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Firm-Level Responses to the CFA Devaluation in Cameroon[1]

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This article assesses the impact of the CFAF devaluation on industrial enterprises in Cameroon. Using detailed survey data spanning the 1992–95 period, the article documents and interprets firms' reactions to the devaluation in terms of adjustments in output, factor usage, market orientation and productivity. The article shows that the CFAF devaluation had the expected effect of increasing the return to producing tradable goods, and increased the real cost of using importing intermediate goods. Despite slow output growth, the pooled sample registered a cumulative rate of productivity growth exceeding 6% over the 1992/93 to 1994/95 period. Exporters appear to have done better than non-exporters, and medium-sized firms appear to have done the worst. These results are robust with respect to measurement technique, and can be obtained using either production or cost data. Hence encouraging signs of efficiency gains are present. The devaluation also influenced export supplies. Firms with low unit costs were relatively likely to become exporters, and tradable goods producers, who were favoured by the devaluation, expanded output. However, the number of firms in our sample that exported did not increase dramatically after the devaluation.

[1] This article is based on a larger study commissioned by the Union Douanière et Économique de l'Afrique Centrale (UDEAC) and the World Bank. Julie Hunt, Isidro Soloaga and Michel Sylvain provided extensive research assistance. Under the supervision of the Centre d'Etudes en Administration Internationale (CETAI) at the University of Montreal, Georges M'benda and Lucie Brindamour conducted field interviews to augment the existing RPED data base.

Introduction

Between 1986 and 1993, adverse terms of trade shocks combined with a rigidly pegged nominal exchange rate and various domestic distortions to reduce Cameroon's per capita income by roughly 50% (World Bank, 1995). Major policy reforms were slow to come, but the CFA franc was finally devalued in 1994. Simultaneously, the Cameroonian government implemented a set of accompanying measures to liberalise trade and reduce tax distortions.

Most analysts agree that the devaluation and accompanying reforms have been desirable, and were necessary for the revitalisation of the Cameroonian economy. However, there is also a widespread belief that the industrial sector has not yet shown a dramatic response. One reason may be that the devaluation was insufficient to change the incentive structure at the 'ground level' decisively. An alternative possibility is that the incentive structure changed, but firms have been unable to react, either because they have not had time, or because they are shackled by the institutional environment and infrastructure problems. Finally, it may be that the devaluation has created clear signals and firms are responding, but no one knows this because the evidence has not yet been collected and analysed.

This paper assesses the merits of these alternative interpretations. It shows that the CFAF devaluation did have the expected effect of increasing the return to producing tradable goods, and increased the real cost of using importing intermediate goods. Overall, real output did not grow much in the pooled sample of firms. This is unsurprising, given that these firms experienced modest increases in real unit costs on average. However, changes in relative prices did seem to matter in terms of moving resources between activities. Firms that experienced declines in unit costs expanded (especially firms producing exportable goods) and firms that experienced increases in unit costs contracted (especially firms that relied on imported intermediate goods).

Despite slow output growth, the pooled sample registered a cumulative rate of productivity growth exceeding 8% over the 1992/93 to 1994/95 period. Exporters appear to have done better than non-exporters, and medium-sized firms appear to have done the worst. These results are robust with respect to measurement technique, and can be obtained using either production or cost data. Hence encouraging signs of efficiency gains are present.

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The paper is organised as follows. Section 1 provides an overview of the pre-devaluation conditions in Cameroon. Section 2 describes the devaluation and associated reforms. Section 3 quantifies the importance of the devaluation from a firm-level perspective using detailed survey data spanning the 1992–95 period.[2] Section 4 documents and interprets firms' reactions to the reforms in terms of adjustments in output, factor usage, market orientation (domestic versus external), and productivity, with particular attention to the issue of whether reforms have generated the intended responses. Finally, Section 5 concludes.

1. Roots of the Crisis[3]

Upon gaining independence in 1960, Cameroon adopted an inward-looking industrialisation strategy. Foreign investors were attracted with preferential tax treatment, while export taxes and high tariff barriers encouraged import substitution. The state also played a direct role in the industrialisation process with directed credit programmes, and by creating public enterprises through the Societé Nationale des Investissments (SNI).

In terms of industrial growth rates, these policies were successful for almost two decades. Between 1961 and 1979, the average annual sector-wide growth rate was 9.7%. However, they also led to major price distortions and to the domination of industry by foreign and public interests, while the indigenous private sector remained under-developed.

[2] Most of these data were collected by the CETAI for the Regional Programme on Enterprise Development (RPED) of the World Bank. Three rounds of a multi-purpose survey were administered between 1993 and 1995 among approximately 200 firms in four manufacturing sub-sectors, wood, textile, food and metal. Follow-up interviews were subsequently conducted with a subset of the RPED firms to obtain detailed price and quantity information on inputs and outputs.

[3] Our summary of the pre-reform conditions in Cameroon is based on World Bank (1995) and Gauthier (1995).

The focus on industrial-sector promotion shifted when Cameroon discovered oil in 1978. Coupled with OPEC price hikes, this development fuelled rapid growth between 1978 and 1986. But the surge in oil revenues drove up the relative price of non-tradable goods, squeezing industrial sector profits.[4] Further, it increased the state's role in the economy, and allowed policy makers to postpone much needed reforms.

Cameroon's economic boom was abruptly halted in the late 1980s by the collapse of world prices for oil and other export commodities. Between 1986 and 1989 the terms of trade deteriorated 50%. Simultaneously, capital fled the economy, leading to a sharp reduction in the liquidity of the domestic banking system. Policy makers initially resisted cutbacks in public sector salaries and investment projects, financing the deficit with increased external borrowing and arrears to the private sector, thereby exacerbating the banking sector crisis. (Their access to external funds was facilitated by Cameroon's membership in the CFA zone, which guaranteed currency convertibility.)

External conditions did not improve, and in September 1988 the government accepted a stabilisation package supported by an 18 month IMF standby agreement. This was followed one year later by a Structural Adjustment Programme (SAP) financed through the World Bank and bilateral donors. The programme's broad objectives were to re-establish income growth and reduce constraints on private sector development.

The nominal exchange rate was fixed *vis à vis* the French franc by the CFA zone, so the government was forced to rely on other policy instruments for adjustment. The result was a large drop in income, without export growth. Because of the pervasiveness of the public sector, its downsizing was extremely difficult. The inward focus of domestic industry, the widespread public controls on economic activity and the overvalued exchange rate made it impossible for traditional and non-traditional exporters to expand their sales abroad and compensate for the declining oil revenues. By 1993, per capita income had fallen to half of its 1986 value (World Bank, 1995). The imple-

[4] By 1986 the domestic private sector produced 15% of manufactured output, the public sector 50%, and foreign interests 35% (CRETES, 1990). Over the same period, the state's share of GDP increased from 18% to 24%.

mentation of structural reforms and devaluation of the exchange rate had become unavoidable.

2. Policy Responses: 1992–95

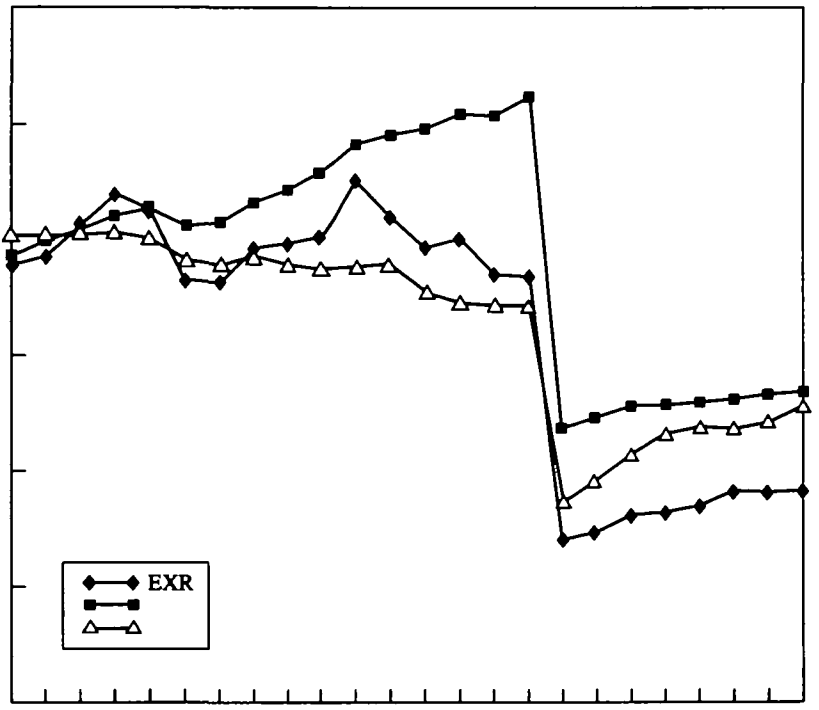
In January 1994, the CFA franc (CFAF) was devalued from 50 per French franc to 100 per French franc. At roughly the same time, a set of accompanying measures was implemented, aimed at reforming tax and commercial policy. Policy-makers hoped that these reforms would improve the functioning of the economy in a number of ways. First, the devaluation was meant to reduce the current account deficit by shifting production into tradable goods and discouraging tradable goods consumption. Second, accompanying measures were intended to reduce the bias toward import-substitution, and thereby to improve allocative efficiency. These measures included unifying the tax structure and scaling back the pervasive system of exemptions. Third, in the short-run, the reform package was intended to increase capacity utilisation by relaxing the foreign exchange constraint. Fourth, it was hoped that the new regime would attract long term capital inflows, thereby accelerating investment and medium term growth.

2.1 The Real Exchange Rate Adjustment

Before discussing whether these objectives were realised, it is useful to review the reforms in more detail. The 50% CFAF devaluation was the single most dramatic policy change. As Figure 1 confirms, both the dollar value (EXR) and the trade-weighted foreign currency value (NEER) of the CFAF fell initially by the full amount of the nominal devaluation. (Each exchange rate series represents the value of the CFAF in terms of foreign currency, so downward movements correspond to depreciation.) However, because Cameroon experienced a burst of post-devaluation inflation, the trade-weighted real effective exchange rate (REER) appreciated somewhat in the aftermath of the 1994 realignment. In fact, this series implies that the real value of the CFAF was only 20% less in the final quarter of 1995 than it was in the final quarter of 1993.

The REER series in Figure 1 describes general changes in the price of Cameroonian goods, relative to foreign goods. However, to study resource allocation within Cameroon it is preferable to use the textbook definition of the real exchange rate, that is, the price of Cameroonian

Figure 1:
CFA Exchange Rate Series



Source: IMF *International Finance Statistics*. All indices are normalised to 100 in 1990.

tradables over the price of Cameroonian nontradables. Although such a series is not directly available, it can be imputed from simulation models. This approach has the added advantage of inferring the 'sustainable' real exchange rate, and thus allows one to assess (albeit crudely) the extent of the currency over-valuation. Performing such an exercise, Devarajan (1996) finds that Cameroon was 60–80% overvalued prior to January 1994.[5] Thus, these estimates suggest that the RER

[5] This estimate is robust with respect to assumptions concerning the base year and supply and demand elasticities.

alignment so far has been insufficient to restore sustainable trade flows.[6]

2.2 Regulatory Reforms and the Institutional Environment

Tax and Commercial Policies

The liberalisation process initiated under the World Bank's SAP has led to several changes in the Cameroonian business environment, particularly with respect to tax and commercial policies. Prominent in the pre-reform fiscal regime were various special tax schemes and a system of case-by-case tax rate negotiations between individual firms and the tax authorities.

Responding to the World Bank's SAP and to the UDEAC objective of promoting regional economic integration, Cameroon initiated trade and fiscal reforms in 1994.[7] These reforms were intended to correct anti-trade biases by increasing the weight of domestic taxes and reducing tariffs. They were also meant to reduce inequality, distortions, and incentives for evasion through the harmonisation of the tax regimes and general rate reductions. Finally, the tariff reductions dampened both the negative effects of the 1994 CFAF devaluation on firms that import intermediate inputs, and the positive effects of the devaluation on import-competing firms.

Severance Laws

The liberalisation process initiated under the World Bank's SAP has led to other changes in the Cameroonian business environment, particularly with respect to labour markets and severance laws. Prior to the reforms, wages and working conditions were centrally regulated. Salary grids determined minimum wages for workers at every level of

[6] According to *Le Commerce Extérieur du Cameroun*, the trade account was in substantial surplus during each year in the 1988/89–1994/95 period (compare Figures 2 and 3, for example.) Hence in the short run, the exchange rate problem is perhaps better viewed as financing debt service and/or avoiding the 'Dutch disease' effects of oil and wood exports. In the longer term, since the reserves of oil and hardwood are limited, sustainability becomes a critical issue.

[7] The Union Douanière et Économique de l'Afrique Centrale is composed of Equatorial Guinea, Congo, Chad, Cameroon, Gabon and the Central African Republic. It was formed in 1964 by the Treaty of Brazzaville.

employment. Moreover, the Labour Code imposed strict layoff rules which included notification to the labour authorities and large severance payments based on a fixed grid. These regulations exacerbated the already high cost of labour and uncompetitive characteristics of the manufacturing process in Cameroon.

The new code, enacted in 1992, did not abolish salary grids and layoff rules, but it made these statutes more flexible. In principle, there still exists a twelve-level wage scale, but enforcement of minimum wage laws has been relaxed. Also, technical layoff rules now allow more flexibility and severance payments have been reduced. Some constraints remain. Firms must still obtain permission from the Labour Department before offering short-term contracts to workers or hiring foreigners, and minimum wages remain high, albeit often ignored. Finally, in some instances the judiciary system still appears to be enforcing the pre-1992 regime.

Banking Sector

Banking sector reforms were implemented as part of the 1989 SAP. These included the creation in 1991 of an agency responsible for delinquent loan recovery, the rescheduling of debts for private banks and the public sector, and several regulatory changes. Nonetheless, producers continue to mention access to credit as a major problem, especially for SMEs. Their complaint is that they lack formal property titles which they can offer as collateral, and hence are rationed out of the market regardless of their profitability and prospects. The supply of loanable funds has also contracted considerably in real terms since 1989.

Several problems were not addressed in the banking reforms. One is that the law does not clearly define the rights and obligations of parties to a loan contract. A related problem is the lack of banking expertise in the judicial system, and the seeming reluctance of the judiciary to protect banking sector interests (World Bank, 1995).

Corruption

As mentioned earlier, a key characteristic of the pre-reform incentive structure was its non-uniformity. Special production and investment regimes were granted to selected firms on a case-by-case basis. Although originally designed to favour industrialisation, these special

regimes created a rent-seeking economy in which considerable resources were devoted to obtaining licences, privileges and other administrative advantages, as opposed to concentrating on socially productive activities.

Rent seeking activity on the part of tax authorities has increased during the economic downturn as public sector wages have fallen. Licensing procedures, approval processes, and customs and tax procedures have typically involved extraordinary payments that increase the cost of doing business. Indeed, among firms in the RPED sample, more than 65% of all respondents report paying government officials to reduce their fiscal obligations or accelerate the public administration process. (World Bank, 1995, provides specifics and numerous anecdotes.)

Infrastructure

Infrastructure services also remain highly deficient. As reported in RPED surveys, electricity, road conditions, telephone services, and security were each considered to be moderate or major problems by at least 40% of the 200 firm sample. Among larger firms, air/sea ports and roads were placed in this category by 71% and 57% of the firms, respectively, in 1992/93. Road conditions, electricity, water services, waste disposal and security were all perceived to have deteriorated in 1993/94.

3. The Incentive Structure at the Ground Level

The CFAF devaluation and accompanying reforms were meant to shift production toward tradable goods, raise the price of exportable goods relative to import-competing products, and level the playing field with respect to tax burdens. This section quantifies the combined effects of these reforms on the incentive structure as firms perceived it.

3.1 Firm-level Changes in Relative Prices

Let us begin by describing how the various changes in policy have translated into changes in relative prices at the firm level. To address this issue, we revisited firms in the RPED data base and collected recall information on the values and quantities of their five major inputs and five major outputs in the fiscal years 1992–93 through 1994–95. Only a

subset of 37 firms were able to supply complete and credible information; hereafter we will refer to this subsample as the 'Re-surveyed' firms.

Using this subsample we constructed unit prices for each product by dividing the value of production by the number of units produced. For example, indexing products by j, we obtained $P_{jt} = V_{jt} / Q_{jt}$, $j = 1, J$. Intermediate input prices and the cost of labour were imputed analogously. Next, using these product and input specific prices, we constructed firm-specific Fischer indices of the price of each firm's output bundle, P_Q, intermediate goods bundle, P_I, and set of workers, P_L.[8] Taking growth rates in these indexes between the fiscal years 1992–93 and 1994–95, firm by firm, we then obtained the cross-firm distributions of growth rates for output and input price changes summarised in Table 1. This two-year time period spans the devaluation and reforms that took place in 1994. The distribution is broken down by sector, by whether the firm was an exporter in 1994–95, and by whether the firm was heavily dependent upon imported inputs.

Relative Input Prices

Several clear patterns in input prices emerge. First, the combination of devaluation and commercial policy reforms increased the relative price of inputs for the average and the median firm. There is a wide range of variation across firms, but the typical increase is about 35%, and more than three quarters of all firms experienced at least some increase. More detailed analysis (not reported) indicates that virtually all of this price increase occurred after the January 1994 devaluation.

Second, export-orientated firms did better than non-exporting firms in the sense that the ratio of their input prices to their output prices grew relatively little. This is what one would expect, given that exporters should have enjoyed a relatively large increase in the CFAF price of their output.

[8] The Fischer price index is a geometric average of the Laspeyres price index, which uses beginning-year quantities as weights, and the Paasche price index, which uses final-year quantities as weights.

Table 1:
*Growth in Prices of Output, Intermediate Input and Labour (Re-surveyed Subsample, Cumulative Percentages 1992–93 to 1994–95)**

	Mean	Standard Deviation	Median	Interquartile Range
Pooled sample (37)				
Output price (P_Q)	35.8	67.1	19.2	2.0 to 58.5
Input price (P_I)	65.0	59.1	71.3	18.7 to 99.6
Wage rate (P_L)	31.5	94.9	15.8	–18.2 to 47.6
Rel. input price (P_I/P_Q)	39.3	61.2	32.9	6.0 to 66.5
Rel. labour cost (P_L/P_Q)	16.6	95.5	–4.4	–34.4 to 40.0
Domestic input intensive (20)				
Output price (P_Q)	26.7	70.0	14.6	–14.2 to 53.1
Input price (P_I)	51.2	58.6	48.5	0.8 to 80.1
Wage rate (P_L)	29.0	76.6	23.5	–17.8 to 50.6
Rel. input price (P_I/P_Q)	35.7	54.9	39.6	10.5 to 54.3
Rel. labour cost (P_L/P_Q)	24.7	80.5	12.7	–30.2 to 63.9
Imported input intensive (17)				
Output price (P_Q)	46.6	64.0	26.5	14.5 to 58.5
Input price (P_I)	81.2	57.3	89.1	71.3 to 117.0
Wage rate (P_L)	34.5	115.2	7.6	–34.6 to 38.8
Rel. input price (P_I/P_Q)	43.5	69.4	41.2	–2.3 to 95.6
Rel. labour cost (P_L/P_Q)	7.1	112.4	–26.6	–39.5 to 5.4
Non exporters (22)				
Output price (P_Q)	24.8	57.9	15.6	–8.6 to 38.1
Input price (P_I)	66.2	65.5	67.9	2.7 to 104.1
Wage rate (P_L)	47.7	109.5	31.3	–18.2 to 69.9
Rel. input price (P_I/P_Q)	45.1	56.1	41.2	6.9 to 75.6
Rel. labour cost (P_L/P_Q)	34.6	104.8	13.6	–23.0 to 57.5
Exporters (15)				
Output price (P_Q)	58.8	81.1	50.6	15.0 to 74.3
Input price (P_I)	62.3	45.3	73.1	35.0 to 92.3
Wage rate (P_L)	–2.2	38.2	–1.9	–20.4 to 15.9
Rel. input price (P_I/P_Q)	27.2	71.7	23.7	–9.0 to 36.2
Rel. labour cost (P_L/P_Q)	–20.8	60.1	–32.0	–48.4 to –10.7

*Numbers of firms in each subsample are given in parentheses

Third, also as expected, firms that relied heavily on imported intermediates did relatively poorly. Note, however, that these firms were able to pass on some of the increases in their input prices as higher output prices. Presumably many of them were producing tradable goods.

Relative Wages

The median relative wage fell by 5% and the interquartile range for output price increases lies above the range for wage increases. So the CFA devaluation apparently pushed down real unit labour costs for most firms. The Salter-Swan model provides a likely explanation (e.g. Corden, 1981). Devaluation increases the price of tradable goods immediately, but wages are fixed by contract and adjust slowly. Note, however, that average real wages rose relative to output prices by about 17% between 1992–93 and 1994–95, implying the presence of some influential outliers.

3.2 The Effects of Changes in Relative Prices and Wages on Costs

Thus far we have established that the devaluation and reforms indeed changed relative prices and wages as intended. We next wish to determine which of these changes (if any) constituted an important shock to operating costs, and whether taken together, they systematically favoured some types of activity over others.

A Methodology for Decomposing Costs

To address these issues, it is convenient to begin with the firm's long run cost function, which gives the minimum attainable cost (C) at a given output (Q), productivity level (A), and vector of input prices for intermediate goods, labour and capital (P_I, P_L, P_K). Let us write this function as:

$$C = f(Q, P_L, P_I, P_K, A) \tag{3.1}$$

Then by Shepard's lemma, the first derivatives of the cost function are the cost-minimising factor demands, so for firms that behave optimally,

$$d\ln C = (1/\eta)d\ln Q + s_I(d\ln P_I) + s_L(d\ln P_L) + s_K(d\ln P_K) + \left(\frac{\delta \ln C}{\delta \ln A}\right)d\ln A \tag{3.2}$$

where s_j denotes the share in total cost of the j^{th} factor, and η is the elasticity of output with respect to cost, i.e. returns to scale.

Incremental changes in the logarithm of a variable correspond to that variable's growth rate, so there is a simple interpretation for equation 3.2. It expresses the rate of growth in total cost as the rate of growth in output, weighted by the inverse of returns to scale, plus the share-weighted average rate of growth in input prices, plus a productivity growth effect.

Normalising by the value of output, we obtain a standard decomposition of the sources of growth in cost per unit revenue (e.g. Chambers, 1988):

$$d\ln C - d\ln(P_Q Q) = (1/\eta - 1)(d\ln Q) + s_I\left[d\ln P_I - d\ln p_Q\right] + s_L\left[d\ln P_L - d\ln P_Q\right] = s_K\left[d\ln P_K - d\ln P_Q\right] + \left(\frac{\delta \ln C}{\delta \ln A}\right)d\ln A \tag{3.3}$$

where P_Q is the price of output. In words, growth in unit costs is equal to the sum of an output growth effect, three relative input price growth effects, and a productivity growth effect. Note that under constant returns (η=1), the output growth effect disappears because efficiency does not depend upon the scale of production.

A second-order Tornqvist approximation to this expression can be constructed in discrete time by replacing differentials with difference operators and replacing shares with averages of their beginning-of-period and end-of-period values, $\overline{s}_j$:[9]

[9] If the (unobserved) cost function is constant returns translog, this expression is exact for the left-hand side (see, for example, Young, 1995). Even if these assumptions do not hold, Equation 3.4 provides a second order approximation.

$$\Delta \ln C - \Delta \ln (P_Q Q) = (1/\eta - 1)(\Delta \ln Q) + s_I\left[\Delta \ln P_I - \Delta \ln P_Q\right] + s_L\left[\Delta \ln P_L - \Delta \ln P_Q\right] + s_K\left[\Delta \ln P_K - \Delta \ln P_Q\right] + \left(\frac{\delta \ln C}{\delta \ln A}\right)(\Delta \ln A) \tag{3.4}$$

where Δ is the difference operator for period t versus $t-1$.[10] The interpretation of each term remains the same when discrete changes in logarithms are used, although they now correspond only approx-imately to growth rates. (The approximation is nearly exact for small rates of growth.)

Implementing the Formula

When we implement Equation 3.4, the output growth effect will be lumped in with the productivity growth effect to yield a general index of efficiency change. We are forced to do this because good measures of the returns to scale are unavailable at the firm level. It is best to think of this scale/productivity term as reflecting all changes in unit costs not accounted for by changes in input prices.

Our assumption that firms frictionlessly adjust all of their factor stocks is unrealistic. Nonetheless, Equation 3.4 should yield a reasonably good approximation to the effects of relative price changes on unit production costs. However the productivity effect should be viewed with more caution, since it is inferred residually as the difference between a number of imperfectly measured variables. Alternative productivity measures based on production-side data will be presented and discussed in Section 4.

To deal with multiple outputs and inputs, we aggregate across the individual commodities using Tornqvist indices. For example, at a given firm, the rate of growth in the output price index is $\Delta \ln P_Q = \Sigma \theta_j \Delta \ln (P^Q_{jt})$, where P^Q_{jt} is the price in period t of the j^{th} product the firm sells, and (suppressing Q superscripts on prices)

[10] Outliers (above the 95th and below the 5th percentile) in the distribution of growth rates were flagged, variable by variable, and the questionnaires were checked for recording errors. When possible, the firms were re-contacted to determine whether extreme values were errors, or actually reflected the firms' experiences.

$$\theta_j = .5\left(\left(\frac{P_{jt-1}Q_{jt-1}}{\sum_{i=1}^{J} P_{it-1}Q_{it-1}}\right) + \left(\frac{P_{jt}Q_{jt}}{\sum_{i=1}^{J} P_{it}Q_{it}}\right)\right)$$

is the average share of the j^{th} product in total revenues in periods t and $t-1$. Analogous methods lead to Tornqvist indices of logarithmic changes in the price of inputs and the price of labour.[11]

Finally, implementation of Equation 3.4 requires a growth rate for the annual rental price of capital. However, this variable cannot be directly observed. We thus assume that the rate of increase in the rental price of capital is the rate of increase in the price of output, causing the fourth right-hand-side term to drop out of Equation 3.4. Also, we take the total rental cost of capital to be 10% of the replacement cost of the capital stocks or the re-sale value of the capital stocks, depending upon which is reported. (Firms were given a choice in the interviews.) Obviously these are crude approximations to the conceptually appropriate measures, but since they only affect the shares of labour and intermediates in total costs, they should not qualitatively change the results on these variables.[12] Their effect on the productivity residual is less innocuous, however, precisely because it is a residual.

What the Data Show

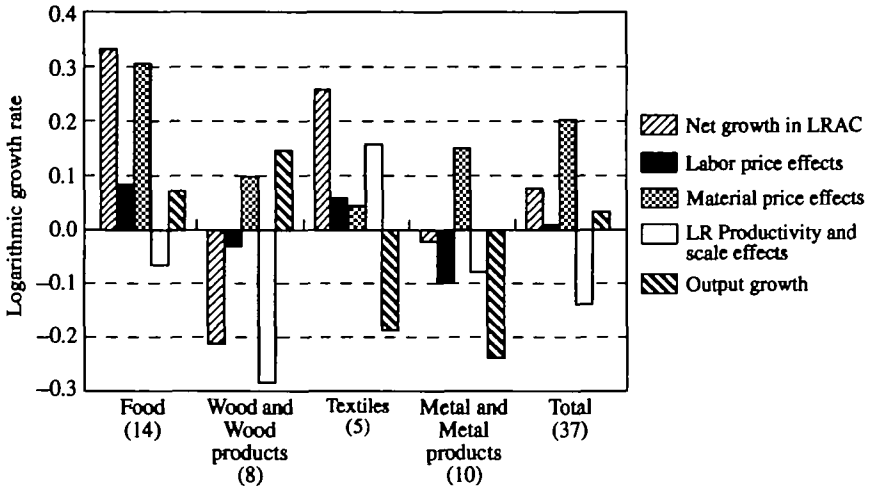
Figure 2 reports weighted average growth rates in cost per unit revenue for the re-surveyed subsample and, using Equation 3.4, decomposes these into the contributions of relative price effects, wage effects and scale/productivity effects. (A negative bar for the scale/productivity effect implies cost reductions due to efficiency gains.) Results are reported for the full re-surveyed subsample, as well as by sector. In each cluster, the right-most bar is the rate of growth in real

[11] In this study the price of labour is constructed as the wage bill divided by the number of workers.

[12] Under these assumptions, capital accounts for about 15% of total costs, intermediate inputs account for about 60%, and labour accounts for about 25%. These figures are typical of factor shares in other semi-industrialised countries.

output. This is not a component of the decomposition; it is reported simply to indicate the rate of expansion or contraction for the associated sample of firms.

Figure 2:
Output Weighted Average of the Growth in LRAC, by Sector



Turning first to the pooled-sample weighted average findings (rightmost cluster), we see that between 1992–93 fiscal year and the post-reform 1994–95 fiscal year, costs per unit revenue rose about 7%. This was attributable to a 20% share-weighted increase in the relative cost of intermediate inputs, which more than offset 14% productivity growth. The real cost of labour barely changed at all. So, although there were some efficiency gains, firms in the full sample were typically a bit less profitable after the devaluation, and the reason was that commercial policy reforms drove up the price of intermediates. Perhaps as a consequence, real output in the pooled sample grew only 3%.

Breaking down the sample by sector, we find relatively large unit cost increases in food (33%), mainly because of large increases in the cost of intermediate inputs. Textiles also exhibit rapid unit cost increases, but in this industry they are attributable to flat output prices

with rising labour costs.[13] Costs per unit revenue actually fell in metal products (–2%), and especially in textiles/apparel (–21%). In contrast to the food and wood products industries, most of the firms in our sample from these sectors were exporters.[14] Output growth in our sample was concentrated in food and textiles/apparel; the other two sectors contracted in real terms. Finally, although productivity figures based on cost functions are crude, it is worth noting that these imply the export-orientated industries managed the most rapid productivity gains (8% in metal products and 28% in textiles/apparels). Regardless of whether one uses weighted averages, medians and unweighted averages (not reported), all imply that efficiency gains helped moderate unit cost increases.

To pursue the sources of intrasectoral variation in unit cost growth, it is interesting to compare firms that imported a large share of their inputs with those that did not. Unless imported inputs all are perfect substitutes for domestic alternatives, one would expect the former firms to experience relatively large input cost shocks. Figure 3 shows that this was indeed the case, regardless of whether one uses weighted averages, medians, or unweighed averages. Comparing the two groups, the difference in unit cost growth rates due to input price changes is roughly 24 percentage points, so the devaluation and reforms placed a substantial extra burden on firms that imported their inputs. One implication is that tariff reductions were dominated by the CFAF realignment, perhaps because many firms were not paying full tariff rates before the trade liberalisation.

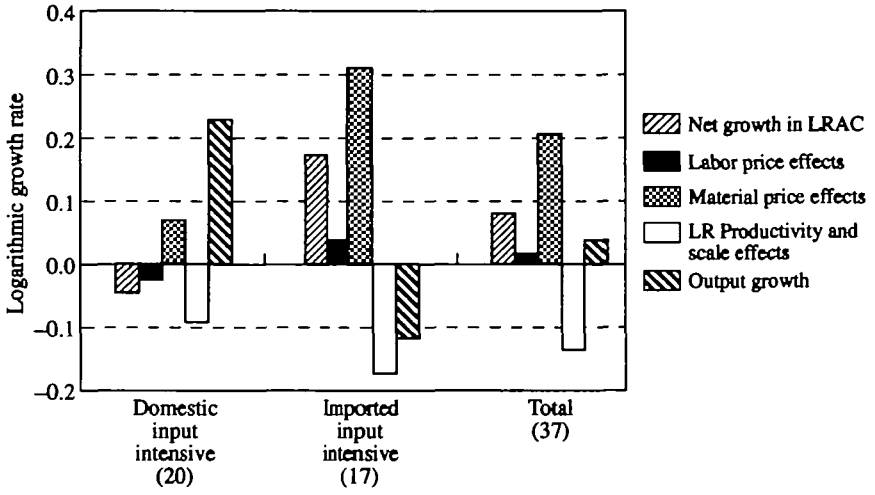
Some firms importing their inputs presumably exported their output, and benefited from offsetting increases in final goods prices. This effect was most important for the metal products sector, which

[13] Although many of the larger wood product firms in the RPED survey are exporters, these firms did not give us complete price information, and hence do not appear in the RPED96 subsample. Our sample of wood product producers is thus composed of small non-exporters who did not experience much increase in their output prices.

[14] In 1994, 5 of the 10 metal products firms in our sample are exporters, and 5 of the 8 textiles/apparel firms are exporters. But only 6 of the 15 food producers and none of the wood products producers are exporters. We caution that our sample is not representative of the population. For example, in the full RPED data set, 18 of the 52 textiles/apparel firms export, and 7 of the 40 wood product firms export.

imported most of its intermediates. However, overall, comparing across firms, there was a weak negative association between shares of inputs imported and shares of output exported.

Figure 3:
Output Weighted Average of the Growth in LRAC, by Imported Input Intensity



To summarise this section, the 1994 CFAF devaluation dramatically increased the price of imported intermediate goods. This increase in costs was large enough to reduce profits for some firms substantially, particularly those that were heavily dependent upon imported intermediates. However, for firms using domestic inputs, and especially for those producing exportable goods, the increase in relative input costs was modest, and did not prevent profit margins from improving. Labour costs rose by roughly the rate of inflation overall, so they went up relative to output prices in non-traded goods sectors, and fell relative to output prices in others. Finally we find some evidence of productivity gains. In Section 4 we will take up the issue of how firms responded to these cost shocks.

4. Responses to the Changing Incentives

It remains to document how firms have responded to the changes in incentives described in Section 3. This section of the study provides

evidence on their output growth, productivity growth, and market orientation (external versus internal).

4.1 Output Growth

One of the fundamental objectives of the devaluation and reforms was to encourage production of tradable goods. Was this goal realised? Table 3 summarises growth rates in these series using weighted averages, unweighted averages, medians, and interquartile ranges. All firm-level growth rates are cumulative for the period 1992/93 to 1994/95, and are constructed using the firm-specific price deflators defined in Section 3 above.

Table 2:
*Real Output Growth by Firm Characteristics (cumulative percentages)**

	Weighted Average	Unweighted Average	Median	Interquartile Range
Pooled sample (37)	3.2	–2.9	–10.7	–36.9 to 25.7
Food (14)	6.9	3.1	–11.9	–33.7 to 26.0
Wood (8)	14.5	21.3	8.2	–27.6 to 40.2
Textiles/apparel (5)	–18.4	–12.9	1.8	–29.8 to 4.7
Metal products (10)	–23.4	–25.7	–25.2	–86.7 to 31.6
Non-exporters (22)	–18.9	–18.4	–25.6	–44.4 to 11.4
Exporters (15)	9.5	19.8	4.9	–15.5 to 36.3
Non-importers (20)	22.5	16.0	8.3	–12.2 to 30.3
Importers (17)	–11.8	–25.1	–31.3	–51.8 to –15.5
Small (17)	–42.6	–8.0	–10.3	–40.3 to 24.8
Medium (14)	–25.4	–2.8	–15.5	–38.6 to 4.9
Large (7)	14.8	9.3	28.5	–29.2 to 36.3

*Numbers of firms in each subsample are given in parentheses

Table 3:
Regression of Output Growth (Δ ln (Q)) on Cost Growth and Industry Dummies (re-surveyed subsample, standard errors in parentheses)

Independent variables	Model 1	Model 2
Intercept	0.061	0.106
	(0.139)	(0.167)
$\overline{s_I}\,\Delta \ln (P_I/P_Q + \overline{s_L}\,\Delta \ln (P_L/P_Q)$	–	–0.439*
		(0.263)
$\Delta \ln (C/P_Q Q)$	–0.593**	–
	(0.157)	
Wood products dummy	0.206	0.162
	(0.231)	(0.267)
Textiles/apparel dummy	–0.001	–0.156
	(0.275)	(0.313)
Metal products dummy	–0.397	–0.328
	(0.218)	(0.250)
Sample size	37	37
R^2	0.363	0.154

* p-value .075, ** p-value .001

Despite the small number of observations, some clear patterns emerge. First, overall, output growth has been close to zero, but this is because small and medium firms have been contracting while large firms have been expanding. Second, exporters, who tend to be the larger firms, have done much better than non-exporters. Interestingly, this pattern depends upon our defining the subsample to be firms that exported in 1994/95. If we take 1992/93 as our reference year, the contrast between exporters and non-exporters disappears. So only the firms that exported under the new regime showed unusually rapid growth. Third, firms reliant on imported intermediate goods did relatively poorly. Finally, the food and wood sectors expanded more rapidly than the textiles and metal products sectors.

How do these patterns relate to the reforms? Overall they are remarkably consistent with the relative price signals we documented in Section 3. Firms reliant on imported intermediate goods experienced

substantial increases in real unit costs, while firms that exported experienced substantial increases in their real output prices. Also, pooling the sample, there was little change in either output or unit costs, on average.

We can be slightly more rigorous about the claim that the relative price signals indeed shifted resources as expected. Regressing real output growth on growth in unit production costs, and including industry dummies to control for sectoral demand shocks and technology, we obtain the results in Table 3. The first column is based on the presumption that unit costs are a direct measure of marginal costs. The second column is based on the presumption that scale economies and measurement error introduce feedback from output growth to average cost growth, and thus uses only the exogenous component of unit cost growth, $\overline{s_I}\,\Delta \ln (P_I/P_Q) + \overline{s_L}\,\Delta \ln (P_L/P_Q)$, as a predictor for growth in real output.

Notice that negative input price shocks are significantly associated with positive output growth, even in our small sample of 37 firms. So firms apparently *did* respond to relative price signals, and output growth was limited at least partly because the price of inputs did not fall much relative to output prices. This explanation is of course consistent with the resource shifts we have already documented toward export-orientated activities and away from activities that rely heavily on imported inputs (see Table 2)

4.2 Productivity Growth

Typically firms become less productive when they contract because idle capacity is created. But if markets were made more competitive by the removal of trade barriers, and if adjustments in factor usage were made easier by the dismantling of severance laws, Cameroonian firms may have reacted to the new environment by improving their efficiency. We saw preliminary evidence that this was the case in our analysis of cost functions; now we look for confirmation from the production side.

Suppose production relationships can be characterised by a general function of the form $Q = g(K, L, M, A^*)$, where Q is gross output and the function arguments are capital, labour, materials, and a productivity index, respectively. (The function need not be the same for

different firms.) Then a second-order Tornqvist approximation to productivity growth can be calculated as:

$$\Delta \ln(A^*) = \Delta \ln(Q) - \bar{s}_M \Delta \ln(M) - \bar{s}_L \Delta \ln(K). \quad (4.1)$$

where $\bar{s}_j$ is the share of the j^{th} input in total costs, averaged over the two periods. In the absence of measurement error and under the assumption of continual long-run equilibrium, the instantaneous growth in A^* is simply the negative of the instantaneous growth in A, which we introduced in our cost function earlier. But of course these conditions do not really hold, and we must work with a discrete time variant of these formulas, so its best to construct both productivity measures and check for robustness.

Applying Equation 4.1 to the re-surveyed subsample, we obtain the cross-firm distributions of productivity growth rates described in Table 5 below.

Regardless of whether we use weighted averages, unweighted averages, or means, the sample clearly exhibits productivity gains between the two fiscal years. Given that we have used very detailed price data to construct our indices of real input growth and output growth, these results strongly suggest that efficiency gains were realised. This conclusion is further supported by the productivity figures based on our cost functions, which we reported in Section 2 above, and which also proved robust to choice of summary statistic.[15]

Clearly, not all firms got better. Half of the firms experienced productivity growth at rates less than 3%, and one quarter of the firms experienced growth below –9%. But the poor performance of these firms was more than offset by substantial efficiency gains among the other half of the sample. The sectoral picture is also mixed. No single industry clearly improves or worsens in terms of all three summary measures, suggesting that there are influential outliners. However, patterns are more stable when we compare exporters to other firms. The consistent message is that exporters did better. A second, and

[15] We worried that the productivity gains might actually reflect reductions in the market value of capital stocks, since these would make firms appear to use less capital per unit output. However, the growth in average capital stocks is very nearly zero. Further, productivity residuals based on short run cost functions do not involve capital stocks values, and these imply larger gains than those based on long run functions.

somewhat surprising message is that only medium-sized firms did poorly.

Table 4:
*Productivity Growth by Firm Characteristics (cumulative percentages)**

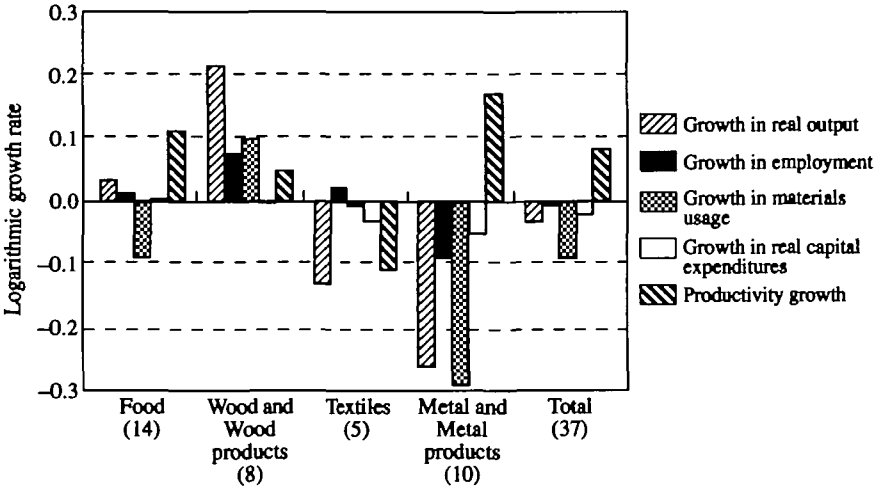
	Weighted Average	Unweighted Average	Median	Interquartile Range
Pooled sample (37)	9.5	8.5	3.0	–9.0 to 28.1
Food (14)	–2.6	11.1	–0.0	–9.0 to 26.0
Wood (8)	27.3	4.8	–0.0	–17.5 to 37.8
Textiles/apparel (5)	–14.4	–11.0	20.1	–54.3 to 27.6
Metal products (10)	–7.6	17.4	11.4	0.06 to 28.1
Non-exporters (22)	4.0	5.3	–0.6	–11.3 to 27.6
Exporters (15)	11.1	13.2	16.2	–4.1 to 33.9
Non-importers (20)	6.1	3.1	16.1	–36.2 to 30.6
Importers (17)	12.1	14.7	0.1	–8.6 to 20.2
Small (17)	6.6	22.8	20.1	–8.0 to 30.0
Medium (13)	–4.2	–12.7	–4.1	–26.5 to 3.0
Large (7)	14.1	13.0	16.2	0.6 to 44.8

*Numbers of firms in each subsample are given in parentheses

It is interesting and remarkable that these gains were accomplished without much output growth. Indeed, among small firms they were accomplished despite contraction (refer to Table 3). One hypothesis that comes to mind is that some firms improved their efficiency by shedding redundant workers. To see if this phenomenon lies behind the productivity figures, we next examine the right-hand side components of Equation (4.1). Each appears as a separate bar in each cluster presented in Figure 4. (Total factor productivity growth figures from Table 4 are also presented for reference.) Overall, there is little evidence that labour shedding was the mechanism through which productivity growth was accomplished. Employment growth was almost exactly zero overall, and positive (albeit slight) in all industries

except metal products. These patterns are robust with respect to whether they are measured by weighted averages, medians, or unweighted means. Further, the metal products industry cut employment mainly because output was contracting, not to increase productivity at given output levels. The productivity growth we observe appears to trace mainly to more efficient use of intermediate inputs.

Figure 4:
Unweighted Average of the Growth in TFP, by Sector



4.3 Export Growth

Finally to analyse export responsiveness, let us begin with the question of whether new exporters were inspired to break into foreign markets by the devaluation and reforms. Widespread entry is a signal that firms considered the future profits from foreign sales to more than outweigh the various start-up costs associated with becoming an exporter.[16] In addition to shedding light on the credibility of export incentives,

[16] These start-up costs involve tailoring their product to foreign markets, developing packaging, establishing distribution channels and researching foreign market conditions.

foreign market entry rates often dictate whether exports will surge or trickle in response to a given policy shock. The reason is that firms already exporting are often unable or reluctant to rapidly increase their foreign sales, even when major changes in the exchange rate have occurred (Sullivan *et al.*, 1995).[17] Rapid export growth therefore often depends upon enticing many non-exporters to pay the start-up costs of breaking into foreign markets.

How much foreign market entry accompanied the CFAF devaluation and concomitant reforms? Ideally we would address this question using comprehensive panel data on the population of manufacturers. But lacking this, we can use the RPED sample of 200 firms to approximate the industrial sector response. Using these data we calculate each of the components in the export growth decomposition from Sullivan *et al.* (1995):

$$\begin{aligned}\frac{Q_t^f - Q_{t-1}^f}{Q_{t-1}^f} &= \sum_{i\in m}\left(\frac{Q_{it-1}^f}{Q_{t-1}^f}\right)\left(\frac{Q_{it}^f - Q_{it-1}^f}{Q_{it-1}^f}\right) + \sum_{i\in b}\left(\frac{Q_{it}^f}{Q_{t-1}^f}\right) - \sum_{i\in d}\left(\frac{Q_{it-1}^f}{Q_{t-1}^f}\right) \\ &= \sum_{i\in m} S_{it-1}^f\left(\frac{Q_{it}^f - Q_{it-1}^f}{Q_{it-1}^f}\right) + \left(\frac{n_{bt}^f - n_{dt-1}^f}{n_{t-1}^f}\right)\left(\frac{\bar{Q}_{bt}^f + \bar{Q}_{dt-1}^f}{2Q_{t-1}^f}\right) + \\ &\quad \left(\frac{\bar{Q}_{bt}^f - \bar{Q}_{dt-1}^f}{Q_{t-1}^f}\right)\left(\frac{n_{bt}^f + n_{dt-1}^f}{2n_{t-1}^f}\right)\end{aligned} \tag{4.2}$$

Here S_{it-1}^f denotes the share of total exports attributable to the i^{th} plant in year $t-1$, n^f refers to the number of plants that are exporting, Q_t^f is output sold in foreign markets during year t, and overbars denote averages among the subscriptal firms. When they appear, i subscripts index firms, b subscripts refer to plants in their first year of exporting,

[17] Studying export booms in Morocco, Mexico and Colombia, Sullivan *et al.* (1995) found that net entry accounted for more than half of the total growth in exports over a five year period. Firms already exporting were either at capacity and unable to export more, or reluctant to redirect output from the domestic market because they faced limited demand for their particular products abroad and/or did not wish to become over-reliant on risky foreign currency-denominated revenue sources.

and *d* subscripts refer to plants that will cease exporting next year. Aggregates without these subscripts refer to the entire set of exporting plants.

We are concerned mainly with the second and third lines of Equation 4.2. The first term there measures the contribution of incumbent exporters to sample-wide export growth. It is a weighted average of the growth in exports among producers who continue to sell abroad ($i \in m$), the weights being their share in total period t–1 exports. The second term measures the effect of net changes in the number of exporters on growth, that is the difference between the number of plants that begin exporting between periods t–1 and t ($i \in b$), and the number of firms that cease exporting over the same interval ($i \in d$). The third term describes the effect on export growth of replacing firms ceasing to export with firms beginning to export. If both groups export the same amount per firm, this turnover effect is nil. On the other hand, when large exporters are dropping out of foreign markets and small scale exporters are replacing them, turnover can be contractionary.

To read this table, notice that the Incumbent Effect, the Net Entry Effect and the Turnover Effect correspond to the final three right-hand side terms of Equation 4.2, and sum to Nominal Export Growth. Both the Net Entry Effect and the Turnover Effect are further decomposed into their multiplicative components, so for example the Net Entry Rate times the Relative Size of entrants is equal to the Net Entry Effect.

Table 5:
*Nominal Export Growth Decomposition (full RPED sample)**

Period	Nominal Export Growth	Incumbent Effect	Net Entry Effect	Net Entry Rate	Relative Size	Turnover Effect	Size Difference	Turnover Rate
92/93 to 94/95	82.5	85.4	8.6	20.8	0.413	–11.5	–0.26	43.8

*All rates are expressed in percentages

Between the 1992–93 fiscal year and the 1994–95 fiscal year, the net entry rate was 20.8%, but the new exporters only exported 41% as much as the incumbents, so the entry effect only amounted to 8.6%. Further, new exporters sold only 26% as much per firm as did the firms that ceased exporting over the sample period, so the replacement of exiting firms with entering firms tended to contract total exports. Put differently, some large-scale exporters dropped out of foreign markets, and the firms that replaced them exported on a much smaller scale.

Combining these effects, we find that virtually all of the export expansion in the RPED sample can be attributed to incumbent firms. There is no evidence that Cameroon generated the kind of entry surge that typically accompanies export booms. Accordingly, it is not surprising that in real terms, overall export growth in the RPED sample was close to nil. Given that the 1994 devaluation should have doubled the CFAF value of foreign sales, the foreign currency value of exports by RPED firms must have actually fallen.[18]

Breaking the sample into two periods, 1992/93 to 1993/94 and 1993/95 to 1994/95, we find that dramatic contraction during the first period was less than completely undone by moderate expansion during the second period (Table 6).

What explains the entry and exit patterns that we observe? Table 7 reports some simple models of the decision to export, and relates behaviour to relative price shocks. The first model expresses the probability of exporting in 1994–95 as a function of short-run average costs (measured as the ratio of labour and intermediate costs to the value of output) and industry dummies. Clearly, the results imply that those firms with lower average costs are more likely to be exporters. So measures that reduce unit short run costs — either by driving up output prices relative to intermediates (as we saw occurred for

[18] Unfortunately, it is difficult to know what has happened to aggregate manufacturing exports. Figures provided by Cameroon's Department of Statistics and National Accounts (1996) show a strong recovery in the volume of manufactured exports, yielding 71% real growth (in 1990 prices) between 1992/93 and 1994/95. But COMTRADE data, which are available only for Cameroonian exports to the OECD, show the dollar value of exports falling almost 50% between 1992 and 1995. Since IMF Direction of Trade data show 80% of Cameroonian exports going to industrialised countries, and the RPED data suggest a similar figure, it is hard to reconcile COMTRADE figures with those of the Department of Statistics and National Accounts.

Table 6:
Nominal Exports of RPED Sample Firms
(Billions of current CFAF)

	1992–93	1993–94	1994–95
Exports to Africa	n.a.	10.8	30.3
Exports outside Africa	n.a.	39.4	135.4
Total exports	88.1	50.2	165.7

Table 7:
Profit Models of the Decision to Export in 1994–95
(standard errors in parentheses)

Independent Variables	Model 1	Model 2
Intercept	–0.433	–0.944
	(0.198)	(0.290)
ln (short run av. cost)$_{1992\text{-}93}$	–	–0.352
		(0.336)
ln (short run av. cost)$_{1994\text{-}95}$	–0.343*	–
	(0.115)	
Δ ln (short run av. cost)	–	–0.125
		(0.176)
Export dummy, 1992–93	–	1.513*
		(0.312)
Wood products dummy	0.036	–0.011
	(.307)	(0.403)
Textiles/apparel dummy	–0.009	–0.049
	(0.301)	(0.407)
Metal products dummy	–0.159	–0.190
	(0.267)	(0.372)
Sample size	114	114
log-likelihood function		

* p value less than .01

exporters) or by driving down labour costs relative to output prices — should induce firms to initiate foreign sales.[19]

The second model recognises that start-up costs link firms' decision to export with their exporting histories. That is, firms that have already adapted their products to foreign markets, established packaging systems and distribution networks, and learned to deal with port authorities and customs officials, will be more inclined to export than those that have not, other things being equal.[20] (Formal models of export behaviour in the presence of start-up costs may be found in Baldwin, 1988; Baldwin and Krugman, 1989; and Dixit, 1989.) This dependence is captured by the inclusion of a dummy variable indicating whether the firm was an exporter before the 1994 devaluation and reforms.

Given that we control for export history and unobserved firm heterogeneity with our dummy for 1992/93 exporting status, is there still a role for short run average costs in predicting export responses? The coefficient on the log of 1992/93 short run unit costs is almost identical to that in model 1, and the coefficient on the change in the log of unit costs is also negative. But these variables are collinear with exporting status, so the standard errors on our cost variables are larger, and neither is individually significant. (The collinearity occurs because costs are serially correlated and firms that were low cost in the past tended to be exporters in the past.) Thus our estimator is not powerful enough to give conclusive evidence, but it does suggest that the cost effect is still there.

However, the strongest predictor of exporting status in 1994/95 is our dummy for being an exporter in 1992/93. Start-up costs are not the only reason for this. Unobserved firm characteristics like multinational

[19] One specification problem with this model is that, upon exporting, firms might suddenly earn higher prices for their output by selling in foreign markets. This would drive down our unit cost measure by driving up the value of output, and attribute the decision to a unit cost shock, even though no exogenous shock occurred. We cannot rectify this problem without more detailed data on export market prices.

[20] In Cameroon, information acquisition costs appear especially important: 'A USAID MAPS study carried out in 1991 concluded that information about markets, product standards, and prices, especially information relevant to export markets, was the single biggest constraint facing the potential exporter — it was cited as an important constraint by over 87% of those firms interested in exporting' (World Bank, 1995, p. 58).

status, location in Douala, and managerial skills persist through time, and induce correlation between exporting status in 1992/93 and exporting status in 1994/95. But more sophisticated econometric models of exporting behaviour that control for unobserved heterogeneity still reveal a substantial role for start-up costs under virtually any assumptions (Roberts and Tybout, 1995; Sullivan *et al.*, 1995; Bernard and Jensen, 1995). Hence, although other studies suggest that the coefficient on our dummy for 1992/93 status is overstated by about 50%, it is almost certain that start-up costs matter. In Cameroon, the usual hurdles that new exporters face are probably compounded by rent-seeking bureaucrats at the port authority and customs. (Qualification for FTZ status also involves considerable effort.)

It is thus very likely that start-up costs are a major reason why the CFA devaluation failed to generate much entry into foreign markets by new exporters. With these barriers to foreign market entry, firms are reluctant to re-orientate themselves toward foreign markets. Their reluctance to do so is heightened by uncertainty about the future real exchange rate (Dixit, 1989). As suggested by the small contribution of net entry effects (Table 5), a one-time nominal re-alignment followed by domestic inflation may be inadequate to convince entrepreneurs that re-tooling is a wise investment. If a surge in manufactured exports is to be generated, credible, long term commitments to outward orientation are needed, as are reductions in bureaucratic barriers to foreign market entry.

5. Concluding Remarks

In sum, the reforms have indeed changed the incentive structure, and firms have reacted as one would expect. Output has shifted toward tradable sector activities, there have been significant productivity gains, and there has been some increase in production. The fact that responses have not been more dramatic probably traces to four factors. First, the real costs of production have not declined on average. On the contrary, they have increased slightly. Second, investing in new productive capacity and employing new workers both involve irretrievable costs, so firms are reluctant to make these commitments unless they are confident that demand will grow. Similarly, few firms are likely to incur the costs of re-tooling to export unless they expect foreign operations to remain profitable in the medium term. Such expectations may not yet be present, particularly given that the effects

of the 1994 devaluation have been partially eroded by domestic inflation. Third, the data describe only one post-reform year, and this may have been insufficient time for firms to have radically changed their behaviour. Finally, corruption, lack of infrastructure, financial constraints and regulatory burdens are often mentioned as barriers to adjustment. It is difficult to quantify these forces, but they have doubtless played a significant role in moderating responses.

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