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Counting the cost: the reserve price scheme for wool 1970–2001

Malcolm Abbott  and David Merrett[†]

This paper provides a policy commentary on the collapse in 1991 of the Australian Reserve Price Scheme for wool. A key cause of the collapse in the Scheme was a change in the RPS's governance arrangements, which led to increased political pressures to raise prices to unsustainable levels. In addition, in this paper an estimation has been made of the direct, upfront costs of the operation of the scheme, drawing on the financial accounts of the various agencies operating the RPS and subsequent wool stockpile. This was undertaken to determine the scale of the policy failure.

Key words: wool, reserve price, buffer stock.

1. Introduction

The wool industry for a long time played a central role in the economic development of Australia (Barnard 1962, 475–479). Its decline in importance to this development took place at the same time that heated debates occurred of whether a centralised attempt should be made to stabilise prices, both before this approach was implemented in the early 1970s and after its collapse in 1991. The impact of the collapse of this centralised attempt had a considerable impact on the Australian wool industry, and internationally, and helped to discredit in Australia the organised marketing of rural produce.

Why did the Reserve Price Scheme [hereafter RPS] for Australian wool end in collapse in 1991? That story has been told in a wide literature. We provide a narrative with differences in emphasis, notably the reasons for a sudden change in the governance of the RPS that effectively handed decision-making authority to wool producers and the environmental changes that took place, especially the floating of the Australia dollar. Moreover, we provide an estimate of the cost of the RPS from its beginnings until the sale of the last bale of stockpiled wool in 2001. We broaden the calculation to include 'hidden' costs and benefits. The calculation of costs provides us with a broader and more substantial measure of policy failure than simply noting its demise.

The RPS operated from 1970 until 1991. However, the parameters of decision-making autonomy by the woolgrower dominated Australian Wool

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Corporation (AWC), which operated the scheme underwent important changes during its lifetime. As Charles Massy (2011) has described in great detail, there was a sustained push by the woolgrowers in positions of authority of the AWC to shift the rationale of the RPS from a modest 'stabilisation' to increasing the price of wool in a rapidly rising market with the assistance from time to time by Country/National Party ministers. The AWC operated as a statutory body with the power to impose levies on growers and to spend monies on a variety of activities. However, the oversight of the RPS by the Government was weakened under the Wool Marketing Act 1987, which sought to corporatise the AWC's operations. Consequently, the Minister no longer had a veto over the reserve price setting unless there was an unresolved dispute between the AWC and the Wool Council of Australia. This legislative expansion of the AWC's powers was an unintended form of 'regulatory capture'. The guarantee of the AWC's debts by the Government was an invitation to moral hazard that the AWC happily accepted.

Studies by Gilbert (1996, 2011) discuss the generic failures in the formulation and execution of RPS that could, singly or in combination, bring about their collapse. These are, first, having the forecasting expertise to determine the direction and extent of price moves in the medium term. Second, having sufficient financial resources to undertake purchases of sufficient scale to achieve the desired price level. Third, the possibility that success in raising prices may stimulate an increase in production to such an extent that prices would fall unless there were further additions to the stockpile. In the case of the first problem, theoretical models suggest that commodity prices exhibit long flat bottoms punctuated by occasional sharp peaks (Williams and Wright 1991). Commodity prices are volatile because of low price elasticities of demand and supply, causing sharp price movements from supply and demand shocks. Such exogenous shocks and price changes created problems for RPS administrators who had to update price support ranges. These conditions became especially acute in the 1970s and 1980s for RPS in tin, sugar and cocoa (Gilbert 1996). Buffer stock schemes, including the Australian RPS, can become expensive, especially if the set price is in excess of the long-run, market-clearing level as the scheme has to fund and maintain a stockpile until prices rise again (Cashin *et al.* 1999). These problems associated with the operation of buffer stock schemes can also make the disposal of stockpiles that maximise grower income difficult.¹ This was certainly the Australian wool case which involved controversy over the decision rules followed in the disposal of the wool stockpile in the 1990s.

We will argue that all of these issues were of importance in the lifetime of the RPS. The advice about price projections became contradictory as agricultural economists located both within the Bureau of Agricultural and

¹ These problems were appreciated by a number of Australian agricultural economists as early as the 1960s, especially the temptation to attempt to use such as scheme to raise prices rather than simply stabilise them (Duloy and Parish 1964).

Resource Economics and the AWC began to differ in their views particularly in the late 1980s. Moreover, they were frequently over-ruled from within the AWC. This disagreement helps to illustrate the difficulty inherent in forecasting episodic price peaks.

The floating of the Australian dollar in 1983 greatly increased the complexity of price forecasting as the fundamentals of supply and demand in raw wool were masked by broader changes in the balance of payments. The Government underwriting of the scheme created a moral hazard that encouraged more audacious price settings, particularly in the late 1980s. Lastly, the extremely rapid increase in the minimum floor price, which doubled in A\$ terms between 1984/85 and 1988/89, boosted the supply of wool.

A global recession in the early 1990s brought an overstretched RPS undone in 1991 as the government intervened taking control of the RPS floor price, first reducing and then abolishing it. New institutions emerged, Australian Wool Realisation Commission, Wool International, and WoolStock Australia, to manage the liquidation of the accumulated stockpile, the equivalent of a year's clip, a process that took until 2001. Massy argued that the collapse of the RPS was one of the greatest corporate disasters in Australia's history. His vantage point was at 1991. We have extended our analysis of the 'cost' of the RPS over the whole period from 1970 until 2001, using the annual flows of outlays such as net wool purchases and sales, net interest payments, wool taxes received and returned, and the operational storage and handling costs. This exercise observes how well the AWC performed as a private speculator in the market. Our estimates differ from both Massy (2011) and Richardson (2001).

The paper proceeds in two parts. First, we explore that underlying weaknesses in the governance of the principal institution in the market, the AWC. In doing so, we will look at how it changed over the long term. We will argue that it should never have been corporatised, and that its functions and structures differed sharply from other government bodies for whom corporatisation made economic sense. So doing simply empowered it to further serve sectional interests. The collapse of the RPS owed more to political ambition than to a lack of good policy advice from within the AWC and ABARE, which was increasingly ignored. Second, we provide an estimation of the net costs of the RPS and its liquidation drawing on the financial accounts of the AWC and others. Again, in doing so we use figures generated over the whole period that the scheme operated and was liquidated (i.e. 1971 to 2001). They show that the greatest part of the cost occurred in a very short period of time. The main arguments are restated in the Conclusion.

2. The RPS (1970-1991) and the post-RPS years (1991-2001)

After decades of argument amongst Australian woolgrowers a reserve price scheme (RPS) began in 1970 following the operation of a partial scheme

(1967-70) that applied only to clips of less than four bales. The push for the introduction of a RPS scheme in Australia stretches back to the 1920s, and over the period, numerous alternative schemes were proposed, debated and on three occasions voted on by woolgrowers, in each case the proposed schemes were rejected by a majority of those voting (1920, 1951 and 1965) (Ville and Merrett 2016). The post-1970 scheme was administered by the newly established Australian Wool Commission (1970-1973) and then by the Australian Wool Corporation until its demise in 1991. By the late 1980s, a combination of a rising floor price and falling market prices meant that the AWC acquired a large stockpile of wool and borrowed heavily to fund its purchases. When the scheme was abandoned in early 1991, the AWC had a stockpile of 4.6 million bales of wool and a net debt of \$2.4 billion.² The administration of the RPS for wool, the only Australian commodity subject to such this form of market intervention, and of that dealing with the aftermath spawned a large literature from agricultural and applied economists (see, for instance, Watson 1990; Vines Report 1991; Gunasekera and Fisher 1992; Hone and Hope 1994; Hertzler 1994; Haszler *et al.* 1996; Turnell 1998; Richardson 2001; Abbott 2013). While Richardson, Abbott (2013), Ville and Merrett (2016) and Massy (2011) have provided narratives of the political and economic imperatives that gave rise to the introduction and operation of the RPS and its ultimate demise, these authors apportion blame to many of the participants, particularly senior officials in the statutory bodies, their advisors and politicians of various hues. There is a wide consensus that the RPS was a failure of significant proportions imposing costs on the growers, taxpayers and the wool industry; however, past estimates of the extent of the cost and scale of the policy failure are few, and vary widely. Determining the full cost of the scheme is a difficult exercise. Significant costs were also borne by the merchants and producers of woollen textiles holding stocks as well as by growers. There were resultant inequities and market distortions associated with the scheme that cannot be calculated directly (Richardson 2001; Massy 2011). Richardson concludes that:

the upfront cost to the Australian taxpayers and to minor extent Australian consumers (whose apparel wool purchases average under 3 per cent of the clip) resulting from the RPS collapse probably approached A\$1.0 billion' (Richardson 2001, 109).

On the other hand, Massy calculates that the direct cost of the RPS scheme to the growers over the life of the scheme, their tax contributions and the outstanding debt, was a 'conservative' total of \$9 billion. This figure includes

² All monetary figures in this paper are in Australian dollars. Figures are in nominal, current dollar terms unless otherwise stipulated. 1976-1991.

the \$1.0 billion cost to taxpayers identified by Richardson (Massy 2011, 381–82).³ The Massy and Richardson figures differ widely partly because they measure different things, but also because they use different methodologies to calculate the cost of the scheme. There are further difficulties in estimating the full costs of RPS as they typically include other indirect costs as well as ‘hidden costs’. For instance, even without its collapse economists disagreed as to whether a stabilisation scheme could help producers by reducing market risks (for the Australian debate, see Gruen 1964; Powell and Campbell 1962; Duloy and Parish 1964; Campbell *et al.* 1980; Salant 1983). Understanding the scope of the costs of the scheme is important to reach an appreciation of the degree of policy failure.

The Australian wool RPS, with a fixed floor price, encountered major difficulties only after 1987 (Richardson 2001). In the late 1960s, falling wool prices created a climate of crisis in the industry and at the time the Government introduced a ‘deficiency payments scheme’ (Abbott and Merrett 2016). As prices remained low, the Australian Government, following the recommendations of a Report by Sir John Crawford, created the Australian Wool Commission, which subsequently operated a flexible reserve price scheme. The Australian Wool Commission was established by the Australian Wool Commission Act 1970 (No 103) on the 4 November 1970 and began a flexible price support scheme on 16 November 1970 (*Commonwealth of Australia Gazette*, No 104, 19 November 1970, 7665; *Official Year Book of the Commonwealth of Australia*, 1971, 1973). The Wool Commission was financed by loans from the trading banks and by the Australian Government (Australian Wool Commission, Annual Report 1971/72). Following the presentation of the Randall Report (1971), the Government replaced the Wool Commission with the Australian Wool Corporation, which commenced operation in January 1973 (Australian Wool Industry Act No. 111 of 1972; *Official Year Book of Australia*, 1973). The AWC integrated the RPS and the wool research, development and marketing activities into a single body.

Wool prices remained low after the AWC began operating in 1973 bottoming out at 127 cents/kg in the financial-year 1974/75 (see Figure 1), prompting the Whitlam Government to replace the flexible reserve with a firm floor price in September 1974, financing the scheme with a 5 per cent levy on the gross proceeds of shorn wool sales. The AWC would buy wool if prices fell below a predetermined rate (the fixed floor price) and stockpile the wool. Only the price floor was announced in advance by the AWC, with the stockpile purchases and sales being discretionary. If funds were exhausted by

³ Massy’s calculations were arrived at by adding together the sums spent to accumulate the 1991 stockpile including the AWC’s reserves, additional grower contributions and borrowings. It also includes the figure that Richardson arrived at (Massy 2011, 382). Richardson’s figure comes from a calculation of the cost to taxpayers of the additional money spent by the Government on such things as flock reduction schemes, government guarantees of debt, supplementary payments and additional wool promotional money (Richardson 2001, 109).

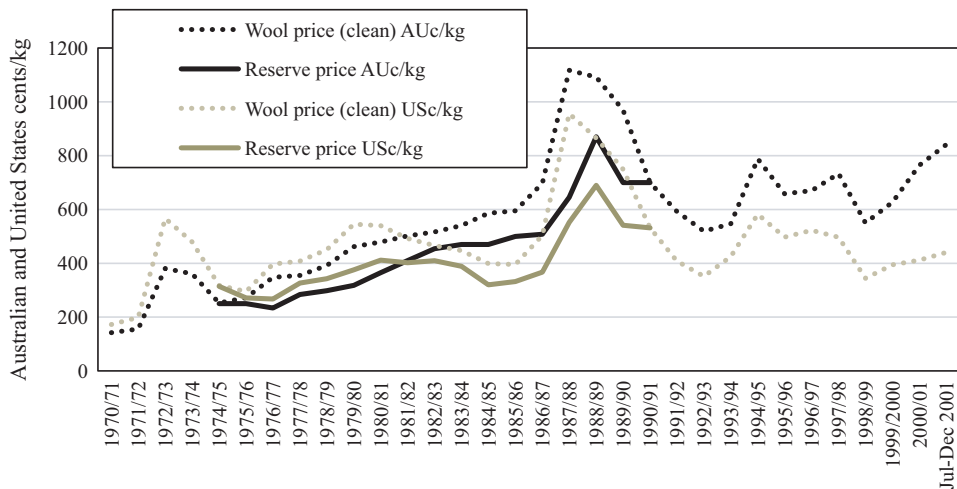


Figure 1 Australian wool market indicator and minimum floor price, 1970/71 to December 2001 (Australian and United States cents/kg). Source: ABARE. [Colour figure can be viewed at wileyonlinelibrary.com]

the purchases of wool, then further purchases could be financed by commercial borrowing against the security of the wool stockpile. During those periods, when prices were high, stockpiled wool was sold. During 1974/75, the RPS resulted in a substantial purchase of wool by the AWC (net purchases of 1,439,656 bales: see Figure 2), which meant that a substantial stockpile of wool was created (see Figure 3). Consequently, the net debt of the AWC rose significantly (Figure 4). As market prices for wool rose through the second half of the 1970s, the AWC sold off the stockpile until it had largely been disposed of by 1981 (Figures 2 and 3). The net debt of the organisation reached zero by 1978/79 (Figure 4), after which the AWC built up its financial reserves. Prices continued to rise through the early and mid-1980s, and although a small stockpile of wool was created in the years 1982/83 to 1986/87, it was largely disposed of in 1987/88 (Figure 3). Booming wool prices in the years 1986/87 to 1988/89 then encouraged the AWC to substantially lift the reserve price, which in turn led to a crisis when prices slumped during the world recession of 1990-1992.

As noted in the introduction economists had identified a number of generic weaknesses in the operation of buffer price support schemes. These were difficulties in forecasting price movements and distinguishing between short and more fundamental longer-term prices; a lack of resources available to the scheme's administrators to defend the chosen floor; and the likelihood of overproduction consequent upon setting the floor too high. Each of these weaknesses became apparent in the mid to late 1980s.

Economists at the AWC and Bureau of Agricultural Economics (BAE, from 1987 ABARE) struggled to predict the course of the price of wool from the mid-1980s. There was agreement between the two agencies from 1984 to 1986 that prices would rise modestly and the rate of increase in the floor price

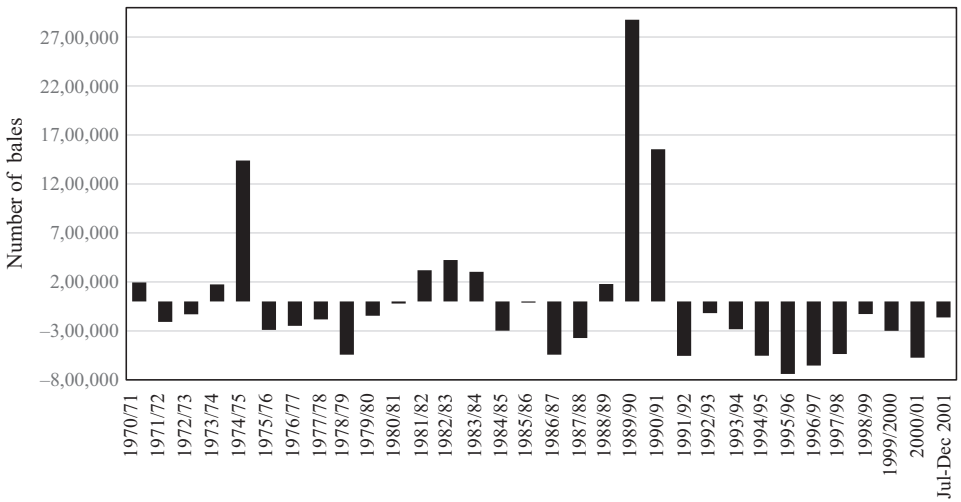


Figure 2 Net purchases of wool by Australian wool authorities, 1970/71 to December 2001 (number of bales). Source: Australian Wool Commission, Australian Wool Corporation, Wool International 1994–1999, WoolStock Australia 2000–2001, Table 3.

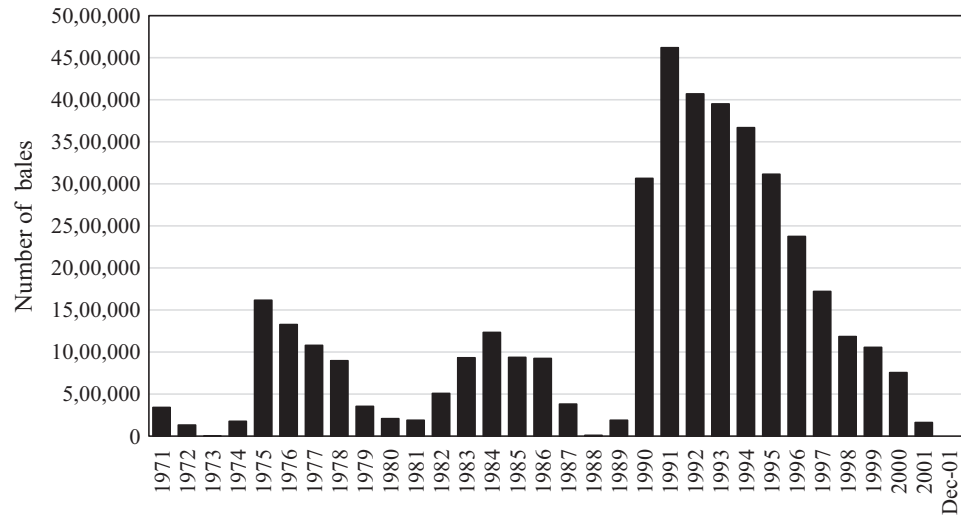


Figure 3 Size of the Australian wool stockpile, June of each year 1971 to 2001 (number of bales). Source: Australian Wool Commission, Australian Wool Corporation, Wool International 1994–1999, WoolStock Australia 2000–2001, Table 3.

should be slowed (Richardson 2001, 102; Massy 2011, 105, 152 & 168; *Canberra Times*, 16 January 1984, 3; and 2 July 1986, 17). Consequently, the floor price was raised by only 1.6 per cent to 508 cents on the advice of the AWC and Bureau in July 1986. Thereafter, economists from the two agencies began to form differing views about the direction of market movements and to distinguish between short and longer-term shifts. For instance, despite the

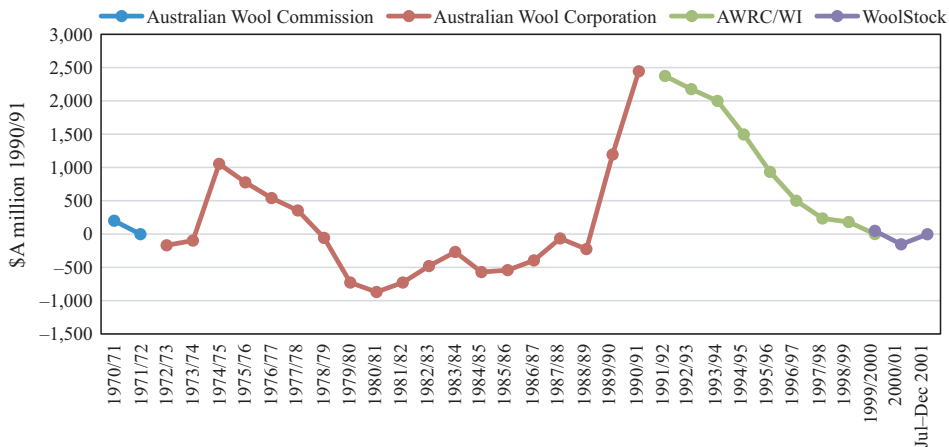


Figure 4 Net debt of Australian wool authorities responsible for the reserve price scheme, end of financial year 1970/71 to December 2001 (\$m 1990/91). Source: Australian Wool Commission, Australian Wool Corporation, Wool International 1994–1999, WoolStock Australia 2000–2001, Table 3. Net debt = Short-term debt plus long-term debt minus (cash and cash equivalents). Cash and cash equivalents are debtors, income accrued and prepayments. [Colour figure can be viewed at wileyonlinelibrary.com]

continued rise in wool prices, the BAE forecast in January 1987 that prices would fall because of the increase in sheep numbers and supply of wool (National Outlook Conference; *Canberra Times*, 30 January 1987, 3; Massy 2011, 132). ABARE became more bullish about price increases in January 1988 and at the January 1989 National Agricultural Conference predicted a further rise in prices (Massy 2011, 180). However, a more cautious ABARE report in May 1990 effectively called for a drop in the floor to 700 cents (*Canberra Times*, 16 May 1990, 1; Massy 2011, 258). Advice from ABARE economists and those within the AWC was now that price increases were less likely and that the floor should be reduced once market prices fell. The global recession of 1990–92 and its impact on wool prices had not been foreseen. Moreover, the AWC had grown overconfident about its financial position having accumulated large sums raised by the levy.

By June 1989, the Market Support Fund of the AWC had \$1,800 million (AWC, *Annual Report* 1988/89, 66). These sums proved, however, to be insufficient to support wool prices at the level desired by the AWC and were quickly exhausted by the extent of the fall in prices below the floor. Loan funds were raised and used but these also proved insufficient to maintain the scheme. Figure 4 shows the increase in net debt that occurred. Moreover, the attempt to maintain prices at high levels encouraged a surge in production of wool in Australia that put further downward pressure on prices (see Figure 5).⁴

⁴ Wool production in mixed farming regions was also encouraged by low grain prices in this period.

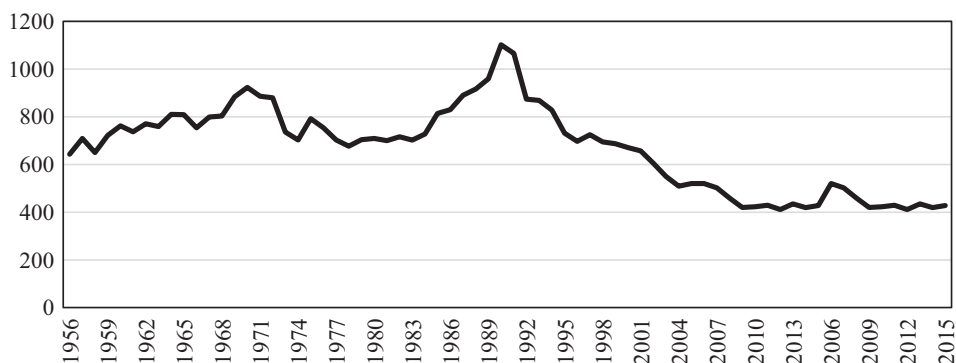


Figure 5 Australian annual wool production, million kg greasy wool, 1956-2014. Source: Australia, *Yearbook*. ABARE.

Other developments placed increasing pressure of the RPS. First, the underlying risks associated with the operation of the scheme rose as the Australian dollar was floated in December 1983. Figure 1 provides figures for the average price of wool and floor price, both in Australian dollars and United States dollars. As can be seen from the Figure, the decline in the Australian dollar after the float exaggerated the rise in average prices in terms of Australian dollars compared to United States dollars. Second, the sharp increase in the reserve price in the late 1980s radically changed the relative price ratio of wool to synthetic fibres. Third, alternative risk mitigation instruments such as futures markets had disappeared. Richardson notes that:

the AWC was absorbing potentially large risks on behalf of woolgrowers, but had no real capacity to offset these risks' (Richardson 2001, 101).

An additional aspect was the asymmetric distribution of benefits and costs between specialist woolgrowers and mixed farmers. All woolgrowers shared the benefits of the RPS but the specialists incurred a disproportionate share of the costs as they were less able to switch out of wool as prices fell. Different supply responses by specialists and more numerous mixed farmers helped to complicate the political governance of the scheme. The politics of the scheme were to ultimately prove its undoing. While the Government had set the reserve price year by year and guaranteed, the finances of the scheme the real power was transferred to growers' Australian Wool Council and the grower dominated statutory bodies, the AWC, in 1987 (Ville and Merrett 2016; Massy 2011). The character of the reserve price had also altered over time. Its earliest incarnation (1970-1973) was a flexible floor price; it became a conservatively set fixed floor price (1974-1984); and a market-related reserve price thereafter. Richardson argues that:

perhaps this was inevitable in industry political terms; the AWC and the Wool Council reached the point where, with what were perceived as large financial resources and revolving funds, their choice was to cut the wool tax [a 5 per cent levy on the sale price introduced in 1974] or set the price more aggressively. They choose the latter in the late 1980s, convincing themselves, with IWS [International Wool Secretariat] assistance, that a new plateau had been achieved through worldwide promotion of wool (Richardson 2001, 103).

Before the changes in the Wool Marketing Act No. 90 of 1987 that altered the procedures followed to set the reserve price a set of checks and balances had been in place as the ultimate responsibility rested with the Minister of Primary Industries and Energy. The Minister received recommendations from the AWC after it was advised by the BAE/ABARE. The Bureau regularly gave advice to the government as well as the AWC on the appropriate floor price as well as more general forecast on wool prices. Their review of factors underlying demand and supply conditions along with price forecasts for the following year was published annually at the National Agricultural Outlook Conference.

After the passage of the new legislation price-setting responsibilities shifted to the Wool Council of Australia, the peak representative body of the Australian wool industry (the Wool Marketing Act No. 90 of 1987, s. 66; AWC, *Annual Report* 1988). This meant that the RPS was now managed at arm's length from the Australian Government who guaranteed its debt. Richardson argues that the change in the governance of the RPS was initiated by Geoff Miller, Permanent Secretary of the Department of Primary Industries and Energy, who sought: 'greater operational independence for statutory marketing authorities' (Richardson 2001, 103). In parliamentary debates, it was argued by the Minister for Science, Barry Jones, who introduced the Bill that this would: 'remove further controls on the Corporation to place it, where possible, on an equivalent footing to commercial business corporations', and be able to respond with: 'maximum commercial flexibility and autonomy' (1987, *Hansard*, 30 April 1987, 2,238, 2,240). This move was in line with the Government's general move towards greater commercial autonomy for government business enterprises, and primary industry statutory marketing authorities (Australia, Department of Primary Industry 1986). Corporatisation, however, generally involves the separation of commercial from regulatory responsibilities and although governance arrangements were changed the AWC still retained its noncommercial responsibilities, such as the power to impose levies on growers, undertake basic research and attempt to set a minimum price in the market. The members of the board, as well, were mainly representatives of the industry rather than members whose primary responsibility was to the commercial goals of the AWC.

Under the legislation, the Minister still had the power to determine the minimum price but only if there was dispute between the AWC and the Wool Council (Wool Marketing Act No. 90 of 1987, s. 66). The legislation also provided for a board mainly made up of directors appointed on the advice of a selection committee which in turn was made up of people nominated by the Wool Council (Wool Marketing Act No. 90 of 1987, ss. 20, 29). The political decisions by wool interest groups, and those within the AWC, as noted by Richardson above, overrode the more conservative recommendations by the economists about the floor price. After a rapid rise in wool prices in the mid-1980s to late 1980s, the Wool Council raised the reserve price by approximately 70 per cent in Australian dollar terms over two years (1986/87 to 1988/89; Figure 1).⁵ When prices declined from 1990, with a collapse in demand from disruption in the Soviet Union and China, the scheme was put under considerable pressure as the Wool Council was reluctant to advocate a reduction in the reserve price, a stance supported by many in the wool industry.⁶

The RPS ended in a two-stage process once the Minister for Primary Industries and Energy finally asserted his authority to manage the growing its ballooning debts: first, a reduction of the floor to 700 cents/kg from 1 July 1990 and, second, its abandonment on 11 February 1991 (Figure 1; Massy 2011). When the RPS collapsed, there was a 4.6 million-bale wool stockpile and a net debt of \$2,400 million. In the years before the crash, the AWC and its affiliates spent \$5 billion of woolgrower, government and borrowed funds on stockpiling wool.

The end of the scheme led to a flurry of organisational change. The AWC was split into three following a review of wool marketing arrangements (Australia, Department of Primary Industries and Energy, Wool Industry Review Committee (Vines Report) 1991). These comprised a new AWC (with responsibility for the marketing, providing funds to the IWS and monitoring of standards; Australian Wool Corporation Act No. 108 of 1991), the Wool Research and Development Corporation (research and development; Primary Industries and Energy Research and Development Amendment Act No. 109 of 1991) and the Australian Wool Realisation Commission that had the responsibility for managing the sale of the stockpile (Australian Wool Realisation Commission 1992-1994 Act, No 107 of 1991). The Australian Wool Realisation Commission had no powers with which to finance purchases of new wool and used the proceeds of its sales to retire the debt acquired in the last years of the RPS. In addition, a tax levied on wool sales was also used to help pay down the debt that had been acquired. The initial schedule gave the Commission some flexibility to maximise the sale price of

⁵ This increase was in stages, from 508 cents per kg to 620 cents in April 1987, and then to 645 cents in June 1987 and 870 cents in June 1988 (Massy 2011, 114).

⁶ Woolgrower organisations tended to support the retention of the high prices, the New South Wales Farmers Wool Committee in particular showing strong public support *Canberra Times*, 20 May 1990, 2, 12 February 1991, 1; Massy 2011, 148).

wool from the stockpile. The Australian Wool Realisation Commission operated in the financial years 1991/92 and 1992/93, selling 331,000 bales in 1991/92, but only 70,000 in 1992/93 because of falling prices (Table 1). The Commission was widely criticised during its operation, being blamed for the low prices and the creation of extra instability in markets (Richardson 2001). The Australian Government, therefore, decided to initiate an additional investigation into the disposal of the stockpile in 1993. Following the release of the Garnaut Report 1993, the Realisation Commission was replaced with Wool International that began operations on the 1 December 1993 through to the 1998/99 season (Wool International Act, No. 64 of 1993). Wool International was compelled to release wool onto the market at a fixed rate. Legislative amendments in 1997 provided flexibility in the disposal of wool and also introduced a target of 31 December 1998 for the repayment of accumulated debt. Once the level of debt had been reduced to a level below that of the value of the remaining stockpile, the Australian Government announced its decision to privatise Wool International effective from the 1 July 1999. It was replaced by WoolStock Australia, and its shares were issued to existing unit holders on 1 July 1999 (*Commonwealth Government Directory*, March-May 1997). This company operated between 1999/2000 and was delisted from the Stock Exchange on the 15 October 2001 after the last wool from the stockpile had been sold (Figure 2).

Initially after the cessation of the RPS wool prices were low, falling to 519 cents per kg clean wool in 1992/93 (Figure 1), before rising unsteadily throughout the 1990s. The peak reserve price of 870 cents was not to be regained until 2002/2003, and then only briefly (*Australian Commodity Statistics* 2013/1995-2013). Indeed, the average price of wool was not consistently above the 870 mark until the 2010s, which meant that attempting to defend this price range would have meant stockpiling wool for another twenty years. Even defending the price set by the Minister in 1989/90 at 700 cents would have been difficult, given that market prices did not exceed this level consistently until after 2000. However, the more modest reserve prices set at the 1986/87 figure of 508 cents, or the 1987/88 figure of 645 cents would probably have meant that the RPS would have survived. The critical problem with the Australian was that management of the scheme fell into the hands of a group who were over optimistic about the price of wool and under estimated the risks of the scheme.

All of the three reasons identified by Gilbert noted above played their part in the failure of the Australian wool scheme, although the timing of the collapse was affected by the changes to the governance arrangements in the second half of the 1980s, which coincided with a sharp fall in wool prices. The general difficulties, around estimating long-run price level about which stabilisation takes place, were still a problem after 1991 and made the maximisation of sales from the stockpile problematic. The advice about price projections also became contradictory because of the existence of agricultural economists within the Bureau of Agricultural and Resource Economics and

Table 1 Australian wool authorities and reserve price scheme data, 1970/71 to 2001

Column	A RPS purchases \$m	B RPS sales \$m	C RPS stocks end of period bales	D Authorities total liabilities \$m	E Authorities assets cash and cash equivalents \$m	F Authorities net debt† 30 June \$m	G RPS interest paid \$m
Australian Wool Commission							
1970/71	55	7	340,507	43	8	35	0
1971/72	53	88	132,562	16	16	0	3
July–December 72	15	39	23581§	22	22*	0	0
Australian Wool Corporation							
January–June 73	3	10	2,395	50	84	–34	0
1973/74	62	15	176,544	32	55	–23	0
1974/75	337	17	1,616,200	343	56	288	17
1975/76	152	171	1,326,700	307	64	243	40
1976/77	60	115	1,078,700	270	81	189	33
1977/78	166	230	896,638	139	43	96	36
1978/79	148	344	353,757	27	51	–24	29
1979/80	8	172	208,497	37	365	–328	8
1980/81	14	116	188,197	74	503	–429	14
1981/82	207	123	507,850	92	493	–401	27
1982/83	389	212	930,928	96	388	–292	61
1983/84	616	283	1,233,879	46	222	–176	84
1984/85	522	534	935,896	99	490	–391	109
1985/86	545	276	924,268	186	581	–395	120
1986/87	241	596	381,520	138	448	–309	97
1987/88	6	394	9,203	179	234	–55	24
1988/89	178	55	188,278	118	325	–207	11
1989/90	2590	317	3,064,693	1650	493	1157	72
1990/91	3174	305	4,618,597	4599	2155	2444	262

Table 1 (Continued)

Column	A RPS purchases \$m	B RPS sales \$m	C RPS stocks end of period bales	D Authorities total liabilities \$m	E Authorities assets cash and cash equivalents \$m	F Authorities net debt† 30 June \$m	G RPS interest paid \$m
Australian Wool Realisation Commission							
1991/92	—	331	4,068,828	2755	343	2412	258
1992/93	—	70	3,950,072	2789	559	2230	196
Wool International							
1993/94	—	161	3,667,029	2551	479	2071	190
1994/95	—	473	3,113,721	1889	1	1891	1582
1995/96	—	539	2,373,908	1082	1	1083	1014
1996/97	—	451	1,719,919	690	2	692	550
1997/98	—	425	1,183,949	275	2	278	261
1998/99	—	77	1,055,464	225	0	225	203
WoolStock Australia							
1999/2000	—	173	755,755	68	67	135	55
2000/01	—	397	162,078	7	0	7	—185
July–December 2001¶	—	159	0	20	0	20	—3
Column	H Interest received (MSF) \$m	I RPS Storage, handling selling and admin \$m	J RPS Wool tax (levy)†† \$m	K RPS wool tax refunded \$m	L Australia min. floor price (clean) A c/kg	M Australia GDP deflator 1990/ 91 = 1	
Australian Wool Commission							
1970/71	0	1	0	0	—	0.174	
1971/72	0	5	0	0	—	0.185	

Table 1 (Continued)

Column	H Interest received (MSF) \$m	I RPS Storage, handling selling and admin \$m	J RPS Wool tax (levy) ^{††} \$m	K RPS wool tax refunded \$m	L Australia min. floor price (clean) A c/kg	M Australia GDP deflator 1990/ 91 = 1
July–December 72	0	2	0	0	–	0.194
Australian Wool Corporation						
January–June 73	1	1	0	0	–	0.201
1973/74	1	2	0	0	–	0.236
1974/75	1	7	44	0	250	0.273
1975/76	4	13	47	0	250	0.313
1976/77	7	13	56	0	234/284	0.349
1977/78	12	13	56	0	284	0.378
1978/79	17	14	64	0	298	0.410
1979/80	28	10	77	0	318	0.450
1980/81	54	12	83	0	365	0.493
1981/82	82	14	87	44	410	0.550
1982/83	96	22	88	41	422/454	0.608
1983/84	96	23	101	51	470	0.655
1984/85	116	24	119	0	470	0.685
1985/86	168	25	126	52	500	0.728
1986/87	171	21	125	132	508	0.781
1987/88	167	22	212	78	645	0.836
1988/89	214	18	230	166	870	0.914
1989/90	73	121	241	209	870/700	0.969
1990/91	5	387	748	0	700	1.000
Australian Wool Realisation Commission						
1991/92	25	40	247	0	–	1.016
1992/93	25	35	197	16	–	1.025

Table 1 (Continued)

Column	H Interest received (MSF) \$m	I RPS Storage, handling selling and admin \$m	J RPS Wool tax (levy) ^{††} \$m	K RPS wool tax refunded \$m	L Australia min. floor price (clean) A c/kg	M Australia GDP deflator 1990/ 91 = 1
Wool International						
1993/94	34	33	114	0	—	1.036
1994/95		125	30	37	—	1.058
1995/96		183	18	37	—	1.086
1996/97		64	9	28	—	1.101
1997/98		26	5	34	—	1.113
1998/99		11	1	23	—	1.119
WoolStock Australia						
1999/2000		12	2	15		1.147
2000/01		8	7	14	—	1.201
July–December 2001 [‡]	—	0	4	6	—	1.236

Notes: [†]Net debt = short-term debt + long-term debt – (cash and cash equivalents). [‡]Cash and cash equivalents = debtors, income accrued, prepayments, investments, advances, reserves (not land, buildings, equipment or wool inventories). Market support fund began on 2 September 1974. These funds are not included in either assets or liabilities. Paid for by 5% wool tax and net sales of wool. In the balance sheets of AWC, they are included as a liability as they are owed to farmers. [§]Stocks 31 December 1972. [¶]2001: six months to December 2001. ^{††}Wool tax is only those funds raised that were put in the MSF. They do not include levies used for promotion and research. Sources: Annual Reports. ABARE, Australian Commodity Statistics.

the AWC whose advice differed, particularly in the late 1980s. This advice, regardless of its source, was often over-ruled from within the AWC. Over the longer term, the float of the Australian dollar in 1983 increased the complexity of price forecasting. In addition, the Government underwriting of the scheme created a moral hazard that encouraged more audacious price settings and finally the extremely rapid increase in the minimum floor price, which doubled in A\$ terms between 1984/85 to 1988/89, boosted the supply of wool.

The change in the governance arrangements that occurred intensified the problems associated with the scheme. Although the changes were made ostensibly to create a greater commercial focus for the AWC, the organisation was still left with statutory powers not generally associated with corporatised government companies, and with a board made up of largely of representatives of woolgrower interests, who were inclined to attempt to use those powers to further their own interests.

3. Costs of the scheme

In determining the scope of the policy failure, it is necessary to examine the costs and benefits over a longer period (1970-2001). This is a difficult task. Not only are there the direct costs of operating the scheme, captured in the AWC's financial accounts, but there are additional costs arising from the impact of the scheme on the price of wool. While selling off the stockpile after 1991 depressed the prices for new wool, it is also true that the purchases in the years immediately before 1991 would have inflated wool prices. The impact of buying and selling wool by the AWC may have largely counterbalanced each other. Moreover, in the absence of the scheme private operators would have incurred greater costs associated with the storage, sale and administration of wool marketing. Also, as Richardson points out (Richardson 2001), the operation of the RPS crowded out some of the alternative means for price risk management, including liquid futures markets and physical contracts and caused considerable disruption to the international trade in wool. Finally, it also encouraged the South African and New Zealand wool authorities to conduct stockpile schemes of their own which entailed additional costs in those two countries (Abbott 2013).

Determining all of these costs would be a difficult and complex task, and we are on firmer ground looking at the direct costs and benefits of the RPS scheme over the entire period 1970 to 2001. To do this, we estimate the financial performance of the RPS as a profit maximising speculator.⁷ In nominal terms, the cash flow outcome of the stock purchases and selling activity would be calculated along the lines:

⁷ We thank John Freebairn for this suggestion.

Table 2 Costs of the reserve price scheme 1970/71 to December 2001

	Nominal \$ m	\$ m 1990/91
Purchases of wool	9,541	13,524
Sales of wool	7,673	10,885
Loss on purchases and sales	1,868	2,640
Interest paid	2,122	2,638
Interest received	1,477	2,029
Net interest paid	645	609
Storage, handling, selling and administration costs	1,077	1,306
Overall cost of the scheme	3,590	4,555

Source: Calculated from figures in Table 1.

$$\sum \{(P_t^s Q_t^s - P_t^b Q_t^b) - D_t r_t - C_t\}$$

where P^s is the sell price of stock; Q^s is the amount of stock sold; P^b is the stock buy price; Q^b is stock bought; D is the accumulated financial debt; r is the interest rate on the debt; and C is the administrative and storage costs of the scheme.

To estimate values in real terms then each is deflated using the GDP deflator to get the cost of the scheme in constant dollar terms. The results of this exercise are given in Table 2, using the data from Table 1. The results in both nominal and constant dollar terms are listed in Table 2. Broadly the costs and the benefits can be divided into two parts. The first is the loss on purchases and sales – that is the difference between the prices paid by the wool authorities for wool, and the price that they sold wool for between 1970 and 2001. The second is net interest minus other costs – interest received on Market Support Funds minus the interest paid on debt accrued, and minus the storage, handling, selling and administrative costs of the scheme.

In the first part of Table 2, the focus is on the purchase and subsequent sale of wool. In nominal terms, the purchases of the authorities operating the RPS amounted to around \$9,541 million (this is the aggregation of numbers in Column A-Table 1) over the period 1970-1991. But it is also true that these purchases were also sold, mostly over the period before 1991, but also from the stockpile after 1991. The sales of wool partially made up for the cost of purchasing the wool. The nominal value of the sale of the wool was \$7,673 million (aggregated sale values in Column B-Table 1). The difference between the two is \$1,868 million. As well as counting the value of purchases and sales and other costs in nominal terms, the figures are converted into constant dollar terms. The reason for doing so is that the real value of the sale and purchase of a bale of wool can differ depending on the year in which it is sold. The GDP deflator is shown in Column M in Table 1 with 1990/91 as the base year. The loss is greater, \$2,640 million in 1990/91 dollars.

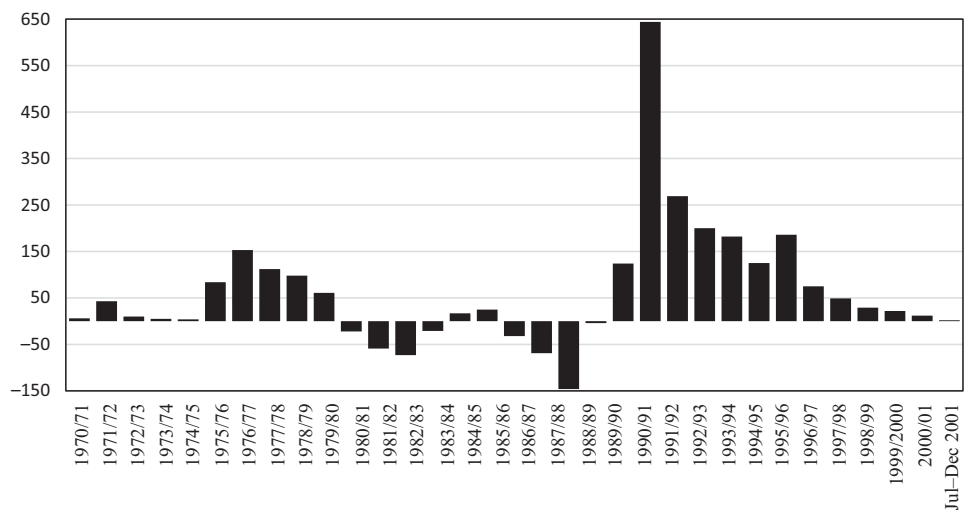


Figure 6 Net interest cost plus the cost of storage, handling, selling and administration of the Australian RPS 1970/71 to December 2001 (\$000, 1990/91).

In addition to the loss on the buying and selling of the stock of wool by the AWC, there are the costs of operating the scheme. These include the net interest paid on debt and the storage and administrative costs. The net interest amounted to \$645 million (\$609 million in 1990/91 \$ terms). Storage, handling and administrative costs were \$1,077 million (\$1,306 million in 1990/91 \$ terms).

Altogether, the cost of the scheme was losses of \$3,590 million or \$4,555 million in 1990/91 \$ terms. These figures are in addition to those identified by Richardson (2001), of approximately \$1 billion (\$1,000 million), which were the taxpayer funded emergency measures undertaken after the collapse.

Figure 4 provides the costs of the scheme in terms of the net interest cost plus storage, handling, etc., in 1990/91 \$ terms. Eighty per cent of the total costs were incurred between 1989/90 to 1995/96, and 30 per cent occurred in 1989/90 (Figure 6).

In addition to these direct costs, agricultural economists were engaged in a debate about ‘hidden costs and benefits’ of this type of scheme from the early 1960s. (Powell and Campbell 1962; Duloy and Parish 1964; Gruen 1964; Tisdell 1972; Ward 1978; Lewis 1979; Campbell *et al.* 1980; Haszler and Curran 1982; Richardson 1982). The main hidden gains and losses identified by the Australian agricultural economists were the impacts on grower revenue of the purchases and sale of stocks. To begin with Powell and Campbell (1962) and Gruen (1964) distinguished between the profitability of a hypothetical RPS from its effects on producer/consumer surplus and from revenue gains and losses. Measuring the hidden revenue effects (gains and losses) of wool price stabilisation depends upon the relative size of the

demand and supply elasticities, and if and how they change over time. Scholars have argued that these elasticities can change in response to changes in income levels (Grubel 1964; Wright 1979; Newbery and Stiglitz 1981; Wright and Williams 1982).

Generally, the impact of rising prices of wool when the authorities purchased wool would be counterbalanced by the reduction of prices when stocks are sold. If, however, the price elasticity of demand is greater (i.e. more elastic) when the stocks are being sold, then when they are purchased the net impact would be a gain to growers. On the other hand, if the price elasticity of demand is lower when the wool is sold, then it is possible that the RPS would lead to net losses.⁸ If the supply elasticities are more or less elastic, this too can impact on the degree to which prices and therefore grower revenue is affected by price movements.

Past estimates of demand and supply elasticities for wool tend to be inelastic, although the estimations are varied (see summaries in Hone and Hope 1994; Haszler *et al.* 1996; and Abbott and Merrett 2016). Whether the elasticities would change depends on a range of factors, the most important being changes in the prices of substitute goods. In the case of the supply, elasticity of wool, however, changed little. For instance, the average price of wool (clean) grew from 533 cents/kg in 1985/86 to 1,003 in 1987/88 (an 80 per cent increase in price). The lagged increase in wool offered to auction between 1986/87 to 1989/90 was 70 per cent (3,209,080 to 5,432,103 bales). After the collapse of the scheme, average prices fell to 488 cents/kg (a 50 per cent reduction in price), with the lagged reduction in wool offerings falling by 52 per cent). Large increases (and decreases) in price, therefore, led to fairly substantial changes in production, implying that the price elasticity of supply did not change and was around unit elasticity.

In the case of demand, the elasticities are influenced by the price changes of substitutes (cotton and synthetic fibres). Most studies contending that elasticities can differ over time, do so because they assert that markets are imperfect and that substitution is distorted. This means that there must be a tendency on the part of manufacturers (i.e. demanders of wool and other fibres) to have a different response to rising prices compared to lowering prices. That is, they must be either more responsive to a change in rising prices (i.e. switch to alternative fibres) than they are to falling prices (i.e. switch to wool from alternative fibres) or the opposite. Changes in income levels can also change the level of the elasticities. At the time of the collapse of the Australian scheme, a world recession was taking place, where demand for wool was very low, and unresponsive to changes in price. This affect was only important for a few years in the early 1990s, as demand and prices strengthened from 1994/95 onwards (see Figure 1).

⁸ This is the view expressed by Grubel as early as 1964 who argued that demand is typically less elastic during periods of high demand than it is during periods of depression, in the latter case substitution being easier when an industry is operating below capacity (Grubel 1964, 384).

This means that it was only in the years 1991/92 to 1993/94 that the demand elasticity was lower than before and after the recession. Of these years, it was only in 1991/92 that significant stocks of wool were sold from the stockpile (\$331 million worth of wool: Table 2), the authorities being reluctant to sell wool in the depressed market. In that year, the sales from the stockpile in value terms were 11.5 per cent of total Australia wool sold. As the average price of greasy wool in that year was 359 cents/kg, if a demand elasticity of -0.5 is assumed, then the stockpile sales depressed prices from an average of 519 cents/kg to 359 cents. If the elasticity had been lower due to falling incomes (around -0.25), then the stockpile sales would have reduced prices to 439 cents. The difference between the two prices is 80 cents/kg, which represents the difference between the effect of buying the stockpile (when the elasticity was -0.5) and selling (if it had fallen to -0.25). As 1,066 million kg of Australian wool was produced in 1990/91 (Figure 5), this represents a loss in value of \$853 million to the industry. It would be expected then that the losses in the years of recession up to 1993/94 would have seen a loss of \$1,000 million or more.

Including this 'hidden' cost takes the total cost of the RPS to the growers (Table 2) over the years 1970 to 2001 to \$4,590 million in nominal costs and \$5,555 million in 1990/91 prices, an increase of approximately 20 per cent. The timing of the 'hidden' cost coincided with the years of the greatest concentration of direct costs and with the emergency funds falling on taxpayers. This estimate of the 'hidden' costs to the industry of the sales from the stockpile must be treated with caution. A thorough analysis would require the construction of a comprehensive model of wool supply and demand, along with speculation by private parties and the AWC, with private decisions influenced by expected prices, however formed, and allowing for variability of prices, and exogenous supply and demand shocks. Even then, there would be alternative and contestable views about the details of the model, including the shapes of the demand and supply curves.

4. Conclusion

The collapse of the RPS had a dramatic impact on the Australian wool industry. Understanding the nature of this collapse can provide assistance in understanding why organised schemes such as these often fail. In terms of this study, a few conclusions can be drawn. First, why did the RPS collapse in 1991? Was the collapse inevitable?

Buffer stock schemes are prone to failure because of forecasting errors about market price levels and as overshooting the long-term market price induces increased production that puts further downward pressure on prices. Moreover, the operators of the scheme might have insufficient financial resources for its defence in the face of sharp price reductions. We have shown that elements of these weaknesses were apparent in the RPS towards the later years of its life. However, we concur with Richardson (2001) and Massy

(2011) that decision making within the wool organisations and the changing relations between the Government and those bodies with respect to the determination of the floor price was a critical tipping point. The AWC misread the market and then refused to reduce its excessive floor price quickly enough to prevent a rapid accumulation of stocks. Its role as a speculator ended in tears. The problems of running the scheme were not just the problems with estimating long-term changes in prices, but instead in the politics involved in managing the expectations of woolgrowers as well as the changes in governance which intensified these problems. Even during the disposal of the stockpile post-1991 difficulties in forecasting wool prices meant that income from the sales was not optimised. Controversy over the pace of these sales continued post-1991, a reflection of the difficulties associated with determining an optimal disposal strategy. The changes in governance arrangements in the late 1980s also intensified these problems, creating as they did conflicts of interest and moral hazards. The attempt to 'corporatise' the AWC was flawed in its intent, both because it still retained considerable regulatory powers not generally associated with a corporatised entity, but also because the board that oversaw its operations was made up mainly of interested parties rather than with people focused on the commercial operations of the AWC.

Finally, we estimate the direct cost of the scheme over the period from 1970 to 2001. Our figure at \$4,555 million in 1990/91 \$ terms is above that of Richardson (2001) (\$1 billion) who calculates the cost to the taxpayer and well below Massy (2011) (\$9 billion) would estimate the cost to growers as well as taxpayers. Our figure is drawn from the full set of accounts of the RPS and includes as estimate 'hidden' costs arising from a heightened degree of the inelasticity of demand with respect to price during the recession of the early 1990s. However, we have not attempted to estimate any additional costs associated with the displacement of private futures markets or storage providers, etc. These affects were probably in excess of an additional \$1,000 million of 'hidden' costs although more work would need to be undertaken to get a more definite estimate.

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