The effectiveness of industry assistance in Australia

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Abstract: The effectiveness of industry assistance in Australia has been little investigated. The renewed interest for addressing market failure after the global financial crisis is not reflected in Australian policy. Here industry assistance is investigated by comparing across industry sectors the share of industry assistance in gross value added and the profit share in output for 20122013. Industry assistance is small and falling in both the growing primary production sector and in the shrinking industry sector. Sectoral estimates of the impact of the effective rate of assistance on multifactor productivity and output from 1990 to 2013 find no link between assistance rate and multifactor productivity, while growth in the latter would raise output in primary production and manufacturing. Factors unrelated to industry performance appear to have determined sectoral industry assistance in Australia.

1. Introduction

This paper investigates the effectiveness of industry assistance at industry sector level in Australia over recent years. Industry assistance is regaining attention as part of a reassessment of the role of industry policy since the Global Financial Crisis (GFC) (Stiglitz *et al.* 2013; Mayhew 2013; Warwick *et al.* 2013), as addressing market failures. Industry assistance is taken to include support for firms through government budgetary measures (including for R&D) and tariff protection (PC 2014), while it should encompass broader aspects of government support (Green & Toner 2012; Mayhew 2013). Despite the renewed international interest, the current Australian policy is to reduce industry assistance from already low levels, having fallen from over 30% to 3% of GDP since 1971 (PC 2014). Considering its policy importance, there has been remarkably little assessment of effectiveness especially at industry sector or aggregate level (Knopke 1988; Chand 1999) and this paper seeks to address that.

Accordingly we first consider what industry assistance covers and the rationale for it (Rodrik 2004). While the focus here is on budgetary and tariff assistance to industry, more widely it encompasses the government contribution to business through infrastructure, regulation of competition, consumption and the labour market, macroeconomic policies, and deeper institutional support. Prior to the GFC industry assistance had come to be regarded with industry policy as 'associated with ineffective and wasteful government interventions at the sectoral and organizational levels' (Mayhew 2013; Rodrik 2004). The market failure rationale for industry assistance which received renewed consideration after the GFC is outlined for this paper (Mayhew 2013, Rodrik 2004).

In investigating the effectiveness of industry assistance at industry sector level, this paper confines itself to only direct and explicit industry assistance, from budget and tariffs, as has been conventionally measured annually for Australia by the government economic policy research body, the Productivity Commission (PC 2014). Strategic assistance might be expected to be reflected in allocation across industry sectors. A positive association with profit share or output growth could be expected within a growing industry if an infant industry approach is taken to policy. Industry assistance ought to promote multifactor productivity (MFP) if it improves innovation. It should increase output growth in exporting sectors according to export led growth. This also depends on government priorities for industry policy, existing industry structure, and the innovation requirements specific to the industry sector. Investigation across industry sectors allows this consideration.

Comparing the recent pattern of industry assistance in relation to industry sector GVA and profit share across industry sectors over the years 20072008 to 20122013 allows inferences about the policy priorities for industry assistance in Australia. In order to investigate and compare the contributions of industry assistance to MFP and output growth over the longer term, estimates are obtained from 1990 to 2013 for three key sectors, primary production, mining and agriculture. The decline in industry assistance in primary production is associated with growth in output and profit share. However industry assistance is found to be unrelated to MFP growth in primary production, the only sector where it is growing. This suggests that MFP rather is being driven by the globalization of that industry sector. In the mining sector the low share of industry assistance in mining GVA, high but declining profit share and declining MFP reflect capital extensive production and apparently low returns to innovation in that sector. A fairly stable share of GVA in the declining manufacturing sector and little evidence of contribution of ERA to MFP growth suggests a pattern of industry assistance due

to incumbency rather than picking winners. The findings for the pattern of assistance across these key industry sectors in Australia imply a lack of effectiveness and an absence of setting priorities for industry policy.

The next section sets out the rationale for industry assistance and the types of industry assistance. The section after that presents the method for investigating the pattern and effectiveness of industry assistance, including for recent years the measurement of the share of industry assistance components across Australian industry sectors, their association with sector GVA and profit share, and estimation of the contribution of industry assistance to MFP and output growth. The final section is the conclusion.

2. Background: rationale for industry assistance, and the types of assistance

The recourse to industry assistance after the GFC called into question the 'free market' approach which had prevailed. It was recognised that an absence of explicit policies merely leaves industry policy to a default setting (Stiglitz *et al*. 2013; Chang 2011). The renewed attention is not matched with empirical investigation of the effectiveness of industry assistance, a part of industry policy, as intended to 'stimulate growth and productivity and rebalance the economy by influencing the sectoral mix of production' (Mayhew 2013). This reconsideration remains largely absent from Australian policy, where assistance is basically assumed to distort incentives and impede market function including the operation of comparative advantage (Banks 2013, Green and Toner 2012). The Overview to the PC's (annual) *Trade & Assistance Review 20122013* states 'Although assistance generally benefits the receiving industry and businesses, it penalises other industries, taxpayers or consumers' (PC 2014).

Having earlier announced 'the end of the age of entitlement' (Hockey 2012), the Federal Treasurer Joe Hockey said prior to the first Budget in 2014 'Too many taxpayers' dollars have been spent on corporate welfare and too often previous governments have been drawn into areas that are better left to the private sector. Not only are these policies an unsustainable use of taxpayers' funds, they also undermine economic incentives, productivity, and ultimately our national prosperity.' (http://www.liberal.org.au/latest-news/2014/04/23/case-change-address-hon-joe-hockey-mp-treasurer). In a context where industry assistance was at its lowest level in forty years (PC 2014), the need to investigate its effectiveness is imperative.

2.2   *The rationale for industry assistance*

Industry assistance is regarded as ineffective or worse in the neoliberal argument, adversely favouring some companies, sectors or countries over others (vertical or selective) and leading to rentseeking. This is regarded as less so if it applies equally to all entities (horizontal), for instance lower corporate tax rates (Mayhew 2013). It affects investment and innovation decisions, leading to suboptimal size and allocation of resources intertemporally. It reduces both total and factor productivities, as resources are misallocated, X-inefficiency proliferates and innovation slows.

Arguments in support of industry assistance emphasize the importance of market failure (Mayhew 2013, Rodrik 2004). Government subsidies and trade protection are defensible according to infant industry or export led growth, and weighing up adjustment costs (Chang 2005). R&D subsidies for one firm's investment generate externalities to other firms, supporting Schumpetarian growth. Vertical policies can be justified by infant industry arguments where capital markets will not 'finance new and promising sectors'. Knowledge spillovers from co-location, clustering or hubs need support in order to generate a big push. Regulation which promotes competition may promote efficiency. 'Rent switching' allows a domestic firm favoured by the government to establish itself in international trade, where the private market would not fund it (Mayhew 2013, 250). Public infrastructure provision and private infrastructure subsidy and regulation provide services otherwise not or suboptimally provided due to network externalities, including in education where production and consumption externalities affect human capital supply. Government failure can also be corrected by such industry assistance, for instance operating well run state enterprises despite poor political governance (Stiglitz *et al.*; 2013, 12).

Table 1 presents types of market failure in relation to industry assistance, along with industry examples and their policy solutions, and examples specific to Australian policy. The examples overlap because more than one market failure is present in the activity. In addition industry assistance also has macroeconomic aspects, affecting employment, stabilisation, economic growth, productivities and sustainability.

Table 1: Types of market failure, examples and policies

Type of market failure:	Symptom	Example:	Policy:

Externality	Spillover from activity to third parties, not reflected in market price:		
• negative	Static, price < optimal, output > optimal, U↓	Pollution from extractive industries and manufacturing	Carbon tax: emissions trading scheme or tax establishes incentive to develop nonpolluting technologies
	Dynamic, price < marginal user cost Discount rate > optimal	Natural resource current use contributes to future exhaustion	Mining tax, sovereign wealth fund (Future Fund), subsidy to energy saving
• positive	Static, price > optimal, output < optimal, U↑	Private health services, lower access reduces labour and HC productivity	Public health services (Medicare)
	Network, coordination: marginal value > 1/n where n is number of points in network	Post, telecommunications, freight transport and logistics, infant industry	Postal service, NBN, regulation of transport and logistics, realizing dynamic comparative advantage, big push
	Dynamic, charge > optimal, quality < optimal	Education and training, contributes to HC, R&D and innovation	Public education, regulate standards, cross border mobility
Public good (or bad)	Indivisibility and nonexcludability		
	Public good, MC→0, U↑	R&D, innovation	Big push hubs, clusters, CSIRO, public education
		Telecommunications, the arts, media	NBN, Australia Council
	Public bad, MC→0, U↓	Climate change, biodiversity reduction	Carbon tax, CSIRO, mining tax, water policy
Imperfect information	Typically producers information > users information, risk preference, adverse selection, moral hazard	R&D, innovation	CSIRO, higher ed
	p>optimal, output<optimal		
Imperfect markets	Few or single seller (or buyer)	air transport, banks, media	ACCC, public provision, regulation (Qantas), 'four pillars', cross media ownership
Government failure	Industry assistance exacerbates negative outcomes in presence of market failure	Logging in old growth forests	Forests policy, World Heritage

Source: derived by author

An empirical investigation of industry assistance at industry sector level is faced by what should be included for the purposes of investigation, given the range of industry assistance (Rodrik 2004). This is summarised in Table 2.

Table 2: Types of industry assistance

	Direct	**Indirect**
Explicit	subsidies, tax breaks and tariffs	support for R&D institutions
	lower corporate tax rates	government contribution to human capital through health, education and training and R&D, OHS
	budget item subsidies and tax breaks to specific businesses or industries, including PPPs for infrastructure construction or operation	services to other business from public infrastructure spending, subsidies to private infrastructure
	support of in firm R&D	(de)regulation of labour market
		competition policy and infrastructure regulation, pricing policy
Hidden	no charge or 'undercharge' for use of natural and public assets, a higher level or quality of provision.	regulatory capture
	off budget funding	arbitrary favour for a particular firm within or without a tender process, including property planning applications.
	not specifically itemised in PPP arrangements.	corruption.
	administrative tariffs	macroeconomic, fiscal, monetary and stabilization
	underreporting of tax payments	legal system and property rights, institutions and culture.
	tax minimization	
	tax avoidance and evasion	

Source: derived by author

This paper focusses on direct and explicit industry assistance (PC 2014) as shown in Table 2, leaving its wider aspects for investigation elsewhere. In a second best world at aggregated level there is no ready to guide to determining optimal levels of industry assistance. At industry sectors level, the direction for optimal policy, whether to increase, reduce or redirect assistance is only broadly inferred so that a positive relation would be expected with output growth, profit share and MFP growth. The following section follows this methodology for evaluating the contribution of industry assistance across key industry sectors for Australia.

3. The pattern of industry assistance and its effectiveness across industry sectors

The pattern and effectiveness of industry assistance across Australian industry sectors is investigated in this section. The scale of industry assistance is compared across industry

sectors where data is available. Its effectiveness over 20072008 to 20122013 is investigated by comparisons in relation to share in GVA and growth of GVA, sector allocation, and profit share across primary production, mining and manufacturing. Finally estimates for the longer period from 1990 to 2013 are obtained for the contribution of industry assistance to MFP and output growth.

3.1 The scale of industry assistance

The direct and explicit section in Table 2 taken to correspond to the standard PC measure of industry assistance in Australia which includes 'import tariffs, budgetary outlays, taxation concessions, regulatory restrictions on competition, and government purchasing arrangements' (PC 2014, 3). The relevant budget items and tariff rules are allocated in the budget to the responsible government agencies and items must be assigned by the PC to the industry receiving them, along with estimates of some regulatory effects, including the tariff impost on imported inputs.

A major omission in the measure for our purpose is Australian states' support not programmed in the Federal Budget, and the PC lists a wide range of items not included in its measure (PC 2014, 56). Significantly corporate tax avoidance is not referred to. Estimates can differ widely, such as subsidies to the mining sector reported as $4.5 billion from Federal and $3.2 billion from states in 20132014 (TJUV 2014, citing Peel *et al*., 2014), compared with the PC estimate of $0.547 billion from the budget.

Current industry assistance in Australia is very small by the PC measures, with total combined industry assistance (from budget and net tariff) at A$8.5 billion in 20122013 (PC 2014), calculated here as 3.0% of budget outlays and 0.56% of GDP. Input tariff penalties of A$7.1 billion fall mainly on the service sector. 84% of the combined total is due to manufacturing, mostly from net tariff. Combined industry assistance was slightly lower in nominal terms in 20122013 but with a similar share in government expenditure to the previous five years (PC 2014). Calculated here in real terms (chain volume), total combined assistance fell by nearly one third (32.4%) or 7% per annum over the five years 20072008 to 20122013, the period immediately following the GFC, during a Labor government and with a relatively strong Australian dollar.

3.2 Industry assistance from budget and tariff and Gross Value Added (GVA) across industry sectors

In order to investigate whether the assistance share of GVA has a positive or negative association with sector growth rates the years since the GFC, the breakdown shares of budgetary, tariff and combined assistance in sector GVA are here calculated. This is presented in Table 3 together with industry sector GVA average annual growth rates 2007-2008 to 20122013 derived (from ABS 5402005).

Table 3: Industry assistance as a share of industry gross value added (GVA) 20072008 to 20122013

		2007-2008	*2008-2009*	*2009-2010*	*2010-2011*	*2011-2012*	*2012-2013*
	Assistance, % of industry GVA from :	%	%	%	%	%	%
Primary production	Budget	8.4	6.3	5.7	4.2	4.3	3.3
	Net tariff	0.3	0.4	0.5	0.4	0.4	0.5
	Combined	9.2	6.8	6.2	4.6	4.7	3.8
Average p a real growth in GVA, %†							4.1%
Mining	Budget	0.5	0.4	0.6	0.4	0.6	0.4
	Net tariff	-0.2	-0.2	-0.2	-0.1	-0.1	-0.2
	Combined	0.3	0.2	0.4	0.3	0.4	0.3
Average p a real growth in GVA, %							4.0%
Manufacturing	Budget	1.6	1.6	1.9	1.6	1.8	1.6
	Net tariff	5.9	6.0	5.7	5.5	5.5	5.4
	Combined	7.5	7.6	7.6	7.1	7.2	7.0
Average p a real growth in GVA, %							-1.0%
Services	Budget	0.4	0.4	0.3	0.3	0.4	0.3
	Net tariff	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4
	Combined	-0.1	-0.1	-0.1	-0.1	0.0	-0.1
Average p a real growth in GVA, %							5.6%*

Total	Budget	0.8	0.7	0.8	0.8	0.7	0.5
	Net tariff	0.2	0.2	0.1	0.1	0.1	0.1
	Combined	1.0	0.9	1.0	0.9	0.8	0.6
Average p a real growth in GVA, %							1.9%

Sources: derived by author from PC 2014 Table A2 and ABS 5402005. †all GVA% estimated from current GVA deflated by GDP chain price index ABS 5204003

The impression of the ongoing importance of primary production and mining in the Australian economy is reinforced in Table 3. Both sectors grew over 4% per annum from 20072008 to 20122013, exceeded by the growth in services. However manufacturing GVA declined by one per cent per annum.

Except for primary production, where the share of budgetary assistance has fallen from 8.4% to 3.3%. The shares of budgetary assistance in GVA for all the industry sectors are generally small and remarkably stable over the years 20072008 to 20122013. This corresponds to a decline in real terms in already small budgetary assistance.

The small negative share of net tariff in GVA in mining is due to the input tariff penalty. The share of the net tariff in GVA is the highest in manufacturing at 5%-6%, mainly due to output tariff protection to textiles, clothing and footwear, and metal products, in the context of a shrinking manufacturing sector. This compares with a very small share in primary production, jumping from 0.28% in 20072008 to around 0.4%0.5%, due to an increase in output tariff, and a very small negative share in mining due to input tariff cost.

The share of combined assistance in GVA in primary production declined from 9.2% in 20072008 down to 3.8% in 20122013, swamping the other sectors and resulting in a fall from 1.0% to 0.60% of total GVA over the same period.

This reflects low and declining priorities for industry assistance at industry sector level. The allocation across industry sectors has been largely a legacy of historical policy priorities within sectors, with a long term decline in assistance to industries in long term decline.

3.3   Industry assistance allocation across industry sectors

The historical priorities for industry assistance are informed by the relative shares in total GVA of industry sector GVA 19891990 to 20122013 as presented in Figure 1. The shares in

assistance to each industry sector out of the total are then compared for recent years with the share of industry sector GVA in the total.

The stable share of primary production in total GVA since 20072008 highlights the decline in assistance in real terms. The share of mining in total GVA reflects the volatility in that sector. The share of manufacturing in total industry GVA has declined three percentage points since 20072008.

Figure 1: Shares of industry sector GVA in total GVA, 19891990 to 20122013
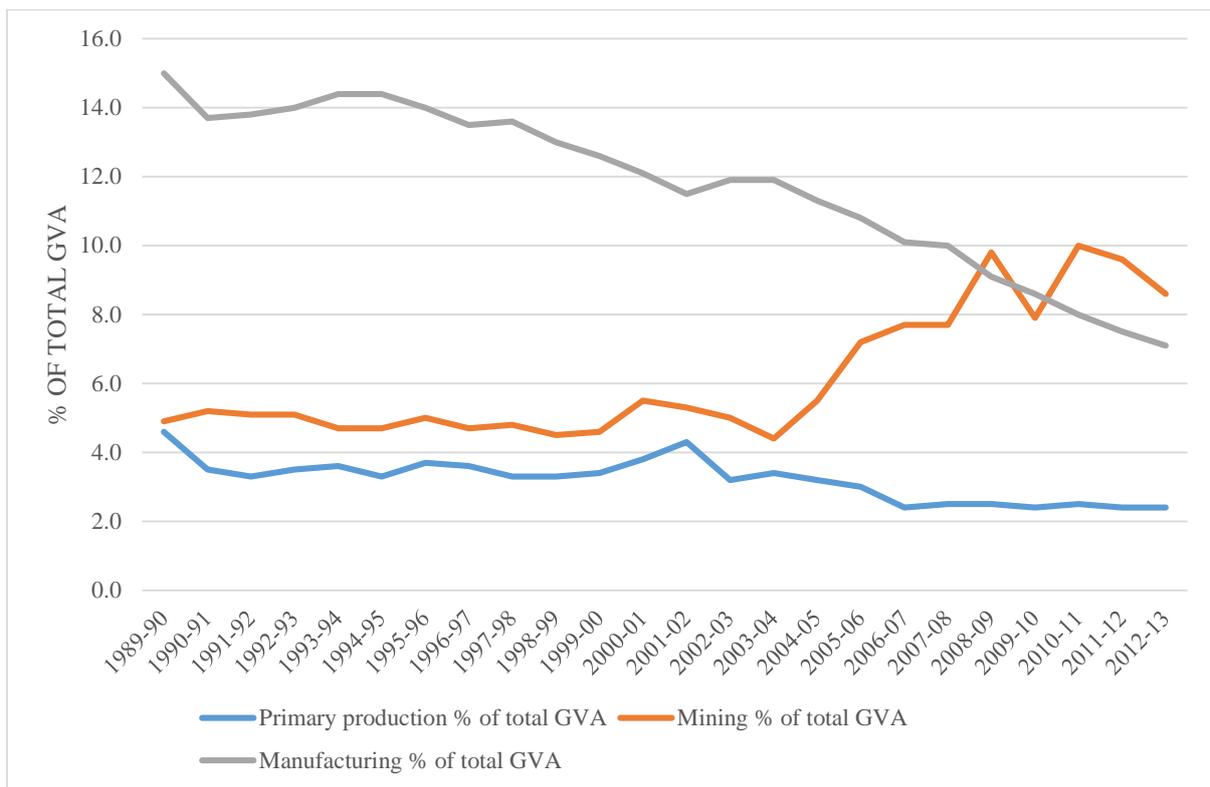
Source: derived from ABS 5204005

Table 4 shows the industry sector priority for industry assistance, comparing the breakdown shares of total assistance granted to each industry sector (PC 2014) with the share of industry sector GVA in total GVA (ABS 5204005).

Table 4: Share of industry sector in total GVA, budget and tariff assistance, 20122013

| Industry sector	GVA, A$m, 20122013	Share of industry GVA, %	Share of budget outlay to industry, %	Share of tax concession to industry, %	Share of gross tariff assistance, %	Share of input tariff penalty, %
Primary production	34190	2.40	17.43	10.90	3.08	1.15
Mining	122028	8.57	9.19	4.26	0.01	3.05
Manufacturing	101427	7.13	30.47	8.12	96.90	29.22
Services	1165536	81.90	36.51	50.93	0.0	66.58
unallocated other			6.40	25.79		
Total	1423181	100.00	100.00	100.00	100.00	100.00
Total value, A$m		1423181	4375.1	3395.8	7843.1	-7112.4

Source: derived from PC data, and ABS 5204005

Whereas primary production is 2.4% of total GVA, it receives 17.4% of budget outlays and 10.0% of tax concessions to industry. Notably the share of tariff assistance to primary production is consistent with its share of industry GVA. Manufacturing receives assistance disproportionate to its share in GVA (7.1%), from both budget (30.5% of outlays) and gross tariff (97%). The currently expanding sector of primary production dominates budget assistance despite the real decline in the latter, and the shrinking sector of manufacturing dominates tariff protection.

3.4 Industry assistance and profit share

Does industry assistance increase the share of profits in output? A positive association with profit share in output could be expected within a growing industry sector, although of course many other factors interact, including the effect on factor intensity due to technological advance and changes to market structure encourage rent accumulation. Figures 2, 3, 4, 5 and 6 present for primary production, mining, manufacturing, services and total industry respectively the profit share as proxied by EBITDA/GVA where profits is taken as Earnings before Interest, Tax, Depreciation and Amortisation (EBITDA); the share of industry assistance in output as measured by IA/GVA where IA is combined industry assistance; and the share of industry assistance in output IA/EBITDA, from 20072008 to 20122013.
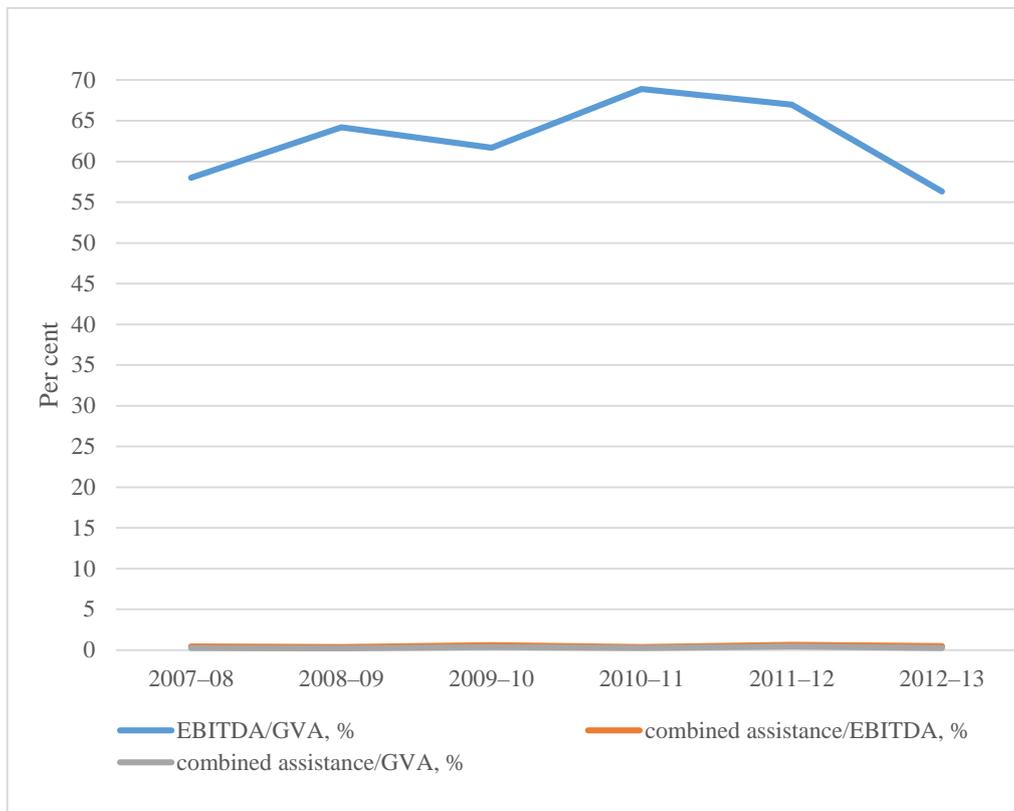
Profit share is rising only in primary production and services, while falling in manufacturing and recently mining, for a downturn overall. The increase in sector profit share in primary production coincides with a fall in the share of industry assistance in its sector profits, the latter being high anyway. This is consistent with the building up of primary production following prolonged drought also coincident with a trend to increasing globalisation for primary production, with technology transfer.

Figure 2: Primary production: Profit share of GVA, combined industry assistance percent of GVA, and combined industry assistance percent of EBITDA
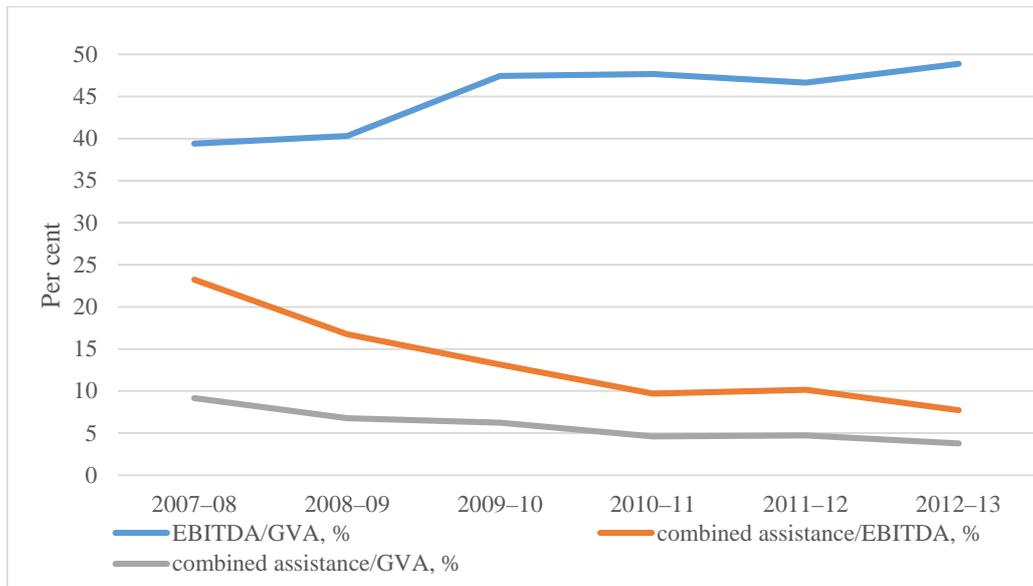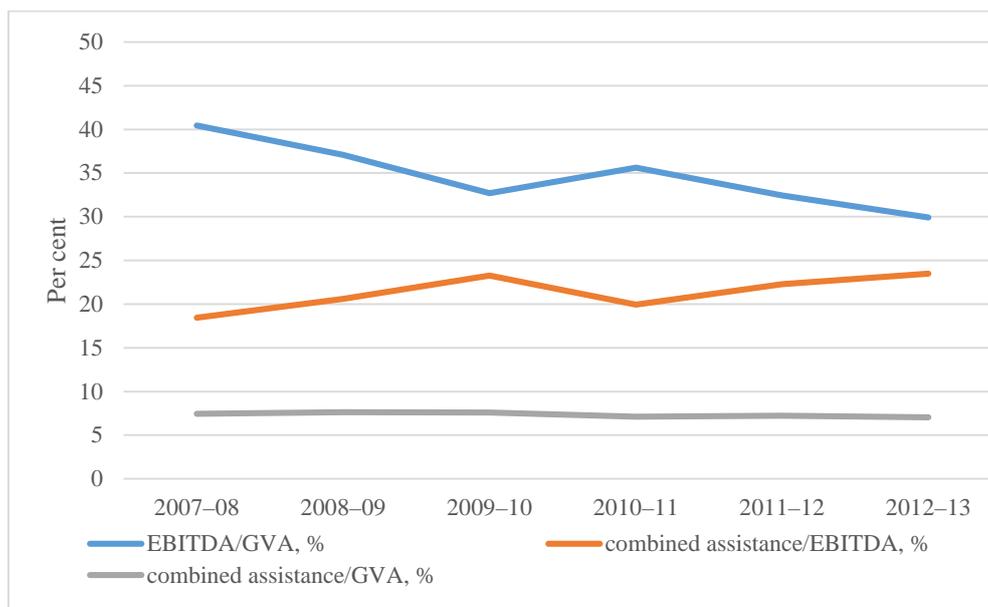

Sources: derived from PC 2014, ABS 524005, ABS 81550DO001_201213

Figure 3: Mining: EBITDA percent of GVA, combined industry assistance percent of GVA, and combined industry assistance percent of EBITDA
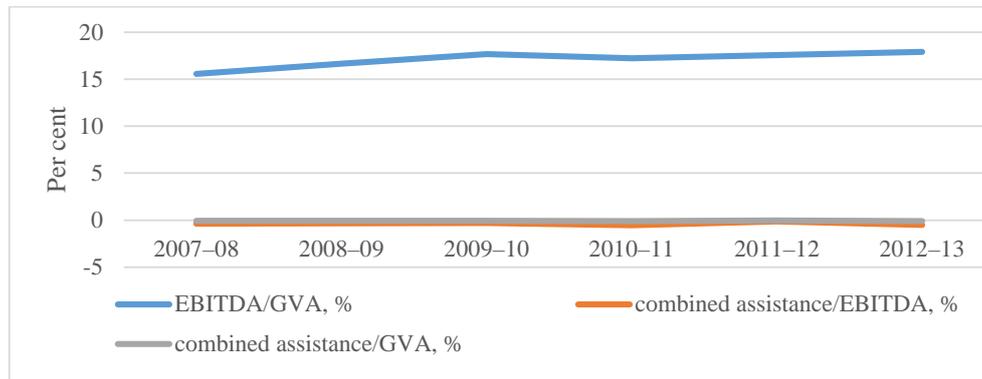
Figure 4: Manufacturing: EBITDA percent of GVA, combined industry assistance percent of GVA, and combined industry assistance percent of EBITDA

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Figure 5: Services: EBITDA percent of GVA, combined industry assistance percent of GVA, and combined industry assistance percent of EBITDA
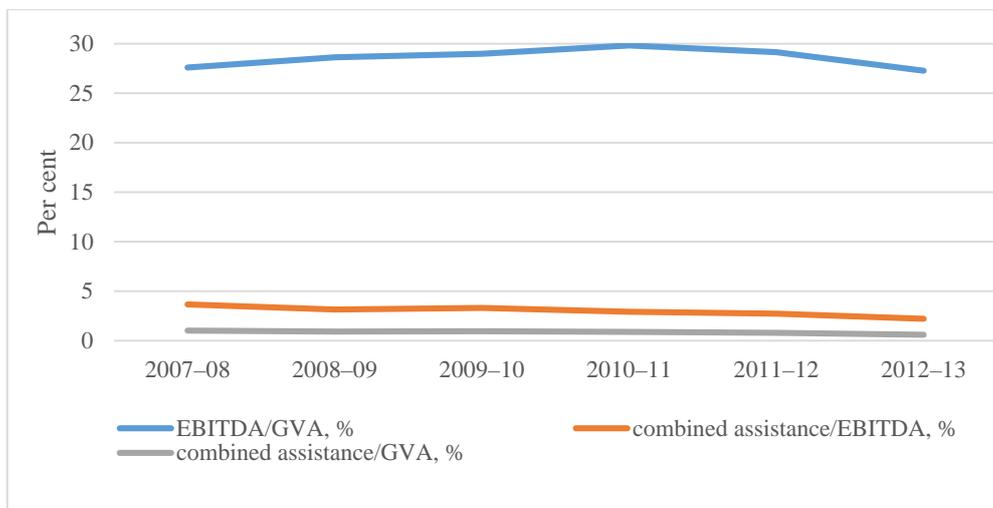

Sources: derived from PC 2014, ABS 524005, ABS 81550DO001_201213

The high profit share in mining reflects its capital intensivity, in a volatile sector. Manufacturing is the reverse of primary production. A downward trend in the profit share in manufacturing coincides with an apparent rise in the share of assistance in profits. Increasing globalisation has not promoted Australian manufacturing, and apparently neither has the relatively high share of assistance.

The low but increasing profit share in services also reflects its labour intensivity, with the measure of GVA problematic in a relatively nontraded sectoral output with traded inputs.

Figure 6: Total industry GVA: EBITDA percent of GVA, combined industry assistance percent of GVA, and combined industry assistance percent of EBITDA

Sources: derived from PC 2014, ABS 524005, ABS 81550DO001_201213

Overall, the increasing profit share with lower assistance points to the globalisation of primary production, whereas the decreasing profit share and higher share of assistance in profits in the manufacturing sector is consistent with its decline.

3.5 Industry assistance and productivity

In order to explore effectiveness of industry assistance in promoting productivity, longer time series, from 1990 to 2013, were able to be obtained in order to investigate the impact of the effective rate of assistance (ERA) on MFP and real GVA across the three industry sectors of primary production, mining (from 1996) and manufacturing. Studies of the impact of industry assistance on productivity in Australia industry have been very few and more disaggregated (Chand 1999, Knopke 1988). Chand (1999) used an import parity series for output, assuming the output was largely of intermediate goods, in eight 2 digit manufacturing industries and using a growth accounting model, finding that one per cent reduction in the nominal rate of assistance increased total factor productivity by up to 0.5 per cent for 19681969 to 19941995. Knopke (1988) applied a Tornquist index to find that the much less protected Victorian dairy industry achieved higher productivity than the NSW industry.

The truncated approach taken due to data limitations is found to be useful nonetheless. This involves estimation in two stages. In the first stage the impact of effective rates of industry assistance (ERA) on multifactor productivity (MFP) for the primary production, mining and manufacturing sectors is estimated. In the second stage MFP and ERA were regressed on GVA across the three industry sectors.

Data on ERA in agriculture and manufacturing are derived by splicing the overlapping series' from the data for Figure 4.5 (PC 2014, Plunkett *et al*., 1992). Comparable series for mining are not available and were proxied by unpublished PC data obtained for budgetary assistance to the mining sector from 19961997. This is a suitable proxy as the net tariff in mining is very small. MFP data are from ABS 5260.0.55.002 for the 'market sector' from 19891990. GVA data are from ABS 5204.005. An unbalanced panel (due to the shorter data series for mining, starting in 1997) for 19891990 to 20122013 was obtained.

The results are presented in Table 5.

Table 5: OLS regression results for the effectiveness of ERA

Industry sector	Primary production	Mining	Manufacturing
Dependent variable	MFP, growth rate		MFP, growth rate
Period	1991-2013		1991-2013
ERA, growth rate	-0.08		0.02
ρ	(0.20)		(0.7514)
R^2	0.03		0.00
Log likelihood	20.50		57.62
Durbin-Watson	2.38		2.47
Dependent variable	MFP, growth rate	MFP, growth rate	MFP, growth rate
Period	1998-2013	1998-2013	1998-2013
ERA, growth rate	-0.29*	0.00	0.10
ρ	(0.01)	(0.96)	(0.40)
R^2	0.37	-0.47	0.05
Log likelihood	17.91	22.52	39.29
Durbin-Watson	2.10	1.10	1.98
Dependent variable	GVA, growth rate		GVA, growth rate
Period	1991-2013		1991-2013
MFP, growth rate	1.06*		0.68*
ρ	(0.00)		(0.00)
ERA, growth rate	0.00		-0.11*
ρ	(0.83)		(0.02)
R^2	0.95		0.34
Log likelihood	54.37		58.92
Durbin-Watson	1.82		1.23
Dependent variable	GVA, growth rate	GVA, growth rate	GVA, growth rate
Period	1998-2013	1998-2013	1998-2013
MFP, growth rate	1.05*	-0.17	0.72*
ρ	(0.00)	(0.45)	(0.01)
ERA, growth rate	0.00	-0.02	-0.22*
ρ	(0.97)	(0.70)	(0.03)
R^2	0.94	-1.11	0.41
Log likelihood	36.04	25.27	42.40
Durbin-Watson	1.90	1.43	1.16

*denotes statistical significance at 5% level.

For the first stage, separate OLS regressions in growth rates for the full sample period from 1991 found no effect of ERA growth on MFP growth in primary production and manufacturing. Growth rates forms do not allow long run relationships to be directly inferred,

but the variables are more likely to be difference stationary if large samples are available. Moreover the scarcity of data allows little investigation of lagged effects. Estimates for the three industries for the shorter sample period from 1998 found for primary production only a 0.3% reduction in MFP for a one per cent increase in ERA. However a log likelihood ratio test for significant difference between the estimations for primary production for the two period lengths found the results were not significantly different. Panel estimation with cross industry fixed effects did not add to information from the separate industry regressions which is not surprising and suggests that industry assistance is indeed determined on an industry specific basis. Impacts of assistance on factor productivities are not here captured and merit further investigation elsewhere.

In the second stage, the lack of impact found of ERA on MFP in growth rates in the first stage means that regressing both MFP and ERA on GVA in growth rates form across the industries is possible. In primary production one per cent MFP growth increased its GVA by about one per cent for both sample lengths, while ERA growth had no effect. In manufacturing a one percent increase in MFP increased output by about 0.7%, however one percent growth in ERA reduced output growth about 0.1% to 0.2%. Overall the effect of assistance on MFP is zero, while the effect on output growth is zero, but small and negative in manufacturing.

4. Conclusion

The findings confirm that empirical investigation at industry sector level can shed light on the effectiveness of industry assistance. Focussing on industry assistance from the budget and net tariffs reveals the difficulty of capturing the impacts of industry assistance narrowly or broadly, particularly in the labyrinth that is Australia's federal system. The recent decline in what was already relatively small industry assistance is shown, but with a different rate of withdrawal in real terms from different industries, mostly in terms of budget to agriculture, and tariff to manufacturing. With the policy impetus to limit industry assistance, the impression is of industry allocation largely determined by inertia, hysteresis and *ad hoc* allocations which are politically determined.

Primary production prevails over other sectors in terms of sector priorities for budgetary assistance in 20122013, again reflecting cyclically and politically determined priorities where assistance does not appear to have promoted the innovation and globalization occurring in the

sector. However the need to evaluate assistance for priorities such as environment and resources is not precluded by this.

Industry assistance in mining while sizeable in dollar terms is very low as a share of GVA in the mining sector. With declines in multifactor productivity and recently in output growth, this reflects the capital extensiveness and low returns to innovation in that sector, and the dependence of Australia's economic growth on that sector.

The effect of disproportionate (mainly tariff) assistance to manufacturing does not appear to promote output or innovation, and reflects the absence of a long term approach. The decline in MFP in a declining sector suggests industry assistance according to incumbency rather than picking winners and a lack of policy attention to the sector.

Little connection is found between industry assistance and MPF across the three industries from what are sparse estimations, calling for wider investigation of productivity impacts elsewhere. In agriculture growth in MFP and not assistance raises output growth. The findings for manufacturing decline in MFP growth contributes to decline output growth. However little support is found for reductions in industry assistance. Rather, a review of industry priorities is called for. Benefits from the reduction in assistance are not as apparent at industry sector level in recent years as they ought to be in order to confirm that policy.

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