Laos

Emerging Rice Market in Laos

Yves Bourdet

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1. Introduction

The main objective of reform policy in Laos has been the development of a market economy open to international trade. Several measures contained in the reform package have been explicitly aimed at increasing the scope of markets as an allocative mechanism in the economy. Examples of such measures are the development of private ownership with defined and protected property rights, promotion of a dynamic private sector, privatisation of state-owned enterprises, suppression of the public distribution network and public marketing boards, opening up of the economy to international trade and encouragement of foreign direct investments. The reform policy measures have indeed been rather successful in that markets are certainly playing a much larger role in the Lao economy today.

Notwithstanding, the emergence of agricultural markets has not been that rapid. The dominant role of the subsistence sector in the economy and the stagnation of incomes in agriculture explain this result. In addition, reform policy has mainly affected the urban areas, at the same time as having limited effects on rural areas. The rapid growth of the industry and service sectors on the one hand and the quasi-stagnation of agriculture on the other confirm this. The purpose of this paper is to analyse the emergence and functioning of the rice market in Laos.

The paper is structured as follows. A second section analyses the patterns of rice demand across space and over time, with particular emphasis on the impact of population growth and changes in real incomes. A third section examines the changes

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that have taken place on the supply side. A fourth section concentrates on the rice market with the focus on prices. In all three sections the regional and provincial dimensions are particularly considered. A final section summarises the main points of the paper and draws some conclusions concerning the prospects for the rice market in Laos.

2. Demand Side Patterns and Trends

The demand for rice reflects consumer preferences. Rice is the staple food in Laos, accordingly accounting for a large share of household consumption. Two main factors shape changes in the demand for rice over time: population growth and the level of per capita income. A third factor, namely changes in rice quality preferences, may also lead to changes in rice consumption over time. Note that this last factor, to a large extent but not exclusively, is dependent upon the level of per capita income.

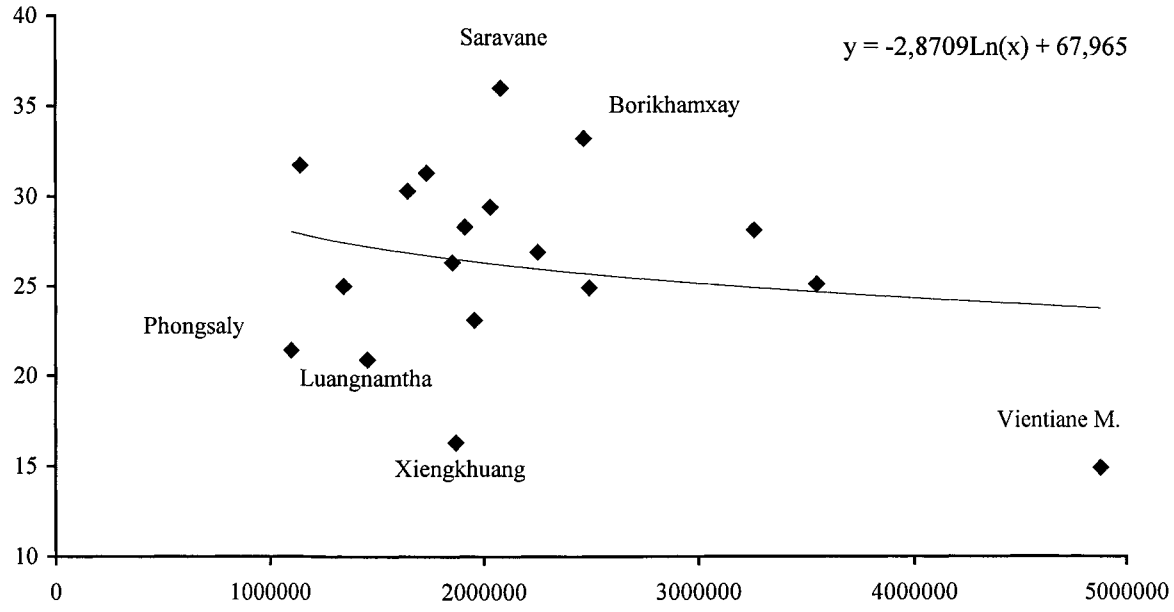
Glutinous rice is the dominant type of rice demanded in Laos and accounts for some 96 percent of total rice consumption, the rest being ordinary rice. Its share in total rice consumption varies somewhat across the Lao regions, from some 95 percent in the southern and central regions to 99 percent in the northern region. There does not seem to be any influence of the level of income per capita on the distribution between glutinous and ordinary rice, which mostly reflects province-specific factors.[1] According to LECS2, glutinous rice accounted for 25.1 percent of total household consumption in 1997.[2] Some five years earlier, in 19992/1993, it had amounted to 27.5 percent. The role of rice varies markedly between urban and rural households and between provinces. In 1997, rice accounted for 29 percent of total household consumption in rural areas, but only 14.4 percent in urban areas. The higher the income per household, the lower the share of total consumption devoted to rice. This is illustrated in Figure 1, confirming that the share of rice in total consumption is

[1] Ordinary rice accounted for 8.9 percent of total rice consumption in the wealthy province of Vientiane Municipality and between 7 and 11 percent in the relatively poor provinces of Phongsaly, Sekong and Attapeu.

[2] Two expenditure and consumption surveys were carried out in Laos in the 1990s. The first, LECS1 (Lao Expenditure and Consumption Survey), covered the period between March 1992 and February 1993, while the second, LECS2, covered the period between March 1997 and February 1998.

negatively related to the average level of household income (see the semi-logarithmic regression line). The coefficient of the regression line indicates that a one-percent increase in household income results in a decrease of 2.87 points in the share of glutinous rice in total consumption. Some outlying observations are Saravane and Borkhamxay, with a relatively too-high share of rice consumption relative to their household income, and Vientiane Municipality, Xiengkhuang, Luangnamtha and Phongsaly, with a relatively too-low share of rice consumption relative to their household income (see Appendix A for a map of the Lao provinces).

Figure 1: Household income (in kips) and share of glutinous rice in total consumption, 3/1997-2/1998.



Source of data: LECS2

Population growth is one of the two main determinants of changes in rice consumption over time. According to the 1995 Population Census, the rate of population growth in Laos was estimated to be 2.5 percent between 1985 and 1995.[3] This is lower than the projection of the 1985 Population Census, which was 2.9 percent.[4] The 1995 census also provides two alternative projections for the period 1995-2010. The first, which assumes unchanged fertility and mortality levels, predicts

[3] National Statistical Centre (1997), p. 7.

an annual rate of population growth of 2.5 percent.[5] The second, based on more realistic assumptions of a decline in fertility and mortality, is somewhat lower, 2.3 percent for the same period. Other things being constant, population growth increases the demand for rice in Laos. The 2.3-2.5 percent range implies that the Lao population is currently increasing by some 105,000 – 115,000 persons per year. This in turn means that the demand for dry rice can be expected to increase by some 13,200 – 14,500 tons per year. This figure is based on a yearly intake of cooked rice of some 210 kilos per person calculated from the average rice intake per day estimated by LECS2. (We used a conversion rate of 0.6 to convert cooked rice into uncooked dry rice.) Population increase is being accompanied by a change in the demographic composition of the Lao population towards a larger proportion of younger and older people. Since rice intake is lower for both these groups than for the middle-age group, we suspect that the increase in rice demand per year is not (and will not be) that large. Therefore 13,200 – 14,500 tons should be considered an upper bound for the annual increase in the demand for rice induced by population growth.[6]

The higher the income the lower the rice consumption that can be expected. As illustrated above, this holds in relative terms (the share of rice in total consumption). But it is less clear whether it also holds in absolute terms, that is in terms of the quantity of rice consumed relative to household income or income per capita. And it is the absolute quantity that determines the impact of income growth on the volume of rice demanded. On a priori grounds we may expect the growth in income per capita to have a long-term effect on the demand for rice that runs counter to the effect of population growth. At low levels of income per capita, income increases are likely to result in an absolute increase in the (per person) demand for rice. But at higher levels, further increases in income per capita can be expected to lead consumers to substitute more varied foods (vegetables, bread, fish and meat) for rice and thus result in a decrease in the quantity of rice demanded per person. The income threshold at which consumers start substituting rice for more varied foods is

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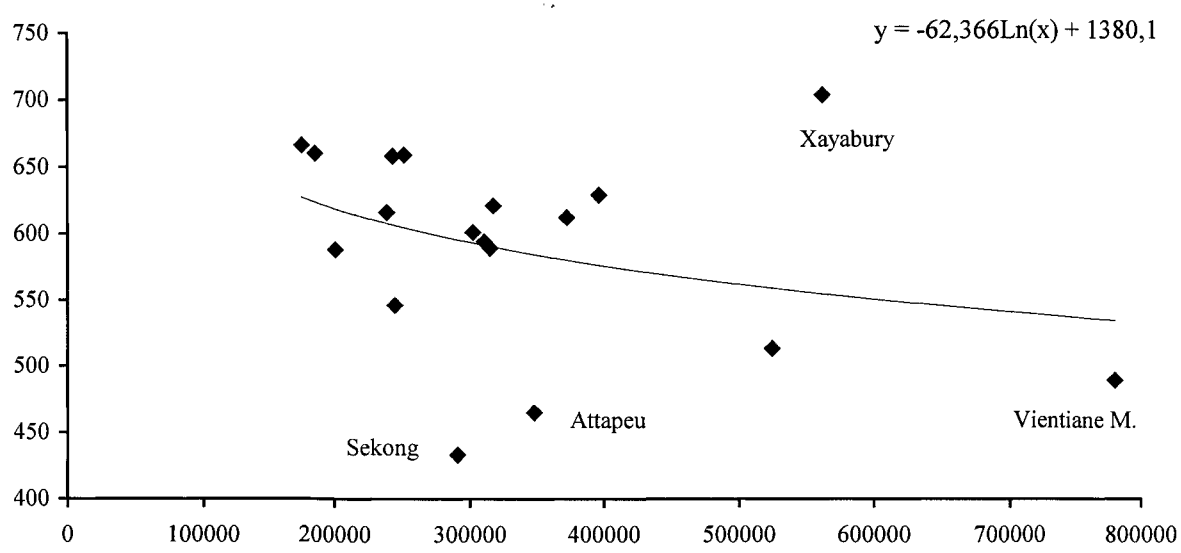
[4] State Statistical Centre (1992), p. 22.
[5] National Statistical Centre (1997), ch. 9, and Hartmann (1996), pp. 13-19.
[6] According to LECS2, average rice intake per day per person in 1997 amounted to 461-601 grams for the 5-14 year olds, 697-722 grams for the 15-49 year olds and 583 grams for 50 year olds and older.

rather uncertain and varies presumably from country to country as a result of the availability of alternative food products and relative prices.

Figure 2: Per capita income (in kips) and rice consumption (cooked rice in grams per day), 3/1997-2/1998.



Source of data: LECS2

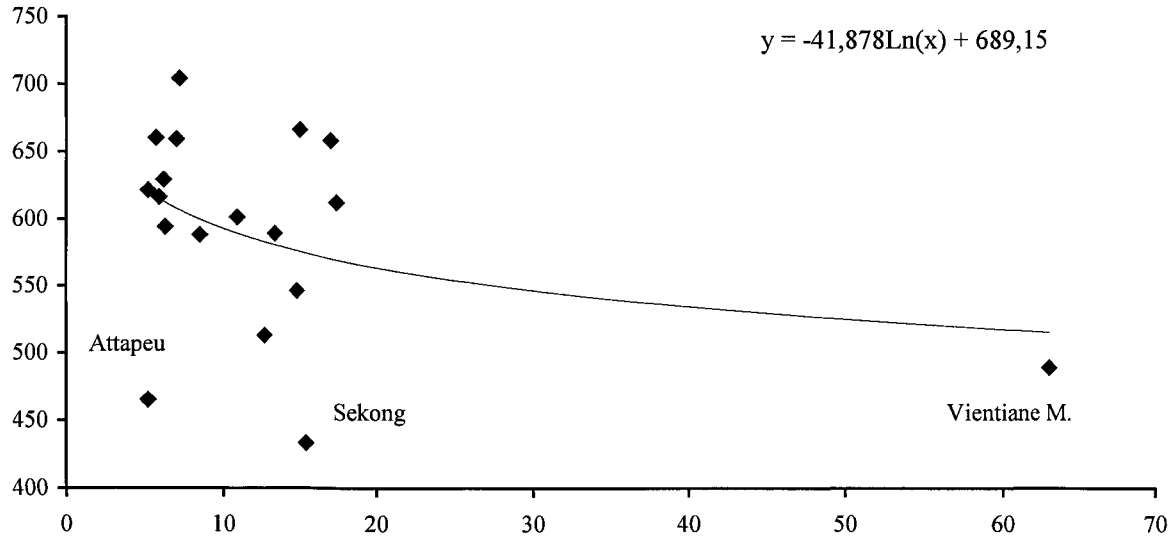
Figure 2 plots total income per capita and daily cooked rice intake by province, as estimated by LECS2. It also gives the (semi-logarithmic) regression line between the two variables. The negative slope of the regression line supports the view that rice consumption decreases with increases in income per capita, but the decrease is rather limited. The existence of a few outliers has a strong influence on the slope of the regression line. The three outliers are the southern provinces of Sekong and Attapeu, and the northwestern province of Xayabury. The first two provinces have suffered from chronic rice shortages whereas the third one has benefited from large rice surpluses. It thus seems as if the local availability of rice in Laos markedly affects the relation between per capita income and rice consumption. This finding indicates among other things the absence of a well-integrated rice market in Laos.

A factor that is often put forward to explain the decrease in rice consumption over time is urbanisation.[7] Urbanisation is accompanied by changes in food habits and

[7] See e.g. Pingali et al. (1997), p. 30.

a diversification of the pattern of food consumption. These changes are to some extent specific in the sense that they are not related to changes in income per capita. At given income levels, a decrease in rice consumption can be the result of the availability of other foods (meat, fish, bread, etc.) and/or altered food habits in urban areas. The relation between the degree of urbanisation and rice consumption (rice intake per day) is illustrated in Figure 3, showing that there is a negative relation between the two variables. The higher the degree of urbanisation, the lower is the rice intake per day, and vice versa. The impact of the degree of urbanisation on rice consumption, as suggested by the slope of the regression line, is highly dependent upon the position of Vientiane Municipality. Excluding Vientiane Municipality produces a significantly weaker relation between income per capita and rice consumption, but still a negative one. (The coefficient of the urban variable changes from –41.9 to –26.6.)

Figure 3: Urban population (in % of total population) and rice intake (grams) per day.



Sources of data: LECS2 for rice intake and Population Census 1995 for urban population.

All in all then, it seems that population growth is the main determinant of the increase in the demand for rice in Laos. The annual increase in rice consumption induced by population growth can be estimated at some 13,200 – 14,500 tons. The opposite (and contracting) effect that growth in per capita income normally has on rice consumption is as yet more uncertain and mostly still to come in Laos. So far this

effect seems to be rather limited and concentrated in Vientiane Municipality, which only represents about 11 percent of the total population. By the same token, urbanisation has so far only had a limited impact on the substitution out of rice. To what extent rice production has responded to these demand changes is the subject of the next section.

3. Supply Side Patterns and Trends

Changes in rice (paddy) production over time are portrayed in Figure 4.[8] Three sub-periods can be clearly depicted. The first sub-period, reflecting the rapid production fall that followed the political changes in 1975, was short-lived and ended with the cessation of the collectivisation process in Laos.[9] The second sub-period, stretching from 1978-1979 to 1985, corresponded to a recovery that ran parallel with the introduction of partial reforms in the agricultural sector.[10] The third sub-period, started in the mid-1980s and still going on, corresponds to a stabilisation of rice production but has been accompanied by rather large year-to-year fluctuations. To a large extent these fluctuations can be ascribed to shifting climatic conditions and repeated droughts.

As illustrated in Figure 5, paddy production can be distributed among three ecosystems, lowland, upland and irrigated. Lowland paddy accounts for the largest, and still growing, share of total paddy production followed in order of importance by upland and irrigated paddy. Lowland paddy accounted for some 79 percent of total production in 1996-1997 and some 70 percent in 1976. The share of upland paddy has

[8] It is widely accepted that official statistics on paddy production in Laos are of poor quality. This is due to the way production is estimated, with first an estimation of the rice areas in the districts, then an approximation of rice yields so as to derive district production, and finally the centralisation of production statistics at the provincial level. The estimate for Laos is made up of these provinces' estimates, as added up by the Ministry of Agriculture. Each stage can be subject to errors that bias estimates of rice production, downward or upward. The first stage can result in an underestimation of upland rice areas that the government attempts to limit. The yields estimates used in the second stage reflect past yields that for a number of reasons (weather, etc.) can differ from current yields. The third stage suffers from a "political bias" in the sense that in some cases the figures reported to the Ministry of Agriculture by the provincial authorities do not correspond to the sum of the various district estimates, but rather reflect the wishes of the provincial authorities. The Agricultural Survey, to be published in 2000, will give a more accurate picture of rice areas and thereby of rice production.

[9] On the first sub-period, see Evans (1990).

[10] For an analysis of this second period, see e.g. Bourdet (1995).

been halved in the meantime whereas that of irrigated paddy has increased, but only since the mid-1980s (from about 2 percent to 6 percent).[11] The increase in irrigated paddy production was particularly rapid during the second half of the 1990s. The main reason behind this is the ambitious irrigation programme launched by the Lao government in 1997 with the main objective of achieving rice self-sufficiency through a fourfold increase in the irrigated rice-growing areas (from some 22,000 ha in early 1997 to some 100,000 ha in 2000).[12] The total costs of the project, which consisted in the purchase of pumps abroad and their installation in low land areas, were estimated at some US$ 40 million.

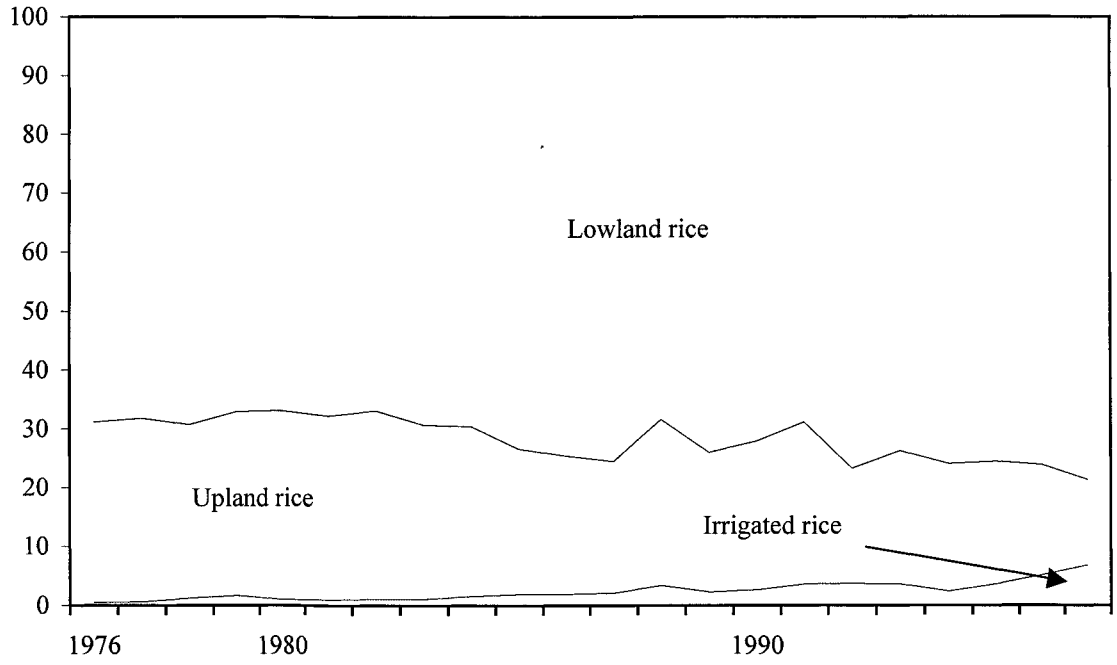
Figure 4: Rice (paddy) production in Laos, 1975-98 (000' tons)

Source: National Statistical Centre

Changes in paddy production over time reflect changes in productivity over time and across ecosystems, rather than changes in paddy areas. Figure 6, illustrating the development of rice yields during the past two decades, shows that the gap between the yields of the various ecosystems has widened tremendously over time. In the mid-1970s, the yields for upland, lowland and irrigated areas ranged within the interval 1-1.5 tons per hectare. Some two decades later, in the late 1990s, the interval had expanded to 1.6-4.3 tons per hectare.

[11] For a description of the Lao ecosystems, see Lao People's Democratic Republic (1999), pp. 71-74.

Figure 5: Distribution of rice (paddy) supply (in %), 1976-1997.



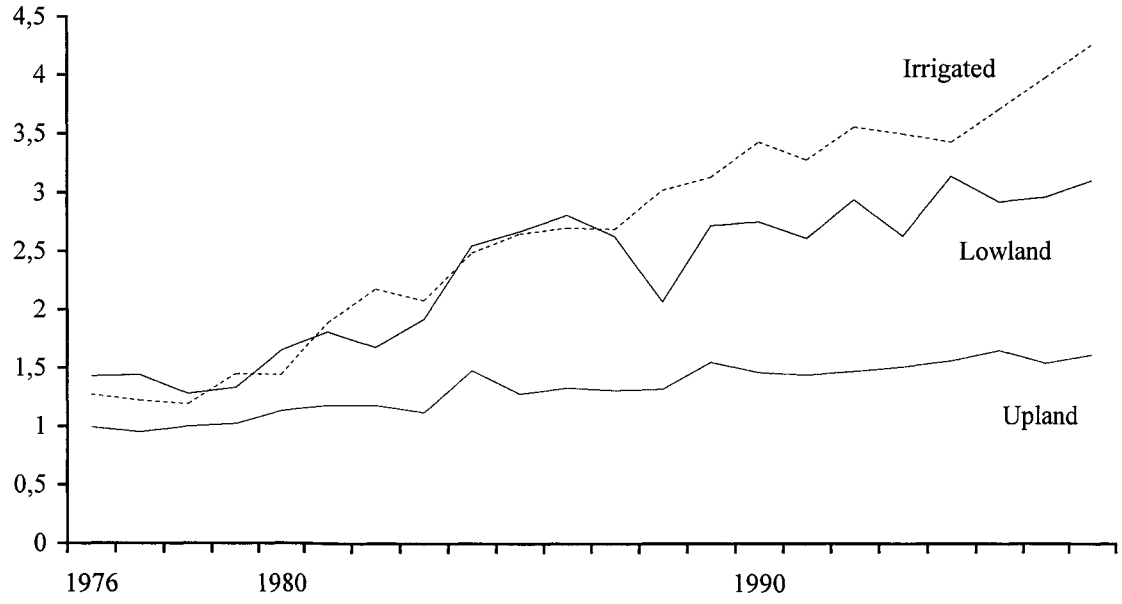
Source: National Statistical Centre

Figure 6 suggests that the increase in total paddy production between the late 1970s and the mid-1980s can be ascribed to improved yields in both lowland and irrigated rice-growing areas. The stagnation in paddy production thereafter reflects the stagnating yields in lowland areas and the dominant role of lowland production in total production. The rapidly improving yields in irrigated areas explain the growing importance of irrigated paddy in total paddy production (see Figure 5), but its share of paddy production is still too small (less than 7%) to influence total production in a significant way. Another finding from Figure 6 concerns upland paddy. The shrinking share of upland paddy in total production (Figure 4) can be ascribed to more or less stagnant upland yields over the whole period considered. The principal factor behind the stagnant upland yields is the continued prevalence of shifting cultivation and the practice of slash and burn in upland rice-growing areas.[13]

[12] For a presentation of the irrigation project and its financial implications, see IMF (1998), p. 6.
[13] There is a clear regional dimension in the extent of slash and burn agriculture with no less than 80 percent of all households practising it in the North, as compared to only 14 and 22 percent in the Centre and the South, respectively. The figures are from LECS2.

Figure 4 concerns paddy production. In order to estimate the volume of rice production, some 35-40 percent (varying according to paddy quality), corresponding to the harvest and post-harvest losses, the part reserved for seeds and the bran taken off in connection with milling should be subtracted from paddy production.[14] This probably explains the major part of the discrepancy between the figures provided by the Ministry of Agriculture and the figures computed from the Household Expenditure Survey (LECS2). For example, the Ministry of Agriculture estimated paddy production at some 1,660 thousands tons in 1997 while total rice production, as estimated by LECS2, amounted to only 1,060 thousands tons between March 1997 and February 1998, that is, some 36 percent lower.

Figure 6: Trend in rice yields by ecosystem (tons/ha), 1976-1997.



Source: National Statistical Centre

The transformation of paddy into rice is carried out by small unsophisticated mills owned by farmers, or private commercial mills often owned by rice traders. (Before 1990 there existed few state-owned mills.) The number of private commercial mills is rather important in rural regions along and near the Mekong river, and in semi-rural areas near the country's principal cities. In the province of Vientiane, for

[14] On the transformation from paddy to rice, see Chazée (1998), pp. 328-330.

example, there were some 900 commercial mills in 1997 or one mill for about 50 households. In other rural regions, in particular in remote regions where subsistence agriculture accounts for the overwhelming share of agriculture, milling is still performed by small unsophisticated mills. Competitive conditions in milling in rural regions along and near the Mekong river and in semi-rural areas are secured by the relatively high number of commercial mills. The relatively high price of rice mills imported from Thailand for commercial purposes - some 150,000-200,000 bahts (3,000-4,000 US$) in 1997 - suggests, however, that rather high barriers to entry exist in the milling industry, limiting the strength of actual and potential competition. For rice farmers, the cost of transforming paddy into rice is rather low, in particular when related to the price of rice. In 1997, the price paid to commercial rice mills to transform 100 kilograms of paddy into rice amounted to 2,100 kips in the Vientiane province, to be compared with a price of 461 kips for one kilogram of rice in the same province (rice price estimate of LECS2).[15] Assuming a rate of transformation of paddy into rice of 60 percent (that is 100 kilograms of paddy give 60 kilograms of rice), the price paid to the commercial rice mills corresponds to some 7-8 percent of the market price of rice in Vientiane province.

The provincial dimension

Rice production in Laos is unevenly distributed over the provinces, naturally because of differences in land type and quality, weather and ecological conditions, human and physical capital endowment and rural infrastructure.[16] The regional and provincial distribution of rice production is illustrated in Table 1. The Centre is the largest rice-producing region with about half of total production, followed by the North and the South. The data on paddy production from the Ministry of Agriculture by and large support the LECS 2 figures, with a few exceptions. The greatest

[15] Instead of being paid in cash some commercial rice mills prefer to keep the rice bran, which is used to feed pigs. One hundred kilograms of paddy gives around 15 kilograms of bran. At a market price per kilogram of 250 kips (in Vientiane province), this gives a revenue of 3,750 kips to be compared with the 2,100 kips paid by the peasant to have his paddy transformed into rice. It is likely that this second system is more common for poor peasants with limited cash.

[16] On the origins and implications of regional disparities in Laos, see Bourdet (1998).

discrepancy is found for the province of Xayabury with a share of rice production much larger than its share of paddy production (10 and 5.4 %, respectively). Non-reported rice production for export to Thailand presumably explains this result. Another reason in the northern provinces is the tendency to under-report rice areas under slash and burn cultivation out of fear of the authorities.

Table 1: Rice production and degree of specialisation in rice production, by province.

	LECS 2		Ministry of Agriculture		
Province	% of rice production 3/1997-2/1998	Rice specialisation index 3/1997-2/1998	% of paddy prod. 1997	Paddy Specialisation index 1985	1997
North	32.5	1.0	25.1	0.7	0.8
Phongsaly	2.5	0.8	2.5	0.8	0.8
Luangnamtha	2.2	0.9	2.5	0.8	1.0
Oudomxay	3.6	0.8	3.7	0.8	0.8
Bokeo	2.7	1.1	2.7	0.8	1.1
Luangprabang	6.9	0.9	5.2	0.7	0.7
Huaphanh	4.5	0.8	3.1	0.7	0.6
Xayabury	10.0	1.6	5.4	0.6	0.8
Centre	49.1	1.0	52.0	1.0	1.1
Vientiane M.	9.8	0.9	11.3	0.7	1.0
Xiengkhuang	4.9	1.1	3.5	1.0	0.8
Vientiane	9.2	1.5	7.4	1.2	1.2
Borikhamxay	4.0	1.1	2.9	0.9	0.8
Khammuane	4.7	0.8	6.7	1.3	1.1
Savannakhet	15.4	1.0	19.2	1.1	1.3
Xaysomboom S.R.	1.0	0.8	1.0	n.a.	0.8
South	18.3	0.9	23.0	1.3	1.2
Saravane	6.5	1.2	7.7	1.2	1.4
Sekong	0.9	0.6	0.8	0.5	0.6
Champasack	8.6	0.8	12.3	1.6	1.1
Attapeu	2.3	1.2	2.2	1.1	1.1

Note: The specialisation index is calculated by dividing each region's (or province's) share of the country's total rice production by the region's share of the country's population. A value higher than one indicates that the region (or the province) tends to be specialised in rice production in the sense that its share of the total rice production is larger than its share of the total population, and vice versa.

Sources: Based on LECS 2 and on data from the National Statistical Centre.

Large discrepancies are also found for the provinces of Savannakhet and Champassak, which together account for a large share of rice production in Laos. In their case, however, their shares of rice production as estimated by LECS 2 are significantly lower than their shares of paddy production. Since the LECS2 figures a

priori are likely to be more reliable than the estimates from the Ministry of Agriculture, we believe that there are some errors in the way paddy production is estimated (and reported) by the officials in these two provinces. Preliminary results from the Agricultural Survey confirm that rice production in Savannakhet and Champasack is lower than that estimated by the Ministry of Agriculture.

Table 1 also provides regional specialisation indexes that take into account the size of the regions (and provinces) in terms of population. A striking result of Table 1 is that the degree of specialisation is low in the great majority of regions and provinces. Note that this applies more to the estimates based on LECS 2 than to those based on data from the Ministry of Agriculture. The specialisation indexes for sixteen out of the eighteen provinces range within the interval 0.8-1.2, which should be regarded as rather low degrees of specialisation. Only two provinces fall outside this interval, Vientiane province with a strong degree of specialisation in rice production and a sizeable rice surplus, and Sekong with a very low degree (about 0.6) of specialisation and chronic rice deficits.

The low degree of provincial specialisation in rice production reflects the dominant place of subsistence farming in Laos. A question that now arises is whether the changes that have taken place in Laos since the start of the reform policy in the mid-1980s have contributed to altering specialisation in rice production across provinces. This may be expected since the liberalisation of internal trade and agricultural prices, removal of restrictions on labour mobility within the country, strengthening of user rights, reform of agricultural taxation and building up of road infrastructures should further specialisation between provinces according to comparative advantages. It should boost production in the provinces with a comparative advantage in rice production, like the central and southern provinces of Champasack, Savannakhet, Vientiane, and Saravane, and contract production in the provinces with a comparative disadvantage, like most of the northern provinces.[17] There is no Household Expenditure Survey covering the late 1980s, and thus we have to rely on the figures for paddy production from the Ministry of Agriculture to examine changes in rice specialisation over time. Table 1 provides evidence of only

[17] On the conditions for rice production across the regions, see e.g. Ma (1994), pp. 133-135.

minor changes in specialisation between 1985 and 1997. Only the Savannakhet and the Saravane provinces have experienced increased specialisation in rice production and a better exploitation of their comparative advantages. Besides, the development of the specialisation index for the northern region runs directly counter to expectations. In 1997, the differences between the northern, central and southern regions in terms of specialisation in rice production were smaller than in 1985!

4. The Rice Market

In Laos, rice is grown on small family farms primarily to meet the needs of the own household. The marketed ratio for rice (sales divided by production) is therefore small and varies markedly across regions and from year to year. According to LECS2, only 7.9 percent of household rice stocks were for selling in 3/1997-2/1998, the rest being for own consumption (86.9 percent) and for seed (5.2 percent). The period 1997-1998 was a relatively prosperous one in terms of production (see Figure 4), which means that 7.9 percent should be regarded as an upper bound. In years of poor(er) production, the marketed ratio for rice should be still lower, a larger proportion of rice production being devoted to household consumption. Not surprisingly, there are rather large differences between urban and rural areas and across the Lao provinces. The marketed ratio varies from 3.7 in the South, to 5.4 in the North and 10.3 in the Centre. The higher figure for the Centre reflects the comparative advantage of this region in rice production. The higher marketed ratio in urban areas (10.1 percent) as compared to rural areas (7.7 percent) reflects the positive impact of market access on the volume of rice produced and offered for sale.[18]

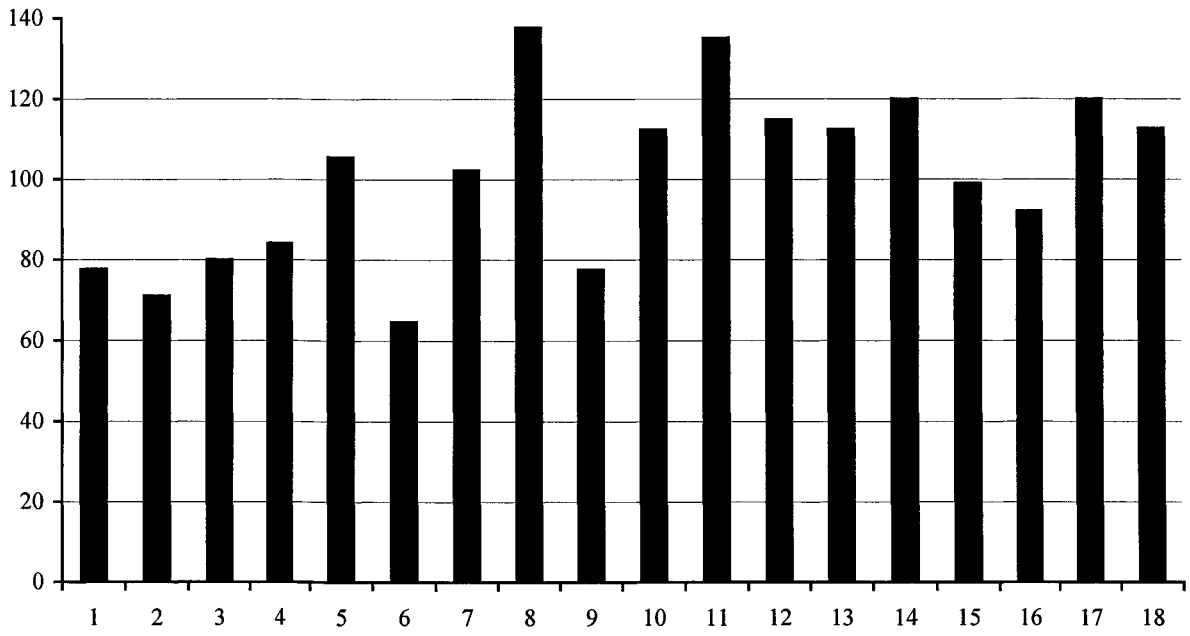
The economics of price disparities across provinces

The fact that only a small share of rice production is traded domestically should produce wide fluctuations in the marketable surplus at the provincial and even

[18] Market access reflects the quality of road infrastructure and the distance to market. Distances to market vary largely across regions in Laos. In 1993, according to the Lao Social Indicator Survey, some 44 percent of the villages in the Centre were more than ten kilometres away from a permanent market, to be compared with 61 and 72 percent for the North and South, respectively.

national level, and eventually result in wide variations in the price of rice both across provinces and over time.[19] However, the emergence and persistence of wide price disparities also depend upon the degree of integration of the provincial markets into the enlarged national market and the forces of competitive arbitrage. The less integrated the provincial markets, the larger the price disparities between the regions and provinces, and vice versa. In a fully integrated national market, the different provincial markets are so united by unrestricted commerce that the prices take roughly the same level throughout the whole integrated area, with ease and rapidity. There can remain, however, some price differences that can be ascribed to various transport and transaction costs and to imperfect information.

Figure 7: Rice prices per province (Laos = 100), 3/1997-2/1998.



Note: The provinces in the figure are (1) Phongsaly, (2) Luangnamtha, (3) Oudomxay, (4) Bokeo, (5) Luangprabang, (6) Huaphanh, (7) Xayaboury, (8) Vientiane Municipality, (9) Xiengkhuang, (10) Vientiane, (11) Borikhamsay, (12) Khammuane, (13) Savannakhet, (14) Xayasomboon SR, (15) Saravane, (16) Sekong, (17) Champasack, and (18) Attapeu.

Source: Computed from LECS2

[19] Note that a similar reasoning can be applied to the world rice market. No more than 4 percent of the world's rice production is traded on the world market, to be compared with 11 percent for coarse grains and 20 percent for wheat. Pingali et al. (1997), p. 137.

LECS2 provides strong evidence of wide rice price disparities between the regions and provinces and a low degree of integration of the regional and provincial rice markets. The highest regional rice prices are to be found in the Centre and the lowest in the North, with the South in between. On average, rice prices were some 16 percent lower than the average price for all of Laos in the North, and some 10 and 14 percent higher in the South and the Centre, respectively, in the period March 1997 to February 1998.

Table 2: Price differences and transport costs between Vientiane Municipality and four provincial centres (kips per kilogram), 1997.

Provinces	(1) Price differences	(2) Transport costs	(3)= (1)– (2)
Luangprabang	132	34	98
Xiengkhuang	247	38	209
Savannakhet	104	43	61
Champasack	73	62	11

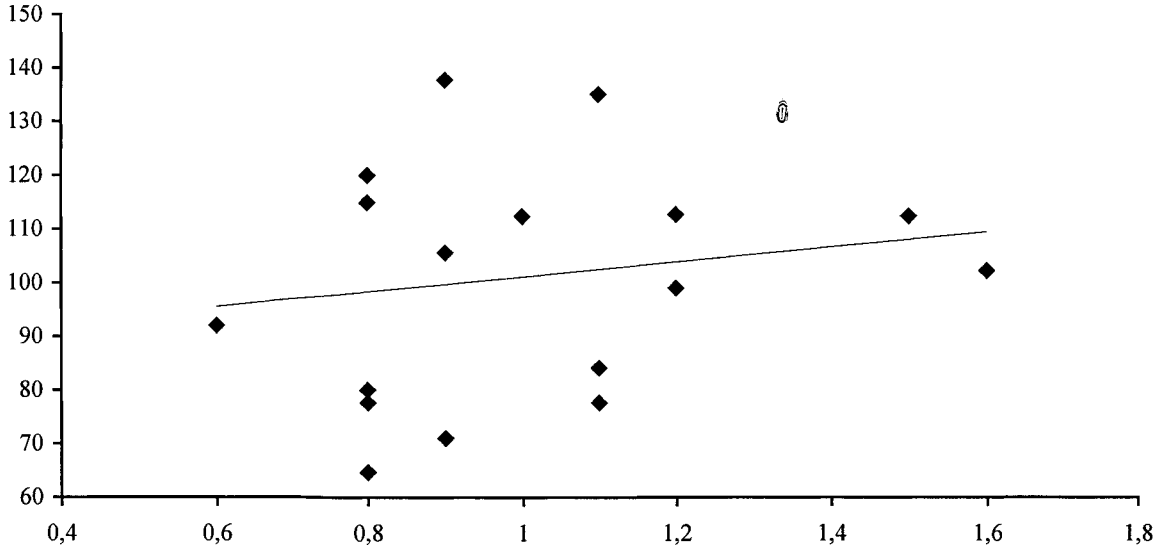
Notes: (1) Price of glutinous rice in Vientiane Municipality minus regional price. (2) The transport costs in 1997 have been set equal to the transport costs estimated by the World Bank for the year 1993 (0.05 kip/kg/km on a good road) indexed on the rate of inflation.

Sources: LECS2 and World Bank (1995), p. 28.

The price disparities between provinces, illustrated in Figure 7, show huge differences within regions. For instance, in the North (provinces 1-7), the price of rice in Luangprabang is 63 percent higher than in the neighbouring province of Huaphanh. By the same token, in the Centre the price of rice in Borikhamxay is 74 percent higher than in the neighbouring province of Xiengkhuang. Price differences in the South are lower, 30 percent is the maximum. The highest rice price is found in Vientiane Municipality and the lowest in Huaphanh. (The average price in the former province is more than twice the level in the latter.) Such huge disparities illustrate the very low degree of integration of the rice market in Laos, at the national as well as at the regional level. Unfortunately, data with which to evaluate the integration of district markets within provinces is lacking.

The large disparities observed between the provinces of the same region and between neighbouring provinces call into question the role of transport costs in price differences, and this even more so when the actual transport costs of rice are calculated and related to the price differentials between Vientiane Municipality and four provincial centres (see Table 2). The price differences between the provinces are much larger than the corresponding transport costs, in particular for the provinces of Xiangkhuang, Luangprabang and, to a lesser extent, Savannakhet (see column 3 in Table 2). It is only for the province of Champasack that the price differential with Vientiane Municipality is close to the transport costs. The existence of such substantial non-exploited arbitrage opportunities illustrates the very low degree of integration of the provincial markets in Laos.[20]

Figure 8: Rice specialisation index (X-axis) and rice price index (Y-axis), 3/1997-2/1998.

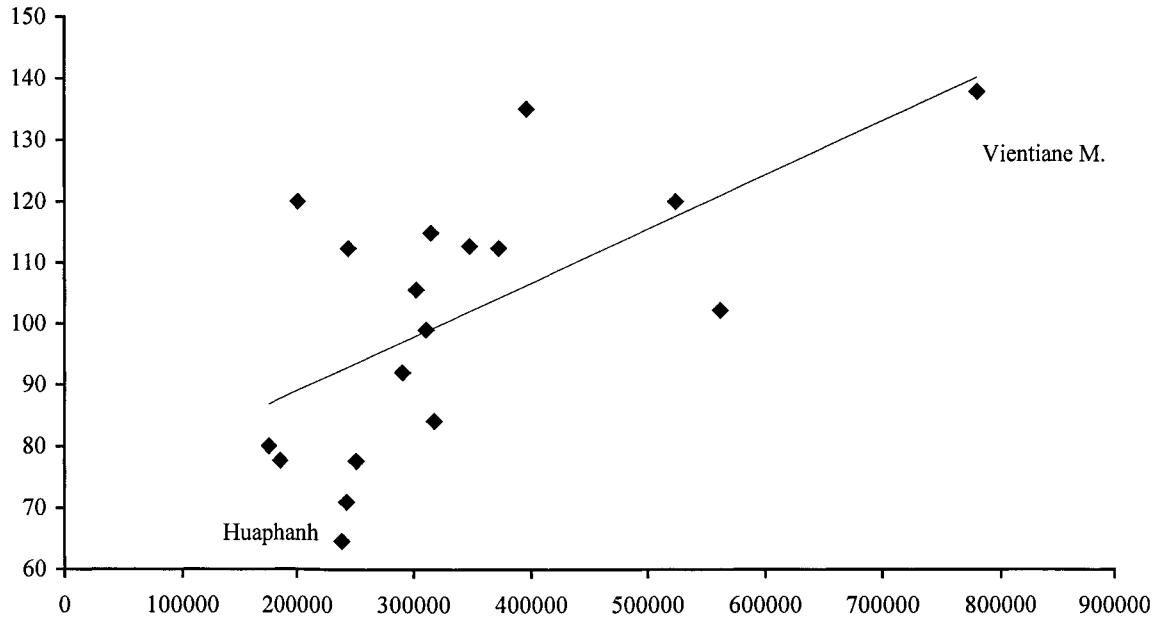


Source: Table 1 and Figure 7.

[20] Corresponding figures (to those in Table 2, column 3) from a World Bank study (World Bank (1995)) for the year 1992 are 53, 91, 34 and 40 kips for Luangprabang, Xiengkhuang, Savannakhet and Champasack, respectively. Comparing these figures to those of Table 2 indicates that the arbitrage opportunities have increased over time and thus that the degree of integration has decreased. Further, this comparison confirms the position of Xiengkhuang and Luangprabang as outsiders in the market integration process in Laos. Finally, it casts some doubt on the "good level of integration" between the provinces of Savannakhet and Vientiane Municipality put forward in the World Bank study.

The rice market is segmented in Laos and it seems more appropriate to think in terms of local markets when studying the price mechanism. Local (provincial) supply and demand conditions determine the price formation process. A priori we may expect the price level to be lower in the provinces that benefit from a comparative advantage in rice production, and vice versa. Figure 8 shows the relation between the specialisation index, which proxies the degree of 'revealed' comparative advantage (see Table 1), and the price level of rice across provinces (Figure 7). A main conclusion from Figure 8 is that there does not seem to be any relation between the degree of provincial specialisation and the level of the rice price in the province. The regression line is slightly upward sloping whereas the opposite was expected![21]

Figure 9: Income per capita (in kips; X-axis) and rice price (index; Y-axis) across provinces, 3/1997-2/1998.



Source: LECS2 and Figure 7.

A tacit assumption behind our reasoning is that all other things are constant, for example, that the demand conditions are roughly the same in the various provinces.

[21] It is sometimes suggested that different competitive conditions in rice milling explain a large part of the price disparities among provinces. This is hardly conceivable, however. As stated above, the price paid by farmers to rice mills corresponds to a minor share of the rice price, some 7.8 percent to be compared with the huge differences in rice prices across provinces.

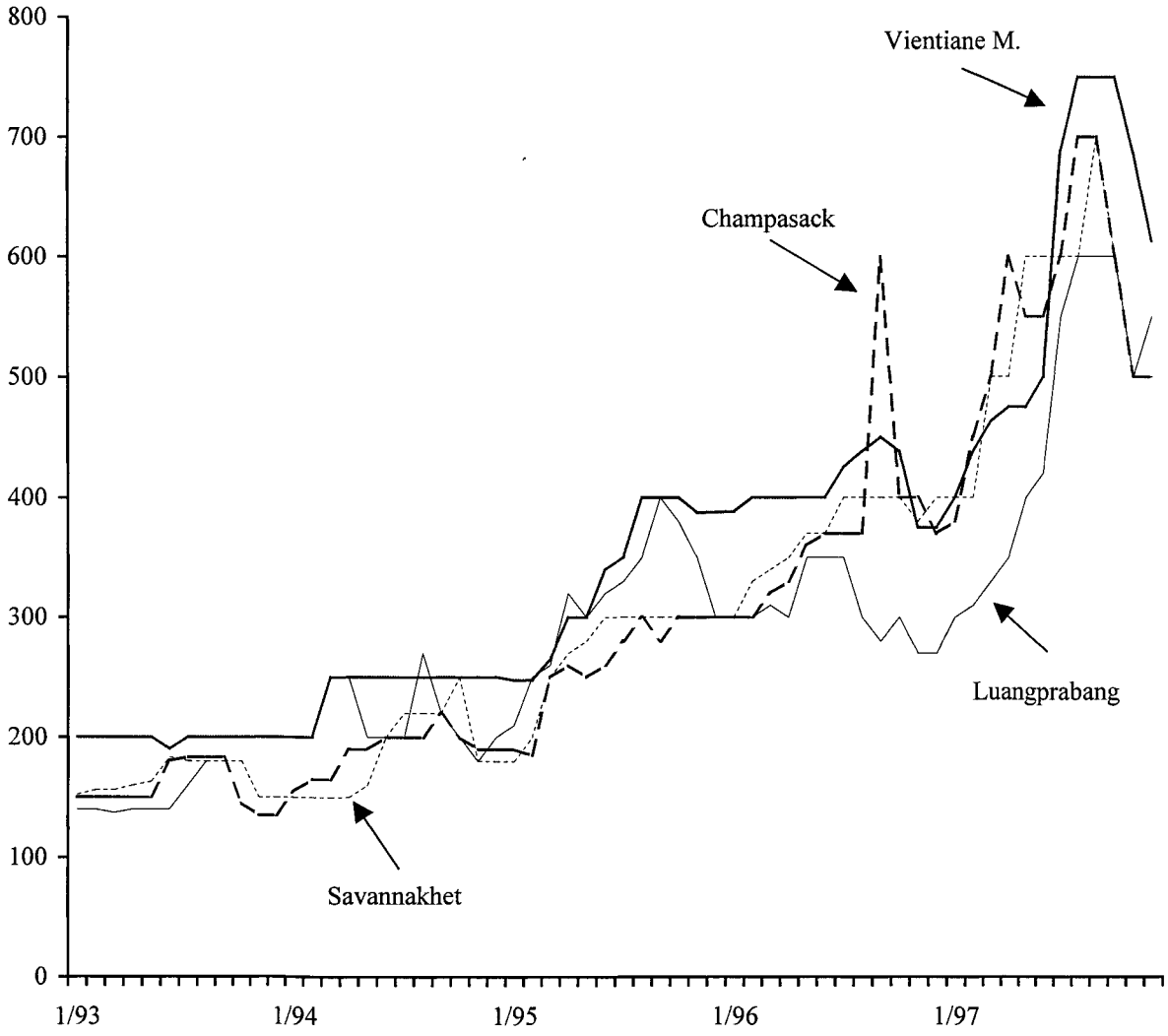
This is hardly realistic in view of the large differences in income per capita and population distribution between the provinces. A look at Figure 7 suggests that rice prices are relatively high in richer provinces and relatively low in poor regions, in particular the northern provinces, with the exception of Luangprabang and Xayaboury. This is further illustrated in Figure 9, which shows a clear positive correlation between the level of per capita income and the level of the rice price across provinces. The relation is less marked but still positive if Vientiane Municipality, with clearly the highest average income per capita and the highest rice price, is removed from the sample.

Price disparities and price changes over time

The LECS2 data pertain to the period March 1997-February 1998. Because of the small size of the marketable rice surplus in the various provinces, we may expect large variations in the rice price not only across provinces but also over time. Therefore the picture that emerges when concentrating on the period covered by LECS2 may actually not be representative of more long-term structural price disparities across provinces and, consequently, of the degree of integration of the rice market. Complementary information can be arrived at by an analysis of the variation of rice prices over time. The higher the correlation between the period-specific changes in the price of rice in the different provinces, the higher the integration of provincial markets in the national rice market can be assumed to be, and vice versa.

The monthly nominal changes in the price of glutinous rice (first quality) in the provinces of Vientiane Municipality, Luangprabang, Savannakhet and Champasack are portrayed in Figure 10. The period covered is rather long, five years, and stretches from January 1993 to December 1997. Data for Luangprabang are lacking for late 1993 and early 1994. Figure 10 points to some interesting findings regarding both price disparities between provinces and changes in the price of glutinous rice over time.

Figure 10: Price of Glutinous Rice (kips per kilogram) January 1993-December 1997.

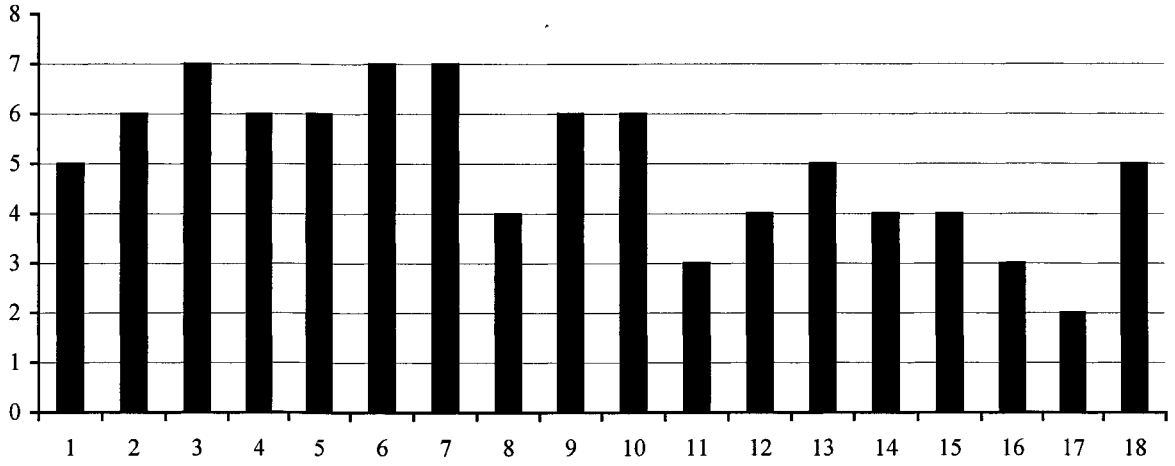


Source: Computed from data provided by the National Statistical Centre.

The first finding from Figure 10 is just the confirmation of the estimates obtained from LECS2. Rice prices during 1997 were highest in Vientiane M. and lowest in Luangprabang, with Savannakhet and Champasack in between. Not only the order but also the magnitude of the price differential across provinces estimated by LECS2 is roughly supported by Figure 10. Taking 100 as the index for Vientiane Municipality, the rice price levels in Luangprabang, Savannakhet and Champasack, as estimated by the National Statistical Centre, are 79, 76 and 95, respectively. This can

be compared with the corresponding index values of 77, 82 and 87 estimated from LECS2.

Figure 11: Rice stock duration in months, 1997-1998.



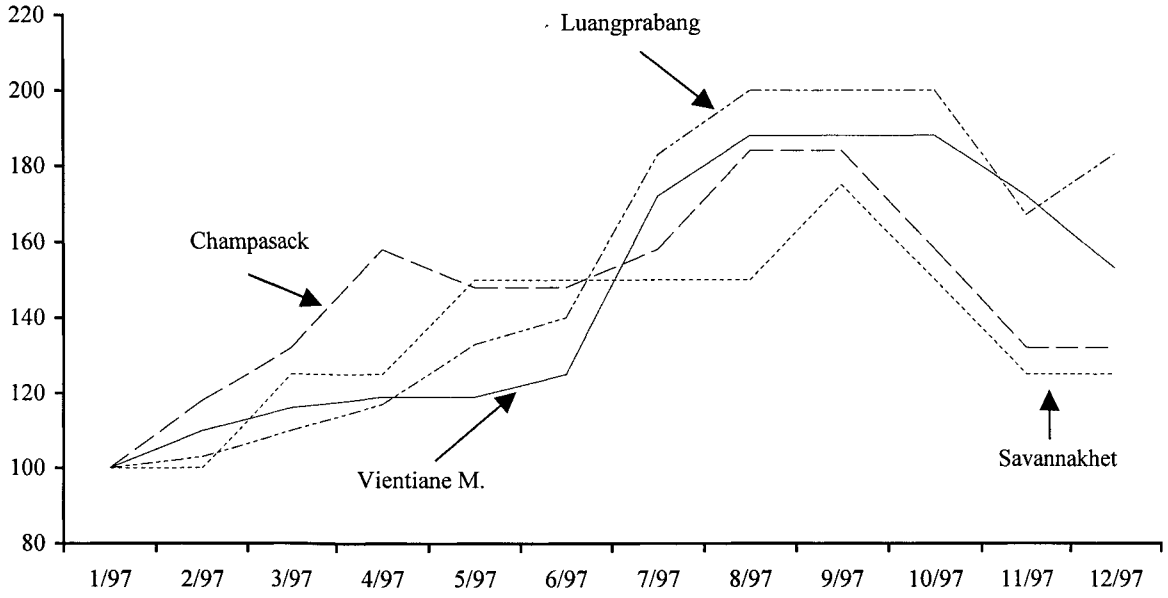
Note: The provinces in the figure are (1) Phongsaly, (2) Luangnamtha, (3) Oudomxay, (4) Bokeo, (5) Luangprabang, (6) Huaphanh, (7) Xayaboury, (8) Vientiane Municipality, (9) Xiengkhuang, (10) Vientiane, (11) Borikhamsay, (12) Khammuane, (13) Savannakhet, (14) Xayasomboon SR, (15) Saravane, (16) Sekong, (17) Champasack, and (18) Attapeu.

Source: LECS2

The second finding from Figure 10 concerns the wide, and even increasing, price disparities between the provinces considered. There is no evidence of a convergence of rice markets and an ongoing integration process among the rice markets of the Lao provinces. The provinces included in Figure 10 are relatively wealthy with a large share of the rural population engaged in market activities, and thus where we a priori would expect the integration process to have gone farthest. It is likely that the inclusion of the remaining provinces in Figure 10 would have resulted in an even stronger conclusion as to the low degree of integration of the rice markets in Laos. Provincial rice markets are segmented and no convergence seems to have taken place since 1993. There does not seem to be any impact of the New Economic Mechanism, an important objective of which is the creation of an integrated economy in Laos, on market integration in rice. The emphasis put by the New Economic Mechanism on macro-economic issues, the urban bias of economic policy and the considerable cost per capita of integrating the agricultural sector into the market

economy presumably explain the poor achievement of reform policy in this particular matter.

Figure 12: The price of rice during 1997 (base 100 = January 1997).



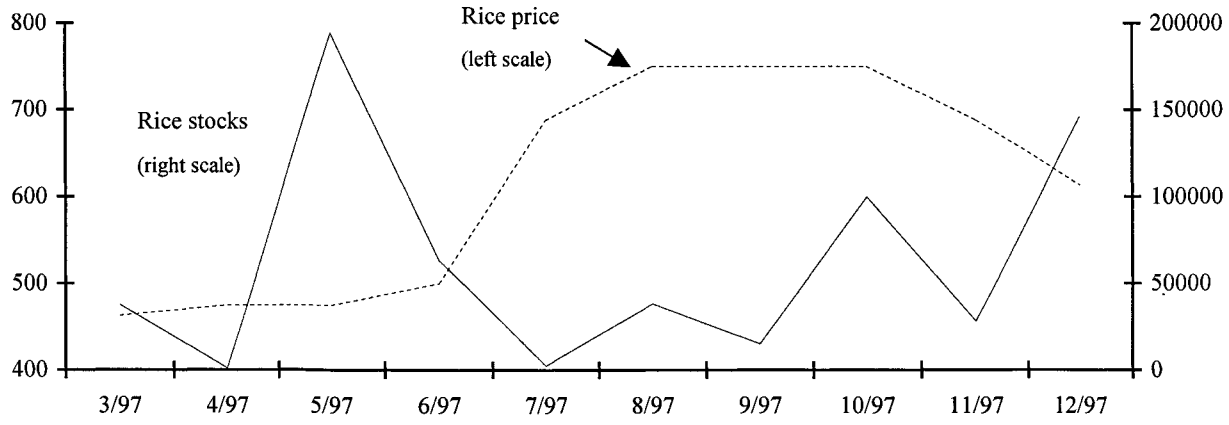
Source: Computed from data provided by the National Statistical Centre.

The third finding from Figure 10 is that rice prices in Vientiane Municipality have been higher than in other provinces except for short periods when prices in Champasack and Savannakhet were higher. The rank order between the provinces shifts over time. For example, rice prices in Savannakhet and Champasack were lower than prices in Luangprabang between mid-1993 and early 1996, but higher thereafter. This suggests that the price disparities cannot be ascribed to more structural factors, like transport costs, collection costs or market structure, that may vary across provinces but are unlikely to change significantly over such a short period. Since demand conditions do not change that rapidly and differently across the provinces, the answer to the large and fluctuating price disparities has to be found on the supply side of the market, for example in shifting climatic conditions.

The fourth finding from Figure 10 concerns the dynamics of rice prices over the year. Prices tend to move downward between August and December, the period of harvesting, and upward in mid-year, when the household rice stocks are exhausted. It

looks as if the storage function has failed to prevent the emergence of large intra-year (intra-seasonal) price swings. The duration of the rice stocks (in months) across provinces is illustrated in Figure 11. The differences between provinces reflect their production performance (and those of households), those with more favourable conditions being better equipped to secure mid-term self-sufficiency. On the other hand, rice availability in some provinces provides no incentive for households to build up rice stocks. An example of this may be Champasack, a rice-growing province bordering Thailand, with average rice stocks of only two months. But differences in rice stock duration may also reflect different storage structures (farm-level or so-called storage rice banks), different levels of development and efficiency of storage, as well as differences in the degree of risk aversion among peasants. The relatively longer duration of rice stocks in the northern provinces, 6 months on average, presumably reflects a combination of these factors, in particular the development of storage rice banks in the North. This explanation should, however, be regarded as tentative since it may be difficult to draw such a long-term, structural conclusion from data for only one specific year.

Figure 13: Rice price (kips per kilogram) and average rice stock per village (in kilograms) in Vientiane Municipality, March 1997 – December 1997.



Source: LECS 2 and data provided by the National Statistical Centre.

Figure 12 also illustrates the seasonal pattern of rice prices over the year and supports the view that prices go up when rice stocks are getting exhausted and go

down during the period of harvesting. The differences observed between the provinces can presumably be ascribed to the differences in seasonal production cycles (harvest later in the North than in the South) and in rice stocks across provinces.[22] That rice prices in Champasack move up earlier than in the other provinces can tentatively be associated with the short duration of rice stocks in this province (only two months). By the same token, the delayed increase in rice prices in Vientiane Municipality and, above all, in Luangprabang may be associated with the longer duration of rice stocks in these provinces, four and six months, respectively. Figure 13 provides some further evidence of the relation between rice stocks and the price of rice. It shows that the exhaustion of rice stocks in mid-1997 ran parallel with an increase in the price of rice, and the augmentation of rice stocks in late 1997 with a decrease in the price. Note, however, that the sudden increase in rice stocks in early 1997 (see Figure 13) was not followed by a downward adjustment in the price of rice. All in all, the picture that emerges is that of unsynchronised price responses to rice stock fluctuations across provinces, which constitutes one more indication of the low degree of national integration of the rice markets in Laos.

The international dimension

Until now we have considered only the domestic dimension of the rice market and ignored international competition. This is a serious shortcoming because of the porous border between Thailand and Laos and the importance of rice import, official and smuggled. A priori we expect the rice markets of the provinces bordering Thailand to be, to some extent, integrated with the Thai market, and the prices in these provincial markets to reflect the development of prices in Thailand. Two factors prevent, however, a full integration of the Lao rice market into the Thai market. One is the strong preference of the Lao population for glutinous rice, which constitutes some 96 percent of total rice consumption, and the fact that imported ordinary rice is not

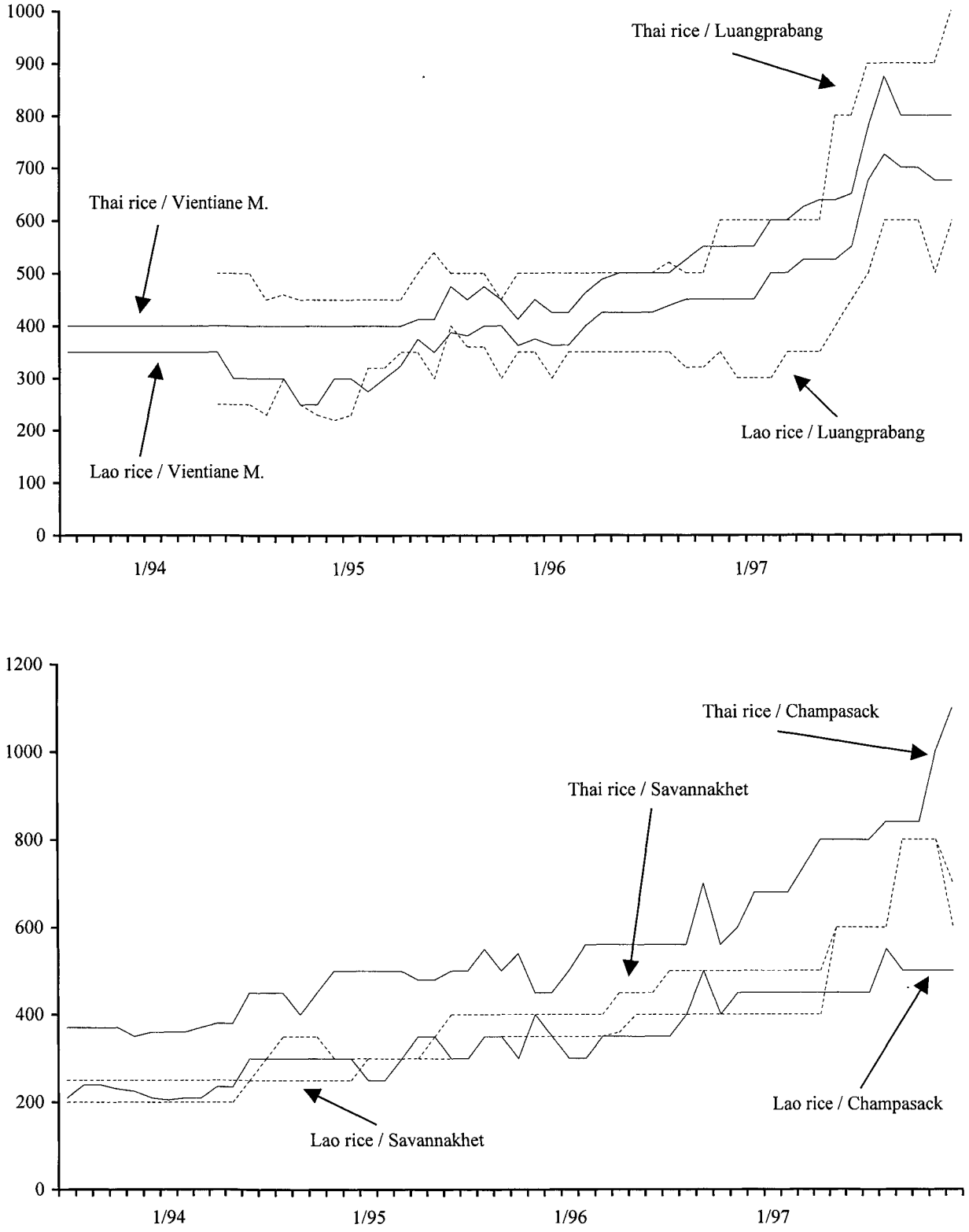
[22] The differences observed in seasonal production cycles also reflect different rice varieties (or different mixes of rice varieties) across the regions (and provinces). The southern and central regions use mainly early and medium maturing rice varieties (100-120 days required from transplanting to harvesting) while the northern region also uses a low maturing variety (140 days required). The variety-mix reflects essentially different climatic conditions and labour scarcities.

completely substitutable with Lao glutinous rice. It should be noted, however, that the provinces bordering Laos in northern Thailand share with Lao people the same strong preference for glutinous rice. The other is the 5 percent duty on rice import, applicable to both paddy and milled rice, and the various non-tariff barriers. Note that Laos' membership in the ASEAN Free Trade Area (AFTA) will not reduce the import duty on rice in the near future, because rice is included on the so-called Sensitive List of products that are not subject to tariff reduction.[23]

Figure 14 illustrates the development of the price of Thai and Lao ordinary rice in the provinces of Vientiane Municipality, Luangprabang, Savannakhet and Champasack between July 1993 and December 1997. Three main findings emerge. Firstly, the differences between the prices of Thai rice sold in different provinces are rather important. In 1997, for instance, taking 100 as the index for Vientiane Municipality, the price of Thai ordinary rice was 110, 72 and 115 in Luangprabang, Savannakhet and Champasack, respectively. The higher price in Luangprabang can, to some extent, be ascribed to higher transport and transaction costs due to the poor communication facilities between Thailand and Luangprabang. Part of the higher prices in Champasack can be ascribed to the same cause. Nonetheless, the large price differences between Vientiane Municipality and Savannakhet (or Savannakhet and Champasack) can hardly be ascribed to transport costs. Local market conditions presumably play a determinant role in these price disparities. Roughly similar price differences existed two years earlier in 1995, which points to structural differences in market conditions, such as different market structures and differences in the costs of import and marketing across these provinces.[24]

[23] On the impact of AFTA on trade policy, see Lao People's Democratic Republic (1998), pp. 19-24.
[24] In 1995, taking 100 as the index for Vientiane Municipality, the price of Thai rice was 113, 76 and 115 in Luangprabang, Savannakhet and Champasack, respectively.

Figure 14: Price of Thai and Lao ordinary rice (kips per kilogram), July 1993 – December 1997.



Source: Computed from data provided by the National Statistical Centre.

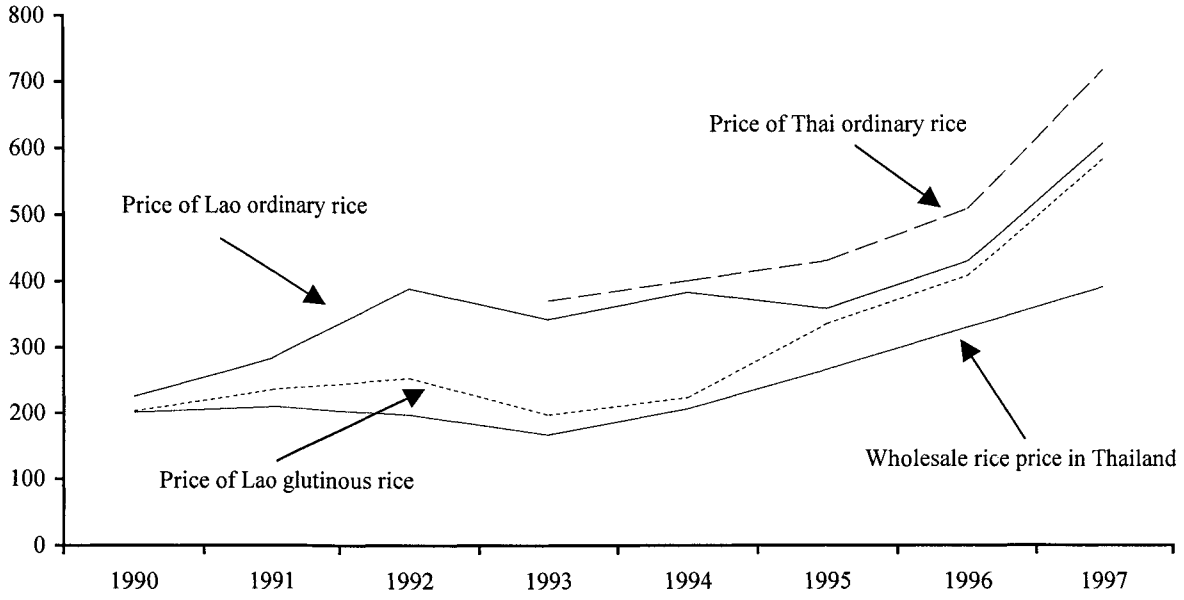
The second finding from Figure 14 concerns the relation between the price of Thai and Lao ordinary rice. In the four provinces considered, the price of Thai rice is higher than that of Lao rice. However, some marked differences exist between, on the one hand, the provinces of Vientiane Municipality and Savannakhet and, on the other hand, those of Luangprabang and Champasack. In the first two provinces, the differences between the prices of Thai and Lao rice are relatively small, some 50 kips per kilogram. In Savannakhet the prices of Thai and Lao rice were even equal during early 1995 and mid-1997. In the two other provinces, Luangprabang and Champasack, considerable differences can be observed between the prices of Thai and Lao rice, with the price of Thai rice sometimes being twice that of Lao rice. Such huge differences can be ascribed to differences in the quality of Thai and Lao rice (and changing relative quality over time). Presumably they can also be ascribed to the complicated system of import licences, which from time to time result in a relative scarcity of Thai rice on the Lao market.[25]

The third finding from Figure 14 concerns the change over time in the prices of Thai and Lao rice and to what extent they are related. The provinces examined can be divided into two sub-groups. The first group consists of Vientiane Municipality and Savannakhet, where there is a rather strong correlation between the two price series. (An exception is, however, the period between mid-1994 and mid-1995 in Vientiane Municipality.) In view of the large supply of Thai rice (actual and potential) and the limited supply of Lao ordinary rice, we suspect this high correlation to reflect the influence of import competition from Thailand on rice prices in Laos. In the two other provinces, Luangprabang and Champasack, the correlation between the two price series is rather weak, reflecting a limited impact of import competition on the price formation process. Note that this contention applies particularly to the province of

[25] The nature of the Lao trade policy regime is well described in the last report of the International Monetary Fund (1999, p. 18): 'A feature of the Lao trade regime is the high degree of administrative discretion in imposing trade restrictions. The Prime Minsiter's Order 06/PM of March 1999 sharply reduced the number of licensed trading companies. The amalgamation of trading companies into six trading groups is intended to facilitate the management of imports in any one product group. Each importer is licensed to import no more than the allocated quantity per year and in addition individual shipments need to be licensed by the Ministry of Commerce and transport. Imports of luxury goods and of foodstuffs produced in the Lao P.D.R. are discouraged.'

Luangprabang (see Figure 14). Higher transport and transaction costs presumably explain part of the second sub-group pattern.

Figure 15: Rice prices (kips per kilogram) in Vientiane Municipality and Thailand, 1990-1997.



Note: Data for Thailand refer to the wholesale price of rice. It was converted into kips by using the parallel market exchange rate in Vientiane.

Sources: Computed from data provided by the National Statistical Centre and the National Statistical Office (Thailand).

The price data on Thai rice in Figure 14 concerns the Lao rice market. A question that arises is whether the price of Thai rice on the Lao market reflects market conditions in Laos rather than the price of rice on the Thai market. As suggested above, two factors militate in favour of a certain de-linkage between the price of rice on the Thai market and that of Thai rice on the Lao market. The two factors are the strong preference of the Lao people for glutinous rice, and the existence of import duties and a complicated system of licences for rice import from Thailand. A third factor could be the existence of a non-competitive market structure in rice import and sale, with few actors involved, and the prevalence of pricing-to-market, that is import prices that mostly reflect the supply and demand conditions on the local Lao market. A second related question that arises is whether the price of glutinous rice is affected by

changes in the prices of Thai and Lao ordinary rice on the local market (actual competition) and also by changes in the price of rice in Thailand (potential competition).

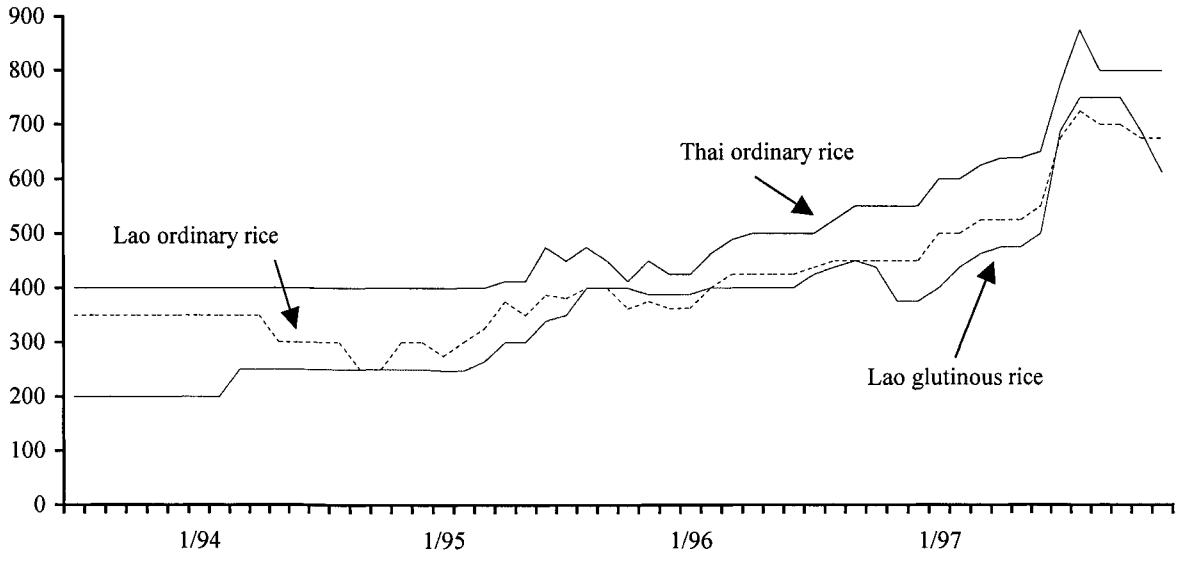
In order to examine this issue, Figure 15 relates the development of the wholesale price of rice on the Thai market to the development of the price of ordinary (Thai and Lao) and glutinous rice in Vientiane Municipality, covering an eight-year period, from 1990 to 1997. Data on the price of ordinary rice from Thailand are, however, only available for the 1993-1997 period. The choice of Vientiane Municipality can be motivated by two related factors: Firstly, it is one of the provinces that are most exposed to import competition from Thailand. Secondly, ordinary rice accounts for a non-negligible share of total rice consumption in Vientiane Municipality, 8.9 percent, to be compared with 1.4, 3.3 and 4.1 percent in Luangprabang, Champasack and Savannakhet, respectively.

A first result from Figure 15 is the large difference between the wholesale rice price in Thailand and the price of Thai rice on the local Lao market. At the current parallel exchange rate, the price of a kilogram of Thai rice in Vientiane Municipality was 160-200 kips higher than the wholesale price in Thailand between 1990 and 1996, and by 1997 the price differential had jumped to some 300 kips. The price differential can be ascribed to the retail margin, import duty and non-tariff barriers, transport and other transaction costs. These factors are more or less constant in the short and medium-term, which explains why the price differential remained relatively constant between 1990 and 1996. But also pricing-to-market behaviour, that is the taking into account of local market conditions, played a role. It is likely that the sharp increase in the price differential in 1997 reflects shifting demand and supply conditions on the Lao rice market, as evidenced by a similar reaction of the domestic rice prices, and exchange rate instability. A sharpening of the system of import licences may also have contributed to this increased price differential.

A second result from Figure 15 is that, until 1994, the price of glutinous rice in Vientiane Municipality was more responsive to changes in the wholesale rice price in Thailand than to the price of ordinary rice. Potential competition seems to matter, from time to time. After 1994 the prices of Lao glutinous and ordinary rice moved parallel

to the price of Thai ordinary rice on the local market. This is further illustrated with the help of monthly data in Figure 16. There is therefore a sort of de-linkage of the Thai and Lao markets after 1994, with a stronger role of pricing-to-market behaviour on the part of suppliers of Thai rice. A striking result from Figure 15 is that the price differential between Lao ordinary and glutinous rice has more or less vanished since 1995. Figure 16 shows that this happened in late 1995 and that it has continued thereafter, except for a few months in late 1996 and early 1997.

Figure 16: Prices (kips per kilogram) of Lao glutinous rice and Thai and Lao ordinary rice in Vientiane Municipality, July 1993 – December 1997.



Source: Computed from data provided by the National Statistical Centre.

In sum, international competition matters for the provinces that are close to Thailand, but there are also indications that the degree of international integration between the Thai market and these provinces is far from perfect.[26] Arbitrage induced trade flows are of more medium-term nature and short-term price deviations may actually occur, from time to time, as a result of pricing-to-market behaviour. In more

[26] Worner (1997) reaches a similar conclusion in a study of the glutinous rice market in Vientiane between January 1988 and April 1993. His study shows that the price of glutinous rice in Vientiane followed the price of glutinous rice in the northeast of Thailand between early 1988 and early 1992, after which a break occurred that could be attributed to the influence of domestic factors on the price formation process.

remote provinces, like Luangprabang, import competition is limited, explaining why prices there quasi-exclusively reflect local market conditions. It is likely that this applies to other remote provinces as well.

5. Concluding Remarks

High transaction costs and a kind of rice self-sufficiency policy at the regional (and even in some way at the household) level have prevented specialisation and the emergence of an integrated rice market in Laos. High transaction costs in agricultural trade ensue from the deficient road and communication infrastructures, poorly developed marketing networks and high costs of collecting relatively small rice surpluses from a large number of farmers scattered over large areas. The low degree of integration of the rice market in Laos is the main factor behind the emergence and persistence of wide price disparities between the provincial (and probably local) rice markets. There are, however, noteworthy differences in the degree of integration of the various provinces into the national rice market. Measures that further the integration of regional and provincial markets are of more long-term character. It takes time to build up an all-weather road network and countrywide (and region-wide) marketing networks. But such measures are necessary for prices to equalise with relative ease and rapidity throughout the regions and the country.

The slow process of integration of provincial (and local) rice markets in Laos runs parallel with the process of transformation of the Lao agriculture from a subsistence sector to a market-oriented sector. In the first stage of the latter process, households are self-sufficient in food and the inputs used in agriculture are typically household generated. In the second stage, households consume only part of their production, the rest being sold in the market, and inputs (and possibly production factors, like labour) are purchased on the market. These are two very different (extreme) situations and the process from subsistence to commercialisation is slow. How far it has proceeded, that is how integrated the households are with the rest of the economy, varies from region to region and from province to province. There is a strong relation between where the provinces are in this process and the erratic nature

of rice supply across provinces (and eventually of prices). An integration of the rice markets countrywide therefore requires a deepening and an acceleration of the transition process from subsistence to commercialisation of agriculture.

But commercialisation of agriculture (and price equalisation across the country) will not by itself permit Lao to achieve self-sufficiency in rice.[27] It is a necessary condition in the sense that trade between rice surplus areas and rice deficit areas is necessary to secure self-sufficiency within the country, at the provincial and district level. But it is not a sufficient condition and Laos will find it difficult to maintain national self-sufficiency in rice production over the next 10-20 years. Rice consumption is still growing in Laos, mainly as a result of population growth, and rice production has difficulties in keeping pace with population growth. Two factors lie behind these difficulties. The first is the decrease in the relative price of rice (in terms of other food products and non-food products). Increased competition from rice import in the wake of the ongoing world trade liberalisation process is likely to strengthen this tendency. The second factor is the increased competition for inputs, both land and water.[28] These two factors tend to reduce the profitability of rice farming and to limit private investments in rice farming and thereby the volume of rice production. In order to counter these forces the Lao government started a large-scale project in 1997, whose objective is to increase fourfold the irrigated rice-growing areas and secure national self-sufficiency in rice. The government project needs to be accompanied by better farming practices, improved input efficiency and more productive rice varieties to have positive effects on rice production in the medium and longer term. Whether this will be enough to counteract the long-term tendency towards lower profitability in rice production is, however, uncertain and outside the scope of the present study. But, this change in relative prices and profitability, of course, also signals that new opportunities for specialisation outside rice production are emerging as the transformation of the Lao economy continues.

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[27] For an analysis of the limits of the Lao government's self-sufficiency policy, see Ma (1994), pp. 132-133, and Anderson (1999), p. 45.

[28] According to LECS1, cultivated land shortage was considered a problem for 71 percent of the Lao villages, in order of importance coming just after irregular rainfall and drought, 87 percent, and before insects and rodents, 67 percent. National Statistical Centre (1993).

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