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THE SHORT-RUN EFFECTS ON

THE AUSTRALIAN ECONOMY OF ALTERNATIVE

OIL-PRICING POLICIES

by

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ABSTRACT

The literature on oil-pricing policy has generally concentrated on the long-run issue of resource allocation. From this viewpoint a policy of world parity pricing is usually optimal. This paper uses the ORANI model of the Australian economy to compare the short-run effects of an increase in the world price of oil under the alternative domestic crude oil-pricing policies which were proposed by the two major political parties prior to the recent Federal election. Results are presented for selected macro-economic variables and industry outputs. The results give an indication of the size of some short-run advantages of restricting the rise in domestic oil prices below that implied by world parity pricing. These advantages, which are concentrated in export and import competing industries, would need to be assessed against the longer run disadvantages of such an approach before any policy conclusions are reached.

explore for oil. Most of the literature on oil-price policy has concentrated on these long-run issues and concluded in favour of world parity pricing.[1] This paper suggests the magnitudes of some short-run costs of world parity pricing to be set against the long-run gains in any cost benefit analysis of the oil-pricing decision.

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1. See, for example, Industries Assistance Commission (1976).

3. CONCLUDING REMARKS

The effects on the domestic economy of an increase in the real world-oil price will depend on what pricing policy is adopted for domestically produced crude oil. In the recent Federal election the two main parties put forward different oil-pricing policies : the Liberals favouring world-parity pricing for domestic crude and the Labor party proposing to hold the rise in the domestic price below the rise in world prices. In this paper the multi-sectoral ORANI model of the Australian economy has been used to compare the short-run effects on the economy of a rise in world oil prices under the alternative domestic pricing policies. Full wage indexation and fixed real domestic absorption were assumed.

The results indicate that the policy of restricting the rise in domestic oil prices when world-oil prices rise produces short-run gains in terms of the domestic price level, G.N.P., aggregate employment and the balance of trade as compared with the policy of world parity pricing. The effect of the policy on individual industries arises from the fact that it allows a lower domestic-cost level than would result from world parity pricing. Industries which engage in international trade are best placed to take advantage of this relative cost reduction. The results presented here show that it is these industries, especially the exporting industries, which have most at stake, in the short run, in decisions about oil-pricing policy.

It must be emphasized that this paper has concentrated solely on short-run effects. No consideration has been given here to longer run questions about resource allocation or the incentive to

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world price of crude oil. A selection of the investment suppliers is given in the fourth group in Table 2.2. Those which supply investment goods to agriculture (Agricultural machinery for example) are projected to gain from the adoption of the alternatives to world parity pricing when oil prices rise. Expansion in the outputs of the agricultural export industries will have led to a reallocation of the investment budget in favour of agriculture. The output of construction related industries on the other hand is not intensively used in capital formation in the export sector. Hence the reallocation of investment does not benefit the construction sector.

The final group in Table 2.2 consists of predominantly non-trading industries. The projections indicate that these industries are not likely to be affected much by the choice of a domestic oil-pricing policy. In the absence of international competition their selling prices move closely with their costs.

The export related industries are a second group which is projected to experience strong output advantage as a consequence of the price-indexation and price-freeze policies. Although not exporting directly, this group produces commodities that are sold mainly to export industries. A good example is the meat producer, Northern beef. Beef is not exported on the hoof but only after processing in the meat products industry (industry 18). Note again that the agricultural industries are strongly represented in the export-related group.

The major import competing industries also stand to gain from policies which tend to hold down domestic costs. The extent to which an industry competes with imports depends on both the share of imports in the total absorption by the domestic economy of commodities classified to that industry, and the users' elasticity of substitution between imports and the domestic source.[1] Industries in the textiles, clothing and footwear sector and in the metal products sector are good examples of industries which face strong import competition.

The output response of industries primarily supplying investment goods will depend on the way in which the aggregate investment budget (which is assumed fixed in all the simulations) is reallocated amongst industries under the three domestic crude oil-pricing scenarios following the two per cent increase in the real

1. The relevant substitution elasticities and import shares from the ORANI data base can be found in Dixon et al. (1982), Table 45.4.

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1. INTRODUCTION

Vincent, Dixon, Parmenter and Sams (1979) have shown how the ORANI[1] model can be used to analyze the short-term effects on the Australian economy of a change in the pricing policy applied to domestic crude oil. This paper uses a similar method to compare the short-term effects of the alternative oil-pricing policies that were proposed by the Liberal and Labor parties in the recent Federal election. The Liberal Party[2] proposed, and is currently implementing, a policy of world parity pricing. That is, the price of all domestic

* The author would like to thank Brian Parmenter, Peter Dixon, David Vincent, Russell Rimmer and Alan Powell for their encouragement and assistance. Full responsibility lies with the author.

The paper is a condensed version of an honours thesis submitted by the author to La Trobe University. Copies of the full thesis can be obtained by writing to the author whose current address is IMPACT Research Centre, 153 Barry Street, Carlton 3053.

1. ORANI is a multisectoral model of the Australian economy and is fully described in Dixon, Parmenter, Sutton and Vincent (1982).

2. Current Political Notes (1980).

crude oil is adjusted at six monthly intervals according to a formula based on the price of Saudi Arabian light crude. The Labor Party's proposal[1] distinguished between 'old' and 'new' domestic crude.[2] Full import parity pricing was to be applied to 'new' crude but a two-fold policy was suggested for the 'old' category : (i) to freeze its price for twelve months, and (ii) after the twelve months to then adjust the price at six monthly intervals by increases in the Australian consumer price index or by percentage increases in the import parity price, whichever is the lesser.

For this paper ORANI was used to project the short-run effects on the Australian economy of an increase in the world price of crude oil under three domestic crude oil-pricing scenarios which reflect the main elements of the alternative policies described above. The three scenarios are :

(1) world parity pricing : the price of domestic crude oil set equal to the world price of crude oil ;

(2) indexation : the price of domestic crude oil indexed to the consumer price index ;

(3) price freeze : the price of domestic crude oil held constant in monetary terms .

1. Keating (1980).

2. Oil produced from wells discovered before the 14th September 1975, is classified as 'old' oil. It should be noted that no 'new' domestic crude oil is currently being produced and that no significant production of 'new' oil will commence until approximately 1983-84 when production from the Fortescue field begins.

Table 2.2 continued ....

51.	Paints, varnishes	0.01	0.04
59.	Cement	0.00	0.01
60.	Ready-mixed concrete	- 0.01	- 0.04
61.	Concrete products	- 0.01	- 0.02
84.	Electricity	0.01	0.04
85.	Gas	0.00	0.01
86.	Water, sewerage	0.00	0.02
87.	Residential building	0.00	0.00
88.	Buildings, n.e.c.	- 0.01	- 0.06
89.	Wholesale trade	0.02	0.08
90.	Retail trade	0.00	0.00
91.	Motor vehicle repairs	0.01	0.04
92.	Other repairs	0.01	0.03
97.	Communication	0.01	0.04
98.	Banking	0.01	0.04
99.	Finance and life insurance	0.00	0.01
100.	Other insurance	0.01	0.03
101.	Investment, real estate	0.01	0.04
102.	Other business services	0.01	0.04
103.	Ownership of dwellings	0.00	0.00
104.	Public administration	0.00	0.00
105.	Defence	0.00	0.00
106.	Health	- 0.00	- 0.01
107.	Education, libraries	- 0.00	- 0.00
108.	Welfare services	0.00	0.01
109.	Entertainment	0.00	0.02
110.	Restaurants, hotels	- 0.00	- 0.01
111.	Personal services	0.00	0.00
112.	Business expenses	0.01	0.05

* For full details on industry classification, see Dixon et al. (1982), Section 45.2. Industries 9 to 13 and 16 to 112 correspond to the 1968-69 official input-output classification. See Australian Bureau of Statistics (1977).

Table 2.2 continued ....

67.	Metal products, n.e.c.	0.02	0.13
68.	Motor vehicles, parts	0.03	0.17
71.	Aircraft building	0.01	0.08
72.	Scientific equipment	0.02	0.13
73.	Electronic equipment	0.01	0.06
74.	Household appliances	- 0.01	- 0.06
75.	Electrical machinery	0.02	0.12
77.	Construction equipment	0.03	0.20
78.	Other machinery	0.03	0.16
79.	Leather products	0.02	0.10
80.	Rubber products	0.02	0.10
81.	Plastic products	0.02	0.10
82.	Signs, writing equipment	0.02	0.13
83.	Other manufacturing	0.01	0.05
96.	Air transport	0.02	0.12
	Selected industries supplying investment goods		
76.	Agricultural machinery	0.07	0.40
60.	Ready-mixed concrete	- 0.01	- 0.05
61.	Concrete products	- 0.00	- 0.03
88.	Buildings, n.e.c.	- 0.01	- 0.07
	Non-trading industries		
7.	Other farming non-traded	0.01	0.07
10.	Forestry	0.03	0.17
15.	Crude oil	0.00	0.00
17.	Services to mining	0.01	0.04
19.	Milk products	0.00	0.01
20.	Fruit and vegetable products	0.00	0.00
22.	Flour and cereal products	0.01	0.04
23.	Bread, cakes	0.00	0.00
26.	Soft drinks, cordials	- 0.00	- 0.00
27.	Beer and malt	- 0.00	- 0.01

continued ...

An underlying ten percent inflation rate was assumed to occur in the world and domestic economies. This assumption is important as it determines the extent of the squeeze on the real price of domestic crude oil which occurs under scenario (3). The results presented are a comparison of the corresponding three sets of projections. It is important to note that the paper is confined to comparing the short-run effects of the policies. It has nothing to say about the longer run issues of resource allocation and incentives for exploration.

In conducting the simulations a two percent increase in the real price of crude oil on world markets was assumed. The model was then shocked with whatever increase in the domestic price of oil products would be implied by this world-price increase under each of the three pricing scenarios. The domestic price increases were derived on the basis of the shares of domestic and imported crude oil in the cost of refined oil. These shares were calculated using data, updated to July 1980, from a Broken Hill Proprietary Company Limited (B.H.P.) econometric model of refinery costs (B.H.P., 1980). The economic environment assumed in the simulations is the same as that assumed in Vincent et al. (1979, pp. 84-86). Briefly, a short-run assumption of fixed industry-specific capital stocks is imposed, real domestic absorption is assumed to be independent of domestic oil pricing,[1] real wages are held constant via 100 per cent indexation of money wage rates to the C.P.I. and all domestic labour markets are assumed to be slack.

1. That is real domestic absorption is assumed to be determined by other arms of government policy (fiscal and monetary policy for example) which are not modelled in ORANI. Thus because any taxes collected from increases in domestic crude oil prices will cut real domestic absorption, the government is assumed to take action that effectively adds back to real domestic absorption what the increase in taxes takes out, via, for example, a compensatory income tax cut.

2. RESULTS

Macro Projections

Table 2.1 contains, for some macroeconomic indicators, comparisons of the effects of the assumed two per cent increase in real world oil prices under the three domestic pricing scenarios.[1] The two colums show respectively deviations of the ORANI projections generated under the indexation and price-freeze scenarios from the projections generated under world parity pricing. Thus the first number in the first column, for example, is to be interpreted as indicating that following a two per cent increase in the real world oil price, the index of consumer prices would rise by 0.06 per cent less if the price of domestic crude were indexed to the domestic C.P.I. than it would if world parity pricing were enforced for domestic crude. Similarly the first number in the second column indicates that the rise in the domestic consumer price index would be 0.37 per cent lower if the price of domestic crude were frozen than it would be under world parity.

In fact the comparisons between the price level projections are the key to understanding the overall result. Since the exchange rate is assumed fixed in the simulations, any shift in the domestic price level can be interpreted as a shift in domestic prices relative to world prices. Such shifts are particularly important for import competing and exporting sectors of the economy. The selling prices

1. Results were also computed for alternative assumptions regarding the change in the real world price of crude oil.

Table 2.2 continued .....

	Import competing industries		
16.	Non-metallic minerals, n.e.c.	0.01	0.07
21.	Margarine, oils and fats	0.02	0.11
24.	Confectionery	0.00	0.02
28.	Alcoholic drinks, n.e.c.	0.01	0.06
29.	Tobacco	0.00	0.01
31.	Man-made fibres, yarns	0.04	0.27
32.	Cotton, silk, flax	0.04	0.23
33.	Wool and worsted yarns	0.01	0.04
34.	Textile finishing	0.01	0.03
35.	Textile floor coverings	0.01	0.04
36.	Textile products, n.e.c.	0.02	0.15
37.	Knitting mills	0.01	0.03
38.	Clothing	0.01	0.03
39.	Footwear	0.02	0.13
40.	Sawmill products	0.02	0.13
41.	Plywood, veneers	0.01	0.07
42.	Joinery and wood products	0.00	0.02
43.	Furniture, mattresses	- 0.01	- 0.09
44.	Pulp, paper	0.03	0.18
45.	Fibreboard	0.02	0.10
46.	Paper products, n.e.c.	0.01	0.06
47.	Newspapers and books	0.01	0.07
48.	Commercial printing	0.01	0.07
50.	Industrial chemicals	0.04	0.24
52.	Pharmaceuticals	0.02	0.10
53.	Soap and detergents	0.00	0.01
54.	Cosmetics, toiletry	0.00	0.01
55.	Chemical products, n.e.c.	0.03	0.17
56.	Oil and coal products	0.10	0.63
57.	Glass	0.02	0.12
58.	Clay products	0.01	0.07
62.	Non-metallic mineral products	0.01	0.04
65.	Structural metal	0,02	0.12
66.	Sheet metal products	-0.00	-0.01

continued...

TABLE 2.2

Industry Output Projections: Comparisons of the Effects of a Two Per Cent Real Increase in the World Price of Crude Oil Under Alternative Domestic Crude Oil-Pricing Scenarios

ORANI number		Comparisons between projected outputs: Effect under indexation minus effect under world parity pricing	Effect under price freeze minus effect under world parity pricing
	Export industries*		
1.	Pastoral zone	0.03	0.17
2.	Wheat-sheep zone	0.03	0.16
3.	High rainfall zone	0.05	0.29
11.	Fishing	0.12	0.73
12.	Iron	0.01	0.06
13.	Other metallic minerals	0.06	0.34
14.	Coal	0.12	0.72
18.	Meat products	0.04	0.26
25.	Food products, n.e.c.	0.10	0.61
30.	Prepared fibres	0.06	0.34
63.	Basic iron and steel	0.07	0.45
64.	Other basic metals	0.07	0.43
	Export related industries		
4.	Northern beef	0.04	0.26
5.	Milk cattle	0.02	0.10
6.	Other farming export	0.05	0.29
8.	Poultry	0.01	0.08
9.	Services to agriculture	0.03	0.20
49.	Chemical fertilizers	0.03	0.19
69.	Ship and boat building	0.06	0.39
70.	Locomotives	0.03	0.16
76.	Agricultural machinery	0.07	0.40
93.	Road transport	0.02	0.15
94.	Railway transport	0.03	0.19
95	Water transport	0.02	0.15

continued ...

TABLE 2.1

Macro Projections[a] : Comparisons of the Effects of a Two Per Cent Real Increase in the World Price of Crude Oil Under Alternative Domestic Crude Oil-Pricing Scenarios

Variable	Comparisons[b]: Effect under indexation minus effect under world parity pricing	Effect under price freeze minus effect under world parity pricing
ORANI index of consumer prices	- 0.06	- 0.37
Aggregate employment (persons) [c]	0.02	0.13
Aggregate exports (foreign currency value)	0.07	0.42
Aggregate imports (foreign currency value)	- 0.02	- 0.10
Balance of trade/G.N.P.	0.01	0.07
Real gross national product	0.01	0.09

a. All projections are in percentage change form except for Balance of trade/G.N.P. where the change in the balance of trade is expressed as a percentage of the G.N.P..

b. To compare the effects of the world oil-price increase under the price-freeze scenario with the effects under the indexation scenario simply subtract column one from column two.

c. Aggregate employment calculated in persons is based on the assumption that hours worked per person are constant.

of industries in these sectors are heavily influenced by world market conditions which are largely independent of domestic costs.[1] Changes in the domestic price level, and thus in domestic costs, will therefore directly affect the profitability of the trading industries. This is reflected in the aggregate trade comparisons in Table 2.1. Since the adoption of indexation or a freeze for domestic crude oil prices rather than world parity pricing has the effect of holding down domestic cost levels in the short run when world oil prices rise, exports are projected to be higher and imports to be lower under indexation or freezing of domestic oil prices than under the world-parity-pricing scenario.

Correspondingly, the indexation and price-freeze policy scenarios are projected to have favourable short-run implications, as compared to world-parity pricing, for the balance of trade and, with domestic absorption held constant, to increase aggregate employment and the G.N.P.. These effects are all larger in the case of the price-freeze scenario than they are when oil prices are indexed. The reason is that, of the three scenarios considered, freezing the domestic crude oil price has the greatest restraining influence on the domestic price level when world oil prices increase.

1. In fact a small country assumption is made in ORANI with respect to import prices. Imports and domestic supplies of the same commodity classification are distinguished as separate commodities and modelled as imperfect substitutes for each other. The elasticities of world demand for Australia's major export commodities are assumed to be high, although not infinite. Their exact numerical values are given in Dixon et al. (1982), Table 29.5.

Industry output projections

Comparisons of the industry-output projections for the three oil-pricing policy scenarios are given in Table 2.2. The interpretation of these results is exactly analogous to that for the macro-comparisons.[1] For nearly all industries, outputs are projected to be higher under indexation or freezing of domestic oil prices than under world parity pricing.[2] When world oil prices rise, domestic industries are advantaged in the short run by the adoption of the alternatives to world parity pricing because the rise in domestic costs generated by the world-price increases is smaller. The direct effect of oil-price changes on industries' costs is not particularly important in this mechanism. For most industries, the share of oil in total costs is small. The main impact is felt via indirect effects, especially the effect on wage rates which are assumed to be indexed to the domestic index of consumer prices. The variation across the industry-output results is explained mainly by variation in the responsiveness of industries to domestic cost changes.

In Table 2.2 industries have been grouped into categories which roughly reflect their responsiveness to cost changes. The major export industries are on average the most responsive group and hence have most to gain in the short run from oil-pricing policies which restrict the rise in domestic oil prices below the rise in world oil prices. These industries sell large shares of their outputs on world markets where demand is assumed to be highly elastic. Their output prices are therefore largely independent of their costs. A large share of the agricultural sector (industries 1 - 3) is included in this group.

1. See page 4.
2. The G.N.P. projections in Table 2.1 can be interpreted as an index of the industry-output results.