

Government Distortions to Agricultural Prices: Lessons from Rich and Emerging Economies

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Abstract

Historically, earnings from farming in many low-income countries have been depressed by a pro-urban bias in own-country price and trade policies, as well as by governments of richer countries favoring their farmers with import barriers and subsidies. Both sets of policies reduce national and global economic welfare. Over the past two decades numerous developing country governments have reduced their sectoral and trade policy distortions, while some high-income countries also have begun reforming their farm protectionist policies. Drawing on results from a new multi-country World Bank research project, this paper summarizes evidence on the changing extent of distortions to prices of farm products nationally, regionally and globally. In particular, it examines the extent to which later-emerging economies of Asia and elsewhere are following the policy trajectory of Northeast Asia's more-advanced economies as revealed by Anderson, Hayami and Others (1986), whereby economic development tended to be accompanied by a gradual reduction in anti-agricultural policies and eventual transition to pro-agricultural pricing. This new evidence is not inconsistent with that past pattern of earlier developers, so the final section focuses on what might be done to avoid a further spreading of agricultural protection growth.

Keywords: Distorted farmer and consumer incentives, agricultural price and trade policy reforms, Asian agricultural development

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For many decades agricultural protection and subsidies in high-income (and some middle-income) countries have been depressing international prices of farm products, which lowers the earnings of farmers and associated rural businesses in developing countries. That worsened between the 1950s and the early 1980s (Anderson et al., 1986), thereby adding to global inequality and poverty because three-quarters of the world's poorest people depend directly or indirectly on agriculture for their main income (World Bank, 2008). In addition to that external policy influence on rural poverty, however, the governments of many developing countries have directly taxed their farmers over the past half-century. A well-known example is the taxing of exports of plantation crops in post-colonial Africa (Bates, 1981). At the same time, many developing countries chose also to pursue an import-substituting industrialization strategy, predominantly by restricting imports of manufactures, and to overvalue their currency. Together those measures indirectly taxed producers of other tradable products in developing economies, by far the most numerous of them being farmers (Krueger et al., 1988, 1991).

This disarray in world agriculture, as D. Gale Johnson (1973) described it in the title of his seminal book, means there has been over-production of farm products in high-income countries and under-production in more-needy developing countries. It also means there has been less international trade in farm products than would be the case under free trade, thereby thinning markets for these weather-dependent products and thus making them more volatile. Using a stochastic model of world food markets, Tyers and Anderson (1992, Table 6.14) found that instability of international food prices in the early 1980s was three times greater than it would have been under free trade in those products.

During the past quarter century, however, numerous countries have begun to reform their agricultural price and trade policies. To get a sense of how much that has reduced the distortions to global markets for farm products, the present paper draws on the results of a recent World Bank multi-country study of policies affecting agricultural price incentives over the past 5 decades. That study includes 75 countries that together account for 92 percent of the world's population and agricultural GDP and 95 percent of total GDP. The sample countries also account for more than 85 percent of farm production and employment in each of Sub-Saharan Africa, Asia, Latin America and the transition economies of Europe.

Specifically, this paper summarizes estimates of the nominal rates of assistance and consumer tax equivalents (NRAs and CTEs) for more than 70 different farm products, with an average of almost a dozen per country. Not all countries had data for the entire 1955-2007 period, but the average number of years covered is 41 per country. Having such a comprehensive coverage of countries, products and years offers the prospect of obtaining a reliable picture of long-term trends in price-distorting policies (as well as annual fluctuations around those trends, not reported here) for country groups, regions, and the world as a whole.

The paper begins with a summary of the methodology used to generate annual indicators of the extent of government interventions in markets, details of which are provided in Anderson et al. (2008). The NRA and CTE estimates are then summarized across regions

and over the half-decades since the mid-1950s. A summary is also provided of an additional set of indicators of agricultural price distortions that are based on the trade restrictiveness index first developed by Anderson and Neary (2005) and modified for the Bank's research project by Lloyd, Croser and Anderson (2009). Then a new set of results from a global economy-wide model provide quantification of the impacts on global agricultural trade of the reforms since the early 1980s and of the policies still in place as of 2004. The paper concludes by drawing on the lessons learned to speculate on the prospects for further reform.

Methodology

Government-imposed distortions can create a gap between domestic prices and what they would be under free markets. The Nominal Rate of Assistance (NRA) for each farm product is computed as the percentage by which government policies have raised gross returns to farmers above what they would be without the government's intervention (or lowered them, if $NRA < 0$). A weighted average NRA for all covered products is derived using the value of production at undistorted prices as weights (unlike the producer and consumer support estimates (PSEs and CSEs) computed by OECD (2008), which are expressed as a percentage of the distorted price). To that NRA for covered products is added a 'guesstimate' of the NRA for non-covered products (on average around 30 percent of the total value of farm production) and an estimate of the NRA from non-product-specific forms of assistance or taxation. Since the 1980s governments of some high-income countries have also provided so-called 'decoupled' assistance to farmers but, because that support in principle does not distort resource allocation, its NRA has been computed separately and is not included for direct comparison with the NRAs for other sectors or for developing countries. Each farm industry is classified either as import-competing, or a producer of exportables, or as producing a nontradable (with its status sometimes changing over the years), so as to generate for each year the weighted average NRAs for the two different groups of covered tradable farm products.

Also computed is a production-weighted average NRA for nonagricultural tradables, for comparison with that for agricultural tradables via the calculation of a percentage Relative Rate of Assistance (RRA), defined as:

$$RRA = 100 * [(100 + NRA_{ag}^t) / (100 + NRA_{nonag}^t) - 1]$$

where NRA_{ag}^t and NRA_{nonag}^t are the percentage NRAs for the tradables parts of the agricultural (including non-covered) and non-agricultural sectors, respectively.¹ Since the NRA cannot be less than -100 percent if producers are to earn anything, neither can the RRA (since the weighted average NRA_{nonag}^t is non-negative in all our country case studies). And if both of those sectors are equally assisted, the RRA is zero. This measure is useful in that if it is below (above) zero, it provides an internationally comparable indication of the extent to which a country's sectoral policy regime has an anti- (pro-)agricultural bias.

Also considered is the extent to which consumers are taxed or subsidized. To do so, a Consumer Tax Equivalent (CTE) is calculated by comparing the price that consumers pay for their food and the international price of each food product at the border. Differences between the NRA and the CTE arise from distortions in the domestic economy that are caused by transfer policies and taxes/subsidies that cause the prices paid by consumers (adjusted to the farmgate level) to differ from those received by producers. In the absence of any other information, the CTE for each tradable farm product is assumed to be the same as the NRA from border distortions.

The cost of government policy distortions to incentives in terms of resource misallocation tend to be greater the greater the degree of substitution in production. In the case of agriculture which involves the use of farm land that is sector-specific but transferable among farm activities, the greater the variation of NRAs across industries within the sector

then the higher will be the welfare cost of those market interventions. A simple indicator of dispersion is the standard deviation of the covered industries' NRAs. However, it is helpful to have a single indicator of the overall welfare effect of each country's regime of agricultural price distortions in place at any time, and to trace its path over time and make cross-country comparisons. To that end, the family of indexes first developed by Anderson and Neary (2005), under the catch-all name of trade restrictiveness indexes, are drawn upon.

To generate indicators of distortions imposed by each country's border and domestic agricultural policies on its economic welfare and its agricultural trade volume, Lloyd, Croser and Anderson (2009) define a Welfare Reduction Index (WRI) and a Trade Reduction Index (TRI) and estimate them for the same focus countries, taking into account that for some covered products the NRA and CTE differ (because there are domestic measures in place in addition to or instead of trade measures). As their names suggest, these two new indexes respectively each capture in a single indicator the direct welfare- or trade-reducing effects of distortions to consumer and producer prices of covered farm products from all agricultural and food price and trade policy measures in place (while ignoring non-covered farm products and indirect effects of sectoral and trade policy measures directed at non-agricultural sectors). Specifically, the TRI (or WRI) is that ad valorem trade tax rate which, if applied uniformly to all farm commodities in a country that year would generate the same reduction in trade (or economic welfare) as the actual cross-commodity structure of agricultural NRAs and CTEs for that country, other things equal.

The WRI measure reflects the partial equilibrium welfare cost of agricultural price-distorting policies better than the NRA because it recognizes that the welfare cost of a government-imposed price distortion is related to the square of the price wedge. It thus captures the disproportionately higher welfare costs of peak levels of assistance or taxation, and is larger than the mean NRA/CTE and is positive regardless of whether the government's agricultural policy is favoring or hurting farmers. In this way the WRI and TRI go somewhat closer to what a computable general equilibrium (CGE) can provide in the way of estimates of the trade and welfare (and other) effects of the price distortions captured by the product NRA and CTE estimates: while not capturing the indirect distortions from other sectors as the RRA does, these indexes have the advantage over a CGE model of providing an annual time series and not requiring a formal model.

Estimates of the changing extent of agricultural price distortions

This section first presents aggregate results for the world as a whole, and then provides more details of the results for Asia in particular, where the evolution of price distortions have been more dramatic than in any other region.

Global findings

The global summary of the new results from the World Bank project is provided in Figure 7.1. It reveals that the nominal rate of assistance to farmers in high-income countries rose steadily from the mid-1950s until the end of the 1980s, apart from a small dip when international food prices spiked around 1973-74. After peaking at more than 50 per cent in the mid-1980s, that average NRA for high-income countries has fallen a little, depending on the extent to which one believes that some new farm programs are 'decoupled' in the sense of no longer influencing production decisions (see dashed line in Figure 7.1). For developing countries, too, the average NRA for agriculture has been rising, but from a level of around -25 per cent during the period from the mid-1950s to the early 1980s to nearly 10 per cent in the first half of the present decade.

The average NRA for developing countries conceals the fact that the exporting and import-competing subsectors of agriculture have very different NRAs. Figure 7.2 reveals that

while the average NRA for exporters has been negative throughout (going from –20 per cent to –30 per cent before coming back up to almost zero in 2000-04), the NRA for import-competing farmers in developing countries has fluctuated between 20 and 30 per cent (and even reached 40 per cent in the years of low prices in the mid-1980s). Having increased in the 1960s and 1970s, the anti-trade bias within agriculture (the taxing of both exports and imports of farm products) for developing countries has diminished since the mid-1980s, but the NRA gap between the import-competing and export subsectors still averages around 20 percentage points.

Figure 7.2 also reveals that the NRA for import-competing farmers in developing countries has increased at virtually the same pace as that in high-income countries. This suggests that growth in agricultural protection from import competition is something that begins at low levels of per capita income rather than being a phenomenon exclusive to high-income countries.

The improvement in farmers' incentives in developing countries is understated by the above NRA estimates, because those countries have also reduced their assistance to producers of non-agricultural tradable goods, most notably manufactures. The decline in the weighted average NRA for the latter, depicted in Figure 7.3, was clearly much greater than the increase in the average NRA for tradable agricultural sectors for the period to the mid-1980s, consistent with the finding two decades ago of Krueger, Schiff and Valdés (1988, 1991). For the period since the mid-1980s, changes in the NRAs of both sectors have contributed almost equally to the improvement in incentives to farmers. The RRA, defined in the previous section, provides a useful indicator of relative price change: the RRA for developing countries as a group went from –46 per cent in the second half of the 1970s to 1 per cent in the first half of the present decade. This increase (from a coefficient of 0.54 to 1.01) is equivalent to an almost doubling in the relative price of farm products, which is a huge change in the fortunes of developing country farmers in just a generation. This is mostly because of the changes in Asia, but even for Latin America this relative price hike is one-half, while for Africa this indicator improves by only one-eighth. As for high-income countries, assistance to manufacturing was on average much less than assistance to farmers, even in the 1950s, and its decline since then has had only a minor impact on that group's average RRA (Figure 7.3).²

Turning to the single indicators of the impact of agricultural distortions on national economic welfare and trade volume, Lloyd, Croser and Anderson (2009) estimate their TRI and WRI for the 75 countries in the above-mentioned World Bank study. The TRI estimates indicate that the trade-reducing impact of agricultural policies for developing countries as a group was roughly constant until the early 1990s and thereafter it declined, while for high-income countries the decline in TRI began a few years later (Figure 7.4(a)). The TRI for developing countries is driven by the exportables subsector which was being taxed until recently and the import-competing subsector which was, and is increasingly, being protected (albeit less than in high-income countries – see Figure 7.2 above). For high-income countries, policies have supported both exporting and import-competing agricultural products and, even though they strongly favour the latter, the assistance to exporters has offset somewhat the anti-trade bias from the protection of import-competing producers.

The WRI estimates, shown in Figure 7.4(b), indicate a steady rise from the 1960s to the 1980s for agricultural policies, but some decline in the 1990s. This reflects the fact that NRAs for high-income and developing countries diverged (in opposite directions) away from zero in the first half of the period under study and then converged toward zero in the most recent quarter-century. That meant that their weighted average NRA traces out a fairly flat

trend whereas the WRI traces out a hill-shaped path and thus provides a less misleading indicator of the trend in resource misallocation in world agricultural markets.

*Findings for Asia*³

From the mid-1950s to the early 1980s, agricultural price and trade policies reduced earnings of farmers in developing Asia on average by more than 20 percent; but that implicit taxation declined from the early 1980s and, from the mid-1990s, the NRA switched sign and became increasingly positive. That average hides considerable diversity within the region, however. Nominal assistance to farmers in Korea and Taiwan was positive from the early 1960s (although very small initially when compared with the 40+ percent in Japan), Indonesia had some years in the 1970s and 1980s when its NRA was a little above zero (as did Pakistan prior to Bangladesh becoming an independent country in 1971), and India's and the Philippines' average NRAs became positive from the 1980s (Table 7.1).⁴

This trend is present for the vast majority of the individual commodity NRAs for the region too, with meat and milk the only products to have seen their assistance rates cut over that period. As is true for other regions of the world, assistance is among the highest for the 'rice pudding' products of sugar, milk and rice (Table 7.2). But even for those three products there is a great diversity across countries in their NRAs, with 5-year averages ranging from almost zero to as much as 400 percent for rice and 140 percent for milk in Korea, and to 230 percent for sugar in Bangladesh. There is a great deal of NRA diversity also across commodities within each Asian economy's farm sector, and the extent (as measured by the standard deviation) has grown rather than diminished over the past five decades, from a regional average of less than 40 percent in the early years under study to more than 55 percent in recent years. This suggests there is still much that could be gained from improved resource reallocation both between Asian economies and within the agricultural sector of individual Asian economies, were differences in rates of assistance to be reduced.

That possibility of trade and welfare gains from further reform is underscored by the estimates of WRIs and TRIs for Asian countries, which are reported in Tables 7.3 and 7.4. For Japan and Korea, their TRIs are very similar to their high NRAs (c.f. Table 7.1), since all major farm products are importable and most are highly protected. Taiwan's TRI until recently was negative, reflecting the fact that its rice producers were assisted even when the island was a significant exporter. China's TRI was always positive and quite high in the 1980s and 1990s, because of the strong implicit taxes on both exports and imports of farm products. India's TRI was even higher, peaking in the latter 1980s and still high compared with China's and those for other South Asian countries. The TRIs for Southeast Asia are generally smaller, but vary considerably across countries and over time.

The WRIs are necessarily positive and generally much higher than the NRAs. For China and India they have become considerably smaller over the past two decades, but they have declined little in such countries as Indonesia, the Philippines and Sri Lanka (Table 7.4), reflecting the fact that a wide range of NRAs still prevail in those countries.

The anti-agricultural policy biases of the past were due not just to agricultural policies. Also important to changes in incentives affecting inter-sectorally mobile resources have been the significant reductions in border protection to the manufacturing sector (which has been the dominant intervention in the tradables part of non-agricultural sectors). That reduction in assistance to producers of non-farm tradables has been even more responsible for the improvement in farmer incentives than the reduction in direct taxation of agricultural industries. For Asia as a whole, the average NRA estimates for non-farm tradables declined steadily throughout the past four or five decades as policy reforms spread. This contributed to a decline in the estimated negative relative rate of assistance for farmers: the weighted average RRA was worse than -50 percent up to the early 1970s, but it improved to an average

of -32 percent in the 1980s, -9 percent in the 1990s and is now positive, averaging 7 percent in 2000-04 (Table 7.1).

Has the international location of production of farm products within Asia become more or less efficient as a result of policy changes over the past five decades? A global computable general equilibrium model with a time series of databases is needed to answer that question well, but one very crude way of addressing the question is to examine the standard deviation of RRAs across the economies of the region over time. That indicator suggests inter-sectoral distortions have become more dispersed across countries over time: it averaged 35 percent during 1960-74, 50 percent during 1975-89 and 55 percent during 1990-2004 (final row of Table 7.1).

Of the striking changes in RRAs shown for individual economies over the past two decades, it is the move from negative to positive RRAs for China and India that matter most for the region – and indeed for the world. The extent of the decline in the non-agricultural NRA since the early 1980s is very similar for those two key countries, but the agricultural NRA has differed: in China the 5-year averages have risen steadily from -45 percent to 6 percent, whereas in India it has been close to zero except for a spike upward when international food prices collapsed in the mid-1980s, and for a rise in the present decade (Figure 7.5).

This dramatic rise in the RRA for the world's two most populous countries is of great significance to the current analyses of the causes of the international food price rises of the present decade. One of the contributors is said to be the growing appetite for food imports by these two countries as they industrialize and their per capita incomes rise. Yet both countries have remained very close to self sufficient in agricultural products over the past four decades. Undoubtedly the steady rise in their RRAs has contributed to that outcome (Anderson and Martin, 2009, Tables 1.9 and 1.10). It may also have helped ensure that the trend in China's ratio of urban to rural mean incomes (adjusted for cost of living differences) has been flat since 1980 (Ravallion and Chen, 2007, Figure 3), and that the Gini coefficient for India has hardly changed between 1984 and 2004 (World Bank, 2008). A major question, to which we return at the end of the paper, is: will their RRAs remain at their current neutral level of close to zero, or will they continue to rise in the same way as observed in Korea and Taiwan and, before them, in Japan and Western Europe?

To summarize, one of the most salient features of price and trade policies in the Asian region since the 1960s is the spate of major economic reforms, including significant trade liberalization. Overall levels of non-agricultural protection have declined considerably, which has improved the competitiveness of the agricultural sector in many Asian economies but especially in China and India. Two other salient features have been the gradual policy movement away from taxing agricultural exportables, but at the same time – and in contrast to non-agriculture – a rise in agricultural import protection. The latter means there is still scope for reducing distortions in resource use within agriculture even in countries with an average NRA for agriculture, and an RRA, close to zero. In particular, an anti-trade bias in assistance rates within the farm sector remains in place. This may be understandable from a political economy viewpoint, but it nonetheless means that resources continue to be allocated inefficiently within the farm sector and, since openness tends to promote economic growth, that total factor productivity growth in agriculture is slower than it would be if remaining interventions were removed.

Effects of past reforms and of remaining policies: results from economy-wide modelling

It is clear from the above that there has been considerable reform over the past quarter of a century of policy distortions to agricultural incentives throughout the world: the anti-agricultural and anti-trade biases of the policies of many developing countries have been

reduced, and the export subsidies of high-income countries have been cut. As well, there has been some re-instrumentation toward less inefficient and less trade-distorting forms of support, particularly in Western Europe (see the dashed line in Figure 7.1). However, protection from agricultural import competition has continued to show an upward trend in both rich and poor countries (Figure 7.2), notwithstanding the Uruguay Round Agreement on Agriculture that aimed to bind and reduce farm tariffs.

What have been the net economic effects of agricultural price and trade policy changes around the world since the early 1980s? And how do those effects on global markets, farm incomes and economic welfare compare with the effects of policy distortions that were still in place as of 2004? Valenzuela, van der Mensbrugghe and Anderson (2009) use a global economy-wide model known as Linkage (van der Mensbrugghe, 2005) to provide a combined retrospective and prospective analysis that sought to assess how far the world had come, and how far it still has to go, in rectifying the disarray in world agriculture. It quantifies the impacts both of past reforms and current policies by comparing the effects of the recent World Bank project's distortion estimates for the period 1980-84 with those of 2004.⁵

Several key findings from that economy-wide modelling study are worth emphasising. First, the policy reforms from the early 1980s to the mid-2000s improved global economic welfare by US\$233 billion per year, and removing the distortions that remained in 2004 would add another US\$168 billion per year (in 2004 US dollars). This suggests that in terms of global welfare the world moved three-fifths of the way towards global free trade in goods over that quarter century.

Second, developing economies benefited proportionately more than high-income economies (1.0 per cent compared with 0.7 per cent of national income) from those past policy reforms, and would gain nearly twice as much as high-income countries if all countries were to complete that reform process (an average increase of 0.9 per cent compared with 0.5 per cent for high-income countries). Of those prospective welfare gains from global liberalisation, 60 per cent would come from agriculture and food policy reform. This is a striking result given that the shares of agriculture and food in global GDP and global trade are only 3 and 6 per cent, respectively. The contribution of farm and food policy reform to the prospective welfare gain for developing countries alone is even greater, at 83 per cent.

Third, the share of global farm production exported (excluding intra-European Union (EU) trade) in 2004 has been slightly smaller as a result of those reforms since 1980-84, because of less farm export subsidies. The 8 per cent share for agriculture in 2004 contrasts with the 31 per cent share for other primary products and the 25 per cent for all other goods – a 'thinness' that is an important contributor to the volatility of international prices for weather-dependent farm products. If the policies distorting goods trade in 2004 were removed, the share of global production of farm products that is exported would rise from 8 to 13 per cent, thereby reducing instability of prices and reducing the quantities of those products traded.

Fourth, the developing countries' share of the world's primary agricultural exports rose from 43 to 55 per cent, and its share of global farm output from 58 to 62 per cent, because of the reforms since the early 1980s, with rises in output of nearly all agricultural industries except rice and sugar. Removing the remaining goods market distortions would boost their export and output shares even further, to 64 and 65 per cent, respectively.

Fifth, the average real price for agricultural and food products in international markets would have been 13 per cent lower had policies not changed over the past quarter century. Evidently the impact of the fall in RRA in high-income countries (including the cuts in farm export subsidies) in raising international food prices more than offset the opposite impact of the RRA rise (including the cuts in agricultural export taxes) in developing countries over

that period. By contrast, removing the remaining distortions as of 2004 is projected to raise the international price of agricultural and food products by less than 1 per cent on average. This is in contrast to earlier modelling results based on the Global Trade Analysis Project (GTAP) protection database. (For example, Anderson et al., 2006) estimated that they would rise by 3.1 per cent or, for primary agriculture alone, by 5.5 per cent). The smaller impact seen in these new results is because export taxes in developing countries, based on the above NRA estimates for 2004, are included in the new database (most notably for Argentina) and their removal would heavily offset the international price-raising effect of eliminating import protection and farm subsidies elsewhere.

Sixth, for developing countries as a group, net farm income (value added in agriculture) is estimated to be 4.9 per cent higher than it would have been without the reforms of the past quarter century, which is more than ten times the proportional gain in non-agricultural value added. If the price and trade policies remaining in 2004 were removed, net farm incomes in developing countries would rise a further 5.6 per cent, compared with just 1.9 per cent for non-agricultural value added. In addition, unskilled workers in developing countries – the majority of whom work on farms – would see their returns rise more than returns on other productive factors from that liberalisation. Together, these findings suggest that both inequality and poverty could be alleviated by such reform, given that three-quarters of the world's poor are farmers in developing countries (Chen and Ravallion, 2008).

Prospects for further agricultural reform

The expectation is that, provided they remain open and continue to free up domestic markets and practice good macroeconomic governance, developing economies will keep growing rapidly in the foreseeable future once the current global recession passes. The growth in Asia will be more rapid in manufacturing and service activities than in agriculture, and in the more densely populated economies of the region that growth will be accompanied by rapid increases in per capita incomes of low-skilled workers where labor-intensive exports boom. Agricultural comparative advantage is thus likely to decline in such economies. Whether these economies become more dependent on imports of farm products depends, however, on what happens to the RRA. The first wave of Asian industrializers (Japan, and then Korea and Taiwan) chose to slow the growth of food import dependence by raising their NRA for agriculture even as they were bringing down their NRA for non-farm tradables, such that their RRA became increasingly above the neutral zero level. A key question, foreshadowed above, is: will later industrializers follow suit, given the past close association of RRAs with rising per capita income and falling agricultural comparative advantage?

When the RRAs for Japan, Korea and Taiwan are mapped against real per capita income, it is possible to superimpose on that same graph the RRAs for lower-income economies to see how they are tracking relative to the first industrializers. Figure 7.6 does that for China and India, and shows that their RRA trends of the past three decades are on the same trajectory as the richer Northeast Asians. That provides reason to expect the governments of later industrializing economies to follow suit if other things were equal.

However, might one expect different government behavior now, given that the earlier industrializers were not bound under GATT to keep down their agricultural protection? Had there been strict discipline on farm trade measures at the time Japan and Korea joined GATT in 1955 and 1967, respectively, their NRAs may have been halted at less than 20 percent (Figure 7.7). At the time of China's accession to WTO in December 2001, its NRA was less than 5 percent according to this present study, or 7.3 percent for just import-competing agriculture. Its average bound import tariff commitment was about twice that (16 percent in 2005), but what matters most is China's out-of-quota bindings on the items whose imports are restricted by tariff rate quotas. The latter tariff bindings as of 2005 were 65 percent for

grains, 50 percent for sugar and 40 percent for cotton (WTO et al., 2007, p. 60). China also has bindings on farm product-specific domestic supports of 8.5 percent, and can provide another 8.5 percent as non-product specific assistance if it so wishes – a total 17 percent NRA from domestic support measures alone, in addition to what is available through out-of-quota tariff protection. Clearly the legal commitments China made on acceding to WTO are a long way from current levels of domestic and border support for its farmers, and so are unlikely to constrain the government very much in the next decade or so (Anderson et al., 2009).

The legal constraints on Asia's developing countries that joined the WTO earlier (except for Korea) are even less constraining. For India, Pakistan and Bangladesh, for example, their estimated NRAs for agricultural importables in 2000-04 are 34, 4 and 6 percent, respectively, whereas the average bound tariffs on their agricultural imports are 114, 96 and 189 percent, respectively (WTO et al., 2007). Also, like other developing countries, they have high bindings on product-specific domestic supports of 10 percent and another 10 percent for non-product specific assistance, a total of 20 more percentage points of NRA that legally could come from domestic support measures – compared with currently 10 percent in India and less than 3 percent in the rest of South Asia.

One can only hope that the China and South and Southeast Asia will not make use of the legal wiggle room they have allowed themselves in their WTO bindings and thereby follow Japan, Korea and Taiwan into high agricultural protection. A much more efficient and equitable strategy would be to instead treat agriculture in the same way they have been treating non-farm tradable sectors. That would involve opening the sector to international competition, and relying on more-efficient domestic policy measures for raising government revenue (e.g., income and consumption or value-added taxes) rather than trade taxes.

It might be argued that such a laissez faire strategy could increase rural-urban inequality and poverty and thereby generate social unrest. On the other hand, policies that lead to high prices for staple foods, in particular, involve potentially serious risks for the urban and rural poor who are net buyers of food in developing countries, as has been demonstrated by concerns about the recent increases in prices of these goods (Ivanic and Martin, 2008). Available evidence suggests that problems of rural-urban poverty gaps have been alleviated in parts of Asia and elsewhere by some of the more-mobile members of farm households finding full- or part-time work off the farm and repatriating part of their higher earnings back to those remaining in farm households (Otsuka and Yamano, 2006, Otsuka et al., 2009). Concerted government intervention through social policy measures can be important both in reducing the gaps between rural and urban incomes, identified by Hayami (2007) as a concern, and in raising national incomes overall. Efficient ways of assisting any left-behind groups of poor (nonfarm as well as farm) households include reducing any underinvestment in rural public goods that have high social payoffs such as basic education and health and rural infrastructure, as well as agricultural research.⁶

The reasons why some countries have reformed their price-distorting agricultural and trade policies more than others in recent decades are varied. Some have reformed unilaterally, apparently having become convinced that it is in their own national interest to do so. China is the most dramatic and significant example of the past three decades among developing countries, and Australia and New Zealand among the high-income countries (Huang et al., 2009; Anderson et al., 2007). Other developing countries may have done so partly to secure bigger and better loans from international financial institutions and then, having taken that first step, they continued the process, even if somewhat intermittently. India is one example, but there are numerous other examples in Africa and Latin America. Few have gone backwards in terms of increasing their anti-agricultural bias, but Zimbabwe and perhaps Argentina qualify during the present decade – and numerous others joined them in 2008, at least temporarily, in response to the sudden upward spike in international food prices. Also,

some have reduced their agricultural subsidies and import barriers at least partly in response to the GATT's multilateral Uruguay Round Agreement on Agriculture, the European Union (EU) being the most important example (helped by its desire for otherwise costly preferential trade agreements, including its expansions eastwards in 2004 and 2007).

The EU reforms suggest that growth in agricultural protection can be slowed and even reversed if accompanied by re-instrumentation away from price supports to decoupled measures or more direct forms of farm income support (Josling, 2009). The starker examples of Australia and New Zealand show that one-off buyouts can bring faster and even complete reform.⁷ But in the developing countries where levels of agricultural protection are generally below those in high-income countries, there are fewer signs of a slowdown of the upward trend in agricultural protection from import competition over the past half-century.

Indeed, there are numerous signs that the governments of developing countries want to keep open their options to raise agricultural NRAs in the future, particularly via import restrictions. One indicator is the high tariff bindings to which developing countries committed themselves following the Uruguay Round: as of 2001, actual applied tariffs on agricultural products averaged less than half the corresponding bound tariffs for developing countries of 48 per cent, and less than one-sixth in the case of least-developed countries (Anderson and Martin, 2006, Table 1.2). Another indicator of reluctance about agricultural trade reform is the demand by many developing countries to be allowed to maintain their rates of agricultural protection for reasons of food security, livelihood security and rural development. This view has succeeded in bringing 'special products' and a 'special safeguard mechanism' into the multilateral trading system's agricultural negotiations, even though such policies, which would raise domestic food prices in developing countries, may worsen poverty and reduce the food security of the poor, and would exacerbate instability in international markets for farm products. Given these developments, it is especially unfortunate that the WTO's Doha Development Agenda is struggling to deliver a new liberalizing agreement, and makes it more likely that developing countries will follow the same agricultural protection path this century as that taken last century by high-income countries.

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Table 7.1 Nominal rates of assistance to agricultural and non-agricultural tradables and relative rate of assistance,^a Asian developing economies and Japan, 1960 to 2004

	(percent)						
	1960- 64	1970- 74	1980- 84	1985- 89	1990- 94	1995- 99	2000- 04
Japan							
NRA Ag.	44.5	47.3	67.0	127.7	129.7	133.4	133.6
NRA Non-Ag.	3.9	2.8	1.1	1.3	1.1	0.8	0.7
RRA	39.1	43.3	65.2	124.8	127.1	131.4	132.1
Korea							
NRA Ag.	4.9	46.1	118.6	159.8	197.6	164.8	171.9
NRA Non-Ag.	37.1	11.4	6.8	5.7	3.3	2.3	1.7
RRA	-21.4	30.5	104.8	145.9	188.2	158.8	167.3
Taiwan ^b							
NRA Ag.	4.7	12.0	18.7	33.8	46.3	54.9	70.9
NRA Non-Ag.	9.3	7.5	5.2	4.5	2.6	1.8	1.0
RRA	-4.2	4.2	12.9	28.0	42.5	52.2	69.0
China ^b							
NRA Ag.	-45.2	-45.2	-45.2	-35.5	-14.3	6.6	5.9
NRA Non-Ag.	41.6	41.6	41.6	28.3	24.9	9.9	5.0
RRA	-60.5	-60.5	-60.5	-49.9	-31.1	-3.0	0.9
Indonesia							
NRA Ag.	na	-3.8	10.5	-1.9	-7.5	-9.7	13.9
NRA Non-Ag.	na	27.7	27.7	26.5	17.6	10.6	8.1
RRA	na	-24.7	-13.5	-22.5	-21.3	-18.3	5.4
Malaysia							
NRA Ag.	-7.6	-9.4	-4.9	1.4	2.6	-0.2	1.5
NRA Non-Ag.	7.4	7.1	5.2	3.9	2.8	2.0	0.9
RRA	-14.0	-15.5	-9.6	-2.4	-0.3	-2.2	0.6
Philippines							
NRA Ag.	-1.7	-6.0	-4.0	15.8	16.7	35.7	23.5
NRA Non-Ag.	19.0	16.3	12.9	11.0	9.9	8.6	6.4
RRA	-17.4	-19.8	-14.9	4.3	6.1	24.9	15.9
Thailand							
NRA Ag.	na	-23.1	-2.3	-6.9	-6.4	1.8	-0.2
NRA Non-Ag.	na	16.1	14.2	11.1	10.0	8.9	7.8
RRA	na	-33.7	-14.4	-16.3	-14.9	-6.5	-7.4
Vietnam ^b							
NRA Ag.	na	na	na	-15.9	-26.4	0.0	20.7
NRA Non-Ag.	na	na	na	4.3	-11.2	1.5	20.8
RRA	na	na	na	-19.2	-17.4	-1.3	0.0
Bangladesh							
NRA Ag.	na	na	-3.9	17.5	-2.4	-8.0	4.0
NRA Non-Ag.	na	na	22.4	28.5	33.3	29.0	23.4
RRA	na	na	-21.5	-8.6	-26.7	-28.6	-15.8
India ^b							
NRA Ag.	5.2	12.6	4.1	67.5	2.0	-2.3	15.4
NRA Non-Ag.	113.0	83.1	59.3	48.6	15.9	12.6	5.2
RRA	-56.3	-38.3	-33.5	11.7	-12.1	-12.9	12.5

Pakistan ^b							
NRA Ag.	-1.0	9.3	-9.3	-5.9	-10.2	-2.6	1.5
NRA Non-Ag.	169.7	146.7	48.3	45.1	39.3	27.0	14.6
RRA	-63.8	-55.9	-38.6	-35.1	-35.2	-23.0	-11.5
Sri Lanka							
NRA Ag.	-25.7	-18.5	-15.4	-11.2	-1.3	14.0	10.8
NRA Non-Ag.	124.6	70.7	57.1	59.0	47.1	36.4	22.9
RRA	-66.6	-51.6	-46.2	-44.3	-32.9	-16.3	-9.8
Asian dev. economies^c							
NRA Ag.	-27.7	-24.3	-18.8	-11.2	-2.6	7.5	11.7
NRA Non-Ag.	67.1	50.3	38.3	15.4	14.9	9.6	4.3
RRA	-56.4	-47.9	-40.8	-22.8	-15.2	-1.9	7.1
Dispersion of national RRAs ^d	30.7	37.6	51.9	56.0	65.1	50.5	50.8

^a The RRA is defined as $100 * [(100 + \text{NRA}_{\text{ag}}^t) / (100 + \text{NRA}_{\text{nonag}}^t) - 1]$, where NRA_{ag}^t and $\text{NRA}_{\text{nonag}}^t$ are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.

^b Estimates for China pre-1981 and India pre-1965 are based on the assumption that the nominal rates of assistance to agriculture in those years was the same as the average NRA estimates for those economies for 1981-84 and 1965-69, respectively, and that the gross value of production in those missing years is that which gives the same average share of value of production in total world production in 1981-84 and 1965-69, respectively. This NRA assumption is conservative in the sense that for both countries the average NRA was probably even lower in earlier years, according to the authors of those country case studies.

^c Weighted averages of the above national averages, using weights based on gross value of national agricultural production at undistorted prices.

^d Simple average of the standard deviation around a weighted mean of the national RRAs for the region each year.

Source: Calculated from Anderson and Valenzuela (2008), which draws on national estimates reported in Anderson and Martin (2009).

Table 7.2 NRAs for Asian developing country farmers, by product, 1960 to 2004

(percent, at primary product level)

	1960- 64	1970- 74	1980- 84	1985- 89	1990- 94	1995- 99	2000- 04
Barley	84	120	166	357	524	543	563
Beef	25	44	101	94	145	106	85
Cassava	na	-23	-9	-17	-11	-14	-10
Chickpea	50	1	8	12	9	15	19
Cocoa	na	-3	-2	-1	-2	-2	0
Coconut	-29	-8	-11	-19	-34	-22	-8
Coffee	na	-7	-9	-5	-5	-1	-2
Cotton	-19	63	-12	-2	-3	0	5
Egg	-21	0	10	22	27	23	51
Fruits & veg	0	0	-8	-3	-11	-6	-4
Jute	na	-30	-29	-35	-38	-6	-39
Maize	-10	19	-20	-6	-15	8	13
Milk	na	122	108	124	40	23	32
Oilseeds	24	11	22	35	21	22	22
Palmoil	-11	-15	-1	-2	2	-9	-3
Pigmeat	16	51	-41	-39	-3	7	4
Poultry	0	18	48	-2	20	17	12
Rice	-6	-17	-27	-6	-9	2	18
Rubber	-16	-8	-19	-14	-16	5	4
Sorghum	82	55	7	36	7	21	16
Sugar	96	13	37	39	13	20	43
Tea	-39	-28	-18	-19	-10	-8	-7
Wheat	-12	15	-3	12	4	18	11
Asian dev. economies:	-2.7	0.3	-21.6	-15.2	-4.8	6.0	10.2

Source: Calculated from Anderson and Valenzuela (2008), which draws on national estimates reported in Anderson and Martin (2009).

Table 7.3 Trade reduction indexes, Asian countries and other regions,^a all covered tradable farm products, 1960 to 2004

(percent)

	1960-64	1970-74	1980-84	1985-89	1990-94	1995-99	2000-04
Bangladesh	na	-13	-1	24	1	-8	6
China	na	na	44	44	19	4	1
India	na	42	38	70	26	18	22
Indonesia	na	1	14	5	2	-1	19
Korea	5	44	119	158	189	164	184
Malaysia	12	8	18	21	14	5	5
Pakistan	7	19	4	12	-3	-2	4
Philippines	-4	1	3	16	18	39	27
Sri Lanka	26	20	13	5	23	17	4
Taiwan	-6	-16	-19	-25	37	67	96
Thailand	na	25	13	11	9	6	1
Vietnam	na	na	na	12	28	6	-11
Asian DCs, total	15	23	34	28	18	8	6
Africa	32	33	18	54	17	16	22
Latin America	22	19	19	13	23	7	8
All developing countries	26	27	28	29	21	9	10
Japan	64	73	105	144	134	132	127
High-income countries, all	19	16	27	28	28	18	18

Source: Lloyd, Croser and Anderson (2009), based on product NRAs and CTEs in Anderson and Valenzuela (2008).

a. Regional aggregates are weighted using the absolute value of net imports (computed as the difference between the value of consumption and the value of production) at undistorted prices.

Table 7.4 Welfare reduction indexes, Asian countries and other regions,^a all covered tradable farm products, 1960 to 2004

(percent)

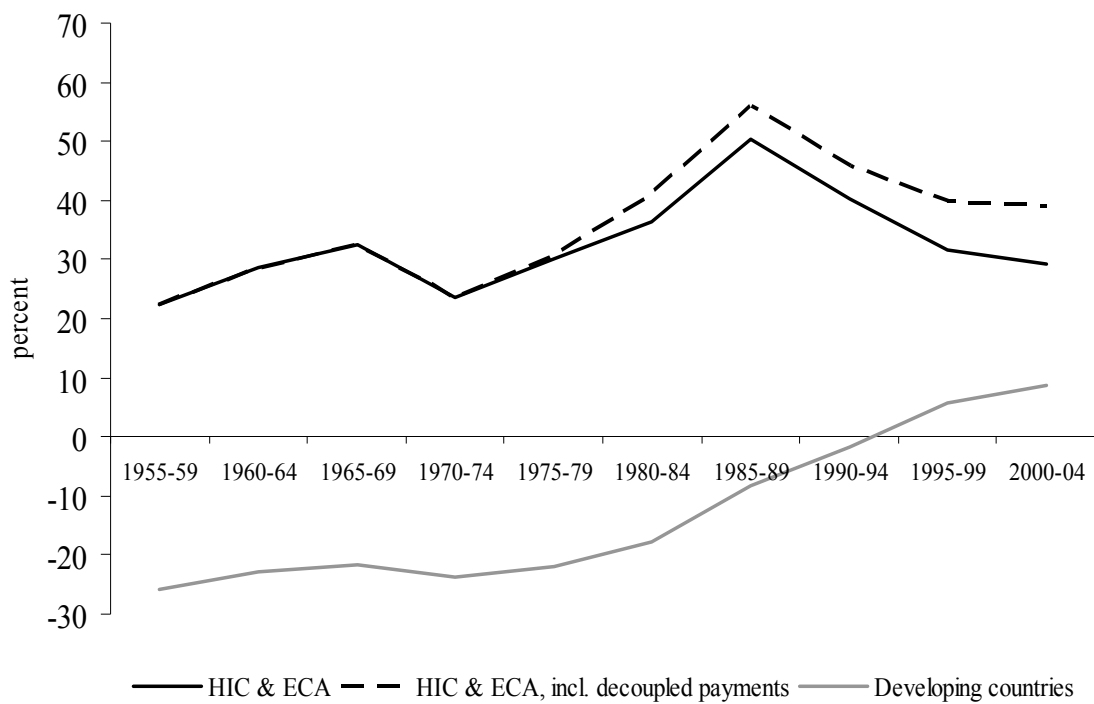
	1960-64	1970-74	1980-84	1985-89	1990-94	1995-99	2000-04
Bangladesh	na	30	29	49	29	25	31
China	na	na	55	48	25	12	8
India	na	49	54	87	31	22	27
Indonesia	na	18	31	21	24	28	27
Korea	45	69	130	176	211	194	228
Malaysia	14	10	57	95	71	31	34
Pakistan	44	75	39	46	31	24	29
Philippines	18	30	33	46	32	51	42
Sri Lanka	32	29	26	29	39	35	30
Taiwan	30	52	43	85	124	155	190
Thailand	na	30	22	18	16	19	12
Vietnam	na	na	na	22	30	24	37
Asian DCs, total	27	39	48	46	28	19	16
Africa	52	52	51	81	52	37	36
Latin America	42	38	44	39	42	20	23
All developing countries	44	42	48	48	32	19	18
Japan	74	106	150	248	240	210	213
High-income countries, all	49	46	69	71	52	38	38

Source: Lloyd, Croser and Anderson (2009), based on product NRAs and CTEs in Anderson and Valenzuela (2008).

a. Regional aggregates are weighted using the average of the value of production and the value of consumption at undistorted prices.

Figure 7.1 Nominal rates of assistance to agriculture in High-Income Countries (HIC) and European transition economies^a and in developing countries, 1955 to 2004

(per cent, weighted averages, with ‘decoupled’ payments included in the dashed HIC line)



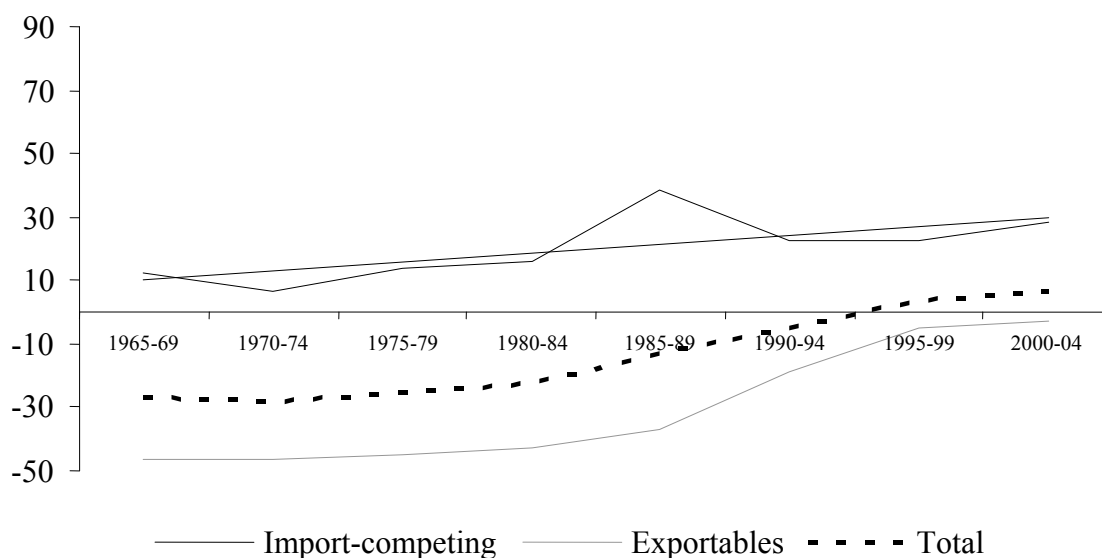
^a Denoted by the World Bank as ECA, for (Central and Eastern) Europe and Central Asia.

Source: Anderson (2009, Ch. 1), based on estimates in Anderson and Valenzuela (2008).

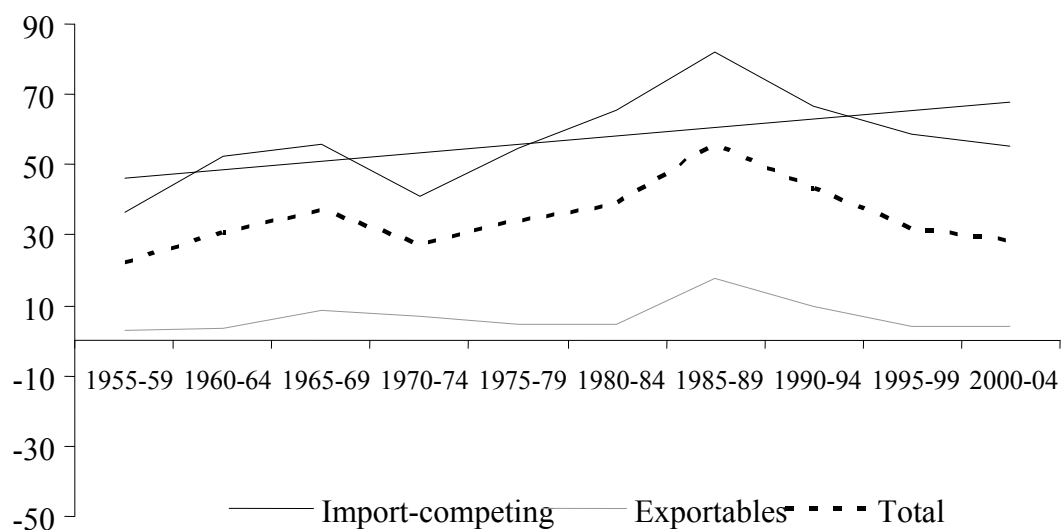
Figure 7.2 Nominal rates of assistance to exportable, import-competing and all covered agricultural products,^a high-income and developing countries, 1955 to 2004

(per cent)

(a) Developing Countries



(b) High-Income Countries plus Europe's Transition Economies

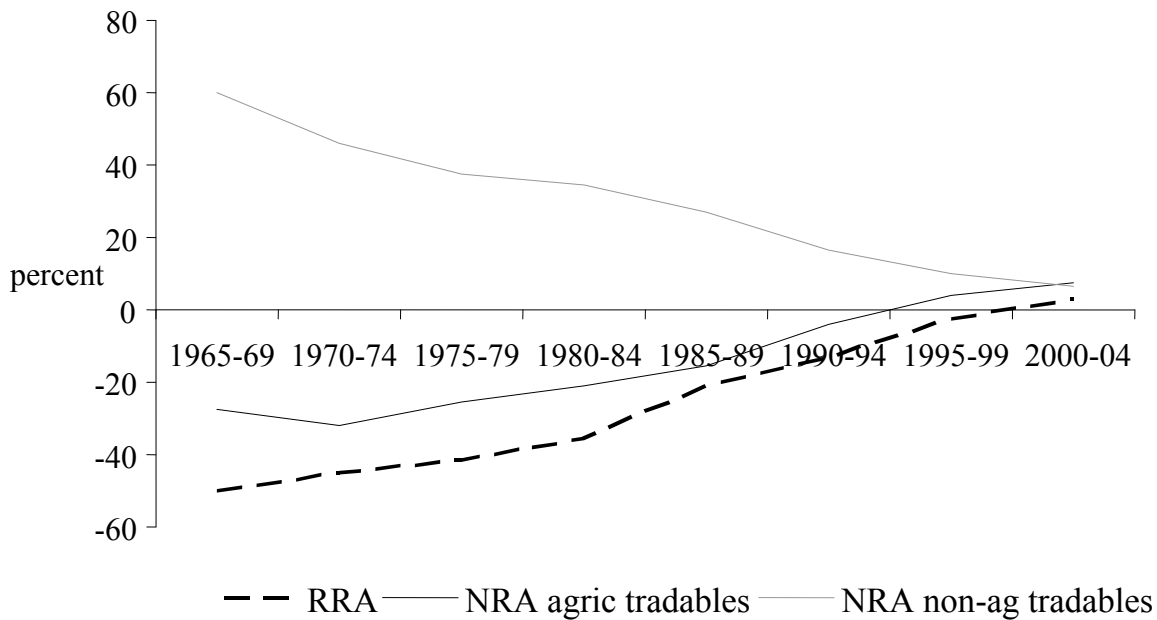


^aCovered products only. The total also includes nontradables.

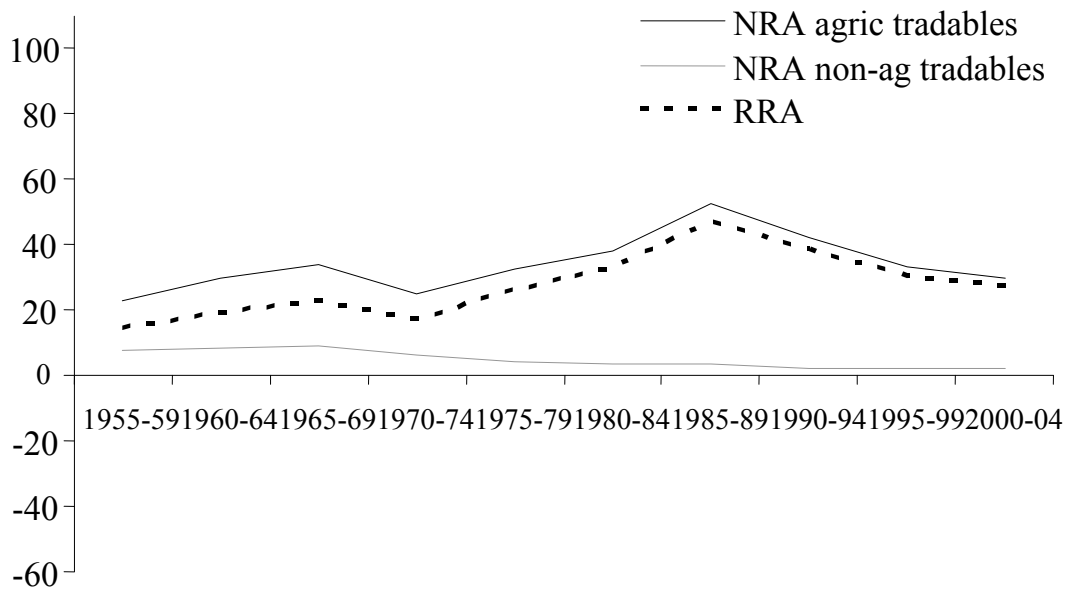
Source: Anderson (2009, Ch. 1), based on estimates in Anderson and Valenzuela (2008).

Figure 7.3 Nominal rates of assistance to agricultural and non-agricultural tradable sectors and relative rate of assistance,^a developing and high-income countries, 1955 to 2004
(per cent, production-weighted averages across countries)

(a) Developing Countries



(b) High-income countries



^a The RRA is defined as $100 * [(100 + NRA_{ag}^t) / (100 + NRA_{nonag}^t) - 1]$, where NRA_{ag}^t and NRA_{nonag}^t are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.

Source: Anderson (2009, Ch. 1), based on estimates in Anderson and Valenzuela (2008).

Figure 7.4 Trade reduction and welfare reduction indexes for tradable farm products, by region, 1960 to 2007

(percent)

(a) Trade reduction index

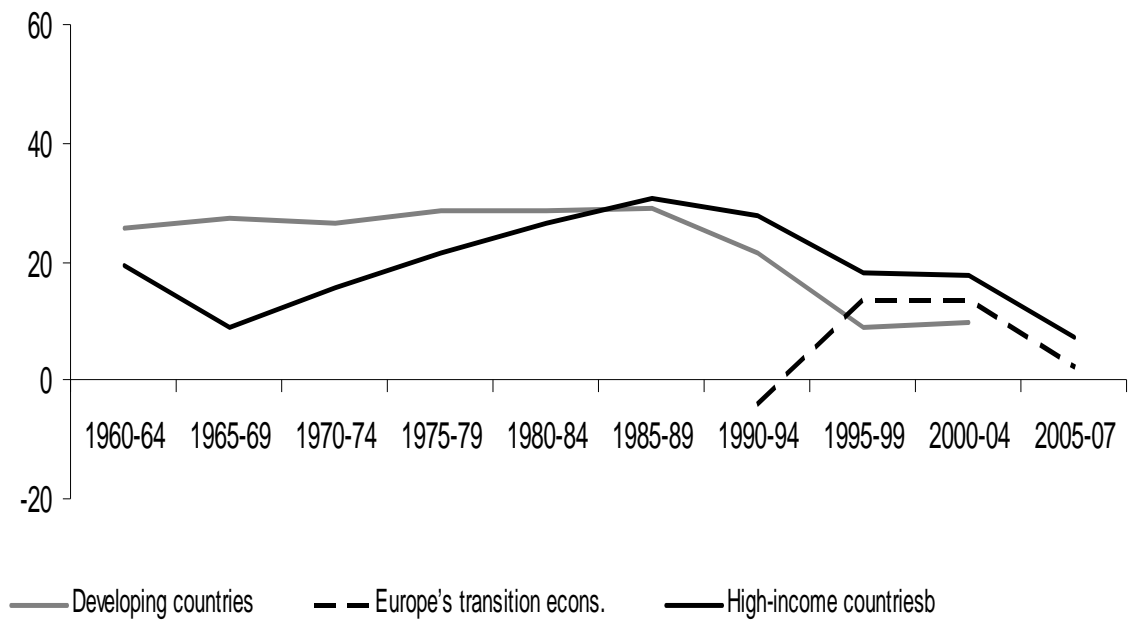
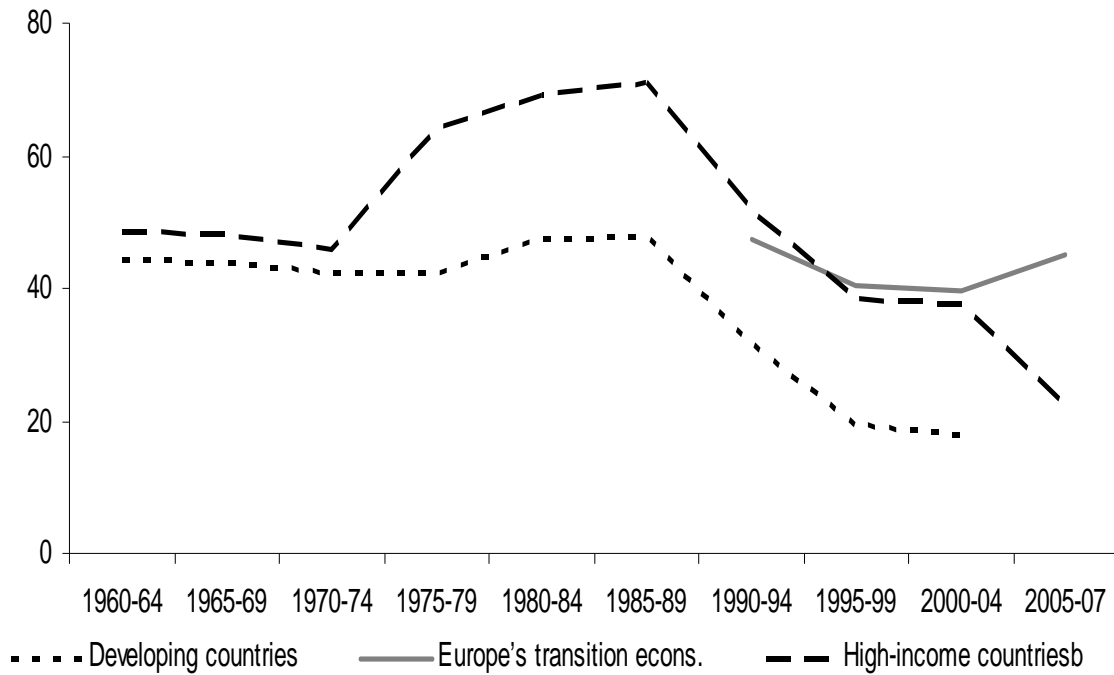


Figure 7.4 (continued) Trade reduction and welfare reduction indexes for tradable farm products, by region, 1960 to 2007

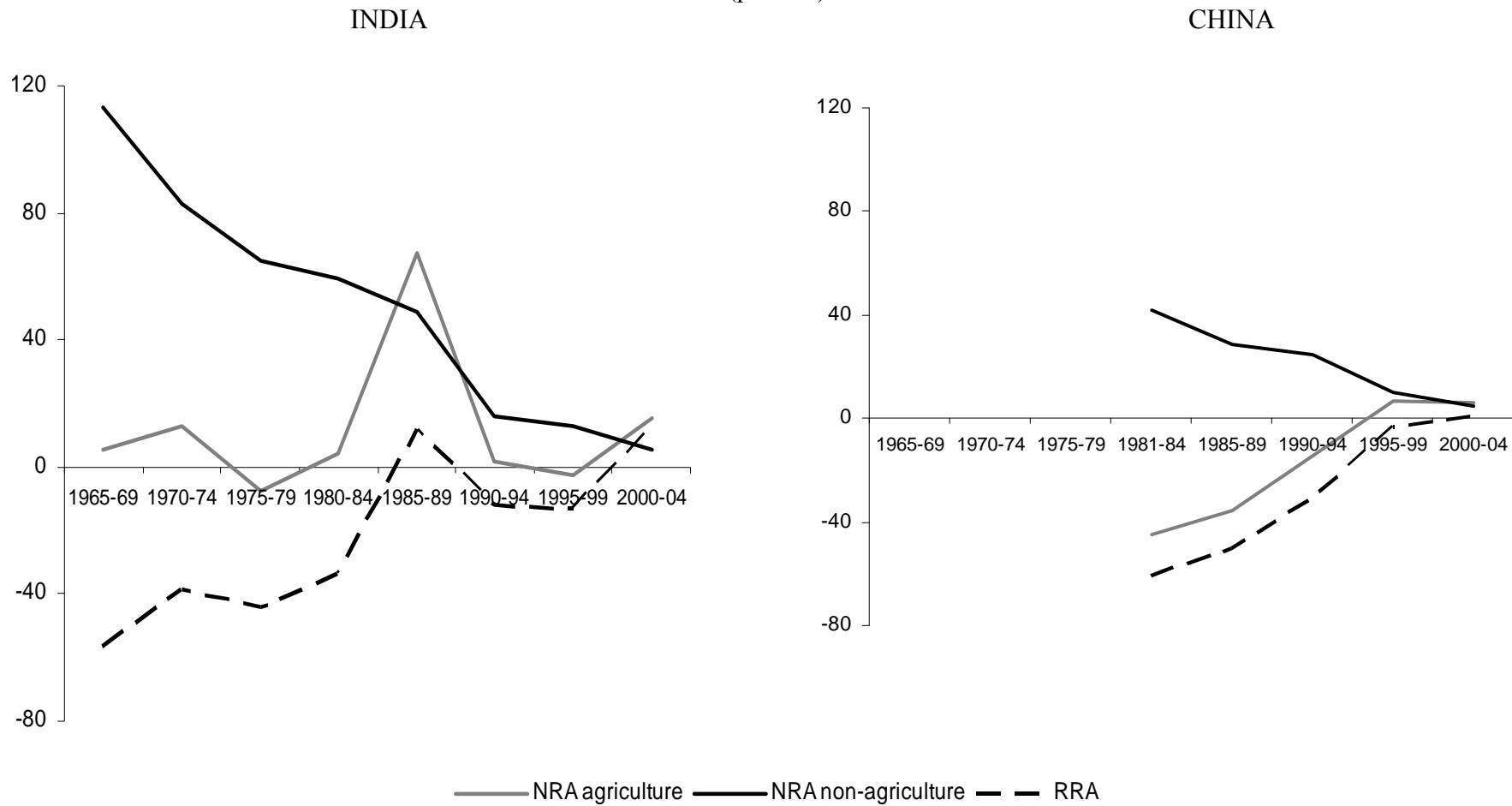
(percent)

(b) Welfare Reduction Index



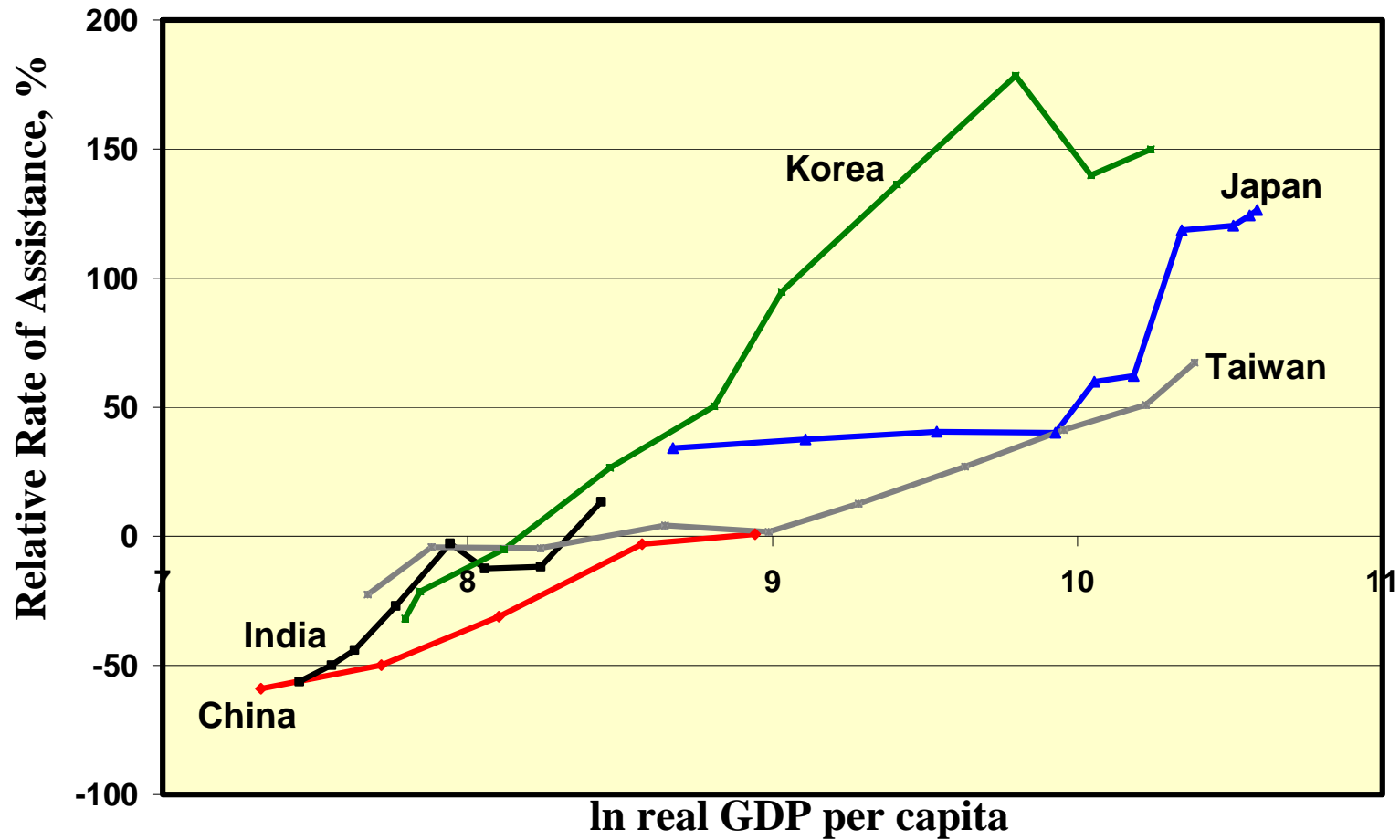
Source: Lloyd, Croser and Anderson (2009), based on NRAs and CTEs in Anderson and Valenzuela (2008).

Figure 7.5 Nominal and relative rates of assistance, China and India, 1965 to 2005
(percent)



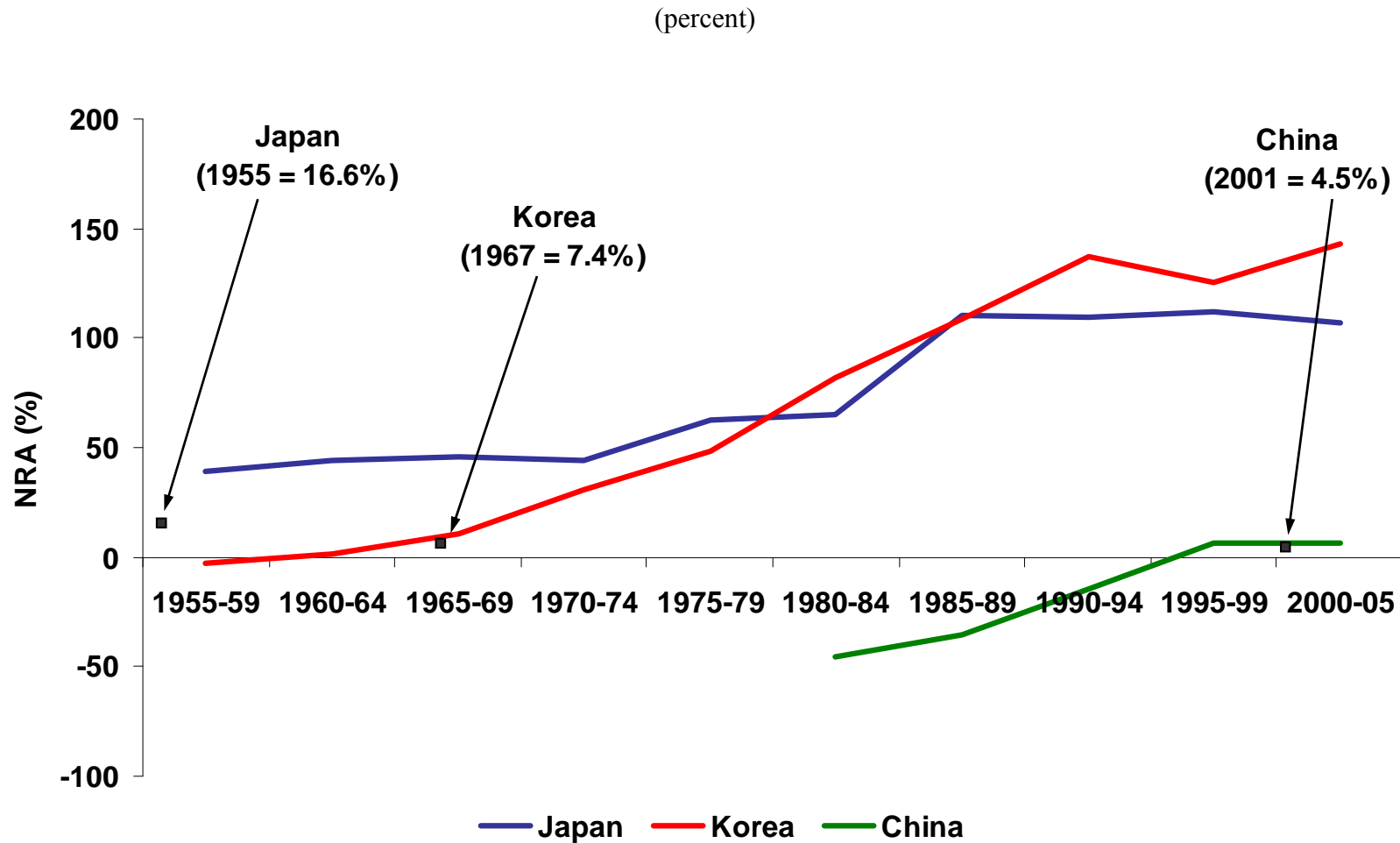
Source: Calculated from Anderson and Valenzuela (2008), which draws on national estimates reported in Anderson and Martin (2008).

Figure 7.6 RRAs and log of real per capita GDP, India and Northeast Asian focus economies, 1955 to 2005



Source: Calculated from Anderson and Valenzuela (2008), which draws on national estimates reported in Anderson and Martin (2008).

Figure 7.7 NRAs for Japan, Korea and China and Date of Accession to GATT or WTO, 1955 to 2005



Source: Calculated from Anderson and Valenzuela (2008), which draws on national estimates reported in Anderson and Martin (2008).

Endnote

¹ Farmers are affected not just by prices of their own products but also by the incentives nonagricultural producers face. That is, it is *relative* prices and hence *relative* rates of government assistance that affect producer incentives. More than seventy years ago Lerner (1936) provided his Symmetry Theorem that proved that in a two-sector economy, an import tax has the same effect as an export tax. This carries over to a model that also includes a third sector producing only nontradables.

² Australia and New Zealand were clear exceptions, where manufacturing protection had been very high and its decline occurred several decades later than in other high-income countries (Anderson, Lloyd and MacLaren 2007).

³ This section draws on and is further elaborated in Anderson (2008).

⁴ Note that it has been assumed that NRA estimates for China pre-1981 and India pre-1965 are the same as the average NRA estimates for those economies for 1981-84 and 1965-69, respectively, and that the gross value of production in those missing years is that which gives the same average share of value of production in total world production in 1981-84 and 1965-69, respectively. This NRA assumption is conservative in the sense that for both countries the average NRA was probably even lower (more negative) in earlier years.

⁵ While international food prices in mid-2008 were well above those of 2004, the slump in these prices over the second half of 2008 suggests that prices in 2009 may not be so different from those of 2004, and in any case the Doha round negotiations have been using such a historical period against which to draw up reform proposals.

⁶ Data in Pardey et al. (2006) suggest that public R&D expenditure in Asia since the late 1970s has averaged less than 0.5 percent of the gross value of production at undistorted prices, which is trivial compared with the NRA via price-distorting measures for Asia. Even if just one-twentieth of the current NRA provided to Asian farmers via farm price-support policies was replaced by agricultural R&D expenditure, that would more than double current public spending on such R&D – and the latter would increase regional economic welfare whereas price-distortionary policies reduce it. Such a boost to Asian R&D could well be able to generate another green revolution of the order of magnitude of the first one that began in the 1960s, especially if it took full advantage of the new developments in biotechnology (as shown for rice, for example, in Anderson, Jackson and Nielsen 2005).

⁷ Anderson, Lloyd and MacLaren (2007). For a detailed analysis of the buyout option versus the slower and less complete cashout option (moving to direct payments), as well as the uncompensated gradual squeeze-out or sudden cutout options, see Orden and Diaz-Bonilla (2006).