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# Are resource-abundant economies disadvantaged?<sup>†</sup>

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Economies well endowed with natural resources relative to other factors of production have grown slower than other economies over the long term. In reviewing possible explanations for this, the article finds unconvincing such common suggestions as declining terms of trade and rising restrictions to primary product markets abroad. It suggests the most likely reason is these countries' own distortionary policy regimes. Recent reforms in some resource-rich economies are already yielding growth dividends. The article also examines the impact of the greening of world preferences and politics on the prospects for resource-abundant economics.

This article reflects on two recent developments in our profession as they relate to Australia and its primary producers. One stems from the renewed interest in national economic performance (as reflected, for example, in demands for reduced government intervention in markets), which has stimulated economists to seek better explanations of why economic growth rates differ between nations. That research has, among other things, raised again the question of why economies well endowed with natural resources relative to labour and other capital—including Australia but also many low-income economies—appear to have performed relatively poorly over the long term. The other development is the burgeoning interest globally in environmental issues (broadly defined to include safe food and freedom from exotic pests and diseases) and the accompanied calls for *more* government intervention because of the externalities involved.

This demand for more environmental policies may at first seem at odds with the general desire to reduce the role of governments. But it takes only a moment's reflection to realise that these two developments are not inconsistent. Reducing governmental distortions to markets boosts national income, and income growth boosts the demand for all normal goods and

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services, including a clean environment. If a cleaner environment is not only a normal good but a superior one (in the sense that its income elasticity of demand exceeds unity), all the more reason to expect income growth to generate demands for better environmental outcomes. Furthermore, if reducing government-induced wastage improves the efficiency of resource use, that is consistent with more environmental consciousness. There is, however, a real risk that heavy-handed or otherwise inappropriate environmental policy responses could undermine the gains from other economic reforms—and even be environmentally counter-productive.

Important aspects of both developments—the demand for better economic performance particularly through reducing government activities and regulations, and the demand for government initiatives to better protect the environment—are their international dimensions. In the first case, economic rationalism has contributed to large-scale liberalisations of trade in goods, services, financial capital and technologies in many parts of the world during the past decade or so; and in the second case, we have heard calls for international environmental agreements and for guarantees that freer international trade and investment will not harm the environment. Since those international dimensions are likely to continue to grow in importance, they are a particular focus of attention in what follows.

The article first reflects on why economies well endowed with natural resources relative to labour and other capital (hereafter referred to as ‘resource-abundant’ or ‘resource-rich’ economies) have grown slower than resource-poor, densely populated ones over recent decades. This issue is not to be confused with the issue of convergence of per capita income levels across countries, because here resource richness is referring to differences not in *aggregate* abundance of resources (and hence not in per capita incomes) but rather in national resource endowment *ratios*. The article then looks at how the greening of politics that accompanies income growth is altering policies and thereby affecting future prospects for resource-rich economies such as Australia’s. In both sections questions are being raised as much as answers given, but hopefully those questions will stimulate new empirical research on yet-to-be resolved issues.

### **1. Why have resource-rich economies grown relatively slowly?**

The world’s fastest growing economies in recent decades—Japan, Hong Kong, Singapore, Taiwan, South Korea, and more recently China—are all densely populated. That is, they are poorly endowed with natural resources relative to labour. In particular, they have very little agricultural land per worker. By contrast, among the slowest-growing of the more advanced economies this century have been land-abundant Argentina, Australia and New Zealand, not to mention the slower-growing, land-abundant, low-

income economies of Latin America and Sub-Saharan Africa. More generally, statistically very significant negative relationships have been found between GDP growth rates and indexes of comparative advantage in natural resource-based products. Sachs and Warner (1995), for example, explore regression relationships between GDP growth from 1970 to 1989 and the ratio of resource-based exports to GDP in 1970 for a sample of 97 developing countries, and find the latter to be a significant explanation of the former, whatever other exogenous variables are included in the regressions. Anderson (1995a) explores a slightly longer period with both wealthy and developing countries, using as a comparative advantage index an estimate of food self-sufficiency ratios in the early 1980s at free-trade prices. That too was highly negatively correlated with GDP growth since 1970.<sup>1</sup>

One possible explanation for this negative relationship is that easy riches lead to sloth. The sixteenth-century French political philosopher, Jean Bodin (1576), asserted that: ‘Men of a fat and fertile soil are most commonly effeminate and cowards; whereas contrariwise a barren country makes men temperate by necessity, and by consequence careful, vigilant, and industrious.’ It is not clear how Bodin perceived the impact on *women’s* efforts, but in any case I suspect differences in inherent slothfulness *per se* (as distinct from inactivity induced by government policies that dampen incentives) are likely to provide at most only a minor part of the explanation for growth rate differences—although I’m not sure how that claim could be tested empirically.

Another often-claimed and related explanation for growth rate differences is cultural determinism. A journalist from the London newspaper *The Times*, who was travelling in Asia in the mid-nineteenth century, reported that the country he was in was inhabited by a homogeneous race of lazy people whom he believed were incapable of ever being industrious. An Australian consultant visiting the same country in 1915, to report to its government on its workers, wrote:

My impression as to your cheap labour was soon disillusioned when I saw your people at work. No doubt they are lowly paid, but the return is equally so; to see your men at work made me feel that you are a very satisfied easy-going race who reckon time is no object. When I spoke to some managers they informed me that *it was impossible to change the habits of national heritage* [emphasis added].<sup>2</sup>

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<sup>1</sup> See also Gelb and Associates (1988) and Auty (1990), who note the poor performance of many oil-rich developing countries since 1973.

<sup>2</sup> As quoted in Bhagwati (1983), with thanks to Justin Lin for bringing it to my attention.

Both reporters were referring to Japan! Those reports, and the fact that it was Europe and not Asia that enjoyed the first few centuries of industrial growth (Jones 1981), make nonsense of the opposite claim that rapid economic growth is peculiar to Asian or Confucian cultures.<sup>3</sup>

Some other common hypotheses that are more narrowly in the economic or political economy realms deserve more consideration. One, popularised by Prebisch (1964)—and contrary to the fear of Malthusians and other doomsdayers—is that resource-abundant economies face continual decline in their terms of trade. Another is the assertion that there are more growth-inducing factors associated with manufacturing industries than primary production. A third is that resource-poor economies have more scope to grow via technological catch-up. And a fourth is that the exporters of resource-abundant countries face larger protectionist barriers abroad than do exporters of non-primary products. Each of these is explored in turn, after which consideration is given to the possibility that policies are more distortionary in resource-abundant economies.

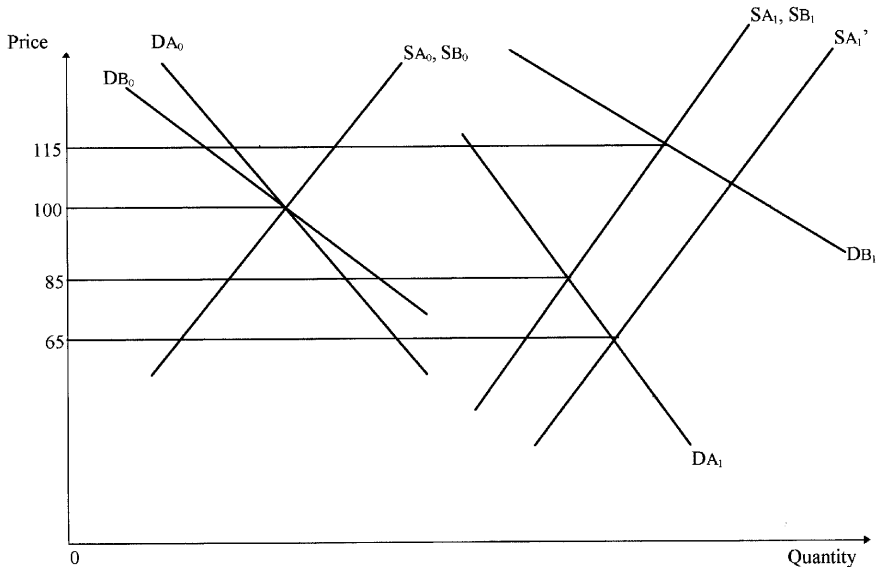
### 1.1 Deteriorating terms of trade

The price of primary products relative to manufactures in international markets appears to have been on a long-run decline for a century or more (Grilli and Yang 1988). Even when more sophisticated adjustments are made to the data to take into account greater improvements in the quality of manufactures, as Lipsey (1994) did recently, that tendency is only weakened rather than reversed. What explains that downward trend?

The most commonly suggested explanation is that the demand for primary products, particularly food at the farm-gate level, is income and price inelastic. The logic is captured in figure 1. Consider a frictionless world economy with just two goods A and B (primary and non-primary products). Assume that it is growing because of improvements in productivity, and suppose for a moment productivity growth is equally rapid in the two sectors. Then the global supply curves for the two goods would shift out at the same rate. In figure 1 the supply curves in the first period are assumed to coincide, hence they would still coincide in the second period after the productivity growth but be further to the right. The income boost resulting from that productivity growth would shift out the global demand curve for each good, but by less for good A (primary products) whose demand is less income elastic. In the illustrated example, the price of A relative to B would

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<sup>3</sup> A slightly more plausible cultural explanation is that ethnically diverse countries might suffer from low levels of trust that reduce investments, as in parts of Africa (Easterly and Levine 1995).



**Figure 1** Changes in supply and demand for primary and non-primary products in a growing economy  
 Source: Adapted from Tyers and Anderson (1992, p. 31).

fall from 1 to  $(85/115 =) 0.77$ , involving a 23 per cent deterioration in the terms of trade for sellers of primary products. Thus economies with a comparative advantage in primary products would grow less rapidly than other economies. For that relative price decline not to occur, given the differences in income elasticities, the slower growth in global demand for primary products would need to be matched by slower growth in their global supply—but then resource-rich economies (those whose primary sectors are relatively dominant) still would be growing slower, because of slower aggregate output growth.

The relative price of primary products would decline even more if there were relatively faster growth in their supply, for example, because of faster productivity growth in primary sectors. In that case, the lower price elasticity of demand for primary products would contribute too. Figure 1 shows that if the primary products supply curve shifted from  $S_{a0}$  not to  $S_{A1}$  but  $S_{A1}'$ , then the relative price of primary products would fall even more. In the example illustrated, that price ratio would fall from 1 not to 0.77 but  $(65/115 =) 0.57$ , representing a 43 per cent deterioration in the terms of trade for primary producers. That greater price decline may mean real incomes of resource-rich economies still grow slower than those of resource-poor economies, despite the greater output of primary products.

This possibility of faster productivity growth in primary than in non-primary production is rejected out of hand by many people. After all, they say, why would labour be drifting from primary to secondary and tertiary sectors if the former was experiencing faster productivity growth? That ignores the distinction between total and labour productivity growth, however. It happens that agricultural technologies have proven to be very malleable, becoming more labour-saving as the relative price of labour rises (Hayami and Ruttan 1985). So substituting land, other forms of capital, and other inputs for labour could be a sufficient explanation for the decline in agriculture's share of employment, leaving unanswered the question of which sector has the faster *total* factor productivity growth.

Two recent empirical studies have examined total productivity growth rates for different sectors across a large number of industrial countries for the 1970s and 1980s (OECD 1995; Bernard and Jones 1996). Both find a much higher rate of TFP growth for agriculture than for other sectors. Bernard and Jones report an average TFP growth rate of 2.6 per cent for agriculture compared with 1.2 per cent for industry, with only one of their sample OECD countries having TFP growth higher for industry than agriculture. An even more recent study, by Martin and Mitra (1996), examines new data for a much larger and more diverse sample of countries (almost 50 countries, two-thirds of them developing) for the quarter century from 1967 to 1992. They also found agriculture's TFP growth rate around twice that for manufacturing, with the difference being larger for developing countries but minor for OECD countries.<sup>4</sup>

An important contributor to rapid productivity growth is the speed with which new technologies can be imported, adapted and adopted. The international dissemination process may be even faster in primary production than in manufacturing. In mining this is because multinational corporations are typically needed to successfully develop large-scale mines, and they bring with them the latest appropriate technology or sometimes develop it on site (witness the innovative, capital-intensive operations of some of the multinational activities in Papua New Guinea, for example). In agriculture it can happen because of agroecological similarities. A recent study by Byerlee and Traxler (1996) found that international spillovers from agricultural research are pervasive, and considerably greater than previously perceived.

Even if evidence on relatively rapid productivity growth in primary sectors is accepted, many people still reject the idea that primary production can

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<sup>4</sup> Nor has TFP growth in mining and mineral processing been slow. See, for example, Tilton (1997).

contribute sustainably to long-run economic growth for another reason, namely, the finiteness of the natural resource base on which that production depends. There is only so much land that can be farmed or forested, or water that can be fished or used for irrigation, or fuels and minerals that can be mined. Thus in terms of figure 1, proponents of this view would say that in the long run, even if productivity growth were faster in the primary sector, the rightward shift of  $S_{A_0}$  would eventually lag behind that of  $S_{B_0}$  because the supply of one or more of its sector-specific primary factors is inelastic.

But the evidence casts doubt on the validity of this view as well. Technological developments continue to drive down the relative economic importance of natural resources in primary production. Farm chemicals—much maligned by some conservationists—raise crop yields and thereby reduce the arable land area needed to produce a tonne of grain. Intensive broiler, egg, and pig sheds and cattle feedlots—criticised by animal liberationists—reduce enormously the amount of land that would otherwise have to be trampled by cattle and sheep rather than cropped if all our meat supplies had to be grass-fed. Huge technological strides are also now being made that are changing fishing from a crude hunter-and-gatherer activity to high-tech deep-sea operations and fish farming (aquaculture). Dripper and other new irrigation techniques and more sensible pricing policies are making ever more efficient use of water in agriculture too. The technologies for mineral exploration, exploitation and processing continue to become more capital-intensive also. Beckerman (1992) notes, for example, that world sales of many minerals during the past 25 years have exceeded known commercially recoverable reserves around 1970, yet today's 'known reserves' exceed those of 25 years ago, despite the fact that the real price of minerals has trended downwards! In short, primary production, no less than and possibly even more than manufacturing and services, is becoming ever more intensive in the use of capital and intermediate inputs. This relative decline in the importance of land, water and mineral resources in primary production is likely to continue to erode the validity of the assertion that supply curve shifts cannot contribute to the explanation for the decline in the terms of trade for economies exporting natural resource-based products.

This review raises numerous empirical questions. For example, to what extent is the decline in the relative price of primary products in international markets due to a relatively rapid (or despite a relatively slow) outward shift in their supply curve as compared with the relatively slow growth in their demand (notwithstanding continuing population growth)?<sup>5</sup>

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<sup>5</sup>The relative unimportance of population in this story is explained convincingly in Johnson (1997).

If the supply curve *is* shifting out faster for primary products than for other products, to what extent is that output increase offsetting the drop in the relative price of primary products in terms of its impact on real incomes of resource-rich economies? It is quite possible that if primary sectors are enjoying relatively fast productivity growth for whatever reason, then this could be a reason to expect resource-rich economies to be growing more rather than less rapidly than other economies, provided the consequent change in the terms of trade were not too severe. The latter implies there is a premium on rapid adoption of new technologies, with those innovative resource-rich economies able to remain at the forefront of primary sector technology potentially doing well. My hunch is that the declining terms of trade for primary exporters could explain at most only a small part of the relatively lack-lustre growth performance of resource-rich economies, but that still needs to be tested empirically. If that is too difficult to do econometrically, it might be worth at least exploring possibilities through sensitivity analysis using a forward-looking global simulation model such as GTAP.<sup>6</sup>

## 1.2 More growth-inducing externalities in industry?

Let me turn now to the assertion, beginning with Adam Smith and David Ricardo, that there are more growth-inducing externalities associated with manufacturing industries than with primary production. Marshall (1890), for example, suggested this was because manufacturing was subject to increasing returns whereas primary production faced decreasing returns. Hirschman (1958) stressed the greater contribution of manufacturing via linkages. This idea was revived recently by Matsuyama (1992) using a two-sector model in which manufacturing is characterised by learning-by-doing that is external to the firm but internal to the sector, an idea extended by Sachs and Warner (1995) for a ‘Dutch disease’ model with a third sector producing non-tradable services. But this extension begs the question of why services (not to mention primary products—consider biotechnologies, for example) might not have learning-by-doing properties as assumed for manufacturing. If services did have those properties, a contraction of manufacturing following a primary sector boom need not slow the growth of a resource-rich economy as in the Matsuyama/Sachs and Warner models. On the contrary, given that the income growth from the boom would boost the demand for and hence production of non-tradable services

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<sup>6</sup> See, for example, the grain productivity growth simulation in Anderson, Dimaranan, Hertel and Martin (1997).

in addition to primary products, learning-by-doing properties in services—if sufficiently strong—could ensure these economies grow as fast as or faster than others. Hence the Matsuyama/Sachs and Warner ideas should be treated simply as theoretical possibilities yet to be demonstrated empirically.

### 1.3 More scope for technological catch-up in resource-poor economies?

This third possibility is based on the fact that relatively backward economies able to readily borrow superior technologies from abroad are likely to grow faster than those at the technological frontier whose productivity growth depends more on indigenous investments in innovation. There is empirical support for this as an explanation for the convergence of economic growth rates around the world.<sup>7</sup> However, this possibility is likely to be of less importance than is commonly presumed in explaining the slower growth of resource-rich as compared with resource-poor economies, because each group includes countries that are at or near the technological frontier and ones that are less advanced. Since resource richness here does not refer to the *aggregate* endowment of resources (as tends to be reflected in per capita income) but rather to the *ratio* of natural resources to other resources such as labour and produced capital, technological catch-up could be an explanation only if technological backwardness was negatively correlated with resource richness in that ratio sense. Unfortunately, it is difficult to get a reliable index of technological backwardness that is independent of other possible explanations of growth rate differences to test this (patent data perhaps?).

### 1.4 Ever-higher protectionist barriers facing primary exports?

What of the fourth assertion, that natural resource-abundant economies grow less rapidly because their exporters face ever-higher protectionist barriers than do exporters of non-primary products? If this were a true description of the pattern of distortions to world trade, it would simply be a contributor to the deteriorating terms of trade mentioned above rather than a separate factor. But is it a true description of that distortion pattern? Certainly agricultural and coal protectionism in Western Europe and

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<sup>7</sup> See, for example, Dowrick and Gemmell (1991), Fagerberg (1994), Eaton and Kortum (1995), and Williamson (1995).

Northeast Asia has been rising for decades, which gives Australians and New Zealanders the feeling that their growth opportunities are thwarted; but many other primary products face few trade barriers. Also, resource-poor, newly industrialising developing countries feel thwarted by OECD countries' restrictions to trade in such items as textiles, clothing, low-priced cars and steel; and services trade, in which many natural resource-poor high-income economies have a comparative advantage, is still highly protected too (PECC 1995).

Would the removal of all policy-induced barriers to goods and services, trade and investment globally make it easier or harder for resource-abundant economies to keep pace with other economies? The agricultural and coal protectionism mentioned above, for example, certainly lowers international prices for those products. But the policies of many developing countries depress their domestic prices and exports of these same primary products, keeping their international prices *higher* than they otherwise would be. OPEC, too, has indirectly supported international coal prices.

In the case of food products, empirical analysis by Tyers and Anderson (1992, table 6.9) suggests the effects of food policies of rich countries on international food prices have been offset almost exactly by the effects of opposite policies of poorer countries. Preliminary empirical results suggest much the same could be true for coal (Anderson and McKibbin 1997). Whether this would generalise if distortions to all product markets were removed simultaneously is an empirical question that global CGE models could in principle address but, to my knowledge, have not. However, the above examples suggest this is unlikely to be a major explanation of the relatively poor performance of resource-rich economies. Nor are the trade policy reforms that are in prospect, following the Uruguay Round and APEC free-trade-by-2010/2020 initiatives, especially likely to favour either resource-poor or resource-rich countries. This is because of the interdependencies that exist between groups of countries. For example, textiles reforms will speed the structural adjustment of resource-poor developing economies such as China away from primary production, which in turn will boost China's growth in demand for primary imports from resource-rich economies (Anderson *et al.* 1997), so both will tend to benefit.

### **1.5 Above-average distortions at home?**

With none of the above possibilities suggesting very strong reasons to expect resource-rich economies to grow slowly, another explanation is required. Might it mainly be that these economies have been more distorted than other economies? This hypothesis is suggested not just by the new growth theories but by virtually all the empirical evidence which shows that economies that are less open to trade, investment and technology inflows grow slower and,

conversely that those economies that reform most in multilateral trade liberalisations gain the most.<sup>8</sup>

It is certainly true that resource-abundant countries protect their manufacturers more than other countries at similar stages of development. Australia and New Zealand are classic examples. So too are many low-income countries of Africa and Latin America which tend also to limit imports of foreign direct investment and discourage, through poorly enforced intellectual property rights, the importation of new technologies.

One might argue by pointing out that land-scarce economies such as in Western Europe and Northeast Asia also are highly protectionist, albeit of their farmers and coal miners rather than their manufacturers. However, there is a difference between the protectionist stances of that group of countries and at least the high-income resource-abundant countries: the former are protecting a very small and declining portion of the tradables part of their economies, whereas Australia and New Zealand have been protecting the bulk of tradables production, namely manufacturing, and so have harmed their economies more. Furthermore, many resource-abundant developing countries have heavily discriminated against their primary sectors with export taxes and overvalued exchange rates, which has harmed the vast bulk of their tradables sectors too.

Given the abundance of strong empirical evidence showing that more distorted economies grow slower, this may well be the main explanation for resource-rich economies' relatively slow growth. If this is true, then the fact that Australia and New Zealand along with many (particularly South American) resource-rich developing countries are at last liberalising and opening their economies bodes well for their futures. Whether they liberalise sufficiently rapidly to match the growth rates of the rest of the world's economies, however, is a moot point and only time will tell. One encouraging bit of information is the growth record of the past decade, which shows the economies of Australia and New Zealand to be doing much better than the OECD average. Certainly that piece of casual empirical evidence is at least not inconsistent with the hypothesis that past distortionary domestic policies rather than such things as the terms of trade or the nature of production are to blame for slow growth in resource-rich economies.

This raises the intriguing political economy question as to why resource-abundant countries in the past have adopted more distortionary policies, and why those policies are now being dismantled in some but not all of those

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<sup>8</sup> Williamson (1995) finds that openness also affects upwards convergence of living standards: that occurred during the relatively liberal periods before the First World War and after the Second World War, but the opposite (divergence) occurred in the protectionist inter-war period.

countries. In recent years the economic theory of politics has been used to explain, among other things, inter-sectoral protection patterns across countries,<sup>9</sup> but has not to my knowledge been used to explain differences between countries in the overall extent of distortion, nor the timing and pace of reform. Analysts interested in doing so will find many suggestive ideas in the literature. Of particular interest are the myriad papers on the contribution of openness to the rapid growth of East Asia's resource-poor economies; a set of papers focusing on the policy choices of many mineral-exporting developing economies that have not performed well (but see the critique by Davis (1995) of the references therein); and studies on why some resource-abundant countries have chosen recently to radically reform their economic policies (e.g., Williamson 1994).

## **2. How will environmental concerns alter growth prospects for resource-rich economies?<sup>10</sup>**

With economic growth comes increasing demands for all normal goods and services, including a cleaner environment (broadly defined to include safer food and freedom from exotic pests and diseases). Governments are thus asked to impose tougher environmental standards as incomes rise. When this is done, each industry's producers often think they are losing competitiveness because of more stringent standards they must meet over time. However, this is true only relative to a situation that excluded them *but only them* from those tougher regulations. Typically, cost-raising standards will be rising in numerous industries simultaneously, both at home and abroad, so it is not inconceivable that an industry's international competitiveness could improve even though it is being subjected to tougher regulations. Consider the effects of demands for higher environmental standards first on the comparative advantages of different countries, and then on protectionism.

### **2.1 Effects on comparative advantages**

If the adopted environmental regulations overcome environmental externalities *optimally* (an important assumption to which I return below), they can be thought of as just another determinant of comparative advantage. In that case, rapidly growing economies might be expected to lose

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<sup>9</sup> See, for example, Anderson (1995b), Cadot, de Melo and Olarreaga (1997), and the references therein.

<sup>10</sup> This section draws to some extent on Anderson (1997) and Stringer and Anderson (1997).

comparative advantage to slower-growing economies in those industries producing tradables whose production costs rise most because of tougher environmental standards/regulations, other things being equal (Anderson 1992).

However, environmental standards are not likely to rise at the same rate even in equally rapidly growing economies. Rather, the severity of environmental regulations tends to be positively correlated with population density, with the degree of urbanisation, and (possibly increasingly for middle-income economies but then decreasingly) with the level of per capita income.<sup>11</sup> For example, mining on the edge of a city or popular resort area is likely to be subject to stricter regulations than mining in remote, unpopulated areas; and farm chemicals are likely to be subject to stricter environmental taxes in settings where farms are close to urban areas or where chemicals would otherwise be used exceptionally heavily. This might lead us to expect resource-rich, lightly populated economies on average to have relatively lower environmental standards, and to have to raise fewer of those standards or raise them less as incomes grow, than resource-poor, densely populated economies with the same per capita income and growth rate.

Furthermore, lightly populated resource-rich economies such as Australia are relatively highly urbanised with a large non-tradables sector, for the reasons we have become familiar with from booming sector theory (Gregory 1974; Corden 1984). Their concentration of non-primary activities in just a few large cities means their stricter environmental standards are likely to apply more to the urban-based industrial sector than to more remotely located primary production.

One might be tempted to conclude from these quick thoughts that the greening of preferences and hence politics will tend if anything to strengthen export opportunities for resource-rich economies and their primary producers. Even those in high-income resource-rich economies like Australia might be better off if their products and production processes, through becoming 'greener' to satisfy developments in local regulations and preferences, give them a competitive edge over producers in developing countries in the markets of other high-income countries where preferences for 'greener' products are strengthening.

However, an important assumption has been made above. It is that the policies being progressively introduced to overcome environmental externalities are optimal, that is, in the sense of equating at the margin social rather

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<sup>11</sup> For empirical verification of the last of these correlations especially, see Grossman and Krueger (1995) and the references therein.

than private benefits and costs of each activity. Yet we know from experience that environmental policies are typically far from optimal. Sometimes (too often, green groups would say) governments delay or neglect to respond adequately to community pressures to raise standards. And often when they do respond, excessive and/or blunt command-and-control policy instruments are used whose economic cost far outweighs any reasonable valuation of the environmental benefits. Partly this is because of inadequate policy advice but much of it may be due to lobbying by vested interest groups. Explaining these policy choices in terms of the economics of politics is an area ripe for more research.<sup>12</sup>

Many examples could be given of inappropriate environmental policy choices. At the international level one that immediately comes to mind that is likely to harm Australia is the Framework Convention on Climate Change aimed at reducing carbon emissions uniformly across (at least OECD) countries. Far more appropriate to begin with would be to reduce existing distortions in OECD energy markets. For example, lowering coal subsidies and import restrictions would simultaneously improve the economy and the environment (Anderson and McKibbin 1997). But let me conclude with a few thoughts on the greening of trade protectionism and in particular on the issue of quarantine.

## 2.2 The greening of protectionism

An important consequence of declines in traditional barriers to international trade and investment is that domestic assistance policies are replacing assistance previously provided via border measures. And with environmentalism being politically correct, assistance in green garb has a reasonable chance of not being challenged. Hence it is not surprising that there are already European Union Council Regulations (e.g., No. 2078/92) allowing environmental subsidies to agriculture, including subsidies to reduce the use of fertiliser and pesticides, to promote environmentally sound production methods, to encourage extensive agricultural techniques, to maintain practices that are already compatible with the environment, and to assist organic farming. These 'Green Box' measures (as they came to be called during the Uruguay Round of trade negotiations) are likely to become more substantial over time, substituting somewhat for traditional protectionism. Hence monitoring their rise may be just as important as monitoring the promised declines in traditional border protection, with a view to arguing

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<sup>12</sup> Early political economy studies that focus on the impact that the greening of politics would have on trade and environmental policies can be found in Anderson and Blackhurst (1992, especially chapters 10 and 11).

against inappropriate interventions. Indeed, no government intervention at all may be optimal in many circumstances (Anderson and Leal 1991), including situations where any politically feasible intervention would be so far from first-best as to be worse than a free-market outcome.

Another consequence of international economic integration is that interest groups are beginning to focus on other causes of comparative cost differences, including domestic environmental and technical product or production process standards at home compared with abroad. The motivation comes not just from a desire to reduce administrative and conformance costs of meeting agreed international standards, and to counter the greater risk of exotic pests and diseases being spread as countries trade more. It also results, in the absence of harmonised standards, from concerns of producers in high-standard countries that their costs of production for some of their industries are higher than in countries with lower standards, thus causing them to be less competitive.

This generates two sets of pressures in high-standard countries. At the domestic level, disadvantaged industries seek a lowering of standards and/or protection from imports from low-standard countries. To prevent standards being reduced, the promoters of high standards tend to support the call for import protection, since that can both reduce the opposition by local firms to higher standards at home *and* increase the incentive for foreign firms and their governments to adopt higher standards abroad. However, because such uses of trade policy are both discriminatory and protectionist, they contravene GATT rules and thereby erode the global trading system. Fortunately, in the first case of this type to come before a GATT dispute settlement panel (the infamous United States–Mexico tuna/dolphin case), the panel ruled against the use of import restrictions.<sup>13</sup> But other cases are bound to arise. Countries such as Australia with a vested interest in maintaining a strong rules-based multilateral trading system need to argue

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<sup>13</sup> When animal welfare groups succeeded in getting US legislation to ban the use by American fishermen of dolphin-unfriendly nets to catch tuna in the Northeast Pacific, Mexican tuna imports expanded rapidly so those groups sought, successfully, to get a ban on tuna imports as well. The import ban was an extraordinarily heavy-handed action, particularly since only a subset of US consumers care greatly about how tuna are caught. Once the GATT ruled that the import ban infringed on Mexico's legal trade rights, alternative solutions were sought. Eventually the import ban was dropped and 'dolphin-friendly' labelling of cans was introduced. US consumers could then choose whether to pay extra for cans so labelled, and Mexican fishing fleets could choose whether to incur the extra costs of production and compliance in order to sell certified cans at the higher price. Had the GATT dispute settlement process ruled otherwise it would have opened up the possibility of a flood of uses of trade impediments to unilaterally impose the standards of one nation (or more usually of one group within a nation) on other nations. Inevitably this would lead to an escalation of trade disputes.

against this abuse of trade policy and to ensure their own policies set a good example (see below regarding quarantine).

The other set of persuasive pressures generated by high-standard countries impacts at the international level, namely for establishing or raising minimum international environmental standards. For the reasons mentioned above, what may seem desirable standards by one country may be seen as excessive by others, particularly by people in countries relatively abundant in natural resources per capita. Hence the latter have a strong interest in ensuring the former do not dominate in the setting of international standards.

To help calm this process, the Uruguay Round produced agreements on Technical Barriers to Trade and on the Application of Sanitary and Phytosanitary Measures (the latter specifically to protect human, animal or plant life or health—see Stanton 1997). WTO members have a right to apply their own standards, provided they are not inconsistent with the TBT and SPS Agreements which includes not being unduly trade-restrictive. The SPS Agreement establishes clear and detailed rights and obligations for environmental health and food safety, as well as measures to prevent the spread of pests or diseases among animals and plants. It outlines procedures for product inspection, treatment and processing, risk assessment and allowable maximum levels of pesticide residues and certain food additives based on already agreed international standards (the Codex Alimentarius Commission for food safety, the International Office of Epizootics for animal health, and the International Plant Protection Convention for plant health). Members can adopt higher standards if they wish, but only with appropriate scientific justification. The TBT and SPS Agreements allow governments to challenge, via the WTO's Dispute Settlement Body, another country's food safety or other technical requirements based on evidence showing the measure is justified. Canada, for instance, is currently challenging Australia's justification for sanitary measures banning salmon imports. Another important food case that is currently before the WTO has to do with the European Union banning the import of beef produced with the use of growth hormones. The EU claims the ban applies to domestic producers and so does not contravene the national treatment provision of the GATT, whereas the United States argues that the hormones are not harmful to humans and hence the EU standard is excessive and labelling should be sufficient protection for consumers. For the first time the WTO has called on scientific experts (including an Australian) to help resolve that case.

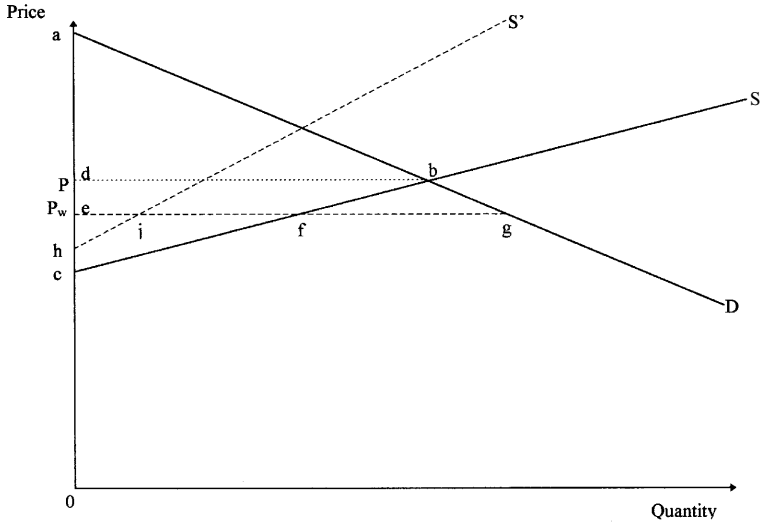
This is clearly an area where trade tensions could escalate. It is telling that during the 47 years of the GATT, virtually no formal trade disputes on SPS measures arose, because a country's import restrictions to protect human, health and plant life were difficult to challenge under previous

GATT agreements. In the first 18 months of the WTO's formation, by contrast, seven formal complaints had been lodged under WTO dispute settlement procedures. The SPS Agreement is thus likely to help those agricultural exporters who have been facing unduly restrictive barriers in potential export markets abroad, and to reduce returns to those producers who have enjoyed protection from import bans on quarantine grounds that cannot be scientifically justified. In the latter cases, removal of unjustified import barriers could boost domestic consumer welfare by more than it would harm domestic producer welfare, as well as boost producer welfare abroad of course (the usual gains from trade liberalisation). From Australia's perspective, getting rid of our own excessive quarantine restrictions would also make it easier for us to argue with other governments and in international fora for similar reforms abroad.

Economists have paid relatively little attention to this issue of technical barriers to trade.<sup>14</sup> Now, however, is an opportune time for Australian economists to make amends, following the release of the Nairn Report (1996) which has brought the issue of quarantine at least under more of a spotlight in Australia. Risk assessment based on empirical evidence is being demanded increasingly in domestic policy debates and for the resolution of international disputes. The Nairn Report correctly stresses the role model Australia could play in developing state-of-the-art quantitative risk assessment procedures. But if those procedures do not include all the relevant economic effects, inappropriately high standards will result. This is because the main losers from excessive quarantine restrictions are—as with traditional protectionism—domestic consumers and exporters at home and overseas suppliers of the allegedly offensive product, all of whom are typically less influential than the industry (and sometimes environmental) groups lobbying for the import barrier. The building in of appropriate economic analysis in risk assessment procedures can help to correct that imbalance, to the benefit of Australia and in particular its consumers and exporters. Our exporters would be helped indirectly by less excessive Australian quarantine restrictions potentially in three ways: (1) via the standard general equilibrium effects of reduced protectionism at home; (2) via the export to other countries and such institutions as the WTO's Dispute Settlement Body of a more complete risk assessment procedure that ultimately would lead to less excessive quarantine restrictions to our export markets abroad; and (3) via the enhanced position of Australia's trade

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<sup>14</sup>Exception are Hillman (1991) and the International Agricultural Trade Research Consortium which recently released a volume of studies on the subject (Orden and Roberts 1997). See also the recent conference paper on the Nairn Report by Tanner (1997).



**Figure 2** Effects of altering quarantine import restrictions

negotiators who could argue in bilateral talks against excessive barriers to our potential export markets without appearing hypocritical.

Indeed, economic analysis at the outset of a quarantine inquiry might even eliminate the need for expensive technical risk assessment in some cases, for it might show that *under no circumstances* would quarantine restrictions be justified. To see this, consider a simple example. Suppose, as with bananas and chicken, Australia bans imports because it does not want to introduce diseases that could raise domestic costs of production. What are the net benefits of that policy, and how do they compare with less extreme policies? The most liberal alternative is to have no import restriction. (A less extreme policy would be to tax imports and use the tax revenue to subsidise producers to help them cover the now higher cost of disease prevention.)

The effect of switching from a complete import ban to free trade is shown in figure 2. With an import ban  $S$  and  $D$  are the domestic supply and demand curves and  $P$  is the domestic price under autarky. Economic welfare from having this industry under these conditions is the sum of the consumer and producer welfare triangles,  $abd$  plus  $cbd$ .

Suppose the price at the country's border is  $P_w$ , and that eliminating the import ban risks introducing a disease that raises expected costs of production in this industry (but has no other adverse effects) such that the supply curve intersects the vertical axis at a point above  $e$  (not shown). If that happened, the local industry would disappear while consumers would benefit from the price fall. In the absence of other externalities, national economic welfare would change to  $age$ , which may be more or less than

before the import ban was lifted depending on whether triangle  $cfe$  is smaller than or exceeds  $fgb$ . Thus, even in this extreme case, where disease prevention costs decimate the industry, it could be economically more beneficial to go to free trade than maintain the ban, namely when  $cfe$  is smaller than  $fgb$  plus the indirect benefits to exporters mentioned above. In less extreme circumstances the free-trade alternative is even more likely to be beneficial. One example is if the probability of disease importation is less than 100 per cent, call it  $Q$ . In that case the expected benefit of moving to free trade would be  $(1 - Q).fgb + Q.(fgb - cfe)$ , which is  $fgb - Q.(cfe)$  and hence is more likely to be positive the smaller is  $Q$ , the probability of disease importation. Another example is if the supply curve's upward movement after the ban is removed leaves it still intersecting the vertical axis below  $e$ , as with  $S'$  in figure 2. In that case the producer surplus is reduced not to zero but to area  $hje$ , so it is only area  $cfjh$  rather than  $cfe$  that has to be less than  $fgb$  to guarantee a net economic welfare improvement. That may be the case either because disease prevention costs are moderate and/or because only some growers/growing areas are vulnerable to the disease.

A conclusion that free trade is superior would be more likely the more price elastic is  $S$  (and to a lesser extent  $D$ ) below  $P$ , the larger the gap between  $P$  and  $P_w$ , the lower the probability of disease importation, the smaller the proportion of production that is vulnerable, and the lower the cost of disease prevention (which could involve research to produce more resistant varieties).<sup>15</sup> It happens that for many small industries such as chickens or bananas, the domestic supply curve is fairly price elastic, because the resources used in producing its product could readily be used in other industries. The domestic demand curve also is often price elastic, because of the presence of close substitutes in consumption. And in the cases of both chicken and bananas, domestic prices are up to twice those observed in, say, the United States, suggesting the gap between  $P$  and  $P_w$  is large for them. Getting estimates of just these three parameters, the price elasticities of supply and demand and the domestic-to-border price wedge, would allow an *a priori* economic assessment that may demonstrate that no technical disease risk assessment is required at all because the country would always be better off under free trade. Just as was the case with the tariff review in the 1970s, perhaps it is time for Australia—for its own sake as well as to set a good example to its trading partners—to undertake a systematic economic review of all its existing quarantine restrictions on imports. Both the Productivity

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<sup>15</sup> Two standard caveats of welfare economics need to be kept in mind here. One is that no one other than these producers is harmed by the disease that may be imported. The other is that any people that are harmed are compensated by those who benefit from the freeing up of trade.

Commission and ABARE are well qualified to undertake such a pro-active review, having recently been involved in reactive reviews in response to requests from our trading partners.<sup>16</sup>

### 3. Conclusions

This review has several implications for resource-rich countries such as Australia. While many empirical questions remain unanswered, the evidence available to date suggests a major explanation for the relatively slow growth of such economies is not to be found in their declining terms of trade, or differences in positive spillover effects from different sectors, or protectionism abroad. Rather, a key explanation is likely to have been their own distortionary policies. The attempt over the past decade or so to dismantle such policies in Australia and New Zealand has certainly contributed to shifting them from among the poorest-performing to among the best-performing OECD economies. Completing that process of economic policy reform and preventing policy reversals remains an ongoing challenge for governments at both national and sub-national levels. This will be all the more important the more other resource-rich economies such as in Latin America move into reform mode, so as to maintain a competitive edge.

The growth in concerns for natural resource conservation and the environment has the potential to raise the value of natural resources and thereby enhance the economic prospects of resource-abundant economies. But whether that potential is realised depends heavily on the policy choices made by governments. Looking for free-lunch policy outcomes should be a priority, where the economy and the environment are improved simultaneously. The example at the multilateral level of reducing coal subsidies and import barriers as a means of lowering carbon emissions is but one reform that would help Australia directly. More usually there tends to be a trade-off between the economy and the environment. Even so, the trade-off need not be large. The example of quarantine restrictions may be a case in point, where Australia's interests are quite possibly being harmed by its own excessive regulation—especially when account is taken of the impact those regulations have indirectly on the country's ability to influence the quarantine policies of our trading partners. Countries seeking to improve their economic performance need to examine all such opportunities for reform both at home and abroad.

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<sup>16</sup> See, for example, the assessments for New Zealand apples (ABARE 1997) and Canadian salmon (Industry Commission 1996). See also the more recent study of Australia's banana import ban (James and Anderson 1998).

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