Impacts of currency depreciation on the tree-crop sector in Papua New Guinea

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The recent depreciation of the PNG kina in recent years has improved the overall profitability and competitiveness of the tree-crop sector, but the sub-sectors have fared differently. The coconut and cocoa sub-sectors would have continued to be adversely affected by high local cost levels without the depreciation. The coffee and oil palm sub-sectors would be profitable even without the depreciation. The depreciation alone would not be sufficient to improve the competitiveness of coconut and, to some extent, cocoa production when world prices are low. Viability of the coconut industry remains a serious problem.

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The tree-crop sector contributes substantially to the economic welfare of about 75 per cent of the population in the non-mining sectors in Papua New Guinea (Papua New Guinea 1995). Coffee, coconut (copra and coconut oil), cocoa, oil palm and rubber are the major tree-crop exports, contributing around 30 per cent of total exports and 90 per cent of agricultural exports. The tree-crop sector is crucial for economic development, and its revitalisation is a priority in economic policymaking (Papua New Guinea 1995).

Papua New Guinea followed a hard currency policy from 1975 until September 1994, with the kina pegged to a basket of five currencies of its major trading partners. While the nominal exchange rate for the kina trended downwards from 1975 to 1990, the real exchange rate, the key factor influencing international competitiveness, appreciated (Asian Development Bank 1993). Garnaut and Baxter (1984), Guest (1990) and Elek (1991) favoured the hard currency policy to minimise the impact of imported inflation. Its critics, however, believed it contributed to the declining competitiveness and poor performance of the non-mining sectors, including the tree-crop sector (see, for example, Jarrett and Anderson 1989, Asian Development Bank 1993, World Bank 1995). They argue that the appreciation of the real exchange rate discouraged the use of domestic resources, including labour.

One of the objectives of the current World Bank structural adjustment program in Papua New Guinea is to improve the

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profitability and competitiveness of tree-crop exports. Depreciation of the kina has been one of its major components, and is expected to have widespread impacts across the economy including the tree-crop sector. According to the World Bank (1995), the floating of the kina in October 1994 and its depreciation by about 30 per cent to US$0.75 per kina in July 1995 improved Papua New Guinea's competitiveness (the kina has continued to depreciate, reaching around US$0.40 by late 1999).

This study is undertaken to evaluate the impacts of the depreciation[1] on comparative advantage (CAS) and competitiveness (CAM) in tree crop production and export. The findings are expected to provide some empirical evidence to improve policy dialogue on the tree-crop sector.

Theoretical analysis

Macroeconomic tools such as exchange rates and interest rates are important factors in determining the price aspects of international competitiveness (Han 1991, Warr 1992). As a relative price between tradable and non-tradable goods, the exchange rate is an important determinant of the allocation of resources in an economy by altering the structure of incentives throughout it (Dorosh and Valdés 1990). An appropriate exchange rate and an appropriate structure of relative prices are key ingredients of a stable macroeconomic environment (Ghura and Hadjimichael 1995) that can promote strong international competitiveness of internationally traded commodities like tree-crop exports.

Countries may attempt to solve their cost problems through structural adjustment or cost adjustment. The optimal policy is to restore the real exchange rate to its equilibrium level and undertake structural adjustment within the tradable sectors (Soderstrom 1985). The experience in Papua New Guinea so far indicates that reaching an equilibrium rate and managing the stability of the currency may only be possible with a competitive exchange market, free capital mobility and a positive investor rating of country risk.

Fallon, King and Zeitsch (1995) studied the impact of the real exchange rate on the non-mineral sectors in Papua New Guinea. Their results suggest that an increase in the real exchange rate considerably reduces the competitiveness of these sectors, with a corresponding reduction in exports and increase in imports.

Methodology

Analysis of the impacts of depreciation on CAS and CAM in the tree-crops sector is based on an evaluation of a reduction in the value of the kina from a pre-depreciation level of US$1.05 per kina to a post-depreciation level of US$0.60 per kina. The analysis is undertaken for the four major tree-crops—cocoa, coconut, coffee and oil palm. The evaluations are carried out for smallholders, who produce about three-quarters of tree-crop exports (Papua New Guinea 1995). They are conducted at the farm level (using farm-gate prices) and export level (using f.o.b. export prices), with sensitivity analysis to allow for price variability.

Scenarios with and without depreciation are simulated, and their impacts on the tree-crop sector evaluated in terms of

- financial and economic rate of return (FRR and ERR)
- domestic resource cost (DRC) ratios
- sensitivity of the above two estimates
- the dollar earned per kina of DRC used in the production of tree-crop exports and
- breakeven farm-gate and f.o.b. export prices.

Two types of farm budgets are prepared for representative farm models of each tree-crop. First, a financial or market-price budget is prepared using market prices for all costs

and benefits. The market-price budgets are decomposed into traded and non-traded items. Traded items are imports or import substitutes and exports or diverted exports. Tradable inputs are classified as foreign resource costs (FRC) for the purpose of the analysis. Domestic resource costs (DRC) are costs of non-traded inputs (goods and services that cannot be normally exported or imported). Second, the market-price budgets are transformed into economic or shadow-price budgets using the shadow prices of production inputs and outputs (Gittinger 1982, Ward, Deren and D'Silva 1991). The standard conversion factor approach (SCF) is used to convert the domestic costs into border prices in order to eliminate any market distortions. The shadow exchange rate (SER) is derived as the official exchange rate (OER) divided by the SER (Gittinger 1982:249).

The discounted cash flow method (Gittinger 1982, Ward et al. 1991) is used to account for the time value of money as the cash flow is over 20 years. The cash flow from the financial farm budget is used to estimate the FRR and the shadow price cash flow is used to estimate the ERR. The discounted costs of production are estimated in terms of non-traded (DRC) and traded (FRC) items.

Parameters used in the analysis are

- shadow wage rate of 60 per cent of the market wage rate (minimum wages)
- SCF of 0.9 to remove distortions in domestic resource prices
- discount rate of 12 per cent per annum
- OER of K1=US$0.55 and SER of K1 = US$0.50.

There are two points where price comparisons can be made—at farm gate, or production point, and at the point of export . These price points allow determination of the price spread over a spectrum of production, processing and marketing activities. At the farm level, income is measured as the farm-gate price times the quantity produced. Only farm production costs are included in estimating the costs of production. At the point of export, the f.o.b. export price times the quantity exported is measured as revenue, and the costs of production include farm production costs plus processing and export marketing costs. All transfer payments (taxes, bounties, levies and so on) are removed from the costs of inputs and outputs.

Tree-crop export income has fluctuated by an annual average of 30 per cent. Sensitivity analysis is carried out by testing the sensitivity of the estimates of CAM and CAS to increases and decreases of prices by 30 per cent. (Note that this effect is equivalent to changing the quantity because the tree-crop export income is the product of prices and quantity.) The breakeven export and farm-gate prices of each commodity are estimated to reveal the impact of price (quantity) variability. The breakeven prices are those below which CAS and CAM is lost. Prices above that level reflect CAS and CAM.

Domestic inflation (measured by the CPI) increased by about 30 per cent after the depreciation. Hence, a 30 per cent increase in DRC is also simulated and the impact measured.

Criteria of competitive and comparative advantage

FRR and ERR are measured following normal practices in estimating internal rates of return in benefit-cost analysis. They are the discount rates that set the net present value of an activity equal to zero (Gittinger 1982).

The DRC ratio is calculated as DRC per unit of net foreign exchange earned (export income in foreign currency less FRC used in the production), expressed in local currency. The numerator—DRC—is measured in local currency and hence requires no conversion. The denominator—the value of foreign exchange saved or earned, or the price of traded output produced minus the traded inputs used in the production—is in foreign currency and hence needs to be converted

into local currency using the exchange rate. If the denominator were left in foreign currency, the measure would be the 'own exchange rate' of the activity—the rate at which it can convert domestic resources into foreign currency.

To estimate CAM, the denominator of net foreign exchange earned in market prices is divided by the market exchange rate to express it in domestic currency. The DRC are then divided by net foreign exchange earnings to measure the DRC ratio in market prices. That is,

$$\left(\sum_{t=1}^{n}\frac{d_m}{(1+r)^t}\div\left(\left(\sum_{t=1}^{n}\frac{p_m}{(1+r)^t}\right)-\left(\left(\sum_{t=1}^{n}\frac{f_m}{(1+r)^t}\right)\div\alpha\right)\right)\right)\div\alpha \quad (1)$$

where d_m and f_m are domestic and foreign resource costs per unit of production at market price expressed in domestic and foreign currency, respectively, over the period t, p_m is the f.o.b. export price in foreign currency per unit of output in market prices, r is the discount rate, and α is the OER (kina per US$).

To estimate CAS, the denominator of net foreign exchange earned in shadow prices is divided by the shadow exchange rate to express it in domestic currency. The DRC are divided by net foreign exchange earnings in shadow prices to measure the DRC ratio in shadow prices. That is,

$$\left(\sum_{t=1}^{n}\frac{d_s}{(1+r)^t}\div\left(\left(\sum_{t=1}^{n}\frac{p_s}{(1+r)^t}\right)-\left(\left(\sum_{t=1}^{n}\frac{f_s}{(1+r)^t}\right)\div\beta\right)\right)\right)\div\beta \quad (2)$$

where d_s and f_s are domestic and foreign resource costs per unit in shadow prices, respectively, over the period t, p is the f.o.b. export price in foreign currency per unit of output at shadow prices, and β is the shadow exchange rate (kina per US$).

When the DRC ratio is less than unity, the shadow-price (market-price) DRC per unit of foreign currency earned or saved is less than the shadow (official) exchange rate, and comparative (competitive) advantage exists (Warr 1992). This means that domestic resources are efficiently used to produce the commodity (in this study, an exportable). If the DRC ratio is greater than unity, there is no comparative or competitive advantage in domestic production. Under these circumstances, domestic production would be more costly than imports, and production would result in a misallocation of domestic resources. The DRC ratio thus serves as an indicator of possible distortion in the economy caused by trade protection and trade policy misdirection. For a detailed discussion on the methodology, refer to Kannapiran and Fleming (1998).

Data collection

Data on the costs of production for cocoa, coffee, coconut and oil palm were provided by the Department of Agriculture and Livestock, Cocoa Board, Cocoa and Coconut Research Institute, Coffee Industry Corporation and Oil Palm Industry Corporation. Other published works were used to supplement these data where gaps exist. See, for example, Overfield (1994), Commodity Working Group–Government of Papua New Guinea (1996), Omuru (1996) and Peter (1996). A field-level survey was carried out to update the data and to collect any missing data. Costs of production vary widely across the country because of the physical, agronomic and geographical features and the farming systems, but a fairly representative farm model was developed for each crop. Prices of inputs and outputs were collected from the respective industry corporations (mainly from their published works).

Results and discussion

Cocoa

- The analysis suggests that the FRR increased after the depreciation from 15 per cent and 29 per cent to 33 per cent

and 47 per cent at the farm gate and point of export, respectively. The comparable increases in ERR are from 33 and 43 per cent to 46 and 59 per cent. After the depreciation, a 30 per cent decline in commodity prices does not adversely affect private profitability (Tables 1 and 2). This finding suggests that the depreciation improved the profitability of the cocoa industry and its capacity to manage commodity price shocks.

- CAM at the farm gate is restored from a marginal DRC ratio of 1.0 to 0.67 following the depreciation (Table 3). CAM and CAS both improved after the depreciation (Tables 3 and 4). The sensitivity analysis suggests that when the cocoa price (quantity) declines by 30 per cent from its mean level, CAM is lost at the export point before the depreciation but is restored after the depreciation. This finding suggests that the risk for private sector investment is reduced after the depreciation.
- The cocoa industry earns US$1.50 (US$2.30) at the farm gate and US$1.67 (US$2.04) at the point of export for every kina of domestic resources at market (shadow) prices (Table 5).
- The breakeven farm gate and f.o.b. export prices per tonne increased from K949 and K1,270 to K1,046 and K1,445, respectively, to reach CAM with depreciation (Table 5). Similarly, to reach CAS, the farm-gate and f.o.b. export prices per tonne must increase from K679 and K949 to K776 and K1,154, respectively. The higher breakeven prices after depreciation suggest an increase in the prices of imported inputs.
- Assuming that the depreciation-linked domestic inflation increases the DRC by

Table 1 **Financial and economic rates of return and sensitivity to price (quantity) variations of tree-crop exports at the farm gate** (per cent)

Details	Cocoa	Copra	Coffee	Oil palm
Financial rate of return (FRR)—private profit				
Base level	33 (15)	7 (-7)	39 (26)	18 (13)
With 30 per cent increase in prices (or quantity)	47 (30)	14 (3)	48 (35)	25 (20)
With 30 per cent decrease in prices (or quantity)	- ve (12)	-7 (-41)	26 (13)	8 (1)
Economic rate of return (ERR)—social profit				
Base level	46 (33)	18 (9)	46 (48)	24 (21)
With 30 per cent increase in prices (or quantity)	60 (46)	24 (15)	56 (57)	31 (27)
With 30 per cent decrease in prices (or quantity)	29 (14)	9 (-3)	35 (36)	15 (11)

Notes: In the case of oil palm the breakeven price refers to the per tonne equivalent of palm oil. A conversion factor of 0.22 is used to derive the fresh fruit bunch (FFB) price.
Figures in parentheses refer to pre-depreciation values.
Source: Author's calculations.

Table 2 **Financial and economic rates of return and sensitivity to price (quantity) variations of tree-crop exports at the point of export** (per cent)

	Cocoa	Copra	Coffee	Oil palm
Financial rate of return (FRR)—private profit				
Base level	47	8	52	47
	(29)	(-7)	(37)	(36)
With 30 per cent increase in prices (or quantity)	62	15	63	60
	(43)	(4)	(46)	(49)
With 30 per cent decrease in prices (or quantity)	- ve	-4	39	29
	(28)	(-33)	(25)	(17)
Economic rate of return (ERR)—social profit				
Base level	59	19	60	50
	(43)	(10)	(45)	(47)
With 30 per cent increase in prices (or quantity)	75	25	71	62
	(57)	(16)	(54)	(60)
With 30 per cent decrease in prices (or quantity)	41	11	47	34
	(26)	(-1)	(34)	(29)

Notes: In the case of oil palm the breakeven price refers to per tonne equivalent of palm oil. A conversion factor of 0.22 is used to derive the FFB price.
Figures in parentheses refer to pre-depreciation values.
Source: Author's calculations.

Table 3 **DRC ratios of tree-crop exports at the farm gate, and their sensitivity to price (quantity) variations**

	Cocoa	Copra	Coffee	Oil palm
Competitive advantage at market prices				
Base level	0.67	1.25	0.49	0.55
	(1.00)	(1.89)	(0.73)	(0.83)
With 30 per cent increase in prices (or quantity)	0.48	0.93	0.37	0.38
	(0.72)	(1.40)	(0.56)	(0.57)
With 30 per cent decrease in prices (or quantity)	1.09	1.94	0.72	1.00
	(1.63)	(2.94)	(1.08)	(1.50)
Comparative advantage at shadow prices				
Base level	0.43	0.77	0.35	0.33
	(0.65)	(1.16)	(0.52)	(0.50)
With 30 per cent increase in prices (or quantity)	0.31	0.57	0.26	0.23
	(0.47)	(0.86)	(0.39)	(0.35)
With 30 per cent decrease in prices (or quantity)	0.69	1.18	0.50	0.57
	(1.03)	(1.79)	(0.76)	(0.86)

Notes: In the case of oil palm the breakeven price refers to per tonne equivalent of palm oil. A conversion factor of 0.22 is used to derive the FFB price.
Figures in parentheses refer to pre-depreciation values.
Source: Author's calculations.

Table 4 **DRC ratios of tree-crop exports at the point of export, and their sensitivity to price (quantity) variations**

	Cocoa	Copra	Coffee	Oil palm
Competitive advantage at market prices				
Base level	0.55	1.15	0.37	0.34
	(0.83)	(1.73)	(0.56)	(0.51)
With 30 per cent increase in prices (or quantity)	0.40	0.69	0.42	0.24
	(0.60)	(1.24)	(0.28)	(0.36)
With 30 per cent decrease in prices (or quantity)	0.90	1.30	0.56	0.58
	(1.36)	(2.86)	(0.84)	(0.88)
Comparative advantage at shadow prices				
Base level	0.40	0.72	0.27	0.21
	(0.56)	(1.09)	(0.41)	(0.32)
With 30 per cent increase in prices (or quantity)	0.29	0.52	0.20	0.23
	(0.40)	(0.79)	(0.31)	(0.15)
With 30 per cent decrease in prices (or quantity)	0.65	1.17	0.40	0.53
	(0.90)	(1.77)	(0.61)	(0.36)

Notes: In the case of oil palm the breakeven price refers to per tonne equivalent of palm oil. A conversion factor of 0.22 is used to derive the FFB price.
Figures in parentheses refer to pre-depreciation values.
Source: Author's calculations.

Table 5 **Breakeven farm gate and f.o.b. export prices and own exchange rates (US$ per kina) of tree-crop exports at the farm gate and at the point of export**

	Cocoa	Copra	Coffee	Oil palm
Breakeven farm-gate price (kina per tonne)				
For competitive advantage	1046	345	1029	115
	(949)	(333)	(990)	(96)
For comparative advantage	776	228	748	87
	(679)	(216)	(713)	(70)
Own exchange rate at the farm gate (US$ per kina)				
At market price of DRC	1.50	0.80	2.00	1.80
At shadow price of DRC	2.30	1.30	2.90	3.00
Breakeven f.o.b. export price (kina per tonne)				
For competitive advantage	1445	423	1441	262
	(1270)	(393)	(1331)	(216)
For comparative advantage	1154	297	1121	205
	(949)	(272)	(1011)	(162)
Own exchange rate at the point of export (US$ per kina)				
At market price of DRC	1.67	0.61	1.88	2.07
At shadow price of DRC	2.04	0.97	2.58	3.30

Notes: In the case of oil palm the breakeven price refers to per tonne equivalent of palm oil. A conversion factor of 0.22 is used to derive the FFB price.
Figures in parentheses refer to pre-depreciation values.
Source: Author's calculations.

30 per cent, the breakeven farm-gate and export prices are K1281 and K1730 to reach CAM, and K752 and K1172 to reach CAS. During the pre-depreciation period, there are instances when the prices fell well below the breakeven prices for CAM.

Copra

- Although the depreciation improved its financial and economic viability, the increase in the rate of return is not sufficient to make the copra industry profitable. The FRR increased after the depreciation from –7 per cent to 7 and 8 per cent at the farm-gate and the exporters' level, respectively. This is still below the opportunity cost of capital in Papua New Guinea. The ERR is higher, and increased to above the opportunity cost of capital, from 9 and 10 per cent to 18 and 19 per cent at the farm gate and point of export, respectively. After the depreciation, a 30 per cent decline in commodity prices leads to deterioration of private profitability, but to a lesser extent than in the pre-depreciation period (Tables 1 and 2).
- CAM could not be restored by depreciation as the DRC ratio remained around 1.25 and 1.15 at the farm gate and point of export, respectively. CAS improved, with DRC ratios declining from 1.16 and 1.09 to 0.77 and 0.72 at the farm gate and point of export, respectively (Tables 3 and 4). This finding suggests that the depreciation is not sufficient to improve CAM in the coconut sub-sector, but does make a difference to CAS. The sensitivity analysis suggests that when the price (quantity) declines by 30 per cent from its mean level, CAM and CAS are lost at the farm gate and point of export, even with the depreciation.
- The coconut industry is the least efficient in terms of exchange earnings. It earns only US$0.80 (US$1.30) at the farm gate and US$0.61 (US$0.97) at the point of export for every kina of domestic resources at market (shadow) prices (Table 5).
- The breakeven farm gate (f.o.b. export) prices per tonne increased from K333 (K393) to K345 (K423) to reach CAM with depreciation (Table 5). Similarly, to reach CAS, the farm gate (f.o.b. export) prices per tonne must increase from K216 (K272) to K228 (K297) (Table 5). Here again, the higher breakeven prices after depreciation suggest an increase in the prices of imported inputs.
- In the event that depreciation-linked inflation increases the DRC by 30 per cent, the breakeven farm-gate and f.o.b. export prices must be K436 and K525 to reach CAM, and K286 and K361 to reach CAS. During the pre and post-depreciation periods, copra prices had fallen well below these breakeven prices.

Coffee

- The FRR to smallholder coffee producers increased after the depreciation from 26 per cent (37 per cent) to 39 per cent (52 per cent) at the farm gate (point of export) (Tables 1 and 2). The ERR declined at the farm gate from 48 to 46 per cent (Table 1). This suggests an increase in real wages or real prices of domestic resources after the depreciation. At the point of export, the ERR increased from 45 to 60 per cent (Table 2). The exporters must have increased their profit margin after the depreciation. With or without the depreciation, a 30 per cent decline in commodity prices does not make the activity unprofitable, because the rates of return are still above the opportunity cost of the capital (Tables 1 and 2). Nevertheless, profitability improved after the depreciation. This finding suggests that the depreciation improved industry profitability and the capacity to manage commodity price shocks.
- The Asian Development Bank (1993) reported adverse CAM and CAS for coffee in Papua New Guinea, but this

study indicates that the situation has changed since the depreciation. Among the tree-crops, coffee is the strongest at the farm gate and second only to oil palm at the industry level in terms of CAM and CAS. CAM (DRC ratios of 0.73 and 0.49 at the farm gate, and 0.56 and 0.37 at the point of export) and CAS (DRC ratios of 0.52 and 0.35 at the farm gate, and 0.41 and 0.27 at the point of export) are at comfortable levels both before and after the depreciation, and improved with the depreciation. The sensitivity analysis suggests that when coffee price (quantity) declines by 30 per cent from its mean level, CAM is lost at the farm gate. This finding suggests the risk factors discouraging private sector investment were reduced after the depreciation.

- The coffee industry is the second most efficient in terms of in exchange earnings and the most efficient in terms of production. It earns US$2.00 (US$2.90) at the farm gate and US$1.88 (US$2.58) at the point of export for every kina of domestic resources at market (shadow) prices (Table 5).
- The breakeven farm-gate and f.o.b. export prices per tonne increased from K990 and K1,331 to K1,029 and K1,441, respectively, to reach CAM after the depreciation. To reach CAS, the farm-gate and f.o.b. export prices per tonne must increase from K713 and K1,011 to K748 and K1,121, respectively (Table 5). The higher breakeven prices after the depreciation suggest an increase in the prices of imported and domestic inputs.
- Depreciation-linked inflation of a 30 per cent increase in DRC causes the breakeven farm-gate and f.o.b. export prices to increase to K1,314 and K1,778 to reach CAM, and K956 and K1,367 to reach CAS. During the pre-depreciation period, there were only one or two instances when the prices went below the breakeven prices for CAM.

Oil palm

- Oil palm is one of the most profitable export crops. The FRR increased after the depreciation from 13 per cent and 36 per cent to 18 per cent and 47 per cent at the farm gate and the exporters' level, respectively (Tables 1 and 2). The improvements in ERR are somewhat lower than the FRR (from 21 and 47 per cent to 24 and 50 per cent). This must be due to the level of price distortion. After the depreciation, a 30 per cent reduction in commodity prices does not make the the activity unprofitable at the point of export (Table 2). However, farm-level profitability is made marginal by the commodity price decline even after the depreciation though to a lesser extent than in the pre-depreciation period (Table 1). The relationship between the farm-gate and f.o.b. export prices must be evaluated to assess the reason for the decline in profitability at the farm level, when at the exporters' level there is no comparable decline due to the commodity price reduction.
- In terms of CAM and CAS, the oil palm industry is the strongest at the export level but second to coffee at the farm level. CAM and CAS in the production and export of palm oil improved with depreciation, with DRC ratios declining from 0.83 and 0.50 to 0.55 and 0.33 at the farm gate, and from 0.51 and 0.32 to 0.34 and 0.21 at the point of export, respectively (Tables 3 and 4). As for coffee, there is a slight increase in advantage at the point of export. This must be due to the disproportionate sharing of the profit between the producers and exporters (see Gumoi 1993). The sensitivity analysis suggests that the industry is strong enough at both farm and industry levels to meet the challenges of commodity price variations after the depreciation. A palm oil price (quantity) decline by 30 per cent from its mean adversely affects

CAM in the pre-depreciation period but not after the depreciation.

- The oil palm industry is the most efficient in terms of exchange earnings. It earns US$1.80 (US$3.00) at the farm gate and US$2.07 (US$3.30) at the point of export for every kina of domestic resources at market (shadow) prices (Table 5).
- The breakeven farm-gate and f.o.b. export prices per tonne increase from K96 and K215 to K115 and K262 to reach CAM, and from K70 and K162 to K87 and K205 to reach CAS, respectively (Table 5). The higher breakeven prices after the depreciation suggest an increase in the prices of imported inputs.
- If depreciation-linked domestic inflation increases the DRC by 30 per cent, the breakeven farm-gate and f.o.b. export prices must be K133 and K297, respectively, to reach CAM and K99 and K228 to reach CAS (Table 5). During the pre and post-depreciation periods, there was no instance when palm oil prices went below the breakeven prices.

Conclusion

The results reported in this study show that the depreciation of the kina has achieved the twin objectives for the tree-crop sector of improving competitiveness and profitability. The coffee and oil palm industries would be profitable with and without the depreciation, and their farm-gate and export prices have been higher than the respective breakeven prices. Their competitive and comparative advantage has also improved after the depreciation. Sensitivity analysis suggests that neither the competitiveness nor comparative advantage of coffee and oil palm is adversely affected by a 30 per cent reduction in commodity prices. The results suggest, however, that depreciation alone is not sufficient to achieve financial profitability in the coconut industry and, in some circumstances, the cocoa industry. Without the depreciation, competitiveness in the coconut and cocoa industries would have been badly affected by their high cost levels. Sensitivity analysis shows that the competitiveness of coconut and cocoa producers would be adversely affected by a 30 per cent reduction in commodity prices. Cocoa export prices at times have been lower than the breakeven price, and copra export prices have been well below the breakeven price.

Note

[1] Depreciation includes the devaluation of the kina (K) in 1994 and the subsequent depreciation.

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