measure the price of the products themselves (the 'outputs' of production). They are not adjusted for inflation.

Each index establishes a base year; the price for that year is taken as 100 points. For the hardwood and pulp and paper import indices (Figure 35 and Figure 36), the base year is 1984–85; for the woodchip index (Figure 37) it is 1988–89. In both cases, the base year is the year preceding the start of the index.

Government revenue

Table 63 shows the total revenue earned from sales of wood from publicly owned native and plantation forests, 1991–92 to 1995–96, by State and Territory.

Figure 32: Balance of trade in wood products, 1974–75 to 1996–97



Notes:
Volume information has been converted into roundwood consumed to allow comparisons.
Deflated value figures for particleboard and medium density fibreboard have been estimated from 1994–95 onward.
Value is given in 1989–90 dollars (SITCC).
Voulume is given in thousands of cubic meters (GRIM).
CPI (base 1989–90 = 100).
Sources:
Australian Bureau of Statistics (1998a).
Quarterly Forest Products Statistic and equivalents.

Table 62: Export income for woodchips and non-woodchip wood products, 1996–97

	Woodchips	All other	Total
Roundwood used ('000 m^3)	6 620	3 377	9 997
	(66%)	(34%)	(100%)
Export income ($m)	516	576	1092
	(47%)	(53%)	(100%)
Unit income ($)	78	170	109

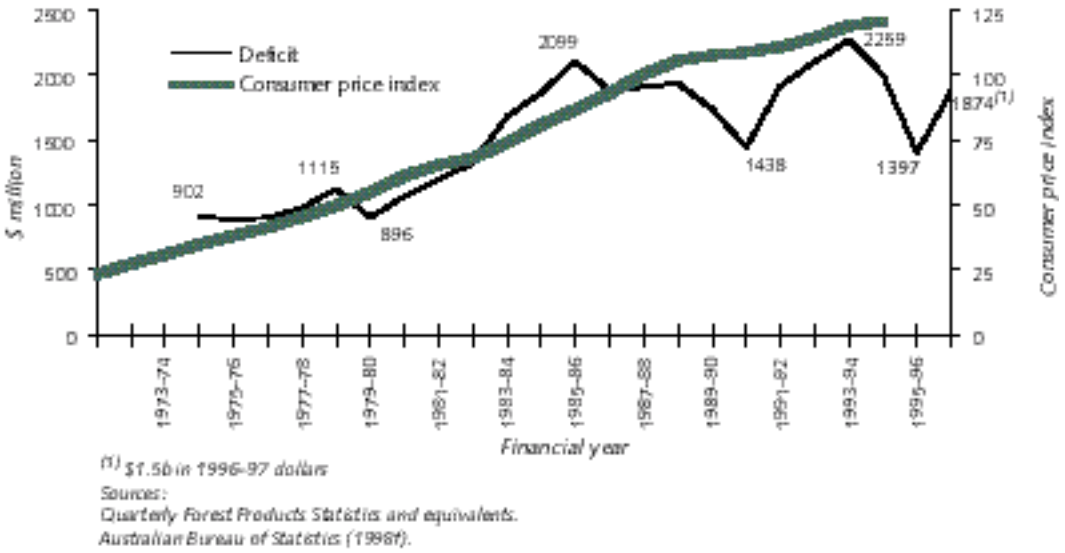
Source:Australian Forest Product Statistics (1997).

Table 63: Total revenue earned by State and Territory agencies from wood sales from plantation and native forests, 1991–92 to 1995–96

Financial year	($'000)								
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Australia
1991/92	ND	78 550	N/A	43 223	28 550	27 870	55 819	70 118	304 130
1992/93	ND	82 820	N/A	47 328	32 010	32 182	53 551	83 896	331 787
1993/94	ND	92 293	N/A	58 844	39 040	35 686	68 812	93 269	387 943
1994/95	ND	102 205	N/A	70 183	41 760	48 682	80 353	97 714	440 897
1995/96	ND	98 394	N/A	70 205	ND	ND	ND	121 496	N/A

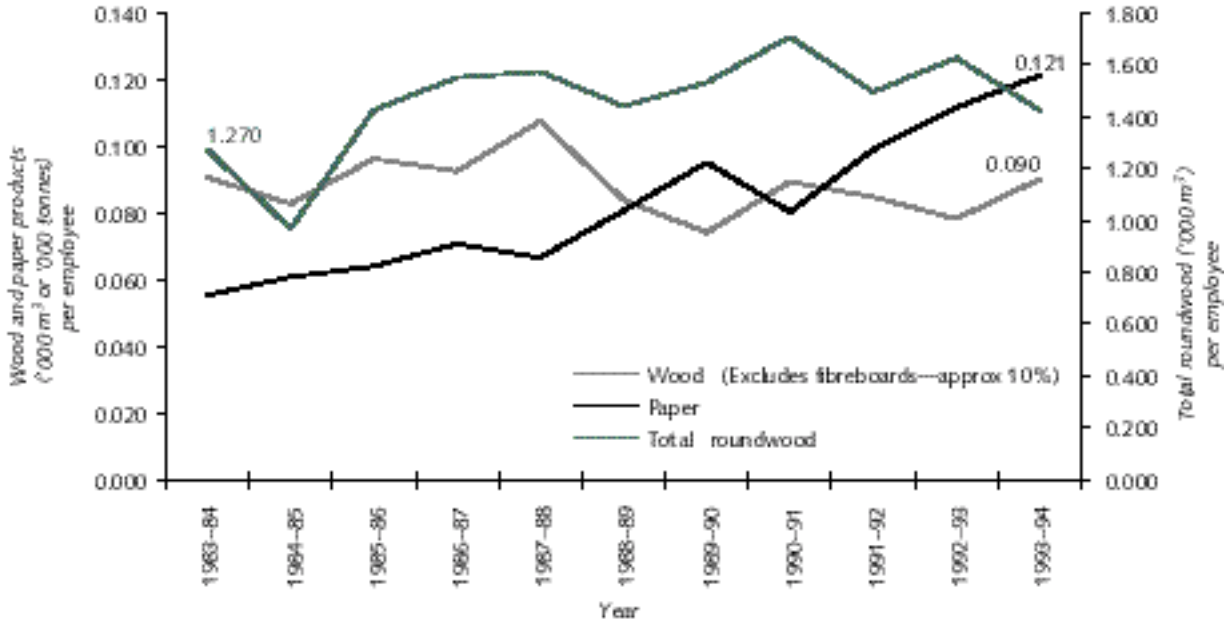
N/A - Not applicable
ND - no data
Source: National Forest Inventory (1997).

Figure 33: Trade deficit in wood products (in 1989–90 dollars)



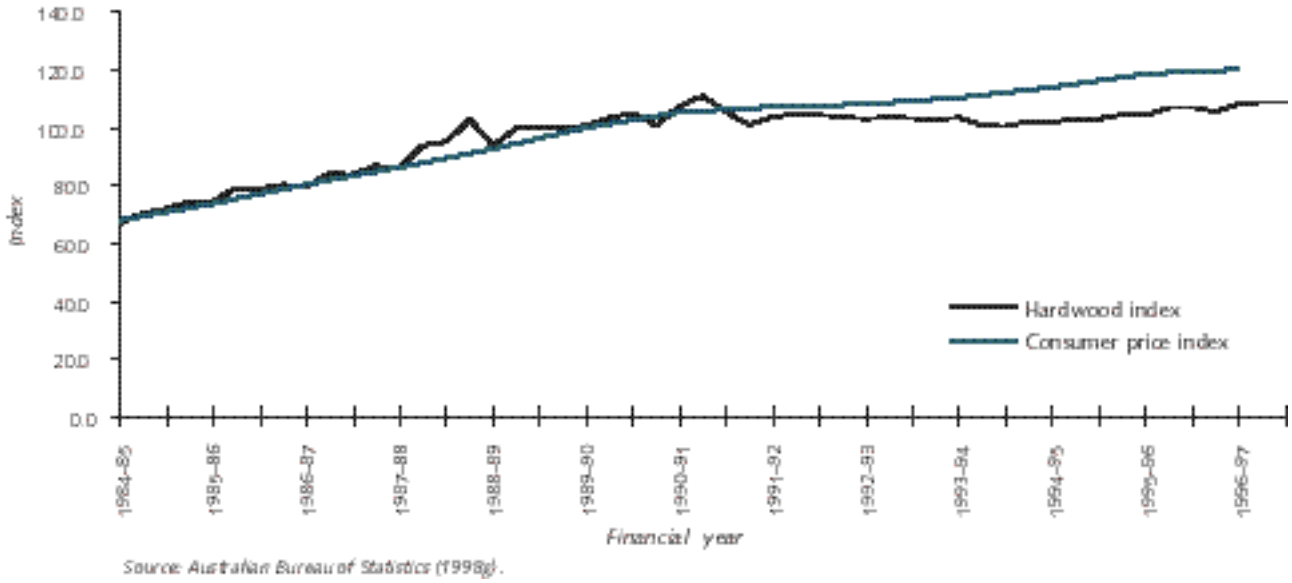
(1) $1.5b in 1996-97 dollars
Sources:
Quarterly Forest Products Statistics and equivalents.
Australian Bureau of Statistics (1998f).

Figure 34: Productivity of Australian forest industries per employee



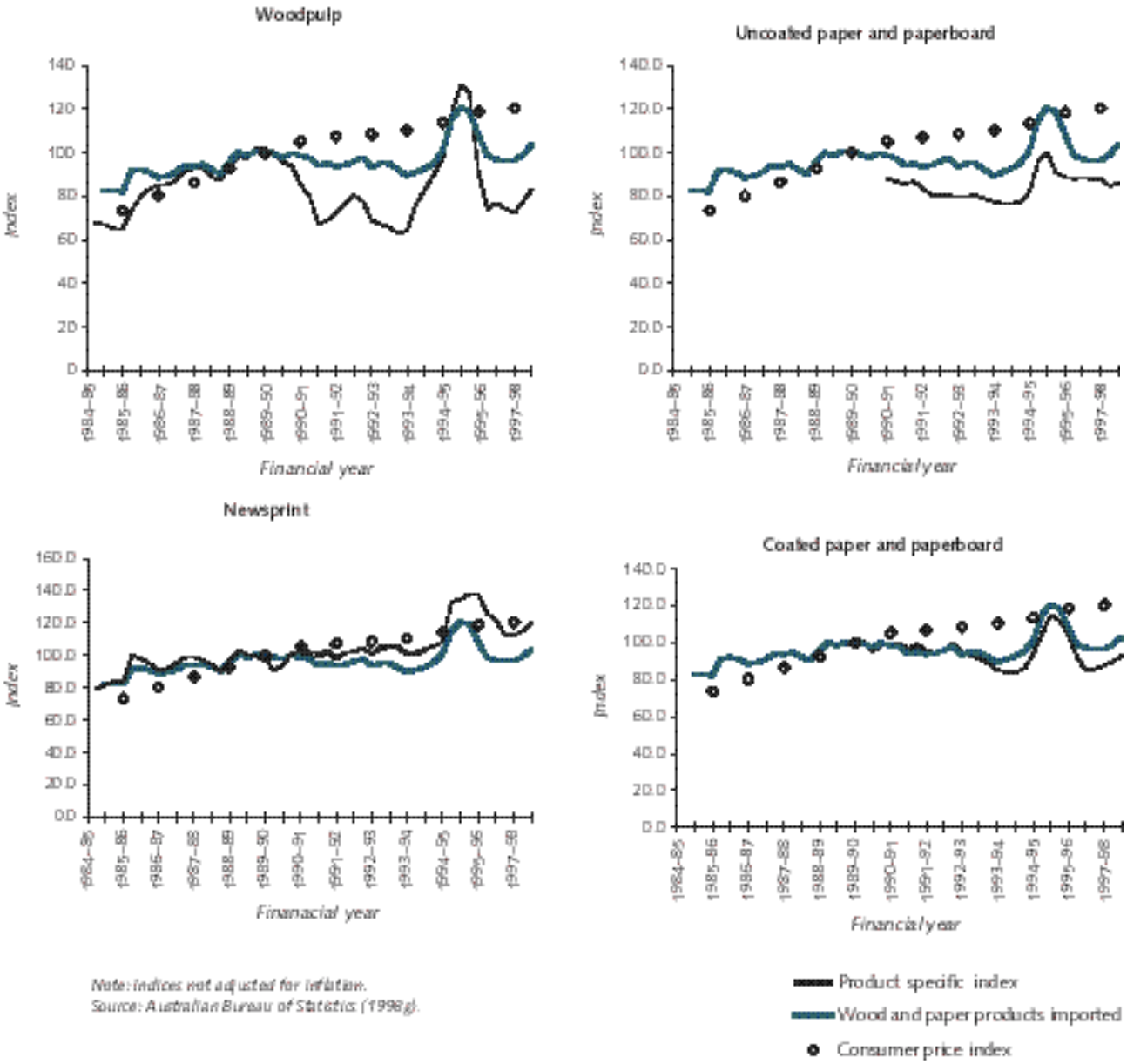
Sources:
Year Book Australia (1997).
Quarterly Forest Products Statistics and equivalents.

Figure 35: Hardwood price index, 1984–85 to 1996–97



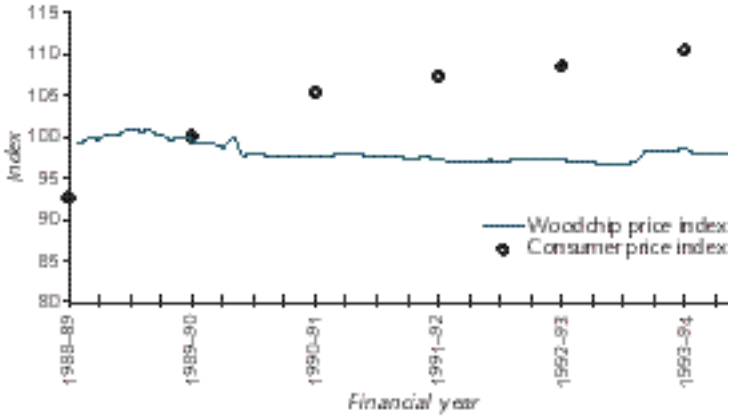
Source: Australian Bureau of Statistics (1998g).

Figure 36: Indices for imported paper products, 1984–85 to 1997–98



Note: Indices not adjusted for inflation.
Source: Australian Bureau of Statistics (1998g).

Figure 37: Woodchip price index, 1988–89 to 1993–94



Note: Index is not adjusted for inflation.
Source: Australian Bureau of Statistics (1995g).