INTERAMERICAN DEVELOPMENT BANK DOCUMENT

JAMAICA

Fiscal Structural Programme for Economic Growth II

(JA-L1051)

ECONOMIC ANALYSIS

This document was prepared by: Gerardo Reyes-Tagle (IFD/FMM), Marcio Cracel, Jorge Baca Campodonico, Carlos Silvani, and Hunt Howell (consultants)

I. EXECUTIVE SUMMARY

1.1 A broad tax reform has been implemented in Jamaica since January 1st 2013. The reform includes legislation to: (i) modernize income tax and customs tariffs; (ii) greatly reduce tax and tariff exemptions in all major taxes (except for a limited number of specific goods and services); (iii) remove most exemptions and all zero rating (except for exports in the case of the General Consumption Tax - GCT); and (iv) establish an initial prudent reduction in tax rates and tariffs.

1.2 The key objectives of the tax reform are to: (i) achieve fiscal sustainability; (ii) reduce tax expenditures; (iii) promote employment; (iv) promote growth; (v) improve competitiveness; and (vi) improve income distribution.

1.3 Depending on the improvements in revenue associated with these reforms, the Government will consider a phased reduction of the statutory rates of the main taxes. This reduction would be contingent upon improvements in revenue deriving from the initial reforms implemented in FY 2013/14 and FY 2014/15.

1.4 This study was prepared to estimate the economic benefits generated by the introduction of a set of fiscal reforms aimed at strengthening the country's fiscal position as well as at achieving the sustainability of public financing and of economic growth. In this context, an Economic Analysis is used to evaluate, the expected results of the Program's tax reform component.

1.5 Based the results of the Revenue Impact of Tax Reform Proposals shown in Table A, the increased collections in each of the eight tax categories were programmed to be phased in according to the schedule presented. This establishes a gradual introduction of the tax reform, starting with an initial increase in collections equivalent to 0.28% of GDP in FY 2013/2014, 0.38% in FY 2014/15, 0.58% in FY 2015/16, and finally with full implementation, an increase in collections equivalent to 0.99% of GDP in FY 2016/17.

1.6 The discount rate used to calculate the Net Present Value is 12% over a period of 10 years. The Reform revenue benefits come from the 8 intervention policies presented in chapter III, starting with a benefit of US$ 39.29 million in 2013 and ending with a benefit of US$141.22 million in 2020.

1.7 The Reform Costs were estimated considering: (i) the Fiscal Administration Modernization Program (JA-L1039) costs, which was developed to support the reform by strengthening the Jamaica Tax and Customs Administrations (US$ 65 Million); (ii) The hiring of a new Ministry of Finance (MoF) staff specifically to manage the reform (10 staff * US$ 60,000, already including salaries and benefits = US$ 600,00 annually); (iii) The hiring of 50 staff (30 and 20 respectively) for the Jamaica Tax and Customs Administration aiming the strengthening of the two organization management capacity to make the reform sustainable (50 staff * US$ 60,000, already including salaries and benefits = US$ 1.8 million annually); and (iv)The costs of tax compliance, which was calculated estimating that approximately 1.000 firms will need to adjust their filling processes (according to the World Bank Doing Business[1] the Jamaica number of hours for compliance in Jamaica is 386 hours * US$12 accountant hour * 1,000 firms = total of US$ 4.4 million yearly).

[1] WB Doing Business - (http://www.doingbusiness.org/~/media/GIAWB/Doing%20Business/Documents/Special-Reports/Paying-Taxes-2015.pdf)

1.8 The Net present Value (NPV) for this base case is US$292 .0 million and Internal rate of Return is 77%.

II. INTRODUCTION

2.1 The Government of Jamaica (GoJ) requested the Bank for support in the implementation of a set of fiscal reforms aimed at strengthening the country's fiscal position and at achieving the sustainability of public financing and of economic growth.

2.2 The present study aims to estimate the economic benefits to be generated from the implementation of a set of tax policy reforms to be introduced by the Fiscal Structural Programme for Economic Growth (FISPEG). The benefits are calculated as the increase in tax revenue net of the transfers from the private to the public sector.

2.3 Experience from similar programs indicates that it is difficult to carry out a precise estimation without accounting for all the economic and financial variables affected by the Program's activities. Analysis of the Program's activities will allow for a partial estimation of the Program's financial benefits in order to generate an Internal Rate of Return (IRR) and the corresponding Net Present Value of the Program's tax policy component. Despite the aforementioned, it is possible to derive an approximate estimation by considering the results already attained by some of the activities supported by the Program.

2.4 This study was prepared to estimate the economic benefits generated by the introduction of a set of fiscal reforms aimed at strengthening the country's fiscal position as well as at achieving the sustainability of public financing and of economic growth. In this context, a Economic Analysis is used to evaluate, the expected results of the Program's tax reform component.

2.5 Based the results of the Revenue Impact of Tax Reform Proposals shown in the Table A, the amount of each of the eight tax categories was programmed to be implemented according to the work plan presented in the Blue Print Tax Reform Document, which establishes a gradual introduction of the tax reform, starting with increased collections equivalent to 0.28% of GDP in FY 2013/2014, 38% in FY 2014/15, 58% in FY 2015/16, and finally with full implementation, an increase in collections equivalent to 0.99% of GDP.

2.6 It is important to highlight that this study does not consider the indirect benefits (the results of which could only be evaluated over the long-term) related to results from social investments in sectors that contribute to poverty reduction and an increase in human capital.

2.7 The Program is structured as three independent operations, each technically integrated under the programmatic modality, comprising financing resources of US$80 million in the first tranche, US$100 million in the second tranche, and an anticipated US$80 million in the third tranche.

III. ASSUMPTION AND METHODOLOGY

Assumption: *By adjusting annually the tax base according to the variation of the GDP and the exchange rate, the introduction of the new Tax Reform, which comprises policies directed to:*

(i) Establishes a new Charities Act on Tax Expenditure, introducing a 5% cap on CIT and PIT Covenanted Donations and Donations to Charities and a JD$ 3,000 million cap on GCT, SCT, Import Duties and CUF;

(ii) Establishes the New Incentive Law, eliminating old tax expenditures in different taxes and introduces a new incentive to all sectors on labor costs and capital goods;

(iii) Introduces in CIT a cap on the interest payments deductions, a 5% cap on all donations charities, a 5% cap on losses for previous years, eliminates the tax relief incentive with grandfathering provisions, eliminates up to 30% in other tax credits, and eliminates all CIT waivers;

(iv) Introduces in PIT a cap on the interest payments deductions of about 1/3 of the current interest payment, a 5% cap on all donations charities, a 5% cap on losses for previous years, eliminates the tax relief incentive with grandfathering provisions, eliminates up to 30% in other tax credits, and eliminating all PIT waivers;

(v) Introduces in Customs Tariffs a new tariff structure, eliminates the discretionary waivers (direct and indirect effects on GCT), and the incentive waivers;

(vi) Eliminates in GCT incentives and discretionary waivers;

(vii) Eliminates in SCT incentive tax expenditure (Ad Valorem) and discretionary waivers (Specific);

(viii) Eliminates CUF incentives and discretionary waiver; will generate a revenue increase, starting with 0.28% of GDP in FY2013/2014 and reaching its full potential in FY 2016/17, with a revenue increase of 0.99% of GDP (US$141.22 million).

Methodology Used to Calculate de Impact of Tax Reform Proposals:

3.1 The methodologies / formulas used to calculate the impacts of the eight categories of reform presented in the aforementioned Table A were developed based on the concepts used in three main studies: (i) Jamaica Dynamic Computable General Equilibrium Model (DCGEM), (ii) Jamaica CIT micro data simulation model, and (iii) Jamaica Custom duties micro data simulation model. The DCGEM is explained in details in annex I at the end of this document.

Table A. Revenue Impact of Tax Reform Proposals

Categories	FY 2011/12 Net Impact (million JD$)	% GDP	FY 2013/14 0.28	FY 2014/15 0.38	FY 2015/16 0.58	FY 2016/17 0.99
			(US$)			
Charities Act	188.06	0.01	593,371.00	809,788	1,245,635	2,132,664
Tax Incentives Law	2,315.93	0.18	7,307,194.45	9,972,311	15,339,639	26,263,147
Consumption Income Tax (CIT)	3,681.02	0.29	11,614,318.22	15,850,351	24,381,376	41,743,593
Personal Income Tax (PIT)	319.72	0.03	1,008,769.62	1,376,693	2,117,661	3,625,669
General Consumption Tax (GCT)	3,629.49	0.29	11,451,740.73	15,628,477	24,040,085	41,159,265
Special Consumption Tax	1,493.02	0.12	4,710,764.91	6,428,899	9,889,081	16,931,192
Customs User Fees (CUF)	1,347.59	0.11	4,251,910.65	5,802,689	8,925,830	15,282,001
Customs Tariffs	(520.99)	0.12	-1,643,829.53	-2,243,375	-3,450,812	-5,908,169
Total	**12,453.84**	**0.99**	**39,294,240**	**53,625,832**	**82,488,511**	**141,229,368**
1 US$ = JD$	100		110	115	120	125
GDP ((million JD$)	1,261,521		1,459,458	1,561,720	1,671,147	1,788,242

Source: Mission calculations based on data received from JCA and TAJ

3.2 The overall impact of these tax policy reform proposals are estimated at JD$ 12,453 million, corresponding to US$ 141.2 million in FY 2016/17. Details of the calculations, corresponding to each category, are provided in the body of the report. Regarding the reforms' implementation schedule, according to the Revenue Impact of Tax Reform Proposals table (See Table A below), the reforms will be implemented progressively in a period of four years, starting in FY 2013/14 and reaching its full implementation in FY 2016/17.

Calculation of all Revenue Impact of Tax Reform Proposals Categories:

Charities Act - *By adjusting annually the tax base according to the variation of the GDP and the exchange rate, the introduction of: (i) a 5% cap on CIT and PIT Covenanted Donations and Donations to Charities; and (ii) a JD$ 3,000 million cap on GCT, SCT, Import Duties and CUF will generate a revenue increase of JD$188.6 million.*

	A	B	C	D	E	F	G	H	I	J	K	L
4				Tax Expenditures	Income	Average	Donations		Charities	per month cap	effect of Cap	Revenue
5						10,708.00	3.0%	8.0%				
6	**CIT**									250.00	10%	
7	Covenanted Donations			325.93	133,855.21		9.78					
8	Donations to Charities			60.71			1.82					11.60
9	**CIT (Other Bodies)**											
10	Covenanted Donations			24.34			0.73					
11	Donations to Charities			24.47			0.73					1.46
12	**PIT**											
13	Covenanted Donations			19.25			0.58					
14	Donations to Charities			21.16			0.63					1.21
15	**GCT**											
16	First Schedule Charities			3.28								
17	Third Schedule Charities			3.59								
18	Discretionary waivers			3,806.37								
19	Charities		50.0%	1,903.19					1,910.06			
21	**SCT Total**											
23	Univ. West Indies			2.30								
24	Discretionary waivers			342.48								
25	Charities			171.24					173.54			
31	**Import Duties**											
32	Second Schedule Charities			6.17								
33	Discretionary Waivers Full			4,887.49								
34	Charities			2,443.75					2,449.92			
37	**CUF**											
38	Customs Act Charities			145.74								
39	Discretionary Waivers			117.25								
40	Charities			58.63					204.37			
42	**Total Tax Expenditures reduction to Charities**								4,737.88	3,000.00	173.79	173.79
43	**Total Additional Revenue**											**188.06**

Calculation Description for Charities Act adjustments

(i) The Donations Average JD$ 10,708.00 (F5) = the average of the last 5 years (before 2011) covenanted donations and donations to charities, which represents 8% (H5) of the 2011 Net Income JD$ 133,855.21 (E7). The information (F5) comes from the DCGEM model. The Net Income in column E7 does not consider salaries, raw material and contributions.

(ii) The introduction of a 5% cap on CIT and PIT Covenanted donations and charities is calculated by applying 3% (G5) = 8% (H5) - 5% cap to (G6+G7), (G9+G10), (G12+G13) = JD$ 11.60 (L8), JD$1#46 (L11), and JD$ 1.21 (L14) respectively.
(iii) The spillover effect cap 10% JD$ 173.79 (L42) = 10% of (total Charities JD$ 4,737.88 (I42) – the cap JD$ 3,000 (J42)).
(iv) The total additional revenue JD$ 188.06 (L43) = L8+L11+L14+L42).

Tax Incentive Law - *By adjusting annually the tax base according to the variation of the GDP and the exchange rate, the elimination of the old tax incentives on CIT, PIT, GCT, SCT, Import Duties and CUF, and introduction of a new incentive to all sector labor costs and capital goods will generate an extra revenue of JD$2,315.93 million.*

	A	D	F	G	H	I	J	K	L	M	N	O	Q	R	S	T	U	V
1	**New Tax Incentive Law Impact**							(1)		(2)	(3)	(2)-(1)+(3)						
2	**2011**					Gross	Incentive		Grand	Tax	Offset							
3		Tax	Tax Credit	Other	NIS	Incentive Old	New	Total	fathering	Expenditures	Not using	Net revenue						
4		Expenditures	Old Regimes	Incentives	Contributions	Employees	Employees	Incentive	old regime	Reduction	new incentive	Increase						
5					11,727.77	5,863.89	5%		50.0%		30%							
6	**CIT**					2,931.94	146.60	3,078.54	5,410.01	5,410.01	1,623.00	**3,954.47**		NIS Contributions				11,727.77
7	CIT Tax Credit Relief	2,136.43												Gross Incentive Old Employe			5,863.89	2,931.94
8	CIT Tax Credit Relief	0.88																
9	**PIT**													Incentive New Employees			5%	146.60
10	PIT Tax Credit Relief	12.69	2,149.12											Duties and Taxes on Capital Goods				17,128.40
11	**GCT**		1,307.62											Incentive Capital Goods			20%	3,425.68
12	Hotel Incentive	39.14																
13	Motion Pictures	25.30																
14	Public Transport	1,077.18																
15	Education	166.00																
16	**SCT**		1,627.56										(1)	Total Incentive				**6,504.22**
17	***Ad valorem***																	
18	Bauxite	44.85																
19	Public Transport	1,367.80																
20	Education	2.30																
21	***Specific***																	
22	Tobacco	212.61																
23	Bauxite	-																
24	**Import Duties**		3,903.41											Grandfathering Old Regime			50.0%	5,410.01
25	Export	12.53																
26	Free Zones	372.67																
27	Hotels	234.59																
28	Manufacturing																	
29	Mining	3,178.43					10,820.02											
30	Motion Picture	16.58																
31	Public transport	0.11																
32	Education	88.50																
33	**CUF**		1,832.31	8,670.90									(2)	Tax Expenditures Reduction				5,410.01
34	Free Zones	1.34																
35	Mining	1,764.44																
36	Petrol Incentive	66.53		8,670.90														
37													(3)	Offset not using New Incenti			30%	1,623.00
38													(4)	Impact of 50% Cap on CIT			15%	1,787.13
39													(2)-(1)+(3)+(4)	**Net Revenue Increase**				**2,315.93**

Calculation Description for Tax Incentives Law changes

(i) The 2011 tax expenditure, tax credit old regime, and Other incentives are presented in columns (D), (F) and (G), and is summarized in (G36) = JD$8,670.90.
(ii) The Labour new incentive is calculated based on the National Insurance System (NIS) contributions JD$ 11,727.77 (H5). The Gross Incentives Old Employs is JD$ 5,863.89 (I5) = 50% of (H5).
(iii) The labor incentive is 50% of the NIS contributions incentives = JD 2,931.94 (I6) = (V7) = 50% of (I5).
(iv) The new employees is estimated 5% of the last year NIS contribution = JD$146.60 (J6) =(V9) = 5% of (I6).
(v) The Total new labor incentive JD$ 3,078.54 (K6) = (I6) + (J6).
(vi) It is assumed that 50% of the firms will opt for grandfathering = JD$ 5,410.01 (L6) = 50% of (F10) + (G36).

(vii) The other 50% of firms will opt for the new incentive and will not receive old incentives = JD$ 5,410.10 (M6) = (V33) = (1-50%) of (F10)+ (G36).
(viii) The offset for not using new incentives is assumed to be 30% = JD$1,623.00 (N6) = (V37) = 30% of (L6).
(ix) Net revenue increase without incentives for capital goods is = JD$ 3,954.47 (O6) = (M6)-(K6)+ (N6).
(x) The total of incentives (V16) = JD$ 6,504.22
(xi) The impact of the 50% cap on annual CIT is 15% of the total CIT (V38) = JD$ 1,787.13
(xii) The net Revenue increase = JD$ 2,315.93 (V39) = (V33)-(V16)+(V37)+(V38).

Consumption Income Tax (CIT) - *By adjusting annually the tax base according to the variation of the GDP and the exchange rate, the introduction in CIT of: (i) a cap on the interest payments deductions of about 1/3 of the current interest payment; (ii) a 5% cap on all donations charities; (iii) a 5% cap on losses for previous years; (iv) eliminating the tax relief incentive with grandfathering provisions; (v) eliminating up to 30% in other tax credits; and (vi) eliminating all CIT waivers will generate a revenue increase of JD$3,681.02 million.*

	A	B	C	D	E	F	G	H	I	J	K
1	**CIT Act Reform Impact**										
2	(JD$ millions)			**2011**							
3							**Cap on**	**Grand**	**Offset**	**Elimination**	**Tax Revenue**
4							**Net Income**	**Fathering**	**New Incentive**	**Waivers**	**Increase**
5	**Expenses**							50%	30%		
6	Interest Payments				50,000.00		10%				1,666.67
7	**Deductions**										
8	Covenated Donations			350.27							
9	Donations Charities			85.18			5%				13.06
10	Losses for Previous Years				168,000.00		5%				2,800.00
11	**Tax Credits**										
12	Tax Relief Incentive			2,136.43				1,068.22	320.46		1,388.68
13	Other Credits		30%	3,205.52				480.83	43.27		1,399.21
14	Waivers			42.50						42.5	42.50
15											
16	Total Gross CIT revenue ncrease										7,310.12
17											
18	New Incentive (up tp 50% of CIT payable)										2,007.60
19	Minimun Business Tx					5.84					259.33
20	Reduction CIT to 25%										(5,882.97)
21	Charities Act										(13.06)
22	**Total Net CIT revenue increase**										3,681.02

Calculation Description for CIT adjustments

(i) The introduction of a cap on the interest payments deductions is calculated by applying 10% to the total Interest paid during the year (JD$ 50,000.00) and calculating 1/3 of the result. The % of JD$ 50,000.00 (E6) / 3 = JD$ 1,666.67 (K6).
(ii) A 5% cap on all donations charities is calculated applying 3% = (8%-5%)[2] to Covenanted donations JD$ 350.27 (D8) + Donation charities JD$ 85.18 (D9) = JD$ 13.06 (K9).

[2] See Charities Act (i) explanation

(iii) A 5% cap on losses for previous years is calculated applying 5% on losses for previous years JD$ 168,000.00 (E10) and dividing by 1/3 = JD$ 2,800.00 (K10).

(iv) The eliminating of the tax relief incentive with grandfathering provisions is calculated by: Grandfathering JD$ 1,068.22 (H12) = 50% of Tax relief incentive JD$ 2,136.43 (D12). Offset new incentives JD$ 320.46 (I12) = 30% of Tax relief incentive 1,068.22 (H12). The total JD$ 1,338.68 (K12) = (H12) + (I12).

(v) The elimination up to 30% in other tax credits is calculated by applying 30% and 50% on other credits JD$ 3,205.52 (D13) = JD$480.83 (H13), and applying 30% and 30% on (H13) JD$ 480.83 = JD$ 43.27 (I13). The total JD$ 1,399.21 (K13) = (H13) + (I13).

(vi) The elimination of CIT waivers is calculated by eliminating JD 42.40 (D14).

(vii) The Gross CIT revenue increase is JD$ 7,310.12 (K16 = K6 + K9 + K10 + K12 +K13).

(viii) The 50% of CIT payable is JD$ 2,007.60 (K18), the minimum business tax is JD$ 259.33 (K19), the reduction of 25% of the CIT is - JD$ 5,882.97 (K20) and the charities act is JD$ -13.06 (K21).

(ix) The total net CIT revenue increase is JD$ 3,681.02 (K22 = K16 + K18 + K19 + K20 + K21).

Personal Income Tax (PIT) - *By adjusting annually the tax base according to the variation of the GDP and the exchange rate, the introduction in PIT: (i) a cap on the interest payments deductions of about 1/3 of the current interest payment; (ii) a 5% cap on all donations charities; (iii) a 5% cap on losses for previous years; (iv) eliminating the tax relief incentive with grandfathering provisions; (v) eliminating up to 30% in other tax credits; and (vi) eliminating all PIT waivers will generate a revenue increase of JD$319.72 million.*

	A	B	C	D	E	F	G	H	I	J	K
2	(JD$ millions)			**2011**							
3							**Cap on**	**Grand**	**Offset**	**Elimination**	**Tax Revenue**
4							**Net Income**	**Fathering**	**New Incentive**	**Waivers**	**Increase**
5	**Expenses**							50%	20%		
6	Interest Payments				500.00		10%				16.67
7	**Deductions**										
8	Covenated Donations			19.25							
9	Donations Charities			21.16			5%				1.21
10	Losses for Previous Years				1,680.00		5%				28.00
11	**Tax Credits**										
12	Tax Relief Incentive			12.69				6.35	2.54		8.88
13	Other Credits		30%	13.13				1.97	0.79		5.12
14											
15	Waivers			0.03						0.03	0.03
16	Minimum Business Tax										922.28
17	Gross impact of PIT reform										982.19
18											
19	New Incentive (up tp 50% of PIT payable)										11.92
20	Reduction PIT to 25%										(674.40)
21	Minimum Business Tax										922.28
22											
23	**Total Net PIT revenue increase**										**319.72**

Calculation Description for PIT adjustments

(i) The introduction of a cap on the interest payments deductions is calculated by applying 10% to the total Interest paid during the year (JD$ 500.00) and calculating 1/3 of the result. % of JD$ 500.00 (E6) / 3 = JD$ 16.67 (K6).

(ii) A 5% cap on all donations charities is calculated applying 3% (8%-5%)[3] to Covenanted donations JD$ 19.25 (D8) + Donation charities JD$ 21.16 (D9) = JD$ 1.21 (K9).

(iii) A 5% cap on losses is calculated by applying 5% on losses for previous years JD$ 1.680,0 (E10) and dividing by 1/3 = JD$ 28.0 (K10).

(iv) The eliminating of the tax relief incentive with grandfathering provisions is calculated by: Grandfathering JD$ 6.35 (H12) = 50% of Tax relief incentive JD$ 12.69 (D12). Offset new incentives JD$ 2.54 (I12) = 20% of Tax relief incentive 6.35 (H12). The total is JD$ 8.88 (K12 = H12 + I12).

(v) The elimination up to 30% in other tax credits is calculated by applying 20% and 50% on other credits JD$ 13.13 (D13) = JD$ 1.97 (H13), and applying 20% and 20% on (H13) JD$ 1.97 = JD$ 0.79 (I13). The total JD$ 5.12 (K13 = H13 + I13).

(vi) The elimination of PIT waivers is calculated by only adding (D15+K15) = JD 0.03 (D15).

(vii) The Minimum Business Tax is JD$ 922.29 (K16).

(viii) The Gross PIT revenue increase is JD 982.19 (K17 = K6 +K9 + K10 + K12 + K13 + K15 + K16)

(ix) The 50% of PIT payable is JD$ 11.92 (K19), the reduction PIT to 25% is – 674.40 (K20), the minimum business tax is JD4 922.28 (K21).

(x) The total net PIT revenue increase is JD$ 319.72 (K23 = K17 + K19 + K20 + K20 + K21).

[3] See Charities Act (i) explanation

Customs Tariffs *- By adjusting annually the tax base according to the variation of the GDP and the exchange rate, introducing in Customs Tariffs: (i) a new tariff structure, (ii) eliminating the discretionary waivers (direct and indirect effects on GCT) and the incentive waivers will generate a decrease in revenue collection of JD$ 520.99 million.*

	A	B	C	D	E
1	**Tariff Reform Impact**				
2					
3	Revenue Effect of the Tariff Reform Proposal				
4	In Million J$				
5	**Customs Tariff and Fees**	**Direct Effect**	**Increase in GCT Tax Base**	**Total**	**Import Duties**
6	1. Tariff Structure	544.53	3.70	548.23	
7	2. Discretionary Waivers	646.17	223.58	869.75	
8	Duty	646.17	223.58	869.75	
9	GCT	-	-		
10	SCT	-	-	-	
11	Customs Fee and Levy	-	-	-	
12	3. Incentives Waivers	100.80	1.80	102.60	
13	Total (1 + 2 + 3)	1,291.50	229.08	1,520.58	(520.99)
14	Prepared based on data from Imports FY 2012-2013				

Calculation Description for Customs Tariff adjustment

(i) The new tariff structures total is JD$ 548.23 (D6) = (B6) + (C6).

(ii) The discretionary wavers total is JD$ 869.75 (D7) = (B7) + (C7).

(iii) The incentive waivers total is JD$ 102.60 (D12) = (B12) + (C12).

(iv) The Total Import Duties (Statutory + discretionary + Old regime + Grandfathering) is JD$ 2,041.56.

(v) The Total Impact is JD$ 1,520.58 (D13) = (D6) + (D7) + (D12)

(vi) The Import Duties impact is – JD$ 520.99 (E13) = JD$ 2,041.56 – (D13)

General Consumption Tax (GCT) - By *adjusting annually the tax base according to the variation of the GDP and the exchange rate, the elimination of incentives and discretionary waivers on GCT will generate a net GCT revenue increase of JD$ 3,629.49 million.*

	A	B	C	D	E	F	G	H	I	J
1	**GCT Act Reform Impact**									
2	(JD$ millions)			**2011**						
3					**Tax**					**Tax Revenue**
4					**Expenditures**					**Increase**
5	**GCT Act**									
6	S 4 Reduced base on Imports				46.76					
7	S4 Reduced rate Tourism				6,332.17					
8	S4 Reduced Tax Base Tourism				699.37					
9	1st Schedule Airline Industry				6.09					
10	1st Educational Supplies				30.17					
11	1st Health Care Supplies				82.50					
12	1st Religious Charities				3.28					
13	3rd Inputs Agriculture Fishing				232.03					
14	3rd Basic Food				7,771.01					
15	3rd Buses				79.27					
16	3rd Computers				-					
17	3rd Educational Supplies				128.12					
18	3rd Energy Conservation				17.42					
19	3rd Health Supplies				1,622.44					
20	3rd Printing Materials				543.31					
21	3rd Religious Charities				3.59					
22	3rd Vehicles				701.52					
23	3rd Construction Services				302.45					
24	3rd Residential Rental				1,722.85					
25	3rd Veterinary Services				251.99					
26	3rd Education Services				1,816.44					
27	3rd Life & Health Insurance				4,499.58					
28	3rd Water Supply				826.27					
29	3rd Electricity Supply				11.61					
30	3rd Financial Services				7,036.34					
31	3rd Petroleum Fuels				439.34					
32	**Incentive Acts**									**1,307.62**
33	Hotel Incentive				39.14					
34	Motion Picture				25.30					
35	Public transport				1,077.18					
36	Education				166.00					
37	**Discretionary Waivers**									**3,924.11**
38	Full Waivers				3,922.44					
39	Partial Waivers				1.67					
40	**Gross revenue increase**									
41	New Incentive Law				653.81					
42	Charities				70.06					
43	Tariff Reform				229.08					
44	SCT, CUF				649.29		**1,602.25**			
45	**Net GCT revenue increase**									**3,629.49**

Calculation Description for GCT adjustments

(i) The calculation on incentive acts included: Hotel incentives (E33) + Motion Pictures (E34) + Public Transport (E35) + Education (E36) = JD$1,307.62 (J32). Note that no other expenditures (E6 – E31) were considered.

(ii) The calculation of the discretionary waivers included Full waivers (E38) + Partial Waivers (E3) = JD$ 3,924.11 (J37).

(iii) The Gross revenue increase considered the new incentive law (E41) + Charities (E42) + Tariff Reform (E43) + SCT and CUF (E44) = JD$ 1,602.25 (G44).

(iv) The Net GCT revenue increase is = JD$ 3,629.49 (J32+J37-G44).

***Special Consumption Tax (SCT) - By** adjusting annually the tax base according to the variation of the GDP and the exchange rate, eliminating SCT incentive tax expenditure (Ad Valorem) and discretionary waivers (Specific), will generate a SCT net revenue increase of JD$ 1,493.02 million.*

	A	B	C	D	E
1	**SCT Reform Impact**				
2					
3	In Million J$		**SCT**	**GCT**	**Total**
4	**Incentive Tax Expenditures**	**2011**	**1,643.07**	**271.11**	**1,914.18**
5	**Ad Valorem**		**1,384.50**		
6	Bauxite	8.84			
7	Motion Pictures	-			
8	Free Zones	5.56			
9	Public Transport	1,367.80			
10	Univ West Indies	2.30	1,384.50		
11	**Discretionary Waivers**	**254.78**	**254.78**	**56.51**	**398.99**
12	**Specific**		**258.57**		
13	Bauxite	40.54			
14	Motion Pictures	-			
15	Free Zones	218.03			
16	Public Transport				
17	Univ West Indies				
18	**Discretionary Waivers**	87.704	87.70		
19	Discount			820.15	
20	**Gross Revenue Increase**		**1,914.18**		
21	**Net Revenue Increase**				**1,493.02**

Calculation Description for SCT adjustments

(i) The ad valorem is the total of the SCT on Bauxite (B6), Free Zones (B8), Public Transport (B9) and University of West Indian (B10) = JD$ 1,384.50 (C5).

(ii) The discretionary waivers : On SCT is JD$ 254.78 (C11); on GCT is 16.5% of the total discretionary waivers on SCT (C11 + C18) = JD$56.51 (D11); The Total Discretionary waivers = JD$ 398.99 (E11 = C11+ D11 + C18)
(iii) The specific is the total of the STC on Bauxite (B13) + Free Zones (B15) = JD$ 258.57 (C12).
(iv) The Incentive Tax Expenditure is the total of (C5) + (C12) = 1,643.07 (C4)
(v) The discretionary waivers discount is JD$ 87.70 (C18).
(vi) Discount on GCT is JD$ 820.15 (D19).
(vii) The Gross Revenue Increase in SCT is = JD$ 1,914.18 (C20 = C5 + C12 – C18).
(viii) The Net revenue Increase is JD$1,491.02 (E21= C20 + E11 – D19)

***Customs User Fess (CUF) - By** adjusting annually the tax base according to the variation of the GDP and the exchange rate, eliminating CUF incentives and discretionary waivers will generate an impact on CUF and GCT revenue of JD$ 1,347.59 million.*

	A	B	C	D	E
1	**CUF Reform Impact**				
2					
3	In Million J$				
4	**Incentive Tax Expenditures**	**2011**		**GCT**	**Total**
5	Mining	1,764.44			
6	Free Zones	1.34			
7	Petrol Incentive	66.53	1,832.31	302.33	2,134.64
8	**Discretionary Waivers**	117.25	117.25	19.35	136.60
9	Discounts		923.65		
10	**Gross Impact**				**2,271.24**
11	**Net Impact**				**1,347.59**

Calculation Description for CUF adjustments

(i) The elimination of CUF incentives calculation includes Mining (B5) + Free Zones (B6) + Petrol Incentives (B7) = JD$ 1,823.31 (C7). The elimination of the GCT incentives on Petrol is JD$ 302.33 (D7). The total of incentives elimination is JD$2,134.64 (E7) = (C7)+(D7).
(ii) The elimination of CUF discretionary waivers is JD$ 117.25 (C8), and the GCT is JD$ 19.35 (D8). The total elimination of discretionary waivers is JD$ 136.60 (E8) = (C8) + (D8).
(iii) The discount is JD$ 923.65 (C9).
(iv) The gross impact is JD$2,271.24 (E10) = (E7)+(E8).
(v) The net impact is JD$ 1,347.59 (E11) = (E10) – (C9).

V. ESTIMATION OF THE BENEFITS

BASE SCENARIO

Reform Economic Benefit										
Categories / FY	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Reform Revenue increase	**0**	**0**	**39,294,240**	**53,625,832**	**82,488,511**	**141,229,368**	**141,229,385**	**141,229,385**	**141,229,385**	**141,229,385**
GDP (million JD$)	1,459,458	1,561,720	1,671,147	1,788,242	1,913,419	2,047,358	2,190,673	2,344,021	2,508,102	2,683,669
US$	110	115	120	125	130	135	141	146	152	158
Reform Costs										
Categories / FY	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
FAP JA-L1039 - US$ 65 Million	13,000,000	13,000,000	13,000,000	13,000,000	13,000,000					
MoF Team 10 * 60,000	600,000	642,000	686,940	735,026	786,478	841,531	900,438	963,469	1,030,912	1,103,076
Jamaica Tax Administration 30 new experts * 60,000	1,800,000	1,926,000	2,060,820	2,205,077	2,359,433	2,524,593	2,701,315	2,890,407	3,092,735	3,309,227
Customs Jamaica Administration 20 New Experts * 60,000	1,200,000	1,284,000	1,373,880	1,470,052	1,572,955	1,683,062	1,800,876	1,926,938	2,061,823	2,206,151
Tax Compliance (1.000 more firms)	4,416,000	4,725,120	5,055,878	5,409,790	5,788,475	6,193,668	6,627,225	7,091,131	7,587,510	8,118,636
Total	**21,016,000**	**21,577,120**	**22,177,518**	**22,819,945**	**23,507,341**	**11,242,855**	**12,029,855**	**12,871,944**	**13,772,980**	**14,737,089**
Reform Return Benefit / Basic Scenario										
Years	1	2	3	4	5	6	7	8	9	10
Net Flow Current Value	-21,016,000	-21,577,120	17,116,722	30,805,887	58,981,170	129,986,513	129,199,530	128,357,440	127,456,404	126,492,296
Net Flow present Value	($18,764,286)	($17,201,148)	$12,183,344	$19,577,698	$33,467,500	$65,855,213	$58,443,306	$51,841,417	$45,962,057	$40,727,134
NPV	$292,092,236									
IRR	77%									

5.1 The discount rate used to calculate the Net Present Value is 12% over a period of 10 years. The Reform revenue benefits derive from the 8 intervention policies presented in chapter III, starting with a benefit of US$ 39.29 million in 2013 and ending with a benefit of US$141.22 million in 2020.

5.2 The Reform Costs were estimated considering: (i) the Fiscal Administration Modernization Program (JA-L1039) costs, which was developed to support the reform by strengthening the Jamaica Tax and Customs Administrations (US$ 65 Million); (ii) The hiring of a new Ministry of Finance (MoF) staff specially to manage the reform (10 staff * US$ 60,000, already including salaries and benefits = US$ 600,00 annually); (iii) The hiring of 50 staff (30 and 20 respectively) for the Jamaica Tax and Customs Administration aiming the strengthening of the two organization management capacity to make the reform sustainable (50 staff * US$ 60,000, already including salaries and benefits = US$ 1.8 million annually); and (iv)The costs of tax compliance, which was calculated estimating that approximately 1,000 firms will need to adjust their filling processes (according to the World Bank Doing Business[4] the Jamaica number of hours for compliance in Jamaica is 386 hours * US$12 accountant hour * 1,000 firms = total of US$ 4.4 million yearly).

5.3 The Net present Value (NPV) was US$292 .0 million and Internal rate of Return was 77%.

[4] WB Doing Business - (http://www.doingbusiness.org/~/media/GIAWB/Doing%20Business/Documents/Special-Reports/Paying-Taxes-2015.pdf)

VI. SENSITIVITY ANALYSIS

6.1 Three scenarios were considered for the sensitivity analysis: (i) The exchange rate increases 50% (US$) due, for example, to rapid improvements in the USA economy; (ii) The GDP decreases 50% due, for example, to the European economy slowdown; (iii) Occurrence of both Scenarios.

Sensitivity Analysis Summary				
Indicators	**Base Scenario**	**Scenario 1: The exchange rate increases 50% (US$) because of rapid USA economy improvements**	**Scenario 2: The GDP decreases 50% due to the European economy slowdown**	**Scenario 3: Occurrence of both scenarios.**
Net Benefit (Present Value) US$ million	292	270	240	221
Internal Rate of Return (%)	77	74	70	67

6.2 The results of the simulations do not modify the findings regarding the viability of the Program, as the Net Present Value of the accumulated benefits remains positive in each of the three different scenarios:

SENSITIVITY 1

Table A. Revenue Impact of Tax Reform Proposals						
Categories	**FY 2011/12**		**FY 2013/14**	**FY 2014/15**	**FY 2015/16**	**FY 2016/17**
	Net Impact (million JD$)	**% GDP**	**0.27**	**0.37**	**0.56**	**0.99**
			(US$)			
Charities Act	188.06	0.01	582,775.09	784,414	1,187,797	1,998,466
Tax Incentives Law	2,315.93	0.18	7,176,708.83	9,659,836	14,627,383	24,610,541
Consumption Income Tax (CIT)	3,681.02	0.29	11,406,919.68	15,353,692	23,249,290	39,116,881
Personal Income Tax (PIT)	319.72	0.03	990,755.88	1,333,556	2,019,333	3,397,524
General Consumption Tax (GCT)	3,629.49	0.29	11,247,245.36	15,138,771	22,923,846	38,569,322
Special Consumption Tax	1,493.02	0.12	4,626,644.11	6,227,454	9,429,907	15,865,798
Customs User Fees (CUF)	1,347.59	0.11	4,175,983.68	5,620,866	8,511,383	14,320,383
Customs Tariffs	(520.99)	0.12	-1,614,475.43	-2,173,081	-3,290,582	-5,536,398
Total	**12,453.84**	**0.99**	**38,592,557.20**	**51,945,508.09**	**78,658,357.57**	**132,342,518.60**
1 US$ = JD$	100		112	119	126	133
GDP ((million JD$)	1,261,521		1,459,458	1,561,720	1,671,147	1,788,242
Source: Mission calculations based on data received from JCA and TAJ						

Reform Economic Benefit										
Categories / FY	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Reform Revenue increase	**0**	**0**	**38,592,557**	**51,945,508**	**78,658,358**	**132,342,519**	**132,342,519**	**132,342,519**	**132,342,519**	**132,342,519**
GDP (million JD$)	1459458	1561720	1671147	1788242	1859771.68	1,934,163	2,011,529	2,091,990	2,175,670	2,262,697
US$	112	119	126	133	141	150	159	168	179	189
Reform Costs										
Categories / FY	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
FAP JA-L1039 - US$ 65 Million	13,000,000	13,000,000	13,000,000	13,000,000	13,000,000					
MoF Team 10 * 60,000	600,000	642,000	686,940	735,026	786,478	841,531	900,438	963,469	1,030,912	1,103,076
Jamaica Tax Administration 30 new experts * 60,000	1,800,000	1,926,000	2,060,820	2,205,077	2,359,433	2,524,593	2,701,315	2,890,407	3,092,735	3,309,227
Customs Jamaica Administration 20 New Experts * 60,000	1,200,000	1,284,000	1,373,880	1,470,052	1,572,955	1,683,062	1,800,876	1,926,938	2,061,823	2,206,151
Tax Compliance (1.000 more firms)	4,416,000	4,725,120	5,055,878	5,409,790	5,788,475	6,193,668	6,627,225	7,091,131	7,587,510	8,118,636
Total	**21,016,000**	**21,577,120**	**22,177,518**	**22,819,945**	**23,507,341**	**11,242,855**	**12,029,855**	**12,871,944**	**13,772,980**	**14,737,089**
Reform Return Benefit / Scenario I / Exchange rate increases 50% because of USA economy improvements										
Years	1	2	3	4	5	6	7	8	9	10
Net Flow Current Value	-21,016,000	-21,577,120	16,415,039	29,125,563	55,151,017	121,099,664	120,312,664	119,470,574	118,569,538	117,605,430
Net Flow present Value	($18,764,286)	($17,201,148)	$11,683,900	$18,509,822	$31,294,168	$61,352,859	$54,423,339	$48,252,161	$42,757,364	$37,865,801
NPV	$270,173,981									
IRR	74%									

SENSITIVITY 2

Table A. Revenue Impact of Tax Reform Proposals						
Categories	**FY 2011/12**		**FY 2013/14**	**FY 2014/15**	**FY 2015/16**	**FY 2016/17**
	Net Impact (million JD$)	**% GDP**	**0.26**	**0.34**	**0.52**	**0.99**
			(US$)			
Charities Act	188.06	0.01	553,927.54	734,717	1,098,401	1,827,740
Tax Incentives Law	2,315.93	0.18	6,821,459.46	9,047,826	13,526,499	22,508,095
Consumption Income Tax (CIT)	3,681.02	0.29	10,842,273.53	14,380,940	21,499,506	35,775,177
Personal Income Tax (PIT)	319.72	0.03	941,713.15	1,249,066	1,867,354	3,107,278
General Consumption Tax (GCT)	3,629.49	0.29	10,690,503.14	14,179,635	21,198,555	35,274,396
Special Consumption Tax	1,493.02	0.12	4,397,623.75	5,832,906	8,720,195	14,510,404
Customs User Fees (CUF)	1,347.59	0.11	3,969,271.16	5,264,749	7,870,800	13,097,011
Customs Tariffs	(520.99)	0.12	-1,534,558.38	-2,035,403	-3,042,927	-5,063,430
Total	**12,453.84**	**0.99**	**36,682,213.35**	**48,654,437.19**	**72,738,383.60**	**121,036,670.31**
1 US$ = JD$	100		110	115	120	125
GDP ((million JD$)	1,261,521		1,362,443	1,416,940	1,473,618	1,532,563
Source: Mission calculations based on data received from JCA and TAJ						

Reform Economic Benefit										
Categories / FY	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Reform Revenue increase	**0**	**0**	**36,682,213**	**48,654,437**	**72,738,384**	**121,036,670**	**121,036,670**	**121,036,670**	**121,036,670**	**121,036,670**
GDP (million JD$)	0	0	0	0	0	0	0	0	0	0
US$	1362442.68	1416940.387	1473618.003	1532562.723	1593865.232	1,657,620	1,723,925	1,792,882	1,864,597	1,939,181
Reform Costs										
Categories / FY	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
FAP JA-L1039 - US$ 65 Million	13,000,000	13,000,000	13,000,000	13,000,000	13,000,000					
MoF Team 10 * 60,000	600,000	642,000	686,940	735,026	786,478	841,531	900,438	963,469	1,030,912	1,103,076
Jamaica Tax Administration 30 new experts * 60,000	1,800,000	1,926,000	2,060,820	2,205,077	2,359,433	2,524,593	2,701,315	2,890,407	3,092,735	3,309,227
Customs Jamaica Administration 20 New Experts * 60,000	1,200,000	1,284,000	1,373,880	1,470,052	1,572,955	1,683,062	1,800,876	1,926,938	2,061,823	2,206,151
Tax Compliance (1.000 more firms)	4,416,000	4,725,120	5,055,878	5,409,790	5,788,475	6,193,668	6,627,225	7,091,131	7,587,510	8,118,636
Total	**21,016,000**	**21,577,120**	**22,177,518**	**22,819,945**	**23,507,341**	**11,242,855**	**12,029,855**	**12,871,944**	**13,772,980**	**14,737,089**
Reform Return Benefit / Scenario II - GDP Decrease 50% because of European Economies Sloedown										
Years	1	2	3	4	5	6	7	8	9	10
Net Flow Current Value	-21,016,000	-21,577,120	14,504,695	25,834,493	49,231,043	109,793,816	109,006,816	108,164,726	107,263,690	106,299,581
Net Flow present Value	($18,764,286)	($17,201,148)	$10,324,155	$16,418,287	$27,935,016	$55,624,964	$49,309,148	$43,685,919	$38,680,362	$34,225,620
NPV	$240,238,037									
IRR	70%									

SENSITIVITY 3

Table A. Revenue Impact of Tax Reform Proposals						
Categories	FY 2011/12	% GDP	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17
	Net Impact (million JD$)		0.26	0.33	0.49	0.99
			(US$)			
Charities Act	188.06	0.01	544,035.98	711,694.86	1,047,399.99	1,712,729.54
Tax Incentives Law	2,315.93	0.18	6,699,647.69	8,764,318.99	12,898,431.72	21,091,775.13
Consumption Income Tax (CIT)	3,681.02	0.29	10,648,661.50	13,930,324.48	20,501,232.26	33,524,027.59
Personal Income Tax (PIT)	319.72	0.03	924,896.84	1,209,927.94	1,780,648.67	2,911,752.54
General Consumption Tax (GCT)	3,629.49	0.29	10,499,601.30	13,735,327.49	20,214,255.55	33,054,757.50
Special Consumption Tax	1,493.02	0.12	4,319,094.76	5,650,136.54	8,315,295.28	13,597,338.20
Customs User Fees (CUF)	1,347.59	0.11	3,898,391.32	5,099,782.35	7,505,340.06	12,272,883.12
Customs Tariffs	(520.99)	0.12	-1,507,155.55	-1,971,624.87	-2,901,636.61	-4,744,814.58
Total	**12,453.84**	**0.99**	**36,027,173.83**	**47,129,887.78**	**69,360,966.92**	**113,420,449.05**
1 US$ = JD$	100		112	119	126	133
GDP ((million JD$)	1,261,521		1,362,443	1,416,940	1,473,618	1,532,563
Source: Mission calculations based on data received from JCA and TAJ						

Reform Economic Benefit										
Categories / FY	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Reform Revenue increase	0	0	36,027,174	47,129,888	69,360,967	113,420,449	113,420,449	113,420,449	113,420,449	113,420,449
GDP (million JD$)	0	0	0	0	0	0	0	0	0	0
US$	1362442.68	1416940.387	1473618.003	1532562.723	1593865.232	1,657,620	1,723,925	1,792,882	1,864,597	1,939,181
Reform Costs										
Categories / FY	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
FAP JA-L1039 - US$ 65 Million	13,000,000	13,000,000	13,000,000	13,000,000	13,000,000					
MoF Team 10 * 60,000	600,000	642,000	686,940	735,026	786,478	841,531	900,438	963,469	1,030,912	1,103,076
Jamaica Tax Administration 30 new experts * 60,000	1,800,000	1,926,000	2,060,820	2,205,077	2,359,433	2,524,593	2,701,315	2,890,407	3,092,735	3,309,227
Customs Jamaica Administration 20 New Experts * 60,000	1,200,000	1,284,000	1,373,880	1,470,052	1,572,955	1,683,062	1,800,876	1,926,938	2,061,823	2,206,151
Tax Compliance (1.000 more firms)	4,416,000	4,725,120	5,055,878	5,409,790	5,788,475	6,193,668	6,627,225	7,091,131	7,587,510	8,118,636
Total	21,016,000	21,577,120	22,177,518	22,819,945	23,507,341	11,242,855	12,029,855	12,871,944	13,772,980	14,737,089
Reform Return Benefit / Scenario III - Both Scenarios Occur										
Years	1	2	3	4	5	6	7	8	9	10
Net Flow Current Value	-21,016,000	-21,577,120	13,849,655	24,309,943	45,853,626	102,177,594	101,390,595	100,548,505	99,647,469	98,683,360
Net Flow present Value	($18,764,286)	($17,201,148)	$9,857,911	$15,449,408	$26,018,579	$51,766,349	$45,863,956	$40,609,855	$35,933,876	$31,773,401
NPV	$221,307,901									
IRR	67%									

ANNEX I

A Dynamic Computable General Equilibrium (DCGE) models are a class of economic models that allow economists to systematically analyze the most important policy challenges and economic shocks in an inter-temporal basis. Their structure is similar to the structure of Computable General equilibrium (CGE) models with the added feature of being dynamic to allow the impact analysis of a given policy or shock to be traced over a number of years. This feature is especially important when analyzing policies that are introduced over given period of years.

The DCGE is an "economy-wide" model because it describes the behavior of producers and consumers and the linkages among them. Producers are depicted by 3 Cobb-Douglas production functions (primary, secondary and tertiary sectors) and consumers by a 10 consumption category Linear Expenditure System (LES). The income generated by factors of production (capital and labor) and other sources of income (remittances from abroad, transfers, and other sources of income) is discriminated by income distribution categories (quintiles). This structure allows the analysis of policy impact on poverty levels and income distribution as well as on sector economic growth and employment.

The main dynamic elements of the model are the annual level of investment in each sector together with population growth and sectorial employment. Sectorial investment is discriminated between public and private investment. The closure of the model is done through the equilibrium between savings and investment and equilibrium between each sectorial production function and its corresponding sectorial demand. In the latter case, equilibrium is guaranteed by the capital utilization factor embodied on each Cobb-Douglas production function.

To conduct experiments with the DCGE model, the analyst first elaborates a base scenario of the Jamaican economy based in most recent performance (calibration of the model). Then defines alternative policy scenarios and measures the differences between the alternative scenarios and the base scenario to draw conclusions on the impact of the proposed policies on economic growth, poverty levels, income distribution, tax revenue, etc. Hence, the model is not a forecasting model but instead a model that allows to study the impact of alternative policy scenarios on a given economic path (the base scenario). The proposed model structure is based in a similar model implemented for the government of Cape Verde that is currently being used as an analytical tool to define its medium term macroeconomic framework.

The model has been implemented utilizing the software package "Eviews 7" and consists of 10 blocks, namely: 1) Population; 2) Production; 3) Income; 4) Consumption; 5) Prices; 6) External Sector; 7) Fiscal Sector; 8) Public debt; 9) Monetary sector; and 10) Equilibrium block. Macro data (statistical information) for the period 1980 – 2011 has been obtained from various government sources. The information received has allowed the implementation of the DCGEM for Jamaica that was used to assess the impact of the incentives and waivers schemes on the Jamaican Economy. In this regards STATIN has been the main source of information together with the MOF and the BOJ.

A first version of the model has been implemented and presented to the Tax Incentives Study Working Group. The model encompasses 10 blocks that interact with each other to generate general equilibrium solutions on a yearly basis. The DCGEM has been the main analytical tool used to assess the impact of incentives and waivers on economic growth, unemployment, poverty, and income distribution. The structure and logical framework of each of the 10 blocks of the model is briefly described in the following paragraphs.

(i) Population Block. This component describes population dynamics grouped by age brackets (0 – 4 years, 5 – 9 years, up to 80 to + years) to model evolution of the working age population, the labor force, and total population depending upon net survival rates by age bracket, net fertility rates and expenditure on health.

(ii) Production Block. This block is comprised of three Cobb Douglas Production Functions corresponding to the Primary, Secondary, and Tertiary sectors of the Jamaican economy. For each production function, capital stocks and labor employed have been estimated to obtain capital-output and capital-labor ratios. Data for the period 1980 – 2011 have been used to estimate each production function. Factor elasticities for Capital and Labor, and Total Factor Productivity have been estimated and analyzed for each economic sector. This block will determine employment levels in each of the 3 sectors and the economy-wide unemployment level.

(iii) Consumption Block. Five Linear Expenditures System (LES) consumption functions have been estimated corresponding to each of the Quintiles included in the model. Income elasticity for each quintile and price elasticity for each of the 11 categories of consumption reported in the Household Expenditure Survey have been estimated for the period 1989 – 2010. This block allows for measuring the impact of changes on relative prices (changes of indirect tax rates) and income (changes on direct tax rates) on income distribution.

(iv) Income Block. This component describes the income distribution among the quintiles of each of the 9 types of income considered in the model (wages for each sector, operating surplus for each sector, pensions, remittances and other income). Income distribution for each quintile has been obtained from the expenditure distribution of the Jamaica Survey of Living Conditions and by adding a savings estimation for each quintile. These values have been reconciled with the values for each category of income so as to obtain data consistency between the expenditure side (consumption) and the National Income side. This block is crucial to studying the impact of removing preferential tax treatments on poverty and income distribution.

(v) Prices Block. This block comprises price indices for each of the 11 categories of consumption, for each of the 3 GDP deflators (primary, secondary and tertiary), deflators for investment, exports, and imports. This component also describes the exchange rate, average wage for each sector, and interest rates. The price indices of the 11 categories of consumption are explained in terms of international price indices (USA price index), exchange rate, and domestic public sector borrowing requirements (public sector credit). The nominal exchange rate is adjusted to maintain purchasing power parity (PPP). Average wages and interest rates are exogenous to the model. GDP deflators are weighted averages of the 11 consumption categories of price indices and adjustment factors to preserve equilibrium conditions between nominal supply and demand.

(vi) Fiscal Sector Block. This block describes each of the government receipts by tax type and the main items of government expenditures to explain the financing gaps (surplus/deficit) and the nature of financing requirements (domestic/external debt). It also encompasses the fiscal expenditures by Ministry to discriminate the allocation of public capital expenditures between the three different economic sectors of the model. It also takes into account expenditures on education and health that link improvements in the Total Factor Productivity parameter of the three Cobb Douglas production functions and on the net survival rates in each of the age brackets of the population component of the model.

(vii) External Block. This component covers both exports and imports of goods and services and the main items of the Balance of Payments. Exports and Imports of goods and services are modeled on

current and constant terms to link with the demand side of GDP. The exchange rate and terms of trade play an important role in the dynamics of this component.

(viii) Monetary Block. This block comprises the Net International Reserves linked to the BOP block, the Public and Private Credit aggregates and other items of Total Liquidity including the Monetary Base, M1, M2 and M3.

(ix) Debt Block. This block links with the Fiscal Sector Block to describe the debt dynamics, both external and domestic, and including amortization, interest payments, and new loans. It allows for estimation of debt/GDP ratios and its impact on risk levels.

(x) Equilibrium Block. This component encompasses three different equilibrium conditions that guarantee a consistent closure of the model making possible the conditions of a general equilibrium model. The first condition is the equilibrium between total investment and savings. This condition guarantees that the level of total investment is equal to the three different sources of savings, namely external, fiscal (government) and private savings. The second equilibrium condition is the equilibrium between the Real GDP on the production side and the Real GDP on the demand side. This equilibrium is realized at the level of each of the economic sector contemplated in the model. The equilibrium is guaranteed by the Capital Utilization factor in each of the three Cobb Douglas Production Functions. The third equilibrium condition is the equilibrium between nominal GDP on the production side and nominal GDP on the demand side. This equilibrium is realized through the adjustment of the price deflators of the three economic sector of the model.

The logical framework of each block of the model is presented below together with some econometric results of the main equations of the model (production and consumption functions, and price indices equations). An analysis of the evolution of TFP for each sector and global GDP is also presented.

A complete specification of the model with its database, equations, estimation procedures, baseline and 11 scenarios results, and graphing procedures in Eviews 7 format is available upon request.