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RESPONDING TO CRISIS WITH INVESTMENT:
THE SHORT-TERM EMPLOYMENT AND ECONOMIC
GROWTH EFFECTS OF CONSTRUCTION SECTOR
INVESTMENTS IN JAMAICA



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The Transport Research Support program is a joint World Bank/ DFID initiative focusing on emerging issues in the transport sector. Its goal is to generate knowledge in high priority areas of the transport sector and to disseminate to practitioners and decision-makers in developing countries.

CONTENTS

ACKNOWLEDGEMENTS	IV
EXECUTIVE SUMMARY	V
INTRODUCTION.....	1
1 SECTORAL DISPARITIES IN CRISIS EFFECTS ON UNEMPLOYMENT .	3
1.1 AN OVERVIEW OF UNEMPLOYMENT IN JAMAICA BY SECTOR.....	3
1.2 UNEMPLOYMENT IMPACTS BY OCCUPATION/LEVEL OF SKILLS	5
1.3 GEOGRAPHIC CLUSTERING OF UNEMPLOYMENT IMPACTS	6
2 INSTRUMENTS AND FUNDING SOURCES FOR EMPLOYMENT- GENERATING INVESTMENTS	9
2.1 ONGOING AND PLANNED PUBLIC STIMULUS SPENDING.....	9
2.2 IS PRIVATE SECTOR ACTIVITY HELPING TO BRIDGE THE EMPLOYMENT GAP?	14
3 DERIVING JAMAICA'S SHORT-TERM EMPLOYMENT AND GROWTH MULTIPLIERS.....	17
3.1 THE INPUT-OUTPUT MODEL.....	17
3.2 RESULTS FOR 2008, AS COMPARED TO 2000.....	20
4 CAPACITY-BUILDING NEEDS AND DATA QUALITY ISSUES	29
4.1 TRAINING OPPORTUNITIES AND NEED FOR CAPACITY BUILDING	29
ANNEX 1: DATA REQUIREMENTS AND GAPS.....	30
ANNEX 2: MAIN LABOR INDICATORS.....	32
ANNEX 3 GENDER SPECIFIC CHANGES IN EMPLOYMENT BY SECTOR... 	33
ANNEX 4: A SUMMARY OF RECENT TRENDS IN JAMAICA'S UNEMPLOYMENT PROFILE ACROSS SECTORS.....	34
ANNEX 5: GOVERNMENT SUPPORT TO THE TOURISM INDUSTRY	35
ANNEX 6: PERCENTAGE DISTRIBUTION OF THE GROWTH MULTIPLIER EFFECT FROM INVESTMENT IN CONSTRUCTION.....	36
REFERENCES	37
LIST OF ABBREVIATIONS	38

LIST OF FIGURES

Figure 1: Percentage Change in Absolute Size of Unemployed Labor Force, January 2008 versus July 2009	4
Figure 2: Employed Labor Force by Sector in Absolute Terms, comparison of years 2006 to 2009 ('000) .	5
Figure 3" Unemployed Labor Force, by Occupation (2009)	6
Figure 4: Unemployment trends by geographic region, April 2007-October 2008 (in percent of total labor force).....	7
Figure 5: Bauxite Mining Communities Affected by Recession.....	8
Figure 6: Direct Annual Jobs Created per US\$ 1 billion of Investment, based on selected projects across LAC	13
Figure 7: Calculation of Backward and Forward Linkages Key Sectors	18
Figure 8: Growth and Employment Multiplier Decomposition across Sectors by Type of Importance, 2008	20
Figure 9: Total Growth created as a result of US\$1 million invested in a specific sector and the percentage distribution of the growth effect across the economy, 2008.....	21
Figure 10: Number of jobs created per investment of US1 million in a specific sector, based on the 2008 IO table.....	22
Figure 11: Total jobs created per US\$1 million invested in a specific sector and the percentage distribution of the employment effect across the economy, 2008.....	24
Figure 12: Employment multiplier effects from investment in the Construction sector, 2008	25
Figure 13: Percentage distribution of the employment multiplier effect from investment in Construction	27

LIST OF BOXES

Box: 1 Manufacturing and the Construction sector concerns: the private sector perspective	15
Box: 2 Future Growth and Employment generation potential of Jamaica's Bauxite sector	23

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EXECUTIVE SUMMARY

Countries throughout Latin America and the Caribbean have responded to the recent financial crisis through various forms of stimulus packages. In the wake of the crisis, unemployment levels remain stubbornly high and governments continue to show interest in addressing short-term unemployment through public works.

Objective of this Paper: In order to form policies that are responsive to the needs of short-term economic stimulus, a series of policy related questions arise.

Do public works investments provide employment or short term growth multipliers commensurate with other forms of investment?

How do public works and construction investments filter through to other sectors?

What are the skill levels of construction workers compared with other sectors and would increased public spending in construction reflect appropriate targeting of low income workers with higher propensities to consume?

This policy note, and the underlying analytical work upon which it is built, aim to address these questions. The paper offers a case analysis Jamaica's struggle to fight recession-driven unemployment. That is, it analyzes the potential for short-term growth and employment resulting from investments in public works and infrastructure—as captured through the Construction Sector of the country's economic matrix. It contrasts that potential with all other sectors of the economy through the use of an Input-Output Model built specifically for this purpose.

Description of the Underlying Analysis: The Input-Output (IO) Model calculates the growth and employment multipliers for three separate years-- 1993, 2000 and 2008. The paper then presents the results and delves into the impacts specific to the Construction sector as well as other public works investments. The matrices of the model and its results have been complemented by extensive interviews with government agencies and industry representatives as well as a review of the government's sectoral strategies (e.g., Construction, Tourism, and Agriculture).

Conclusions: The research concludes that support to the Construction industry could contribute to the Jamaican Government's anti-recessionary policy albeit within the fiscal constraints that define Jamaica's ability to stimulate its economy. There are several underlying factors that drive this conclusion:

Investments in the Construction Sector have relatively high short-term growth and employment multipliers.

The construction sector has:

- Sufficient size to absorb significant new employment capacity; and
- A traditional role to be played by public funding.
- Multiplier effects from investments in the Construction Sector disburse to other areas of the economy to a significant degree.
- The skill levels required of the construction sector are relatively low, suggesting:
- Transfers to the sector would be an effective proxy for targeting; and
- The sector's labor flexibility could attract unskilled and unemployed workers from other areas of the economy.

Growth in other high impact sectors—particularly agriculture and tourism—depend up on increased linkages to markets and, thus, could benefit indirectly but importantly from public works investments.

Summary Impact Estimates: As revealed by the IO model-based calculations, investment in the sector—whether public or private—has a relatively high multiplier effect on both short-term employment and growth generation. An investment of US\$1 million in the Construction sector is associated with the creation of 81 jobs across the economy (58 of those in the sector itself), comparable to the effect if the same amount is invested in private sector-led industries, such as the Hotels sector. In growth terms, US\$1 million of investment in Construction generates about US\$1.5 million worth of growth across the economy, comparable to the growth effect associated with investment in the Agriculture or the Bauxite sector.

Expressed in different terms, about US\$99 million would need to be invested in the Construction sector to generate 8,000 jobs (a target selected to represent 80 percent of the jobs lost in the sector during the recent recession). In comparison, the IO model-based calculations show that an investment of US\$134 million would be required in the Manufacturing sector to create the same number of jobs.

Beyond the magnitude of the multiplier, the employment and growth impacts associated with investment in the Construction sector are dispersed across other sectors. Thus, while about 72 percent of the short-term jobs created remain in the Construction sector itself, the rest are distributed across industries as diverse as Services, Transport, Agriculture, and Manufacturing. The relatively high employment multiplier and dispersion of the employment effects across a number of sectors can be explained in part by the flexibility and mobility of Jamaica's labor force.

While the calculated employment and growth multiplier effects are not specific to the investment *source* (i.e. public as opposed to private), there is a distinct role for publicly-sourced spending in the Construction sector. More so than in sectors dominated by private ownership and management, such as the Tourism industry, Manufacturing, Agriculture or Financial Services sectors, there is a public good rationale for Government financing in the Construction sector. This is most evident in investment in public works—such as roads, bridges, drainage, sanitation, dams or public buildings—aimed at improving the capacity and quality of infrastructure assets and services.

Finally, the IO model-based analysis reveals the Construction sector as having linkages with a number of other productive sectors of the Jamaican economy, particularly the Agriculture and Tourism sectors. The linkage of Construction to these sectors is primarily through its role in ensuring physical access to markets and services—a relationship that is drawn out in the Tourism and Agriculture Sector Plans prepared by the Planning Institute of Jamaica (PIOJ) for 2009-2030. The IO model reveals the importance of these sectors as contributors to growth and employment suggesting that public works investments that promote tourism and agricultural competitiveness will provide important knock-on effects to the economy as a whole.

INTRODUCTION

With employment being a lagging indicator of economic recovery, the LAC region overall still struggles with elevated levels of unemployment even as economic contraction has bottomed out. Against this general regional background, however, the crisis has been more prolonged—and its effects more severely felt—in the region’s smaller economies across the Caribbean. These countries have been hit by several factors simultaneously. Remittances—declining in absolute terms as a result of the global recession—represent a key contributor to foreign exchange and income generation. The small economies of the region have also been disproportionately affected by the decline in global demand in the tourism sector.

The Jamaican economy exemplifies the severe effects and increased economic uncertainty caused by the global economic crisis, with the country’s real GDP declining by 0.7 percent on an annual basis during the last quarter of 2008 and an estimated contraction of as much as 3 percent in FY09/10. Aside from additional pressures for fiscal and debt sustainability, the economic crisis has also led to a sharp fall in the price and output in the aluminum and bauxite industry—a key exports and foreign exchange generating sector—creating significant unemployment with associated social implications.

Even under current economic conditions, the Jamaican economy continues to be heavily dependent on services, which account for more than 60 percent of GDP. However, due to the reliance on tourism and the economy’s structural weaknesses, the economy, already characterized by growth levels below those in the rest of Latin America, faces comparatively greater challenges as the global economy slows. Most visibly, the economic slowdown is being manifested through short-term job losses in specific productive sectors, including Construction, Manufacturing, and Mining. The majority of job losses overall are among unskilled and semi-skilled workers.

As analyzed by previous World Bank research (see Schwartz, Andres, and Dragoiu 2009), evidence of public works projects from other countries in LAC shows that the direct and indirect short-term employment generation potential of infrastructure capital investment projects can be considerable. Annualized short-term employment impacts range from thousands to hundreds of thousands of jobs per US\$1 billion, depending on the specific sectoral composition of the “basket” of investments, local wages, levels of “leakage” due to imports of inputs, and the technologies employed in each investment. On the higher side of the capital investment spectrum, water

distribution and sewerage expansion can generate up to 100,000 jobs for every US\$1 billion spent. As a non-capital expenditure, rural road maintenance projects that employ micro-enterprises may generate between 200,000 to 500,000 annualized direct jobs for every US\$1 billion spent. These calculations estimate direct jobs to on-site workers and indirect jobs from the provision of material and equipment. They do not consider the effects of induced expenditure on consumption unrelated to the investment in question.

This Policy Note and the underlying analytical work and in-field capacity building activities are focused specifically on Jamaica. The approach to the work also established a methodology for merging labor survey data with Input Output Models, and training public officials in the use of these tools.¹ The aim is to address the problem of recession-driven unemployment—as opposed to long-term unemployment—by analyzing the short-term growth and employment generation potential resulting from investment in public works and infrastructure. The results reflected in the Note serve as a basis for policy recommendations based on respective industry matrices (official statistics) and input-output tables. These were built through collaboration with the Statistical Institute of Jamaica (STATIN), the Planning Institute of Jamaica (PIOJ) and the Jamaica Central Bank. The team effort and the exchange of ideas with these institutions have been extraordinary.

Given the flexibility of the IO approach for short-term simulations, the PIOJ and the Central Bank have also confirmed their interest in applying the IO approach to analyzing the impact of other relevant variables of the Jamaican economy, in particular, the short-term price effects caused by changes in the tax regime. This work will serve as a basis for training in the application of the model so that the shelf-life of the initiative is extended beyond 2010 and the breadth of the relevance beyond questions of investment for employment generation.

¹ Leveraging this experience funded by TRS, the World Bank team is now utilizing resources from the Spanish Trust Fund for LAC (SFLAC) to apply a modified approach to the work in conjunction with the Central Banks and Ministries of Economy of El Salvador and Panama.

1 SECTORAL DISPARITIES IN CRISIS EFFECTS ON UNEMPLOYMENT

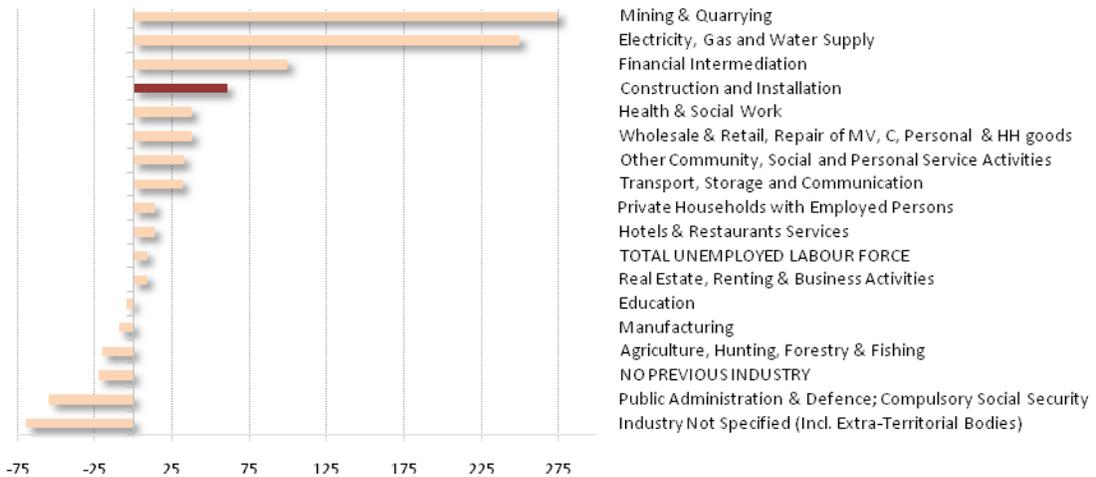
1.1 AN OVERVIEW OF UNEMPLOYMENT IN JAMAICA BY SECTOR

Jamaica's overall unemployment level rose by about 9 percent between January 2008 and July 2009. This average, however, masks significant disparities across sectors. As shown in Figure 1, the levels of unemployment more than doubled in some sectors—particularly those with small labor forces, such as Mining & Quarrying and Electricity, Gas & Water Supply. In contrast, levels of unemployment *declined* in Agriculture, Hunting, Forestry & Fishing (hereafter "Agriculture") by about 20 percent;² in Manufacturing by 9 percent; and in the Education sector by 4 percent. Similarly, in the Public Administration, Defense & Compulsory Social Security sector, the size of the unemployed portion of the labor force declined from 4,100 to 1,900. In the Transport, Storage & Communications sector (hereafter "Transport"),³ the absolute number of unemployed workers increased by about 30 percent (8,900 workers in absolute terms). This is comparable to the short-term trend in the Wholesale & Retail, Repair, and Personal & Household Goods sector (hereafter "Wholesale & Retail"). Of the sectors that employ a large share of Jamaica's labor base, Construction has been hit the hardest.

² The decrease in unemployment in the Agriculture, Hunting, Forestry & Fishing sector, however, can be almost entirely attributed to the seasonality of employment opportunities in this sector, with employment supply rising in the summer months and stagnating in winter.

³ The "Transport" sector data do not include infrastructure, such as roads or railroads. Workers that are employed in road construction, for example, are captured by the "Construction" sector data. In 2008, transport (road transport, railway services, water transport and air, including services allied to transport) and storage represented 5.6 percent of Jamaica's GDP (Transport Sector Plan 2009-2030).

FIGURE 1: PERCENTAGE CHANGE IN ABSOLUTE SIZE OF UNEMPLOYED LABOR FORCE, JANUARY 2008 VERSUS JULY 2009



Source: STATIN

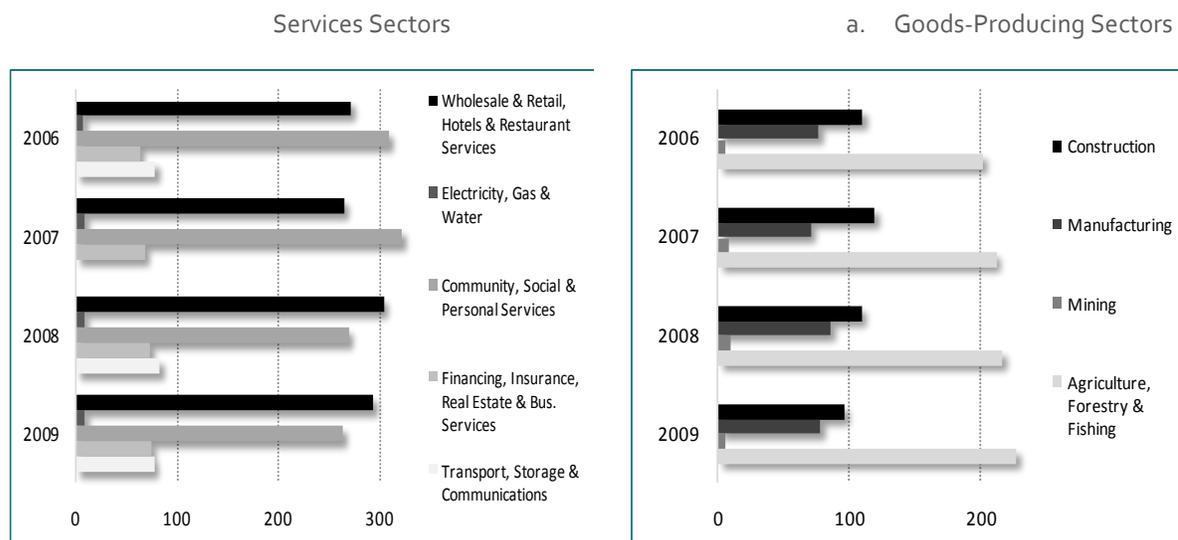
Short-term Shock in the Construction Sector⁴

The annual *Labor Force* publication by STATIN estimates that the Construction sector accounted for 9.8 percent of the total labor force in October 2008. Given the significant size of the labor force involved, and reflecting the overall pulse of the economy, the crisis effects have been particularly severe in this sector.⁵ In Construction, the number of unemployed rose by as much as 60 percent in the 18 months from January 2008 to July 2009. This short-term decline identified by STATIN is corroborated by a 4-year trend identified by the Ministry of Labour and Social Security (MLSS) which found that the number of people employed by the Construction sector dropped steeply between 2006 and 2009, from about 110,000 to 96,000 (see Figure 2). This is the steepest decline among the economy's goods-producing sectors and contrasts sharply with a simultaneous rise in the number of employees in the Agriculture sector over the same period. Thus, while about 12,000 Construction sector jobs were lost from 2006 to 2009, 10,500 were created in the Agriculture sector. This may suggest a short-term shift of redundant construction workers to family and contract farming for subsistence purposes.

⁴ For a summary of unemployment effects on other sectors, see Box 4 in the Annex.

⁵ The Construction sector represents approximately 8 percent of Jamaica's GDP (Construction Sector Plan 2009-2030).

FIGURE 2: EMPLOYED LABOR FORCE BY SECTOR IN ABSOLUTE TERMS, COMPARISON OF YEARS 2006 TO 2009 ('000)



Source: Labour Market Information System, Jamaica Ministry of Labour and Social Security

According to the data collected by STATIN and analyzed by PIOJ, in July 2009, the Construction sector employed only 8.4 percent of Jamaica’s employed labor force, down from 10.4 percent in January 2009. During this period, the Construction sector thus also significantly increased its share in Jamaica’s overall unemployment, from about 10 percent in January 2008 to close to 20 percent by July 2009, corresponding to an increase in absolute terms from about 15,000 to over 25,000 unemployed workers. The rise in the share of the sector in the overall unemployment was particularly stark among males, from about 30 percent in January 2008 to 40 percent in July 2009.

Based on conversations with the Incorporated Masterbuilders Association of Jamaica (IMAJ),⁶ the recession has mostly affected the commercial building sector, including levels of employment. The few existing contracts are mostly being carried out by foreign companies, with only incidental services being bought locally and a small share of work implemented by local sub-contractors.

1.2 UNEMPLOYMENT IMPACTS BY OCCUPATION/LEVEL OF SKILLS

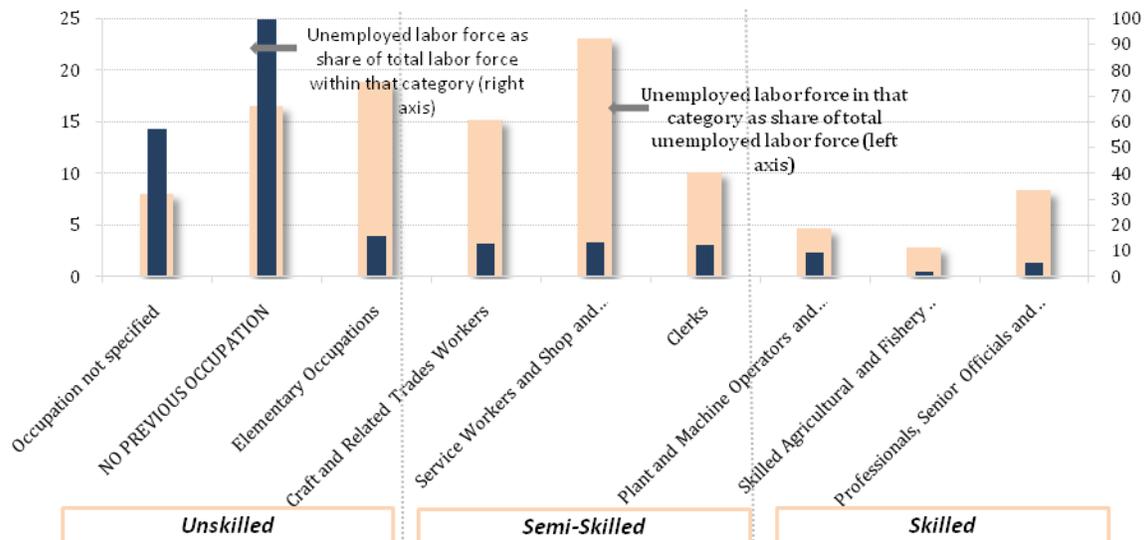
The category of Jamaica’s labor force most impacted by the recession is that of semi-skilled and unskilled workers (see Figure 3). As illustrated in Figure 3, the unemployed unskilled laborers⁷ in 2009 accounted for about 43 percent of the country’s total unemployed labor force. The unemployed semi-skilled

⁶ Meeting with the President and several other IMAJ representatives, Kingston, January 12, 2010.

⁷ This category includes labor force that either (1) does not have a specific occupation; (2) has had no previous occupation; or (3) has an elementary occupation, as classified by STATIN.

workforce, including craft and related trades workers, service workers, and clerks, together accounted for another 48 percent of Jamaica's total unemployed labor force, while only 16 percent of all the unemployed in 2009 were skilled.⁸

FIGURE 3" UNEMPLOYED LABOR FORCE, BY OCCUPATION (2009)



Source: Authors' calculations based on STATIN figures.

1.3 GEOGRAPHIC CLUSTERING OF UNEMPLOYMENT IMPACTS

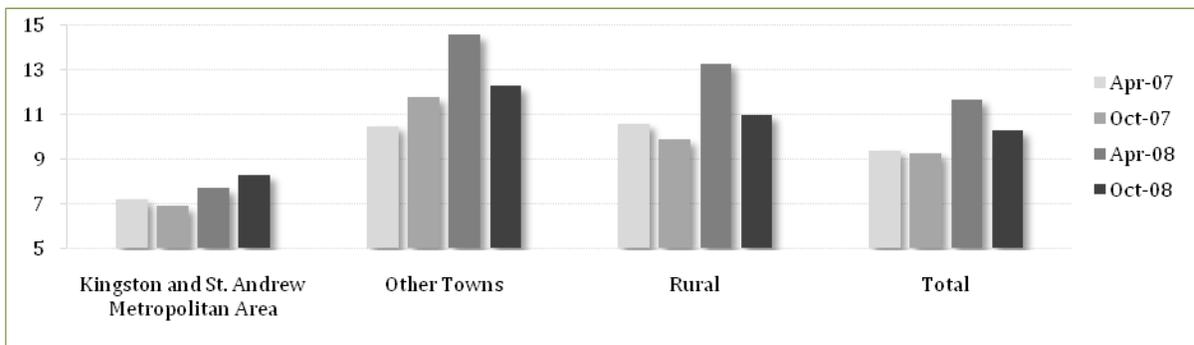
Linked to the uneven sectoral unemployment trends caused by the crisis is an uneven distribution across Jamaica's metropolitan and rural areas, with the secondary towns suffering the most notable spikes in unemployment since the beginning of the crisis.⁹ While STATIN does not collect or map information focused specifically on the geographic distribution of unemployment impacts in the context of the current recession, nor collect data on migration and remittances, it has tracked at least indicative developments in employment trends by geographic clusters – distinguishing the scattered urban areas from the rural ones (Figure 4).

⁸ The "skilled" category combines the labor force within the following occupational categories distinguished by STATIN: (1) plant and machine operators and assemblers; (2) skilled agricultural and fishery workers; and (3) professionals, senior officials and technicians.

⁹ Spikes in unemployment were disproportionately distributed also in terms of age groups, with most of the increase in the unemployed labor force occurring in the 25-34 age group (18 percent between 2008 and 2009).

Of the geographic regions delineated above, the areas most severely affected are the former Bauxite mining communities across the St. Elizabeth, St. Ann, Manchester, and St. Catherine parishes (Figure 5). According to the analysis done by the Ministry of Labour and Social Security,¹⁰ the bauxite communities saw the steepest rise in unemployment in relative terms between January 2008 and July 2009, when employment in the Mining sector overall declined by 62.5 percent (6,500 workers). Similarly to the communities dependent on sugar production, the Bauxite mining towns have historically been comparatively more vulnerable to recessionary pressures, given their homogeneity of employment.

FIGURE 4: UNEMPLOYMENT TRENDS BY GEOGRAPHIC REGION, APRIL 2007-OCTOBER 2008 (IN PERCENT OF TOTAL LABOR FORCE)



Source: STATIN

Prior to the recession, the Bauxite industry overall, including aluminum and crude bauxite production, employed about 6,000 people – with entire communities dependent on this source of income in counties such as Clarendon, Manchester, St. Catherine, St. Elisabeth, and St. Ann. Jamaica’s Bauxite & Alumina Trading Company¹¹ notes particularly high associated employment spillover effects in the Agriculture sector whose activity is also concentrated in the same areas,¹² but also in the Health & Education sectors that had developed in these areas. Historically, the Bauxite mining sector has also been closely linked with the Sugar industry, over time attracting an increasing share of the industry’s labor force.

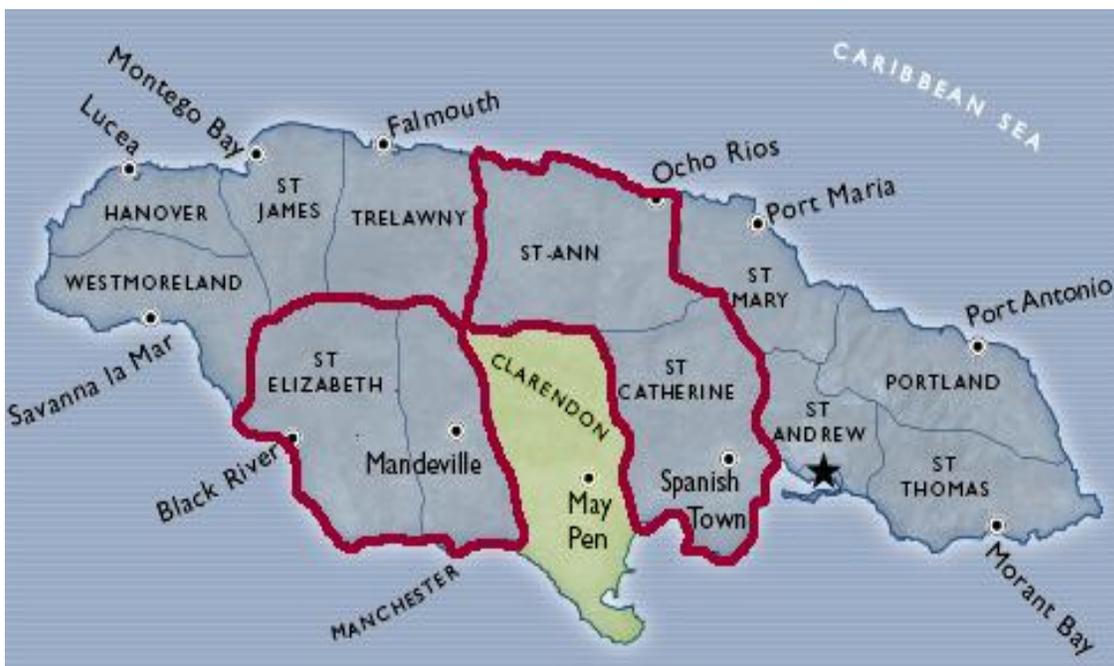
¹⁰ The Team convened with several officials from the Ministry and the Jamaica Productivity Centre, including the Director of Planning, Kingston, January 13, 2010.

¹¹ Based on a discussion with the Managing Director and several other company representatives, Kingston, January 14, 2010.

¹² Winalco, in particular, owns a lot of the agricultural land in these areas and, in fact, used to be the largest dairy producer in Jamaica.

Of the four alumina production plants owned by Jamalco, Windalco, and Alpart, currently only the one owned by Jamalco is still operating. Of the total labor force employed in the industry, about 75 percent are skilled specialists and 25 percent are unskilled laborers. The employment share of Jamalco, the only remaining Bauxite company whose plant is located in the Clarendon parish,¹³ is small compared to the total industry as it existed prior to the recession. Namely, the company employs only about 800 people, about 90 percent of which is Jamaican, with a few foreigners employed in the more technical level.

FIGURE 5: BAUXITE MINING COMMUNITIES AFFECTED BY RECESSION



Source: Authors' elaboration based on USAID map

Given the country's size and the flexibility of the unskilled labor force, the geographic dispersion may not be a major hindrance to movement among low-skilled work opportunities. That is, it is relatively easy to commute to centers of remaining and new employment opportunities even without permanently migrating, for instance, from the declining bauxite communities, such as Clarendon, to Kingston.

¹³ The map in Figure 5 illustrates the geographic concentration of Bauxite sector-specific unemployment effects of the recent recession. Namely, the parishes marked in red—St. Elizabeth, St. Ann, and St. Catherine—have been the worst hit, while Clarendon has been affected less and currently houses the only remaining plant owned by Jamalco.

2 INSTRUMENTS AND FUNDING SOURCES FOR EMPLOYMENT-GENERATING INVESTMENTS

Fiscal space for government spending on infrastructure and social programs is scarce Jamaica. This is due to a number of long-term macro-economic challenges, including the high merchandise trade deficit and a debt-to-GDP ratio of almost 125 percent, whereby debt servicing consumes nearly half of government expenditures. In addition, the government has also been reluctant to privatize several state-owned companies, such as the former sugar estates and the national airline. These structural weaknesses, the historically low levels of government infrastructure investment, and – more recently – high interest rates and energy prices have contributed to the erosion of the country's productive sectors. This, in turn, may be contributing to the unemployment and under-employment rates. In the past few years, the economy's structural flaws and considerable unemployment levels have been exacerbated by the impact of the global crisis across a number of sectors and geographic localities. This places the government in a position where it faces the difficult prospect of having to achieve fiscal discipline in order to maintain debt payments while simultaneously addressing the elevated -- often sector-specific -- short-term unemployment issues.

2.1 ONGOING AND PLANNED PUBLIC STIMULUS SPENDING

The main investor in public works projects across the country, the Government is also the largest single client in the Construction sector. The Ministry generally responsible for the construction sector is the Ministry of Transport and Works (MTW), in charge of preparing the recent draft Construction Industry Policy aimed at addressing a range of issues, including the development of skill levels in the construction industry. The National Works Agency (NWA) is the main public sector agency responsible for infrastructure construction and maintenance, while the National Road Operating and Construction Company (NROCC) is the key public sector company responsible specifically for the development of Highway 2000. Lastly, the Port Authority of Jamaica is the main statutory body responsible for the construction of maritime infrastructure.

Despite its historical role in directly financing public works, the Government has used its limited fiscal space to stimulate the Tourism Sector. The Government of Jamaica sees the Tourism sector as critical for both employment generation and foreign exchange earnings.¹⁴ According to the Ministry of Finance,¹⁵ the government has provided specific incentives to companies operating in the Tourism industry¹⁶ – for example, through a reduction of the Sales Tax by half (to 8.5 percent). In December 2008, the government issued a stimulus package, reducing the VAT for the Tourism sector from ½ to as low as ¼ of the normal rate and exempting exporters of primary goods and minerals from the infrastructure user fee (otherwise set at 2 percent). Beyond this support to the Tourism industry, the government has not focused on stimulating short-term job creation. Instead, it has been mostly concerned with general fiscal sustainability and the more pressing structural balances, including the complex tax code and the large debt, which are seen as primary obstacles to improving the country’s competitiveness and growth prospects.

According to the Ministry of Labor, the government has not explicitly prioritized employment benefits in its decision-making. Although set contracts restrict the use of internationally bid construction contracts to drive local employment, the government tries to monitor the employment generation from these projects, as well as the extent to which increased productivity in public works results in employment shedding and labor force displacement.

Several public works projects that were started before the recession are still ongoing (particularly unaffected has been the construction of inner city housing and roads). Still other projects are being re-tendered and several are at a standstill. Few, if any, new projects have been started since the crisis. As indicated in the Government’s Construction Sector Plan 2009-2030, on-going and recent major infrastructure projects have included airport construction projects, highway and transport center construction, seaport and container terminal expansion, and construction associated with major international events, including the Cricket World Cup:

¹⁴ See Box 4 in Annex for more details on the Government’s policies and investment benefiting the Tourism sector.

¹⁵ The Team met with the Deputy Financial Secretary in Kingston on January 14, 2010.

¹⁶ Tourism is one of the leading industries in Jamaica, contributing an estimated 8 percent of total GDP, directly employing approximately 80,000 persons and accounting for some 47 percent of total foreign exchange earnings from productive sectors. At the same time, there is a relatively high leakage of these benefits (estimated at over 50 percent of tourism earnings) through imports of goods and services and payments of interest and investment income to overseas providers of capital. Also, while the accommodation sub-sector is currently still mostly Jamaican-owned, a notable trend in recent years is the construction of large hotels by Spanish hotel chains. PIOJ (2009): Tourism Sector Plan 2009-2030.

- In the Transport sector, the Norman Manley International Airport (NMIA) Capital Development Programme: Phase 1A was completed in September 2008; work on Phase 1B is ongoing with completion date set for 2012. The second and final phase of the Sangster International Airport Expansion Project is expected to be completed in mid-2009.
- The domestic aerodromes have experienced improvement works in recent years. Works were undertaken at the Negril Aerodrome to rehabilitate and improve the facility and included the extension of the existing runway. Work also commenced on extending the runway at the Boscobel Aerodrome and upgrading the terminal and air infrastructure, with completion slated for 2010.
- Construction work on Segment 2A of the North Coast Highway Improvement Project (Montego Bay to Greenside) was completed in July 2008, valued at US\$54 million. Work on Segment 3 continued in 2008. The project, which included the rehabilitation of 96 km of a 2-lane main road from Ocho Rios to Port Antonio, included the construction of 8 new bridges and the rehabilitation of 16 bridges. Project financing came from an 80 million Euro grant from the EU and counterpart funding from the Government of Jamaica (GOJ) of 25 million Euros.
- Work is currently ongoing on the Linstead to Moneague Bypass segment of Highway 2000. Started in June 2007, the construction of the approximately 20 km road is expected to be completed in 2010. The Highway 2000 Project overall, planned as a PPP, implies the construction of a 230 km highway running from Kingston to Montego Bay and Ocho Rios, Jamaica's first toll road.
- Construction work on the Yallahs River Bridge was completed in August 2008 (contract sum valued at J\$402.7 million).
- Work on the Kingston Container Terminal Expansion Project continued and was 98-percent complete at the end of December 2008.

In 2008, the Road Maintenance Fund (RMF) disbursed over J\$500 million to repair main roads island-wide,¹⁷ used to repair roads damaged by Hurricane Dean in 2007 and Tropical Storm Gustav in 2008. It also contributed J\$180 million to the GOJ/IDB National Road Services Improvement Programme, focused on maintenance of main roads in 5 selected parishes. In addition, the Urban Development Corporation (UDC) is currently spearheading plans for the construction of a Transport center in Downtown Kingston, and additional plans

¹⁷ Total expenditure on road work programs in Jamaica in 2008 amounted to J\$4.2 billion, compared with \$5.2 billion in 2007 (ESSJ 2008).

have been proposed by local government authorities to construct municipal transportation centers in Clarendon, Westmoreland, and elsewhere.¹⁸

In June 2010, an additional public works initiative, the J\$20 million Patching Programme, was launched by the NWA, funding the repair of about 36 deteriorating roads in Kingston, St. Andrews and St. Catherine. The activities funded by the program were intended to be undertaken over the course of the summer.

In the *maritime* sub-sector, major recent or ongoing projects include: the Kingston Container Terminal Development (project cost: US\$103.4 million); the Rehabilitation of Esso Bunker Terminal by Petrojam; the Ocho Rios Cruise Ship Terminal Development (project cost: US\$43 million); the Montego Bay Cruise Ship Terminal Development (US\$67 million); construction of a steel, lumber, and cement facility at Rio Bueno (US\$18.6 million); construction of a multi-port facility as part of the Esquivel Development Project, including for LNG, bulk minerals, and general cargo (US\$2.3 billion); development of cruise ship terminals at Lucea, Falmouth, Port Antonio, and Kinston; and development of aggregate an export facility at Salt River.¹⁹ The Port Authority of Jamaica (PAJ) is responsible for the majority of these projects.

Similarly, *Housing* represents a major component of the Construction sector. About 4,000 housing developments were initiated in 2008,²⁰ including those built by all Public Sector Agencies.²¹ Most of those were concentrated in urban areas, based on the availability of adequate infrastructure. Over 5,000 initiatives saw a completion in 2008, with almost a half of those by the National Housing Trust (NHT). As indicated in the Construction Sector Plan 2009-2030, the main providers of formal housing solutions include MWH, UDC, NHT, the Housing Agency of Jamaica (HAJ), and the West Indies Home Constructors (WIHCON). In addition, the existing Joint Venture Housing Policy provides a framework to encourage partnerships with private sector housing developers, whereby the MWH uses land it owns to form partnerships with private firms to develop housing solutions at lower market costs. Other forms of Government support to housing construction currently include the Social Housing Programme and the Mortgage Financing Provision, which involves the provision of short-term financing for residential construction and infrastructure

¹⁸ In 2009, the Government introduced a special consumption tax on fuel of \$8.75 per liter. Proportions of this tax will be used to fund the RMF over the next 3 years. RMF will receive 20 percent of the tax for FY09/10 and 35 percent and 50 percent for FY10/11 and FY11/12, respectively. PIOJ (2009): Transport Sector Plan 2009-2030.

¹⁹ PIOJ (2009): Transport Sector Plan 2009-2030.

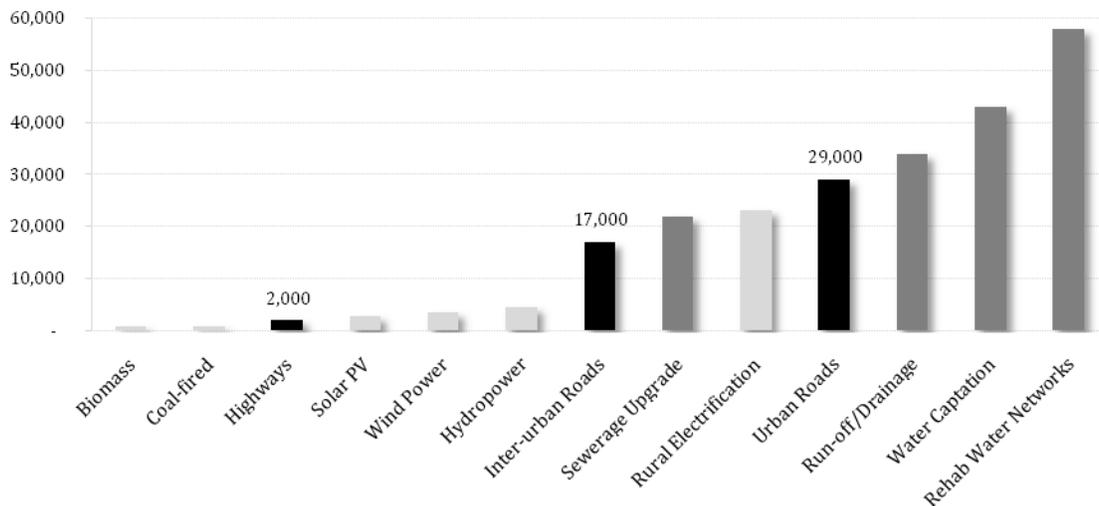
²⁰ In comparison, according to the most recent official national housing needs assessment (1986-2006), Jamaica's housing requirements averaged 15,500 new units annually, in addition to about 9,700 upgrades.

²¹ The public sector has traditionally accounted for as much as 75 percent of mortgage funds for new housing construction. PIOJ (2009): Housing Sector Plan 2009-2030.

development and the insuring of residential mortgages through the Jamaica Mortgage Bank.²² In addition, in rural areas, the Ministry of Local Government and Environment is currently implementing a complementary program aimed at rehabilitating water supply infrastructure to improve the quality and accessibility of potable water.

Figure 6 illustrates the indicative employment generation impacts from infrastructure investments of some of the types listed above, as calculated based on analysis of projects carried out as part of stimulus packages launched in other countries in the LAC Region. The LAC-wide analysis shows the large dispersion of employment impacts across the various construction/infrastructure projects, with a large variance even among road construction and repair initiatives (such as those supported by the Jamaican government and its National Works Agency), with as few as 2,000 or as many as 29,000 annual jobs created per US\$ 1 billion invested in Highways versus Urban Roads, respectively. While there is no direct evidence from specific projects in Jamaica or elsewhere in LAC, it is likely that the number of jobs created through investment in road *maintenance* projects, such as the ones currently financed by the NWA, is even higher.

FIGURE 6: DIRECT ANNUAL JOBS CREATED PER US\$ 1 BILLION OF INVESTMENT, BASED ON SELECTED PROJECTS ACROSS LAC



Source: Schwartz, Andres and Dragoiu, 2009

²² Due to costs of materials, however, most units being delivered in the housing market are within the middle income price range; hence, unit costs are around \$3.8 million, affordable only to those earning over \$48,000 monthly, and thus effectively excluding about 32 percent of the population from the formal housing market. As a result, already now, about 50-70 percent of housing developments take place outside of the formal legal requirements. PIOJ (2009): Housing Sector Plan 2009-2030.

The high wage bill of the public sector--presently at 11 percent of GDP--is already a big concern for the government. Government fiscal plans strive to reduce the figure to closer to 8 percent within the next 3-4 years. This will primarily affect the Civil Service, the Health & Social Work, Education, and Public Administration & Defense industries as well as the Water and some of the Gas sub-sectors. These sectors in total historically employ about 10 percent of Jamaica's workforce. A wage freeze was already put in place for FY09/10, which will continue for the next 2 years, also helping to reduce the budget deficit. However, while there is government initiative and a dedicated team analyzing the options for restructuring the public sector and improving the control and management of its employment, no definite plan exists as of yet. The key proposition currently being considered is the divestiture of some of the state-owned companies.

2.2 IS PRIVATE SECTOR ACTIVITY HELPING TO BRIDGE THE EMPLOYMENT GAP?

Given that funding of public works projects, such as road construction and maintenance, will present a challenge to the public sector, it will be important to explore further opportunities for private sector participation and cost recovery through user fees in the construction of new assets, based on the example provided in the first phase of Highway 2000. Here, concerns of capacity have been raised by the government and by contractors alike.

According to the Construction Sector Plan 2009-2030, in 2007, 487 contractors are registered with the National Contracts Commission (NCC), of which 73 percent were classified as Grade 3 or below, indicating that the majority of companies in the sector are relatively small with limited capacity. Grade 1 contractors are pre-qualified to a maximum of J\$150 million (about US\$2 million) per contract, a level that is relatively small by global standards. The majority of construction firms in Jamaica are locally owned. However, a small number of large foreign companies typically undertake major construction projects, including large infrastructure and tourism projects. In many cases, local construction companies are involved as sub-contractors on such projects.

BOX: 1 MANUFACTURING AND THE CONSTRUCTION SECTOR CONCERNS: THE PRIVATE SECTOR PERSPECTIVE

In the **Manufacturing** sector, according to the Jamaica Manufacturers' Association (JMA), implementation of the agreed-upon policy changes has been lagging, with the Tourism/Services sectors being given increasing tax breaks and other incentives since the early 1990s. This has resulted in the collections from the Tourism sector amounting to only about JM\$2 billion annually (2007), compared to JM\$13.5 billion from the Manufacturing sector. At the same time, the employment share of the two sectors has been much more equal – with each of the sectors each employing about 75,000 people in July 2009. The tax disincentive has also encouraged Manufacturers to work unofficially, notwithstanding the government's goal to make all of the sector's companies to register by April 2010. Not only the rate but also the complexity of the tax system (with about 7 different taxes to be paid annually) represents an obstacle, especially in the light of the low overall level of education. Also here, the government has agreed to make improvements through simplification. Lastly, Manufacturing activity is being inhibited by the licensing procedures of the National Environmental Planning Agency (NEPA), which the JMA sees as an administrative obstacle to new up-starts in the sector.

The JMA considers the pullout of international companies to be less a result of the recession than the possibility of default, despite the expectation of a government refinancing of the debt at a lower rate (down from the current 27 percent). Access to credit for local Manufacturers is already improving, although it is still insufficient. At the same time, the complexity of procedures and the cost of credit have been increasing. Other challenges for Jamaica's Manufacturing sector, as identified by the JMA, include: (i) the lack of properly organized infrastructure – i.e. the lack of Factor Free Zones and infrastructure serving the factory areas – although the government's plans do include the creation of a Free Trade Zone; (ii) red tape for exporting; and (iii) low – albeit increasing -- productivity levels, documented by the Jamaica Productivity Center (JPC).

Based on discussions with IMAJ, local private initiative in the **Construction** sector, on the other hand, is being stifled and projects bogged down by their dependence on access to international credit, especially in the light of Jamaica's credit rating downgrade. Here, construction in the Hospitality sector has been most affected despite government's efforts to support hotel-building activities through a housing trust. Still, developers from the EU find it easier to get their governments' guarantees for borrowing and are effectively crowding out Jamaican firms that IMAJ considers to be able to offer the same level of quality and expertise.

On top of concerns about the availability of local financing and the cost of capital, the local construction industry complains about the complex way that contracts are structured. Their preference is for regulations that promote technology transfer and local capacity building, and offer explicit support to local content in the national procurement policies. Moreover, the recession has caused a sharp increase in the performance requirements of securities bonds for local companies, with which the companies' asset base has not been able to keep up. Combined, the above factors present a significant challenge to local private entrepreneurship even in sectors where the Jamaican companies' expertise may be comparable to foreign competitors.

As analyzed by the PIOJ and pointed out in the Construction Sector Plan 2009-2030, the international competitiveness of the domestic construction companies is affected by: limited economies of scale, constraints in business environment and infrastructure, and inadequate number of experienced professionals and technical staff, among others. While some segments of Jamaica's Construction sector are relatively shielded from international competition, for example, construction of individual homes. However, international competition has a significant impact in the area of large construction projects, including road and airport construction, and hotel and

resort developments. These areas have seen increased penetration of foreign-owned companies that enjoy advantages of greater economies of scale and access to financial and technical resources. This trend has included government projects as well as construction projects undertaken by private sector clients. However, the Sector Plan also emphasizes that the Jamaican economy overall benefits from the performance of construction projects at the highest possible levels of quality and efficiency, including those undertaken by foreign-owned companies. It therefore questions whether local firms should seek to achieve international competitiveness in all areas of construction, including large, specialized projects.

Similarly, with respect to the competitiveness of domestic Manufacturing companies, the Manufacturing Sector Plan 2009-2030 points out that, despite the natural linkages between Manufacturing and other sectors, especially the Tourism industry, the domestic Manufacturing sector is relatively high-cost and not very competitive across major product lines. The Plan highlights the difficulty for local manufacturers to compete with imports as suppliers to the tourism industry, especially since the Government policy seeks to enhance the competitiveness of tourism by granting access to inputs at world market prices. Therefore, the Plan highlights the need for the local manufacturers to find niches in which they can supply goods on a competitive basis.

Particularly in the Construction sector, over the last two-three years, Jamaica has seen an increased influx of foreign investment and labor force, for example, Chinese investment in road construction projects and investment by EU-based companies in the rehabilitation of Kingston's water supply systems. Even though the majority of Construction companies operating in Jamaica are sub-contractors for large foreign firms, the sector retains a large local employment effect, employing not only unskilled labor but also skilled artisans.

3 DERIVING JAMAICA'S SHORT-TERM EMPLOYMENT AND GROWTH MULTIPLIERS

In an effort to provide a window into the effective use of public spending as it relates to short-term growth and employment generation in a small and open economy like Jamaica's, the paper develops an Input-Output Model. The Model is based on Input-Output tables prepared by STATIN. Calculating the growth and employment multipliers for three separate years – 1993, 2000, and 2008 – the paper then presents the overall results, while delving more specifically into those specific to Construction sector and other public works investments.

3.1 THE INPUT-OUTPUT MODEL

In an open market economy, industrial output X can be divided into two parts: One corresponds to the industrial production destined to supply the input requirements of the industry itself AX and the other part satisfies the final buyers demand Y from households, government, the external sector and other final buyers.

$$X = AX + Y \quad (1)$$

In equation (1), A is a $n_{\text{industries}} \times n_{\text{industries}}$ matrix in which each of its elements a_{ij} measures the percentage of the production from the industry i demanded by the industry j . In other words, a_{ij} measures the intermediate consumption of goods and services that each industry makes of itself and of the rest of the industries in the economy. The equation (1) can be re-expressed in terms of the final demand as follows:

$$X = (1 - A)^{-1}Y \quad (2)$$

In equation (2), the Leontief inverse matrix $(1 - A)^{-1}$ provides a measure of the product multipliers of the economy. In it, the sum of all elements of a specific column j corresponds to the product multiplier of that particular industry. The product multiplier of industry j , also known as the backward linkages of industry

j , measures the increases in production occurring in all industries when the final demand of industry j increases by one unit.

On the other hand, the sum of all elements of a specific row i in $(1 - A)^{-1}$ measures the forward linkages of the production of that industry. Forward linkages of industry i correspond to the increases in production occurring within industry i when total final demand increases by one unit.

Alternatively, by combining information from the Leontief inverse matrix and the "employment coefficients" it is possible to obtain a measure of the employment multipliers by industry. The employment coefficient of industry j corresponds to the employment per dollar of output in that specific industry. The employment multiplier quantifies the multiplicative effect, in terms of jobs created, induced by a unit increase of final demand in the industry j .

$$M = E(1 - A)^{-1} \quad (3)$$

In equation (3), E is a diagonal matrix $n \times n$ where each element of the diagonal corresponds to the employment coefficient of a specific industry. In matrix M , each of the columns j summarizes the multiplier effect of the industry j in itself and in the rest of the industries in the economy. In turn, totals column correspond to the employment multipliers by industry.

Finally, based on information from the Leontief inverse matrix it is also possible to classify industries in four major groups of sectors. This classification is derived from the backward linkages BL and the forward linkages FL as follows:

FIGURE 7: CALCULATION OF BACKWARD AND FORWARD LINKAGES KEY SECTORS

$$\text{Sensitivity of Dispersion } SD = n * \frac{FL_j}{\sum FL_j} \quad (4)$$

1	Base	Key
	Isolated	Driver
		1

$$\text{Power of Dispersion } PD = n * \frac{BL_j}{\sum BL_j} \quad (5)$$

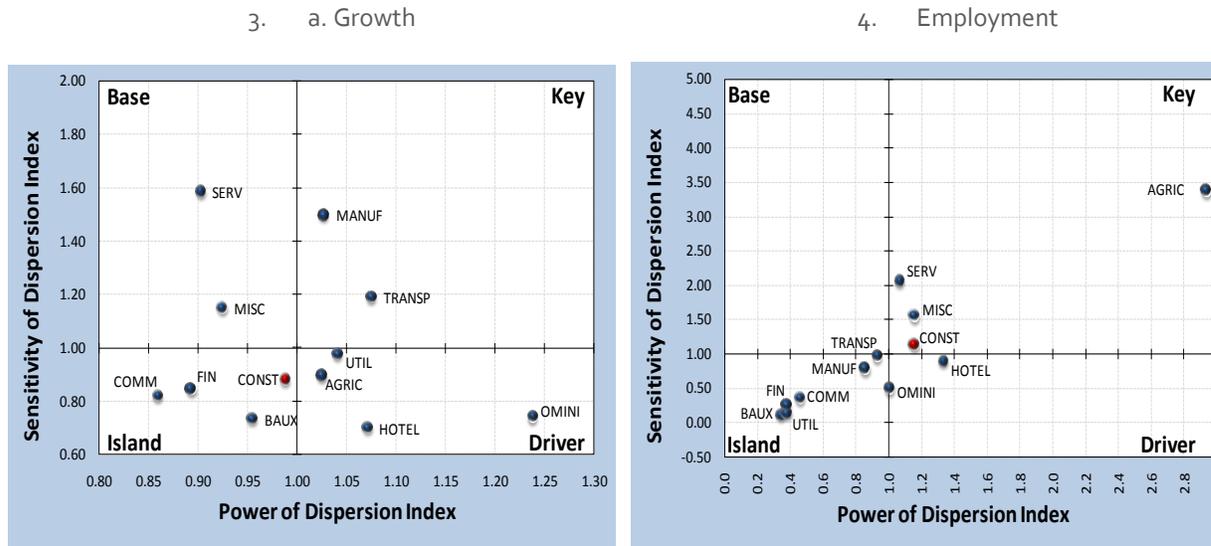
- An industry is "key" (see Figure 6, equations 4 and 5) when its "pull effect" on industries in the economy is higher than the average effect caused by other industries ($PD > 1$) and, simultaneously, the pull effect of the economy as a whole on that specific industry is higher than the average effect on all industries ($SD > 1$).
- A "driver" has a pull effect on industries higher than the average ($PD > 1$) but, at the same time, the pull effect of the economy as a whole on it is lower when it is compared with the average impact induced on all sectors ($SD > 1$).
- Conversely, an industry is "base" or strategic when its effect on industries of the economy is lower than the average pull effect, but the impact of the economy as a whole on that specific sector is higher than the average effect induced on other industries.
- Finally, "isolated" are those industries in which both dispersion indicators are below the average. These are industries whose reaction to changes in final demand is lower than in the whole economy.

In the IO model, changes in output and employment are induced through the final demand Y . The model is short term because the intermediate consumption matrix A (see Equation 1) is assumed constant. On the other hand, final demand reflects the demand for goods and services made by households and government. However, the spending decisions of households may be affected by spending decisions of the government. The households' demand for goods and services can be encouraged by the government through subsidies, cash transfers and other types of demand incentives. Moreover, the government can boost the final demand of a specific industry through the household demand by implementing targeted transfers, for example, transport or housing subsidies, educational and health vouchers, food Coupons, among others.

3.2 RESULTS FOR 2008, AS COMPARED TO 2000

The graphs below figuratively represent a sectoral classification of the economy in terms of both growth and employment multipliers, based on the gross output and input-output data for year 2008.

FIGURE 8: GROWTH AND EMPLOYMENT MULTIPLIER DECOMPOSITION ACROSS SECTORS BY TYPE OF IMPORTANCE, 2008



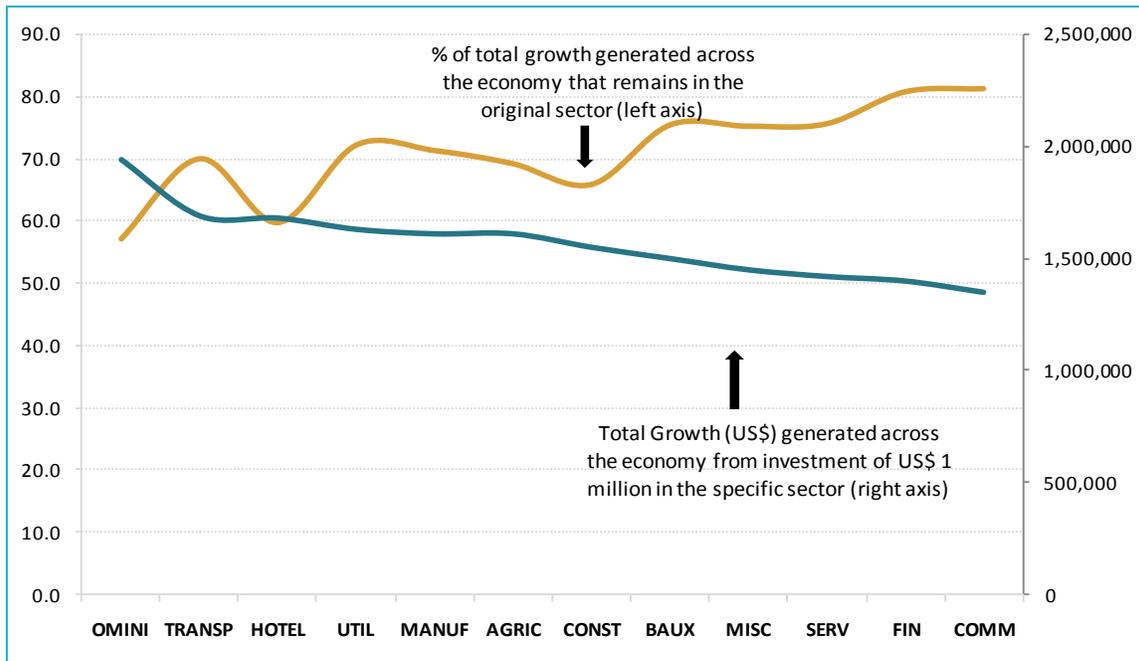
Source: Authors' calculations based on data STATIN data

The calculations reveal the Construction sector as one of several “key” sectors in terms of employment generation. Even In 2008, its pull effect (number of jobs created) on other industries was higher than average, and, simultaneously, the pull effect of the economy as a whole on the number jobs generated inside the Construction sector itself was above the average impact induced on all sectors. When compared to earlier estimation periods (i.e. 1993, 2000), in 2008 the sector’s reaction to changes in final demand was higher, relative to the reaction shown by the economy as a whole.

The most important employment multiplier effects, however, are associated with the Agriculture and the Hotel sectors. Both sectors also exhibit high multiplier effects on gross production (growth)--above the average effect of all sectors combined. However, over time, both sectors have also lost share in Jamaica’s GDP, the fall being particularly severe in the case of the Hotel industry after 2005. Similarly, although the growth multiplier effect of the generated by the Manufacturing sector exceeds the average for all industries, the sector itself has experienced a significant decline in its share in GDP, especially after 2006, from 14 percent to about 8.5 percent this year. Finally,

the Bauxite industry, has, over the past decade, remained an “isolated” part of the economy, reacting to changes in final demand to a lower extent than is the case for most other sectors of the economy.

FIGURE 9: TOTAL GROWTH CREATED AS A RESULT OF US\$1 MILLION INVESTED IN A SPECIFIC SECTOR AND THE PERCENTAGE DISTRIBUTION OF THE GROWTH EFFECT ACROSS THE ECONOMY, 2008



Source: Authors' calculations based on STATIN data

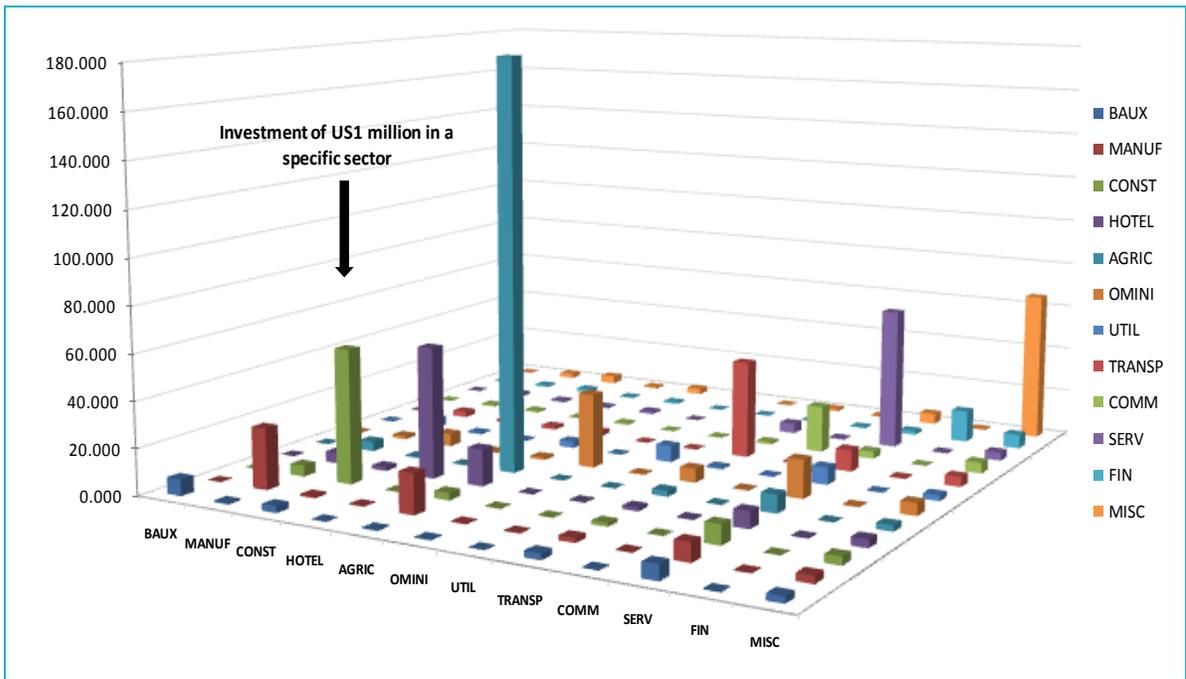
As indicated by the calculations based on the 2008 IO table, the total impact on growth resulting from sectoral increases in the final demand is very uneven, depending on the sector in which investments are made, as is the share of growth that occurs in that specific sector. As illustrated in Figure 9, the total growth impacts – at US\$1.94 million – are the greatest when investment is made in the “Other Mining” sector (i.e. mining activities other than Bauxite and Alumina), followed by the Transport (US\$1.69 million) and the Hotel (US\$1.68 million) sectors, while in the Communications and the Financial sectors they are the lowest, at US\$1.35 and US\$1.4 million, respectively.

In terms of the percentage share of total growth that is retained by the sector itself, as opposed to being spread across the economy, the ranking of the different sectors is almost exactly opposite. Namely, the Communications and the Financial sectors retain more than 80 percent of the overall growth multiplier effect when investment is made in these respective sectors. In comparison, when investment is made in the Other Mining or the Hotel sector, only 57 percent and 60 percent, respectively, is retained by these sectors themselves. The Agriculture and Construction sectors rank somewhere in the middle in terms of both indicators, each associated with a total growth multiplier effect of about US\$1.6 million as a result of an investment of

US\$1 million, with about 65-70 percent retained by the respective sectors themselves.

With respect to short-term employment generation, however, the distribution of impacts and the role of the different sectors are somewhat different. Figure 10 illustrates the distribution of employment multiplier effects across sectors in terms of the number of jobs created as a result of investment of US\$ 1 million in a specific sector.

FIGURE 10: NUMBER OF JOBS CREATED PER INVESTMENT OF US\$1 MILLION IN A SPECIFIC SECTOR, BASED ON THE 2008 IO TABLE



Source: Authors' calculations based on STATIN data

Based on the Input-Output table for 2008, the results indicate that the total employment effects of investment of a million U.S. dollars are very different depending on the sector to which the investment flows. As shown also in the subsequent graph (Figure 11), the total short-run employment benefits across the economy are the largest when the investment is made in the Agriculture sector – a total of 205 jobs per US\$ 1 million invested – followed by the Hotel, Miscellaneous, and Construction sectors, with 80-93 jobs generated across the Jamaican economy, including within the sectors themselves. On the other end of the spectrum, investment of the same amount in the Bauxite or the Financial sector generates only about 25 jobs.

It should be noted that the IO-based analysis is blind to sources of finance. It does *not* provide any comparative information on the general equilibrium effects, the opportunity cost, or the sustainability of investment in the specific

sector. Similarly, it does not offer any sense of the extent to which public investment in a given sector (such as Agriculture, Hotels or Bauxite) would be sustainable or crowd out private investment, nor does it provide guidance on the extent to which the Government should be involved in operating/managing a sector's assets.

Regarding the share of the total short-term employment multiplier effect retained by the sector in which the investment is made, the Agriculture and Services sectors are the most extreme, with about 85-90 percent of all the jobs created remaining in these sectors. If a million dollars are invested in the Bauxite or the Utilities sector, on the other hand, most of the employment multiplier impact – more than 70 percent of all jobs generated -- occurs in the rest of the economy, while only about 30 percent remains in the sectors themselves. A large share of the employment multiplier effect from investment in the Bauxite sector, for example, is picked up by the Construction, Transport, and Miscellaneous sectors (11-12 percent each), whereas, if a million dollars is invested in the Utilities sector, about 28 percent of the total short-term employment multiplier effect occurs in the Services sector and another 16 percent in the Manufacturing sector.

BOX: 2 FUTURE GROWTH AND EMPLOYMENT GENERATION POTENTIAL OF JAMAICA'S BAUXITE SECTOR

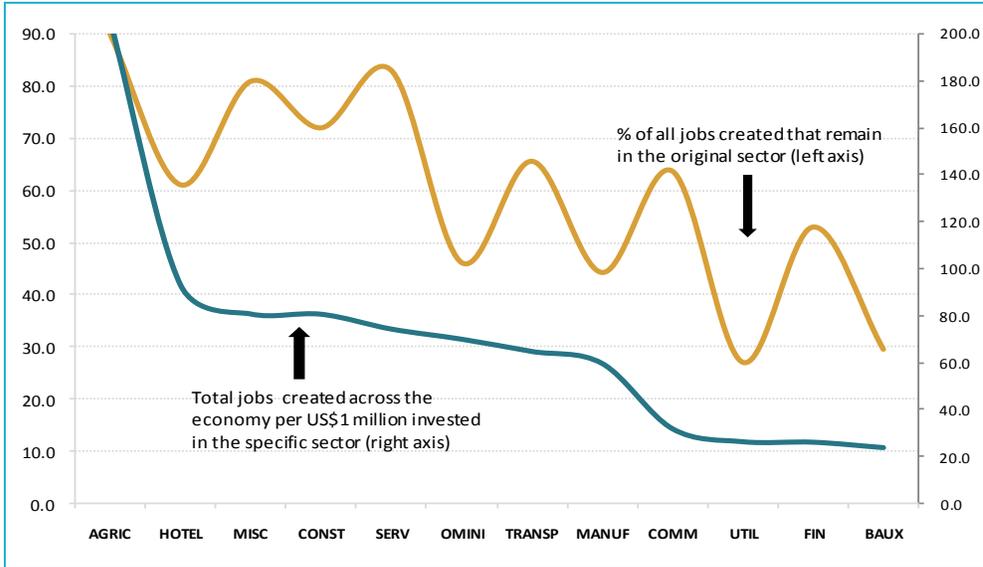
In terms of the future prospects of Jamalco--the half Jamaican-owned and, currently, the only functioning-- Bauxite company, the expectations are generally positive. While the only domestic demand source for alumina is the Chemical sector, consuming approximately 10,000 metric tons a year, Jamalco's export markets are diverse. Still, given the particularities of the company's ownership, most of its profit leaves Jamaica, and, in reality, the multiplier effect in terms of employment holds to a much larger degree than in terms of **growth** (where the workers' wages represent the main share of income staying in the economy).

In terms of the future of the Bauxite sector overall, feasibility studies are currently being conducted for possibly building a new aluminum plant in St. Ann, where the investment – estimated at US\$1.5 billion - would likely come from U.S. and Chinese companies, and the potential direct **employment** generation would be about 3,000 temporary jobs in Construction and about 600 permanent jobs for plant operators. In the case that the investment is predominantly Chinese, also some of the labor force is likely to be imported, and the employment benefits for Jamaicans themselves are uncertain. The outcome of the feasibility study is likely to depend on whether a new energy solution can be found for firing the plant, as Jamaica will otherwise remain one of the highest-cost producers in the world. For this reason, despite the large remaining bauxite reserves, it is no longer a major alumina-manufacturing center, with Australia, China, Russia and currently also Brazil being able to utilize their large indigenous energy sources and thus minimize production costs. The Ministry of Energy has suggested that a solution for the proposed plant in St. Ann could lie in Liquefied Natural Gas (LNG) imports, and is already engaged in negotiations with Trinidad and Gazprom about a build-own-operate model.

Thus, while short-term stimulus targeting the Bauxite or the Utilities sector may be effective in generating direct, concentrated growth impacts in these sectors, it will not be effective in creating either a large overall employment multiplier across the economy as a whole, or in generating jobs within these exact sectors. Instead, investment in Bauxite will provide some stimulus to employment generation for the Construction and Transport sectors while investment in

Utilities will provide modest stimulus to the Manufacturing and the Services sectors.

FIGURE 11: TOTAL JOBS CREATED PER US\$1 MILLION INVESTED IN A SPECIFIC SECTOR AND THE PERCENTAGE DISTRIBUTION OF THE EMPLOYMENT EFFECT ACROSS THE ECONOMY, 2008



Source:

Authors' calculations based on STATIN data

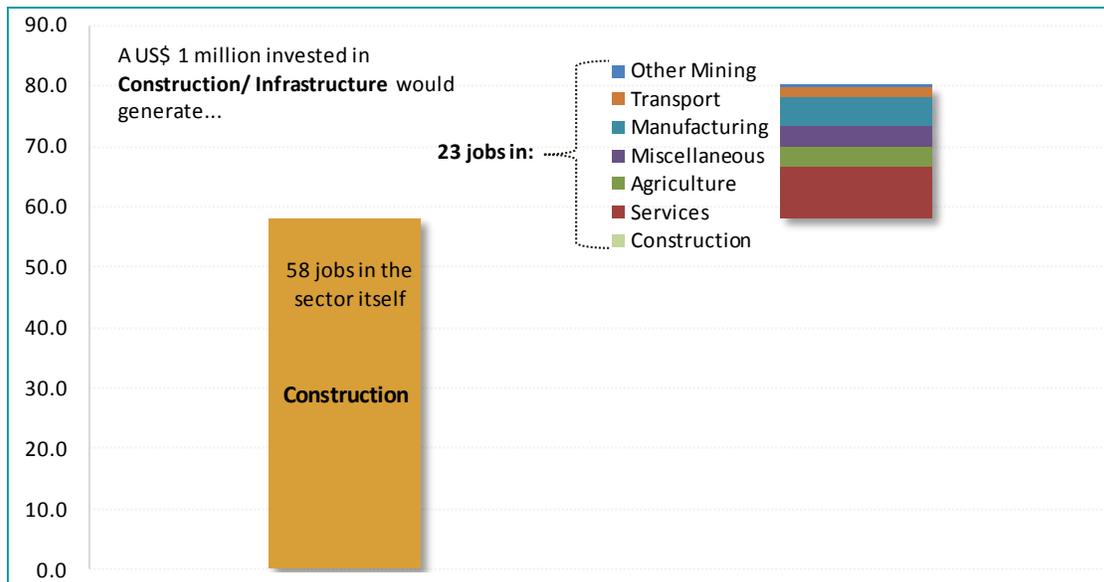
With respect to the Construction sector more specifically, the results derived from the 2008 IO table show that the investment of a million U.S. dollars will generate 58 jobs in the sector itself (72 percent of the total), in addition to 23 jobs in other sectors, including 8.5 jobs in the Services sector and 4.8 jobs in Manufacturing. Compared to the Agriculture sector, investment in the Construction sector is thus associated with larger secondary employment effects across the rest of the economy, both the total employment multiplier effects and the dispersion of these effects being relatively high. Furthermore, increased activity of the Construction sector, such as stimulus-financed public works focused on road construction and repair, also facilitates the physical access to markets for Jamaica's agricultural producers and improves the infrastructure for tourism (i.e. Hotel sector) development, both sectors with yet higher employment multiplier effects than the Construction sector itself, in turn, potentially releasing large benefits in terms of agricultural productivity.

The *linkages* between Construction sector activity and that of other sectors is highlighted in the Government's Construction Sector Plan 2009-2030, which emphasizes the sector's close relationship with the tourism, housing, financial and business services, manufacturing, transport, storage and communications, and distribution, as well as the social sectors that generally fall under government services. Economic activity in any of these sectors contributes to growth in the Construction sector through their construction cost component, since the sector draws on a wide range of inputs, including building materials

and supplies, labor and professional services, energy, transport and other supplies. Inversely, the low average growth in the macro-economy in recent years has been reflected in the performance of the construction sector.

As indicated in the **Agriculture** Sector Plan 2009-2030 developed by the PIOJ, farm roads (approximately 1,500 km in total) and parochial community roads represent a significant component of Jamaica’s road network. The maintenance of farm roads is the responsibility of the Ministry of Agriculture, through the Rural Agriculture Development Agency (RADA), with the road rehabilitation works carried out with the goal of diversifying and expanding the agriculture production through the rehabilitation of parochial and farm roads and market access for small-scale farmers. The Plan also points out that improvements in competitiveness of the domestic Agriculture sector will require further investments in key infrastructure, including: improved maintenance of feeder roads in key agricultural areas; enhanced irrigation works in keeping with the National Irrigation Development Strategy; sorting, grading and packaging facilities; and warehousing and storage facilities. The development of the Agriculture sector will also require the coordination of land use planning of agricultural lands with other competing land uses, including mining, quarrying, housing and commercial development, and an integrated rehabilitation of mined-out lands and resettlement of agricultural communities in planning for agricultural sector.

FIGURE 12: EMPLOYMENT MULTIPLIER EFFECTS FROM INVESTMENT IN THE CONSTRUCTION SECTOR, 2008



Source: Authors’ calculations based on STATIN data

Linkages to the Construction sector activity are also pointed out in Jamaica’s **Transport** Sector Plan 2009-2030. The Plan concludes that the efficient management of the transport sector can provide tremendous economic and

social gains to a country through indirect and direct employment as well as induced development which ultimately leads to wealth creation and growth. In turn, such sectors as mining, manufacturing, trade, tourism, and agriculture, which are critical to a nation's growth and development, depend upon transportation. The importance of the *public* transport system, specifically, is further highlighted by the finding of a recent survey that nearly 75 percent of Jamaica's households do not own a motor vehicle.²³ Overall, the Plan concludes that improvements in the physical economic infrastructure—roads, air and sea ports, and telecommunication networks—usually has higher payoffs in the form of higher rates of economic growth than equivalent investment in health and education over the time horizon to 2030, due to their faster impact on total factor productivity. It points out that the returns to investment in physical infrastructure tend to be higher in countries at Jamaica's income level, especially considering the relative underinvestment in physical infrastructure in recent decades. In addition, high-quality infrastructure also contributes to social and environmental goals by improving access to public services.

Finally, as pointed out in the Tourism Sector Plan 2009-2030, there is a strong linkage between the Construction sector and the tourism industries (i.e. **Hotels** and related services). It is manifested primarily in the accommodation sub-sector, where large investments have brought several new hotel developments on stream. In turn, the rapid hotel expansion has also created a demand for housing units, in, or close to resort areas to cater to workers in the industry. The development of the *Harmony Cove* resort, the luxury condominiums of the *Plamyra* group, and other projects, are expected to fuel growth in both construction and tourism, and will also require additional supporting infrastructure. A number of hotels are scheduled to come on-stream or are already under construction, including Iberostar Rosehall, RIU IV, AM Resorts, and Fiesta, among others. Similarly, the tourism sector is also dependent on public utilities, including electricity, communications, and water, are integral to the functioning of the tourism sector. The upgrading of water and sewage systems in resort areas, therefore, is an ongoing concern for the authorities. Major recent/ongoing infrastructure upgrading projects relevant to the tourism sector include the Montego Bay Sewage System and the Lucea-Negril Water Supply Projects under the Northern Coastal Development Project.

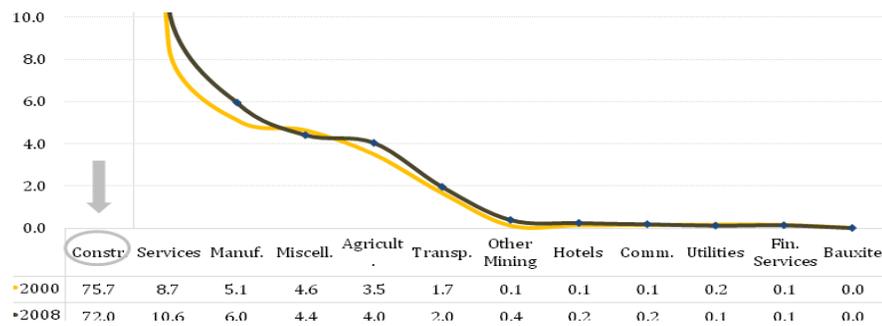
Finally, the Tourism sector is linked to Construction sector activities—specifically, transport infrastructure construction and maintenance—also through roads, the expansion of airport facilities, and cruise shipping ports. The Highway 2000 project, designed to link Kingston to Ocho Rios and Montego Bay via a modern toll road, and the Northern Coastal Highway Improvement Project, which on completion will extend from Negril through Montego Bay and Ocho Rios to Fair Prospect in Portland, covering four major resort zones, are

²³ PIOJ and STATIN (2007): Residential Consumer End Use Survey.

some of the current examples of road development that will directly benefit the Tourism sector.²⁴ Investment in road and other infrastructure, thus, is necessary for Jamaica to be able to reap maximum benefits from its Tourism sector. Although not yet fully defined, the economic impact of the sector is undoubtedly significant, including through the creation of indirect and induced employment. Corroborating the findings of this paper, presented in Figures 9 and 11, the visitor accommodation (Hotels) component of the sector exhibits a significant indirect and induced growth and employment effect in the Jamaican economy overall. As shown by assessments carried out in 1997, while the direct employment in the Hotel industry in that year was 33,927, the total employment attributable to tourism in Jamaica, including direct, indirect and induced, was estimated at 160,762, representing about 17 percent of the total employment in Jamaica.

As illustrated in the Figure 13 below, the distribution of trickle-down employment effects in other sectors, resulting from investment in Jamaica’s Construction sector, has changed somewhat since the beginning of the decade. Compared to 2000, the share of employment remaining in the Construction sector itself was somewhat lower in 2008; however, almost three-fourths of the jobs created were still retained directly within the Construction industry. Of the other segments of the Jamaican economy, the employment multiplier effect from investment in Construction has, throughout the estimation period, remained the strongest—and increasingly so—in the Services and the Manufacturing sector. Throughout the estimation period, the employment multiplier effect from Construction sector investment has remained zero or close to zero in the Utilities, Communications, Hotels, Financial Services, Bauxite, and Other Mining sectors.

FIGURE 13: PERCENTAGE DISTRIBUTION OF THE EMPLOYMENT MULTIPLIER EFFECT FROM INVESTMENT IN CONSTRUCTION



Source: Authors’ calculations based on STATIN data

²⁴ PIOJ (2009): Tourism Sector Plan 2009-2030.

In terms of the growth multiplier effects, the distribution across sectors has followed a similar trend, remaining nearly constant in 2008 compared to 2000 (see Figure 14 in Annex 1). Here, too, the share retained by the Construction sector itself has declined somewhat—from 69 to 66 percent of the total growth multiplier effect—while that picked up by the Manufacturing and the Services sectors, the next biggest beneficiaries, has increased. As with the employment multiplier, investment in the Construction sector seems to generate almost no growth multiplier effects in the Bauxite or the Hotel Sector.

4 CAPACITY-BUILDING NEEDS AND DATA QUALITY ISSUES

4.1 TRAINING OPPORTUNITIES AND NEED FOR CAPACITY BUILDING

The Ministry of Labour and Social Security focuses on raising productivity across sectors through three main avenues:

- (i) research, information, and advocacy;
- (ii) technical assistance to SMEs; and
- (iii) public education to develop a 'productivity culture,' for example, through support to trainer-trainee programs.

According to its own past surveys, with the most recent one carried out in 2009, the labor force skills that are currently in highest demand by private sector companies are in the areas of IT, Accounting, Entrepreneurship, and Customer Service. The HEART Trust - Human Employment and Resource Training – is a government agency that provides certified training opportunities for high-school graduates and also carries out assessment of their impact. Focused on analyzing and matching the demand and the supply of different skills actual training programs, its training framework, however, is still inadequate for preparing specialists at higher levels than 1-3 due to the lack of instructors,²⁵ the result being the increasing migration of average-skilled labor force abroad.

The Planning Institute of Jamaica develops its own IO model and CGE model-based calculations for the government, for instance, the employment and growth impacts of investment in Mining and Tourism sectors (preliminary results are available for the analysis based on 2000 data). The PIOJ considers its work to be complementary to STATIN's; yet, similarly to STATIN, it acknowledges the need for additional technical assistance in perfecting the modeling work and coding economic and labor activity.²⁶

²⁵ Based on a 2009 survey carried out by the Ministry of Labour and Social Security.

²⁶ Based on discussions with representatives of the Sustainable Development Division of PIOJ and the Economic Accounting Division and Labor Statistics Division of STATIN, Kingston, January 11-15, 2010.

ANNEXES

ANNEX 1: DATA REQUIREMENTS AND GAPS

Unemployment impacts of the recession are being tracked on two levels: through STATIN's Labor Force Survey, and by the Ministry of Labour itself (as large establishments are mandated by law to report this type of data to the government). As the two are using different approaches, the data produced are different, with the informal sector only being captured through STATIN's Survey. At the same time, while STATIN seems to cover smaller firms and developments at the local (parish) level, sample sizes are generally too small to carry out robust statistical analysis.

With respect to labor force participation, STATIN only collects data on differences between genders. Furthermore, the labor participation rate should be interpreted with caution, as also the people not actively looking for work are counted as part of labor force, leading to an elevated formal participation rate. In this context, one of the concerns about the multipliers obtained from this exercise is their validity in the context of the high employment informality, as the calculations are based exclusively on the Labor Force Survey, while, for instance, the characteristics of the informal Construction sector - which takes up a significant part of the overall sector - are not being traced. Likewise, there are no data on the precise labor force characteristics and internal dynamics taking place over the past 2 years, even though informality issues overall have been studied at least partially through a survey ordered by the Planning Institute of Jamaica in 2007. As a result of the limited knowledge about the profile of the workforce active in the informal sector, the government's reach is also limited in terms of providing training opportunities and short-term job placement services, public education institutions thus being the only channels of assistance.

Additionally, there are several issues related to linking the IO and the labor market data, and, while STATIN has produced the cross-classification between the Jamaica Industrial Classification and the ISIC, these files have not been made publicly available. A related issue lies in the fact that the system of national accounts has been revised since 1993, whereby the valuation at factor costs has been replaced by valuation at producer prices based on the new taxation system that after the 1993 includes the VAT. As a result, the calculated multipliers need to be carefully checked against other sources, such as the Employment and Earnings Survey 2008. Finally, for the purpose of allowing the Ministry of Labor, the NWA, and other relevant institutions to prioritize public works and other investments in the context of a short-term economic

decline, improvements are needed in the design of STATIN's Labor Force Survey, for instance, in aspects related to its migration-focused part, its timeliness and continuity, the adequacy of sample size in parish-level surveys, the availability and quality of data on other than large enterprises, and the extent to which the Survey can be integrated with other economic data.

According to the Sector Plans produced by the PIOJ in the context of the Strategy Vision 2030 Jamaica, data-related issues inhibit investment and policy-related decision-making in a number of sectors. As stated in the *Tourism* Sector Plan 2009-2030, for example, despite its importance to the Jamaican economy, Tourism does not presently appear as a separate sector within the national accounts of the country. In addition, there remain gaps in information on various aspects of the industry. Under the adoption of the United Nations System of National Accounts for Jamaica, the introduction of a Satellite Account for the tourism sector will allow collection and analysis of data on the sector that will facilitate systematic measurement and monitoring, and improve the ability to evaluate its economic impact and plan for its long-term development. Similarly, according to the *Transport* Sector Plan, while employment generation and gross revenues earned in the maritime services sub-sector is not insignificant; however, the importance of the contribution of the sub-sector to national employment and the GDP in general has not been accurately assessed, largely due to absence of credible statistics, leading to general apathy of the population and the government.

ANNEX 2: MAIN LABOR INDICATORS

	2008				2009		
	January	April	July	October	January	April	July
TOTAL POPULATION	2,682,100	2,684,700	2,687,300	2,689,800	2,692,400	2,694,900	2,697,500
Labor Force	1,299,200	1,289,300	1,300,400	1,309,300	1,280,600	1,268,300	1,273,700
Employed Labor Force	1,167,500	1,138,500	1,168,200	1,174,500	1,138,100	1,123,200	1,129,600
Unemployed Labor Force	131,700	150,800	132,100	134,700	142,500	145,100	144,000
Outside The Labor Force	679,300	693,900	687,400	682,900	716,200	730,400	726,900
Employment Rate	89.9	88.3	89.8	89.7	88.9	88.6	88.7
Unemployment Rate	10.1	11.7	10.2	10.3	11.1	11.4	11.3
Job Seeking Rate	6.4	7.2	6.1	6.7	6.5	7.4	7.8
Percentage of Population 14 + Outside LF	34.3	35	34.6	34.3	35.9	36.5	36.3
Labor Force as a % age of Total Population	48.4	48	48.4	48.7	47.6	47.1	47.2

ANNEX 3 GENDER SPECIFIC CHANGES IN EMPLOYMENT BY SECTOR

In analyzing the recent developments in employment for Jamaica's labor force, it should be noted that important differences exist between the male and female labor force in terms of employment by sector. Jamaica's **male labor force** is primarily employed in the Agriculture, Hunting, Forestry & Fishing sector, with the share of the sector in the overall male employment increasing markedly over the last two years, from 24.2 percent in January 2008 to 28.6 percent in July 2009. In absolute numbers, the number of males employed in this sector increased by about 22,000, or 13.6 percent.

The next two most important sectors for male labor force employment are Construction & Installation and Wholesale & Retail and Repair, respectively, accounting for 14.2 and 14.5 percent of total male employment in July 2009. The relative shares of these two sectors in the overall male employment have decreased somewhat relative to January 2008: the share of the Construction & Installation sector – from 17.2 percent, and the share of Wholesale & Retail and Repair sector – from 16.6 percent. In absolute terms, male employment in the former decreased by 20 percent and, in the latter, by 16 percent.

The Wholesale & Retail and Repair sector continues to have an even larger weight in the overall employment supply for Jamaica's **female labor force**, with its share rising from 24 percent in January 2008 to 26 percent in July 2009. In absolute terms, this sector employed 5% more of the female labor force in July 2009 compared to January 2008. The next most important sectors for female employment in Jamaica were Education (10.2 percent of total) and Agriculture, Hunting, Forestry & Fishing (9.8 percent), while the Hotels & Restaurant Services sector accounted for 9.1 percent of all female employment. No significant changes were observed in the relative share of these sectors over the January 2008-July 2009 timeframe; in absolute terms, the number of females employed in the Education sector increased by 2.3 percent, while it increased by as much as 4.6 percent in Agriculture, Hunting, Forestry & Fishing. On the other hand, the number of females working in the Hotels & Restaurant Services sector decreased by 2.8 percent.

Source: STATIN

ANNEX 4: A SUMMARY OF RECENT TRENDS IN JAMAICA'S UNEMPLOYMENT PROFILE ACROSS SECTORS

Agriculture and Wholesales & Retail: Two industries continue to dominate Jamaica's labor force in terms of levels of employment – Agriculture and Wholesale & Retail. About 20 percent of the employed labor force (or about 230,000 employees) were employed in the Agriculture, Hunting, Forestry & Fishing sector in mid-2009, located in rural areas, primarily on the South coast of the island. In this sector, the absolute number--as well as the share in the overall employment--in fact, rose slightly over the past two years (in absolute terms, by about 20,000 employees). In the Wholesale & Retail and Repair sector, an opposite trend occurred. Absolute employment figures decreased over the period from January 2008-July 2009, from about 230,000 to about 220,000. In mid-2009, the sector stood as the second most important in terms of employment, providing jobs to about 244,000 people, corresponding to just below 20 percent of all labor force.

Manufacturing: According to the Jamaica Manufacturers' Association (JMA),¹ a non-governmental entity consisting of representatives from approximately 300 Jamaican companies, within the Manufacturing sector, only the Food and Beverages sub-sector remained relatively flat and avoided a decline, largely due to the growth in the Agriculture sector (as increasing numbers of laid-off unskilled workers from other sectors like Construction and Mining are moving into farming) and the "buy your own" campaigns of the Ministry of Agriculture. The consumers' decreasing spending ability and the increasing propensity to spend only on necessities has also propelled this pattern. In addition, new export markets are beginning to open for the Food and Beverages industry, for example, for Red Stripe in the EU and the U.S. Based on STATIN's official data, the Manufacturing sector, located mainly in Kingston and St. Catherine, in mid-2009 accounted for 7 percent of the existing employment, employing 88,000 persons.

Services: In Jamaica's various Services sectors, Community, Social & Personal Services was hit the hardest, with a decline in the number of employed labor force from a peak of 322,000 in 2007 to 263,000 in 2009. On the other hand, new jobs were created in the largely state-owned Electricity, Gas & Water sector, with an increase in the employed labor force by about 23 percent, albeit from a low base in absolute terms.

Bauxite: Unemployment spiked in the Bauxite mining sector, as 3 of Jamaica's 4 bauxite firms suspended operations in 2009 due to falling demand amid the global economic downturn. At the same time, unemployment increases in the sector cannot be attributed solely to the recession. Perhaps more so, they are due to such factors other as the antiquated nature, low efficiency, and high operating costs of the other three plants and the general move towards more capital-intensive production, with Alco, in particular, contributing hundreds of millions of dollars of investment. Nevertheless, the Mining sector overall even now contributes about 6 percent of Jamaica's GDP, including through the Bauxite Levy – a flat tax that has been amended several times. Along with Tourism, the sector is also an important foreign exchange earner for the economy.

Source: STATIN, PIOJ

ANNEX 5: GOVERNMENT SUPPORT TO THE TOURISM INDUSTRY

Financing for the tourism industry comes from a number of local sources, including commercial banks and development banks. At the end of 2008, total commercial bank loans and advances to the tourism sector stood at J\$40.8 billion, up from J\$7 billion at the end of 2002 (ESSJ 2008).

The Tourism Enhancement Fund (TEF) was established in 2005 to provide financing for the development of tourist attractions and to support implementation of other aspects of the Tourism Master Plan. The TEF is funded through a Tourism Enhancement Fee of US\$10 charged to incoming airline passengers and US\$2 charged to cruise passengers. As of March 2009, the resources of the TEF stood at \$4.2 billion, with over \$3.3 billion approved for projects and over \$1 billion disbursed.

Other funding sources for the sector include international financial institutions and bilateral agencies which have provided significant levels of funding for tourism-related infrastructure, including the NCHIP, expansion of cruise ship piers, and sewage and water projects in resort areas.

Visitor expenditure in 2008 was US\$1,975.5 million. Foreign direct investment in the tourism industry in Jamaica has averaged US\$143.6 million annually over the 2003-2007 period, representing 19.1 percent of total FDI inflows over that period.¹

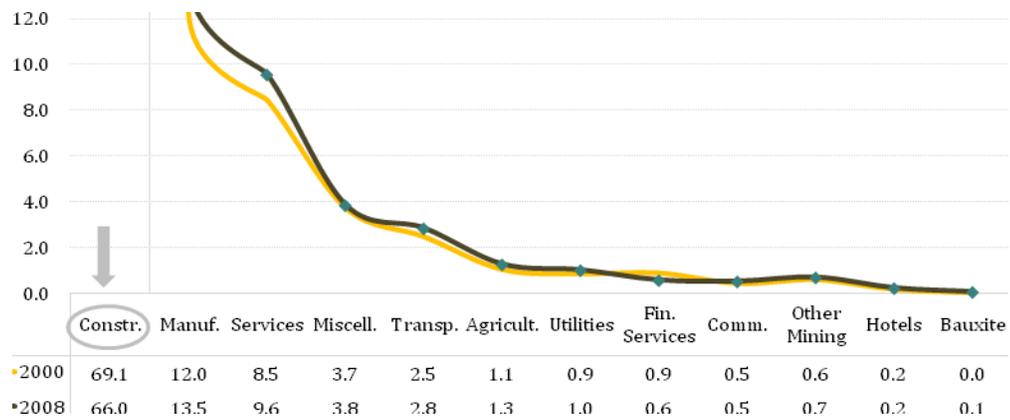
The Government directly provides a number of incentives to the accommodation sub-sector:

- The *Hotel Incentives Act* and the *Resort Cottages Incentives Act* enable tax incentives to be provided to properties to encourage development and improvement;
- The Short-Term Incentives Programme (STIP) and Emergency Incentives Scheme; and
- Small Hotel Incentive Grant.

From 2003 to June 2009, a total of 59 attractions, representing both new and existing projects, have received incentives with capital investment totaling over J\$3.5 billion. In addition, the sector also benefits from the Tourism Ground Transportation Sub-Sector Incentive Policy (in effect since 2006), allocating cars to sector entities at only 25-percent of the duty.

Source: PIOJ (2009): Tourism Sector Plan 2009-2030

ANNEX 6: PERCENTAGE DISTRIBUTION OF THE GROWTH MULTIPLIER EFFECT FROM INVESTMENT IN CONSTRUCTION



Source: Authors' calculations based on STATIN data

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LIST OF ABBREVIATIONS

AAJ	Airports Authority of Jamaica
ARIP	Airport Reform and Improvement Programme
BOJ	Bank of Jamaica
CMI	Caribbean Maritime Institute
DBJ	Development Bank of Jamaica
ESSJ	Economic and Social Survey Jamaica
GDP	Gross Domestic Product
GOJ	Government of Jamaica
HAJ	Housing Agency of Jamaica
IMAJ	Incorporated Masterbuilders Association of Jamaica
IDB	Inter-American Development Bank
J\$	Jamaican Dollar
JAMACLO	Jamaica Aluminum Company
JBDC	Jamaica Business Development Centre
JMA	Jamaica Manufacturing Association
JPC	Jamaica Productivity Centre
JRC	Jamaica Railway Corporation
JTB	Jamaica Tourist Board
JTI	Jamaica Trade and Invest
KSAC	Kingston and St. Andrew Corporation
LAC	Latin America and the Caribbean
LNG	Liquefied Natural Gas
MFPS	Ministry of Finance and the Public Service
MIIC	Ministry of Industry, Investment and Commerce
MLSS	Ministry of Labour and Social Security
MOAF	Ministry of Agriculture and Fisheries
MTW	Ministry of Transport and Works
MWH	Ministry of Water and Housing
NCC	National Contracts Commission
NCHIP	Northern Coastal Highway Improvement Project
NCTVET	National Council on Technical and Vocational Education and Training
NEPA	National Environmental Planning Agency
NHDC	National Housing Development Corporation
NHT	National Housing Trust
NMIA	Norman Manley International Airport
NROCC	National Road Operating and Constructing Company
NRSIP	National Road Services Improvement Programme
NWA	National Works Agency
PAJ	Port Authority of Jamaica
PIOJ	Planning Institute of Jamaica
PPPs	Public Private Partnerships
RADA	Rural Agricultural Development Authority
RMF	Road Maintenance Fund
RMFB	Road Maintenance Fund Board
SIA	Donald Sangster International Airport

STATIN	Statistical Institute of Jamaica
STIP	Short-Term Incentives Programme
TEF	Tourism Enhancement Fund
TS&C	Transport, Storage and Communication
UDC	Urban Development Corporation
UNWTO	United Nations World Tourism Organization
USAID	United States Agency for International Development
US\$	United States Dollar
WIHCON	West Indies Home Contractors



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