TRADE SHOCKS

Consequences and Policy Responses
in Developing Countries

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PREFACE

We are pleased to publish *Trade Shocks: Consequences and Policy Responses in Developing Countries,* by Paul Collier and Jan Willem Gunning, as the fifty-first in our series of Occasional Papers, which present perspectives on development issues by noted scholars and policy makers.

In this study Professors Collier and Gunning examine a question of great importance for countries whose resources are disproportionately concentrated in single commodities, such as coffee or oil, and which are therefore vulnerable to trade shocks. This paper explores how mistaken policy responses to such shocks have had destructive consequences for many developing economies. They summarize two works, still in progress, that examine for policy lessons both theoretical issues and empirical evidence from a large number of countries on three continents.

The authors explore five key issues: whether volatile prices carry beneficial or harmful implications for expected national income, the extent to which smoothing of shocks over time will improve economic performance, Dutch disease (favorable external shocks causing shifts of resources away from other [nonboom] tradable sectors), the theory of construction booms (positive shock causing disproportionate increase in demand for assets vis-à-vis consumption), and the fix-price macroeconomic response (effects of price rigidities in the labor market).

The authors discuss the relationship of trade and monetary policies, emphasizing exchange rate policies and how they react to shocks. They observe that when policy does not respond efficiently to shocks, the result can be intense price and income volatility. They suggest, however, that price volatility should not be viewed as universally harmful. In the

wake of preventative shock, volatility may be seen as a force for long-term growth, provided the private sector—which is best able to adapt to short-term fluctuations—is not unduly restrained by government control of income windfalls.

Professor Collier is coauthor along with Professor Jan Willem Gunning of the major multi-country study still in progress, ''Trade and Development: Protection, Shocks, and Liberalization,'' summarized in this paper. Funded by the Agency for International Development, the World Bank, and British Petroleum, this study advances twenty-five case-studies of episodes of external shocks in Africa, Latin America, and Asia, providing evidence of patterns in policy response.

We hope this paper will be valuable for policy makers and scholars who are trying to reform the policy responses of developing countries that experience major trade shocks.

Nicolás Ardito-Barletta
General Director
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Panama City, Panama
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Both Professor Gunning and Professor Collier are Professeurs Associetés at CERDI, Université d'Auvergne. They have written, with David Bevan, *Peasants and Governments: An Economic Analysis and Controlled Open Economies: A Neoclassical Approach to Structuralism.*

Paul Collier and Jan Willem Gunning

Trade Shocks: Consequences and Policy Responses in Developing Countries

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The history of external shocks, followed by errors in policy response, is a very long one. A famous example occurred in the 1860s, during the American Civil War. The interruption to American cotton exports caused a corresponding cotton boom that enormously increased public revenue in Egypt. With a lag, public expenditure increased but could not be scaled back when the boom was over. The resulting bankruptcy handed the Suez Canal to Anglo-French ownership. To take a current example, a reasonable case can be made that the present fiscal crisis in Nigeria can be traced to the 1991 oil boom that resulted from the invasion of Kuwait. In this paper we first briefly review the main analytic building blocks that are useful in thinking about external shocks. Although Dutch disease is one of them, we think it has received disproportionate attention. In ''Shocks, Assets, and Output'' we address asset behavior, which we regard as the central issue in dealing with shocks. We draw on two blocks of evidence, a twenty-five-country study of which we are the coordinators, and a thirty-five-country econometric time series study by Deaton. Both are work in progress. In ''Consequences of the Control Regime'' we turn to the appropriate control regime, focusing on trade and monetary policies. The final section provides a conclusion on policy lessons.

Five Analytic Building Blocks

Five analytic building blocks are useful in thinking about external shocks. They are, first, the theory of whether volatile prices are good or bad in the restricted sense of what they imply for expected income. Second is the extent to which intertemporal smoothing of shocks is appropriate. Third, and most familiarly, is the Dutch disease approach. Fourth is the intersection of the second and third approaches—the theory of construction booms. Finally, there is the fix-price macroeconomic approach.

Instinctively, one imagines that price volatility must be disadvantageous compared with some "equivalent" constant terms of trade. Although this instinct may well turn out to be right, there is one interesting sense in which it is absolutely untrue: a volatile terms of trade should result in a higher income terms of trade than if the terms of trade were constant around either its arithmetic or its geometric means. The reason is that if there is any intratemporal substitution in either production or consumption, then the economy will to some extent be able to take advantage of fluctuations in relative prices, exporting disproportionately more of its export good when its price is high, and concentrating on import substitution when its price is low. Price volatility is thus an opportunity to make a killing, which is missing when the terms of trade are constant. This simple insight has two powerful corollaries. First, it suggests that an appropriate strategy for an economy that is subject to a lot of price volatility is to have as much resource mobility as possible. Concerning the less mobile factor, capital, the economy would invest in general rather than sector-specific skills and physical capital, short-lasting rather than long-lasting sector-specific capital (vehicles rather than buildings), and have a large "moving sector" (following Mussa's term). Concerning the intrinsically more mobile factor, labor, policies that tended to convert labor from a variable to a fixed factor by restricting layoffs would be costlier in such an economy than in others, because labor mobility is likely to be the primary means of achieving short-term shifts in output. Second, it suggests that either domestic or world price stabilization would reduce real income. Domestic price stabilization removes the incentive for domestic agents to shift resources or consumption. World price stabilization removes the

opportunity for the economy to cash in on high prices. We do not wish to overstate this position. On balance, we believe that price volatility is damaging. However, it does suggest an alternative focus for public policy.

While the first building block has assumed price volatility and deduced that a high degree of intratemporal substitution in production and consumption is the appropriate response, the second poses the question of whether a price shock should be treated as having intertemporal implications. Some price shocks are pretty obviously temporary, such as the coffee booms induced by Brazilian frosts. However, most price shocks, even if temporary with the benefit of hindsight, do not occur in a context in which the duration of the shock is readily discerned. Indeed, most econometric studies of commodity prices are not able to reject the hypothesis that they are random walks, implying that price changes should be regarded as permanently altering the expected future price by the same amount. This should not be taken too seriously. First, the forecasting record of commodity prices using econometric methods, notably by the World Bank, is very poor. Second, recent improvements in econometric specification are starting to find some reversionary component to prices, while simulation models yield occasional peaks (during stockouts) followed by long, shallow troughs. The present state of knowledge about commodity prices justifies neither the assumption that shocks are entirely temporary (though they may be), nor that they are permanent (though they may be). Given the high degree of uncertainty about the persistence of a price shock, the response then depends in part on whether there are asymmetries between the consequences of errors of optimism and pessimism. For instance, if the costs of erroneous optimism exceed those of pessimism, then caution would be appropriate. There are, therefore, two rather different justifications for high savings rates in response to positive external shocks: that based on a belief that the shock is temporary, and that based on uncertainty coupled with asymmetric costs of errors. Neither of these propositions is currently well established.

The third building block, Dutch disease, is familiar: favorable external shocks shift resources out of the nonboom tradable sector. This is only a ''disease'' if particular assumptions are added to the standard analysis; for example, if the shock turns out to be temporary but this is

not realized at the time, then those resource shifts that are costly to reverse will be excessive. It is hardly surprising, though, that an economy would do better if there were perfect knowledge of the future, and there is no reason to believe that resource allocation errors would be any greater in response to external shocks than to any other innovation. Arguments based on learning by doing in the nonboom tradable sector, or any other externalities generated in the sector, are not really shock-specific: they constitute a case for favoring the sector in all circumstances rather than for shielding it from Dutch disease effects.

The fourth building block, construction booms, combines the Dutch disease disaggregation into tradables and nontradables with the intertemporal analysis that disaggregates into consumer goods and assets. A positive external shock induces a disproportionate increase in the demand for assets relative to consumption. Some of these assets are nontradables, such as buildings and infrastructure. Hence, the rise in demand for consumer nontradables is weaker than that predicted within the framework of Dutch disease theory (with a boom fully treated as temporary it might be close to zero), whereas the rise in demand for nontradable capital goods may be very substantial. The sector that produces these goods, namely the construction sector, is therefore a major beneficiary of external shocks. Indeed, the construction boom could be much more pronounced than the primary export boom that induces it. But, if the price of construction services is driven up substantially, then smart agents will temporarily acquire foreign assets that they will repatriate once the price of construction is lower. This role of foreign assets as a means of stretching the investment boom over a longer period than the savings boom, thereby raising the efficiency of domestic investment, is one of the central propositions of the theory.

The final building block is to introduce some nominal or real price rigidities, for example, in the labor market or a part of it. Shocks may have temporary effects because they catch agents by surprise. The most obvious examples concern temporary increases in employment. This could be brought about because the shock might raise the price level, lowering real wages until agents recontract, or the shock could raise the equilibrium real wage while leaving the actual real wage temporarily fixed by contracts. Aside from these necessarily temporary effects based on surprise, shocks could have permanent effects if there

is a formal/informal labor market dichotomy. The real wage in the formal sector might be above the equilibrium wage but not functionally related to it. Thus, a favorable shock that raised the equilibrium real wage need not induce recontracting in the formal sector, but could lead to the enlargement of that sector (and the contraction of the informal sector) for the duration of the favorable shock (rather than for the duration of surprise). There is scope for asymmetries in response. One such assumption, sometimes made, is that real or nominal wages are flexible upward in response to positive shocks, but rigid downward in response to negative shocks. In the African labor markets with which we are familiar this would probably be the reverse of the truth. By the time of the favorable shocks of the mid-1970s African formal sector wages were high as an inheritance from the political economy of independence. Wage earners on the whole did not succeed in raising real wages during the booms. By contrast, during the negative shocks of the 1980s, real wages fell with remarkable flexibility. As we will see, the quest for plausible accounts of asymmetries turns out to be important.

Shocks, Assets, and Output: Some Evidence and Its Implications

The government must have some policy toward shocks because, like other agents, it gets revenue and makes expenditures. Revenue will change as a result of the shock even if there is no direct taxation of the windfall. For instance, during the coffee boom of 1976–1979, the Kenyan government ended up with about half of the windfall even though it had virtually no tax on coffee itself, because it derived much of its revenue from import taxes and imports increased substantially. The returns to public expenditures are also likely to change, though not in a straightforward manner (Bevan et al. [1989]). For instance, if public investment in infrastructure is complementary to private investment then there is a case for increasing it during the boom, whereas offsetting this, such expenditures will amplify the construction boom. In this section we investigate public and private expenditure responses to external shocks. We turn to the other aspect of government policy, the control regime, in ''Consequences of the Control Regime.'' Still, it is convenient to bring one control into the picture at an early stage because

it directly concerns the asset policies that are the main focus of this section, namely exchange controls that prevent private agents from legally acquiring assets abroad. This control was common to most though by no means all of the countries to be discussed.

We now turn to the evidence to see whether there was a pattern to policy responses. We draw mainly on two sources. The first is a set of twenty-five case studies of episodes of external shocks in Africa, Latin America, and Asia (although most of the Asian studies are as yet incomplete).[1] The second is a study by Deaton (1992) on thirty-five African countries over the period 1968–1985, in which time series on export prices of commodities are related to GDP and the components of national expenditure.

We begin with the identification of the shocks: In what sense were there ex post episodes and were these identifiable ex ante? Generally, the greatest difficulties were with the oil economies. Clearly, there were very large price shocks that ex post proved temporary. There was some basis for regarding them at the time as temporary because the history of cartels suggests that they rarely persist; however, there was no way of knowing how temporary this might be and in the late 1970s and early 1980s the central forecasts of the oil price had it continuing to rise in real terms. Most oil producers also had large quantity shocks. These ranged from the discovery of, in practical terms, limitless supplies (Venezuela) to supplies that were expected to be exhausted over ten to fifteen years (Cameroon). This seems to have been fairly typical of mineral extraction: price shocks that were very hard to interpret (another example would be Zambia and the copper price and a series of highly inaccurate World Bank forecasts), but quantity shocks that were much easier to read. In between were quantity shocks induced by pricing policy. As an example, in 1980 the de Beers diamond cartel suspended purchases so as to defend the price and this caused a temporary but

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1. The case studies have been done to a common design. The study is funded by the Research Department of the World Bank, the International Center for Economic Growth, the Oxford Institute for Energy Studies, and the Dutch government. The countries included are Kenya, Egypt, Niger, Senegal, Cameroon, Cote d'Ivoire, Zambia, Botswana, Malawi, Ghana, Nigeria, Mauritius, Colombia, Mexico, Costa Rica, Venezuela, Bolivia, Indonesia, Pakistan, Bangladesh, Papua New Guinea, Malaysia, Thailand, Sri Lanka, and Philippines. Preliminary results are published in Bevan et al. (1993, 1993a).

substantial negative shock in Botswana. In 1981 Nigeria drastically reduced oil exports in an attempt to defend the premium price of its oil over North Sea crude. In both these cases, even though the quantity change could reasonably be seen as temporary, there was uncertainty over whether the strategy would succeed in its objective: in Botswana it did and in Nigeria it didn't. The broad picture on mineral shocks is that the price shocks are often long-lasting and hard to read; the quantity shocks related to discoveries are long-lasting, whereas the quantity shocks related to cartel behavior are periods of high uncertainty. By contrast, agricultural shocks seem rather easier to read. Price shocks such as the beverage booms of the late 1970s are evidently temporary because supply either recovers (where the source of the shock is a fall in supply) or can be expanded almost without limit in the medium term. Quantity shocks are usually climatic and again therefore quickly reversed.

The two reasons for having a high savings rate from windfalls, either because they are seen to be temporary or because they are regarded as highly uncertain, thus apply very differently to the various types of shock. The peculiarity is that this seems to make little difference to savings behavior.

Are Windfalls Saved and Who Saves Them? First, it must be admitted that it is not a straightforward matter to calculate windfall savings rates because it is necessary to specify counterfactual income. Even ex post, this is fairly arbitrary, and we have no way of knowing how agents viewed their likely incomes ex ante. The twenty-five case studies did, however, use a reasonably common approach and so have some internal consistency. Where windfall savings rates are found to be in the range of 60 to 90 percent whereas normal savings rates are below 20 percent, the conclusion that windfall savings are high is unlikely to be an artefact, although the actual rates cannot be regarded as robust.

With the above caveat, most countries experiencing windfalls have had high savings rates out of them even when the shocks appeared likely to be long-lasting. Examples are the Nigerian oil boom of the 1970s, most other oil booms, and the Botswana diamonds boom. Booms that looked likely to be short-lived also usually generated high savings rates: Kenya, Colombia, Niger, Cote d'Ivoire, Malawi, Senegal, and Mauri-

tius. Complete failures to save windfalls were fairly rare. In Ghana there was no savings from the cocoa boom (although it was fairly obviously temporary) and in Nigeria during the second oil boom of 1979–1981 the rate of windfall savings was probably slightly negative due to heavy borrowing.

We now turn to a disaggregation of behavior between the public and private sectors. It is not entirely straightforward to identify whether shocks were public or private. The initial configuration of taxes or ownership rights gives a clear categorization, but endogenous changes in tax effort or government transfers complicate the picture. In Côte d'Ivoire and Senegal, tax collection efforts slackened during the period of the windfall so that part of it was transferred in a highly indirect form to the private sector. In Kenya and Malawi precisely the opposite happened: tax effort was increased during the boom. Purchasing power could also be transferred from the government to private agents. In Ghana, due to high export taxes, the government initially received the entire windfall on cocoa but then transferred about three quarters of it to public sector employees. In Indonesia there was some transfer of the oil windfall to farmers, for example, through fertilizer subsidies. Of course, in some sense almost all public uses of windfalls benefit private agents (military hardware is probably the most pertinent exception), but there is a difference between transfers of purchasing power such as is achieved by raising public sector wages, and the provision of illiquid assets such as an expansion of public primary education or roads. We can therefore distinguish between the savings rates out of windfalls that were received by and stayed with the private sector, windfalls that were received by and stayed with the public sector, windfalls that were indirectly transferred from private to public agents, and windfalls that were indirectly transferred from public to private agents.

We have at present seven cases of private agents directly receiving at least part of the windfall. In four of these the recipients were farmers: coffee farmers in Kenya, Colombia, and Costa Rica, and groundnut farmers in Senegal. The remittance booms in Egypt and Pakistan accrued directly to households. Finally, in a more marginal case, a substantial part of the Zambian copper boom of the early 1970s accrued to the Zambian copper company ZCCM, which was majority publicly owned but behaved to some extent independently of the government. In

each of these cases the private agents had high savings rates out of the windfall. The highest, that of Kenyan coffee farmers, was about 70 percent. The Kenyan government made special efforts through the coffee marketing cooperatives to explain to farmers that the price increase was caused by a frost in Brazil and was therefore unlikely to persist. Considerably the lowest rate, 33 percent, is that of Colombia. The first conclusion from this is that, as far as the evidence permits, it suggests that private agents respond in a cautious and farsighted way to positive shocks. This cuts away the main rationale for domestic stabilizing taxation policies. The government does not need to play a custodial role because private agents, sharing the same information as the government, make sensible savings decisions. The second conclusion is that the Colombian case is out of line, and so it is of obvious interest to inquire why. One possibility is that private agents took into account the savings behavior of the government, which had a particularly high and institutionalized savings rate from its component of the windfall. A second is that coffee farmers became confused as to the nature of the price increase. During 1977 not only was the world coffee price high, but within Colombia the price to farmers probably rose disproportionately because the former government marketing monopoly was liberalized, allowing private coffee marketing firms to buy at close to world prices. Bates argues that this was a response to the fact that the 1978 elections were to be the first genuinely contested elections in many years, so that rural votes now mattered.[2] It is thus possible that coffee farmers attributed much of the price increase to a change in market structure driven by the switch to contested elections. In this case they would have interpreted much of the increase in income as permanent rather than transient and therefore rationally have chosen a lower savings rate. There are other possible explanations and the issue is evidently important for whether the Colombian government can afford to trust its farmers to make savings decisions.

There are many more cases in which the government directly received and kept all or part of the windfall. In some ways the most

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2. We are indebted to discussion with Robert Bates (Department of Government, Harvard) for this point. His work on the Colombian coffee boom is in progress.

remarkable case is Colombia. The initial reaction of the government to the coffee boom windfall, which it shared with private agents, was to reduce its own expenditure in order to dampen what it expected would be the inflationary pressure of increased private expenditure. Although this was the only example of an initial public savings rate in excess of 100 percent, quite commonly public savings rates were high and occasionally maintained at high levels for long periods (for example, Botswana and Cameroon). There were also, however, cases in which the public savings rate was zero (Ghana, Costa Rica, Mexico) and often a pattern in which there was a loss of control of public expenditure with a consequent decline from high savings to dissavings (Nigeria). On the whole it is quite surprising that even in countries where the government was notorious for inefficiency and extravagance (like Nigeria and Zambia in the 1970s) the savings rate from public windfalls was fairly high.

There are only two cases in which the windfall accrued directly to the private sector but was, to a substantial extent, transferred indirectly to the public sector through increases in other taxes, these being Kenya and Malawi. In the Kenyan case the public sector managed to capture about half of the windfall. Despite policy statements that the resources were to be used for capital expenditure, in the outturn the public savings rate was low. Quite how low depends on how much of the postboom experience is attributed to the consequences of the boom. During the boom itself the government had a windfall savings rate of 20 percent. But, this masks an initially high rate that decreased as recurrent expenditure ballooned. By the end of the boom, recurrent expenditure was high and persisted, while capital expenditure was reduced to pay for it. If allowance is made for this during the three postboom years before the budget was restored to its preboom configuration, then the overall public windfall savings rate is slightly negative: the boom rephased public investment but did not increase it overall. This pattern was not repeated in Malawi, where the government achieved a respectable savings rate out of its share of the windfall.

There are two further cases in which the boom was received by the government but indirectly transferred in part to the private sector, these being Ghana and Cameroon. In each of these cases private savings out of the windfall were low: 15 percent in Cameroon and zero in Ghana.

One interpretation of these results is that indirect transfers between

agents, whether public to private or private to public, tend to destroy the essential information about the true nature and source of the income windfall. To take an extreme example, the Ghanaian civil servants who received part of the cocoa boom in the form of higher salaries would have needed much greater foresight to realize that these wage increases would not be sustained once the cocoa price fell than the foresight needed by Kenyan coffee farmers to realize that their high coffee incomes would not persist. But, because there are few cases, they might all be explicable ad hoc. For instance, in Ghana during the late 1970s the environment for private asset accumulation was unattractive, so savings might have taken the form of illegal acquisition of foreign exchange, which would obviously not be recorded in the data. With this caveat, our tentative conclusion is that high savings rates are normal in response to external windfalls unless the transfer mechanism succeeds in divorcing the recipient from the information about the true source of the windfall. The high savings rates seem to apply even where, on the basis of price forecasts made at the time, or the reserves of newly discovered minerals, it would be quite reasonable to expect the income stream to persist for many years. In any event, this behavior has ex post turned out to be shrewd in that seldom have income sources persisted. Even in the case of the most sustained windfall, Botswanan diamonds, the true source is not so much the reserves of diamonds in the ground as the preservation of the cartel that keeps the price at perhaps ten times its marginal cost. As events in Russia and Angola have demonstrated in the past year, even this cartel, much of which is the most successful in world history, is far from secure, and so a high savings rate is much the most prudent course.

Finally, there should be some qualification to the high rate of public savings out of windfalls. We have seen that in the case of Kenya the rate of public savings out of its windfall is very sensitive to the time period over which the shock is defined. Although initially the government saved part of the windfall, it also increased recurrent expenditure and was unable to reduce it once the windfall ended, forcing it to dissave. This pattern was found in several of the other studies. It is also consistent with results by Deaton (1992), for thirty-five African countries during 1968–1985. He finds that government expenditure has a much higher degree of persistence than the other components of expenditure. This