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W. Max Corden

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Arndt-Corden Department of Economics
Crawford School of Economics and Government
ANU College of Asia and the Pacific

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W. Max Corden
Department of Economics
University of Melbourne

Corresponding Address :
W. Max Corden
Department of Economics
University of Melbourne
Vic 3010 Australia

Email: m.corden@unimelb.edu.au

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THE DUTCH DISEASE IN AUSTRALIA
Policy Options for a Three-Speed Economy

W. Max Corden
Department of Economics
University of Melbourne
Vic 3010 Australia
m.corden@unimelb.edu.au

Abstract

This paper expounds the concept of Dutch Disease as it applies currently to Australia, noting the various gains and losses resulting from the Australian mining boom. "Dutch Disease" refers to the adverse effects through real exchange rate appreciation that such a boom can have on various export and import-competing industries. Particular firms or industries may be both gainers and losers. The distinction is made between the Booming Sector (mining), the Lagging Sector (exports not part of the Booming Sector, and import-competing goods and services), and the Non-tradable Sector. The main discussion focuses on policy options, given a floating exchange rate regime: Do nothing, piecemeal protectionism, and establish a Sovereign Wealth Fund. The costs of any measures that successfully moderate real appreciation of the exchange rate "exchange rate protection" are noted. An issue is whether firms and industries can be clearly divided into those that belong to the Non-tradable Sector and those that belong to the Lagging Sector, the latter being the losers from Dutch Disease. If such a clear distinction cannot usually be made, then the case for "doing nothing" is strengthened. Finally, the implications of direct intervention by the central bank in the foreign exchange market are explored, and (when combined with appropriate fiscal policy) are shown to have certain similarities with the effects of a Sovereign Wealth Fund.

Key words: Dutch Disease, exchange rate protection, mining boom, Sovereign Wealth Fund

JEL classification: E60, F32, F41

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THE DUTCH DISEASE IN AUSTRALIA[1]

Policy Options for a Three-Speed Economy

From 2005 to2011 the Australian mining industry grew about 90%. This was by value measured in Australian dollars. During the same period the value of Australian GDP grew about 43%. Exports of the mining industry's products – principally iron ore and coal – grew 140% in value. This reflected, to a great extent, increases in prices – in fact a 41 % increase in Australia's terms of trade. The cause was primarily an increase in demand from China. With GDP in the rest of the economy growing by 37% over this period, all this is summed up by the popular Australian term "the two speed economy".[2]

The mining boom was the principal – but by no means only – cause of a substantial 31% real appreciation of the Australian dollar over the period, (as measured by an index of the trade-weighted exchange rate). In turn this real appreciation had an adverse effect on at least some (and perhaps many) import-competing and non-mining export industries.. These were the losers from the mining boom.

It is these losers that the theory of the Dutch Disease focuses on. Thus Australia is now really not a "two-speed" but a "three speed" economy. The fast moving part is the Booming Sector, the slow moving or even declining part is the Lagging Sector, and the rest – where there are more likely to be gains – is the Non-tradable Sector.

The theory of the Dutch Disease analyses the way a sectoral boom affects other parts of the economy, especially the parts affected adversely. There is an extensive worldwide literature in this field. This paper rests on a standard model presented in Corden and Neary (1982), and more concisely as the "Core Model" in Corden (1984, Section I)[3].

[1] I am indebted to help from and discussions with Larry Cook and Vince Fitzgerald.
[2] The figures quoted here are provisional, subject to revision. Mostly they report changes between the fiscal years 2005-06 and 2010-11. Arguably the current mining boom began in 2005.
[3] Pioneering Australian contributions are Gregory (1976) and Snape (1977).

In Section I of the present paper I give a brief overview of the Dutch Disease story, or at least the part that is described in these earlier articles as the Spending Effect. Unlike in the earlier papers, monetary considerations are briefly introduced here. The main part of the paper is in Section II, which discusses in detail and perhaps controversially three policy options for governments. Later sections discuss various complications.[4]

I: INTRODUCING THE DUTCH DISEASE OLICY OPTIONS

Export Boom and Capital Inflow

I assume realistically that the Australian exchange rate floats, thus responding to supply and demand of foreign currency relative to the Australian dollar. There is no intervention in the foreign exchange market by Australia's central bank, the Reserve Bank of Australia (RBA), though I discuss intervention policy at the end of this paper. Until then I assume a pure floating rate.

Export income of the Australian mining sector – called the Booming Sector here - increases sharply owing to higher international prices, and this appreciates the exchange rate. As a delayed result of the higher prices the quantity of exports also increases. The net result is a big, indeed dramatic, rise in incomes in that sector. A further by-product is that foreign capital flows into the sector, to finance its development. This capital inflow also appreciates the exchange rate.

Spending of the sector rises thus both because of the higher incomes caused by the higher prices and outputs and because of the increased capital investment, substantially financed by foreign capital inflow. Some of the spending goes on imports, on the remittance of dividends abroad, and on the purchase of foreign assets of various kinds. These involve an outflow of funds from Australia and thus depreciate the exchange. But there is still a net appreciation. Imports and the various other outflows just moderate the initial appreciation.

[4] A concise historical overview of Australia's five mining booms, beginning with the gold rush of the 1850s, is in Battellino (2010). More details of the current boom in iron ore, coal and gas (LNG) are in Christie et al (2011). While the boom so far is mainly in iron ore and coal, investment planned in Liquefied Natural Gas (LNG) development is substantial and a boom in investment, production and exports of LNG is in prospect. See Jacobs (2011).

Funds that are not spent abroad are spent at home. This is the Spending Effect. The funds are spent either directly by the companies concerned, or indirectly by the recipients of the higher incomes. In addition, higher profits and perhaps additional taxes will lead to more tax revenue paid, and this will lead to more government spending and more spending by other taxpayers and by citizens who benefit from reduced taxes they pay and from extra benefits received.

The Three Sectors

The whole economy can be divided into the Non-tradable Sector and the Tradable Sector. The Non-tradable Sector consists of those industries or activities the prices of which are determined by demand and supply domestically. The Tradable Sector consists of export and import-competing industries. These are industries the prices of which are determined in the world market, set by world prices and the exchange rate.

In turn the Tradable Sector can be divided between the Booming Sector and the Lagging Sector. In Australia the Booming Sector consists of the mining industries, principally iron ore and coal producers and exporters. The Lagging Sector consists of the export and import- competing industries that lag behind (as the name suggests). This sector – which is the locus of the Dutch Disease problem – consists of a part of manufacturing industry, of part of agriculture and of certain services, principally those provided by the tourism industry and the export-of-education industry. Their prices are given in the world market and have not risen in the way that booming sector prices have. Hence an exchange rate appreciation lowers their prices in terms of Australian dollars. These Dutch Disease industries are the losers in the three-speed economy.

Thus the economy outside the Booming Sector can be divided into two parts, namely the Non-tradable Sector and the Lagging Sector. This division is actually an over-simplification and there are various complications I shall discuss below. But for the time being it is helpful to adhere to the simple classification

Going back to the beginning of our story, it follows that the mining or resources boom brings about both an increase in spending on Non-tradables, which is expansionary, and an exchange rate appreciation that is contractionary. The first effect raises the outputs of Non-tradables and the second effect reduces the profitability and outputs in the Lagging Sector, which is the Dutch Disease effect.

Internal Balance

Interest rate policy is managed by the RBA to maintain "internal balance". This might be aimed at keeping the inflation rate or the rate of unemployment constant, or some compromise between these two objectives. With both an expansionary and a contractionary effect resulting from the resources boom, the RBA might have to adjust the interest rate either way. Suppose that with a given interest rate, the net effect is expansionary. Then the RBA would raise the interest rate, and this would contract the economy through two channels: aggregate spending would decline in the usual way, and foreign capital would be drawn into Australia through the higher interest rate, and this would increase the appreciation of the exchange rate. Of course, the higher interest rate would also lead to less domestic capital outflow.

Summary up to this Point

What is the conclusion at this stage? When there is a booming sector among exports – like the Australian mining sector – or among import-competing industries, the exchange rate appreciates. Similarly, when there is substantial net capital inflow the exchange rate appreciates. And appreciation has an adverse effect on non-boom parts of the tradable sector - i.e. the Lagging Sector. In Australia's case this includes parts of manufacturing but also agriculture, tourism and education.

Who then are the gainers and the losers? Obviously shareholders, executives and employees in the Booming Sector benefit. If the Booming Sector pays significant taxes on its increased income the benefits may spread through the community. In addition, others in the community will benefit when the pattern of domestic demand shifts in their favour. And the losers are, above all, the producers in the Lagging

Sector. And that is the Dutch Disease problem. This problem arose in the Netherlands in rhe sixties as a result of its natural gas discoveries in the North Sea.

Essentially this Dutch Disease effect is brought about by real appreciation relative to the alternative situation with no boom. If the boom plus nominal appreciation led to a process that raised the price level of non-tradables above where it would have been otherwise (as is likely), then real appreciation would have been greater than nominal appreciation. The assumption of "internal balance" as described here implies that, in general any nominal appreciation will lead to real appreciation, but not necessarily to exactly the same extent.

Can one say that there is a national or Australian community gain or loss? There is a gain in two senses. First, there is a potential gain for the whole community through the increase in tax revenue coming from the Booming Sector – at least provided that the money is wisely spent by the government. Secondly, one could argue that in the (Pareto) compensating sense there is a national gain when the gains from the boom are potentially able to compensate the losers, the latter being primarily in the Lagging Sector. But since full compensation never takes place, there will always be losers, in this case possibly with substantial losses. And that – to repeat - is the Dutch Disease problem.

II: POLICY OPTIONS

I now discuss three possible policies to deal with the Dutch Disease problem.

1. Do Nothing

One obvious policy is to allow the Dutch Disease to happen and for policy makers to resist pressures to "do something". The real exchange rate appreciation is an inevitable consequence of the terms of trade boom and the capital inflow, both of which have benefits. In time capital inflow into the mining industry is likely to slacken off, even if the terms of trade improvement remains. Some industries rise and some decline, and some declines, in any case, may be temporary The government can

help in the adjustment process, but should not try and stop or slow up adjustment. That is one point of view, though it may not be politically attractive.

2. Piecemeal Protectionism

I come now to a policy, or group of policies, that are highly undesirable and, in particular, are based on questionable economic thinking. Of the various groups of industries adversely affected by Dutch Disease it is manufacturing, or perhaps particular manufacturing industries, or even firms, that are usually selected for deserving special assistance, whether in the form of subsidies or import tariffs. One reason is that manufacturing has been in steady decline, as measured by relative output or, even more, by relative employment. A shift from manufacturing to services has been a worldwide trend in advanced economies.. In Australia a role has also been played by tariff reductions. Over a period of more than twenty years Australia has been transformed from a high tariff to a low tariff country.

The arguments against piecemeal protection, as this policy was once practised, are well known. How can a government or official authority “pick winners” as compared with the decentralised decisions of many entrepreneurs and managers.? How can government judge which industries have good future prospects justifying special help? Furthermore, uneven protection is inefficient and, most important of all, strengthens the power of interest groups.

If protection of particular industries is urged because of the adverse effects of the Dutch Disease there is one aspect that is crucial, namely the general equilibrium effects.

Suppose extra protection is provided for the motorcar industry. This reduces imports of motorcars, as is intended by the protectionist policy. But, given capital inflows and other factors, the lower imports will lead to extra appreciation of the exchange rate. If all manufacturing industries were significantly protected there would be a substantial appreciation, which would worsen the Dutch Disease effects on other Lagging Sector industries, notably agriculture, tourism and education exports. Similarly, protection for selected manufacturing industries would have adverse Dutch Disease effects on

other, less protected Lagging Sector industries, including unprotected manufacturing. These losers would thus suffer not only from the effects of the mining boom but also from the political success of their industry colleagues in extracting protectionist measures from the government. Furthermore, piecemeal protectionism creates distortions within the broader Lagging Sector.

Recently it has been suggested that the mining industry should be required to source various supplies or services domestically rather than importing or 'outsourcing" them. A similar requirement might be imposed on government spending and on private suppliers to the government. Such requirements would also lead to greater exchange rate appreciation than otherwise. It would thus benefit some industries and workers and through the Dutch Disease effect would damage others. In addition, it would impose an extra cost on the mining industry and on the government both of which would be compelled to source their supplies less efficiently than otherwise. It is a particular kind of piecemeal protectionism.

3 Sovereign Wealth Fund

A third alternative is a fund, similar to Norway's sovereign wealth fund (SWF), which is financed by taxation of the booming mining sector, and which invests wholly internationally and not at home. In the last aspect it differs from Australia's Future Fund that invests both at home and abroad. Both funds are a form of national savings, but the SWF that I envisage has two special characteristics: it is financed by the profits of the Booming Sector, and it invests wholly abroad. The latter characteristic means that it generates capital exports, and hence would offset, in part, the effects of the Booming Sector's capital imports. It would thus moderate the exchange rate appreciation and thus the Dutch Disease effect. It would benefit firms in the tradable sectors of the economy not selectively but in a uniform way, differing in this respect from piecemeal protectionism.

It has two other desirable qualities.

First it ensures that the gains of the Booming Sector are partially shared with the rest of the Australian community. This raises, of course, the broader and controversial

issue of the appropriate extent of taxation of mining in Australia. Here it should be noted that the SWF need not necessarily be financed by a tax on mining that is additional to existing taxes or to taxes that are imposed for other reasons, in particular resource depletion. In other words, it could simply be financed out of consolidated revenue, involving the allocation of a fiscal surplus.

The appropriate rate of tax on mining is a separate issue that I do not discuss here, being a big subject of its own. It has to be borne in mind that, even if mining were subject to the same rates of company tax as other industries in Australia, the mining boom would generate higher tax revenue that could then finance a SWF.

Secondly, by investing abroad the Fund gives Australians an internationally diversified nest egg. It spreads the risks of bad things that might happen specifically to Australia rather than to the world as a whole. I have in mind here, for example, effects of global warming or of regional political or economic disturbances. If mining industry prices and hence profits decline because of new competitive producers emerging and developing in other countries, the fund would automatically reduce its new international investments, and might repatriate earlier investments to compensate for the loss of Australian government revenues..

Of course, individual Australians are free to diversify their investments internationally, whether through superannuation or other investments, But the SWF is a way in which the government can bring about some moderation of Dutch Disease effects without discriminating between different Lagging Sector industries.

Probably the strongest argument in favour of such a fund is that it would be more efficient and less politically objectionable than piecemeal protectionism. Its success in reducing the Dutch Disease effect might weaken political pressures for piecemeal protectionism, especially those favouring manufacturing.

Exchange Rate Protection: Its Costs and Benefits

The SWF proposal is really just a special case of a more general type of policy designed to moderate the Dutch Disease effect of the mining boom. We have here a special kind of protection – one that is designed to benefit all Lagging Sector industries evenly by moderating the exchange rate appreciation that is brought about by the boom, a boom that is caused by improved terms of trade and higher capital inflow. This is "exchange rate protection.[5]"

Any policy that reduces net capital inflow either by reducing gross inflows or increasing capital outflows will depreciate the exchange rate – or moderate an appreciation that would otherwise have taken place. Such an "exchange rate protection" policy will thus moderate or even avoid Dutch Disease effects.

Let us list some possibilities. One might start with a Future Fund which invests at home in infrastructure development. It then stops investing at home and invests abroad instead, and so turns itself into a SWF. Alternatively controls or taxes might be imposed on capital inflows (as is often discussed internationally). These controls or taxes might be imposed only on short-term capital imports or only on capital flows into the Booming Sector. Finally, private capital outflows might be encouraged, perhaps through superannuation regulations or tax concessions. In all cases there is less capital investment at home whether by foreigners, by private domestic agents or by the government,

What are the effects?

Firstly, in all cases some Australian industries – for example, those that would benefit from infrastructure investment – lose and others - in the Lagging Sector – gain. There is thus a redistribution of income between firms, industries and, indeed, Australians

[5] See Corden (1985).

more generally. I would add (for the benefit of the trade union movement) that some jobs will be lost and others gained.

Secondly, it follows that measures to moderate or avoid Dutch Disease impose costs in the form of possible underinvestment at home. Indeed many people may find it counterintuitive that there should be a deliberate policy of discouragement of investing at home relative to abroad. Depending on the potential returns to Australia as a whole from investment at home versus investment abroad, if at the margin in order to reduce the Dutch Disease effect low-return foreign investment is favoured over higher return home investment (perhaps allowing for various externalities), then all these policies can be said to give rise to a "cost of protection". Basically it is the cost of protecting all tradable industries (above all, those in the Lagging Sector) relative to non-tradable producing industries.

Provisional Policy Conclusion

My provisional policy conclusion is the following. First, piecemeal protectionism should be ruled out. Second, a SWF that aims to moderate the DD effect for a limited or transitional period, and that contributes to some extent to risk spreading, may be desirable. In time it could combine with the Future Fund, thus investing both at home and abroad and thus ending its initial aim of moderating the DD effect. Third, apart from that, the government's role should be limited to adequate taxation of the Booming Sector, and to assisting any part of the economy, including Lagging Sector firms, in adjustment to changing conditions. It should not try to pick winners.

III: SOME COMPLICATIONS

Can the Non-tradable Sector be distinguished from the Lagging Sector?

It is really an over-simplification to clearly distinguish the Non-tradable Sector and the Lagging Sector. The neat theoretical model with which I started turns out to have

some problems when one looks at industries and economic activities in detail. It may not always be clear which are the losers from appreciation of the exchange rate and hence the “victims” of Dutch Disease.

A domestically produced product that depends on domestic demand and supply may also be an imperfect substitute for imports, and thus also depend on world prices and the exchange rate. It may then benefit from the domestic demand expansion resulting from the boom, but also lose from the associated appreciation.

I suspect that this could be quite common in manufacturing. Perhaps the best examples come from the building and construction industry that generates a big demand for various manufactures. Many of these are importable, but with significant transport costs, and where made-to-measure requirements advantage local suppliers over overseas ones.

And what about retailing? One might think of that as the non-tradable service par excellence. A store that sells imported goods will benefit from a boom in two ways, both through the favourable demand effect and through the exchange rate appreciation. But then we must allow for a radical new development, namely the increasing use of the internet in by-passing local retailers. Now the service is tradable, and to some extent has entered the Lagging Sector, though so far not with regard to all forms of retailing..

Coming back to manufacturing we can certainly conceive of a firm that produces two groups of products. One group produces non-tradables, the prices of which are determined by domestic demand and supply and a second group where the prices are closely determined by international prices converted at the current exchange rate[6].

Then there is the tertiary education industry. Its income comes partly from the government and local students, and partly from foreign students. The boom is likely

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[6] Usually much emphasis is placed on the adverse effect of Dutch Disease in Australia on manufacturing.. Here it should be borne in mind that manufacturing is now in Australia quite a small employer of labour. Taking average figures by decades, in the 1960s manufacturing employed 26% of the workforce, but by the 2000s it was down to 11% (with services at 72%). See Connolly and Lewis (2010)

to raise the first category of income and, through the Dutch Disease effect lower the second.
Similarly a boom would probably raise the income of the local tourist industry derived from domestic residents, while having the usual adverse Dutch Disease effect on demand from foreign tourists.

Insofar as these examples are representative of the larger economy (and far more empirical research is needed here) one might conclude that Dutch Disease is not a major problem, and thus the “do nothing” policy option should be preferred.

Resource Movement Effect

The theoretical articles on Dutch Disease distinguish between the Spending Effect and the Resource Movement Effect. All the discussion so far in this paper has concerned the Spending Effect.

The Resource Movement Effect deals with the effect of the Booming Sector attracting labour and capital from the other two sectors, and so disadvantaging the latter. With the Booming Sector becoming more profitable it will attract labour directly from the Lagging Sector even at the initial exchange rate. . This will reduce output and profitability in the Lagging Sector and is distinct from the Spending Effect (which works through the real exchange rate). The Resource Movement Effect reflects the common view that the mining boom has created a shortage of skilled labour in other sectors.

In addition, the Booming Sector is likely to attract labour from the Non-tradable Sector. In that case this has to be set against the increased demand for the products of that sector owing to the boom. On balance the increase in demand for non-tradables may be less than the reduction in supply caused by the outflow of labour, in which case their prices would rise or monetary policy would become more contractionary, involving a rise in the interest rate. In turn a rise in the interest rate would attract capital inflow, hence appreciate the exchange rate, and thus increase the adverse

Dutch Disease effect on the Lagging Sector, leading to further reduction in output in that sector.

The general point is that for two reasons the Resource Movement Effect of a boom would reduce output, or might reduce output, of the Lagging Sector (in addition to the Spending Effect that operates through real exchange rate appreciation). These effects might also operate through the movement of new capital between sectors.

I have not pursued this Resource Movement Effect further in this paper because I judge that it is not particularly significant in Australia.. There are two reasons.

The first is that the movement of labour between sectors is somewhat reduced by Australia's immigration policy, which readily allows skilled immigration, which can go directly from overseas into the Booming Sector. The second is that the movement of capital between sectors is similarly reduced by high international capital mobility.

Of course, changes in relative outputs (and hence inputs of capital and labour) do respond to the original causes of the mining boom and then are affected by the Spending Effect and its indirect consequences on the exchange rate, as described earlier. But direct movements at initial prices and exchange rates are likely to be modest. If this empirical judgment is thought to be wrong then more emphasis will have to be placed on the Resource Movement Effect.

What about Exchange Rate Intervention by the Central Bank?

Central banks do intervene in foreign exchange markets in order to avoid or moderate appreciations owing to capital inflow. Such intervention has been common in Latin America, and has also been pursued by the Bank of Japan and no doubt other central banks. But there are difficulties, so that exchange rate intervention is not an easy way out from the problems and trade-offs just discussed.

Let us look at this matter more carefully. Assume that the exchange rate has appreciated because of capital inflow, perhaps short-term speculative flows explained

by expectations of some more fundamental changes. The central bank then buys foreign currency to moderate the appreciation, hence increasing foreign exchange reserves. But this will increase the money supply and this will, or may, stimulate inflation. While inflation in itself may not be desired, this also means that real appreciation will still come about even though nominal appreciation has been avoided or reduced.

The obvious solution then appears to be to sterilise the monetary effects of the exchange rate intervention. This involves the central bank selling bonds, and thus withdrawing money from the market, and so restoring the money supply to where it was to start with. That is what a sterilised intervention is meant to do. But now there are two new problems. For the market to absorb the extra bonds the interest rate may need to rise. The first problem is that the rise in the interest rate will draw capital into the country and thus, once more, bring about appreciation, defeating the original purpose of the intervention. But this effect may only take place with a lag, so that temporarily the intervention may achieve its objective. So I come to the second problem.

The interest rate that the Bank receives for its foreign reserves is likely to be less than the interest rate it has to pay in the domestic market for the bonds it sells. Thus a loss will be made, and with a continuous intervention operation this loss may turn out to be substantial. Such a loss – often experienced in Latin America – is called a "quasi fiscal deficit" and must eventually be covered by the government.

What then is the solution? It is for the government to run a fiscal surplus, and then, with the money that it saves because of this surplus, it buys the bonds that the central bank sells. It is then not necessary for the domestic interest rate to rise. In other words, a policy of sterilised exchange rate intervention – which is a form of monetary policy – has to be associated with a contractionary fiscal policy.

Now I come to the bottom line. This monetary cum fiscal process is essentially the same – or at least similar – to the Sovereign Wealth Fund process described earlier. With the SWF foreign investments would be longer-term and held by the Fund; this time the foreign investments are normally liquid short term funds and held by the

central bank. In the SWF case the fiscal surplus takes the form of savings made by the Fund; while this time the savings, in the form of a fiscal surplus, are simply made by the government. To sum up, to achieve the desired real appreciation someone has to save (or to forgo domestic investment) and someone has to invest abroad.

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