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Aid and the Fiscal and Monetary Responses to Dutch Disease

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Abstract

This study assesses the fiscal and monetary management challenges that can be associated with large inflows of foreign aid. It provides a brief overview of the literature on Dutch Disease (DD) as applied to mineral wealth and then assesses the conventional policy responses that are available to mitigate the main problems that can be caused by DD. This discussion incorporates an identification of the additional issues and transmission mechanisms that arise when the source of DD is a surge in foreign aid. This analysis is designed to illuminate the circumstances in which an aid-induced DD effect is likely to call for countervailing macroeconomic policy interventions, and when other approaches may be more appropriate. The study concludes with an empirical assessment of the relative importance of mineral-based and aid-based DD problems in low- and middle-income economies. It suggests—contrary to the mainstream literature—that foreign aid and mineral exports typically create joint macroeconomic management problems for such countries.

Keywords: Aid, Dutch Disease, monetary policy, fiscal policy
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1 Introduction

Based initially on the experiences in The Netherlands in the 1960s, a very substantial literature on Dutch Disease (DD) has emerged starting in the early 1980s.[1] Empirical work was quick to follow and econometric results over many years have suggested the presence of a so-called 'natural resources curse'. In simple terms, 'Dutch Disease' refers normally to the effects of increased exports, or higher prices of natural resources on a country's real exchange rate: an appreciation being likely to cause significant reallocations of factors of production, and a decline in non-mineral exports of both agricultural and manufactured goods. Although most of the literature has been applied to exports of oil, gas and minerals, similar effects can and have been argued to apply to other shocks emanating from a large increase in foreign exchange inflows, such as capital inflows, remittances, and foreign aid. The DD implications of foreign aid transfers came into greater prominence around the time of the July 2005 Gleneagles Summit when substantial increases in aid volumes to some low-income countries were widely anticipated.[2]

This study is designed to look in particular at the fiscal and monetary management challenges that can be associated with large inflows of foreign aid especially in low-income countries where such flows are most likely to be large both absolutely and relative to other macro flows. But in the process of addressing that central issue, the study also explores (i) the differences and similarities between the optimal policy responses to foreign aid flows on the one hand and foreign exchange receipts from natural resource exports on the other, including the challenges they present for monetary and fiscal policy management, and (ii) whether, based on some actual country experiences, aid volumes are currently a major concern in relation to Dutch Disease relative to the concerns that relate to natural resource exports. In addition, given that several traditionally large recipients of foreign aid are already or are expected to become new oil and gas economies in the near future (e.g. Ghana, Mozambique, Uganda, Tanzania) some attention will be given to the fiscal and monetary management challenges that such countries face—possibly as aid volumes decline in relative if not absolute terms.

The outline of the study is as follows. Section 2 provides a brief overview of one part of the very extensive economics and political economy literature on Dutch Disease (hereafter DD). Section 3 discusses the appropriate monetary and fiscal policy responses that are available to mitigate the main problems that can be caused by DD. This discussion is divided into first, a summary of the conventional wisdom about how best to deal with traditional DD which arises from mineral wealth and second, a review of some of the additional issues that arise when the source of DD is a surge in foreign aid. Section 4 then examines the transmission mechanisms whereby foreign aid may be argued to create a DD problem. This analysis is designed to illuminate the

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1 A good early theoretical example was Corden and Neary (1982). See also Neary and Van Wijnbergen (1986). An early empirical study was reported in Sachs and Warner (1997). The most recent relevant paper of which we are aware is van der Ploeg and Venables (2010).

2 A much cited paper that majors on the foreign aid causes of Dutch Disease is Adam and Bevan (2006).

circumstances in which an aid-induced DD effect is likely to call for countervailing macroeconomic policy interventions, and when other approaches may be more appropriate. Section 5 provides a simple empirical discussion that assesses the relative importance of mineral-based and aid-based DD problems in a sample of low and middle-income economies. It suggests—contrary to the mainstream literature—that foreign aid and mineral exports typically create *joint* macroeconomic management problems for low and middle-income countries and not problems that can be easily separated. Section 6 brings together the main conclusions of the study.

2 A brief review of the literature

The literature on DD contains important contributions from both mainstream economics and also from political-economy. These are usefully—but somewhat artificially—addressed separately. In this current section, we major on the economic analysis. In Section 4 some relevant strands from the large political-economy literature are also introduced.

2.1 The economic analysis

Originally, 'Dutch disease' had a very specific meaning—the appreciation of a country's real exchange rate as a result of inflation arising from spending increased natural resource revenues leading to an overheated economy plus an appreciation of the nominal exchange rate as the domestic currency attracted higher demand. The result of this was expected to be a contraction of those productive sectors that were *not* part of the cause of the surge in revenues: e.g. the non-mineral traded goods sectors in the case of a mining-induced episode of DD. A DD problem caused by 'excessive' flows of donor aid would also be manifest in an increased demand for non-tradables offset by some contraction of the productive sectors that sought to trade their output internationally. However, over time, this basic meaning of DD has evolved and, in some of the literature, the term has acquired a broader meaning. In some studies the term has taken on a very much wider meaning to encompass all of the negative macroeconomic effects associated with the 'resource curse' including at least three strands, each of which have their own substantial literatures namely:

- a long-term decline in the terms of trade;[3]
- an increase in the volatility of both export and government revenues;
- crowding-out effects that occur without necessarily needing the intercession of real exchange rate appreciation.

[3] This issue is one of the longest running and most controversial issues in the development economics literature: both its empirical and the theoretical assertions have been much debated (Toye 1987; Kindleberger 1956; Maizels 1968; Mikesell 1997). Although some of the relatively recent empirical work appears to support the existence of a long-term secular decline in primary product prices relative to prices of manufactures Brohman (1996), doubts remain—Bleaney and Greenaway (1993), Pindyck (1999). It is of course the case that the most recent past has seen the international concerns on this matter switch more to the dramatic *increases* in some primary products prices such as oil, gold and coffee as the rapid growth of China in particular has pushed up global demands.

In other parts of the literature the term has been given a much narrower meaning.[4]

In the initial mainstream economics discussion, the DD impact has often been split into a resource movement effect and a spending effect. The first of these two effects works via a relatively high marginal product in the booming resource (or other expanding sector) which in its turn draws (mobile) resources out of other sectors. Thus factors of production move into the expanding sector bidding up wages and causing other sectors to contract. The spending effect arises when, as a result of the windfall incomes created by the expanding sector, demand rises for both tradable and non-tradable products and services. Since tradable products equalize demand and supply in international markets, any increased demand for these can be met by higher imports, and without a need for any major price adjustment. However, the prices of non-tradable products are equilibrated in domestic markets and with supply being relatively inelastic in the short-term, prices will tend to rise relative to those of tradable products. This results in further resource shifts from tradable to non-tradable activity. If the expanding sector is an enclave—as mining activities, for example often are—and if it participates to only a limited degree in domestic factor markets then there will be a much smaller 'resource-movement effect' but the 'spending effect' will still ensure that the non-tradable sectors will expand at the expense of the non-mineral tradable. Note that it is the *relative* prices of non-tradables to tradables that is crucial to the DD results and not the *absolute* prices of these products.

Over time other dimensions of DD—defined simply as a contraction of the non-mineral (or non-oil and gas) tradable sector—have emerged. One argument is that government subsidies used to protect non-resource tradables that are weakened by a mineral boom, aggravate the sector's problems and eventually become unsustainable (Auty 1994). Another is the 'leap frog effect' when governments use their windfall incomes to by-pass the labour intensive phase of industrialization and move straight to the heavy, capital-intensive phase with negative effects for those parts of the tradable sector most able to create jobs and livelihoods (Sarraf and Jiwanji 2001). Others have addressed the issue by considering 'learning by doing' in the context of DD (Van Wijnbergen (1984); Krugman (1987); Sachs and Warner (1995); and Gylfason et al. (1997)) all assume that because the benefits of learning by doing can accrue only from tradable activities, a contraction in that sector implies lower overall national productivity.

In this and other ways, much of the literature on DD is focused on the effect of DD on manufacturing (Sachs and Warner 1997). This reflects the fact that much of the earlier research on DD was concentrated on the developed countries (Benjamin et al. 1989). However, as the condition of DD began to be attributed more and more to low- and middle-income developing economies then attention did switch to agriculture, and the possible decline of tradable agricultural activity as a major issue of concern, Benjamin et al. (1989). The radical decline of (internationally) tradable agricultural activity in oil-rich Nigeria is a clear and worrying example.

The more general question is whether a contraction of any particular sector, such as manufacturing, should be an issue for concern. Sachs and Warner (1997) argue that if neo-classical competitive conditions prevail then a declining manufacturing sector

4 For example, one source described it as a failure of resource abundant economies to promote a competitive manufacturing sector—Sarraf and Jiwanji (2001).

implies no long-term harm. However, when this is not the case—which is arguably the norm—then the contraction of manufacturing caused by the DD mechanisms can lead to chronically slow growth. This implies also that the natural resource sector in contrast to manufacturing lacks positive externalities. There are several claimed advantages for manufacturing. For example, manufacturing is said to be better at stimulating forward and backward linkages, Hirschman (1958). It is also claimed to be superior in terms of creating learning by doing externalities, Matsuyama (1992). Natural resource-based activity—including even traditional agriculture—fails to deliver these benefits to the same extent. If similar DD problems were to be ascribed to a sudden boost in foreign aid receipts, then similar arguments would need to be invoked to suggest the negative impact of aid on manufacturing and the other internationally tradable activities of the economy.

The significance of this line of argument has more recently been accentuated in some peoples' view by the successful experiences of China and other East Asian countries: a success based at least in part on maintaining an undervalued or 'competitive' real exchange rate to foster economic growth; see for example, Magud and Sosa (2010) and Levy-Yeyati and Sturzenegger (2007).

Another area relates to the impact of natural resources on social capital and on entrepreneurship. It has been suggested that resource poor countries accumulate new social capital faster than resource-rich countries (Woolcock et al. 2001). One explanation for this is that limited natural resources help to promote early industrialization which also results in earlier urbanization. This in turn weakens the bonds of traditional social capital (which can be argued to stifle entrepreneurship) by allowing people to escape from villages into an urban environment with greater anonymity and better functioning markets. At the same time this can confer a savings dividend by reducing the dependency ratio. However, this type of reasoning assumes that urbanization is not based mainly upon the state provision of rent-seeking employment. Clearly in cases where public sector employment is a major urban sector activity—as it is in many aid-dependent countries—then the boost to urban entrepreneurship and the productivity benefits of new forms of social capital will be somewhat diluted.[5]

If there is controversy over the exact nature of the theory of DD, there is even greater dispute over whether empirical evidence supports its existence. Early researchers and notably the much cited papers by Sachs and Warner (e.g. 1997) have claimed that growth rates in manufacturing and services have been slower in natural resource-based economies than elsewhere. However, there are numerous dissenting voices and significant variation and subtlety in the empirical work that has been conducted on this matter. Some more recent studies have even managed to reverse the direction of impact: i.e. resource intensity slightly increases rather than reduces growth rates when resource intensity is measured in a different way from that used by most studies (Brunnschweiler and Bulte 2008). From the viewpoint of this present study the most important conclusion is the one re-iterated in a very recent paper for the IMF namely that, ... 'the

[5] Some authors claim that there is in any case a lack of evidence that the creation of a manufacturing industry can have a positive effect on an economy (Auty 1994). Others suggest that there is little statistical evidence to indicate that a decline in manufacturing has a negative effect on learning by doing and growth (Stijns 2001).

channel through which DD reduces economic growth is not found (definitively)[6] in the literature' (Magud and Sosa 2010).

3 Monetary and fiscal policy responses

3.1 The appropriate responses to resource-induced shock

In this section of the study we revert to using the term 'Dutch Disease' in its initial narrow sense as explained above as the appreciation of the real exchange rate as a result of excessive spending of additional revenue flows from a source such as new natural resource exports or foreign aid.

The conventional technical policy response to this phenomenon is by now very well established at least in principle and is well summarized in a recent paper by Magud and Sosa (2010) of the IMF.[7] They make four main points as follows.

First, the real exchange rate, being a relative price, is not a variable that can be directly influenced by either monetary or fiscal policy. Rather, it is the derived outcome of forces working on both the supply and demand for tradable and non-tradable products. Insofar as policy can exert any influence it must do so indirectly via intermediate variables. One such variable would be the nominal exchange rate which can be influenced through various standard interventions in local money markets (e.g. a sterilization operation whereby the central bank sells domestic securities into the local market in order to mop up a surplus of liquidity arising from foreign exchange inflows). Another would be some moderation in the growth of total government expenditures to partially offset the inflationary effects of the foreign resource inflows on domestic demand. A third would be a rebalancing of government expenditures in favour of tradable goods—also to partially offset the domestic inflationary pressures on non-tradable goods and services.

Second, any given appreciation of the real exchange rate will have a differential impact on the economy and especially on economic growth depending on whether or not it emanates from an economic 'shock' that reflects an equilibrium phenomenon. If the appreciation is driven by a permanent change (e.g. a mineral resource that can generate its rents for many years or a sustained increase in aid volumes), then it will imply a long-run equilibrium movement of the equilibrium real exchange rate, and in principle DD should not be a matter for concern. In that new equilibrium, it may well be the case that there will be some dampening effect on manufacturing and other tradable activity but this can be offset by the long-lived beneficial wealth effects that accrue from the new resource rents (or similar positive shock). The real dangers associated with possible DD in this situation emanate either from (i) overshooting caused perhaps by excessive monetary expansion and/or by speculative capital inflows stimulated by the boom, or from (ii) an overestimation by economic agents about the longevity/persistence of the shock which could also lead to an overshooting real appreciation.

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6 My addition.

7 The actual implementation of the appropriate policy package will invariably be much more difficult.

If we apply this same logic to foreign aid a similar conclusion follows. As Barder (2006: 13) has stated '… If aid is permanently increased, and this results in a shift of production from tradables to non-tradables, this is not directly a cause for concern, at least in the short run. The immediate value of exports is that they pay for imports. If exports can be reduced in the long run *with no corresponding fall in imports* (emphasis added)—because permanently higher levels of aid pay for those imports instead—then as a matter of accounting, the country is better off. This shift in output would be problematic only if the fall in tradable production were to lead to a sustained fall in future economic growth'.

Third, Magud and Sosa note that it is often difficult for policy makers to assess whether any given shock and the corresponding real exchange rate appreciation is temporary or permanent (equilibrium). If they interpret a permanent shock as temporary, they may for example decide to intervene in the foreign exchange market to slow the appreciation of the nominal exchange rate: one of the indirect policy routes to influencing the real exchange rate (see first point above). This can be done in a floating exchange rate system by sterilizing some of the inflows and so accumulating increased official reserves. However, the debt servicing costs of this action—specifically the costs associated with the government bonds issued to soak up the foreign exchange inflows—could often exceed the returns on the increased level of reserves and so result in a high fiscal cost and also some further macroeconomic collateral damage (see also Calvo 1991).

If on the other hand the authorities interpret a temporary shock as permanent and take no action to offset the real exchange rate appreciation they risk the losses to economic growth referred to in much of the literature on DD without the beneficial long-lived wealth effect that would be associated with a permanent shock.[8] This is the worse of all possible worlds and it has been analysed for the case of foreign aid in some depth by various authors, including Heller (2005), Foster and Killick (2006), IMF (2005) and Barder (2006).

In practice the problems of diagnosis are more or less difficult depending on the type of funds flow that is the source of the shock. In the case of foreign exchange earnings from minerals, oil or gas in a country that is newly entering the league of 'resource-rich' economies (e.g. Uganda at the present time), it is inherently difficult to assess whether the promised mineral wealth based on early stage drilling, will indeed result in a permanent or merely a temporary structural change. By contrast, in the case of a middle-income economy with reasonably well-developed financial markets, speculative inflows of portfolio capital are inherently easier to assess in terms of their permanence or otherwise. So in this case, the device of temporary *capital controls* as employed at various times in countries such as Chile and Malaysia, are a justified route to limit the macroeconomic effects. Such an intervention can limit the cost of accumulating reserves while avoiding a real exchange appreciation that will almost certainly need to be reversed in the future; (see Magud et al. 2007) for more extensive discussion of this matter). This is not to say that policy makers will always be smart enough to either get

8 At the same time it should be noted that the extensive review of the empirical literature carried out by Magud and Sosa (2010) indicated (i) that in most studies there is a significant appreciating effect of a revenue shock on the real exchange rate (this applies whether the shock is caused by natural resource exports, by remittance flows or by foreign aid flows) but (ii) that in most studies this effect does not carry over to cause lower growth rates; see Figure 1 of their paper.

the diagnosis right, or to apply the correct interventions if they do. The macro/currency crises of the 1990s in Mexico, Russia and East Asia were associated in part with the authorities' failures to react properly to capital flows that were partly either speculative in nature or unsustainable for other reasons. Velasco (2011) and others have noted the strong pro-cyclicality of Mexico's and other countries' responses to commodity booms in the past.

In the case of a low-income country that funds itself by using unusually large flows of foreign aid, the diagnostic problem should be relatively much easier to deal with in principle. Surges of foreign aid flows can sometimes be associated with a one-off flow of humanitarian aid responding to some non-repeatable disaster such as the tsunami of 2004 or a major earthquake. Such surges typically self-sterilize in the sense that the new funds are used very quickly to purchase importable supplies of food, medicines etc. from abroad or available domestic services. Their ongoing macroeconomic consequences are unlikely to be a source of major problems that call for any monetary or fiscal interventions. By contrast, aid increases that are likely to be relatively permanent in nature (recognizing that no aid is ever fully permanent) complicate the situation in various ways and so these are discussed separately and in detail below. The general rules of sound policy practice for the situation of a temporary surge in aid have been articulated by Barder (2006). They all involve some adjustments in behaviour by aid donors supported by the host governments. These adjustments include:

- making aid less volatile and so more predictable, so that (i) any increases in aid are likely to be sustained over time, and (ii) the local monetary authorities can take the necessary steps to choose how much of the impact on exchange rates they wish to sterilize: something that is more or less possible depending on the depth of capital markets which appropriate aid policy interventions can and have influenced;
- allowing recipient countries to save some part of any aid surge (in the form of higher reserves) rather than spend it, so that they can smooth the domestic expenditures that might otherwise cause real exchange rate appreciation;
- allowing aid recipients also to use temporary surges of aid inflows largely to purchase imported goods, such as essential medicines—as in the case of humanitarian aid;
- being more cautious about additionality requirements, which require recipients to demonstrate that aid has been used to increase total expenditure in a particular sector. This relaxation of donor policies would enable recipients better to manage the overall macroeconomic effect of aid flows.

Possibly the biggest threat to good practice in these various areas is the growing significance that aid donors attach to the demonstrable results of aid and the associated need for clear accountability and improved governance more generally in the recipient countries. If such rules can be assessed and applied on a long-term basis—with increases in aid flows responding smoothly to an improving long-term faith in the governance standards of the recipient, then the potential DD problems can be avoided. However, if there are frequent knee-jerk reactions by donors to apparent poor performance and short-term declines in the measured results of aid, then the DD-type problems will be correspondingly more likely. Unfortunately this is much more likely to

occur in the poorest economies which typically have the worst governments and where the ability to manage aid volatility is at its weakest.

The fourth and final point from Magud and Sosa is that the available policy armoury of the authorities to address a possible DD problem certainly includes the use of offsetting fiscal policy measures. In principle, such measures can help above all to mitigate the spending effect associated with DD. For example, in the case of any surge in funds that is known to be purely temporary in nature, fiscal policy can work by smoothing expenditures over time to reduce what might otherwise be a significant volatility of total domestic expenditures, as well as major ups-and-downs in the real exchange rate and output levels. If such volatility threatens to be repeated on a regular basis, the introduction of some formal basic fiscal rules, or even a formally constituted stabilization fund, can in principle be considered as the means to smooth expenditures. Again this is inherently more difficult for low-income, low-capacity countries and especially for fragile states.

Formal fiscal rules have become ever more common budget management devices in the past twenty years. By drawing on evidence from a recent in-depth research paper,[9] the IMF now notes that … 'Based on a new database[10] spanning the entire Fund membership, 80 countries had national and/or supranational rules in place as of early 2009. Of these, 21 are advanced economies, 33 emerging markets, and 26 low-income economies. In contrast, in 1990, only seven countries had fiscal rules' (IMF 2009). Following work by Kopits and Symansky (1998), the more recent IMF paper defines a fiscal rule as 'a permanent constraint on fiscal policy through simple numerical limits on budgetary aggregates'. The nature of the aggregates chosen as subjects for fiscal rules vary from country to country but will typically involve one of: (i) rules on budget balance (overall, primary or structural involving various degrees of cyclical adjustment to the raw numbers); (ii) rules on debt levels (relative to GDP or some other macro aggregate); (iii) rules on expenditures (total, primary or recurrent and expressed either as absolute limits or limits on growth rates); and (iv) revenue rules (involving fixed ceilings and floors). The Fund paper notes that these different rules have different macroeconomic management properties that are summarized briefly in Table 1.

It is noted that a rule that uses the objective of balancing the budget over an economic cycle has been found empirically to provide the greatest degree of economic stabilization. Velasco (2011) in more detailed work on one of the more successful examples of the use of fiscal rules, has commented favourably on how such rules helped Chile to improve its fiscal stability in the face of large swings in copper prices. However, he also recognizes—as does the IMF paper (2009)—some of the inherent political-economy and economic problems that are involved in establishing and maintaining binding fiscal-rule constraints over budget decisions. For low-income countries one big problem (and it may be a problem at least on a par with the political

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9 IMF, Fiscal Affairs Department, *Fiscal Rules—Anchoring Expectations for Sustainable Public Finances*, 16 December 2009, Washington, DC.

10 This database has been compiled mainly from the responses to questionnaires by IMF area departments combined with an assessment of national fiscal framework legislation, and also by using the European Commission's 'Domestic Fiscal Governance Database' for EU countries. The data that are included cover several dimensions of fiscal rules, such as their legal origins and basis, the numerical targets that are used and the coverage of fiscal aggregates.

difficulties) is that they are likely to have a higher volatility of tax revenues than middle-income countries that makes it more difficult to stabilize over the cycle. Also there is some evidence that aid is pro-cyclical and that exacerbates the problem.

Table 1: Properties of different types of fiscal rules against key objectives

	Objectives		
Type of fiscal rule	Debt sustainability	Economic stabilization	Government size
Overall balance	++	-	0
Primary balance	+	-	0
Cyclically adjusted balance	++	++	0
Balanced budget over the cycle	++	+++	0
Public debt-to-GDP ratio	+++	-	-
Expenditure	+	++	++
Revenue			
Revenue ceilings	-	-	++
Revenue floors	+	+	-
Limits on revenue windfalls	+	++	++

Notes: Positive signs (+) indicate stronger property, negative signs (-) indicate weaker property, zeros (0) indicate neutral property with regard to objective.

Source: International Monetary Fund (2009).

More generally the policy responses described above depend crucially for their effectiveness on the quality of the underlying diagnosis. They are conditioned also by the political realities (especially in very poor countries) that it is extremely difficult to restrain expenditures in boom periods in order to provide for a prospective smoothing of expenditures in leaner periods—a point explicitly recognized by leading commentators on this topic such as Velasco.[11]

In the situation of a long-sustained positive shock to the flow-of-funds, the commonly prescribed policy approach is to establish some sort of 'futures fund' where the surplus fiscal receipts of the short-term can be set aside, normally in internationally invested assets, in order to fund larger expenditures at some future date. It is noted that a futures fund and a stabilization fund, such as that set up in Chile in 2001, can in principle be managed under some common institutional arrangement. However, those assets held for the purposes of stabilization clearly have a different (shorter-term) function from those held as a futures fund and they must be structured and differentiated accordingly. Norway, after its large oil and gas discoveries in the early 1970s, is the best and most successful example of a futures fund although complementary policies in Norway at the same time—for example, the use of manufacturing wages as the leader for economy-wide wage-setting—also contributed to the stable outcomes that Norway achieved.

[11] The fiscal rules introduced into Chile initially in 2001 (before the Fiscal Responsibility Law of 2006) included the use of a Social and Economic Stabilization Fund that held excess surpluses in boom periods (accumulating to over US$20 billion at the peak in December 2008 before funding withdrawals to respond to the fiscal pressures caused by the 2007-09 global financial crisis) (Velasco 2011).

Futures funds in low-income countries have generally been unsuccessful. Relatively recent examples include the fund establishment in relation to the Chad-Cameroon pipeline for oil and the fund established in relation to the Lesotho water exports to South Africa by the Lesotho Highlands Water Authority. Botswana's own sovereign wealth fund[12]—the Pula Fund has been established longer and appears to have been more successful.[13] Two aspects of the mainstream advice about futures funds can partly explain the reasons for their low rate of adoption and success in lower-income countries. The first is the guidance to hold the funds in the form of international financial assets. Even in the case of the fund having a stabilizing objective, this approach is argued to limit the damage to domestic households and firms in periods of fiscal difficulty when the funds need to be drawn down.[14] Second, specialists such as Velasco strongly argue that the funds need to be managed by specialist fund managers who are wholly independent of government. This was certainly the case in the Chilean example, already cited. But a third and structural reason for their failure is possibly the most telling. It is well established empirically that there is a strong deficit bias in the budget balances of lower income countries (Alesina and Perotti (1996). It follows that the commitment to a structurally neutral budget balance with at times large surpluses being held and held abroad will be a very difficult one to establish politically. The political economy mechanisms can be explained by the so-called 'voracity effect' of booms, see Lane and Tornell (1996).

Overall, it is certainly the case that countries that are unwilling to accept too much real exchange rate appreciation should be prepared to tighten their fiscal policies somewhat in boom periods and then relax them in periods of slump. As is noted by Magud and Sosa (2010) this constitutes the most reliable way to contain domestic demand, keep inflation in check, and—in the wake of a surge in capital inflows—avoid any excessive deterioration of the current account.

3.2 Responses to aid-induced shocks

Many of the component parts of these technical aspects of the conventional policy response to DD are applicable without too many fundamental adjustments to DD—inducing shocks that emanate from a surge in foreign aid flows, rather than from a natural resource discovery. The main differences relate (i) to the likelihood of the various different situations described above actually occurring and (ii) to the associated strength of the need to mobilize any mitigating policy response to different types of aid flows. The likelihood is conditioned by the fact that aid flows seem inherently less likely to be *cyclically volatile* than are earnings from a major natural resource.[15]

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12 Sovereign Wealth Funds are defined as special purpose investment funds or arrangements, owned by the general government. They are typically set up to operate over a long-term investment horizon and not for short-term stabilization purposes. However, there are hybrid arrangements. For example, the Pula Fund in Botswana has agreed trigger points that allow the fund to be drawn from in the event that other macroeconomic policy adjustments have proved insufficient to stabilize the reserve level of the country.

13 This may be explained in part from the fact that diamond producers do get a lot of help from the practice of the dominant producer namely De Beers in stabilizing the world diamond price.

14 *Natural Resource Charter*, University of Oxford, November 2010 Precept 8, page 13.

15 See Hudson (forthcoming).

Instabilities in aid flows can and do occur but are more likely to be driven by political factors. For example, there may be a cessation of aid flows in response to some flagrant breach of good practice regarding corruption control or human rights. Similarly as argued by Collier (2007), in post-conflict countries there is often an immediate surge in aid inflows which comes to an end after a couple of years—a period, he argues, when the continuation of aid inflows is likely to be particularly beneficial. But in such cases, cyclicality as such is not the problem. Furthermore, the periodic perturbations of aid receipts will probably be less easily accommodated by standard DD-type policy responses. It also seems highly unlikely for example that aid donors (especially after the Paris Declaration) would ever be misguided enough to provide a country with such large surpluses of aid in the short-term that any sort of stabilization or futures fund would even be contemplated to mitigate the potential DD effects of such a surplus. Sound management of this highly unlikely situation would be much more effectively dealt with by agreeing with the donors to scale down their own short-term funding of the country in favour of more funds in the future or to allow recipient governments to save any short-term surpluses as proposed by Barder (2006: 26). It is easy to agree with Magud and Sosa that in the context of foreign aid … 'the creation of a sovereign wealth fund to be held abroad would not *make sense*'. However, it will be an interesting question as to whether this attitude might need revision if highly aid-dependent countries also begin to enjoy sizeable resource inflows associated with oil and gas, e.g. Ghana and Uganda.

Nonetheless surges in the flow of aid can and have occurred in response to new international agendas such as those that emerged from the Gleneagles Summit in 2006.[16] Such surges are unlikely to cause macroeconomic instability. For example, in the already mentioned case of a large but non-repeatable surge in aid for humanitarian purposes, the potential negative macroeconomic effects are likely to be almost irrelevant given the way in which those funds are most likely to be spent. There are also other ways in which aid flows can in effect be sterilized in terms of their effects on the domestic macro economy. Perhaps the best example is US aid where a very high proportion of ODA is spent in the US and given to international (mainly US) consultancy or contracting companies.[17] More generally it can be noted that official DAC statistics on aid-tying do *not* include technical co-operation—this can result in a serious understatement of the problem of tied aid. But in many other cases any surge in aid flows may be expected to cause some DD-like symptoms if the increased aid flows are large relative to the absorptive capacities in the beneficiary countries.

This rather casual set of statements about the similarities and possible differences between the macroeconomic effects of a natural-resource based shock on the one hand and a foreign-aid induced shock on the other are reinforced somewhat by the empirical evidence synthesized from a wide range of studies by Magud and Sosa (2010). Figure 1 below juxtaposes their results for the two different types of shocks—natural resources

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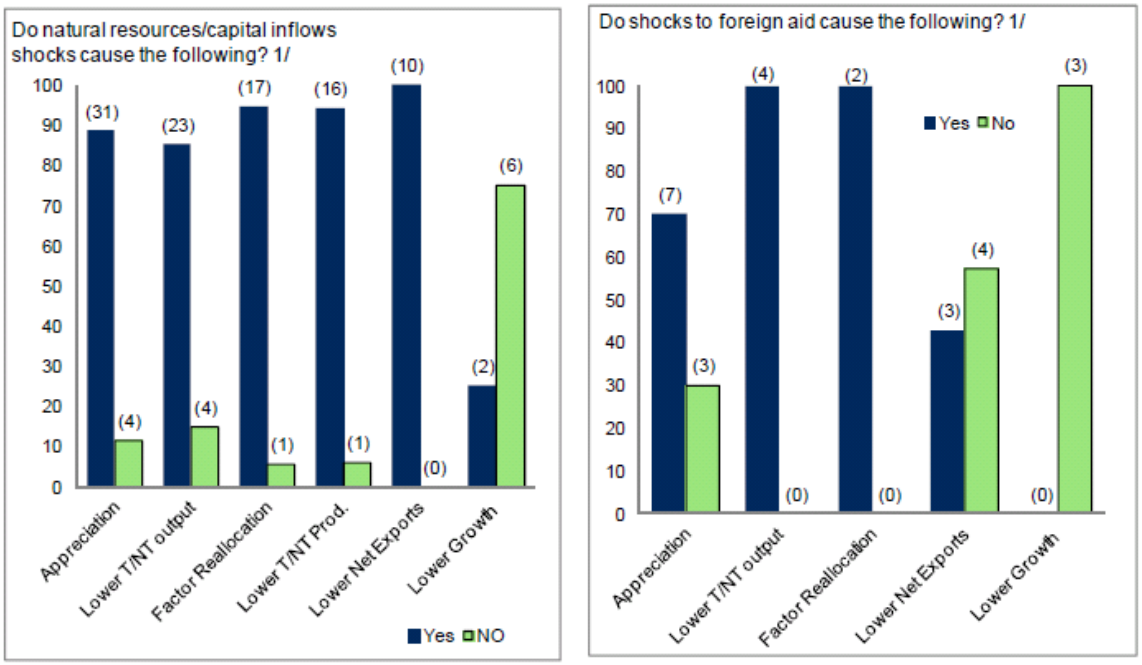
16 At the G8 Gleneagles Summit in 2005, the G8 and other donors pledged to increase aid by US$50 billion a year by 2010, with half of the additional aid going to Africa. Overall this suggested an increase of more than 60 per cent over the level in 2004 (OECD-DAC 2006).

17 Roger Riddell in recent work on Uganda found that of the US$230 million of US ODA 'given' to Uganda, the Ugandans estimated that at least US$180 million never left the States (informal communication).

and foreign aid. The vertical scale indicates the percentage of studies that gave the results indicated on the horizontal axis whereas the numbers in parenthesis show the actual number of studies that were consulted.

Figure 1: Literature review of the effects of Dutch disease



Source: Magud and Sosa (2010).

It is noted first that there is a much larger literature on the first topic (natural resources) than on the second (foreign aid): this implies a somewhat higher level or reliability over the results for the first topic than for the second topic of foreign aid. But if we directly compare the two sets of results there is a remarkable similarity in the conclusions that are reached in relation to most of the variables indicated on the horizontal axis. Both types of shocks seem more likely than not to create some real exchange rate appreciation; both seem likely to divert resources to non-tradable activities (unambiguously so in the case of aid) but neither type of shock seems to have the dramatic negative effects on economic growth that is commonly ascribed to DD. This may possibly indicate that aid is actually financing the right services, e.g. more teachers which, after a lag, are having a growth effect.

This last result confirms econometric results in which aid and natural resources rents are both introduced as explanatory variables in the same equations for economic growth. In particular, Collier (2007) notes that, when aid is introduced alongside resource rents in growth regressions, the hypothesis that they have the same effect can be decisively rejected.[18] Nonetheless, it is reasonable to be concerned that governments that receive a

[18] See also a fairly recent study of eleven African countries that found that tax effort increased in the 1990s when aid flows increased (Bourguignon et al. 2005). Collier interprets his own result to suggest inter alia that the negative patronage effects that many have associated with resources rents, apply less forcefully in the case of foreign aid. He also argues that aid agencies are typically adding considerable value to the transfers that they administer which ensure that these transfers are not used to fuel the

lot of money from aid may be less accountable than if they raised all of their revenues through tax (Barder (2006: 20).

These results largely confirm our rather casual statements at the top of this sub-section about the similarities of the policy interventions needed to deal with the two types of shock but also the differences in the substantive effects of these shocks especially on economic growth. One caveat to this is that the Magud and Sosa results shown in Figure 1 do not tell us anything about the *scale* of the effects (e.g. of aid on the real exchange rate). Hence the size of the possible problems and the necessary policy interventions is not revealed by these results.

4 Mechanisms for the transmission of dutch disease via aid

In order to deepen the discussion and throw further light on the appropriate policy responses to a DD problem induced by aid flows, we next examine some of the mechanism through which aid might be argued to generate DD-type outcomes. The empirical literature summarized in Figure 1 above suggests that there can indeed be DD-type outcomes caused by aid flows but why exactly might aid generate such undesirable outcomes and how can policy be adjusted to avoid these?

A number of different theoretical mechanisms—from both the economics and the political economy disciplines—have been used in the literature to explain or rationalize the potential DD effects of foreign aid as illustrated in Figure 1 above. In the paragraphs that follow we draw selectively on those mechanisms in order to direct attention to some of the further similarities and differences between natural resource-induced DD and foreign aid-induced DD.

4.1 An increased role for the state

Mineral wealth and large flows of foreign aid have one important thing in common. They both tend to increases the relative importance in economic activities of the formal state. In the case of foreign aid this effect is normally but not always a direct one.[19] In the case of mineral wealth, it arises because of the high level of rents accruing to government as tax and royalty income. Many of those writing about the minerals 'resource curse' see a major part of the explanation of the phenomenon as essentially political, relating to the consequently expanded role of the government.[20] Clearly that phenomenon applies with equal or greater force to receipts of foreign aid which are almost invariably channelled on a government to government basis (including public development banks and other agencies). After all the correct title for foreign aid is Official Development Assistance (ODA). There are many strands of DD-type problems that can stem from the generic problem of the governments of low-income countries

kind of patronage that is seen in countries with large natural resource rents. 'Aid does not appear to have a significant negative effect on tax effort, nor does it fuel corrupt politics in the way that resource rents sometimes do.' (See also the later discussion on political economy in this present paper).

19 In other cases some aid may flow via NGOs or to parts of the country's private sector.

20 For example, Ascher (1999); Auty (1998); Auty and Mikesell (1998); Sarraf and Jiwanji (2001); McMahon (1997); Ross (1999), (2001); and Stevens (1986).

having more liquid resources at their disposal—whether from mineral rents or from foreign aid. In brief, those that are flagged in the literature include:

- Poor expenditure management. Plentiful supplies of funds in the hands of a small government elite can in some instances weaken prudence and the normal procedures of 'due diligence' which may in any case be relatively weak. The pressure on making the 'right choices' may seem somehow less important when the revenue source is perceived as some form of external windfall. One common example is that of a government relaxing its tax effort (Collier 2007), or deciding on new and prestigious capital spending without much thought to the recurrent spending implications in future years (Sarraf and Jiwanji 2001).[21]

- There can also be increased corruption in the form of the illegal diversion of resources. Some authors on mineral issues have argued that corruption evolves from the clash between traditional values and foreign norms (Mbaku 1992). So in the case of mineral rents the high concentration of ownership on wealthy multi-national companies can easily help to explain why resource rich countries may experience greater levels of corruption. A similar argument can be applied in the case of foreign aid transfers. Moyo (2009: 48) has made the link between foreign aid receipts and mineral rents extremely forcefully saying ... 'The point about corruption in Africa is not that it exists; the point is that aid is one of its greatest aides. Mineral rents …' like aid, are susceptible to theft and have provided practically unlimited opportunities for personal wealth accumulation'. Moyo's proposition regarding aid is strenuously disputed and some aid donor practices have clearly made it impossible for recipients to have the 'unlimited opportunities for personal wealth accumulation' that she claims.

- Increased rent-seeking: similar arguments can be adduced in relation to the increased likelihood of rent-seeking which is about the incentives that economic agents perceive to compete for 'artificially contrived transfers'—Tollison (1982), and the associated efforts in some cases to persuade the government to create even more such transfers (Mbaku 1992). Aid receipts are an obvious and natural target for this type of activity in societies whose (relatively weak) institutions are likely to encourage or at least condone such behaviour.

- *Dirigiste* economic policies and poor investments. The exploitation of mineral wealth has a long history in poorer countries of encouraging host governments to intervene actively in investment decisions—via subsidies and protectionism—in order to promote a particular type of new industrial structure. Foreign aid in today's world is somewhat less likely to lead to the more extreme of the outcomes that have sometimes followed from the discovery of huge new mineral wealth: outcomes such as unsustainable investment booms, white elephant investments in large but relatively unproductive public sector projects such as

[21] This point is more obviously relevant to natural resources windfalls than to aid receipts. In the case of aid significant amounts of the aid effort of recent years has been directed at reform agendas including public expenditure reform. The consequence is that countries that do not commit to such reforms do not get large amounts of aid, or donors hold back on aid, until reform does takes place. The exceptions tend to be countries such Afghanistan where aid is delivered for strategic reasons, and the public expenditure reform is at best weak.

palaces and new military capacity, and, in some cases such as Mexico in the late 1970s to hugely excessive external borrowing. However, donor programmes have had to become increasingly vigilant to head off these types of sub-optimal investment outcomes, and they are still not wholly successful in doing so. Furthermore there is now substantially more recognition by aid donors that sound industrial policies can be valuable instruments of development policy and can stand in place of the unqualified liberalization policies of the past. This changing attitude serves to dilute the previous donor anxieties about dirigiste policies; see Pack and Saggi (2006); Page (2011); Lin (2011).

These four dimensions of 'weak governance' are present in varying degrees in all aid-dependent economies. They may perhaps have become somewhat less of an issue in the past decade during which donors have increasingly majored on 'improved governance' as one of their core objectives. However, to the extent that these governance weaknesses still exist, they drive the pattern of resource allocation in an economy in ways that are inimical to the avoidance of the DD problems. So for example, taken together they are likely to results in lower total levels of productive investment than is possible; to a relative increase in expenditures on non-tradable activities (e.g. large public services and large military establishments (Collier 2007);[22] to implicit and explicit protection of some productive activities that will have the effect of reducing the relative returns from internationally tradable activities and so on.

In short, aid by putting more resources in the hands of government has several possible routes through which to generate some DD-type outcomes and to have some of the standard negative implications for tradable goods activity.

4.2 Technical economic transmission mechanisms

There are a number of technical papers on aid that suggest expected outcomes that complement the results suggested by the political economy literature. For example, Prati and Tressel (2005) utilize a two-sector open economy model in which an exogenous flow of foreign aid can either be consumed or invested in productivity enhancing public goods. Their analysis demonstrates a potential role for macroeconomic policy and specifically a policy that adjusts domestic credit via a standard sterilization operation. The authors show that the ability of this policy intervention to increase welfare is conditional on the time profile of foreign aid. If, for example, the foreign aid is heavily front-loaded, monetary policy will either stimulate *savings* if it is contractionary, or stimulate *consumption* if it is expansionary. So properly managed monetary policy has the potential to smooth the effects of uneven (annual) flows of foreign aid. However, too much front-loading of aid may result in excessive costs (of the sterilization) and so offset the otherwise positive benefits of the policy intervention. The presence of any learning-by-doing in the model can further enhance the productivity and growth-boosting effects of the monetary policy intervention. Once again, fragile states seem more likely to face difficulties in these respects. In particular, post-conflict countries, which will typically have very weak monetary authorities, are most likely to see their aid front-loaded.

[22] Collier (2007: 103) has estimated that something around 40 per cent of Africa's military spending is inadvertently financed by aid.

It is clear that this sort of consequence of foreign aid closely mirrors the predicted outcomes from the various policy interventions discussed earlier that are designed to mitigate the unevenness of natural resource flows. But one caveat needs to be put very forcefully—none of the positive technical benefits suggested by Prati and Tressel will accrue if the political economy distortions mentioned above push the aid disproportionately towards unproductive uses!

A similar health warning applies in the case of some other similar technical papers. As was noted above, it is the negative impacts of increased aid flows on the tradable goods sector that is often the main focus of concern about aid-induced DD. One obvious mechanism that could negate this concern would be a mechanism whereby increased public expenditure was able to generate productivity spin-offs for both tradable and non-tradable sectors. This extra angle was introduced by Torvik (2001), but then elaborated considerably further in a two sector model[23] by Adam and Bevan (2006: 262-63). By way of introduction to their own paper, Adam and Bevan note that aid-funded public investment in, for example, rural roads is likely to benefit the production of (non-tradable) food crops more than that of tradable manufactures, while the reverse is likely for, say, spending on telecommunications infrastructure.[24] They also suggest two mechanisms whereby a higher level of public investment (funded by aid) may have results that run counter to inequality and poverty-reduction objectives. First, ... 'the immediate beneficiaries of higher public investment expenditure tend to be the non-poor working in the services and manufacturing sectors as opposed to the poor who are more likely to produce mainly food and cash crops'. Second, even if the new public investment enhances productivity in the non-tradable sector', this may shift the domestic terms of trade against net producers of non-tradables and, to the extent that the poor are located in these sectors, worsen the distribution of income.

A number of important results emerge from the theoretical model developed by Adam and Bevan (2006: 269) including the following:

- The formal algebraic results for the first and second periods of their basic theoretical model suggest that when productivity effects are explicitly considered, the over-time movement of the equilibrium real exchange rate is ambiguous—in response to an increased flow of foreign aid which is spent on public infrastructure. In cases where this aid-financed public expenditure is targeted mainly at improving the productivity of the *non-tradable sector* and where the income elasticity of demand for non-tradable goods such as basic food is low, the probable initial (year one) appreciation is likely to be followed by a subsequent (year 2) equilibrium depreciation of the real exchange rate.

- Their results also suggest that the growth of aggregate exports and total output in the medium term is strongest in cases where public investment is skewed in favour of non-tradable production. This paradoxical result arises because of their unconventional assumption that substantial productivity gains are indeed possible in the non-tradable as well as the tradable areas of activity—a far cry from what is assumed in the mainstream DD literature of Sachs and Warner

[23] The two sectors being tradables and non-tradables.

[24] Which in any case is much more likely in today's world to be financed by private capital.

(1995) and many others.[25] Further confirmation and some elaboration of these results emerge also from the numerical computable general equilibrium model that Adam and Bevan (2006) calibrate for the case of Uganda. The various simulations differ mainly, but not only, in terms of the amount of bias that they introduced into the productivity of different sectors: the production possibility frontier being skewed in different simulations in favour of either export- or domestic good production. The model also realistically assumed a chronic shortage of public sector infrastructure and so a higher marginal product of new investment in such capital. The results suggest the following:

- If the model parameters are set to allow zero impact of the public investment on private sector productivity (the 'base' case), then an aid injection on the scale assumed by the authors[26] has most of the negative DD effects and few positives. So, for example the real exchange rate appreciates on a sustained basis (over the 10 year period that is simulated). There is also a large contraction of exports in favour of increased production of domestic output; a decline in total savings as the fiscal deficit worsens in response to the real appreciation; and a relative decline in rural incomes in spite of a slight increase in total household disposable income.

- When instead the model allows a neutral spill-over of public investment to higher productivity in the private sector, there is again a real exchange rate appreciation initially but this is now virtually all reversed within the ten year period of the simulation. As a consequence this simulation suggest a significant sustained boost to GDP, some improvement to the fiscal balance; and an initial export decline which is more than reversed to give an overall improvements within the ten year period of the simulation. Real household incomes also increase significantly in this experiment but with a slightly smaller percentage increase for rural households.

- The results of the first two simulations and other experiments (which introduce various degrees of sectoral bias into the productivity-raising effect of higher public expenditure) are shown in Figure 2 below but only for the real exchange rate variable. These confirm the significant differentiation between the *impact* effects of the expanded aid and the *longer-term* effects with the degree of difference being dependent on the extent of bias in the productivity spill-overs of the additional aid.

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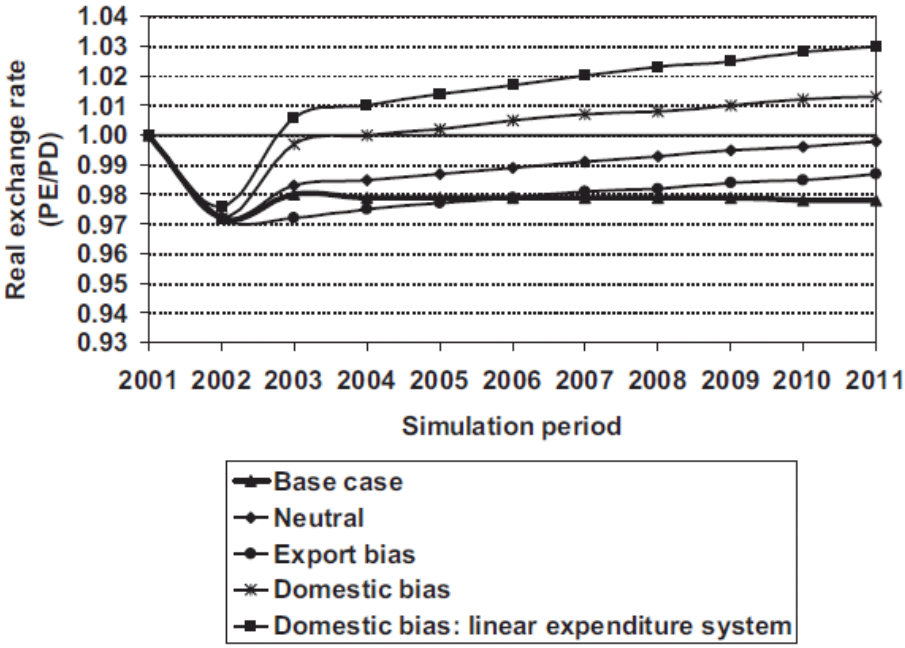
25 This assumption needs some refinement in terms of the type of non-tradable activities to which it may reasonably be applied. These subtleties are not considered further in this present summary.

26 The numerical model uses a policy experiment involving a permanent 12.5 per cent in the net flow of grant aid all of which is assumed to finance an in public infrastructure investment. The increase in aid that is assumed was the equivalent to just under 2 per cent of baseline GDP. The authors note also that this step increase is roughly equivalent to the size of the increase in net aid flows to Mozambique, Tanzania, and Uganda at the end of the 1990s related to the Heavily Indebted Poor Countries Debt Initiative.

Figure 2: Export-weighted real exchange rate response to aid-financed public investment



Source: Adam and Bevan (2006: 279).

4.3 The implications for the monetary and fiscal policy responses

Two distinct types of conclusions for policy emerge from the analysis of this section. First, if the various components of weak governance are present in a country then a sudden surge of foreign aid is likely to involve both a substantial *leakage* of the aid flows (from their intended purposes) and some significant *distortionary* effects. The distortionary effects in turn are more likely than not to discriminate against tradable economic activities in some of the ways encompassed by the DD propositions. But in such a case it would be very much a second best approach to invoke the use of monetary and fiscal policy to offset the DD-effects as advocated in the conventional economic-theory logic (e.g. as in Magud and Sosa 2010). The effective use of such an intervention would be likely to be undermined by the very same basic weaknesses of governance that are causing the aid-effectiveness problems in the first place. Certainly there would be no guarantee to the contrary! The first-best approach would instead involve a direct attack on the underlying problems of governance—in addition to the other programmes of government and donors—to try to eliminate the weaknesses that may otherwise undermine the intentions of the aid donors.

Second, if the governance weaknesses are not the main concern, then the precise pattern of usage of the foreign aid flows become the critical determinant of whether any complementary fiscal and monetary policy response might be needed if and when there is a surge in foreign aid flows. But even if this surge causes some of the DD symptoms, it once again would not be a first-best approach to invoke monetary and fiscal policy as the first line of response to that problem. Indeed as Adam and Bevan (2006: 289) themselves suggest in the conclusion to their paper. '… serious analysis of the impact of aid must pay close attention to supply-side issues, which are likely to be specific to the uses to which aid is put'. They also note that the full and proper assessment of the

macroeconomic impact of aid depends closely on the underlying microeconomics of the associated public expenditures it finances. The design of any complementary macroeconomic policy response can usefully be seen as a matter of only second-order importance. This again connects the analysis to the new evolving views about industrial policy that were mentioned earlier.

5 Are aid-flows likely to cause DD-type problems?

The published empirical literature on this question is largely inconclusive. Some studies such as Rajan and Subramanian (2005) have suggested that aid inflows do have systematic adverse effects on a country's competitiveness, as reflected in a decline in the share of labour intensive and tradable industries especially in the manufacturing sector. However, others have found the DD-type effects to be small. Malik (2005); Arndt et al. (2009, 2010, 2011) have provided a more substantial repudiation of the Rajan and Subramanian results. Killick and Foster (2010: 91) examine seven specific episodes of foreign aid surges in Africa and find that on balance the results about DD are reassuring.[27] Their main results are reproduced as Table 2.

Table 2: Dutch disease indicators for Africa

Country and surge period	RER	Domestic inflation rate	Total exports	Share of non-traditional exports
Ethiopia 2001-3	No significant change	Small decline	Some growth	Some increase
Ghana 2001-3	Some appreciation	Major decline	Some growth	Little change
Mauritania 1999-2	Some depreciation	No significant change	Small decline	n.av
Mozambique 2000-2	Small depreciation	Modest reduction	Substantial growth	Large increase (new mines)
Sierra Leone 2000-2	Significant depreciation	Substantial reduction	Large expansion (post-conflict)	n.av
Tanzania 2000-3	Small depreciation	Small decline	Substantial growth	Substantial increase
Uganda 2000-3	No change	No change	Little change	Substantial increase

Source: Killick and Foster (2011: s91).

The authors note that in the various case studies that they examined, a recurring line of explanation for the apparent lack of any strong DD-type effect was that, 'in the type of economy studied here, export expansion is more likely to be constrained by non-price factors, such as transport and storage facilities'). This is a key point and it also provides a specific example of the Adam and Bevan proposition that public investment in non-tradables can sometimes have productivity—enhancing effects. Nonetheless, Killick and Foster argued strongly against dismissing the potential significance of a DD effect from aid on the following main grounds.

[27] Another relevant paper is Arndt et al. (2009).

First, none of the countries in question fully absorbed and spent the aid surges that they studied. For this reason it can be argued that they did not fully experience an 'aid surge' in the proper sense of the term. Rather, in some country cases, the authorities explicitly held back from actually spending all the increased aid receipts because of the fear that a real exchange rate appreciation might follow. Specifically, in the cases of both Tanzania and Uganda, the central banks explicitly restrained the absorption of available aid for fear of exchange-rate appreciation.

Second there is a general concern (in this context) about the manner in which aid is increasingly spent. In particular, with the strong modern-day emphasis on poverty-reduction, there is an increasing likelihood that aid will be concentrated more in those sectors which have the effect of raising demand and so the relative prices for non-tradable goods and services.[28]

5.1 Minerals, oil and gas versus foreign aid

Further light can be shed on the question in the title to this sub-section by looking at the volumes of ODA receipts by country and comparing these with the volumes of foreign exchange earnings from mining activity plus oil and gas. This is a crude comparison but it does help to put into perspective the relative importance of foreign aid versus mineral revenues as a potential future source of DD. The ODA and export data have been assembled from OECD and WDI sources for all low and middle-income countries where the data needed are available. The main data point is 2009 but use has been made of earlier year numbers in a few country cases where the 2009 data are not available. Data for 108 low and middle-income countries have been assembled.

First in Figure 3 we look at the magnitudes of the ODA receipts of each country expressed as a proportion of that country's total exports.

This first comparison tells us that there are currently about 17 low and middle-income countries (to the left of the first red arrow) in the sample of 108 countries where annual ODA receipts are the equivalent of 50 per cent or more of total exports of goods and services. In eight extreme country cases such as Afghanistan, Congo DR, Eritrea, Rwanda and Sierra Leone, the ODA: export ratio is well over 100 per cent. However, the data also tell us that there are more than 75 low- and middle-income countries (to the right of the second red arrow) in the sample of 108 countries where ODA receipts are the equivalent of 20 per cent or less of total export receipts. In most of these cases they are well under 10 per cent of total exports.

We next examine some data from UNCTAD sources about the size of mining and oil and gas export revenues. These data have been assembled and presented in a paper by Kardan and Roe (2009) which used data for 2006 and updated by Wheeler and Haglund (2011) using 2010 data. Figure 4 uses these 2010 data to compare the ODA/Export ratios for 2010 (left axis) with the ratio of exports of minerals, oil and gas to total exports for 2009 (right axis).

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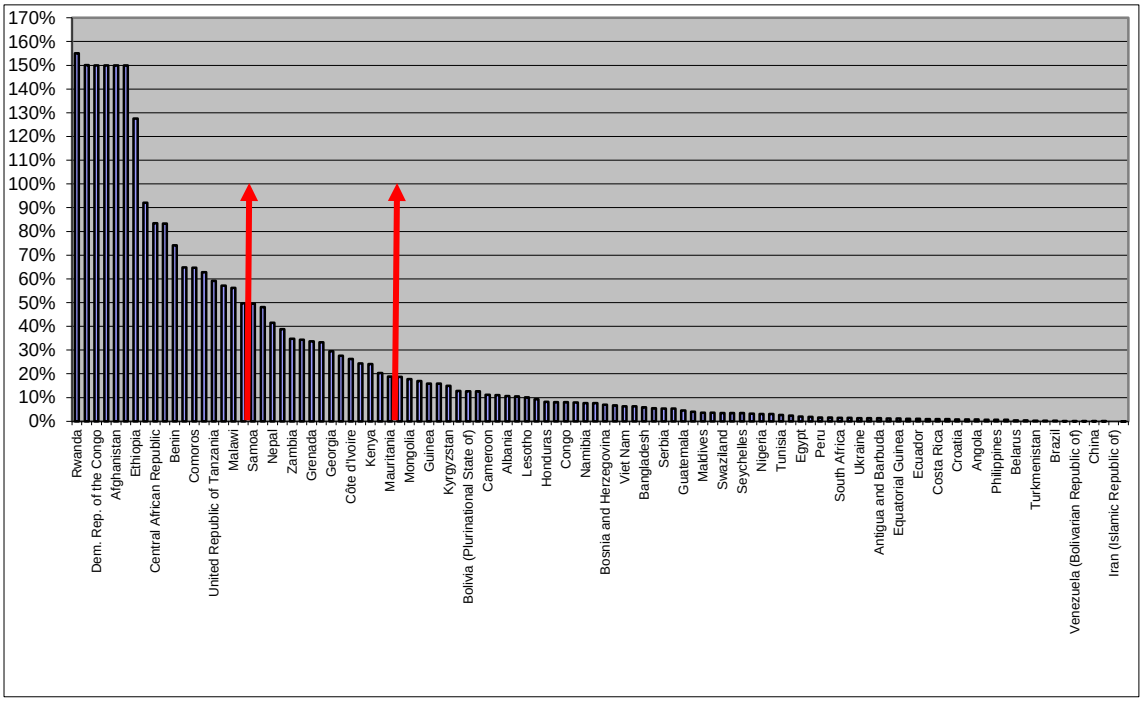
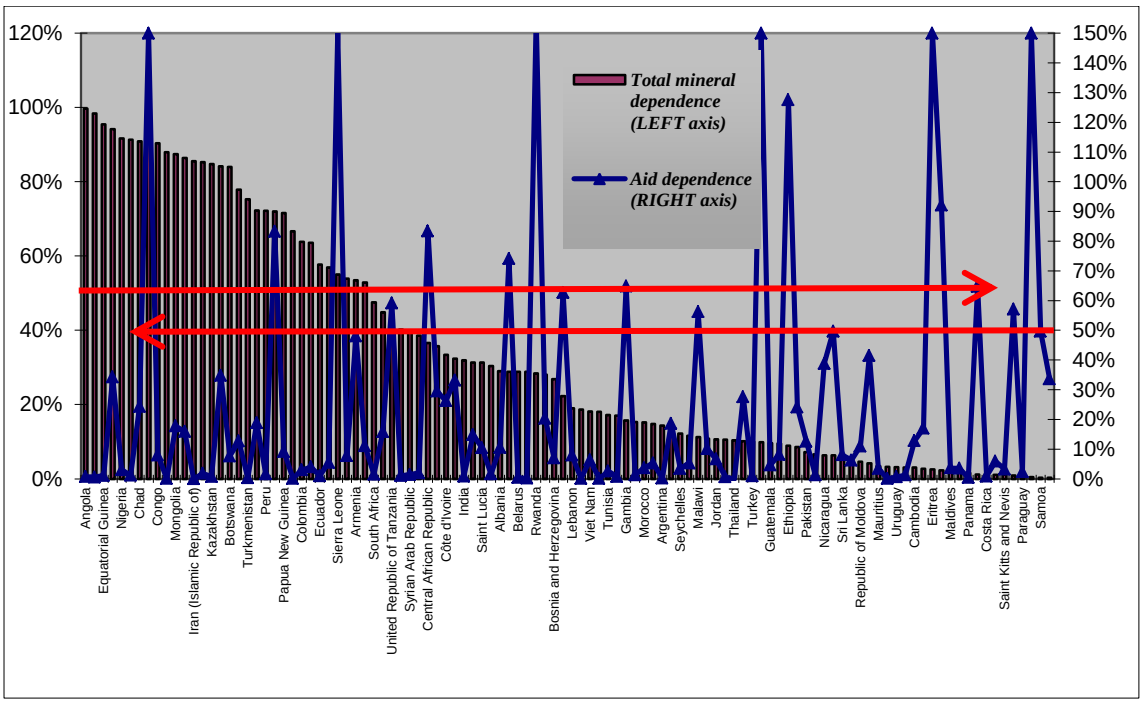
[28] This may be forced by the conditionality of donors or by other reasons. However, there is a counter-argument that can be inserted here. Specifically, some poverty-focused projects can and do operate in a different direction. For example, they may help small holders to move into tradable crops which will not merely push up the relative prices of non-tradables.

Figure 3: ODA flows (net) in 2009—per cent of total exports



Source: Prepared by author based on OECD-DAC data.

Figure 4: Comparing ODA receipts with exports of minerals, oil and gas 2010



Source: Kardan and Roe (2009) and Wheeler and Haglund (2011).

The Kardan and Roe and Wheeler and Haglund data are somewhat incomplete because they do not show the true rate of emerging mineral dependence of several aid-dependent countries that have only recently—or will shortly—become significant exporters of oil,

gas and minerals. These include countries such as Uganda and Kenya, but also Afghanistan, which is currently one of the most aid-dependent countries in the world. Nonetheless their data suggest some significant results.

First, in the sample of 108 low- and middle-income countries included in Figure 3, there are as already noted some 17 countries having an ODA/export ratio greater than 50 per cent (indicated in Figure 4 by those countries above the lower and left-pointing red arrow). These include countries with extremely high values for that ratio such as the Democratic Republic of Congo, Rwanda, Sierra Leone and Mozambique. By contrast, in 2010 there were no less than 32 countries where the mineral, oil and gas exports already exceeded 50 per cent of total exports (indicated by those countries above the right-pointing arrow. Based on this admittedly simple comparison, it can reasonably be claimed that the likelihood of DD problems from mineral, oil and gas exports is substantially higher in more countries than is the likelihood of such problems arising because of 'excessive' flows of foreign aid.

Second, among the countries that have the higher levels of aid dependence shown in Figures 3 and 4, many also have high levels of dependence on the exports or minerals, oil and gas. In fact there are 47 countries shown in Figure 3 that have ODA/export ratios greater than 10 per cent. 25 of these—or more than half the sub-sample—have mineral export ratios greater than 20 per cent, 20 of them have mineral export ratios greater than 30 per cent, 18 of them have mineral export ratios greater than 40 per cent and 12 of them have mineral export ratios greater than 50 per cent. In short, in this sub-sample of aid-dependent countries, it is commonly the case that the foreign exchange inflows associated with mining, oil and gas are three to five times as large as the foreign exchange inflows from foreign aid. It is of course the case that the DD-potency of the different flows will be different. Some aid flows are effectively self-sterilizing—as was noted earlier—as are many of the foreign exchange receipts from mineral exports to the extent that these are spent on imports.

However, even with this caveat taken into account, it does seem to be the case that the DD dangers of foreign aid and mineral exports cannot be looked at in isolation. Indeed, it is increasingly the case that the world's more aid dependent economies are increasingly ALSO highly dependent on minerals, oil and gas for their foreign exchange earnings. Aid-dependent economies are still highly dependent on agrarian activities for the livelihoods of their people but less dependent on such activities than is often assumed for their foreign exchange earnings.

It would seem to follow, in sharp contrast to the prevailing literature that the DD effects of aid and mineral resources need to be treated as *joint* and not as *separable* problems. This we hazard will become increasingly true in the years ahead as (i) more countries become less dependent on aid and not least because they are acquiring market-borrowing powers on the back of oil discoveries (e.g. Ghana, and later Kenya and even Tanzania) and (ii) more low and middle-income countries discover oil and gas reserves.[29] There will likely be a large role for technical assistance in managing this, including possibly from some MENA countries who learnt the hard way.

[29] The surge in exploration activity has been driven both by the increasing demands for oil and gas coming from China and elsewhere but also by the large increases in oil and gas prices in international markets in recent years.

6 Main conclusions

This study has examined a wide range of issues pertaining to both the significance and the policy remedies for possible DD problems in low and middle-income countries. It has been based on the pre-existing literature on the topic but has also incorporated some newer empirical evidence.

The consolidated evidence clearly indicates that DD problems can and do occur because of surges in foreign aid flows. In common with the well-documented issues pertaining to natural resource exports, DD can also occur if there is a sustained increase in aid flows that is wrongly diagnosed and responded to by the policy makers. There is a substantial empirical literature that suggests some symmetry as between the DD-type effects of natural resource rents on the one hand and foreign aid on the other. Both can cause a real exchange rate appreciation and both can cause a significant switch of total production from tradable to non-tradable goods and services. However, the evidence is largely mute on the question of the absolute and relative magnitudes of these two different sources of DD-type problems.

This study also confirms and explains the very well developed armoury of monetary and fiscal policy instruments that can be mobilized by the authorities to help mitigate the main effects of DD. Some of these instruments are more self-evidently appropriate to deal with the natural resource-cases of DD than those cases that are caused by a surge in foreign-aid. In particular since foreign aid in most situations can be thought of as an 'exogenous policy-controlled variable', some at least of the possible negative effects of DD can be addressed most efficiently merely by the better management of aid flows. This is not possible to anything like the same extent in respect of natural resource revenues which for all practical purposes in most countries can be thought of as a 'non-policy variable'. Natural resource revenues are arguably also inherently more volatile than are aid flows (in most country cases) and so more difficult both to anticipate with any precision and to compensate for via macro policy interventions.

There are well understood and documented methods for seeking to mitigate the worse manifestations of DD and some at least of these have relevance also to the foreign-aid case. However, there are key differences. In particular futures funds and stabilization funds that are commonly advocated to deal with commodity export instability, would represent a serious case of overkill if applied to the treatment of any foreign-aid induced episodes of DD—the occasional uncertainties about aid flows notwithstanding. Instead, there is considerable responsibility attached to aid donors both to manage their own policies in ways that can limit the dangers of DD occurring and also to adjust their aid flows if and when DD does seem to be a possibility. The most important of these responsibilities is (i) that of managing total aid flows in a coordinated manner across donors and (ii) allowing aid recipient's greater flexibility in using some aid flows to build reserves rather than having to commit all of them to immediate expenditures. This conclusion also has implications for the manner in which donors think of and monitor the so-called additionality of their aid.

The study further assesses the various possible transmission mechanisms from foreign aid to DD-type outcomes. It emphasizes that these mechanisms can involve both political-economic and institutional influences as well as narrowly technical economic ones. The important point is made that in those cases where various failings of

governance or institutions (e.g. corruption, rent seeking etc.) are the main reasons why the intentions of aid transfers are perverted in a way that intensifies some DD-type symptoms, then it would be very much a second best solution to utilize technical monetary and fiscal instruments to address the problem. Indeed the very weaknesses of governance and institutions that are the cause of the basic problem would be more than likely in such cases to undermine the effectiveness of the possible monetary and fiscal responses.

In the other cases where the economic forces alone are driving the DD problem, then it has been shown quite clearly that the appropriate policy responses will depend critically on the purposes to which the aid is directed and how it is spent. Much aid is fully self-sterilizing as for example when a large humanitarian transfer is spent 100 per cent on imported foods, shelters and medicines. In other cases, when the extra spending is such as to result in a significant spill-over from higher public investment—financed by the foreign aid—to higher productivity in the private sector, then any early-stage real exchange rate appreciation is likely to be reversed in the longer term. Hence no fiscal and monetary policy adjustment is needed to address the initial signs of a DD problem. The situation is quite different if the spending of foreign aid is not fully absorbed by imports and also involves no significant spill-over to increased private sector productivity. But in that case, it is debateable whether the first best solution should not be to re-think the uses of aid rather than resort to a fiscal and monetary policy response designed to mitigate the adverse consequences of aid. More generally, it is safely concluded that the responsibility for the avoidance of DD lies at least in part with the careful examination of the microeconomic effects of aid flows and not only with the macroeconomic policy instruments.

Finally, the study considers the relative significance of foreign aid flows and exports earnings from natural resources (specifically mineral plus oil and gas) as likely sources of DD-type problems. Two main conclusions emerge from this analysis. First, the data suggest that the likelihood of DD problems from mineral, oil and gas exports is substantially higher for low and middle-income countries than is the likelihood of such problems arising because of excessive flows of foreign aid. Second, since many low and middle-income countries are at one and the same time both aid-dependent and mineral-dependent, the DD management challenges of aid and mineral resources need to be treated as joint and not as separable problems. This is not commonly done in the literature. Further this is likely to become increasingly the case in the near future as more low and middle-income countries that still rely on foreign aid move into the camp of oil and gas exporters. We anticipate some huge dilemmas for the main aid donors to still poor aid-dependent economies such as Tanzania and Uganda once the oil and gas bonanzas anticipated for these countries begin to complicate the challenges of effective macroeconomic management.

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