

INSTITUTE OF SOCIAL STUDIES

**TRADE REFORM AND COMPARATIVE ADVANTAGE:
EXPECTATIONS FOR COSTA RICA'S AGRICULTURAL
DEVELOPMENT**

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ABSTRACT

In response to the crisis of the early-1980s, Costa Rica underwent a structural adjustment focused on a trade reform that involved trade liberalisation and non-traditional export promotion. The reform has been expected to affect agriculture, since it is the sector with 'comparative advantage'. Based on traditional trade theory, the governments have expected an agricultural modernisation, whereby the sector would become an engine of growth and exports, and more employment and incomes for rural workers would be created. These expectations have not been fully fulfilled since both market distortions and factor market heterogeneity have been overlooked when predicting trade reform effects. The reform has allowed modernisation and growth in agriculture; yet, the sector has not turned into an engine of growth. International prices and exchange rate appreciation have led to unfavourable relative prices for agriculture, thus biasing the reallocation of resources towards non-tradables. Though, export promotion has allowed the surge of non-traditional export agriculture, hence offsetting the unfavourable relative prices and allowing export growth. As a result, workers have been reallocated from agriculture towards non-tradables; yet, employment grows in the rural areas, but not in agriculture. Since non-traditional agriculture is more capital intensive, skilled workers are more demanded. Due to the nature of non-traditional crops, unskilled workers are hired under temporary schemes. Thus, the wage gap between skilled and unskilled workers widens, leading to low real incomes for most agricultural workers and unequal distribution, which is precisely opposite to the conventional interpretation of the traditional trade theory.

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1. INTRODUCTION

In the early-1980s, Costa Rica began an era of structural adjustment in response to economic problems triggered by the 'debt crisis'. With strong emphasis on trade reform, the adjustment brought about a new model of agricultural development. The macroeconomic policy is aimed at closing up the balance of payments deficit, for which more economic openness was arranged with international organisations. At the micro-level, incentives were set to promote non-traditional exports, mainly from agriculture, and thus strengthen up the export supply to cope with more openness. These policies have been expected to affect agriculture fairly much, since it is the sector where the country presumably has 'comparative advantage'. Based on the traditional trade theory, Costa Rica's governments have expected an agricultural modernisation, whereby the sector would turn into an engine of growth and exports, and more employment and incomes for rural workers would be created. However, experience after nearly two decades shows no clarity on the extent to which these expectations have been fulfilled; thus, the issue of trade reform implications for agriculture's income distribution and poverty has remained open to diverse interpretations. This paper aims to analyse the extent to which these expectations have been fulfilled. It argues that the expectations of Costa Rica's governments cannot fully match the real outcomes because, due to the fact that they are strongly based on the traditional trade theory, several key features of agriculture have been left aside at the time of predicting trade reform outcomes. Specifically, by using the Costa Rican case, emphasis is placed on the argument that to understand trade reform expectations and its resulting trade-offs in agriculture, particular features of agricultural markets such as market distortions and heterogeneity in rural factor markets must be taken into account.

The remainder of the paper has been organised in four more sections. Section 2 describes the trade reform that has been undertaken in Costa Rica, highlighting the expectations of the governments since the reform began, and more importantly, explaining how such expectations have been created according to the main cornerstones of the traditional trade theory. Section 3 is devoted to explain the extent to which trade reform expectations have been fulfilled in Costa Rica. A number of arguments are touched upon in Section 4, to explain why trade reform expectations strictly based on the traditional trade theory, and according to the Costa Rican experience, cannot be fully fulfilled because market distortions and heterogeneity in rural factor markets are issues

left aside for designing trade policy. The last section of the paper presents the concluding remarks.

2. TRADE REFORM EXPECTATIONS IN COSTA RICA AND TRADITIONAL TRADE THEORY

The crisis of the early-1980s triggered stagnation in Costa Rica's agricultural production and exports. In order to reactivate the economy, the government undertook stabilisation and structural adjustment policies since 1984, under loan support from the International Monetary Fund and the World Bank, respectively. After stabilisation was relatively achieved by the mid-1980s, the adjustment began with three processes: trade reform, economic deregulation and public sector reform. The former has been considered the core of the adjustment in terms of implementation, whereas the other two processes have been seen as the means to create an appropriate environment to trade policy (Monge and Lizano: 1997: 9-10). The World Bank's advice to Costa Rica as to trade reform implementation has been along the following lines:

The key issue in trade policy is the need to reduce protection, which prevents the allocation of resources according to comparative advantage and hurts the export sector...Price, tax and subsidy policies have been areas of major reform since 1985. The aim has been to reduce intersectoral and intercrop price distortions in order to fully exploit the country's comparative advantages (World Bank, 1988: 11, 21).

Traditional agriculture¹ had been promoted in the pre-reform period, due to its importance for socio-economic development. With the debt crisis though, agriculture stagnated and became unable to foster development. Agriculture has always been considered the sector with comparative advantage in Costa Rica, because its production is labour intensive and the country is labour-abundant. The sector has been very important for the economy: on average, 50 percent of the GDP came from agriculture in the 1960s and 1970s. Hence, the World Bank's suggestion to Costa Rica's government was to overcome the stagnation through further exploitation of the agricultural comparative advantage, targeting agricultural diversification.

This proposal certainly relied on the traditional theory of trade, according to which the Heckscher-Ohlin theorem suggests that a country should specialise in the production and export of the commodity which intensively uses its abundant factor (Evans, 1989: 86-7). Specialisation should take place at the same time that import barriers are removed, as well as other trade restrictions such as export taxes, which hamper

export development, and export subsidies whose granting may imply the imposition of 'antidumping duties' by other countries trying to offset price differentials.

Under this policy framework, many less developed countries (hereafter LDCs) have been told by international organisations to expect favourable results. One main expectation is that with trade liberalisation, specialisation in agriculture will allow increasing capacity utilisation and exploitation of economies of scale, hence enhancing productivity and full employment of production factors. As a result, specialisation should lead to growth in the economy. For LDCs, specialisation in the production and export of primary commodities has been thought of as the factor to turn agriculture into an engine of growth and exports (Balassa, 1987: 32-3). Specialisation, according to this framework, has also been viewed as a contributing factor to employment, income distribution, and wealth (*ibid.*: 32-3). Such presumption is based on the Stolper-Samuelson theorem, which for LDCs specialising in agriculture predicts that the expansion in exportable production, which is presumed to be labour-intensive, will lead to a higher labour-capital ratio (Samuelson, 1948, 1949). This is expected to trigger two changes in the labour market. First, employment creation, because the activities upon which the exportation is based are labour-intensive (Balassa, 1987: 38-9). Second, the higher demand for labour implies substitution of capital for labour and hence a higher ratio of factor remuneration (wage/profits). This leads to a higher capital labour ratio (K/L) in the production of exportable commodities. As labour is combined with more capital, the productivity of labour rises, thus leading to higher real wages (for agriculture) in the long run. As a result, there will be a larger share of labour earnings in national income (Salvatore, 1995: 235).

Based on all these presumptions, Costa Rica has adopted the following trade reform. **First**, trade liberalisation, through converting non-tariff barriers to tariffs and reducing nominal tariff rates, and through participating in multilateral and bilateral trade agreements. **Second**, innovating from the traditional view of trade, temporal export promotion, adopted in conformity with international organisations who recommended it, due to the previous export bias that arose with import substitution strategies (Masís and Rodríguez, 1994: 19). This way, trade liberalisation could be undertaken under a 'neutrality regime' to support the export sector to cope with more openness (see e.g., Rhee, 1984; Damill and Keifman, 1992; Evans *et al.*, 1992). Export promotion² was designed to favour non-traditional agricultural exports (hereafter NTAXs)³, mainly exports directed to markets out of Central America. Export subsidies have been the

main promotion instrument. This whole package of policies has been effective to open up the economy (see Figure A1 in Annex A). The indicator of openness, which measures the ratio between the sum of total exports and total imports to GDP, increased considerably from 57.4 to 110.4 percent between 1984 and 1998.⁴ Based on comparative advantage principles, Costa Rica's governments have defended the following expectations from the trade reform: an agricultural modernisation turning agriculture into an engine of growth and exports; and, due to the higher agricultural growth, more employment and better income conditions for rural workers.

3. FULFILMENT OF TRADE REFORM EXPECTATIONS IN COSTA RICA

3.1. The expectation of agriculture becoming an engine of growth and exports

Experience after sixteen years shows an ambiguous pattern regarding the fulfilment of the governments' trade reform expectations. Costa Rica's agriculture has in fact modernised and diversified, as more investment has been channelled towards non-traditional agriculture. Notwithstanding, the comparative advantage has not been fully revealed in terms of agricultural growth attainment. Table 1 shows growth rates and the sectoral contribution to GDP for two periods: the trade reform period when export promotion prevailed (1984-1989), and the trade reform period when import liberalisation prevailed (1990-1998). Clearly, trade reform has enhanced growth possibilities in agriculture, which was actually expected as the reform targeted non-traditional agriculture.⁵ In this sense, the expectation of agriculture becoming an engine of growth has been partially fulfilled. However, with the exception of Construction and General Government, the other sectors of the economy also show the same satisfactory pattern in terms of growth. But more importantly, while agriculture's contribution to GDP has declined, the contribution to GDP of sectors like Basic Services, and Commerce and Services, has increased. This evidence suggests that the expectation of agriculture becoming an engine of growth has only been partially fulfilled.

Table 1:
Structural adjustment and changes in productivity (%) during the trade reform, 1985-1998

SECTOR	Output Growth ^{a/}		Sectoral contribution to output		Employment Growth		Sectoral contribution to employment		Productivity growth ^{c/}		Weighted Average Sectoral Productivity Growth		Sectoral labour reallocation	
	X_i^*		X_i/X		L_i^*		L_i/L		p_i^*		$(X_i/X) \cdot p_i^*$		$(X_i/X - L_i/L) \cdot L_i^*$	
	85-89	90-98	85-89	90-98	85-89	90-98	85-89	90-98	85-89	90-98	85-89	90-98	85-89	90-98
Agriculture ^{1/}	7.6	5.5	19.4	18.6	3.4	-0.1	26.7	23.0	0.5	1.0	0.8	1.0	-0.3	0.0
Industry ^{2/}	7.0	6.7	21.8	21.6	9.1	1.3	17.4	17.0	0.0	1.2	-0.4	1.1	0.4	0.1
Construction	6.4	5.0	4.4	3.9	9.6	2.6	5.6	6.4	-0.2	0.0	-0.1	0.1	-0.1	-0.1
Basic services ^{3/}	10.1	9.8	10.9	13.4	-2.0	6.4	5.5	5.9	1.2	0.9	1.3	0.4	-0.1	0.5
Commerce and serv. ^{4/}	7.2	6.5	30.0	30.4	4.8	6.6	19.0	21.9	1.2	0.5	0.7	0.0	0.5	0.6
General government	4.4	3.9	9.3	7.9	15.1	4.0	0.9	0.8	0.4	0.3	-0.9	0.0	1.3	0.3
Other services ^{5/}	7.0	6.7	4.3	4.3	2.4	3.7	24.9	25.1	-0.3	-0.6	0.2	0.1	-0.5	-0.8
Total	7.2	6.5	100.0	100.0	4.5	3.1	100.0	100.0	2.8	3.4	1.6	2.8	1.2	0.6

Notes:

^{a/} GDP at constant prices (local currency) of 1995.

^{b/} *i* represents 7 sectors.

^{1/} Aggregates agriculture, forestry and fishing.

^{2/} Includes manufacturing.

^{3/} Includes electricity, water, transports, storage and communications.

^{4/} Includes retail and wholesale trade, restaurants, hotels, financial establishments and real estate.

^{5/} Includes social, personal and communal services.

^{c/} Following Taylor *et al.* (1998) (in de Jong and Vos, 2000: 9), the decomposition of productivity is developed as follows. Labour productivity is defined as $\rho = X/L = \Sigma X_i/L_i$, where *X* is output and *L* is employment. Taking differentials one obtains:

$$\begin{aligned} \rho &= \Sigma[(X_i/X) \cdot X_i^* - (L_i/L) \cdot L_i^*] \\ &= \Sigma[(L_i/L) \cdot \rho_i^*] + \Sigma[(X_i/X) - (L_i/L)] \cdot X_i^* \\ &= \Sigma[(X_i/X) \cdot \rho_i^*] + \Sigma[(X_i/X) - (L_i/L)] \cdot L_i^* \end{aligned}$$

The asterisks indicate rates of growth. The first term decomposes productivity growth into the difference between output change and employment growth. The other two terms define productivity growth as the weighted average of sectoral productivity growth (for *i* = 7 sectors) plus a 'correction term' to account for sectoral reallocations of, respectively, output and employment. The reallocation weights $(X_i/X) - (L_i/L)$ reflect productivity differences between sectors.

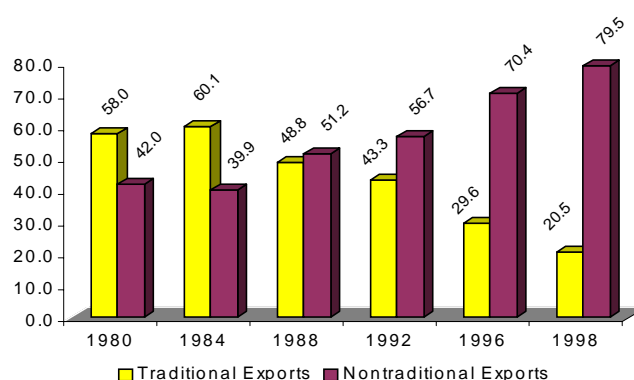
Source: Author's own calculations based on data from the Central Bank of Costa Rica and the Household Surveys of Employment and Unemployment.

Here we can pose the hypothesis that agriculture has played an indirect role in the dynamism of the growing non-tradable sectors. If this hypothesis were found true, then the role of agriculture's dynamism in bringing about more economic activity to the services and commercial sectors would be important, and thus the expectation of agriculture becoming an engine of growth would appear to have been fulfilled in another way. This hypothesis was tested through analysing the input-output linkages of agriculture with commerce and services, for which a social accounting model was used,

based on the Social Accounting Matrix (SAM)⁶ of Costa Rica. Since this SAM records prices of 1991, it was expected to reflect the structure of the economy after eight years of trade reform implementation. The model included the estimation of average propensities to spend (APSs)⁷ and social accounting multipliers, to analyse forward and backward linkages of agriculture with commerce and services⁸. The results are summarised in Table A1 in Annex B. The analysis of APSs showed a fairly weak forward linkage of agriculture with the broadly defined sectors ‘commerce’ and ‘services and trade’ of the SAM. The situation changed slightly as far as backward linkages are concerned, because agriculture showed a relatively higher linkage with ‘commerce’, but not with ‘services and trade’. It was confirmed through the accounting multipliers that agriculture’s forward linkages are low and its backward linkages relatively higher but not enough to indicate a strong productive linkage. Still, agriculture’s backward linkages were found higher for ‘commerce’ and not for ‘services and trade’. In the end, the social accounting model suggested that agriculture’s production linkages with commerce and services are weak for firmly arguing that growth in non-tradable sectors, is largely explained by a higher indirect productive importance of agriculture during the trade reform. This confirmed again that the expectation of agriculture becoming an engine of growth has not been fully fulfilled.

Conversely, trade reform has turned agriculture into an engine of exports. As shown in Graph 1, the share of non-traditional exports in total exports began to increase significantly from 1984. In 1988, non-traditional exports were already 51.2 percent of total exports, share that increased up to nearly 80 percent in 1998. Agriculture plays a determinant role in such pattern; between 1983 and 1997 agriculture’s exports accounted on average for about 63.2 percent of total exports. Agricultural export dynamism has been led by NTAXs. Only in the 1980s, while NTAXs grew by 22 percent in Chile and 78 percent in Guatemala, they grew more notably by 348 percent in Costa Rica (Carter *et al.*, 1996: 33).⁹ Weeks (1999: 55-61) analysed agro-export growth in Central America during 1970-1994, and found that the trade reform was not associated with a revealed comparative advantage in Central America’s agricultural exports, with the exception of Costa Rica.¹⁰ In 1984, NTAXs’ share of agriculture’s exports was 3.2 percent. From that year onwards, this share has ever risen, reaching a maximum of 37.1 percent in 1996. The evidence shows a sustained annual growth of NTAXs of 17.3 percent between 1984 and 1997.

Graph 1. Costa Rica: Structure of Total Exports (%), 1980-1998



Source: Author's own construction based on data from the Central Bank of Costa Rica, 1999.

3.2. The expectation of agriculture bringing about more employment and better income conditions for rural workers

Regarding the second expectation, Table 1 indicates a reallocation of workers from agriculture towards industry and non-tradable sectors. Data from the Household Surveys of Costa Rica¹¹ lend support to the occurrence of this change, as they indicate that while rural employment has increased on average by 4.3 percent during 1985-1998, agricultural employment increased only by 1.1 percent (see Table 2). In the 1990s, while employment in the rural area grew on average by 2.9 percent, employment in agriculture fell on average by 0.1 percent. This is consistent with data on the structure of the rural labour market, which during 1984-1997 has trended as follows (see Table 3): the number of *wage earners* and *self-employed workers* has increased sharply by 4.0 and 4.5 percent, respectively; the number of *family-unpaid workers* has stagnated and increased only by 0.2 percent; and, the number of *employers* has increased considerably by 12.1 percent. Moreover, *wage earners* remain as the most important category of rural employment (67.8% of the total). This evidence suggests two things regarding rural employment: first, *wage labour* is higher during trade reform; and second, the reform privileges off-farm employment due to the fact that agricultural employment (e.g. that by *family workers*) has fallen, whereas *employers* and *self-employed workers* increased their participation and growth in rural employment.¹²

Table 2:
Employment in Urban and Rural Areas, 1985-1998.
Growth Rates (%) and Contribution to the Total (%)

	1985-89		1990-98		1985-98	
	Growth %	% of the Total	Growth %	% of the Total	Growth %	% of the Total
1. Urban	1.6	47.2	3.4	45.6	2.7	46.1
2. Rural	7.5	52.8	2.9	54.4	4.3	53.9
2.1. Agriculture ^{1/}	3.4	27.3	-0.1	22.5	1.1	24.0
3. Total (1+2)	4.5	100.00	3.1	100.0	3.5	100.0

^{1/} The percentage to the total is the share of agriculture's employment in total employment.

Source: Author's own calculations based on data from the Household Surveys of Costa Rica.

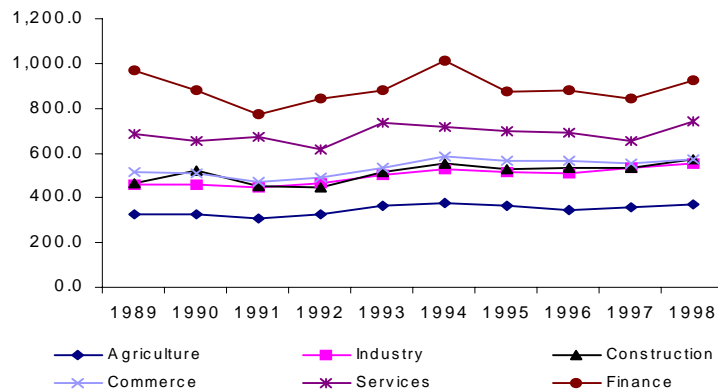
Table 3:
Employment in the Rural Area by Category, 1985-1997. Growth Rates (%)
and Contribution to the Total (%)

	1985-89		1990-97		1985-97	
	Growth %	% of the total	Growth %	% of the total	Growth %	% of the total
Wage earners	5.6	67.1	4.1	68.1	4.0	67.8
Self-employed workers	9.9	21.2	1.4	20.7	4.5	20.9
Family (non-paid) workers	6.6	7.6	-0.6	5.1	0.2	5.9
Employers	21.4	4.1	10.0	6.1	12.1	5.4

Source: Author's own calculations based on data from the Household Surveys of Costa Rica.

The changes in the rural labour market indicate a liberation of workers from agriculture, likely explained by the withdrawal of farmers and workers from the traditional sub-sector (see Table 1). This has likely resulted in an overall reduction in wages in agriculture. Data availability on wages of skilled and unskilled workers imposed limitations to the analysis at the time of elaborating this paper. However, data on average real monthly income paid in agriculture lend support to the conclusion that the remuneration of workers in agriculture, is the lowest in the economy and remains nearly constant during trade reform (see Graph 2). A judgement on the expectation of more employment and higher incomes for rural workers based on such evidence and the previous findings on rural employment would indicate that the expectation of the government appears to have not been fully fulfilled.

Graph 2. Costa Rica: Average monthly income by sector, 1989-1998. Millions of local currency at prices of 1995.



Source: Author's own construction based on data from the Household Surveys and the Central Bank.

4. WHY IS IT THAT TRADE REFORM OUTCOMES DO NOT MATCH THE THEORETICAL EXPECTATIONS?

4.1. Market distortions and unbalanced growth

One of the reasons why trade reform outcomes do not fully match the theoretical expectations is that, such expectations have been based on a theoretical approach which overlooks the fact that agricultural markets in LDCs are characterised by distortions that influence the allocation of resources. As a result, the investment criteria in LDCs contradict those of the traditional trade theory. According to this theory, the optimum pattern of production of a country is determined from a comparison of the opportunity cost of producing a given commodity with the price at which the commodity can be imported or exported. Under the assumptions of full employment and perfect competition, the opportunity cost of a commodity is equal to its market value. This assumption fails during trade reform because distortions arise from the reform itself and from agriculture's relative prices. Thus, factor prices do not reflect the opportunity costs with accuracy (Chenery, 1961: 20-1). This paper argues that due to both market imperfections, unbalanced growth within agriculture and in the whole economy precludes agricultural specialisation to turn agriculture into an engine of growth.

4.1.1 Trade reform as a distortion

Export promotion is a distortion that works as a source of 'unbalanced growth' such that agriculture does not boost as a whole, but only some of their production activities. In Costa Rica, export promotion has been deliberately designed to benefit those

producers achieving high volumes of non-traditional exports. Non-traditional agriculture requires large capital investments and learning processes (new technology) (Carter *et al.*, 1996: 59). Also, since this type of agriculture requires long maturity periods (from seven to twelve years), producers should maintain enough resources to keep in business during the crop gestation period. Once domestic production requirements are solved, producers have to integrate with other processes (i.e. commercialisation) beyond the domestic borders. Capital should be large enough to cope with contingencies such as international price fluctuations, market limitations, and natural disasters. In Costa Rica, both production costs and the level of investment that is required to produce non-traditional crops, work as barriers to enter the market, as shown by Monge (1994: 385-95). Because of all these requirements, export promotion can be seen as an infant industry mechanism expected to help the attainment of economies of scale. This process itself destroys the optimality of laissez-faire and free trade (Krueger, 1984: 136). But, apart from this, it is worth nothing that investment becomes a determinant factor to benefit from trade reform. Since investment will be concentrated in non-traditional sectors, then 'unbalanced growth' is likely to arise (Streeten, 1959; Hirschman, 1958). In this sense, capital availability is a determinant for agricultural modernisation (Stephen and Abbott, 1986: 5). Therefore, export promotion entails that comparative advantage can only be determined for investment in a non-traditional sub-sector.

In this framework, investment allocation is distorted by the trade reform itself, which via export promotion biases resource allocation not in favour of traditional agriculture. Between 1984 and 1998, non-traditional agriculture's share in agriculture's product went up from 8.7 percent to 16.3 percent, at the cost of significantly decreasing the share of traditional agriculture (see Table 4). This is not meant to be called a bad outcome of trade reform. In fact, the surge and growth of non-traditional agriculture has led to modernisation in the sector, and export growth for reasons explained below. What is argued here is that agriculture has not turned into an engine of growth because, while non-traditional agriculture does grow, traditional agriculture does not, and investment which was channelled massively to the non-traditional sub-sector in the 1980s, did not grow the same in the 1990s. Since non-traditional agriculture has been exclusively promoted for export purposes, then although agricultural growth may have not been fairly considerable, the reform has in fact led to high agricultural export growth (Weeks, 1999: 55-61).

Table 4:
Agriculture's Gross Product in local currency at prices of 1995.
Sub-Sectoral Disaggregation (%), 1980-1998

	1980	1984	1988	1990	1991	1992	1993	1994	1995	1996	1997	1998
Traditional agri-culture	84.1	87.0	82.2	81.5	81.5	82.1	82.5	82.0	82.6	80.2	79.3	79.7
Traditional export commodities (TAXs)	47.7	50.8	50.4	50.4	50.5	51.6	51.9	50.7	51.4	49.2	47.9	49.7
Livestock and animal commodities	27.0	25.8	25.1	24.9	25.3	25.5	26.3	26.6	27.1	26.4	26.6	26.0
Basic Grains ^{1/}	9.4	10.5	6.6	6.2	5.7	5.1	4.2	4.7	4.1	4.6	4.8	4.1
Non-traditional agriculture	9.1	8.7	11.5	12.3	11.9	12.3	12.4	13.2	13.4	15.7	16.5	16.3
Other ^{2/}	6.9	4.3	6.4	6.2	6.6	5.6	5.1	4.8	4.1	4.1	4.2	4.0

^{1/} Include rice, maize, beans and sorghum

^{2/} Include cotton, tobacco, potatoes, onion, woods products, agricultural improvements, etc.

Source: Author's own calculations based on data from the Planning Secretariat for Agriculture of Costa Rica (SEPSA) and the Central Bank of Costa Rica.

4.1.2 *Distorted prices*

Price distortions affect investment reallocation too, with the implication that the expectation of agriculture turning into an engine of growth is also hampered. The traditional trade theory defends that in a competitive economy, comparative advantage should manifest itself through relative prices. With external account liberalisation, the exchange rate should find its equilibrium level, and this should rise the prices of tradables relative to non-tradables, hence reversing the declining trend of agriculture's terms of trade (Weeks, 1999: 51-3). Since agriculture's output is overwhelmingly tradable, the sector is presumed to be labour intensive, and LDCs are labour-abundant, then investment should move towards agriculture.

However, prices do not adjust that flexibly and are rather influenced by market distortions. The trade pattern of primary commodities implies market forces leading to a long-term fluctuating-declining trend in real prices, and low income and price elasticities of the demand for primary products (Anderson, 1990; Anderson and Tyers, 1991). Costa Rica's main agricultural products have faced unfavourable prices during the trade reform. Figure A2 (Annex A) shows that the most important export products, coffee and bananas, face in general unfavourable prices during the reform. The prices of important export products like meat also show a declining trend, mainly during 1984-1990. Basic grains prices also decline since 1983 (with slight increases since

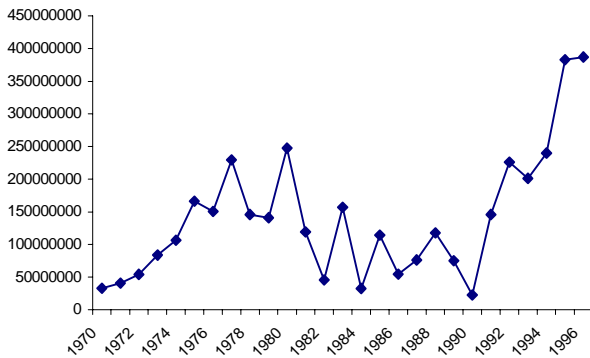
1990 and 1991 for rice and sorghum, respectively). Even the prices of some of the most important non-traditional crops have also been falling during trade reform.

Moreover, income elasticity of demand is typically less than unity for agricultural products (Anderson, 1990: 19). Conversely, evidence indicates that income elasticity of demand for services is much higher in LDCs (see e.g., Lluch, Powell and Williams, 1977; Kravis, Heston and Summers, 1983; Summers, 1985; Theil and Clements, 1987). This implies that during growth, the prices of non-tradables relative to agricultural tradables tend to increase, and the demand for tradables grows less than proportionately. As a result, agriculture's share of GDP tends to fall, which can only be counteracted if productivity growth is higher for tradables (see e.g. Kravis and Lipsey, 1988). Based on this argument, it can be argued that the higher income brought about in Costa Rica with the structural adjustment may have increased the demand for non-tradables relative to tradables, and that explains partially why agriculture's share of GDP has declined relative to non-tradables (see Table 1). This pattern could have not been counteracted by higher productivity in agriculture, since productivity growth has also taken place in non-tradable sectors (see Table 1).

Regarding the exchange rate, as Edwards (1992: 27) puts it, 'the channel through which structural reform affects agriculture (and for that matter aggregate employment), is the real exchange rate'. Trade reform has sooner or later been accompanied by capital account liberalisation in most Latin American countries. The implication is that the lowering of barriers to foreign capital inflows works as a countervailing factor to the manifestation of the agricultural comparative advantage (Anderson, 1990: 23). If the domestic financial market is under reform, which seems to be a complementary policy to trade reform under structural adjustment programmes in LDCs, then the relaxation of capital controls will tend to result in massive capital inflows. These, in turn, will generate a real exchange rate appreciation and a loss of competitiveness that will reduce the chances of a successful trade reform (Edwards, 1992: 16). In Costa Rica, the capital account was liberalised in March 1992, and since then, net total private capital inflows have been increasing significantly (Graph 3). Parallel to this, the exchange rate has appreciated in real terms (Graph 4). Studies by Weeks (1999: 61-2), de Janvry *et al.* (1997), Valdés (1996) and Edwards (1989) confirm that in Latin America, exchange rate appreciation has discouraged domestic and foreign investment in agriculture in the 1990s. The argument is that, because of real exchange rate appreciation, within tradables, agricultural prices do not rise relative to other tradables and the price

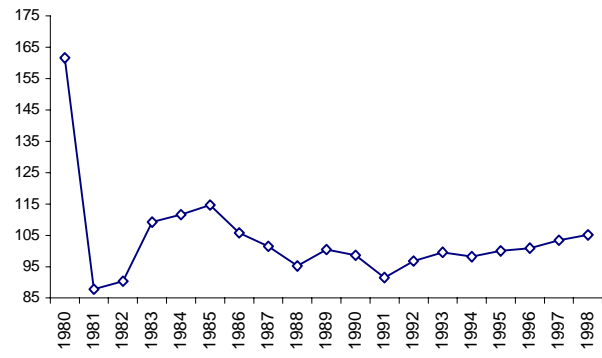
level, hence relative prices turn unfavourable to agriculture. Clearly, the overvalued exchange rate provokes a deviation from agricultural comparative advantage (Stephen and Abbott, 1986: 34).

Graph 3. Costa Rica: Net total private capital inflows, 1970-1998. In US dollars.



Source: World Bank, World Development Database 1998.

Graph 4. Costa Rica: Real effective exchange rate, 1980-1998 (1995=100)



Source: IMF, International Financial Statistics Yearbook, 1999.

Unfavourable international prices and appreciated real exchange rate have resulted in unfavourable relative prices for agriculture. Other macro-policies may have also affected agricultural relative prices, although to a lesser degree (de Janvry *et al.*, 1997: 15). For instance, the liberalisation of agricultural product markets in Costa Rica has included the elimination of state marketing boards and ending government involvement in the procurement and distribution of crops, with a consequent effect on prices. Guaranteed price schemes and producer price controls have been replaced by variable tariff or levy schemes. Many consumer price controls have been removed. In the factor markets, the liberalisation has included reduction and elimination of subsidies and the privatisation of parastatals involved in input markets. Masís and Rodríguez (1994: 23) and de Janvry *et al.* (1989: 160-1, 201-5) have confirmed that the higher agricultural product volume in Costa Rica has been accompanied by lower relative prices, hence the contribution of agriculture to GDP has fallen. Weeks (1999), de Janvry *et al.* (1997), and Valdés (1996) have also confirmed this for Latin America. As a result, the terms of trade of Costa Rica's agriculture vis-à-vis other sectors of the economy are in general unfavourable since 1983 (see Figure A3 in Annex A).

Due to agriculture's unfavourable relative prices, the resource allocation is not carried out according to the comparative advantage theory. Complementarily, if the income elasticity of the demand for non-tradables is higher than that for agriculture, it

is likely that the higher income brought about in Costa Rica with the structural adjustment has led to a higher demand for non-tradables more than proportionately to agriculture. As a result, it is possible to observe ‘unbalanced growth’ in the economy, as other sectors, probably of a non-tradable nature, become more important in GDP relative to agriculture (recall Table 1). Complementary evidence on the composition of GDP suggests that the growing pattern in non-tradable sectors is explained by a significant growth in tourism, mainly ecological tourism that has fostered activity in restaurants, hotels and transport in the rural areas (see Figure A4 in Annex A).¹³ In contrast, the share of agricultural exports in total exports does not show the same pattern, as explained in the previous section. Weeks (1999) has found that unfavourable prices have negatively affected Central American countries’ major exportables, which has undermined the return to most of the region’s major agricultural crops. Nevertheless, in real terms, agricultural exports only grew in Costa Rica, because the diversification has been a countervailing factor to unfavourable agricultural prices. This explains why, as mentioned earlier, the comparative advantage has indeed been fulfilled in terms of export growth, which is one of the most positive effects of the trade reform.

4.2. Heterogeneity in the rural factor market and factor reversals

Factor market heterogeneity also curtails the predictability of the traditional trade theory on trade reform outcomes in LDCs’ agriculture. That is why the expectation regarding trade reform bringing about more employment and better incomes for rural workers, is not fully fulfilled in Costa Rica. The assumptions being challenged are twofold. First, the Heckscher-Ohlin premise that factors of production (i.e. capital and labour) are qualitatively similar and therefore comparable across output sectors, with a total amount that is constant. This implies homogenous production functions across sectors and full employment and domestic mobility of factors. Second, the idea of the Stolper-Samuelson theorem, which applied to LDCs predicts that specialisation in agriculture will create a capital-labour substitution effect that benefits wages in the long term as labour is utilised relatively more intensively.

These two assumptions come across limitations because factor abundance is not the only determinant of factor intensity. In the simple two good framework of the traditional trade theory, inclusion of land increases the number of factors to three (land, labour and capital). Accordingly, the simple factor intensity (capital-labour ratios) loses relevance for determining comparative advantage based on factor abundance

(Stephen and Abbott, 1986: 3). In addition, if labour is mobile, as seems to be the case with the rural-urban labour mobility, then the labour abundance transcends sectors and the strict sectoral-factor-abundance-concept of the theory loses application. Then, what does determine factor intensity in Costa Rica's agriculture?

4.2.1 *Factor heterogeneity*

In reality, labour, variable inputs, capital and land are used in agriculture. Even if agriculture were labour-abundant, factor intensity is not easily predictable because of the innumerable different gradations of skilled labour (Wood, 1994: 48-50). Thus, various alternative combinations of five factors (skilled labour, unskilled labour, variable inputs, capital and land) are available for producing a commodity and not only a unique unskilled-labour-intensive technique. Since rural factor markets are heterogeneous, factor costs do not reflect their opportunity costs with accuracy as the traditional trade theory predicts; hence, factor intensity is not easily predictable. According to this theory, the marginal productivity of labour would be highest in LDCs, and then production processes labour-intensive (Chenery, 1961: 27). Kahn (1951: 40) has shown that natural resources, specialised skills, particular climatic conditions, among other things, may turn the marginal productivity of capital higher in a line that is more capital intensive than in another that is less so. If this were the case, a 'factor reversal' takes place in agriculture, something that cannot be explained by the traditional trade theory. What follows then is to explain why such 'factor reversals' take place in agriculture.

Factor intensity in agriculture depends primarily on the type of crop. Not all crops in agriculture are labour intensive; rather, they may require different working-capital requirements for their production. Because of rigid standards for product quality and uniformity, many export crops require intense use of purchased inputs and thus large amounts of working capital to finance them. According to Davis (1998), what matters for understanding trade liberalisation outcomes is not the country's factor abundance, but rather the *local* factor abundance within the country's 'cones of diversification'. A country can be very labour abundant with respect to the global economy, however, it could be capital abundant in the local sense in some production lines relative to other production lines of the country's 'cones of diversification'. Stephen and Abbott (1986) found that countries more dependent on agricultural trade tend to have more capital intensive agriculture than countries relying less on trade.¹⁴ In this respect,

Carter *et al.* (1996) have confirmed that since the 1980s, agriculture tends to be more capital intensive in some Latin American countries.

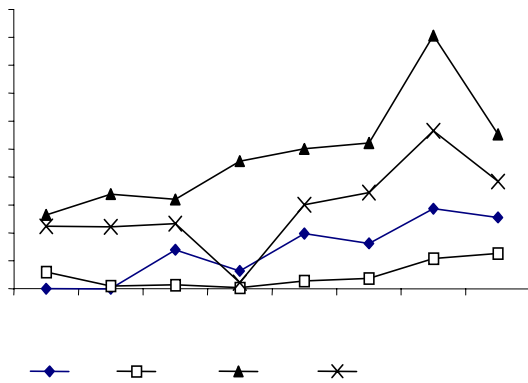
In Costa Rica, the export promotion carried out during the last two decades brought about the surge of non-traditional agriculture. It can be argued that within agriculture's 'cone of diversification', in general, non-traditional agriculture is capital intensive relative to traditional agriculture. Various studies agree that this is the case. Achón (1994: 257-8) found that the ratio 'sowed land area/labour force'¹⁵ is much larger in non-traditional agriculture compared to basic grain production. Studies carried out by the National Chamber of Agriculture and Agro-industry of Costa Rica show that in the 1980s, the relative participation of wage in the production costs of non-traditional producers has decreased whereas that of agricultural inputs, mainly of agrochemicals, has increased.¹⁶ Likewise, a study by Weller (1992) on production costs indicates a significant weight of agro-chemicals in Costa Rica's non-traditional agriculture. This study also shows that the employment creation in Costa Rica's non-traditional agriculture in the 1980s, including occasional and total employment, amounted to 15,000 jobs, which represented only 3 percent of the rural employment (see also Fox, 1989).

Trade reform also involves 'artificial factors' that affect the price system (Chenery, 1961: 29). As a result, the reform can bring about structural changes that cause exogenous shifts in relative factor demands (O'Connor and Lunati, 1999: 6). If the reform involves export subsidies to non-traditional crops that are capital intensive, then factor intensity in these activities will by no means be determined by factor abundance. Likewise, according to the 'Skill-Enhancing-Trade' hypothesis, rising trade liberalisation accelerates inflows of physical capital and technology to LDCs. This hypothesis entails a violation of the international factor immobility of the Heckscher-Ohlin model. Wood (1994: 38) supports this hypothesis by arguing that the rates of profit between developed countries and LDCs are similar and capital goods are internationally (more freely) traded. Accordingly, Robbins (1994, 1995, 1996ab) has found that trade liberalisation in Latin America may be associated with large increases in machinery imports. Based on these arguments, it can be argued that LDCs do not use the factor capital intensively, not because they cannot access it, but because labour is relatively cheaper. Thus, comparative advantage cannot be conferred by a factor such as machines. The implication of the 'Skill-Enhancing-Trade' hypothesis is that the use of capital implies more use of skilled labour, which challenges the conventional ways of interpreting labour intensity in agriculture.

Export promotion benefits non-traditional agriculture, which given the nature of its production, tends to encourage capital investment. Because of this, and encouraged by the reduction of import tariffs, capital goods have become more mobile and cheaper with the reduction of trade barriers in Costa Rica. Trade liberalisation seems to have accelerated the inflows of physical capital and agro-chemicals, which supports the ‘Skill-Enhancing-Trade’ hypothesis. Figure A5 (Annex A) shows that certainly, the imports of machines have been growing, especially in the 1990s. Likewise, the importation (and use) of agro-chemicals has increased very significantly (with the exception of pesticides, whose use has been discouraged by pro-environment policies). Therefore, although Costa Rica can be unskilled-labour abundant with respect to the global economy, it has turned capital abundant in non-traditional agriculture (relative to traditional agriculture). This is reflected in higher productivity growth in agriculture during the opening of trade (see Table 1).

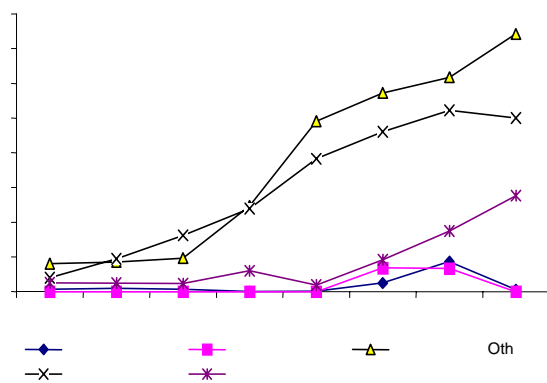
The reduction of import tariffs to certain commodities can also discourage production lines that are labour intensive, due to a lack of competitiveness (Wood, 1997: 49-51). In Costa Rica, the import barrier cutback to some unskilled-labour-intensive products has discouraged their production and encouraged their importation. Such is the case of basic grains and some vegetables, which are mostly produced by small-farmers who have shown little competitiveness to cope with higher imports encouraged by the openness (Sánchez, 1999: 11-4). As a result, the country has become a net-importer of these commodities in the 1990s (see Graphs 5 and 6). The discouragement to the production of all these commodities may explain a lot of the reduction in agricultural (family) employment that was discussed earlier.

Graph 5. Costa Rica: Imports of Basic Grains, 1990-1997. In thousands of US dollars.



Source: Planning Secretariat for Agriculture of Costa Rica (SEPSA).

Graph 6. Costa Rica: Imports of Selected Vegetables, 1990-1997. In thousands of US dollars.



Source: Planning Secretariat for Agriculture of Costa Rica (SEPSA).

4.2.2 Factor remuneration and income distribution

Factor heterogeneity impedes to set a rule to predict labour remuneration. This is why in Costa Rica, contrarily to the expectation, the real income of rural workers instead of increasing, keeps being the lowest in the economy. If agriculture turns capital intensive, as it is the case of non-traditional agriculture, then skilled labour will be needed. The implication of this is that as specialisation encourages capital intensive production, wage differentials between skilled labour and unskilled labour widen, even if the country is unskilled-labour abundant (Wood, 1997: 46). As a result, the distributional consequences will be opposite to those one would anticipate with a conventional interpretation of the traditional trade theory. More specifically, the Heckscher-Ohlin assumption of ‘factor price equalisation’ and the ‘capital-labour-substitution-effect’ of the Stolper-Samuelson theorem are challenged.

These arguments can be associated with the evidence presented earlier on the Costa Rican rural labour market. It was shown that trade reform has promoted off-farm employment and occasional-wage employment. The former requires high skills relative to the latter.¹⁷ Due to the type of crops in non-traditional agriculture, unskilled labour is demanded under temporary schemes. For that reason, although Costa Rica may be unskilled-labour abundant relative to the global economy, it has turned capital abundant in non-traditional agriculture. The resulting outcome is a higher gap of wages between skilled and unskilled workers. Robbins (1996a) found this to be the case of some LDCs, through a study which also included Costa Rica (see also UNCTAD, 1997).¹⁸

Although more unskilled labour is demanded on temporary bases, its wage is not expected to increase at the same rate of that of skilled labour due to ‘technology deepening effects’. This may lead to higher wage dispersion in agriculture with likely negative distributional consequences, which may worsen if there is already high income inequality, as it is the case in Latin America. Because of the wage dispersion, the theoretical premise that influences policy makers to expect higher agricultural labour earnings in national income does not apply to the Costa Rican case.

5. CONCLUDING REMARKS

This paper has attempted to provide insights into the issue of trade reform and agriculture in two ways. Firstly, it argues upon why traditional trade theory cannot fully explain trade reform outcomes in LDCs’ agriculture. Different arguments on the need to account for market distortions and rural factor market heterogeneity have been touched upon, looking for a better understanding of the situation of agriculture during a trade reform. A great deal of attention has been paid to the fact that, since trade policy makers in Costa Rica have overlooked these special features of agriculture, their expectations cannot be fully satisfied. Secondly, the clarification of these special features of agriculture allowed to develop a more realistic analysis of two expectations in Costa Rica: agricultural modernisation turning agriculture into an engine of growth and exports; and, due to the higher agricultural growth, more employment and better income conditions for rural workers.

With regards to the first expectation, the paper has shown that the reform has indeed resulted in agricultural modernisation. As a result, agriculture has grown; however, it has not become an engine of growth for the economy. Rather, non-tradable sectors show fairly positive growth rates too, but more importantly, they have become more important in GDP relative to agriculture. The explanations for such a pattern were twofold. First, trade reform has worked as a distortion by promoting only a non-traditional sub-sector in agriculture. Investment has been channelled towards non-traditional export agriculture, at the cost of discouraging traditional agriculture. This has led to ‘unbalanced growth’ in agriculture. Second, unfavourable agricultural relative prices, mainly influenced by the trend of international prices and real exchange rate appreciation, have biased the reallocation of resources in favour of non-tradables sectors, hence leading to ‘unbalanced growth’ in the economy. Yet, the share of agriculture in total exports has not declined because the export promotion has led to diversification,

thus offsetting the unfavourable relative prices, and hence allowing the manifestation of the comparative advantage in terms of agricultural export growth.

Regarding the second expectation, the changes in production have affected the rural labour market. There has been a reallocation of workers from agriculture towards non-tradable sectors, which is associated with the liberation of workers from traditional agriculture. However, employment tends to grow in the rural areas, mainly that of the off-farm type. Such changes are explained because a 'factor reversal' seems to have taken place since non-traditional agriculture, highly shaped by 'artificial factors' (i.e., reduced tariffs and export taxes, and increased export incentives), requires a more intensive use of capital. The constraints for meeting capital requirements seem to have been relaxed by more openness. The higher intensity in the use of capital in non-traditional agriculture has implied a higher demand for skilled labour. On the other hand, due to the nature of non-traditional production, unskilled-wage labour is demanded under temporary schemes. As a result, the wage gap between skilled and unskilled workers tends to widen, which has reflected in an overall trend of low-real income for workers in agriculture. Thus, the distributional outcomes seem to be opposite to those one would anticipate with a conventional interpretation of the traditional trade theory, which implies that the second expectation has not been fully accomplished.

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ENDNOTES

1. Coffee, bananas, sugar cane and livestock products are the main traditional agricultural commodities in Costa Rica.
2. Export promotion has been carried out through various incentive regimes in Costa Rica. Export processing zones (EPZs) had already emerged in 1981 to promote exports as controlled areas without resident population that were dedicated to the handling, processing and production of non-traditional products. The EPZs were particularly designed to encourage 'draw-back' or *maquila* industries, which can import and export duty free and benefit from tax exemptions. In 1984 the 'export contracts' were instituted by the government as incentives to exonerate exporters from import tariffs, indirect taxes and other taxes (income, indirect and export). These contracts also included the tax-credit certificates *Certificados de Abono Tributario (CATs)* for exporters that achieved to set large amounts of non-traditional exports in 'third markets' after producing an output containing 35% of national value added in the form of local raw materials, labour or energy. Even though the *CATs* were legally created in 1972, it was not until 1984 that they became fully operational within the framework of a larger export promotion strategy. The so-called *Temporal Admission* regime was also created in 1984 to allow any investment directed to exportation (after having being passed through any transformation process in the country) be developed without being charged any tax (Monge: 1994: 374-5). This regime benefited the most new export manufacturing activities (e.g. electronic components).
3. The main non-traditional agricultural exports (NTAXs) are mangos, melons, pineapples, macadamia and cashew nuts, cardamom, cut flowers, ornamental plants, citrus juices, coconut oil, tubers, and winter vegetables.
4. Even though this indicator is not strictly speaking a measure of openness but of trade volumes, the trend of import tariffs and export taxes (see Figure A1 in Annex A) suggests that the increase in the indicator of openness fairly much reflects a pattern of openness of the Costa Rican economy.
5. It is worth noting that the stage of faster export promotion was more advantageous to agricultural output growth relative to that of faster trade liberalisation.
6. A SAM is a square matrix that records the transaction accounts of an economy and was conceived as an initial step for understanding income distribution as an integral part of the development process. The particular focus on income distribution is consistent with more conventional disaggregations of production, factors, trade, etc. (Pyatt and Round, 1977: 339).
7. An average propensity to spend results from calculating the share of a particular expenditure with respect to the total expenditure. The analysis of APSs allows looking at the structure of the economy in terms of flows between the economic agents and at the expenditure structure of the economy in a com-

parative manner. APSs are fixed, linear, valued at constant prices and considered stable over the short - to medium - term (see e.g., Pyatt and Roe, 1977; Pyatt and Round, 1977).

8. For obtaining the social accounting multipliers, a matrix was calculated from the SAM to determine how income injections affect the expenditures of the exogenous accounts of the matrix, which implies changes in the exogenous demand that generate, under the assumption of idle capacity, additional sectoral production and factor income changes. The analysis of accounting multipliers allows us to give a proper economic interpretation to the elements of the final demand through which input-output linkages (backward and forward) can be determined (see e.g., Pyatt and Roe, 1977; Pyatt and Round, 1977).

9. It is worth mentioning that while trade reform policies began in Costa Rica in 1984, they took place two years later in Guatemala and began much earlier in the 1970s in Chile.

10. The cases of Nicaragua and El Salvador can be considered somehow inconclusive in Weeks' analysis because of the effects of wars in the 1980s. However, even during the reform of the 1990s, a period without war, net agricultural exports continued to decrease in these countries.

11. The National Institute of Statistics and Censuses of Costa Rica carries out the Household Surveys of Employment and Unemployment, which cover about 1 percent of the population and provide information on households' income, working hours, types of employment, education, age, etc.

12. Monge (1994) surveyed 20 non-traditional companies in melon, pineapple, ornamental plants and cassava production in Costa Rica. These activities amounted on average to 83 percent of total agricultural export value during 1985-1991. He came to three conclusions that support the argument posed here: a) 25 percent of the enterprises recruited family labour as permanent workers in off-farm activities (administrative and managerial posts); b) 65 percent of the enterprises recruited family labour as temporary workers; and c) the remaining 10 percent of the enterprises did not recruit family workers at all.

13. Since 1985, year in which trade reforms began to be implemented, the sector tourism has been receiving incentives with the approval of the *Ley de Incentivos para el Desarrollo Turístico*. Data from the Ministry of Tourism of Costa Rica indicates that the number of foreign tourists tripled between 1985 and 1998.

14. The sample of this study included 98 countries distinguished on the basis of trade status (net agricultural exporter, net agricultural importer, self-sufficient) and geography (Southern Europe, Middle East including North Africa, Sub-Saharan Africa, Central Asia, East Asia, Latin America, and industrialised countries).

15. Data availability did not allow calculating the ratio 'labour input/unit of output' which could possibly work better as a proxy for labour intensity. However, Achón's ratio 'sowed land area/labour force' gave us an approximation of the labour intensity in non-traditional agriculture.

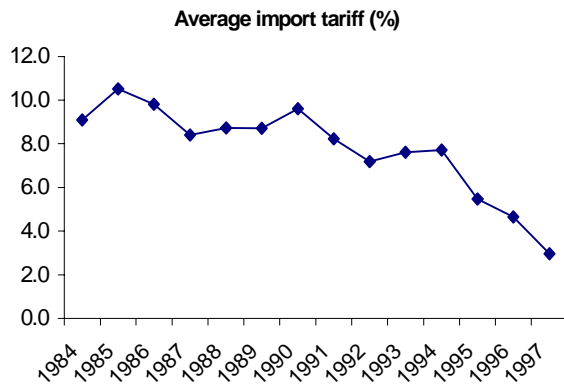
16. These studies included a sample of 19 non-traditional commodities (see Achón, 1994: 259). It should be taken into account that the share of wage cost in production costs is an indicator of labour-intensity which may be affected by relative price changes. However, it confirms what the 'sowed land area/labour force' ratio suggests.

17. Robbins and Gindling (1997: 18-32) studied income inequality in Costa Rica during the trade reform and found that the relative demand for labour has moved towards more skilled labour.

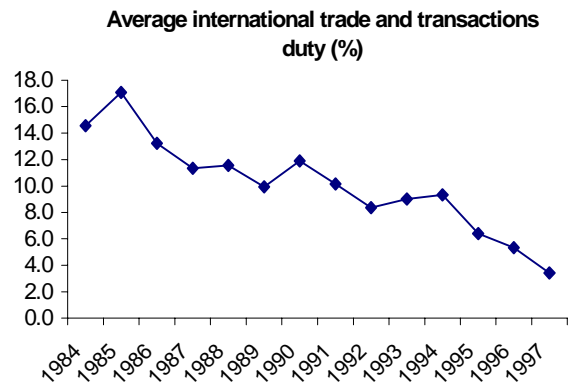
18. Robbins (1996a) conclusions were drawn from cross-sectional household survey data for Argentina, Chile, Costa Rica, Colombia, Malaysia, Mexico, the Philippines, Chinese Taipei and Uruguay.

ANNEXES
A: Figures

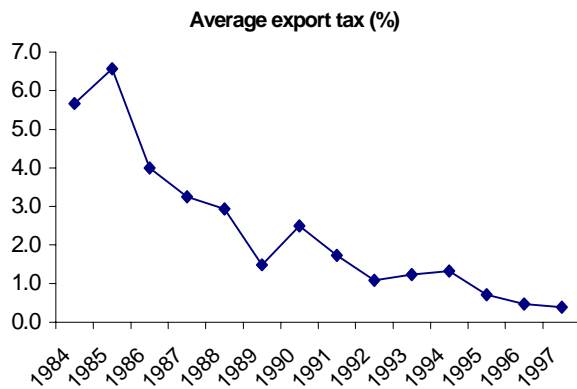
Figure A1. Costa Rica: Taxes and subsidies to international trade, 1984-1997



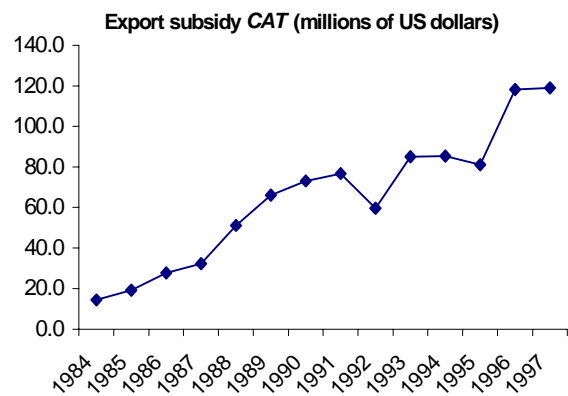
Source: Author's construction based on information from the Customs Information System (SIA), Ministry of Finance of Costa Rica, 2000.



Source: Author's construction based on information from the Customs Information System (SIA), Ministry of Finance of Costa Rica, 2000.

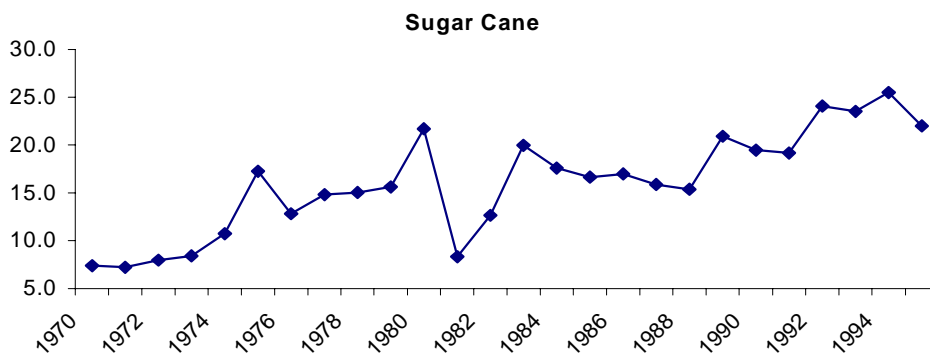
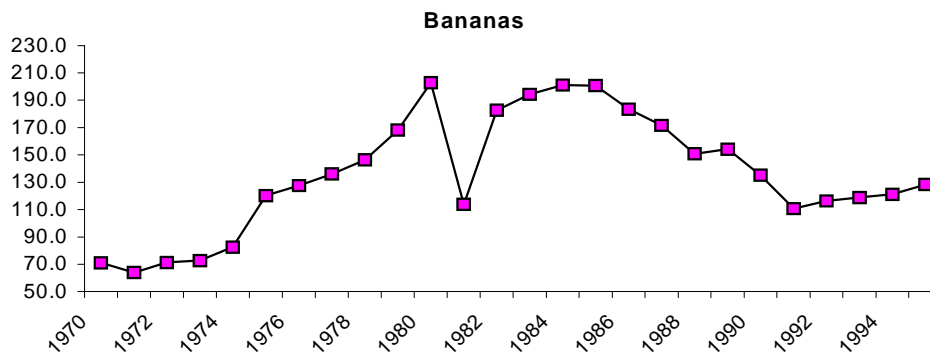
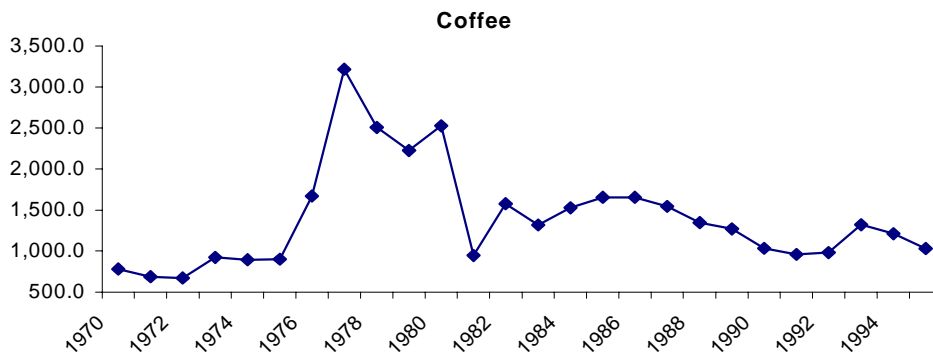
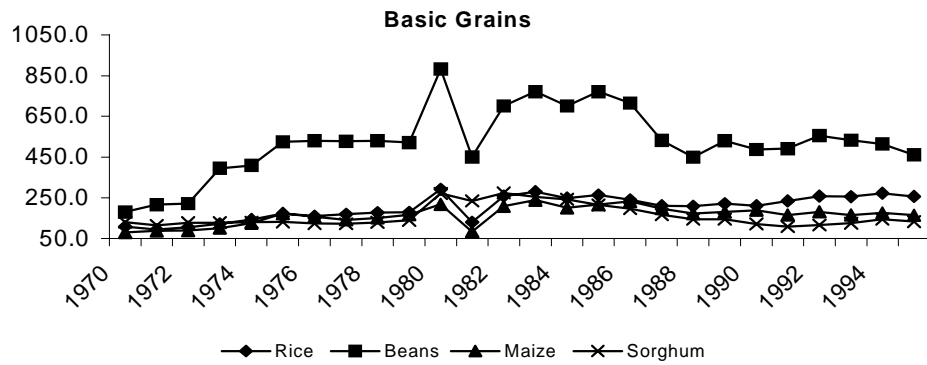


Source: Author's construction based on information from the Customs Information System (SIA), Ministry of Finance of Costa Rica, 2000.



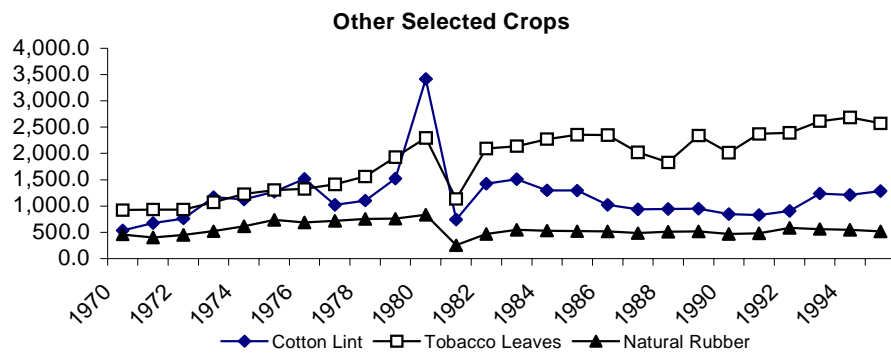
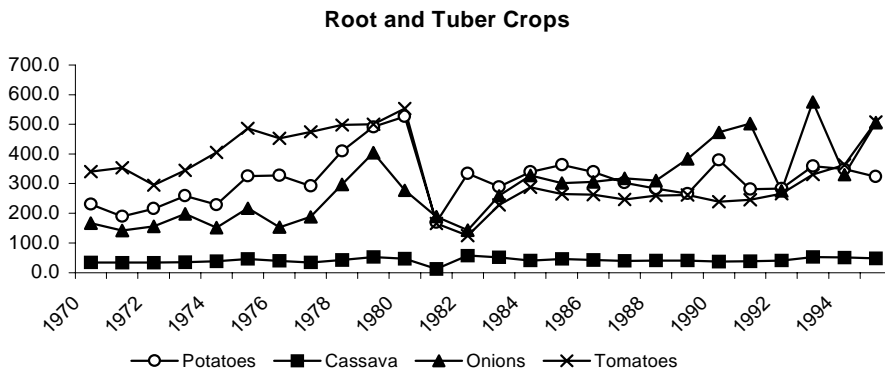
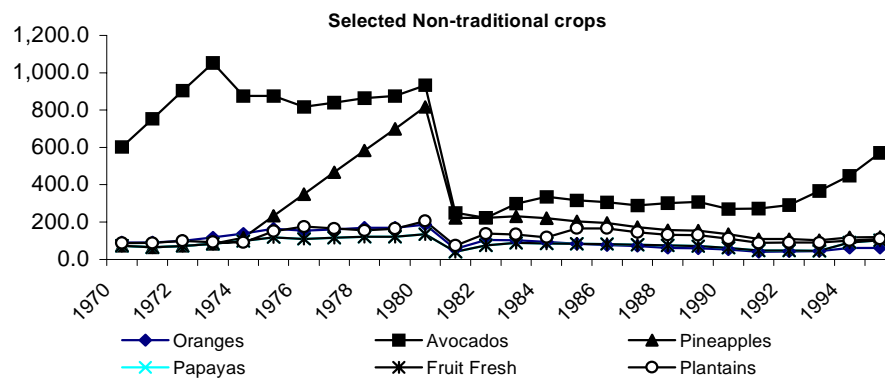
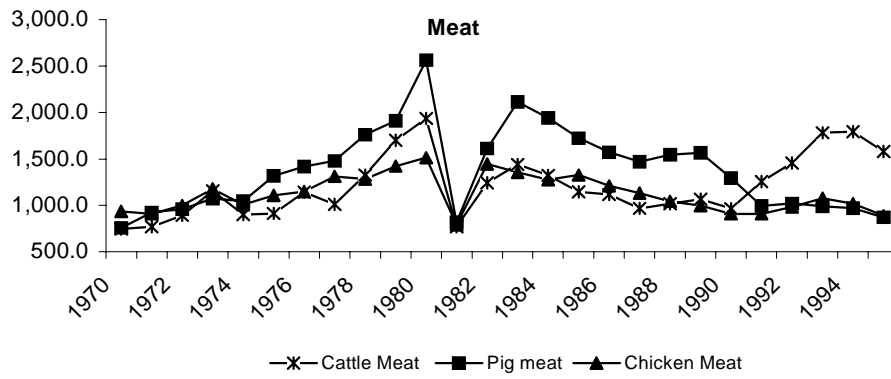
Source: Author's construction based on data from the Central Bank of Costa Rica, 1999.

Figure A2. Producer Prices for Costa Rica's selected main export crops (US\$/Metric Tons), 1970-1997



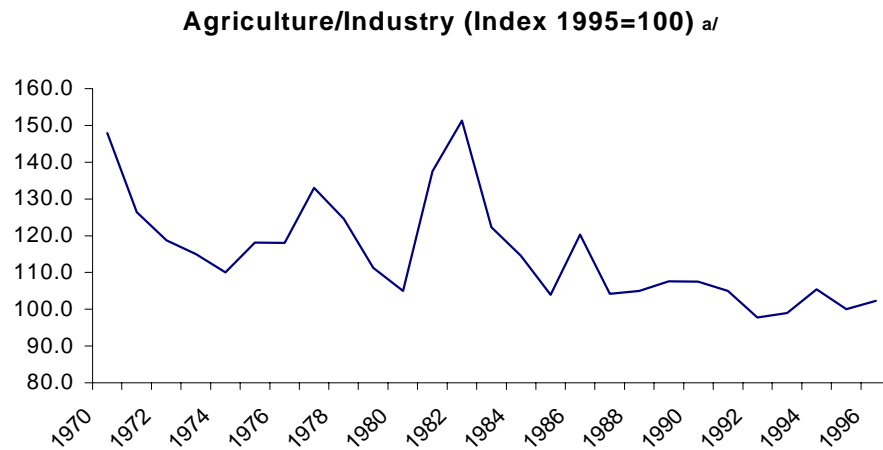
Source: Author's construction based on data from FAO, FAOSTAT DATABASE, 2000.

Figure A2. (continuation)

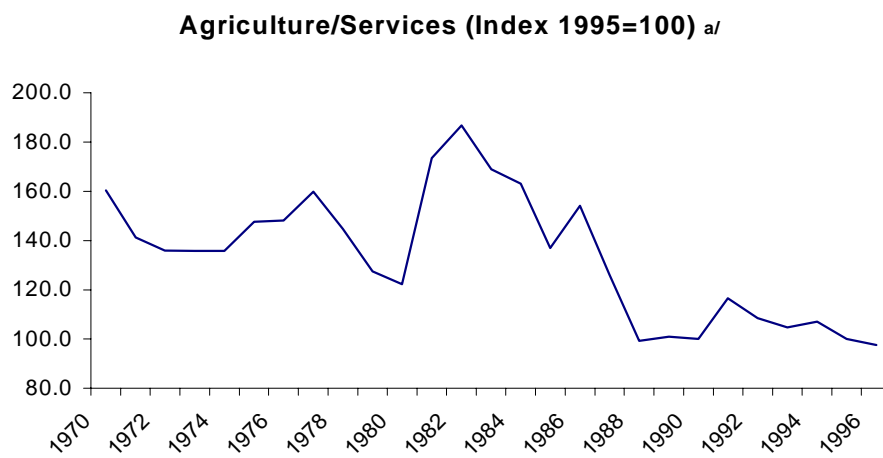


Source: Author's construction based on data from FAO, FAOSTAT DATABASE, 2000.

Figure A3. Costa Rica: Terms of trade of Agriculture vis-à-vis Industry and Services, 1970-1996

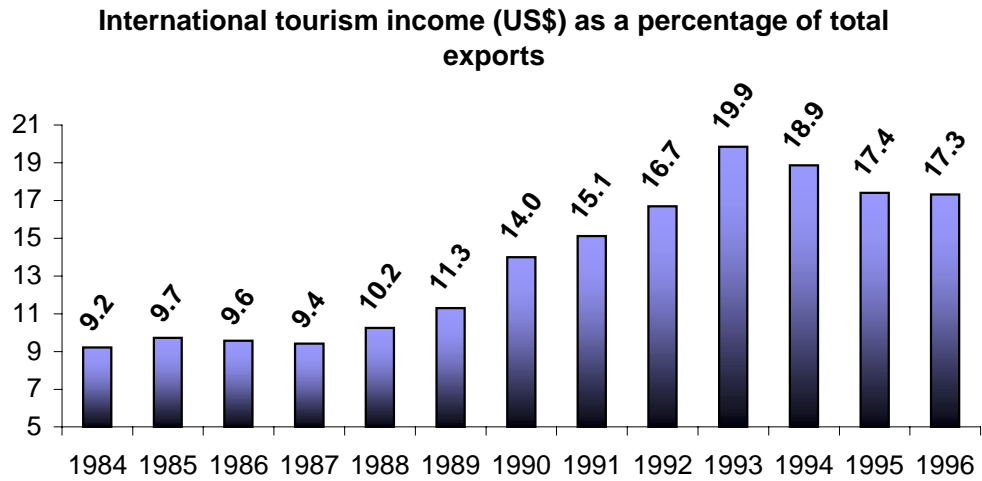


^{a/} The index has been calculated based on the value added ratio between agriculture and industry.
Source: Author's construction based of data from the Central Bank of Costa Rica, 1998.

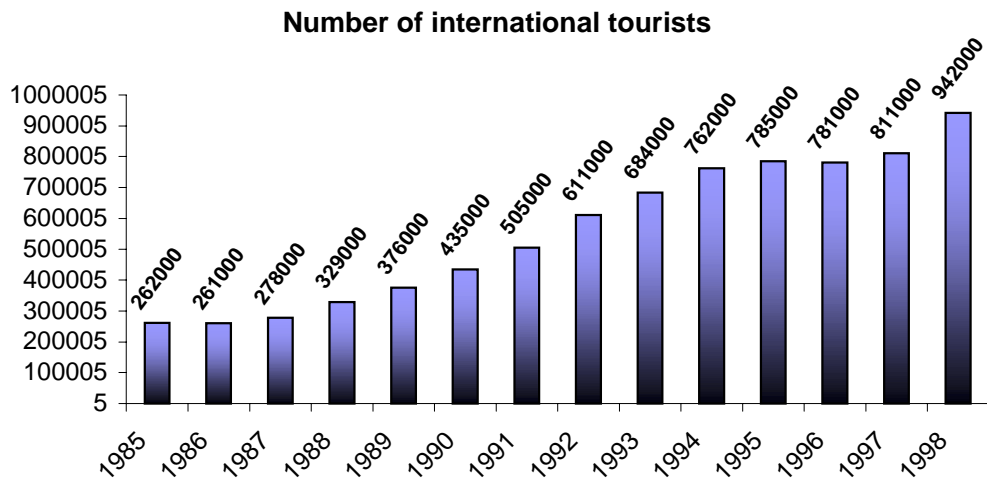


^{a/} The index has been calculated based on the value added ratio between agriculture and services.
Source: Author's construction based of data from the Central Bank of Costa Rica, 1998.

Figure A4. Costa Rica: main trends in international tourism, 1984-1998

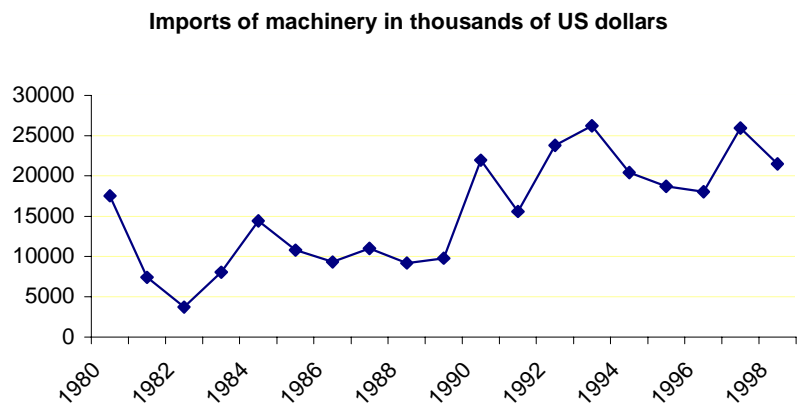


Source: Author's construction based on data from the World Bank, World Development Data Base 1998.

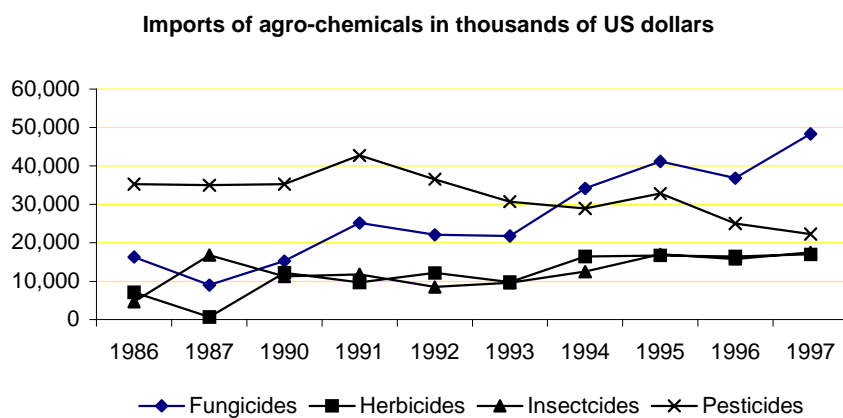


Source: Author's construction based on data from the Ministry of Tourism of Costa Rica, 1999.

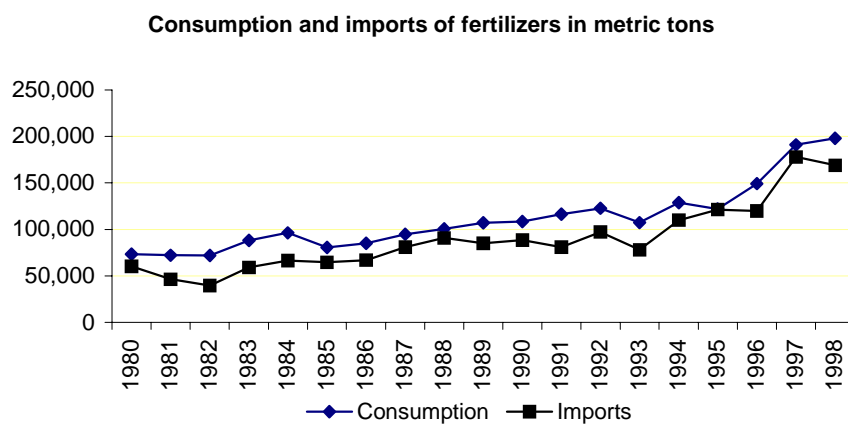
Figure A5. Costa Rica: imports of machinery and agro-chemicals, and consumption of fertilizers in agriculture



Source: Author's construction based on data from the World Bank, World Development Data Base 1998.



Source: Author's construction based on data from FAO, FAOSTAT 1999.



Source: Author's construction based on data from FAO, FAOSTAT 1999.

B: Tables

Table A1: Results of the Social Accounting Model.
Average Propensities to Spend (APSs) and Accounting Multipliers.
Agriculture (traditional and non-traditional) vis-à-vis aggregate sectors ‘Commerce’ and ‘Services and Trade’.

Average Propensities to Spend (APSs) From agriculture to commerce, and services and trade (forward-linkages)		
SECTOR	Traditional agriculture	Non-traditional agriculture
Commerce	0.00	0.00
Services and trade	0.00	0.00

Average Propensities to Spend (APSs) From agriculture to commerce, and services and trade (backward-linkages)		
SECTOR	Traditional agriculture	Non-traditional agriculture
Commerce	0.10	0.11
Services and trade	0.01	0.01

Accounting multipliers Row-wise (forward linkage for agriculture with commerce, and services and trade)		
SECTOR	Traditional agriculture	Non-traditional agriculture
Commerce	0.08	0.10
Services and trade	0.02	0.03

Accounting multipliers Column-wise (backward linkage for agriculture with commerce, and services and trade)		
SECTOR	Traditional agriculture	Non-traditional agriculture
Commerce	0.30	0.27
Services and trade	0.28	0.22