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Safety Nets for the Poor: A Missing International Dimension?

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The problem

Considerable attention has been given to the appropriate extent and form of safety nets for the poor in developing countries (see Chapter 3 of this volume). However, the literature on this subject has focused almost exclusively on domestic institutional arrangements which may protect the poor from adverse shocks. A question that has received insufficient consideration is whether international institutions and instruments can play a useful role in helping poor countries (and poor persons in poor countries) cope better with the shocks that they experience. That is the question addressed in this chapter.

We should distinguish the origination (national or international) of the shocks faced by poor people in poor countries from the appropriate level of remediation (national or international) for these shocks. For example, some shocks may be largely national in origin, but it might be quite appropriate to create insurance arrangements which ensure that their impact is spread across countries. Conversely, some shocks may be significantly international in origin, but the appropriate response to these shocks may be to design national institutions that can cope well with them and defuse their effects. The question explored below is whether there are shocks (whether or not international in origin) whose appropriate level of remediation is at least in part international and, if so, what form the arrangements governing such remediation should take.

Why poor countries and poor people in poor countries may experience more shocks and suffer more from the shocks that they experience

There is an extensive and burgeoning literature on the volatility of incomes of poor countries and on the volatility of incomes of low-income people within these countries. Inter alia, this literature establishes that the incomes of poor countries, and of poor people in poor countries are both volatile.[2]

The literature emphasizes that aggregate incomes of poor countries are volatile for a variety of reasons. One of the most important of these is the fact that a large number of these countries rely substantially for their export earnings on sales of a very small number of primary commodities, the world prices of which market are quite unstable.[3] The substantial dependence of many poor countries on agriculture (and especially of rain-fed agriculture) is another reason for volatility in aggregate incomes, since changes in natural conditions can have a large impact on agricultural incomes from year to year. Fluctuations in exchange rates, to which poor countries are especially prone because of their limited capacity to intervene in financial markets and their weak monetary and fiscal institutions, can also give rise to large fluctuations in national income (see Chapter 4). Unstable world interest rates may also substantially influence countries' real income, especially if they are highly indebted and must refinance debts at current interest rates. Unreliable external assistance is another possible reason for fluctuations in national income and in government expenditures. There is also evidence that very low income countries are more likely to suffer from natural disasters.[4] Another reason that poor countries have high volatility of aggregate income is that their production may not be very sectorally diversified. An economy with a small number of sectors of production, each of which employs a small number of inputs, is likely to be one in which aggregate incomes are greatly sensitive to variation in costs of individual factors of production, prices of individual outputs and production conditions. Large countries (in particular, continental-sized countries such as India, China and Brazil) may be able to insure themselves against the effects of shocks as many shocks that they experience are likely to have an impact that is sub-national rather than national. This option may not be available to smaller countries.

Fluctuations in aggregate incomes are likely to be experienced differently by different groups within a poor country. Who bears the brunt of adverse shocks depends upon specific circumstances and is difficult to characterize in general. However, in many countries poor persons are more likely to be exposed to aggregate fluctuations because of their heavy dependence on a single source of income (very often related to agriculture) and their inability to protect themselves from aggregate fluctuations, due to insurance mechanisms that are either inadequate or entirely absent. Such protection may be costly and therefore unavailable to the poor. In countries in which the price of necessities is greatly influenced by world prices, the cost of living of the poor may be greatly influenced by (fluctuating) world prices.[5] The poor may also rely on government services. As a result, they may be harmed by decreases in government expenditure that follow adverse aggregate shocks.[6]

There are a number of reasons why adverse shocks may have more long-lasting deleterious effects in poor countries than in rich ones. One of the most important reasons for this is that the very survival of individuals may be jeopardized by adverse shocks. Adverse shocks may severely decrease the ability of persons to survive. There is empirical evidence that adverse shocks have an impact on survival even in rich countries.[7] The relationship between resources and survival is sometimes summarized by a 'survival function' which describes the probability of survival

survival
chance

s(q1/2+q2/2): survival given certain
mean level of resources

s(q)

s(q1)/2+s(q2)/2: mean level of
survival given uncertain
resources

q1   q2   q
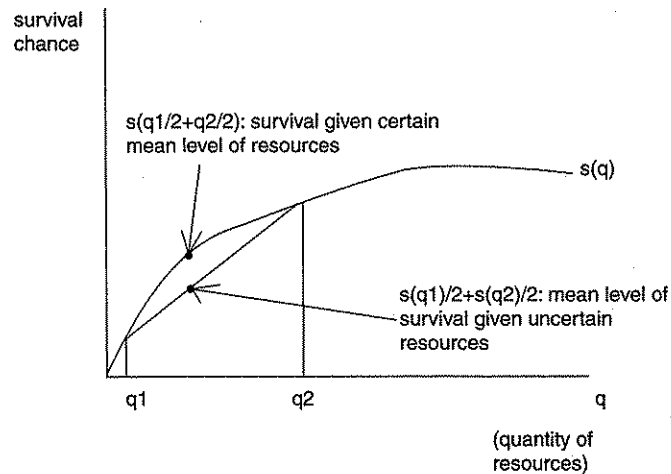
(quantity of
resources)

Figure 7.1 Effect of uncertain access to resources on survival

given a specific level of consumption of resources. It is frequently assumed that the incremental impact of additional resources consumed on survival is greater when a person is poorer, in which case the survival function is concave. In this case, greater variability in consumption will be associated with decreased survival (see Figure 7.1).[8]

More generally, asset holdings, health, nutrition and schooling can be harmed by adverse shocks, which may have effects that are long lasting and difficult to reverse. Damaging hysteresis effects of this kind can help to cement poverty traps. Long-lasting 'dynastic effects' can arise which, in the absence of further intervention, may last over long periods and perhaps even generations.[9]

Adequacy and risk

The premise of this chapter is that it is morally desirable that individuals attain a minimally adequate level of 'advantage' as assessed in *some* space. The space in which advantage is assessed can be defined in various ways (for example, in terms of money, an index of command over resources or 'primary goods', utility or capabilities) so as to reflect the normative priorities and practical judgments of an evaluator. Once the focal space is specified, the level of advantage deemed minimally adequate in this space must also be specified. We choose to refer to advantage and the minimally adequate level of advantage rather than to any specific conception of advantage or minimally adequate level thereof in order to develop a very general framework.

We suppose that objective to be pursued is adequacy of individual advantage. This objective can give rise to a *derivative* concern about volatility: even where a

minimally adequate level is *often* achieved, due to volatility the minimally adequate level may *sometimes* fail to be achieved. A person whose level of advantage is below the minimally adequate level will be referred to as poor, and a person whose level of advantage is not presently below the minimally adequate level but whose level of advantage could come to be below the minimally adequate level due to adverse shocks will be referred to as potentially poor.

Let us explore the problem in a more formal framework. Consider the following simple model. Assume that there is a well-defined metric of individual advantage, and that the level of attainment of individual advantage can be indicated by a real number. $a \in R$. Now, suppose that each individual, i, has a level of advantage at a moment in time, t, described by a stochastic process (possibly differing from individual to individual) which possesses the following form:

$$a_t = a_t + \varepsilon_t \qquad (7.1)$$

where $a_t \in R$, and ε_t is a random variable with mean zero. An interpretation of ε_t is that it describes the shocks experienced around a baseline level of advantage a_t. We may refer to (7.1) as the advantage generation process. This formulation is rather general in that both ε_t and a_t are permitted to vary with time and perhaps also to be influenced by prior history. Now, represent the level of advantage deemed minimally adequate for an individual by z. In that case, we are concerned with whether the following inequality (let us call it the adequacy condition) is satisfied:

$$a_t \geq z \qquad (7.2)$$

We may consider different ways of modifying (7.1). For example, we may consider:

$$a_t = a'_t + \varepsilon'_t + \tau_t \qquad (7.3)$$

where $a'_t = a_t + \Delta a_t$, $\varepsilon'_t = \varepsilon_t + \Delta \varepsilon_t$ is a random variable with mean zero, and τ_t a non-trivial (i.e., non-constant) deterministic function of ε_t with mean zero over possible states of the world (i.e. $\int_{-\infty}^{\infty} \tau_t(\varepsilon'_t) d\varepsilon'_t = 0$) and the property that $\tau_t(\varepsilon'_t) \leq 0$ when $\varepsilon'_t \geq 0$ and $\tau_t(\varepsilon'_t) \geq 0$ when $\varepsilon'_t \leq 0$ (i.e. $\tau_t(\varepsilon'_t)\varepsilon'_t \leq 0$).

We may distinguish different means of changing the advantage generation process (7.1). A 'risk modification mechanism' is any action taken before time period t which causes the replacement of ε_t (in (7.1)) by $\varepsilon'_t = \varepsilon_t + \Delta \varepsilon_t$ (as in (7.3)). An 'insurance mechanism' is a function $\tau_t(\varepsilon_t)$, which provides compensatory transfers that increase the level of advantage experienced in some states of the world in which adverse shocks (i.e. negative realizations of ε_t) have arisen and requires the payment of 'premiums' which diminish the level of advantage experienced in some other states of the world in which positive shocks (i.e. positive realizations of ε_t) have arisen. Insurance mechanisms compensate for the occurrence of adverse shocks but do not directly diminish them. A 'baseline modification mechanism' is

any action taken before time t which causes the replacement of a_t (in (3.1)) by $a_t' = a_t + \Delta a_t$ (as in (7.3)).

An unconditional social transfer (in which resources transferred to an individual are independent of the realization of ε_t) is an example of a baseline modification mechanism. Economic growth (which influences individual private income and thereby changes a_t) is another example of a baseline modification mechanism. Many actions that we may find of interest in practice may fall into more than one of these categories.

Consider equation (7.1) more closely. Since ε_t is a random variable there are three possibilities:

1. The adequacy condition is always satisfied.
2. The adequacy condition is never satisfied.
3. There are some states of the world in which the adequacy condition is satisfied and some states of the world in which it is not.

Now, in the first case, we have no reason for concern, at least if our sole objective is to achieve minimal adequacy. In the second case, we have great reason for concern. Since by definition τ_t and ε_t have mean zero, no risk modification or insurance mechanism (or combination of such mechanisms) can ensure that the adequacy condition is always satisfied, although they may ensure that the adequacy condition is sometimes satisfied (at the cost of ensuring that shortfalls from adequacy are even more severe than they would otherwise be at other times). Furthermore, if we treat each additional unit of shortfall from adequacy as being increasingly disvaluable, then risk modification and insurance mechanisms which ensure that the adequacy condition is sometimes satisfied will be undesirable ex ante since they will have the effect of causing shortfalls from adequacy for the corresponding increases in other states of the world. Therefore, only a baseline modification mechanism offers a potentially desirable approach to ensuring that the adequacy condition is attained in at least some states of the world. When the adequacy condition is never satisfied, it is appropriate to think of shortfalls from minimal adequacy as arising from endemic structural causes such as poverty (expressed by a_t) rather than from adverse shocks or vulnerabilities (as expressed by ε_t). For that reason, although it is of great practical importance, this case will not be studied further in this chapter.

The third case is that which is of interest to us in this chapter. In this case, both risk modification or insurance mechanisms and baseline modification mechanisms can influence how often the adequacy condition is met, and if it is not met, then to what extent it fails to be met. It is obvious that policies that raise a_t and those that decrease the net effect $(\varepsilon_t' + \tau_t)$ on individual advantage of negative shocks can each increase the frequency with which the adequacy condition is met, and diminish the extent of shortfalls from the adequacy condition when such shortfalls arise.

Our premise is that it is desired to identify institutional arrangements and policies (i.e. baseline modification mechanisms, risk modification mechanisms, and insurance mechanisms) that will enable as many persons as possible to attain the adequacy condition (7.2) as frequently as possible, given that the process initially underlying the determination of individual advantage is described by the advantage generation process (7.1). We ignore other objectives here in order to simplify the choice problem, although these will, of course, have to be considered in public policy analysis more generally. In order to identify 'optimal' institutions and policies, it will be necessary to employ evaluative judgements with which to determine how good or bad are alternative states of the world as well as how good or bad are actions that influence the likelihoods of these alternative states of the world arising. There are many plausible ways of forming such evaluative judgements and associated aggregation structures, each of which may induce distinct conclusions concerning optimal policies. For purposes of exposition, we may consider a simple example of the optimal policy choice problem. Let the shortfall of each person, i, from minimum adequacy, z, in discrete time period t be represented by $s_{it} = (z - a_{it}' + \varepsilon_{it}' + \tau_{it})$. We assume z to be the same across all individuals and time periods for expositional simplicity. Each individual's shortfall from minimum adequacy in a given time period is an element in a matrix, S, of the shortfalls experienced by all individuals in all time periods during the planning horizon. The values of the matrix, S, depend on the realizations of the random variable ε_{it}'. If we define Ω as the matrix consisting of elements ε_{it}' then we may express this dependence in the form $S = S(\Omega)$. A particular choice of policies affects both Ω and the effect of Ω on S.

We may define, on the basis of appropriate evaluative judgements, some aggregate over all persons (for example $\varphi_t = \sum_{i=1}^{n} s_{it}^{\alpha}$ where $\alpha \in R$ is a measure of aversion to increased shortfalls) of the shortfalls experienced in each time period. In effect, this is a means of aggregating the information in a given column of S. We may define further, on the basis of appropriate evaluative judgements, an aggregate over time periods of the aggregate shortfalls experienced in each timeperiod (for example, $\Phi = \sum_{t=1}^{m} \varphi_t$, where it is assumed that the planning horizon consists of m time periods and no discounting is applied). In effect, Φ is a means of aggregating all of the information contained in each possible realization of the matrix S and assigning a disvaluation to this realization. Since there is uncertainty about the value of S, the choice of optimal policies must reflect an approach to decision-making under uncertainty. Specifically, such an approach must recognize that each combination of policies influences the possible states of the world, their associated likelihoods and the individual shortfalls experienced in each state of the world. The value attached to a specific combination of policies derives from aggregating the valuations associated with the alternative states of the world that can arise as a result of these policies, given the associated likelihoods of each of these states arising under this combination of policies. There are plausible means of undertaking such aggregation. One possible, and well- known, means of undertaking such aggregation is the expectation operator. Without further effort at justification, we adopt it here so as to provide an example of the steps involved in defining fully the problem of optimal policy selection. Let A, N and T respectively represent the set of feasible baseline modification, risk reduction and insurance policies. Then, the problem of optimal policy selection is:

$$\min E(\Phi) \text{ subject to } a_{it}' \in A, \ \varepsilon_{it}' \in N \text{ and } \tau_{it} \in T$$

More generally, one may wish also to impose the constraint that the cost, c, of implementing a combination of policies is less than some maximum (e.g., $c(a'_{it}, \varepsilon'_{it}, \tau_{it}) \leq \bar{c}$, where $c(a'_{it}, \varepsilon'_{it}, \tau_{it})$ is a cost function representing the cost of implementing a specific combination of policies). Under suitable technical assumptions this problem is well defined and possesses a solution.

A typology of policy options and their international dimensions

In the framework of analysis introduced above, it is clear that public policies to protect poor or potentially poor people from the impact of adverse shocks can take three forms: those that increase the baseline level of advantage (which can be modelled by the effect of the policies on a_t), those that diminish the occurrence of adverse risks (as modelled by the effect of the policies on ε_t), and those that diminish the ultimate disadvantages experienced as a result of the occurrence of adverse outcomes (which can be modelled by the effect of the policies on τ_t). We have referred to these policies respectively under the headings of development, risk reduction, and insurance. A specific policy option may, of course, fall into more than one of these categories.

Let us characterize each of these approaches in general terms, and attempt specifically to understand the role of *international* policies of each of these kinds in influencing the exposure of persons to disadvantage.

Development policies

Development policies increase the baseline level of advantage of individuals (modelled as an increase in a_t). Development is by itself a means of protecting poor or potentially poor people from the impact of adverse shocks, as it diminishes the likelihood that adverse shocks will cause their level of advantage to fall beneath a given threshold of adequacy. National and international policies which promote development are therefore valuable not only in raising absolute levels of advantage, but also in reducing vulnerability to the occurrence of serious disadvantages. If the source of potential adverse shocks that may be experienced by the poor or potentially poor is international, and if these adverse shocks cannot directly be diminished, then a moral as well as practical case for international assistance to promote development may arise: Steps to enhance the baseline level of advantage of poor or potentially poor people help to protect them from shocks of international origin.

Risk reduction policies

Risk reduction policies diminish the occurrence of adverse risks (modelled by an effect on ε_t). Actions on the part of countries which influence the extent to which adverse risks are created or transmitted to poor countries (and poor people within them) qualify as risk-reducing. For example, policies which stabilize the world prices of essential commodities consumed by poor people or of the commodities exported by poor countries, policies which stabilize interest and exchange rates and more generally which stabilize world financial markets, and policies which diminish climatological and other environmental risks may all be classified as risk-reducing. Fluctuations in interest rates and other key features of the world

market economy have in the past adversely affected developing countries (and, in particular, the poor within them). The developing world debt crisis of the early 1980s, triggered by sharp increases in world interest rates, is one example. The international origins of these risks may gave rise to a moral as well as practical case for international policies aimed at risk reduction.

Insurance policies

Insurance policies diminish the disadvantages experienced as a result of the occurrence of adverse outcomes (modelled by an effect on τ_t). We will consider three types of insurance policies by way of example. Each has been widely discussed in the literature: self-insurance through stabilization and reserve funds, mutual insurance through formal insurance contracts or risk-sharing institutional arrangements, and insurance equivalence through the use of market-based instruments. In principle, these can each be implemented through contractual or institutional arrangements at sub-national, national, or international levels.

Insurance mechanisms can take diverse forms which should be separately considered. We focus especially on measures to reduce aggregate income fluctuations, recognizing that the level of advantage of individual poor persons is likely to be influenced by such aggregate fluctuations but also by independent factors.

(i) Self-insurance through stabilization and reserve funds

This approach to insurance has a lengthy history in both developing and in developed countries. In particular, many natural resource exporting countries have established 'rainy day' funds as a means of providing self-insurance (see Chapter 10 on Chile). There are at least four obstacles to such self-insurance by countries. First, a supposition of self-insurance is that the rainy day comes late and not early. Without this supposition being satisfied, it may not be possible to accumulate adequate self-insurance funds. Countries that have access to credit may in principle be able to borrow against a future reserve fund. However, countries may be constrained from additional borrowing due to a variety of reasons. In the presence of credit constraints, the initial 'seeding' of a self-insurance fund through international assistance, which would be augmented by subsequent payments into the fund of 'insurance premia', could be one mechanism through which poor countries could begin self-insurance.

Secondly, for self-insurance funds both to be protected from risks and to be readily available for use they may have to be kept in a fairly safe and liquid form, as a result of which these funds may be unavailable for investment in domestic productive opportunities. These funds may therefore be viewed as 'sterile'. Self-insurance can only provide fully for potential losses if it diverts substantial resources from present productive investment and consumption. Diversion of resources from other present needs to a large extent is likely to be sub-optimal.[10] This is an important reason why self-insurance may be unattractive, especially in poor countries.

Thirdly, self-insurance funds provide a tempting resource which invites 'raiding' by unprincipled or undisciplined political authorities. Self-insurance funds must be readily available for use if they are to provide an effective insurance mechanism. However, as a consequence they are potentially depletable.

Fourthly, self-insurance by countries leaves unused opportunities to insure against risks that are uncorrelated across countries. As a result, it is a comparatively costly form of insurance. Self-insurance has a place in the panoply of insurance instruments but is unlikely to be the most attractive of mechanisms for these reasons.

In addition to self-insurance by individual countries, the possibility of self-insurance by groups of countries which possess common characteristics (for example, that are exporters of a certain commodity) must also be considered. Programmes of this type attempt to provide collective self-insurance for member countries against aggregate level fluctuations (for example, in export prices). The history of such programmes is extensive and varied.

(ii) Mutual insurance through formal insurance contracts or risk-sharing, institutional arrangements

Mutual insurance can take diverse forms. One form is a formal insurance contract which takes advantage of the fact that the parties to the contract face at least partially independently determined risks in order to diminish the extent to which the effects of adverse occurrences are experienced by each individual party. Another form that it can take is an informal insurance contract embodied in redistributive institutions. For example, federal governments often implement some form of resource redistribution between their constituent entities which is contingent on actual occurrences (or states of the world).

Major obstacles to the existence of mutual insurance schemes can include (i) a lack of verifiability of the outcomes being insured, (ii) difficulty in identifying the risks associated with a particular outcome, (iii) the potential that an insurance scheme may create 'moral hazard' problems in which the incentive to avoid the risks being insured against is diminished, and (iv) the potential that an insurance scheme may face 'adverse selection' problems in which it is only joined by those parties which face the highest unobserved risks. Insurance schemes can become unviable for any of these reasons. For all of these reasons, formal insurance contracts rarely insure against risks to incomes themselves, but rather may insure against adverse fluctuations in the determinants of income (such as costs and prices). There are few examples at the international level of informal insurance contracts embodied in redistributive institutions. A notable exception is the European Union, which effectively offers insurance to its member countries against medium and long-term fluctuations in relative income, through measures such as its structural funds and other income-sensitive tax and transfer policies.[11]

Arguably, to the limited extent that the international aid regime is responsive to the relative prosperity of countries, as well as to the occurrence of adverse occurrences such as natural disasters, it provides another such example. There are also a few examples of insurance schemes at the international level focused on commodity prices, as will be discussed further below.

It may be difficult to characterize the risks associated with aggregate income fluctuations in developing countries, because of the changing and complex causal structure underlying incomes, and the frequent occurrence of unpredicted and perhaps unpredictable 'small sample' events, which may make it extremely difficult to understand the risks associated with specific outcomes and bedevil any effort to bring into being functioning insurance schemes.

(iii) Insurance equivalence through the use of market-based instruments

An alternative means of insuring against adverse occurrences is to make use of appropriate market-based instruments, if they exist. In particular, options, futures and other derivatives instruments can potentially be used in a manner that reduces countries' risks. The appropriate use of options and futures markets, if they exist, can ensure that adverse risks to aggregate income are avoided. Indeed, from the standpoint of an agent seeking to reduce the impact of adverse occurrences, there is a functional equivalence between derivatives appropriately used and insurance contracts.[12] There are, however, a number of issues to be faced in this regard. First, whereas derivatives markets for some of the important determinants of aggregate income – such as commodities prices, interest rates and even weather – often already exist, derivatives markets for a number of the other aggregate risks faced by countries – such as fluctuations in local agricultural output – do not exist. The problems identified above as obstacles to the existence of straightforward insurance contracts are also potential obstacles to the creation of derivatives markets. Shiller (1993, 2003) emphasizes that these problems can potentially be overcome in relation to aggregate incomes, since their aggregative feature diminishes the moral hazard problems present in relation to individual agents and since credible index numbers for aggregate incomes already exist or can potentially be created.[13] There are, however, some dangers associated with the creation of additional derivatives markets which can be used by poor countries to hedge against risks. One concern is that the existence of these markets can provide incentives for destabilizing speculation. The impetus to undertake speculative attacks may be enhanced if doing so can give rise to profits. In particular, the ability to influence the prices of the underlying assets in relation to which derivatives are defined while undertaking derivatives trades typically provides profit-making opportunities. There is a danger that efforts to shift such prices will emerge purely for this reason. The possibility that the role played by derivatives will be market destabilizing and risk increasing rather than market stabilizing and risk decreasing is real.[14]

Moral reasoning and minimal adequacy

The achievement of minimal adequacy is by definition an end of special moral concern.

There are special reasons to disvalue shortfalls from minimal adequacy, which go beyond the reasons that there may be to disvalue disadvantage as such, whether relative or absolute in nature. The existence of such shortfalls may demand special moral attention, and induce strong obligations to remedy such shortfalls on the part of agents who do not suffer these shortfalls, whether or not they can be deemed causally responsible for the existence of the deprivations.[15]

Such obligations may be more intense still if there is reason on the part of an agent to think that she has contributed to the existence of shortfalls from minimal adequacy. The special moral opprobrium that is to be attached to such contributions to others' severe disadvantages gives rise to strong moral obligations to perform remedial actions. Indeed, it may not even be necessary to demonstrate such contributions with certainty. If it cannot be significantly discounted that the past actions of an agent have causally contributed to present disadvantages, this may give rise to moral obligations to undertake remedial actions.[16]

There is therefore special moral reason for rich countries that cannot adequately discount the possibility that they were involved in the production of international shocks which have had adverse impact on the poor to take steps to reduce severe deprivation. These steps could take the form of development-oriented policies which help to enhance the baseline level of advantage of poor and potentially poor people, changes in policies and actions which reduce the extent to which risks arise in the first instance, and the creation and subsidization of insurance mechanisms so as to diminish the ultimate impact on poor persons of adverse shocks which do take place.

Although the requirement to promote minimally adequate levels of advantage for human beings generates especially strong moral obligations, there are other moral arguments for reducing the creation of systemic risk-creating activity. Foremost among these is that such risk-creating activity can be viewed as imposing upon others negative externalities to which they have not consented. The moral and legal arguments that typically apply in such cases pertain here.

The political economy of volatility and insurance

In order to understand what policy options are likely to be feasible or infeasible, it is essential to take note of the political economy underlying volatility and insurance.

It is interesting to note that uncertainty can theoretically be in the interest of firms, especially those that lack price-setting power in product or factor markets.[17] This result, which may at first appear surprising, is a consequence of the convexity of such a firm's profit function (defined in relation to output prices and input costs). If firms can make flexible input and output decisions then their average profits may be higher in a volatile environment. Empirical evidence concerning the effects of uncertainty on investment and profits is mixed, and does not therefore permit a clear rejection of this possibility. In contrast, as we have noted, volatility of prices is not in the interests of consumers in general, and in particular of poor ones. These background facts give rise to the possibility of a conflict of interest between producers and consumers, whether they are respectively within the same country or in different countries. Similarly, government decision makers may have less incentive to reduce exposure to risk than do individual persons, especially if decision makers respond to the interests of small constituencies who are relatively insulated from such risks. We may imagine, for instance, the existence of an inner belt of constituents who enjoy government influence and are well protected from variations in government expenditure and an outer belt of constituents which enjoy little government influence and bear the brunt of such variations. A government 'captured' by privileged interests in this way may have little incentive to reduce aggregate-level fluctuations.

Many social insurance schemes contain an implicit transfer component in addition to their risk-sharing component. When risks are not fully understood it may be difficult to identify the extent of the transfer element in a social insurance scheme. Unsurprisingly, such schemes may be opposed by those groups which provide a net contribution to the transfer component of the scheme. Efforts to reduce systemic volatility (and even more so volatility experienced by disadvantaged or vulnerable groups) may not be met with strong support from all quarters if it is perceived that they are likely to include a transfer component.

We have noted that at present few formal insurance schemes exist at the international level. There is a reason, however, that explicit ex-ante insurance schemes may be preferable to ad-hoc ex-post compensation schemes (i.e. those that compensate countries ex-post for the occurrence of an adverse event); whereas net beneficiaries and net payers into a scheme are necessarily known in *ex-post* compensation schemes, they are not known in ex-ante insurance schemes, which increases the likelihood that membership in such schemes will appear comparatively attractive to countries, even if membership requires financial contributions. As a result, the level of compensation likely to be provided to eventual beneficiaries under such schemes may be higher than under the ex-post alternative. Presently, ad-hoc ex-post compensation schemes, which are often under-financed, are the norm.

Past international-level risk-reduction and insurance mechanisms

A number of risk-reduction and insurance arrangements which seek to diminish shocks of international origin faced by developing countries or to protect them partially from the impact of aggregate shocks to national income and to foreign exchange earnings have arisen in recent decades. Some of these continue to exist whereas others are defunct. These arrangements can be separated into two kinds. The first are *ad hoc* schemes which protect countries against the impact of aggregate shocks on an *ad hoc* or discretionary and *ex post* basis. For example, donors have sometimes provided additional aid to countries that have experienced negative shocks to aggregate income or foreign exchange earnings, especially as a result of natural disasters. This aid practice can be viewed as providing a degree of *de facto* insurance to countries. The financing offered by international financial institutions to countries suffering exchange rate imbalances might also be viewed as providing a degree of *de facto* insurance. Although the conditioning of such financing on having experienced adverse shocks is typically informal, this is not always so.[18] A crucial distinction, however, is that international financial institutions typically provide opportunities to borrow rather than grant assistance. From this point of view, their activities are not insurance providing in the traditional sense.[19]

The second type of scheme seeks to diminish risks faced by countries or to insure them against the impact of adverse occurrences through institutional and *ex ante* mechanisms.

For example, an interesting (and unique) example of explicit insurance against natural disasters is that of the Commonwealth and Small States Disaster Management Scheme (CDMS), launched jointly by the Commonwealth and Lloyd's Syndicates. Under the scheme, countries with small populations can negotiate insurance which provides partial repayment of debts in the event of natural disasters. However, to date the premiums involved appear to have been too high to generate widespread interest.

There is a long history of the use of international buffer stocks as a means of attempting to stabilize the prices of commodities and, thereby, of national real incomes. Famously, John Maynard Keynes forcefully advocated national and international efforts to achieve commodity price stability through the use of buffer stocks and envisioned that they would play an important role in the postwar international economic system.[20] The use of international buffer stocks to stabilize specific commodity prices became prevalent in the 1960s and 1970s as part of international commodity agreements. In the 1970s, it was sought unsuccessfully to expand these within the context of an 'Integrated Programme for Commodities'. Most such schemes have ceased to exist, in some instances after enjoying brief successes. Failed agreements to manage such schemes have existed under the International Sugar Agreement (scheme ended in 1984), the International Tin Agreement (scheme ended in 1985), the International Cocoa Agreement (scheme ended in 1998), the International Coffee Agreement (scheme ended in 1989), and the International Natural Rubber Agreement (scheme ended in 1999).[21] Of course, there are some examples of enduring and successful stabilization schemes.[22] Reasons for the termination of such agreements are complex, but appear to include differences in opinion regarding the price objective to be sought between importing and exporting country members,[23] difficulty in determining what constitutes a long-run equilibrium price, difficulty in making predictions as to the duration of negative shocks, openness to speculative attack if target prices are perceived as lacking credibility, difficulties in policing the behaviour of member countries, and the interest and carrying costs of buffer stocks.[24] The long run of low prices experienced in the 1980s appears to have been a decisive factor in the collapse of a number of such schemes.[25] A central difficulty of buffer stocks schemes is the exhaustion of available funds due to unexpectedly long periods of low prices. Moreover, buffer stocks are difficult to begin because of the cost of their initial financing. There is a strong case to be made that most buffer stock agreements were bound to fail because of the low level at which they were financed. As a result, it cannot be concluded on the basis of past experience alone that such schemes are infeasible.[26]

There have also been efforts to stabilize export earnings of countries without stabilizing prices of exported commodities. The European Union's STABEX fund attempted to stabilize export earnings related to specific commodities for ACP (African, Caribbean and Pacific) countries under the Lome Convention between 1975 and 2000. The fund provided transfers to countries based on reductions in export-earnings relative to a previous multi-year average. However, only certain commodities were covered, and a small number of countries were overwhelmingly the beneficiaries of the fund.[27] Moreover, for many years it required that gains from the fund should be reinvested in the specific sector covered by the fund, limiting its ability to cushion the impact in other sectors of the economy of export-earning induced variations in government revenue, demand and employment. The fund was moreover perceived as having a slow rate of disbursement (up to 12 months after the decline in export-earnings was registered). Another fund established under the Lome Convention, SYSMIN, provided similar stabilization of export-earnings arising from minerals exports (other than oil, gas, and precious metals) of ACP countries. This fund has ceased operation in 2000 as a result of the expiry of the Convention. Since then, under the successor convention (the Cotonou Agreement) a system of financial support 'to mitigate the adverse effects of any instability in export earnings' known as FLEX has been in operation. The eligibility criterion is an adequately sizable loss of export earnings as compared with average earnings in preceding years. Support is limited to four successive years. Unlike STABEX and SYSMIN, FLEX does not focus narrowly on specific export commodities and does not presently require that funds transferred under the scheme be spent on specific purposes. Disbursements under FLEX have thus far been relatively modest (€36.5 million in 2000–2002).[28]

Practical proposals

The reduction of the creation of risks that are international in origin is a worthy end. A number of sources of such risks are presently discernible. Institutional mechanisms at the international level (such as the so-called Tobin tax on currency transactions) may play an important role in diminishing creation of risks of this kind.

There is no single best option for developing countries to reduce their exposure to risks. The use of a broad portfolio of strategies to reduce risks will be appropriate for most countries. However, here we would like specifically to consider the question of how countries can best reduce the likelihood that their poorest citizens will suffer adverse shocks, as well as the impact of such shocks, should they be suffered.

A number of means have been proposed to address aggregate income shocks faced by developing countries. Past and present schemes of this kind, aiming at the reduction of export price and income volatility, were surveyed in the preceding section. Instruments of this kind (discussed in the previous section) have played an important role in reducing the fluctuations in export income faced by some (especially smaller poor countries). As noted above, in practice relatively few countries and commodities have been covered by these schemes, and their importance has diminished over time (or they have even ceased to exist over time) because of difficulties in managing and financing them.

Recently, interest has grown substantially in the use of market-based instruments to provide insurance to countries against aggregate fluctuations, although there

are as yet few, if any instances of countries systematically using these instruments to provide such insurance. Dodd (2004), Pollner (2001), Freeman *et al.* (2003b) and IMF (2003) contain a useful catalogue of such instruments that are presently traded, and the suggestion that they may be fruitfully employed by developing countries to diminish vulnerability to aggregate fluctuations. These instruments include catastrophe bonds, contingent surplus notes, exchange traded catastrophe options, catastrophe equity puts, catastrophe swaps, weather derivatives, commodity-indexed bonds, and commodity-linked bonds. Market-based instruments of these kinds can potentially be applied to limit the risk faced by individual countries. Their essence is to transfer risk to others in exchange for a payment. For example, catastrophe bonds are bonds which are subject to default by the issuer in the event that a defined catastrophe takes place. A contingent surplus note gives the issuer a right to sell debt at a specific price to the buyer of the note in the event of a defined catastrophe. Exchange-traded catastrophe bonds entitle the buyer of the option to payment in the event that total insurance claims of a specified type exceed a defined level. Catastrophe swaps guarantee that an investor assumes an insurer's liabilities in the event of a defined catastrophe, in return for specified payments to an investor. Weather derivatives guarantee payments in the event that a specific weather event takes place. These market-based instruments are at the time of writing almost exclusively traded in, and defined in relation to, events in developed countries. Moreover, their use has been limited even in developed countries, although it is growing.[29]

There is a widespread and growing view that market-based instruments of these kinds offer better options for diminishing the risks to foreign exchange earnings and aggregate income faced by many developing countries than the traditional mechanisms such as commodity price stabilization through buffer stocks.[30] Indeed, in principle the two approaches can deliver equivalent results.[31] However, at present the belief in their potential is largely speculative, and is likely driven by private as well as public interests. It must be remembered that the use of derivatives contracts can also carry significant costs, in the form of margin requirements. Costly or inadequate access to credit can make it especially difficult to meet these requirements.[32] Moreover, in the absence of adequate international regulation, it is not obvious that such contracts will be adequately reliable. The default risk associated with derivatives contracts is inherent. It may be addressed through an adequate public role in securities markets (presently lacking at the international level) and through the development of private systems for identifying default risks.

Perhaps unsurprisingly some recent proposals for mechanisms that reduce aggregate income instability faced by developing countries have emphasized the need for an international public intermediary to play a role in financing, creating, monitoring or issuing the derivative contracts that may be employed by countries.

Bower and Kamel (2003) call, in a detailed and well-argued proposal, for the creation of an international agency (to be called the Global Commodity Insurer or GCI) 'that would operate an international Commodity Price Insurance (CPI) scheme with the objective of protecting national government revenues, spending and investment against the adverse impact of short-term deviations in commodity

prices, and especially oil prices, from their long-term equilibrium level'. The GCI 'would take advantage of the rapid growth of trading in derivative securities in the global capital market since the 1980s by selling CPI insurance contracts tailored to the specific commodity price exposure faced by national government, and offsetting the resulting price risk with a portfolio of derivative contracts of five-year or longer maturities, supplied by banks, insurers, reinsurers, investment institutions, and commodity trading companies, with investment grade credit ratings'. Similarly, Sarris (n.d.) calls for the developed countries to establish a fund which acts as an international financial intermediary that would make available to low-income commodity- or food-dependent countries single year or multi-year 'put and call like options' for commodity exports and cereal imports and would 'reinsure its own risk exposure with commercial options or swaps, etc.' The fund would potentially offer subsidies to individual countries. Although there are certainly technical and practical problems involved in implementing schemes of this kind, the logic underlying them seems highly plausible.

Other recent proposals (e.g. Loser (2004), Martin and Bargawi (2004), and Guillaumon, Guillaumont Jeanneney, Jacquet, Chauvet and Savoye (2003)) have emphasized the possibility that the provision of insurance may become a goal that is built into systems of aid provision, so as to provide aid to individual countries in a manner that explicitly counteracts adverse 'cyclical' economic shocks (especially those of international origin, such as commodity price variations).

Another possibility is to create a global contingency fund that would provide additional resources to countries facing severe negative shocks. The fund could be financed in advance and could rapidly disburse resources to countries that suffer adverse shocks of specific kind (for example, due to natural disasters), after an appropriate international assessment (for example, by a standing 'peer and partner review committee' which includes representatives from other countries).[33] Recent proposals for a standing United Nations fund for providing rapid disbursements to countries affected by emergencies are along these lines.

Schemes of the kind described above are designed to protect countries against shocks to aggregate income (or, more specifically, to foreign exchange and government revenues). As instruments to address adverse shocks experienced by the poor, they suffer possible disadvantages. First, as they are often designed to insure against variations in aggregate income arising from a specific source (for example, commodity prices) they cannot adequately insure countries against variations in aggregate incomes from other sources (for example, adverse climatic events, or sudden decreases in remittances) which may have an important impact on the poor. Secondly, they cannot directly insure the poor against adverse shocks to their level of advantage. For example, the level of advantage of the poor (or potentially poor) may be influenced by the distribution of aggregate income (as distinguished from the level of aggregate income) and by the level and nature of public expenditures which advance their interests. For this reason, although aggregate stabilization schemes are potentially helpful, they do not offer a fully adequate means of diminishing the volatility of incomes (or, more generally, levels of advantage)

experienced by the actually or potentially poor. The extent to which stabilization of aggregate incomes helps to achieve that end will depend upon the extent of correlation between incomes of the poor or potentially poor and aggregate incomes (or, more specifically, the insured components of aggregate income such as foreign exchange and government revenues). There is reason to think that in practice the link between aggregate export incomes and the advantages experienced by the poor may sometimes be weak. Variations in aggregate export earnings may not be translated directly into variations in wages and employment within the export sector (especially in the case of capital-intensive resource-extracting industries). The poor may work in production of non-tradable or import-competing items and the effects of fluctuations in the export sector on their wages and employment may accordingly be limited.[34] The extent and pattern of public expenditures from which the poor benefit may fluctuate for reasons other than that there are variations in aggregate income.[35]

In principle, insurance schemes that insure the poor or potentially poor against fluctuations in *their* levels of advantage are needed. The informational barriers and transactions costs involved in establishing such schemes directly (i.e. with individual persons as parties to an insurance agreement) may be prohibitive. However, their indirect equivalent may be more feasible to create. In particular, it may be possible to establish insurance mechanisms which protect the poor by providing states with the ability and means of extending appropriate social protections, regardless of fluctuations in the demand for these protections.

Existing national social safety nets which can meet increases in demands for social support rapidly and at low marginal costs are likely to continue to be the most effective means of protecting the poor from adverse shocks, whether of national or international origin.[36] A central question is that of how such standing social safety nets should be financed. Large countries may be able to finance such schemes through their internal resources. Because of the scale and internal diversity of such countries, shocks are likely to be localized and there is likely to be scope for self-insurance.[37] In contrast, smaller countries may find it difficult to absorb the increased demand on fiscal resources resulting from the expansion of needs in the wake of an adverse shock. The adverse shock may have a sizable negative effect on aggregate national income and government revenues. Foreseeing this, such countries may believe it is inadvisable or infeasible to put in place domestically financed standing social safety nets, which can meet unpredicted increases in needs rapidly and at low marginal costs. How can this obstacle to the creation of effective standing social safety nets which effectively protect the poor be overcome?

A means of addressing this problem may be to create a global reinsurance fund. A global reinsurance fund would provide insurance to poor countries against the risk of expanded demands for social support resulting from sizable unpredicted shocks of national or international origin. The extent and nature of the insurance provided would be determined bilaterally by negotiation between the global reinsurance fund and each individual country, and would reflect the specifics of the risks judged to be faced in an individual country as well as the nature and

extent of the social protections offered by actual or proposed domestic standing social safety nets reinsured by the global fund. Reliable and externally verifiable public statistics on the coverage and disbursements of the social safety nets would be required, and would have to be developed systematically in consultation with the reinsurance fund. The creation of such statistics would also serve as a basis for increased public accountability and program efficiency. The reinsurance fund would enable poor countries to withstand the risks associated with rapid increases in demand for social support from standing social safety nets, and thereby make it more feasible to establish them. Premiums for the reinsurance fund would be shared between poor countries and rich countries, with the degree of the subsidy to each country determined by appropriate considerations. Each rich country's contribution to the cost of these subsidies would reflect its role in creating risks of international origin faced by poor countries, and its commitment to help the poor in these countries.[38] Funding can be provided through voluntary yearly contributions, a permanent cost-sharing agreement between governments (perhaps embodied in a transparent formula established and periodically revised by the governing body of the reinsurance fund) or through earmarked international taxes (such as those which been recently proposed in relation to short-term capital inflows and jet fuel) collected by governments and provided to international institutions including the reinsurance fund for agreed purposes.

A global reinsurance fund of this type would help countries to establish standing social safety nets that offer effective protection to the poor or potentially poor against adverse shocks, whether national or international in origin. It is appropriate that the costs of creating and maintaining such a fund should be shared between poor and rich countries. Such sharing would underline a conception of shared responsibility for eliminating serious disadvantages and recognize the causal role that countries may have played in creating adverse shocks that are experienced elsewhere. It would also create an incentive for developing countries to establish standing systems of social protection by reducing their potential costs.

A global reinsurance fund is only one example of an international mechanism for expanding protections available to the actually or potentially severely disadvantaged. Other possible mechanisms must be envisioned and explored. Practical insight and institutional imagination are required in order better to develop innovations that spread risks more equitably – across societies and persons.

Notes

1 I would like to thank the participants in the workshop Workshop on Pro-Poor Macroeconomics held in Florence on 24–5 February 2005, and Stuart Corbridge, Andy Mold and Giovanni Andrea Cornia for helpful written comments.
2 On the latter, see e.g. the contributions in Dercon (2004).
3 See Dodd (2004), Table 1, for some illustrative evidence of the relation between commodity export prices, GDP, and government revenue for some developing and transition countries.

4   '... between 1990 and 1998, 94 per cent of the world's major disasters and 97 per cent of disaster-related deaths were in developing countries' (IMF 2003). See also Freeman, Keen and Mani (2003a, b).

5   Of course, the consumption basket of the affluent may also be quite import intensive so this is in the end an empirical question. At any event, we are not at pains to show that the poor are more subject to these vicissitudes than the non-poor, but rather to show that they are vulnerable to them in absolute terms. Discuss Indonesia's domestic rice price regime – an effort to come to terms with this problem.

6   Evidence on correlation between government revenues and price shocks.

7   See, for example, Aldy (2004) who shows that heating subsidies diminish deaths of the elderly due to cold weather shocks in the United States.

8   See, for example, Ravallion (1987).

9   Basu and Tzannatos (2003), Carter and Barrett (2005), Dasgupta (2003).

10 See Appendix III in Freeman *et al.* (2003b).

11 In this way, it acts as federal countries do with respect to regions within countries.

12 Given the existence of complete derivatives markets and the assumption that arbitrage opportunities have been exhausted, for any insurance contract that may be offered an equivalent set of state-contingent outcomes can be achieved through the buying and selling of appropriate derivatives products.

13 See Shiller (1993, 2003).

14 For an accessible presentation of the issues, see Dodd (2004).

15 See Barry (2005a,b,c).

16 Ibid.

17 See Oi (1961), and Abel (1983), Friberg and Martensen (2000), Gil (2005), Hartman (1972, 1976), Leahy and Whited (1996).

18 For example, the IMF 'has provided Emergency Assistance for Natural Disasters since 1962, when it agreed to lend Egypt 25 percent of quota to help cover temporary liquidity needs resulting from a major crop failure' (IMF, 2003, p. 23). The IMF's Compensatory Financing Facility (CFF) has provided 'financing for members experiencing balance of payment difficulties resulting from a temporary decline in export earnings or a temporary increase in cereal import costs' (ibid, p. 25). A variety of rules restrict eligibility to temporary shocks of external origin of a sufficiently large magnitude. Use of the CFF was extensive in the 1980s and 1990s but has been limited subsequently, as greater use has since been made of 'augmentation' of general lending arrangements (in particular, the so-called Poverty Reduction and Growth Facility (PRGF)) to meet unanticipated needs, typically during semi-annual reviews. As pointed out by Mold (2005), since January 2000 it has not been used once. It is arguable whether these mechanisms should be considered to be forms of insurance. Insofar as the IMF is a co-operative of member countries with capital paid-in by all members, the IMF mechanisms just surveyed might be viewed as insurance. Of course, contributions of paid-in capital vary according to the member and no explicit insurance 'premia' are paid, as a result of which it may contrarily be argued that these mechanisms constitute safety nets rather than insurance schemes.

19 The rate of interest charged may also be quite high. See, for example, Martin and Bargawi (2004, 15): 'The IMF Compensatory Financing Facility (CFF) is so expensive that it would breach the concessional borrowing ceilings which are standard in African PRGF programmes, with the result that no African low income country has used it recently.'

20 See Bower and Kamel (2003) and Turnell (1998). Keynes built on the ideas presented by Benjamin Graham in his 1937 book *Storage and Stability*.

21 IMF (2003), Mehta and Chavas (2004).

22 Price stability has been an avowed goal (arguably achieved) of successful cartels in industries such as oil and diamonds. Of course, the primary goal of such cartels may be to raise rather than stabilize prices.

23 See the description of the collapse of the International Rubber Agreement in IMF (2003), p. 72.

24 Bower and Kamel (2003) describe concisely the insights of Newbery and Stiglitz (1981) on the dilemmas facing buffer stock schemes, as a result of the stochastic nature of commodity prices: 'Two issues arise: first, that the financing and insurance may be so large that it exceeds the potential benefit of stockpiling even if prices are very volatile. More importantly, even if the benefits justify the costs, there is always a possibility that a very long run of low prices followed by an equally long run of high prices might occur or indeed *vice versa*. This means that, no matter what the starting stock level, there would always be some probability that stocks would be depleted before prices fell or that stocks would grow so large that they exceeded total available storage capacity or finance before prices rose again. For all practical purposes, Newbery and Stiglitz conclude that complete price stabilization in a buffer stock scheme is therefore impossible.'

25 See, for example, Cashin, Liang and McDermott (1999).

26 See Mold (2005).

27 'Over the period 1975–1995, STABEX transfers totaled about €3 billion, and four products (coffee, groundnuts, cotton and cocoa/copra) accounted for 80 per cent of effective transfers' (IMF, 2003, p. 82).

28 'Compensation for Fluctuations in the Export Earnings of ACP Countries', UK. Parliament, Select Committee on European Scrutiny Twenty-First Report.

29 Exchange-traded catastrophe options currently trade on the Chicago Board of trade. The market in weather derivatives is now relatively large, possessing a market value of $4.5 billion in the United States in 2001 (IMF, 2003). So far, catastrophe bonds have been issued primarily by insurance firms. However, Froot (1999) found that there was 'no coverage for the largest, most severe events'.

30 See, for example, Bower and Kamel (2003), Dodd (2004), Gilbert (1996), ITFCRM (1999), Sarris (n.d).

31 See Bower and Kamel (2003).

32 Ibid.

33 See Reddy and Heuty (2005) for more on the concept of peer and partner review.

34 See e.g. Mold (2005).

35 Indeed, the STABEX fund prohibited beneficiary countries from expending the monies received from it for purposes other than to protect the income of firms and persons involved in production of covered exports.

36 The Employment Guarantee Scheme in Maharashtra, India, in which the poor are entitled to demand public employment at the statutory wages, provides an especially successful example of a scheme of this kind. For an elaboration of this general argument see, for example, Cornia and Reddy (2004) and Cornia (2001).

37 The contrast between India's internal response to the Indian Ocean Tsunami disaster of December 2004 as compared to other countries, which relied more greatly on external resources, is illustrative in this regard. The relative ease with which it has handled the crisis is due not only to the smaller number of people affected but, equally importantly, to the manageable magnitude of the demands created by the crisis in relation to available internal resources, including existing provisions for emergencies.

38 In principle, the equivalent of this scheme can be achieved through private reinsurance or through the creation of appropriate derivatives markets. The World Food Programme is presently developing, in conjunction with private reinsurance companies, rainfall based insurance contracts. Premiums would be partially or fully paid by donors and would finance rapid drought-related emergency assistance when required. See 'Radical plan for Ethiopia aid', *Financial Times*, 11 May 2005.

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