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The Caribbean Basin Economic Recovery Act and Prospects for Economic Growth in Jamaica

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Abstract—In August 1983, the Caribbean Basin Economic Recovery Act was signed into law by President Reagan. The purpose of the Act was to liberalize trade, to promote local investment, and to increase supplemental aid to developing countries. In this paper a model of one of the beneficiary countries (Jamaica) is built and growth rates of selected macroeconomic variables are estimated through 1990. The potential for positive economic growth in Jamaica is assessed. We conclude that an optimal program for Jamaica seems to be one of moderate growth in central bank credit combined with a small increase in exports.

INTRODUCTION

In February 1982, President Reagan announced the Caribbean Basin Initiative and in August 1983 the Caribbean Basin Economic Recovery Act (CBERA) was signed into law. The CBERA was designed to ". . . alleviate the problems of high unemployment, large debt-servicing costs, and slow economic growth . . ." [1] of beneficiary countries by encouraging a diversification in production and exports through a liberalization of trade policies, tax incentives to promote local investment, and a program of supplemental aid. Since the economies of the Caribbean are heterogeneous, each country has experienced a unique set of problems; inasmuch, the CBERA was designed to deal with the individual problems of each country. This paper builds a model of the Jamaican economy in particular and assesses the prospects for an export-led model of development in the country as envisioned by the CBERA.

BACKGROUND TO THE CBERA

The economic collapse in Jamaica between 1973 and 1980 is a matter of record. Real gross domestic product (GDP) declined 18% between 1974 and 1980. In terms of expenditures, 1980 real investment was two-thirds the 1966 level while private consumption was approximately the same in 1980 as in 1966. Significantly, public sector consumption rose continuously and reached a peak in 1978–1979. The last half of the 1970s was marked by large increases in government spending, expanding deficits, increased unemployment, and high inflation. Examples of undesirable economic policies have been cited by Bonnick [2]: an excessively high minimum wage, failure to adjust exchange rates, overprotection of the manufacturing sector, underprotection of the agricultural sector, and the government's use of a "single stick" approach to the many varied problems in Jamaica.

As Stone [3] has pointed out, these policies led to an export of capital, a dependency on external borrowing, a manpower drain to other countries, increased corruption, and poor management in government. What little hard currency was earned was invested overseas. Fortunately, Stone [4, 5] has suggested that trends such as these can be reversed. He emphasized that foreign currency earnings will determine whether economies such as Jamaica's can achieve a higher income level. His analysis suggests that an export-led development strategy may be the only viable option for

Jamaica. Given the country's relatively substantial endowment of natural resources, its proximity to the United States (U.S.) market, and its well developed financial system, measures such as the CBERA appear, in principle, to provide the best chance for Jamaica to reverse its economic decline.

In the past, much of the U.S.' assistance concentrated on government to government financial aid. The CBERA was one of the first efforts to mobilize a substantial array of private sector resources to expand the economy. Advocates of the act stress that its provisions respond to the priorities of the region's leaders which involve a preference for trade access over financial assistance. It is interesting to note that Jamaica was expressly mentioned by President Reagan in a recent national address:

> ... after a decade of falling income and exceptionally high unemployment, Jamaica's new leadership is reducing bureaucracy, dismantling unworkable controls and attracting new investment. Continued outside assistance will be needed to tide Jamaica over until market forces generate large increases in output and employment, but Jamaica is making freedom work [6].

FORECAST OF ALTERNATIVE DEVELOPMENT STRATEGIES

The objective of this paper is to build a time series model of the Jamaican economy which incorporates the major structural changes of the last 20 years and to then estimate the values of certain macroeconomic variables through the year 1990. Following this, the impact of alternative export growth rates are examined. The model is estimated using 1951–1982 International Monetary Fund data. It is aggregative in nature since data on individual sectors were not always available. The validity of this type of model has been discussed by Behrman and Hanson [7] and has previously been estimated for Mexico by Looney and Frederiksen [8]. The specific objectives of the model are to estimate the growth rates of selected macroeconomic variables and to project their 1990 values, to determine the highest attainable real GDP in 1990 given several constraints (such as inflation rates consistent with a fixed exchange rate), and, finally, to uncover potential conflicts between growth, inflation, and external debt.

A two-stage least squares procedure was used to estimate the parameters of a distributed lag model where the impacts from changes in debt or export performance are distributed over time. The price data were deflated by the International Monetary Fund consumer price index to obtain a constant price series; central government debt data and the levels of exports and imports were deflated by the U.S. export unit price deflator. While the estimated model appears as Table A1, the following functional relationships are noted:

(1) Private consumption (PCON) adjusts to GDP in the previous year and Keynesian injections of government expenditures (basically make-work programs), but is crowded out by external debt.

(2) Private investment (PINV) also responds to GDP in the previous year and is also crowded out by external debt.

(3) Government consumption (GCONS)—basically current salaries—is financed largely by revenues from the previous year. Marginal changes in GCONS are financed through increases in debt and Bank of Jamaica (BoJ) credit.

(4) New government investment (GINV) is not directly related to revenues but rather to the amount of credit and debt the government can mobilize.

(5) Imports (IMP) appear to be a function of foreign exchange earnings and GCONS. Increases in GCONS spill over into the balance of payments—i.e. any increase in the budget will lead to increases in imports.

(6) Exports (EXP) are directly related to the U.S. rate of growth.

(7) Domestic debt (DEBT) increases to finance export shortfalls and GCONS. It is a distributed lag function since debt commitments increase over time.

(8) The money supply (M1) depends on the liquidity in the economy. Liquidity in turn depends on external debt, credit from the BoJ and GCONS.

(9) Inflation (CPI) is a distributed lag function increasing over time as the money supply increases.

Table 1. U.S. GNP growth vs real growth in Jamaican GNP and exports

U.S. GNP growth rate (%)	Average annual rate of real growth in Jamaican GNP (%)	Exports (%)
0	−7.57	−0.74
1.0	−5.06	0.78
2.5	−1.84	2.97
3.0	−1.50	3.68
3.5	−0.64	4.38
5.0	2.62	6.42

Table 2. Optimal control forecasts, 1983–1990, given annual growth of Bank of Jamaica credit of 15, 20, and 35%

	External debt constant				External debt increased 5%			
	Rate of export growth:				Rate of export growth:			
	2.0%	4.5%	6.0%	8.0%	2.0%	4.5%	6.0%	8.0%
	Bank of Jamaica credit to Government: 15% annual growth							
(A) Average annual growth								
Gross national product	−4.0	−1.4	1.2	3.5	−2.3	0.7	2.4	4.6
Private:								
consumtion	−6.7	−2.4	−0.2	2.6	−6.0	−1.8	0.3	3.0
investment	−2.3	0.1	1.5	3.3	−2.7	−0.2	1.2	3.0
expenditure	−6.1	−2.1	0.1	2.7	−5.5	−1.6	0.5	3.0
Government:								
consumption	−2.4	−0.3	1.1	2.7	1.0	2.7	3.9	5.2
investment	1.2	1.2	1.2	1.2	4.2	4.2	4.2	4.2
expenditure	−1.2	0.2	1.1	2.2	2.1	3.2	4.0	4.9
Savings	17.0	18.3	18.9	20.0	18.9	20.1	20.7	21.7
Domestic–external gap	7.0	6.1	5.4	4.6	5.4	4.6	4.0	3.3
Domestic debt	6.1	3.2	1.5	−2.0	9.0	6.6	5.3	2.6
Consumer price index	8.6	8.7	8.8	8.9	10.4	10.5	10.6	10.7
	Bank of Jamaica credit to Government: 20% annual growth							
(B) Average annual growth								
Gross national product	−3.1	0.1	1.8	4.1	−1.6	1.3	3.0	5.0
Private:								
consumption	−6.3	−2.1	0.1	2.8	−5.6	−1.5	0.6	3.2
investment	−2.4	0	1.4	3.2	−2.9	−0.4	1.0	2.9
expenditures	−5.8	−0.2	1.9	4.6	−5.2	−1.4	0.6	3.2
Government:								
consumption	−0.6	1.2	2.5	4.0	2.4	3.9	5.0	6.3
investment	2.7	2.7	2.7	2.7	5.4	5.4	5.4	5.4
expenditures	0.6	7.7	2.6	3.6	3.5	4.4	5.1	6.0
Savings	17.9	19.2	19.8	20.8	18.7	20.9	21.4	22.3
Domestic–external gap	6.2	5.4	4.7	4.0	4.8	4.2	3.4	2.7
Domestic debt	7.5	5.0	3.5	0.4	10.1	8.0	6.8	4.4
Consumer price index	12.5	12.6	12.6	12.7	13.9	14.0	14.0	14.1
	Bank of Jamaica credit to Government: 35% annual growth							
(C) Average annual growth								
Gross national product	−2.2	0.8	2.5	4.6	−0.7	1.6	3.6	5.6
Private:								
consumption	−5.8	−1.7	0.4	3.1	−5.1	−1.2	0.9	3.5
investment	−2.6	−0.2	1.2	3.0	−3.1	−0.6	0.9	2.7
expenditures	−5.4	−1.5	0.5	3.1	−4.9	−1.1	0.5	3.1
Government:								
consumption	1.2	2.9	4.0	5.3	3.9	5.3	6.3	7.4
investment	4.3	4.3	4.3	4.3	6.7	6.7	6.7	6.7
expenditures	2.3	3.3	4.1	5.0	10.0	10.9	11.6	12.4
Savings	19.0	20.1	20.7	21.7	20.7	21.7	22.6	23.1
Domestic–external gap	−5.4	−4.6	−4.0	−3.3	4.0	3.3	2.5	2.1
Domestic debt	9.0	6.7	5.4	2.8	11.4	9.4	8.3	6.2
Consumer price index	17.0	17.0	17.1	17.2	18.1	18.1	18.2	18.2

OPTIMAL CONTROL SIMULATIONS

The model described above was used to simulate the Jamaican economy in an effort to examine the impact of alternative export growth rates. In order to evaluate each simulation, an objective function and welfare loss function were specified. The objective was to maximize real 1990 GDP where the loss function was taken to be the annual inflation rate. Exports were allowed to grow at 2.0, 4.5, 6.0, and 8.0% over the forecast period. These alternative growth rates reflect the response to a combination of possible changes in the U.S. rate of growth and the effect of the CBERA. As equation (6) of Table A1 indicates, exports in Jamaica have been determined primarily by U.S. gross national product (USY) levels. Estimates of the average annual rate of change of

Jamaican GNP and exports in relation to different U.S. GNP growth rates are given in Table 1 (assuming BoJ credit grows at 20% and external debt remains unchanged).

As can be seen, the U.S. GNP would have to grow at an average annual rate of just over 3.5% to allow for a positive growth rate of Jamaican GNP. For purposes of the simulations (discussed below), we have thus assumed a 3.5% annual growth rate for the U.S. economy, a stable exchange rate, and a maximum inflation rate of 20% in order to minimize the possibility of devaluation.

Table 2 presents the results of various Jamaican macroeconomic variables under the four alternative export growth rates where (a) Bank of Jamaica credit grows at 15, 20 or 35% (Parts A, B, C, respectively), and where (b) external borrowing is either held constant or grows at 5.0% annually. The results indicate the importance of export growth to Jamaican prospects for economic growth. For example, if external borrowing were to remain constant while exports were to grow at 2.0%, GNP would decline by 4.0%. If external borrowing were to increase at 5.0% with the same level of export growth, the decline in GNP would be cut almost in half to 2.3%. On the other hand, if exports were to grow at 8.0%, GNP would grow at either 3.5% with no increase in debt or at 4.6% with a 5.0% increase in debt.

Table 2 also indicates that if exports grow at their historical rate of 4.5%, external financing will be a necessary condition for economic growth. With no borrowing, GNP will decline by 1.4%. With 5.0% borrowing, GNP will increase by 0.7%. If exports were to increase marginally to 6.0%, growth would rise to 1.2%—a further indication of how important export growth is to the economy.

If BoJ credit grows at 20% annually (Table 2, Part B), consumption increases if exports grow at 6.0%. Although inflation increases slightly, it appears that a policy designed to let credit grow at 20% rather than at 15% is preferred. If this policy is adopted, the relative ineffectiveness of extra borrowing compared to export growth is apparent. If exports were to grow at either 6.0 or 8.0%, the contribution of the extra 5.0% borrowing would be minimal; changes in PCON and GNP are quite small while inflation increases. In other words, the positive contribution made by the CBERA (if the U.S. GNP grows at the assumed rate) is, in fact, the growth of the economy without additional international debt.

The third simulation increases BoJ credit to 35% (Table 2, Part C). In general, a policy of printing more money is not optimal. At 4.5% export growth, for example, private consumption and expenditures decline; private investment declines even faster as external borrowing increases. If exports were to grow at 6.0%, inflation would increase to approximately 18%. Obviously, the public sector is less efficient than export growth in stimulating the private sector.

Table 3 presents an alternative program to an export-led model of development, where the external debt declines at a rate of 2.5% annually. Two simulations were run under this "Manley-type" program of self reliance, with BoJ credit growing at 11 and 15%, respectively. At best, we estimate that under these conditions exports would grow only at historical rates. GNP growth would be either negative or close to zero, while private consumption and expenditures would decline.

Table 3. Optimal control forecasts, 1983–1990, given annual growth of government external debt of −2.5%

	Bank of Jamaica credit 11% increase		Bank of Jamaica credit 15% increase	
	Rate of export growth: 2.0%	4.5%	Rate of export growth: 2.0%	4.5%
Average annual growth				
Gross national product	−3.6	−0.3	−2.7	0.4
Private:				
consumption	−6.4	−2.2	−5.9	−1.8
investment	−2.2	0.2	−2.4	0
expenditures	−5.8	−0.2	−5.5	−1.6
Government:				
consumption	−1.9	0.1	0.1	1.9
investment	1.6	1.6	3.3	3.3
expenditures	−0.7	0.6	1.2	2.3
Savings	17.3	18.6	18.4	19.6
Domestic–external gap	6.8	5.9	5.9	5.1
Domestic debt	6.3	3.5	7.9	5.4
Consumer price index	11.9	11.9	16.5	16.6

From these results we conclude that an optimal path for Jamaica would likely contain the following elements: no extra international debt, a 20% growth in BoJ credit to the government, and a small increase in export growth over the historical rate of 6.0%. Clearly, Jamaica's success depends to a large extent on its export performance. As noted above, exports will, in turn, depend on (a) the performance of the U.S. economy and (b) the success of programs such as the CBERA.

With regard to the latter, several scholars are quite pessimistic. Roussland and Lindsey [1], for example, estimated the change in export earnings if tariffs were eliminated and concluded that "... in the short run the annual welfare gain to these countries is less than $25 million and the annual increase in their export earnings is less than $81 million." They felt that the exclusion of many products from tariff elimination would greatly reduce potential benefits. They estimated that the effective tariff rate was only reduced 40% on products such as textiles and apparel, gloves, footwear and petroleum. Newfarmer [9] also noted that the effectiveness of the CBERA was limited by product exclusion and the elimination of tax credits by the U.S. Congress for local investment. His analysis compared specialized measures (such as the CBERA) with the more general measures such as multilateral financial arrangements and the macroeconomic policies of the industrialized countries. He concluded that since the Caribbean economies are so closely integrated with the U.S. economy "general measures have greater impact than the specialized measures. In some cases, the best that specialized measures can do is offset the unintended adverse consequences of the general measures."

An early estimate of the effectiveness of the CBERA has been calculated in a recent paper by Pelzman and Schoeple [10]. Using a partial equilibrium approach, they estimated the gross trade creation effects of the CBERA program for all the beneficiary countries. Their estimates for Jamaica were between a $5.4 million trade diversion to a $7.9 million trade creation.

Clearly, our results do not suggest that the CBERA can turn Jamaica into a newly industrialized country such as Taiwan or Singapore. Rather, the results suggest that with a very small increase in export growth—whether it be as a result of increased U.S. growth or as a direct result of the CBERA—Jamaica can reverse its recent negative growth. It appears that many of the most pessimistic projections made about the Jamaican economy anticipate some export growth. Our estimate that exports need to increase by 1 or 2% does not appear to be an unrealistic goal in the current Jamaican environment.

CONCLUSIONS

This paper has built a time series model of the Jamaican economy in an effort to predict the values and growth rates of selected macroeconomic variables through the year 1990. This, in turn, will help in evaluating the prospects for economic growth in Jamaica. Simulations of the economy were conducted using various growth rates of exports, accounting for the performance of the U.S. economy, the possible success of the CBERA, different rates of external borrowing, and selected rates of BoJ credit to the government. The major conclusions of our work are that (a) increased capital flows to Jamaica will not be as effective as increases in exports, and that (b) an optimal policy for the country would be a moderate (20%) growth in central bank credit combined with a small increase in exports. Our results suggest that even if exports were to grow at but 1.5% more than their historical rate, the prospects for economic growth would still be quite favorable.

REFERENCES

1. D. Roussland and J. Lindsey. The benefits of Caribbean basin countries from the US CBI tariff eliminations. *J. Policy Model.* **6,** 13–30 (1984).
2. G. Bonnick. Jamaica: liberalization to centralization, and back? In *World Economic Growth: Case Studies of Developed and Developing Nations* (Edited by A. Harberger), pp. 265–292. Institute for Contemporary Studies, San Francisco (1984).
3. C. Stone. *Understanding Third World Politics and Economics.* Earle Publishers, Jamaica (1980).
4. C. Stone. Patterns of insertion into the world economy: historical profile and contemporary options. *Soc. Econ. Stud.* **32,** 1–35 (1983).
5. C. Stone. Jamaica in crisis: from socialist to capitalist management. *Int. J.* **40,** 282–311 (1985).

6. *New York Times*, February 25, 1985.
7. T. Behrman and J. Hanson. *Short Term Macroeconomic Policy in Latin America.* Ballinger Publishing, Cambridge, Mass. (1979).
8. R. Looney and P. Frederiksen. The feasibility of alternative IMF-type stabilization programs in Mexico, 1983–87. *J. Policy Model.* **5,** 461–470 (1983).
9. R. Newfarmer. Economic policy toward the Caribbean Basin: the balance sheet. *J. intam. Stud. Wld Affr.* **27,** 63–89 (1985).
10. J. Pelzman and G. Schoepfle. The impact of the Caribbean Basin Economic Recovery Act on Caribbean nations' exports and development. *Econ. Dev. Cult. Change* **36,** 753–796 (1988).

APPENDIX

Table A1. Macroeconomic Forecasting Model†

Estimating equations		R^2	DW	F
(1) Private consumption (PCON)	= 1347.4 + 0.31 GDPL + 1.45 GCONS − 0.39 DEBT (2.54) (2.55) (−3.46)	0.90	1.82	54.15
(2) Government consumption (GCONS)	= 470.6 + 0.22 GDPL + 0.28 DEBTPUB + 0.06 BOJCREDL (13.49) (3.68) (2.62)	0.95	2.35	106.25
(3) Private investment (PINV)	= −358.6 + 0.06 GDPL − 0.04 DEBT (4.80) (−2.91)	0.55	2.86	11.64
(4) Government investment (GINV)	= 51.6 + 0.24 DEBTPUB + 0.06 BOJCRED (5.10) (2.00)	0.95	2.47	195.37
(5) Imports (IMP)	= 3.9 + 1.00 EXP + 0.23 GCONS (14.93) (2.07)	0.96	2.71	351.55
(6) Exports (EXP)	= −1087.5 + 1.14 USY (5.98)	0.92	2.07	107.43
(7) Domestic debt (DEBT)	= −570.7 + 0.94 DEBTPUB − 0.64 EXP + 1.28 GCONS (3.42) (−3.51) (2.73)	0.91	2.10	67.91
(8) Money supply (M1)	= −29.9 + 0.36 DEBTPUB + 0.14 BOJCREDN + 0.15 GCONS (2.23) (2.8) (3.27)	0.98	2.60	316.01
(9) Consumer price index (CPI)	= 0.01 + 0.66 CPIL + 0.0001 M1L (7.12) (6.75)	0.99	2.00	1932.79

Exogenous variables: Bank of Jamaica nominal credit to the Government (BOJCREDN); exports (EXP); dollar denominated public debt (DEBTPUB); net factor payments (NETFAC); change in stocks (STOCKS).
Transformed variables: real Bank of Jamaica credit to the public sector (BOJCRED) = BOJCREDN/CPI.
Identities: national savings = gross national product − PCON − GCONS; gross national product = gross domestic product − net factor payments; gross domestic product = PCON + GCONS + PINV + GINV + STOCKS + EXP − IMP.

†t-Statistics in parentheses.