

Thailand's Economic Boom and Bust, and the Fate of Agriculture

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THAILAND'S ECONOMIC BOOM AND AGRICULTURAL BUST

In the middle and late 1980s, a remarkable combination of domestic and international phenomena came together to “make a miracle” in Thailand: an acceleration of real economic growth from about 6 percent per year in 1976-1985 to above 8 percent in 1986-1995. At its peak in 1988-1990, growth averaged 12 percent per year. Low wages, progressive reductions in trade barriers, and years of conservative macroeconomic management resulting in low inflation and a stable exchange rate made the Thai economy an ideal host for a flood of foreign investment in the late 1980s, especially that from Japan after the Plaza Accord and the subsequent appreciation of the yen relative to the US dollar. The same factors enabled Thai exporters to ride a tremendous wave of growth in global trade from the mid-1980s. And from late in the decade, emergence of a securities market (the SET) and a series of economic policy reforms to open the Thai capital account facilitated a flow of foreign-currency denominated borrowing that by the mid-1990s had become a torrent ([Figure 1](#)).¹

Tax reform and liberalization of the domestic financial sector, coupled with easier access to foreign resources, fueled a domestic investment boom that by the early 1990s had spilled over from tradable sectors (those producing goods for export or for import substitution) into demand for non-traded assets, particularly stocks and real estate. The boom in demand for non-traded assets drove up their prices, sometimes in spectacular fashion, and created an entire class of wealthy urban Thais whose assets were their shares in the ownership of banks, finance companies, real estate and property developments, construction firms, and a raft of ancillary industries. The Bangkok skyline became a forest of cranes as property developers competed to construct ever-taller and more prestigious office blocks and apartment towers. Employment in the construction sector grew from an average of 6 percent of the non-agricultural labor force in 1980-1989, to over 10 percent in 1990-1995.

In spite of sharply rising inequality, there could be few complaints that the gains from this growth were not widely shared. With employment demand outpacing labor force growth, real wages rose rapidly from 1989 and, as a result, overall poverty incidence declined.² Political instability notwithstanding (the country experienced five constitutional changes of government and one coup d'etat between 1988-1995), and in spite of lingering doubts about the robustness of its economic and financial institutions, Thailand had become a model developing economy, winning a place in the group of eight “high-performing Asian economies” that the World Bank in 1993 dubbed *The East Asian Miracle*.

The gains from the boom were not uniformly shared among sectors, however. Agriculture, historically the mainstay of the Thai economy, the primary employer and major source of export earnings, captured only a tiny fragment of the investment boom, and as the most labor-intensive set of industries, found itself increasingly unable to compete with wages offered in other sectors ([Figure 2](#)). After 1989, as close to three million workers out of a total agricultural labor force of about 20 million walked off the land ([Figure 3](#)), planted area began to decline ([Figure 4](#)) and agricultural output growth rates decelerated ([Table 1](#)). The sector experienced negative growth in 1990 (−3.5%) and again in 1993 (−1.9%). The *relative* decline of agriculture, an inevitable and generally welcome trend in a growing economy, threatened for a time to become an *absolute* contraction.

In an open economy, the decline of agriculture is an inevitable feature of economic growth and is not in itself a cause for concern. Rather, it should be regarded as a problem and addressed with appropriate policies only under some specific sets of conditions, in particular conditions that may result in a long-term reduction in aggregate welfare, or a reduction in the probability that a given poor household will move out of poverty. Admittedly, with the benefit of hindsight, we can observe many of these conditions in Thailand's decade of miraculous growth. Now that rapid growth has come to an end, at least for some time, the health of agriculture has become an issue of great pertinence to employment, poverty and long-term economic growth.

The Fate of Agriculture

As is well known, economic growth reduces the relative profitability of agriculture through several mechanisms. Of these, the most important are domestic terms of trade changes (a decline in relative agricultural prices, known to economists as Stolper-Samuelson effects), and unequal rates of factor endowment growth, which cause factors to migrate to sectors where their relative productivity is higher (Rybczinski effects). Both of these intersectoral effects have been observed to be important features of explanations for the relative decline of Thai agriculture over the period 1960-1985 (Ammar 1996, Martin and Warr 1994). Rising prices of non-traded goods (which are produced mainly in non-agricultural sectors) and growth of non-agricultural capital stocks have apparently been the main engines of structural change in the Thai economy. In this story, both rising prices and investment in non-agricultural industries increase labor productivity outside the farm sector. Wage pressures and declining relative agricultural prices squeeze farm profits and discourage investment, and this reduces the agricultural growth rate relative to rates in the rest of the economy.

While the overall agricultural decline is easy to see and interpret, it is also relevant to ask what effects changing output and factor markets exert within the sector. In Coxhead and Jiraporn (1998), we evaluate the impacts of agricultural and non-agricultural growth on agricultural land and labor demand. Unlike most previous analyses of similar questions, the model acknowledges that labor is mobile between sectors, and also that total agricultural land area fluctuates in response to economic and technological signals.³ Thus, in the model, agricultural wages are determined by non-agricultural wages, which are described in turn as functions of non-agricultural prices, investment, and the overall growth rate of the labor force. Through this channel, the determinants of growth in non-agricultural sectors can also determine employment and aggregate land use changes within agriculture (for more details of the model see the Appendix).

Estimated with a 35-year times series of data (1961-1995), the model sheds significant light on the intersectoral causes of declining land and labor use. Some of the results of this econometric analysis are shown in [Table 2](#). Each entry in the table is an elasticity indicating the estimated impact of some change on the relevant endogenous variable (labor use, land use or agricultural wages), taking account of concurrent changes in the other endogenous variables. Two sets of estimates are shown. In the shorter-run estimates it is assumed that agricultural land use decisions are made on the basis of a fixed amount of labor. In the longer-run estimates, land use decisions are made on the assumption that labor is intersectorally mobile. The results confirm that in spite of significant investments in agricultural productivity, for example the expansion of irrigation, the evolution of agricultural factor demand is largely driven by non-agricultural phenomena, specifically by non-agricultural prices and investments. These raise agricultural wages and this in turn drives agricultural resource allocation decisions. The estimates show the agricultural labor demand elasticity with respect to an increase in non-agricultural capital stock at -0.26 (a 1% increase in non-agricultural capital will reduce farm labor demand by 0.26%). The labor data are measured in millions of workers and the capital stock in baht* 10^{12} , so the elasticity value can be interpreted as follows: other things equal, one agricultural worker migrates to non-agriculture for every four million baht invested (US \$160,000 at the pre-1997 exchange rate of baht 25:\$1).

The elasticity of agricultural land area with respect to non-agricultural investment is about -0.07 ; by an analogous calculation, every one million baht invested outside agriculture reduces planted area by about one rai (0.16 ha). Comparing these numbers with the average agricultural labor-land ratio (approximately 0.16, i.e., one worker per six rai) provides an immediate sense of the Rybczinski effect of non-agricultural growth in Thailand: at constant prices, non-agricultural investment growth causes factors to be withdrawn from agriculture at a rate of four workers per rai.

The econometric result provides strongly intuitive explanations both for the decline of agricultural land area, and for some of the reasons behind the rapid mechanization of Thai agriculture since 1989 ([Figures 4, 5 and 6](#)). With massive outflow of labor, a considerable amount of agricultural land was idled. In light of the discussion to come, it is also of particular interest to note from [Table 2](#) that in the shorter-run the elasticity of agricultural labor demand with respect to agricultural machinery is negative. Labor and machinery are clear substitutes; each percentage point increase in agricultural machinery stocks diminishes labor demand by 0.18 percent. In the short run, therefore, mechanization diminishes employment opportunities in agriculture, a point to which we shall return when considering the implications of the current economic crisis.

WAS GROWTH IN THE 1990s “TOO FAST”?

As we have just seen, the economic boom of 1988-1995 was associated with the reversal of long-term growth rates of employment and land area in Thai agriculture. The economic implications of these declines and of dramatically slower farm output growth are potentially profound. Agriculture has long been regarded as one of the economy's leading

sectors, and Thailand enjoys clear comparative advantage in several crops, most notably rice. Agriculture's sudden decline may also be a source of policy concern if it has occurred at a rate greater than warranted by long-term trends in factor endowment and productivity growth rates, and if the economy is characterized by significant market or technological irreversibilities.

Where does the problem arise? In the standard "Dutch disease" model of growth and structural change, the long-term relative decline of a tradable sector occurs in response to a permanent change in relative prices or rates of factor accumulation, technical progress, or changing consumer preferences (Corden and Neary 1982). In such cases the decline (e.g., of agriculture) is socially optimal, since any intervention directed at slowing or reversing the sector's decline would reduce economic welfare. In this story, the decline of Thai agriculture is a natural consequence of long-term non-agricultural growth and there is no economic basis for concern.

In the Thai case, however, some key assumptions of this standard theoretical result may be violated. In particular, the primary fuel for the boom was the accumulation of capital which, in contrast to the standard Dutch disease model, is internationally mobile in the Thai economy after 1990 due to capital market liberalization. The implication is that resources upon which the boom is built may relatively easily be withdrawn from the economy, with consequent reductions in non-agricultural production and labor demand. The fact that much of this investment was financed by borrowing in short-term international money markets is of course relevant to the outcome, since it means that the end of the boom, when it came, was marked by very rapid capital outflow. It is also significant that much of the boom occurred in labor-intensive non-tradable sectors such as property development and construction, where asset prices were driven to unjustifiable heights in a fashion characteristic of a "bubble" economy.⁴

Seen this way, the investment boom of the 1990s was analogous to a temporary resource boom of the kind experienced by most oil-exporting countries in the 1970s. Those countries discovered, belatedly in most cases, that treating a boom as permanent when it is in fact temporary can have undesirable consequences. The same may now be true of Thailand. First, the decline in agriculture's domestic terms of trade with other sectors—caused by the investment boom and by spending on non-traded, non-agricultural goods and services—was probably exaggerated. Second, too-rapid growth in non-agricultural labor demand may have stimulated a faster rate of non-agricultural wage growth than long-term factor market trends would warrant. This in turn provided incentives for labor migration, and thus for a contraction of planted area (as shown in Table 2) as well as for agricultural mechanization.

Even so, the non-agricultural boom raises potential long-term problems only if it has long-term effects. We contend that the boom may have stimulated a pattern of agricultural responses which will be costly to correct in the long run, and which in the short run may have significant implications for employment and poverty. Both labor migration and mechanization entail sunk costs, and their presence suggests that the investment boom may have induced some changes in labor markets and agricultural technology that will be costly to reverse in the very different economic climate of the late 1990s. The presence of sunk costs and other irreversibilities provide justification for protection to sectors that are negatively affected by a temporary boom (van Wijnbergen 1984). A variant of this argument applies to rural-urban migration, where reversal of the labor flow entails welfare-reducing transactions costs for workers who have invested time and money in gaining a foothold in the urban labor market. Once again, the implied loss of welfare motivates policies to dampen the effect of the boom.⁵ In either case, excessive investment may have some unexpected long-term costs for the Thai economy. Some resources will have to be expended to correct them. In this sense, Thai economic growth in 1988-1995 may have been "too fast," and corrective policies to inhibit it, and thus to prevent such a rapid agricultural decline, were merited.

THE CRISIS AND ITS CONSEQUENCES

While this is not the place in which to explore the causes of the ongoing Thai economic crisis in detail, some salient features of the late boom period and beyond deserve mention. The first is that for a number of reasons having to do both with domestic and international developments, the non-agricultural industries hardest hit by declining international markets for Thai exports and by the collapse of the Thai property and real estate "bubble" were also among the most labor-intensive. The export collapse of 1996, one of the triggers of crisis, affected labor-intensive sectors such as garments and footwear by far more than the average (Warr 1997). Likewise the construction industry, which depends largely on the pace of investment in property development, accounts for a significant fraction of total non-agricultural employment. The second salient feature is that even as the crisis began to unfold in late 1996, the Thai government insisted on maintaining the more-or-less fixed baht-dollar exchange rate in spite of mounting evidence that this had caused the baht to become over-valued relative to the currencies of Thailand's major trading partners, notably Japan. The fixed exchange rate commitment worked to the disadvantage of traded goods sectors, and thus prevented an agricultural recovery from beginning earlier. Third, the Thai economy was "in transition" in a

number of important respects in the first half of the 1990s, and one of particular significance is that in response to government encouragement, many Thai farmers had embarked on agricultural diversification. The switch away from rice and toward field crops such as mungbean, soybean and sugarcane facilitated agricultural mechanization just as agricultural wages were beginning to rise very sharply.

Irreversibilities and Implications

As we have seen, one source of the economic crisis was a real exchange rate appreciation (a rise in the relative prices of non-traded goods) that reduced the international competitiveness of Thai traded-goods sectors. Rapid wage growth associated with the real appreciation reduced profitability in many of Thailand's traditional, labor-intensive export manufacturing industries. The loss of international competitiveness, exacerbated by increasingly tight liquidity through 1996-1997, caused a contraction in garments, textiles, footwear and similar sectors that threw tens of thousands of unskilled or semi-skilled workers out of work. In late 1997, the Thai press reported huge increases in open unemployment and predicted widespread movement of labor "back to the farm." One question that immediately arises is whether such a movement would actually occur and, if so, with what consequences.

The rapid transfer of labor out of agriculture in the past decade appears to indicate a high degree of intersectoral labor mobility in Thailand. The recession, however, may well reveal that this mobility is much greater in one direction—away from the farm—than the other. This asymmetry has two possible causes. First, even with high and rising open unemployment, the expected wage in non-agriculture may still exceed the reservation price of migrant labor. This was indicated in a recent press report in which the Agriculture Ministry proposed a scheme of subsidies to encourage reverse migration:

According to a government report, 600,000 industrial workers have lost their jobs this year. The Agriculture Ministry believes that many would go back to farming and related activities *if the incentives were right* ["Ministry Seeks Funds to Lure Unemployed Back to Farms," *Bangkok Post*, October 28, 1997, italics added].

If the basis of this report is accurate then a sizable part of the presently unemployed industrial labor force prefers urban unemployment to returning to the farm (of course, the total number of the unemployed has risen very significantly since the date of that report). The famous Harris-Todaro migration model predicts that with urban wages higher than those in rural (i.e., agricultural) occupations, but with the probability of urban employment being less than one, there will always be a pool of unemployed urban workers for whom the prospect of a high-paying urban job in the future is still more attractive than returning to the farm to receive a low, though certain, wage (Harris and Todaro 1970). Their decisions can be reinterpreted in a more modern way in terms of irreversible investments. By deciding to leave the farm, migrant workers have *exercised an option*—in this case, the option of staying home and earning a low but certain wage—and invested in the rural-urban move and associated costs. Having done so they are unlikely to give up their new situation readily, especially if they continue to believe that a recovery is imminent and therefore that they should remain "in line" in the urban job market. This labor market rigidity is one of the reasons for the sudden increase in open unemployment among Thai workers after the onset of the crisis.

A second reason may have to do with the nature and rate of agricultural and non-agricultural investment in recent years. As we have seen, agricultural investment in labor-replacing equipment—large and small tractors in particular—grew exponentially during the period of very rapid intersectoral labor transfer. At the same time, national stocks of buffalo, used as a very labor-intensive source of draft power, fell sharply ([Figure 7](#)). These data suggest that even if labor were to return to the farm, fixed investments in labor-replacing machinery (another form of sunk cost) may mean that the creation of new farm jobs occurs only with a long lag—too long, perhaps, to motivate any labor transfer in the short run. A more capital-intensive, mechanized agricultural sector may be another reason why, even with open unemployment of unskilled labor in urban areas, there is little reverse migration.

Finally, the crisis may have negative environmental implications in rural areas. Although the mechanization data suggest limited possibilities for reverse migration, there is of course variation within agricultural regions. Farmers in highland agriculture have been much slower to mechanize than those in other areas. Moreover, property rights in land remain poorly defined in highlands, imbuing much land in such regions with the characteristics of an open-access resource. Thus while our analysis indicates that the *total* agricultural labor demand response to the economic crisis is likely to be limited, the potential for expansion is greatest in areas of agriculturally marginal land. Such a response to unemployment and declining real wages would match that of other Southeast Asian countries in periods of recession and economic crisis (Coxhead 1992, Cruz and Repetto 1992). In many of Thailand's agricultural highlands, outmigration in the 1990s resulted in substantial reforestation as farms were abandoned. In other areas, farmers

switched from upland rice and corn to considerably less labor-intensive perennial crops, such as fruit and coffee—yet another example of an investment which cannot easily be reversed. If these trends have been widespread, then migrant workers returning to highland areas may find themselves forced to re-colonize former agricultural lands that had been reforested, and highland soil and water quality resources may suffer as a consequence.

Poverty and Income Distribution

Much of the foregoing is speculative in that, at present, we lack suitable data to test the hypothesis of irreversibility in agricultural investments and intersectoral labor flows. Nevertheless, it is worth considering some welfare implications should the capacity of agriculture to re-absorb labor indeed be found to have diminished. A logical way to do this is to compare indicators of human welfare from previous periods of economic stress in the Thai economy, specifically the downturn of the early 1980s.

In recent years, Thailand's record of poverty alleviation has been exemplary. Since poverty and labor productivity are intimately linked in developing economies, it is clear that the investment boom of the past decade made a major contribution to poverty decline through its effects on wages. However, Thailand's recent past contains some warning signs that appear to be relevant in the present period of crisis and adjustment. From 1960 to 1980, the headcount measure of poverty in Thailand declined from 59 percent to 20 percent, and the number of the poor from 16.7 to 9.5 million (World Bank 1990: Table 3.2). However, during the economic slowdown of the early 1980s, poverty incidence actually increased, and in marked fashion—not only in relative terms but also in absolute numbers. Between 1981 and 1986, the headcount measure increased from 20 percent to 26 percent, and the number of the poor from 9.5 million to 13.6 million (*ibid.*, Table 3.3). This dismal record stands in sharp contrast to those of other countries in similar periods. In Indonesia, for example, a larger economic downturn in the mid-1980s was nevertheless associated with continued poverty alleviation.

Unlike the current crisis, Thailand's slowdown of the early 1980s did not produce a recession: real GDP growth had averaged about 7 percent annually from 1965-1980, and dipped to about 5 percent in 1981-1986. In contrast, the economy failed to grow in 1997 and is predicted to experience at least one, and perhaps more, years of *negative* real GDP growth in 1998 and beyond. However, the 1980s slowdown was accompanied by a reduction in net rural-urban migration, indicating that in the past, when times were hard, Thais fell back on agriculture as a source of income and employment. If the rapid agricultural mechanization that has accompanied the non-agricultural investment boom has diminished the capacity of agriculture to absorb labor in the late 1990s, then an important component of the Thai economy's informal safety net for poor, unskilled labor may have disappeared. In retrospect, there was a case for subsidizing agricultural output and employment during the “boom” years of the past decade, as a means of inhibiting the negative effects of the boom on agricultural production, land use and the rate of mechanization. Treating the temporary investment boom of 1988-1995 as though it were permanent may have generated some long-run problems of adjustment in Thai agriculture and in labor markets.

It will be some time yet before accurate data on changes in poverty in 1997-1998 become available. However, with unemployment reaching 2.8 million in early 1998 and with mounting evidence of the weakening of informal safety nets based on transfers within families (*New York Times*, June 8 1998, p.1), the human costs of structural adjustment are becoming abundantly evident. In May 1998 the Thai government successfully renegotiated the terms of its balance-of-payments support agreement with the IMF. The main feature of the new agreement is a relaxation of fiscal policy targets to provide the government with additional resources to cushion the impact of the crisis on the poor. While new spending under this plan may have some impact on growth and employment through domestic demand, the net effect will almost certainly be to increase the duration and the cost of the Thai economic adjustment. As we can now recognize, this painful trade-off between poverty alleviation and a return to growth is a direct consequence of structural changes wrought by the untrammled expansion of the 1990s bubble economy.

Appendix: An econometric model of agricultural factor demand

Our model seeks to explain changes in agricultural factor demand over time. Its structure is informed by several stylized facts. (1) While the total size of the agricultural labor force is by no means fixed, the agricultural wage is endogenous to agricultural labor demand. (2) Changing factor proportions, output diversification and technical progress in agriculture could all contribute substantially to changes in observed aggregate agricultural factor demand. Given these, in order to model labor demand, we must simultaneously explain wage formation. Our model explains agricultural land and labor demand in terms of agricultural product prices, prices of other variable inputs, quantities of fixed inputs, and measures of technological progress. We assume the return to agricultural land to be determined residually, so its price does not appear in these expressions.

Labor demand. Agricultural labor demand (LA) is determined by the agricultural wage (WA)⁶ and the price of fertilizer (PF), both expressed in terms of agricultural prices (PA); quantities of non-labor factors including land (NA), irrigation (IR) and agricultural machinery (KA); and a measure of technical progress (T), as in (1):

$$(1) LA = LA(WA/PA, PF/PA, NA, IR, KA, T)$$

Land demand. While the total land area may be fixed in the short run, planted area fluctuates from year to year. In our model the demand for land, measured as area planted in each period, is determined by agricultural prices, labor availability or wages, the price of fertilizer, the quantities of other inputs (irrigation, labor, agricultural machinery), and technology. Whether the quantity of agricultural labor or wages should appear in this equation depends on our labor mobility assumption. If labor were intersectorally immobile (or at least of limited mobility), then it would be appropriate to use the quantity of labor as a measure of a fixed endowment. Alternatively, if labor were mobile so that farmers, having made their land use and technology decisions, could readily hire the required labor, then the wage would be a mere appropriate explanatory variable. Neither specification is likely to be strictly correct in a short-medium run analysis of Thai agriculture, and we lack sufficient information for an empirical test. Accordingly, we fit both models and compare their results. The alternative explanations for land demand are shown as (2a) and (2b):

$$(2a) NA = NA(PA, WA/PA, PF/PA, IR, KA, T),$$

or:

$$(2b) NA = NA(PA, PE/PA, LA, IR, KA, T),$$

Equations (1) and either (2a) or (2b) are interdependent since endogenous variables appear on their right-hand sides. Moreover, due to the large share of agriculture in total employment, the agricultural wage is also not invariant with respect to changes in agriculture and its presence as an explanatory variable is another source of simultaneity bias. We resolve these problems, and in doing so capture the economic links between agricultural and non-agricultural development, by simultaneously explaining the agricultural wage by reference to the intersectoral labor market.

Agricultural wages. The Thai labor market exhibits a high degree of intersectoral motility, and the agricultural wage has tracked the non-agricultural wage closely over time. We expect that agricultural wages (WA) and non-agricultural wages (WN) are related, but that the correspondence is not exact due to transactions costs and adjustment lags, i.e., $WA = WA(WA_{-1}, WN)$. We then explain WN by constructing an inverse non-agricultural labor demand function in terms of non-agricultural prices (PN), the aggregate capital stock (KN), labor supply (LF), and a time trend (T) capturing technical progress: $WN = WN(PN, KN, LF, T)$. If a linear combination of these variables is correlated with the non-agricultural wage, then we can explain the agricultural wage by a partial adjustment expression:

$$(3) WA = WA(WA_{-1}, WN) \\ = WA(WA_{-1}, PN, KN, T, LF),$$

in which the current value of WA depends on contemporaneous and lagged values of exogenous variables determining the non-agricultural wage.

By substitution from (3) into (1) and (2) it can be seen that the reduced form of the system is a pair of agricultural factor demand equations in which the explanatory variables are prices (PA, PN), fixed factor stocks (KA, KN, IR), and technical progress (T). We are thus able to measure factor demands in terms not only of agricultural prices and endowments, but also of key variables in the non-agricultural sectors that are likely to have influenced agriculture through relative price and factor productivity effects. We estimate the system (1)-(3) in double-log form using three-stage least squares. We use time series of provincial and regional data from the TDRI Dynamic Project (TDRI 1997). For a complete description of data and estimation procedures see Coxhead and Jiraporn 1998.

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