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BELIZE: POVERTY AND ECONOMIC SECTOR PERFORMANCE

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PREFACE

Belize has a low number of households living under the poverty line, but a relatively high number of them are indigent. The last consumption-based measurement of poverty carried out in 2002 showed that 24.5 percent of households (or 33 percent of individuals) were poor and 7.5 percent were indigent (10 percent of individuals). The income gap was low, at 11 percent. That is, households needed to increase their per capita consumption by 11 percent on average to reach the poverty line.

An important dimension of poverty in Belize is that it is highly sensitive to covariate shocks. As mentioned previously, the economy is vulnerable to external shocks. Its exports are dependent on few agricultural products. The poor work mainly in the agricultural sector producing traded goods. Therefore, the country's terms of trade volatility is directly correlated to the levels of poverty.

Another characteristic of poverty in Belize is that extreme poverty is geographically concentrated. The combination of relatively low poverty levels and a high level of indigence is explained by large regional differences such as the high and extreme poverty in the south, specifically in the region of Toledo. The Toledo and Cayo districts, where 29 percent of the population lives, concentrate two-thirds of the country's indigents. Even worse, the Toledo district has less than 9 percent of the total population, but more than a third (36 percent) of all indigent households live there. Additionally, extreme poverty is directly related to ethnicity; 57 percent of Toledo's population is Mayan, compared to an average of 4 percent for other districts.

This study was part of the analytic work carried out in preparation for the Bank's Strategy with Belize in 2004. The main conclusions of the paper are that given the poverty characteristics and market conditions of the country, poverty alleviation policies need to address both issues, reducing vulnerability to external shocks and augmenting the assets of the extremely poor.

Regional Operations Department II is making this study available to a wide audience because it believes its conclusions are of interest to researchers and policymakers working on the impact of macroeconomic variables on poverty. The study was prepared by Florencia Devoto, Coordinator for Belize (OD3) and coordinated by Carola Alvarez, Advisor (RE2). The author wants to thank Oscar Cetrángolo (CEPAL), José J. Gómes, (OD3), Luis Marcano (OVE) and Marcos Robles (SDS), for the helpful comments received on this document. The physical production of the study was the responsibility of Miriam Perez-Fuentes, who is in charge of producing the hardcopy and web editions of this series.

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Washington, DC, March 2006


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Lighthouse Reef
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Dolores
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Big Fall
San Luis
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Gulf of Honduras
Barranco
Gulf of Amatique
Modesto Méndez
Livingston
Puerto Barrios
Santo Tomás de Castilla
Puerto Cortez
Omoa
Baracoa
Tela
Belize
International boundary
District boundary
National capital
District capital
Railroad
Road
Track

CONTENTS

I. INTRODUCTION

Historically concentrated in a few agricultural export-products and in tourism, the Belizean economy is subject to fluctuations arising from international demand, commodity prices and weather conditions. The Belizean economy has shown one of the best performances of the region in the past decades, although the economy's growth has been far from stable. Between 1986 and 1992 the economy experienced high growth rates, followed by a slowdown during the years 1993 to 1997 before resuming its higher growth rates between 1998 and 2000.

Poverty has closely followed the pace of economic growth. During the nineties poverty rates were also volatile and changes in poverty were negatively correlated to changes in economic growth for most years of the decade. According to the Belizean Poverty Assessment conducted in 2002, Belize has a relatively low number of households living under the poverty line compared to the region, but a relatively higher number of indigent people[1]. Furthermore, indigence is geographically concentrated, mainly in the Toledo district. Belize thus has a dual poverty structure: areas in which structural poverty dominates are less vulnerable to the economic cycle while areas in which temporary poverty dominates (and where the vulnerable population is closer to the poverty line), register significant changes in poverty depending on the overall economic performance of the country.

The objective of this document is to examine the relationship between economic performance and poverty. In order to do so, it explores the determinants of changes in poverty during the 90s, and particularly how this relationship holds for those sectors that led economic growth. More specifically, it looks at the relationship between the sector in which vulnerable people work and the economic sectors that led either the recovery or the slow down of the economy, after controlling for other relevant demographic and

[1] The consumption-based measurement of poverty of the Report shows that 24.5% of households (or 33.5% of individuals) were poor and 7.5% were indigent (10.8% of individuals).

socioeconomic factors. Analysis is based on cross sectional data gathered through the Labor Force Survey[2].

Section II describes the macroeconomic performance of the Belizean economy from the mid eighties to the year 2000, and proceeds to identify three distinct growth periods. After that, Section III introduces the data sources and the methodology used for the purpose of the analysis. Section IV presents poverty profiles according to different demographic and socioeconomic variables. Section V is devoted to identifying the determinants of poverty. It starts by explaining changes in poverty from an accounting perspective, then, using a multivariate approach, the individual contribution of each one of the explanatory variables for the three years is identified. Conclusions and policy recommendations are discussed in the last section.

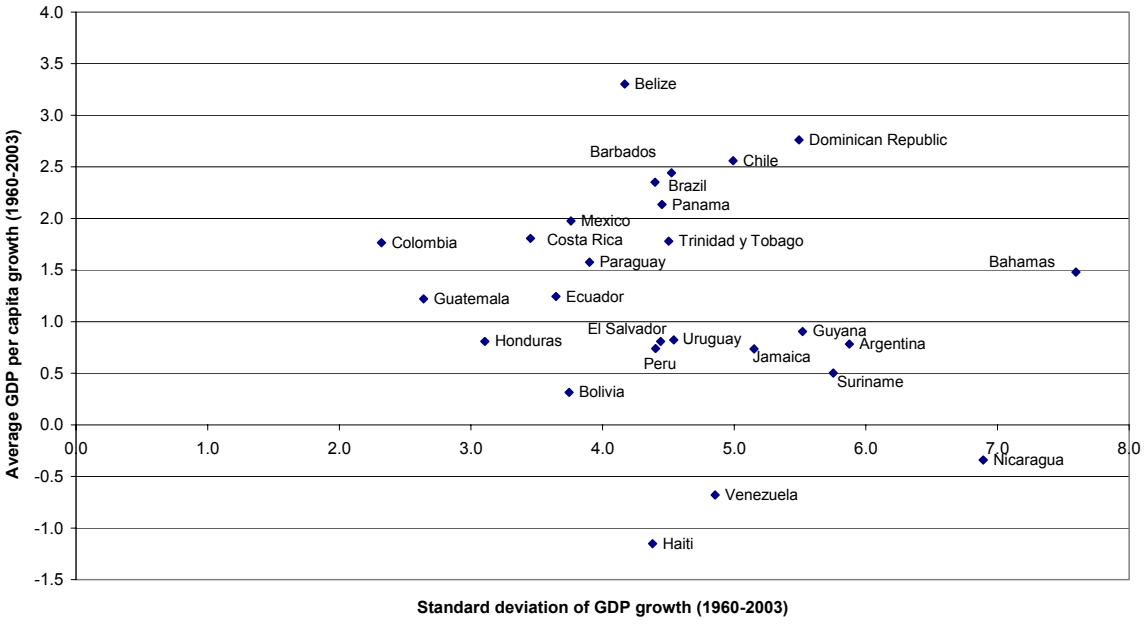
[2] 1993, 1996 and 1999 Labor Forces Surveys that were conducted by the Central Statistical Office of Belize are utilized.

II. MACROECONOMIC OVERVIEW

Belizean economy has been historically concentrated in a few agricultural export-products and more recently also in tourism, being subject to fluctuations arising from international demand, commodity prices and weather conditions. Belize has benefited from a preferential access to international markets, which is expected to be phased out in a nearby future. During the nineties most efforts have focused on developing non-traditional crops, mainly for export.

The Belizean economy has shown one of the best performances of the region (Latin America and the Caribbean) in the past decades, despite its vulnerability to external fluctuations. The country registered the region's highest GDP per capita growth during the 1960-2003 period, while the volatility of the economy was on par with the regional average (see graph 1). From the mid eighties to the late nineties (the period this document focuses on), the economy only registered positive growth rates, recovering from the stagnation that characterized the first half of the eighties (see graph 2).

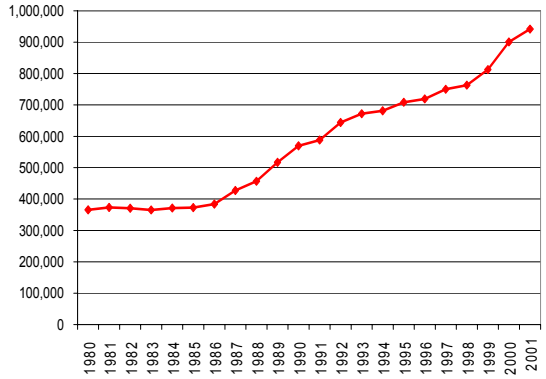
Graph 1. Growth and volatility of Latin American countries, 1960-2003



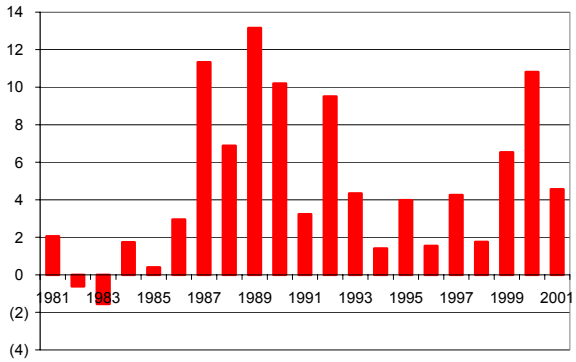
Source: World Development Indicators (World Bank), proprietary analysis.

However, the economy's growth has been far from stable during these years (see graphs 2 and 3). From 1986 to 1992, it experienced a period of high growth, registering an annual average growth rate of 8.6%. From 1993 to 1997, a low-growth period followed, in which the economy' growth decelerated to a 3.2% annual average rate. In 1998, growth picked up again, to average an annual rate of 6% between then and 2000[3].

Graph 2. GDP 1980-2001
In constant prices, Bz. $



Graph 3. GDP growth 1981-2001
In percentage



Source: Central Statistical Office of Belize.

The following sections are devoted to the analysis of each of these periods in order to identify their main growth drivers. The contribution of the sectors to growth are assessed based in two concepts: (i) *contribution to growth:* it resumes the overall contribution of each sector to the average growth rate registered in the period (measured as the share on the total average growth rate), and (ii) *contribution to change in growth:* it resumes the contribution of each sector to the change in the average growth rate with respect to the previous period (measured as the share of the change in the contribution of the sector to growth on the overall change in the growth rate).

A. The First High Growth Period (1986-1992)

The economic recovery of the mid eighties reflected the Government's dual development strategy of: (i) promoting export-led growth through agricultural production diversification and; (ii) increasing public sector investment (mostly in infrastructure).

[3] The availability of Labor Force Surveys until 1999 forces to define this time period of analysis.

During this period, agricultural produce and exports diversified away from sugar to banana and citrus (oranges and grapefruits). Simultaneously, the manufacturing (mainly garments) and tourism sectors were and fishing sectors have been the economy's mainstay, accounting for approximately developed.

During this period, the agricultural, forestry 19% of GDP and 76% of exports earnings (see tables 1 and 6, Annex A). Sugar remained the single most important crop, representing 38% of exports in monetary terms. Most sugar cane is produced in the north of the country where land is most suited for this crop. The second most important crop was citrus (oranges and grapefruits mainly), with 18% of export earnings. Citrus production is mostly concentrated in Stann Creek Valley, with a smaller share coming from the west of the country. Lastly, banana exports were the third most important source of foreign exchange revenues (9%), a marked increase over the early 80s period, where it represented on average 4% of revenues.

Belizean agricultural exports benefited considerably from preferences under both American and European trade regimes. In 1984, the Caribbean Basin Initiative (CBI) came into effect, providing duty-free access of Belizean sugar, citrus (and its concentrates) and banana to the U.S. market, subject to quota limits. Preferential access to the EU's market was guaranteed by the Lomé Convention, which promoted Belize's exports (particularly sugar and banana). Not only the country's trade structure is highly concentrated in terms of products and services, but also in their destination. Between the US and the UK around 80% of exports are purchased.

The second economic leading sector was tourism, accounting for around 18% of GDP. The sector started to realize its potential as the offer of hotel beds expanded. Tourism was the main growth booster during the period (see tables 1 and 3, Annex A). Tourist attractions are concentrated in the Belize District (comprising Belize City and the coastal areas), and the Cayo District (where Mayan archeological sites are located).

Manufacturing, which represented 18% of GDP as well, mainly consisted in garment manufacturing for re-export to the U.S. The rest of the industry was confined to agro-

based activities and to import-substituting products. During this period, garment represented the second largest export activity (18% of export earnings) after agricultural produce.

Transport & Communications for its part accounted for 12% of GDP. The important contribution of the sector to growth, the second largest, reflects Government 's investment policy carried out during this period: among other initiatives, an extensive road construction program was implemented. Moreover, the sector was boosted by the remodeling of the international airport and investments in Belize Telecommunications Limited (BTL) that started after its partial privatization in 1988.

A summary of growth determinants for the period 1986-1992 is presented below (see tables 2 and 3 in Annex A for a complete analysis).

Contribution to growth	*Contribution to acceleration of growth*
1. Tourism: 23% 2. Transport & Communications: 22% 3. Agriculture, Forestry & Fishing: 17%	1. Tourism: 39% 2. Agriculture and Manufacturing: 16% each

On the demand side, the boom in exports and earnings from tourism led the recovery, reflecting the success of the diversification strategy. Private consumption and fixed capital formation were the second contributors to growth, both of them funded by capital inflows (the United Kingdom's expenditures related to its military presence in the country traditionally contributed to 4% of GDP[4]).

B. The Low Growth Period (1993-1997)

The economic slow down of the beginning of the nineties was due mainly to cutbacks in public capital expenditures, the withdrawal of the British garrison (1994) and a weak performance of exports and tourism owing to the impact of the 1994 Mexican peso devaluation. During this period, the economy registered a 3.2% annual average growth rate.

[4] IADB (1995).

Agriculture, Forestry and Fishing continued to be the main economic sector of the economy, accounting for 20% of GDP and around 75% of exports (see tables 1 and 6, Annex A). Moreover, the sector led growth during the period, contributing to 35% of registered growth (see table 2, Annex A). Sugar continued to dominate but started to loose dominance against banana and citrus. Sugar production remained stable with an annual production of around 1,2 million long tons and exports of around one third of total export earnings. Banana became the second most important export crop, representing 17% of the exported value. Banana production increased sharply during the period from 2 to 2.9 million 42 lb boxes. The third most important crop was citrus, yielding 16% of export revenues. Orange and grapefruit production grew fast, from respectively 1.6 million and 0.9 million (1986-1992 period) to 2,9 million 90lb boxes and 1.1 million 80lb boxes (see table 9, Annex A). Marine products, mainly shrimp and lobster, also emerged as an important source of foreign exchange, representing 10% of exports.

While tourism remained the second largest economic sector (18% of GDP), its growth slowdown is considered to be the second cause of the country's overall growth deceleration. This was mainly due to the 1994 Mexican peso devaluation, which negatively impacted tourist activity, through (i) a shortening of the average length of stay of tourists; (ii) a stagnation of tourist arrival numbers and (ii) a sudden decline of the number of cruise-ship passengers (see table 7, Annex A).

Manufacturing contributed around 17% of GDP (and was the third growth leading sector), experiencing, however, a growth deceleration similar to the rest of the economy. Garment production fell by 50% between 1993 and 1995 (see table 12, Annex A), mainly as a result of increased Mexican competition in Belize's main export markets. This also resulted in a fall in export earnings contribution (13% compared to 18% over the 1986-1992 period).

The significant role played by the Transport & Communications and Construction sectors in the slowdown of the economy (see table 3, Annex A) mainly reflects the cutbacks in public capital expenditure during this period (both sectors were highly dependent on public contracts for public infrastructure projects).

Tables 2 and 3 of Annex A details the main sectors' growth contribution for the period 1993-1997. A summary is presented below:

Contribution to growth	*Contribution to deceleration of growth*
1. Agriculture, Forestry & Fishing: 35%	1. Transport & Communications: 27%
2. Tourism: 20%	2. Tourism: 26%
3. Manufacturing: 18%	3. Construction: 22%

On the demand side, weak export performance translated into a 9pp loss in terms of overall contribution to GDP. Gross fixed capital formation stopped being one of the leading growth sectors, replaced by private and public consumption. Both components represented more than 90% of overall growth (see table 5, Annex A).

Public finances had to adjust after the retirement of the UK garrison in 1994 and the decrease in trade revenues (import tariffs, stamp duties and export taxes) that resulted from the implementation of the common external tariff of the Caricom. Since 1991 until 1995, the public sector registered a persistent large deficit that was faced with repeated capital expenditures cutbacks (in 1993 and 1995), a current expenditure cutback (in 1995) and the introduction of a value-added tax (VAT) of 15% (in 1996) (see table 13, Annex A). In 1996, the deficit of the Central Government was successfully reduced to 2.5% of GDP (compared to a 6% deficit registered in 1994)[5].

There was a reduction in the trade deficit in the three years following 1993 mainly due to the reduction in imports caused by the fiscal austerity measures. In 1997, imports started to grow again, widening the trade imbalance. The reduction in the services account surplus caused by the departure of the UK garrison was partly offset by an increase in tourism revenues. Moreover, the reduction in the trade deficit decreased the magnitude of the needed service account surplus.

[5] IMF(2000).

C. The Second High Growth Period (1998-2000)

The high-growth period that followed (6% annual average) was mainly the result of People's United Party (PUP) Government expansionary fiscal policy, both through an increase in expenditures and a reduction in tax-rates. Moreover, the recovery of tourism, fishing, and some agricultural activities helped to foster economic growth.

Agriculture, forestry & fishing remained to be the main economic sector of the economy, accounting for 22% of the GDP and 76% of export earnings. The fishing sector was the second in importance for growth and recovery. Sector growth was driven primarily by marine products, citrus and bananas; displacing the traditional role of sugar. Orange and grapefruits production increased 60% and 17% respectively with respect to the 1993-1997 period, while banana production rose 20% (see table 9, Annex A). Marine products brought 16% of export earning; around 50% more than in the previous period. In 2000, citrus replaced sugar as the largest single export crop. Development of other products such as papaya, ginger, fruits and beans also contributed to booster of exports.

Tourism regained its growth strength, leading the overall economic recovery of the period (see table 3, Annex A). New developments contributed significantly to the growth of the sector such as intensive marketing campaigns, restoration of archeological sites and the construction of a tourist village for cruise-ship passengers. In part these developments were the outcome of the *Mundo Maya* agreement that Belize ratified in 1996 with its neighbor countries, in order to preserve archeological sites and promote tourism in the region. While tourist arrivals increased from 134,000 to 187,000 between 1997 and 2000, cruise-ship passenger's arrivals increased from 2,700 to 49,400 during the same period.

Manufacturing was the third growth leader, mainly because of the recovery of garment production (see table 12, Annex A). The medium term outlook of manufacturing is uncertain since the sector, which remained confined to import substitution products for local consumption and a few export products, started to experience the reduction of import controls that implied the movement towards the Caricom.

Construction activity boosted growth again as a result of the PUP government's commitment of building 10,000 houses and the reconstruction efforts that followed Hurricane Keith (October 2000).

To sum up, the main growth contributors during the period 1998-2000 were (see tables 2 and 3 of Annex A for a detailed analysis):

Contribution to growth	*Contribution to growth booster*
1. Tourism: 33%	1. Tourism: 45%
2. Fishing: 17%	2. Fishing: 28%
3. Manufacturing: 16%	3. Construction: 26%

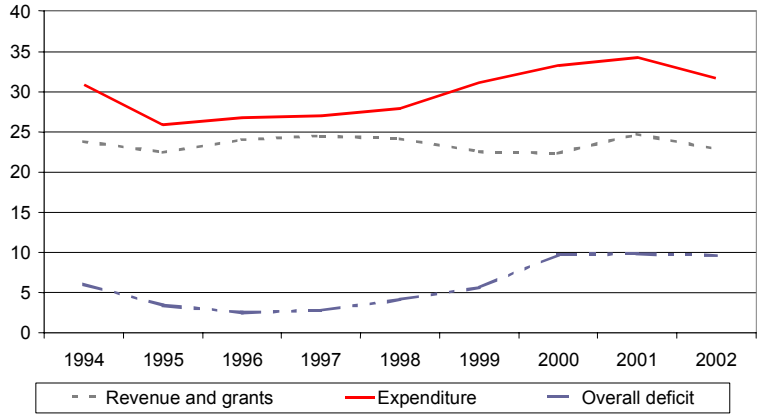
On the demand side, the boom in exports, driven mainly by marine and agricultural products and tourism, increased again the contribution of exports to GDP to 70%. Fixed capital formation was the second growth leader of the period, reflecting the increase in capital expenditure carried out by the government.

On the fiscal side, public deficit worsened increasingly from 1998 to 2000. The deficit escalated from 4% of GDP in 1998 to around 10% in 2000 (see graph 4). The widening of the fiscal imbalance was due to a simultaneous increase in expenditures and reduction of revenues. On the expenditure side, large-scale investment programs were intensified by the Government in 1998 (increased to 37% of GDP)[6]. The fall in revenues was caused by generous tax cuts and duty exemptions, as well as the lack of buoyancy of the tax regime due to the tax-sheltered status of the dynamic sectors. In April 1999, the value-added tax that was introduced in 1996 was substituted by a sales tax of 8%[7], the highest rate of the income tax to individuals was reduced and many business tax rates were diminished. The goal of this tax reform was to foster business activities, increasing, at the same time, tax revenues.

[6] IADB (2004b). This programs included the upgrading and expansion of roads, ports and airports and electrical and telephone services, social programs and construction and rehabilitation of the housing sectors.

[7] This was promised by the PUP in the electoral campaign.

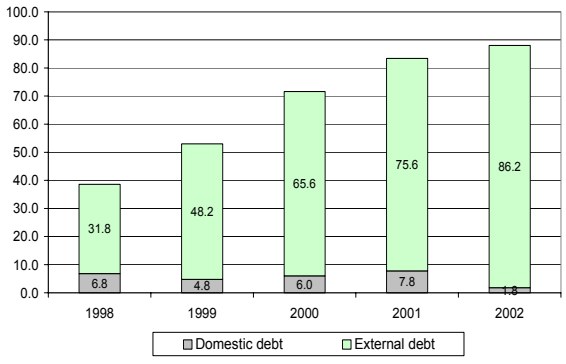
Graph 4. Central Government's fiscal deficit 1994-2002
In percentage of GDP



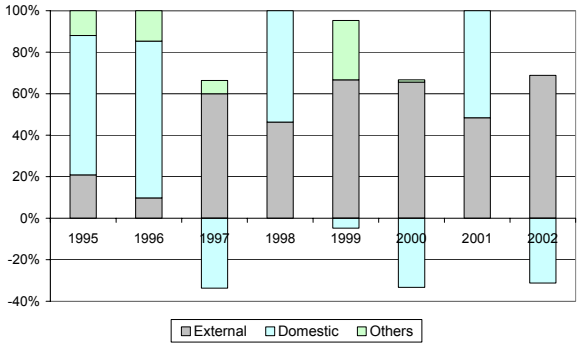
Source: IMF Statistical Appendix, Staff Report for the 2003 Article IV Consultation.

Since 1997, the funding of the public deficit shifted from domestic to external borrowing (see graph 6). External debt-to-GDP ratio thus rose from 32% to 86% between 1998 and 2002 (see graph 5). This also caused a significant increase of debt services, which rose from 3.4% to 10.9% of GDP between 1998 and 2002. As a percentage of the government's current revenues, interest payments increased from 15.5% to 46.7% in those years[8].

Graph 5. Debt evolution 1998-2002
In percentage of GDP



Graph 6. Central Government Borrowing sources 1995-2002



Source: IMF Statistical Appendix, Staff Report for the 2003 Article IV Consultation.

[8] IMF (2004).

The trade deficit widened again due to the increase in import expenditures, fostered by the economic recovery. The trade deficit almost doubled from 1997 to 2000. The surplus on the service account and the positive net transfers were not enough to prevent an increase in the current account deficit. Although there were large capital inflows to finance government expansionary policy and post Hurricane Keith reconstruction, overall balance of payments deficit turned to be negative in 1998 and 2000[9] (see table 14, Annex A).

To sum up the changes that occurred in production and exports during the whole 1986-2000 period, we can look at the evolution of their composition. The diversification of production and exports resulted in:

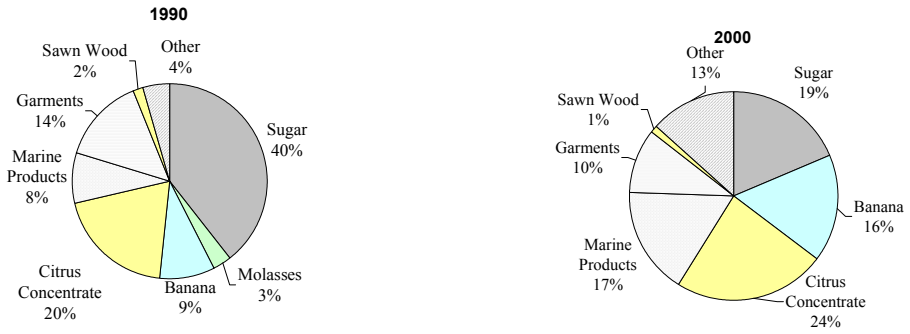
(i) *changes in the contribution of sectors within the main economic activities (primary, secondary and services) but not among them*. While the contribution to GDP of the primary and secondary activities and services remained relatively stable during the decade, significant changes occurred within them. In the primary sector, fishing and aquaculture activities increased their contribution to GDP from 2.6% (1986-1992 period) to 5.1% (1998-2000 period), while forestry lost most of it. In the service sector, tourism increased its share from 17.5% (1986-1992) to 19.3% (1998-2000) while public administration decreased its share (see table 1, Annex A).

(ii) *changes in the contribution of crops to export earnings.* In 1990, the composition of the exports of goods was: 40% sugar, 20% citrus, 14% garments, 9% bananas and 8% marine products (see graph 7). The decrease of the preferential prices of the main export products, together with a slow down in tourism receipts, caused a decrease in exports (as a share of GDP) between 1993 and 1996. As the economy diversified to new export products, especially seafood products, papayas, ginger, fruits and beans, exports recovered. In 1999, they represented 60% of GDP, approximately the same share

[9] After 2000, the economy slow down again due to: (i) a less expansionary fiscal policy, (ii) the effects on production associated with the arrival of Hurricanes Heith and Iris; (iii) a decrease in world tourism flows following 9/11; (iv) a shrimp –virus epidemic and (v) a reduction in exports (IADB (2004b)). On the fiscal side, after a short adjustment in expenditures in fiscal year 2002/2003, the authorities increased again its

observed at the beginning of the nineties (see graph 1, Annex A). In the year 2000, citrus represented 24% of total exports of goods, sugar and its products 19%, marine products 17%, banana 16% and garments 10%. It can be observed that citrus, marine products and bananas performed very well, while sugar exports suffered a visible deterioration due to the impoverishment of the terms of trade.

Graph 7. Exports of goods composition, 1990 and 2000
In percentage



Source: elaborated based on Central Bank of Belize.

Belize was one of the most open economies of the Latin American and Caribbean region[10]. In 1990, total trade of goods and services represented 130% of GDP; while in 2002, they represented 125% of the GDP (see graph 1, Annex A). As it was previously stated, country's export performance has greatly benefited from preferential access to the American and European markets. Since preferential conditions under which the country has got access into those markets have deteriorated over time and are expected to deteriorate even further in the near future, there were strong efforts to diversify exports to new products such as seafood products, papayas, ginger, fruits and beans.

An additional element that is relevant for the evolution of production is the high exposure of Belize to natural disasters[11]. Whenever this type of adverse natural shocks has occurred, they have affected the productive structure of the economy and its level of

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capital expenditures widening again the fiscal deficit. The increasing public external debt leaded to a downgrade of the public sector foreign-currency bonds and notes in August 2004.

[10] Based on World Development Indicators, World Bank.

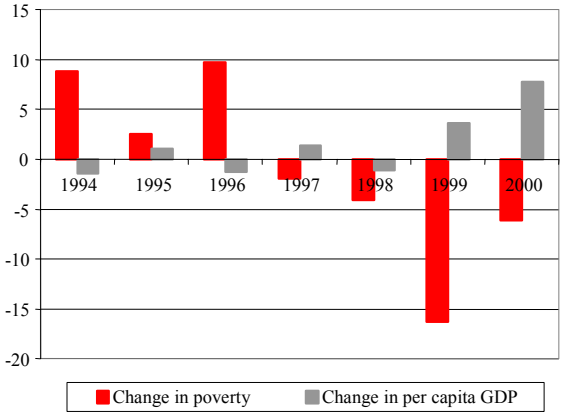
[11] In the second half of the nineties, the country suffered from the Tropical Storm Roxanne (1995), Hurricane Keith (2000) and Tropical Strom Chantal and Hurricane Iris (2001).

production, disrupting the internal and external balances of the economy. It is estimated that during the nineties the average cost of natural disasters represented around 10% of GDP[12].

D. Macroeconomic performance and poverty

Belizean economy is characterized by a close evolution of GDP growth and poverty rates during the 90s. First, we identify that poverty rates were volatile during the 90s, as well as GDP growth. Second, there is a negative correlation between changes in income per capita and changes in the headcount poverty index. These two variables move in opposite directions for most years between 1994 and 2000 (see graph 8).

Graph 8. Poverty change and GDP per capita growth 1994-2000
In percentage



Source:change in poverty indicators elaborated based on 1993-1999 LFSs and change in GDP per capita elaborated based on Central Statistical Office of Belize.

The following sections will focus on studying this particular characteristic of the Belizean economy. The determinants of changes in poverty during the 90s, and particularly how this relationship holds for those sectors that led economic growth will be explored. More specifically, it will look at the relationship between the sector in which vulnerable people work and the economic sectors that led either the recovery or the slow down of the economy, after controlling for other relevant demographic and socioeconomic factors.

[12] IADB (2004b).

III. METHODOLOGY AND DATA

This section presents: (i) a definition of poverty, (ii) the data sources used for the purpose of this analysis and its limitations and; (iii) the definition of different measures of poverty that will be used in the analysis.

To be in poverty means that one's standard of living falls below some socially defined minimum, generally expressed in terms of the ability to satisfy basic needs of nutrition, health, housing and the like. Typically either consumption or income levels are used as a proxy for individual's welfare, and a level of income that permits the purchase of a basic-need basket of goods, called the poverty line, is determined. Thoretically, consumption is a better measure of welfare than income because a welfare measure should be based on permanent instead of current income.

Unfortunately, there is limited data on consumption to conduct the poverty analysis proposed in this report. In order to assess poverty, the Central Statistical Office (CSO) of Belize conducted two Living Standard Measurement Surveys (LSMS) in which poverty is measured on consumption; the first one in 1996 and the second one in 2002. The LSMS of 1996 collected information of 1,200 households in urban and rural areas. The poverty indexes were estimated based on the level of household expenditures together with poverty and indigence lines defined by the CSO for each district[13]. In 2002,[14] the sample consisted on 1,680[15] households randomly selected from urban and rural areas and from each district.

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[13] The indigence line is equivalent to the cost of a nutritional basket able to contribute with the minimum calories and nutritious requirements of an average person. The poverty line is between 27 and 120 percent higher than the indigence line. "Belize: Poverty Assessment Report 1996". "*Poverty Line measures the monetary value of the minimum food and non-food items that should be obtained by a household to fulfill its basic needs established by the Commonwealth Caribbean for the Caribbean Food and Nutrition Institute CFNI. The poverty line developed for this study is based on the food and non-food requirements of a family of five comprising two adults, male and female, two children under age 12, and one teenager*."

[14] This survey was part of the goal of the government of having a new Country Poverty Assessment to be used as a base for the "*National Poverty Elimination Strategy*" started in 1998 and updated in 2003.

[15] They represent 3.1% of the total households identified by the 2000 Population and Housing Survey. See Government of Belize (2004), Appendix C.

Even though the LSMSs have been very useful to characterize poverty in Belize for those two years, they do not provide enough data points for the purpose of our analysis. It would be ideal to count with a panel data set in oder to be able to follow the perfomance of the households over time but, unfortunately, there is no such a data set available for Belize. The closer available data set is the Labor Force Survey (LFS) which provides several data points for 90s and allows to measure poverty based on labor income. It was conducted on annual basis from 1993 to 1999 by the CSO.

The LFS collects information that "yield key economic indicators like employment and unemployment rates, the incidence, trend and level of underemployment, the size and structure of the labor force"[16] as well as, labor income, occupation, education, economic sector, etc, from a sample of approximately 3,000 households in urban and rural areas and with regional representation. We will focus on the data collected by the LFS for the years 1993, 1996 and 1999, since they represent the end of each of the GDP growth periods identified in section II[17]. For the purpose of the poverty analysis, we chose the year 1996 because income per capita reached the lowest level of the low-growth period[18].

To use labor income as a proxy of individual's standard of living has the following shortcomings. First, as it was stated before and this is general to all income based analysis, income is not as well accepted as consumption as a measure of the welfare of households. Second, the survey does not provide data on alternative sources of household income to labor that are important when assessing poverty. Although labor income underestimates the actual value of the total resources of the households, it still is the indicator of the return of the major asset of the households: the labor force. Labor income thus allows us to estimate most of the effect of macroeconomic volatility on household welfare, both the effect on income of the members already working and of some coping strategies like 'sending more household members to the job market'. Other coping strategies, the ones consisting on selling of assets, are not reported in the results of this

[16] LFS, Central Statistical Office of Belize.

[17] As we stated in that section, the period 1986-1992 was characterized by high-growth rates, followed by a low-growth period that lasted until 1997. Between 1998 and 2000 growth speeded up again.

document. Another problem, also common to the consumption surveys, is the existence of workers that do not declare income or 'missing cases'.

In order to overcome part of these problems, we first estimated the labor income for the individuals that declared to be employed but did not declare income. Based on the information of the individuals that were employed and declared labor income for the same period, we estimated the coefficients of a linear model of labor income as a function of a set of socioeconomic and employment variables, provided by the LFSs. The estimated coefficients were used to compute the predicted labor income of those that did not declare income. Secondly, we excluded from the sample those households where there was no member employed and that declared household income equal to zero[19].

The poverty line levels used in this document are the 1996 LSMS official estimates. For 1993 and 1999 the poverty line was adjusted by the national Consumer Price Index.

We now turn to the choice of a poverty measure. The simplest and more commonly used index is the headcount ratio, defined as the portion of the population below the poverty line. The index is computed according to the following formula:

$$Po = Q / N$$

Po: headcount index,

Q: number of individuals below the poverty line,

N: number of individuals in the population.

The disadvantage of this index is that it is insensitive to changes in the average income of the poor population and to transfers within the poor population. At the same time, transfers from the poorest to the poor near the poverty line will be translated in a reduction of poverty according to this measurement.

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[18] Based on 1993-1996 LFSs.

[19] This group was mainly formed by households with the head over 65 years old or with only a single female member. They declare to have other sources of income (pensions, family transfers, etc.) but the survey does not provide information about their quantities.

To register changes in the average income and in the income distribution among the poor we can use the poverty measure developed by Foster, Greer and Thorbecke (FGT)[20]. The FGT index is defined as follows:

$$P_\alpha = \frac{1}{N}\sum\left(1-\frac{y_i}{z}\right)^\alpha 1(y_i < z)$$

α: degree of aversion to poverty,

z: poverty line level

Yi: measure of welfare or, in our case, income per capita of the household.

N: number of individuals in the population.

In words, the FGT index is the summation of the gap between the income of each poor household and the poverty line income level, raised to a power α that reflects the degree of poverty aversion. The greater is α, the more sensitive the FGT index is to the welfare of the poorest person. In the extreme, if α tends to infinite, the FGT only measures the well being of the poorest person of the distribution.

Note that if we set the power α equal to zero, the FGT index becomes the *headcount ratio (Po)*. As we have already explained, this index does not register any change in the average income of the poor population and in the distribution of income among the poor. If we set α equal to one, the FGT becomes the *poverty gap measure (P1)*. The poverty gap is the percentage by which the average income of the poor falls short of the poverty line, multiplied by the share of the poor population. This measure accounts for changes in the average income of the poor population but still does not register changes in the distribution of the income among the poor population. To incorporate this feature in the poverty measure, the FGT for α equal to two shall be computed.

[20] There is a vast literature on the measurement of poverty. See Foster (1984), Foster, Greer and Thorbecke (1984), Ravallion (1992) and Sen (1976).

The FGT index has the advantage that it is decomposable, what allows us to identify the sources of poverty for a given year and of the change of poverty over time[21]. For a given year, the overall poverty index is equal to the weighted sum of the individual group indexes, as it is shown in the following formula:

$$P^{\alpha} = \Sigma \; m_j * p^{\alpha}_j, \qquad j = 1, \ldots, k.$$

P^{α}: overall poverty index,
p^{α}_j: poverty index of the j group,
α: degree of aversion to poverty,
k: # of mutually exclusive groups,
m_j: share of group j in the total population,

Therefore, the contribution of the jth group to the overall poverty index is $m_j * p^{\alpha}_j / p^{\alpha}$. Moreover, the change in the FGT index can be decomposed to show the sources of the change in poverty. For analyzing the changes in poverty between time t and 0, the index can be decomposed in following way:

$$p^{\alpha}_t - p^{\alpha}_0 = \Sigma \; (m_{j0} (p^{\alpha}_{jt} - p^{\alpha}_{j0}) + p^{\alpha}_{jt} (m_{jt} - m_{j0}) + (p^{\alpha}_{jt} - p^{\alpha}_{j0})(m_{jt} - m_{j0}))$$

within **between** **cross product**

The first term on the right hand side is the contribution of changes in the poverty indexes *within* sectors. The second term takes account of migration of population among sectors or changes in the share of each sector in the population. Finally, the third sector, the *cross product term,* tells whether expanding sectors have rising or falling poverty indexes; if the cross product is positive, it means that expanding (contracting) sectors have rising (falling) poverty.

The three measures of poverty and the decomposition of poverty indexes by source above described are used in Section IV to characterize poverty in the years 1993, 1996 and 1999. In section V, the decomposition of changes in poverty (univariate analysis) and a probit model (multivariate analysis) are used in order to enquire about the determinants of poverty and its relationship with growth leading sector during the 1986-2000 period.

[21] Kanbur (1987) and Ravallion and Huppi (1991).

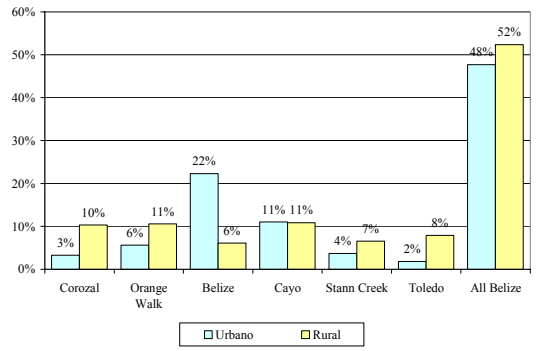
IV. OVERVIEW OF POVERTY

A. Population

With a population of 249,800 in 2000 and an area of 22,963 sq km, Belize is a sparsely inhabitated country. Population is concentrated in Belize disctrict, where almost one forth of the population inhabits in the former capital of the country, Belize City. The rest of the districts hosts between 10% and 20% of the total population of the country, being Toledo the one with the smallest share (see graph 9).

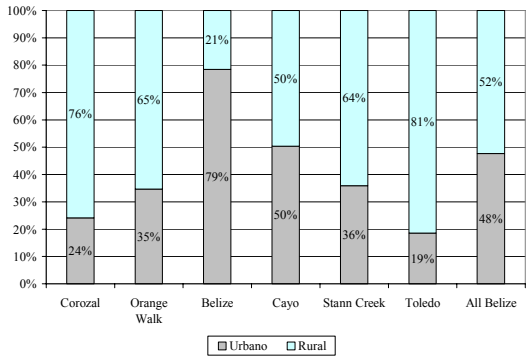
Population is on average equally distributed among urban and rural areas. Belize district is predominantly urban concentrating its population in Belize City, followed by Cayo where half of its population is urban. Orange Walk and Stann Creek has two thirds of the population on rural areas and most of the population of Toledo and Corozal is rural (see graph 10).

Graph 9. Population by district - 2000



Source: Central Statistical Office of Belize.

Graph 10. Urban and rural population by district - 2000



Source: Central Statistical Office of Belize.

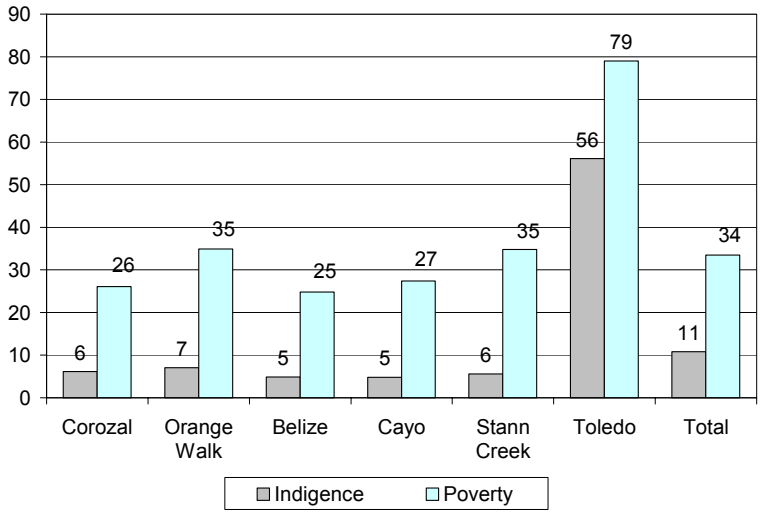
Belize is an ethnically diverse country in which historically relations between ethnic groups have been extremely positive. In the beginning of the nineties the traditional dominance of Creoles was displaced by the Mestizos, together with the influx of population from Guatemala and El Salvador. In 2000, Mestizos accounted for almost a half of the population, followed by the Creoles (33%) and the Mayas (10%). The north and middle of the country (Corozal, Orange Walk and Cayo districts) are dominated by

the Mestizos while Belize Disctrict is mainly Creole. Maya population dominates in Toledo. Stann Creek is the most diversily inhabitated district.

B. 2002 Belizean Poverty Assessment Report

Based on the 2002 Belizean Poverty Assessment Report, Belize has a relatively low number of households living under the poverty line compared to Latin America and the Caribbean[22], but a relatively high number of indigent people. The consumption-based measurement of poverty shows that 24.5% of households (or 33.5% of individuals) were poor and 7.5% were indigent (10.8% of individuals).

Graph 11. Poverty and Indigence rates by district, 2002
In percentage



Source: 2002 Poverty Assessment Report.

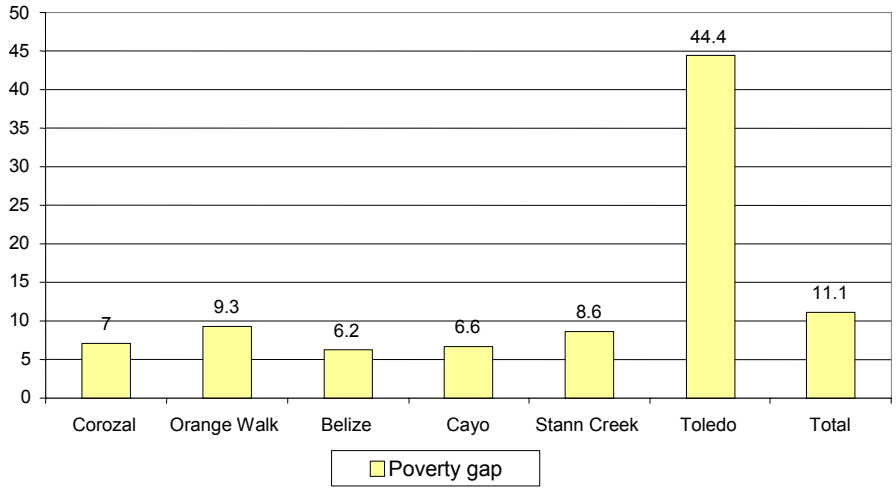
Poverty and indigence are concentrated in Toledo district. While Toledo hosts around 10% of the total population, it contributes with 25% of the poor individuals of the country. Poverty and indigent rates reach 79% and 56% respectively in this district, well above the values of the other districts (see graph 11).

The income gap was at 11 percent for the whole country. That is, households needed to increase their per capita consumption by 11 percent on average to reach the poverty

[22] Based on ECLAC (2001).

line.[23] At the district level, there is a huge disparity between the poverty gap of Toledo and of the rest of the country poor population. Toledo poverty gap is 44% while Orange Walk, the second highest poverty gap, reaches only 9%. Belize district is the closest on average to the poverty line level with a poverty gap of 6% (see graph 12).

Graph 12. Poverty gap by district, 2002
In percentage



Source: 2002 Poverty Assessment Report.

The regional distribution of poverty and its depth leads to identify a dual poverty structure. The dominance of structural poverty in Toledo makes poverty measures be less vulnerable to the economic performance than in the rest of districts where vulnerable population is closer to the poverty line. In these districts, small changes in average income have a significant effect on poverty rates.

At the national level, the Poverty Assessment 2002 also shows that poverty is almost equal among males and females, 34% and 33% respectively, and lowers for older age groups. While the level of poverty among children reaches 39%, the youth registers 34% and the elderly 27% (see table 1).

[23] Government of Belize (2004).

Table 1. Headcount rates for different groups, 2002
In percentage

	Headcount rate (P0)
Sex	
Males	33.9
Females	33.2
Age	
Children (0-17)	39.0
Youth (14-24)	33.9
Elderly (> 65)	26.5

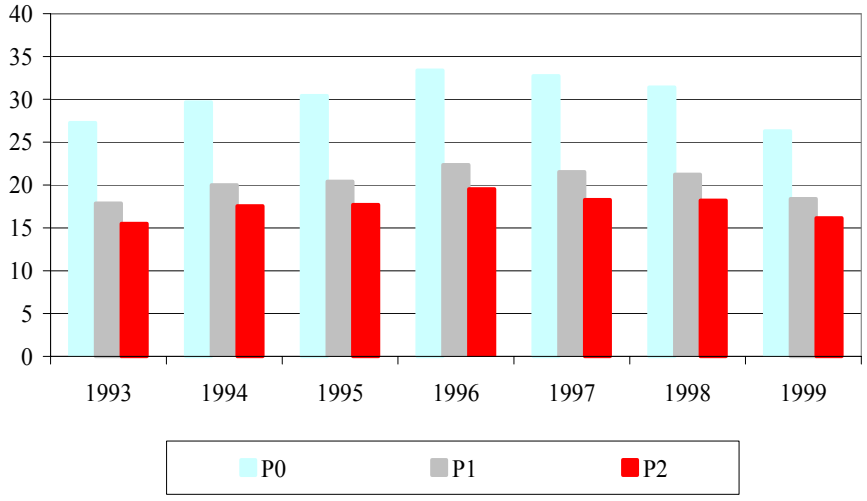
Source: 2002 Poverty Assessment Report.

C. Poverty profiles for the decade

We now turn to characterize poverty based on the data provided by the LFS 1993-1999. We first look at the overall evolution of poverty at the national level and then, taken advantage of the decomposable property of the FGT indexes, we look at different poverty profiles for the years 1993, 1996 and 1999 according to a set of demographic and socioeconomic variables.

We first find that the three poverty measurements (Po, P1 and P2) performed very similarly at the national level. As we mentioned before, headcount poverty increased between 1993 and 1996 driven by the slow growth of the economy and the opposite trend was observed in the following period, between 1996 and 1999, when economic growth speeded up again. Both, the poverty gap (P1) and the intensity of poverty (P2) measurements, follow the same pattern as the headcount index (P0) during the period (see graph 13).

Graph 13. Poverty 1993-1999
In percentage



Source: Poverty indicators elaborated based on 1993-1999 LFSs.

The following tables display poverty profiles for 1993, 1996 and 1999 according to a set of demographic and socioeconomic variables: urban/rural zone, district, schooling and economic activity of the head of the household. Based on the findings of the previous section, Toledo District was excluded from the estimates. From now on, we will focus on the study of poverty excluding Toledo District.

For the **rural/urban** classification we find that (see table 2):

(i) *rural areas are the poorest and the ones with highest incidence in poverty for the three years*. Poverty rates (P0) are much larger in rural areas than in urban areas and rural areas contribute with around three fourths of total poverty.

(ii) urban areas are more vulnerable to growth performance than rural areas. Urban areas not only display lower headcount poverty rates than rural areas, but also smaller poverty gaps and a more equal distribution of income. The fact that vulnerable population is closer to the poverty line resulted in a higher incidence of urban areas in poverty during the low-growth period and in a smaller incidence during the second high-growth period.

(iii) *urban incidence in poverty decreased in 1999 compared to 1993*. Economic recovery of the 1998-2000 period benefited proportionally more households located in urban than in rural areas, resulting in a lower incidence of urban areas in P0 in 1999 compared to 1993.

Table 2. Poverty and contribution to poverty by urban and rural areas

1993					Contribution to overall poverty		
	P0	P1	P2	Pop share	P0	P1	P2
Urban	7.3%	2.2%	1.2%	55%	28%	26%	28%
Rural	23.7%	7.9%	3.9%	45%	72%	74%	72%

1996					Contribution to overall poverty		
	P0	P1	P2	Pop share	P0	P1	P2
Urban	11.7%	3.7%	1.8%	55%	35%	33%	32%
Rural	26.0%	8.9%	4.6%	45%	65%	67%	68%

1999					Contribution to overall poverty		
	P0	P1	P2	Pop share	P0	P1	P2
Urban	5.9%	1.8%	0.8%	52%	24%	23%	24%
Rural	19.9%	6.2%	2.8%	48%	76%	77%	76%

Source: elaborated base on 1993, 1996 and 1999 LFSs.

The results for the decomposition by **district** shows that (see tables 3):

(i) *Corozal and Cayo are the districts with the highest incidence in poverty, while Belize is the least poor and the one with the least incidence in poverty.* Headcount poverty index (P0) is much higher in Corozal and Cayo than in the rest of districts in 1993. This continues to happen in the years 1996 and 1999 but with a smaller differential. The same trend is observed in P1 and P2 indexes. Both districts contribute on average with 50% to overall poverty.

(ii) E*volution of poverty was different among regions*. While headcount poverty indexes worsened in most regions between 1993 and 1996, a reduction in poverty was observed in Cayo. Between 1996 and 1999, every district registered a descrease in its P0 index.

(iii) *Belize was more vulnerable to growth performance than the rest of the districts.* Contribution to overall poverty of Belize district showed the largest changes during the 1993-1996 and the 1996-1999 periods. As we found for the urban areas, this feature is

associated to the fact that income gap of Belize was the closest to the poverty line among the districts and income distribution the most equal.

(iv) *Orange Walk and Stann Creek increased their incidence in poverty from 1993 to 1999, while the rest of the districts decreased it.* Poverty rates (P0) of most regions improved in 1999 compared to 1993, with the exception of Stann Creek, where it remained at the same level, and Orange Walk, where it worsened. Thus, Stann Creek and Orange Walk had a higher contribution to overall poverty in 1999 compared to 1993.

Table 3. Poverty and contribution to poverty by district

1993					Contribution to overall poverty		
	P0	P1	P2	Pop share	P0	P1	P2
Corozal	23.7%	7.6%	3.5%	17%	27%	27%	25%
Orange Walk	14.9%	4.2%	1.9%	18%	18%	16%	14%
Belize	5.4%	1.9%	1.0%	35%	13%	14%	15%
Cayo	22.9%	8.3%	4.6%	18%	29%	32%	35%
Stann Creek	15.8%	4.8%	2.3%	12%	13%	12%	11%

1996					Contribution to overall poverty		
	P0	P1	P2	Pop share	P0	P1	P2
Corozal	26.5%	7.9%	3.4%	16%	24%	21%	18%
Orange Walk	21.2%	6.3%	2.7%	16%	19%	17%	14%
Belize	9.6%	3.0%	1.6%	36%	19%	18%	19%
Cayo	20.8%	7.8%	4.2%	19%	21%	24%	26%
Stann Creek	23.8%	9.4%	5.3%	13%	17%	21%	23%

1999					Contribution to overall poverty		
	P0	P1	P2	Pop share	P0	P1	P2
Corozal	20.4%	6.1%	2.6%	16%	25%	24%	23%
Orange Walk	17.2%	4.8%	2.0%	17%	23%	20%	18%
Belize	3.5%	0.8%	0.3%	35%	10%	7%	6%
Cayo	17.2%	6.0%	3.1%	19%	26%	29%	32%
Stann Creek	15.5%	5.2%	2.6%	14%	17%	19%	21%

Source: elaborated base on 1993, 1996 and 1999 LFSs.

The analysis of poverty indexes by **schoooling** of the head of the households shows that (see table 4):

(i) *The group with complete primary has the highest incidence in poverty, for the three measures of poverty.* This group accounted for 50% (on average) of overall poverty in the years 1993, 1996 and 1999. Incidence in poverty decreased as the economy slowed down and increased again as the economy recovered. Moroever, poverty rates decline as the education of the head of the household increases for all three years.

(ii) *Poverty worsened in the slow-growth period and improved in the high-growth period*. Table 4 shows that all poverty measures worsened in the slow-growth period and improved in the high-growth period.

Table 4. Poverty and contribution to poverty by household head education

1993					Contribution to overall poverty		
	P0	P1	P2	Pop share	P0	P1	P2
None education	24.5%	10.0%	5.7%	8%	14%	17%	20%
Incomplete primary	21.5%	6.9%	3.5%	16%	23%	22%	23%
Complete primary	16.1%	4.9%	2.3%	49%	54%	51%	48%
Incomplete junior secondary	9.9%	3.4%	1.6%	7%	5%	5%	4%
Complete junior secondary	4.6%	1.6%	0.8%	11%	3%	4%	4%
More education	1.8%	0.7%	0.4%	10%	1%	1%	2%

1996					Contribution to overall poverty		
	P0	P1	P2	Pop share	P0	P1	P2
None education	19.2%	7.3%	3.9%	13%	14%	16%	17%
Incomplete primary	27.1%	9.1%	4.5%	19%	28%	29%	28%
Complete primary	19.9%	6.4%	3.3%	41%	45%	44%	44%
Incomplete junior secondary	18.4%	4.6%	1.9%	5%	5%	4%	3%
Complete junior secondary	8.1%	2.4%	0.9%	14%	6%	6%	4%
More education	3.7%	1.9%	1.4%	8%	2%	2%	4%

1999					Contribution to overall poverty		
	P0	P1	P2	Pop share	P0	P1	P2
None education	19.8%	7.0%	3.4%	8%	12%	14%	15%
Incomplete primary	21.3%	7.0%	3.2%	14%	24%	25%	25%
Complete primary	15.5%	4.4%	2.0%	46%	57%	53%	51%
Incomplete junior secondary	3.3%	1.0%	0.5%	19%	5%	5%	5%
Complete junior secondary	1.2%	0.4%	0.2%	11%	1%	1%	1%
More education	9.1%	2.6%	0.7%	0%	0%	0%	0%

Source: elaborated base on 1993, 1996 and 1999 LFSs.

The results for the decomposition by the **economic sector** in which the head of the household works, shows that (see table 5):

(i) *Agriculture workers are the poorest and the ones with the highest incidence in poverty, among the empoyed.* Households with heads working in the agriculture sector show the highest level of headcount poverty, poverty gap and severity of poverty. At the same time this is the group with the highest incidence in poverty, hosting around 45% of the total poor population. The incidence in poverty remained stable during the period.

(ii) *Overall poverty indexes in every sector increased during the low-growth period and decreased during the high-growth period.* Poverty headcount increased between 1993 and 1996 and decreased between 1996 and 1999.

(iii) *Tourism sector was more vulnerable to growth performance than the rest of the sectors, in particular, than agriculture.* Poverty indexes of tourism sector showed a much more volatile performance than agriculture. This feature is associated to a relative low income gap and intensity of poverty index for the tourism sector.

Table 5. Poverty and contribution to poverty by head of the household economic sector

1993					Contribution to overall poverty		
	P0	P1	P2	Pop share	P0	P1	P2
Unemployed / out of labor force	20.3%	7.0%	3.6%	12%	17%	18%	19%
Agriculture	26.7%	9.3%	4.6%	24%	44%	47%	47%
Manufacturing	10.5%	2.2%	0.9%	9%	7%	4%	3%
Construction	4.2%	0.6%	0.1%	7%	2%	1%	0%
Commerce, hotels and restaurants	5.9%	1.5%	0.7%	15%	6%	5%	4%
Transport and communications	12.3%	4.6%	2.6%	6%	5%	6%	7%
Public administration	10.1%	2.1%	0.9%	9%	6%	4%	3%
Others	10.5%	4.1%	2.3%	18%	13%	15%	17%

1996					Contribution to overall poverty		
	P0	P1	P2	Pop share	P0	P1	P2
Unemployed / out of labor force	26.1%	9.2%	4.8%	12%	17%	18%	19%
Agriculture	27.8%	10.3%	5.6%	28%	42%	47%	50%
Manufacturing	15.3%	3.6%	1.4%	10%	8%	6%	4%
Construction	11.7%	2.7%	0.8%	5%	3%	2%	1%
Commerce, hotels and restaurants	13.4%	4.0%	1.9%	17%	12%	11%	10%
Transport and communications	7.0%	1.5%	0.5%	6%	2%	1%	1%
Public administration	5.7%	2.1%	1.1%	8%	3%	3%	3%
Others	15.0%	4.8%	2.3%	15%	12%	12%	11%

1999					Contribution to overall poverty		
	P0	P1	P2	Pop share	P0	P1	P2
Unemployed / out of labor force	18.1%	6.6%	3.4%	11%	16%	19%	21%
Agriculture	22.3%	7.2%	3.3%	25%	45%	47%	46%
Manufacturing	14.7%	4.1%	1.9%	8%	9%	8%	8%
Construction	7.8%	2.5%	1.1%	6%	4%	4%	4%
Commerce, hotels and restaurants	7.0%	1.7%	0.7%	18%	10%	8%	7%
Transport and communications	3.6%	0.3%	0.0%	6%	2%	0%	0%
Public administration	4.2%	0.4%	0.1%	7%	2%	1%	0%
Others	8.6%	2.7%	1.4%	18%	12%	13%	14%

Source: elaborated base on 1993, 1996 and 1999 LFSs.

V. POVERTY AND MACORECONOMIC VOLATILITY

A. Decomposing the changes in poverty

We now start to attempt to identify the determinants of changes in poverty observed in Belize between 1993 and 1999. In this section we use the decomposable feature of the FGT indexes to address this issue in an accounting sense and, in the next section we attemp to estimate the individual contribution of each variable to the likelihood of being poor with a probit model.

In the methodological section we showed that FGT indexes could be decomposed to show the source of changes in the overall poverty changes. We identified the following sources of change: 1) *within* sectors, 2) *between* sectors and 3) *cross product* term. We will focus on the analysis of changes in the headcount index since, as we found in section IV.C, the three poverty measurements performed similarly during the period.

Table 6 displays the decomposition of P0 between 1993 and 1996 and between 1996 and 1999. There are two important **overall results**. The first one is that *changes in poverty occurred mainly within groups during the two periods studied*. This means that labor mobility across sectors is not predominant in Belize as economy deteriorates or improves. The second one is that *most of the poverty changes are not concentrated in the largest groups of poor population*. If we look at the rural and seven year educated groups, the groups with highest incidence in poverty in 1993, we find that these groups did not experience the highest absolute change in the P0 index for the two periods. Table 6 shows that two thirds of the increase in the headcount index occurred during the low-growth period of the economy come from urban areas. Both the *between* and the *cross product* terms also indicates that the rural group was expanding for both periods. At the same time, people with one to six years of education supported the biggest bulk of poverty increase, followed by the group with complete secondary. The same trend, but with opposite sign, is observed during the recovery period.

The decomposition of changes in the headcount index by **economic activity** shows that, between 1993 and 1996, most of the change in poverty was explained by tourism and

agriculture sectors. Tourism was the main contributor in absolute terms to the overall increase in poverty (it contributed with 40% of the total change in poverty), followed by agriculture (which contributed with 30%). Between 1996 and 1999, agriculture was the main contributor to poverty reduction, followed by tourism. The poverty increase in tourism between 1993 and 1996 was due to an overall decrease in the labor income of the workers of the sector, being mainly a *within* sector phenomenon. No migration effect was observed. This trend is consistent with the role of the sector in the slowdown of the economy. As we saw in the macroeconomic section, tourism was the main sector responsible for the overall deceleration of growth. The poverty increase in agriculture sector was mainly a *between* sector phenomenon due to the migration of workers towards the sector. Even though agriculture was the main contributor to growth during the period, the affluence of new workers to a sector that already has low labor income compared to the rest of the economy, explains the increase in poverty observed in the sector. In this case, an important part of the effect of the economic slowdown was supported by the group with major incidence in poverty. During the recovery period, agriculture benefited mainly from the increase in average labor income (*within* sector source) but there was also some contribution from workers leaving the sector. The reduction of poverty registered in tourism sector, the main growth contributor of the period, was due to an almost exclusive *within* sector effect.

The analysis of changes in poverty rates by **district** shows that the regions that have the major incidence in poverty (Corozal and Cayo) are not the ones that supported the largest effect of poverty change. Between 1993 and 1996, the main receptors of the increase in poverty were Belize and Stann Creek Districts and, between 1996 and 1999, the reduction of poverty benefited mostly Belize, Stann Creek and Corozal. Since the economic activities are spatially concentrated, it is easy to establish a parallel between changes in poverty rates of regions and economic activities. Belize hosts 40% of the employment of the tourism sector[24] and, at the same time, tourism is the main source of employment of the district (tourism represents 17% of the district employment). We find similar results to the ones observed for the sector as a whole: poverty rates evolved on

[24] Based on 1993 LFS.

opposite direction than economic growth during the 1993-1996 and the 1996-1999 periods, being mainly a *within* sector phenomenon.

Table 6. Contribution to changes in poverty (Po), by different groups

	1993-1996				1996-1999			
	Total	**Within Groups**	**Between groups**	**Cross product**	**Total**	**Within groups**	**Between groups**	**Cross product**
By area								
Urban	2.3%	2.4%	-0.1%	0.0%	-3.3%	-3.2%	-0.3%	0.2%
Rural	1.2%	1.0%	0.2%	0.0%	-2.2%	-2.7%	0.8%	-0.2%
By region								
Corozal	0.3%	0.5%	-0.2%	0.0%	-1.1%	-1.0%	-0.2%	0.0%
Orange Walk	0.7%	1.1%	-0.3%	-0.1%	-0.5%	-0.6%	0.1%	0.0%
Belize	1.6%	1.5%	0.0%	0.0%	-2.2%	-2.2%	-0.1%	0.1%
Cayo	-0.3%	-0.4%	0.1%	0.0%	-0.6%	-0.7%	0.0%	0.0%
Stann Creek	1.3%	0.9%	0.2%	0.1%	-1.0%	-1.1%	0.2%	-0.1%
By ethnic								
Creole	2.0%	2.0%	0.0%	0.0%	-3.1%	-2.9%	-0.6%	0.4%
Maya	0.3%	0.7%	-0.3%	-0.2%	0.0%	-0.3%	0.3%	-0.1%
Mestizo	1.8%	1.1%	0.6%	0.1%	-2.0%	-2.3%	0.5%	-0.1%
Others	-0.5%	0.0%	-0.5%	0.0%	-0.4%	-0.5%	0.2%	0.0%
By education								
None education	0.5%	-0.4%	1.2%	-0.3%	-0.9%	0.1%	-1.0%	0.0%
1-6 years	1.8%	0.9%	0.7%	0.2%	-2.1%	-1.1%	-1.3%	0.3%
7 years	0.2%	1.9%	-1.4%	-0.3%	-0.9%	-1.8%	1.1%	-0.2%
8-10 years	0.3%	0.6%	-0.1%	-0.1%	-0.4%	-0.8%	2.5%	-2.0%
11 years	0.7%	0.4%	0.2%	0.1%	-1.0%	-1.0%	-0.2%	0.2%
> 11 years	0.1%	0.2%	0.0%	0.0%	-0.3%	0.4%	-0.3%	-0.4%
By sector of economic activity								
Unemployed / out of labor force	0.6%	0.7%	-0.1%	0.0%	-1.1%	-1.0%	-0.3%	0.1%
Agriculture	1.2%	0.3%	0.9%	0.0%	-2.0%	-1.5%	-0.6%	0.1%
Manufacturing	0.5%	0.4%	0.0%	0.0%	-0.3%	-0.1%	-0.2%	0.0%
Construction	0.3%	0.5%	-0.1%	-0.1%	-0.1%	-0.2%	0.2%	-0.1%
Commerce, hotels and restaurants	1.4%	1.1%	0.1%	0.1%	-0.9%	-1.1%	0.2%	-0.1%
Transport and communications	-0.3%	-0.3%	0.0%	0.0%	-0.2%	-0.2%	0.0%	0.0%
Public administration	-0.4%	-0.4%	-0.1%	0.0%	-0.2%	-0.1%	-0.1%	0.0%
Others	0.4%	0.8%	-0.3%	-0.1%	-0.7%	-0.9%	0.5%	-0.2%

Source: elaborated base on 1993, 1996 and 1999 LFSs.

Agriculture is the main economic activity of Stann Creek (it represents 40% of total employment). The changes in poverty rates were caused mainly by a *within* the group effect for both periods, reflecting the change on average income labor observed for the agriculture sector as a whole. This district benefited from the development of new dynamic exporting activities (citrus and seafood products) in the second part of the

nineties. Despite not being a very significant effect, Stann Creek received workers in both periods. Corozal also benefited from the good performance of agriculture between 1998 and 2000.

B. Estimating the determinants of poverty

We will now use a multivariate regression analysis to identify the independent contribution of each determinant to the likelihood of being poor. We will estimate the likelihood of being poor as a function of the set of demographic and socioeconomic variables described below, using a probit functional form. This analysis will allow us to isolate the individual association of each independent or explanatory variable and the likelihood of being poor. Since this is not a linear model, the quantitative relationship between each independent variable and the probability of being poor will depend not only on the value of the coefficients but also on the level of the independent variables. One of the main shortcomings of not having a panel data set is that we cannot estimate a model that takes account of the effects of migration of workers among groups and sectors. In this regard, the findings of the previous section, i.e. that changes in poverty rates are mainly explained by changes *within* and not *between* groups, reduce the importance of this phenomenon. The results of the estimated models for the years 1993, 1996 and 1999 are displayed in Table 7 and their interpretation is presented in following paragraphs[25].

1. Demographic variables : the coefficients associated to the urban areas and male household heads are negative for all three years. These results show that households located in urban areas or with male heads are less likely to be poor than the ones located in rural areas or with female heads. These results concide with the ones of the poverty profiles that showed higher poverty rates (P0) for rural areas and for households with female heads. Moreover, the coefficientes associated to age and age squared show that the older the household head the lower likelihood of being poor, accelerating as the age increases.

[25] The base group is: rural area, female HH head, Belize district, mestizo and out of labor force/unemployed.

2. Schooling of household adults: this variable reflects the average years of education of the household adults, including the head of the household. The adults were defined as the members older than 12 years. The negative coefficients for the square of the variable for all three years indicate that more average years of education in the household are associated to a lower likelihood of being poor, accelerating as the years of education increase.

3. Size and dependence ratio of the HH: the size of the household is defined as the total number of members of the household. The ratio kids to adults is defined as the division between the number of members younger than 12 years old and the number of members older than 12 years old. As it was expected, more members in the household or a higher ratio of kids to adults is associated to a higher likelihood of being poor (for all three years).

4. Number of hours worked: the larger he number of hours the head of the household works, the lower the likelihood of being poor.

5. Economic activity of the head of the household:

- Agriculture: the estimated coefficients show that there is a higher probability of being poor associated to the agriculture sector than to the base group, for all three years[26]. Although agriculture was the main growth leading sector during the low growth period, the differential increased between 1993 and 1996. The positive and bigger likelihood differential associated to the people working in the sector in 1996 indicates that: (i) labor income is on average low compared to the rest of the economy and; (ii) the sector was attracting workers as it was expanding (see table 6). For the following period, in which the sector performed poorly as the economy was growing fast, the differential remained around the same magnitude. The differential did not increase due to the fact that the sector was expelling workers.

[26] We have to remember that the results of this section differ from the ones of the decomposition analysis because these ones identify the isolated association between the sector and the likelihood of being poor (we are controlling for all the other characteristics of the population working in this sector, which are different among sectors). Moreover, when we work with dummy variables, we estimate if there is a differential effect compared to the base group.

The development of new leading export activities (citrus and seafood products) could not offset the effect of the deceleration of sugar production.

- Commerce, hotels and restaurants: in 1993, people working in tourism sector showed a negative likelihood differential of being poor, reflecting: (i) labor income is on average higher compared to the base group; (ii) the outstanding performance of the sector during the 1986-1992 period (it was the main contributor and booster of growth of the overall economy); and (iii) the absence of migration of workers towards the sector. The growth slowdown that experienced the sector between 1993 and 1996 (it was the main responsible for the overall economic deceleration) resulted in a positive likelihood differential of being poor for the tourism workers in 1996. The leadership that tourism exercised during the following period (it became again the main contributor and booster of growth of the overall economy) makes the positive likelihood differential disappear in 1999.

- Manufacturing: the estimated coefficients show a negative probability of being poor associated to the sector in 1993, reflecting the role of the sector as growth booster during the 1986-1992 period. In 1996, the coefficient becomes positive due to the significant slow down registered in production and translated in a decrease on average labor income. The decomposition analysis confirms that, between 1993 and 1996, there was no migration of workers to or from the sector. During the second high-growth period, the coefficient associated to the sector was not statistically significant different form zero. This outcome is consistent with the leadership that the sector exercised as growth leader and the migration of workers from the sector.

- Construction: a household with a head that works in the construction sector is associated to a negative likelihood of being poor for all three years. The role of the sector as the third contributor to the 1993-1997 economic slowdown resulted in a bigger coefficient for 1996 compared to 1993. The likelihood differential associated to the sector increased slightly in 1999 (but not statistically different from the 1996 coefficient), as the sector recovered during the 1998-2000 period

(the sector was the third economic booster). Growth did not resulted in a significant smaller probability because workers migrated towards the sector, making the average real wage to remain around the same levels than in 1996.

- Transport and communications: the sector registers statistically significant negative coefficient for 1996 and 1999. The significant deceleration of sector growth between 1993 and 1997 (it was the main contributor to overall growth deceleration) was not translated in an increase in poverty associated to the sector. Moreover, no migration effect is observed.

- Public administration: for all three years, there is a negative likelihood differential associated to the sector. The likelihood decreases over time[27]. The decrease reflects, in part, the adjustment carried out by the public sector: workers left the sector.

6. Household district: in order to interpret these coefficients correctly, we have to remember that, in the multivariate analysis, the coefficients reflect the performance of the regions after controlling for the other explanatory variables included in the model[28]. The estimates show positive likelihood differentials for all districts for all three years. This means that households located in Belize district have on average a smaller probability of being poor than the ones located in the rest of districts.

- Corozal: after controlling for the average effect of the agriculture sector (the sector employs almost half of the labor force of the district) and for all the other socioeconomic variables, there is still a positive and large likelihood differential of being poor associated to the households located in this region compared to the base district. As the poverty profile by district shows (see table 3), Corozal was one of the districts with major incidence in poverty. The coefficient[29] becomes even larger when the economy is recovering.

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[27] The 1999 coefficient is statistically significant smaller than the 1993 coefficient. No statistically significant differences are found between the 1996 and the 1999 coefficients.

[28] For example, the average performance of the economic sectors is already captured in the coefficients of the sector explanatory variables.

[29] This difference between coefficients is statistically significant.

- Orange Walk: the households located in this region show an increasing positive likelihood differential of being poor. The effects of the sugar crisis seem to have offset the positive spillovers coming from other activities (tourism and manufacturing represented around 30% of the employment of the region in 1993).

Table 7. Determinants of the likelihood of being poor

	1993	1996	1999
Demographic variables			
Urban area	-0.209**	-0.103**	-0.169**
Male HH head	-0.359**	-0.230**	-0.085**
Age HH head	0.180**	0.098**	0.166**
Age^2 HH head	-0.003**	-0.002**	-0.003**
Age^3 HH head	0.000**	0.000**	0.000**
Schooling of HH adults			
Average years of schooling		0.057**	0.418**
Average years of schooling ^ 2	-0.009**	-0.012**	-0.048**
Size and dependence ratio of the HH			
# of members	0.102**	0.151**	0.100**
Ratio kids to adults	0.650**	0.534**	0.630**
HH head job			
# of hours worked	-0.008**	-0.014**	-0.017**
HH District			
Corozal	0.599**	0.726**	0.846**
Orange Walk	0.099*	0.329**	0.587**
Cayo	0.552**	0.224**	0.610**
Stann Creek	0.287**	0.487**	0.446**
HH head ethnic			
Creole	-0.168**	0.194**	
Maya	0.257**	0.508**	0.580**
Other ethnics	0.233**		0.130**
HH head working in:			
Agriculture	0.222**	0.363**	0.356**
Manufacturing sector	-0.306**	0.188**	
Construction sector	-0.885**	-0.155**	-0.212**
Trade, hotels & restaurants sector	-0.534**	0.119**	
Transport & communications sector		-0.239**	-0.333**
Public administration sector	-0.229**	-0.378**	-0.409**
Health & education sector	-0.529**	-0.502**	0.167*
Other sectors		0.432**	0.320**
_cons	-4.191**	-3.176**	-5.002**

Notes: probit model of the likelihood of being poor estimated in base of 1993, 1996 and 1999 LFSs. Base group: rural area, female HH head, Belize district, mestizo and out of labor force or unemployed HH heads. * Significant at 5% confidence level. ** Significant at 1% confidence level. A detailed version of these estimates is presented in Annex B.

- Cayo: the differential of the district decreases in 1996 and increases in 1999. This district, as Corozal, has one of the greatest incidences in poverty. The development of new economic activities (mainly tourism and citrus) since the mid nineties may have generated positive spillovers that decreased the likelihood of being poor in 1996 compared to the base district, but they were not maintained over time.

- Stann Creek**:** the likelihood of being poor increased for households inhabiting the district in 1996, compared to the base group and remained around the same magnitude in 1999.

VI. MAIN FINDINGS

Based on the decomposable property of the FGT indexes, we found that most of the changes in poverty: (i) occurred *within* groups during the 1993-1996 and the 1996-1999 periods, and (ii) did not affect the groups where the poor are concentrated. With the exception of agriculture, the groups with highest incidence in poverty in 1993 (rural and seven year educated groups and Cayo and Corozal Districts) did not experience the biggest absolute change in the poverty headcount index during the two periods studied.

We found an association between economic performance of the sector and the role of the sector as a determinant of poverty. Households with heads working in the agriculture sector have a positive likelihood of being poor for all three years. Overall, this outcome shows the relative low labor income of the sector compared to the rest of the economy. Our results also show that during the period 1993-1996, in the agricultural sector economic growth was not accompanied with a concomitant reduction of poverty within the sector due to the inflow of poor workers into this sector. In the following period, 1996 to 1999, the likelihood differential associated to heads of households working on agriculture decreased slightly, due to the outflow of workers from the sector and the successful development of new leading exporting crops. The likelihood of being poor for the workers of tourism follows the pace of the performance of the sector. The slowdown of the sector resulted in a positive likelihood differential in 1996, which disappears in 1999 as the sector recovers. For household heads working in the construction sector, the likelihood of being poor increases in 1996 compared to 1993, when the sector contributes to the deceleration of overall economic growth, and it decreases slightly in 1999 due to the leading role played by the sector during the recovery.

Moreover, other relevant explanatory variables resulted to be statistically significant. The households located in urban areas and with male heads are less likely to be poor than the ones located in urban areas and with female heads. More average years of education of the household adults leads to a lower likelihood of being poor. More members in the household or a higher ratio of kids to adults is associated to a higher likelihood of being poor (for all three years). The existence of a head of the household with a full time job leads to a lower likelihood of being poor.

The findings of this paper show that part of the population registers significant changes in its welfare depending on the economic performance of the sector in which they work. For this group, openness of the economy creates high elasticity and, given that there is low mobility across sectors, people's welfare is tied to the faith of the sector they work in. Belize, thus, has a dual poverty structure: structural poverty is less vulnerable to the economic cycle while temporary poverty (where the vulnerable population is closer to the poverty line) registers significant changes in poverty depending on the economic performance of the country. This characterization of poverty implies that policies that aim at alleviating poverty should follow a different strategy for each type of poverty.

Deepening export diversification would help to reduce the incidence of poverty since it will restrict the effects of external shocks on overall economic performance. However, poverty rates will still be affected by regional economic shocks or by macro-economic ones. Moreover, even if the economy diversifies further, low labor mobility will require some type of intervention in the occurrence of a sector-specific economic shock. A potential policy to mitigate the effects of economic shocks on households could be work-fare programs. These kind of "safety net" programs aim at responding quickly to shocks in consumption expenditures of the households. The advantage of these programs is that they are easy to implement and they rely on self-targeting mechanisms to reach the beneficiaries of the program.

VII. ANNEX A. MACROECONOMIC STATISTICS

Table 1. GDP by sector of activity
In %, at constant 1984 prices, at factor cost

	1980-1985	1986-1992	1993-1997	1998-2000
I. PRIMARY ACTIVITIES	**21.0**	**19.8**	**20.6**	**22.3**
1.1 Agriculture	15.7	14.0	14.6	15.0
1.2 Forestry & Logging	2.0	2.6	2.3	1.5
1.3 Fishing	3.1	2.6	3.0	5.1
1.4 Mining	0.3	0.6	0.7	0.7
II. SECONDARY ACTIVITIES	**27.8**	**26.1**	**25.4**	**23.7**
2.1 Manufacturing	21.1	17.7	16.8	16.0
2.2 Electricity & Water	1.6	1.8	2.1	1.9
2.3 Construction	5.1	6.6	6.6	5.8
III. SERVICE	**54.7**	**57.7**	**57.3**	**57.3**
3.1 Trade,Rests.,Hotels	16.8	17.5	17.9	19.3
3.2 Transport & Communications	7.7	11.9	14.7	14.1
3.3 Finance & Insurance	5.0	5.1	4.8	4.8
3.4 Real Estate & Bus.Serv.	5.8	5.3	5.1	5.7
3.5 Public Administration	10.0	9.6	7.9	6.8
3.6 Comm. & Other Services	9.4	8.3	6.9	6.7
IV. Imputed Bank Service	**3.6**	**3.6**	**3.3**	**3.3**
Charges [deduct]	3.6	3.6	3.3	3.3

Source: elaborated based on Central Statistical Office of Belize.

Table 2. Contribution to GDP growth by sector of activity
In %, at constant 1984 prices, at factor cost

	1981-1985	1986-1992	1993-1997	1998-2000	1981-1985	1986-1992	1993-1997	1998-2000
TOTAL GDP	**0.4**	**8.2**	**3.1**	**6.4**	**100**	**100**	**100**	**100**
I. PRIMARY ACTIVITIES	**0.2**	**1.5**	**1.1**	**1.2**	**44**	**19**	**35**	**18**
1.1 Agriculture	0.1	0.9	1.0	0.2	26	11	33	3
1.2 Forestry & Logging	(0.1)	0.4	(0.1)	(0.2)	(19)	4	(4)	(3)
1.3 Fishing	0.1	0.1	0.2	1.1	29	2	6	17
1.4 Mining	0.0	0.1	(0.0)	0.1	6	1	0	1
II. SECONDARY ACTIVITIES	**(0.2)**	**2.0**	**0.5**	**1.6**	**(55)**	**25**	**15**	**25**
2.1 Manufacturing	(0.3)	0.9	0.6	1.0	(65)	12	18	16
2.2 Electricity & Water	0.1	0.2	0.1	(0.1)	23	2	4	(1)
2.3 Construction	(0.1)	0.9	(0.2)	0.6	(14)	11	(7)	10
III. SERVICE	**0.4**	**4.9**	**1.6**	**3.9**	**101**	**60**	**52**	**62**
3.1 Trade,Rests.,Hotels	(1.1)	1.9	0.6	2.1	(270)	23	20	33
3.2 Transport & Communications	0.6	1.8	0.4	0.7	150	22	13	10
3.3 Finance & Insurance	(0.1)	0.4	0.1	0.4	(14)	5	4	7
3.4 Real Estate & Bus.Serv.	0.0	0.3	0.2	0.4	5	4	8	6
3.5 Public Administration	0.7	0.3	0.0	0.2	168	4	0	3
3.6 Comm. & Other Services	0.3	0.2	0.2	0.2	63	3	6	3
IV. Imputed Bank Service	**(0.0)**	**0.3**	**0.1**	**0.3**	**(10)**	**3**	**2**	**5**
Charges [deduct]	(0.0)	0.3	0.1	0.3	(10)	3	2	5

Source: elaborated based on Central Statistical Office of Belize.

Table 3. Contribution to change in GDP growth by sector of activity
In %, at constant 1984 prices, at factor cost

	1986-1992	1993-1997	1998-2000	1986-1992	1993-1997	1998-2000
TOTAL GDP	**7.8**	**(5.1)**	**3.3**	**100**	**100**	**100**
I. PRIMARY ACTIVITIES	**1.3**	**(0.4)**	**0.1**	**17.2**	**8.2**	**1.8**
1.1 Agriculture	0.8	0.1	(0.8)	10.2	(2.6)	(25.9)
1.2 Forestry & Logging	0.4	(0.5)	(0.1)	5.5	9.1	(2.6)
1.3 Fishing	0.0	0.0	0.9	0.4	(0.6)	27.7
1.4 Mining	0.1	(0.1)	0.1	1.1	2.3	2.5
II. SECONDARY ACTIVITIES	**2.2**	**(1.5)**	**1.1**	**28.8**	**30.5**	**34.5**
2.1 Manufacturing	1.2	(0.4)	0.5	15.6	7.7	14.9
2.2 Electricity & Water	0.1	(0.0)	(0.2)	0.9	0.6	(6.5)
2.3 Construction	1.0	(1.1)	0.9	12.4	22.2	26.1
III. SERVICE	**4.5**	**(3.3)**	**2.3**	**58.2**	**65.6**	**71.1**
3.1 Trade,Rests.,Hotels	3.0	(1.3)	1.5	38.6	25.5	44.5
3.2 Transport & Communications	1.2	(1.3)	0.2	14.9	26.5	7.3
3.3 Finance & Insurance	0.4	(0.3)	0.3	5.8	5.1	9.6
3.4 Real Estate & Bus.Serv.	0.3	(0.1)	0.1	3.6	1.2	4.3
3.5 Public Administration	(0.3)	(0.3)	0.2	(4.5)	6.5	5.7
3.6 Comm. & Other Services	(0.0)	(0.0)	(0.0)	(0.2)	0.8	(0.3)
IV. Imputed Bank Service	**0.3**	**(0.2)**	**0.2**	**4.1**	**4.3**	**7.4**
Charges [deduct]	0.3	(0.2)	0.2	4.1	4.3	7.4

Source: elaborated based on Central Statistical Office of Belize.

Table 4. GDP by demand component
In %, at constant 1984 prices, at market prices

	1986-1992	1993-1997	1998-2000
Total: Gross domestic product	**100**	**100**	**100**
General government final consumption expenditure	16.8	17.0	16.9
Private final consumption expenditure	54.2	57.6	55.1
Increase in stocks	1.2	0.4	3.1
Gross fixed capital formation	26.0	24.7	26.3
Exports of goods and services	69.0	60.4	70.5
Imports of goods and services	(67.2)	(60.1)	(72.0)

Source: elaborated based on Central Statistical Office of Belize.

Table 5. Contribution to GDP growth by demand component
In %, at constant 1984 prices, at market prices

	1986-1992	1993-1997	1998-2000	1986-1992	1993-1997	1998-2000
Total: Gross domestic product	**8.6**	**3.2**	**6.0**	**100**	**100**	**100**
General government final consumption expenditure	0.8	0.7	1.0	9	23	17
Private final consumption expenditure	3.6	2.3	3.3	41	71	55
Increase in stocks	(0.4)	0.2	0.8	-5	6	13
Gross fixed capital formation	4.0	(0.7)	4.8	47	-20	79
Exports of goods and services	8.0	0.6	8.2	93	19	135
Imports of goods and services	(7.4)	0.1	(12.0)	-86	3	-199

Source: elaborated based on Central Statistical Office of Belize.

Table 6. Exports by product
In %, based on Bz$.

	1980-1985	1986-1992	1993-1997	1998-2000
Sugar	50.8	37.8	31.9	24.2
Molasses	1.6	1.7	3.2	0.3
Banana	4.0	8.8	16.6	16.6
Citrus Concentrate	11.6	18.0	15.9	17.9
Marine Products	9.7	9.4	10.1	15.7
Garments	16.8	17.6	13.0	11.4
Sawn Wood	1.7	2.4	1.8	1.4
Other	3.8	4.4	7.5	12.6
Total	100	100	100	100

Source: elaborated based on Central Bank of Belize.

Table 7. Tourism indicators

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Tourist arrivals (# people)	77,542	99,308	103,609	120,069	121,270	123,389	134,289	166,743	172,292	186,883
Cruise-ship passengers (# people)	428	1,455	5,904	13,661	7,975	771	2,678	14,183	34,130	58,131
Tourist expenditure (Bz$ million)	89.5	119.3	138.50	142.70	154.10	177.20	176.00	216,6	222.9	240.4

Source: Central Statistical Office of Belize.

Table 8. Change in tourism indicators
In %

	1992	1993	1994	1995	1996	1997	1998	1999	2000
Tourist arrivals	28	4	16	1	2	9	24	3	8
Cruise-ship passangers	240	306	131	-42	-90	247	430	141	70
Tourist expenditure	33	16	3	8	15	-1	23	3	9

Source: elaborated based on Central Statistical Office of Belize.

Table 9. Agricultural production – quantities

	Average production			Change between periods (in %)	
	1	2	3	1-2	2-3
	1986-1992	1993-1997	1998-2000		
A. CROPS					
Sugar Cane ("000 L. tons)	947.86	1,155.40	1,134.67	21.9	-1.8
Oranges ('000 90 lb. box)	1,592.57	2,932.40	4,641.67	84.1	58.3
Grapefruit ('000 80-lb. box)	910.43	1,127.80	1,318.33	23.9	16.9
Corn ('000 lbs.)	51,658.00	67,632.00	80,811.33	30.9	19.5
Rice paddy ('000 lbs.)	11,225.00	24,404.20	23,455.67	117.4	-3.9
R.K. Beans ('000 lbs.)	6,085.00	7,776.60	8,150.00	27.8	4.8
Bananas ('000 42 lb. box)	1,251.29	2,636.38	3,193.00	110.7	21.1
Cocoa, dry beans (lbs.)	216,898.00	102,217.80	109,781.00	-52.9	7.4
B. LIVESTOCK					
Cattle : No. slaughtered	7,575.00	8,219.00	7,148.33	8.5	-13.0
: Dressed weight	2,738.71	3,094.60	2,651.33	13.0	-14.3
Pigs : No. slaughtered	8,669.57	12,398.00	13,609.33	43.0	9.8
: Dressed weight	982.00	1,526.40	1,796.67	55.4	17.7
Poultry: No. slaughtered	3,399.14	4,753.60	4,504.00	39.8	-5.3
: Dressed weight	11,334.86	16,099.00	17,600.00	42.0	9.3
Milk ('000 lbs.)	2,500.43	2,795.40	2,835.00	11.8	1.4
Honey ('000 lbs.)	348.79	164.60	154.33	-52.8	-6.2
Eggs ('000 doz.)	2,058.29	2,435.80	2,738.67	18.3	12.4

Source: elaborated based on Central Statistical Office of Belize.

Table 10. Agricultural production – value

In thousands of Bz$.

	Sugar	Citrus	Grains	Bananas	Cattle & Dairy	Poultry & Eggs	Other	Total
1986-1992	9,465	11,315	79	10,060	618	361	4,439	36,338
1993-1997	14,786	27,121	851	13,127	495	1,080	4,431	61,892
1998-2000	16,782	24,950	755	13,268	386	990	6,286	63,417

Source: elaborated based on Central Statistical Office of Belize.

Table 11. Composition of agricultural production – value

In %

	Sugar	Citrus	Grains	Bananas	Cattle & Dairy	Poultry & Eggs	Other	Total
1986-1992	26	31	0	28	2	1	12	100
1993-1997	24	44	1	21	1	2	7	100
1998-2000	26	39	1	21	1	2	10	100

Table 12. Garments production

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Production (thousands)	3,492	3,798	2,902	4,276	3,302	1,974	1,990	1,992	2,144	2,134
Growth rate (%)		8.8	-23.6	47.3	-22.8	-40.2	0.8	0.1	7.6	-0.5

Source: Central Bank of Belize.

Table 13. Central Government Finances
In Bz$ million

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Revenue	249	282	265	281	271	311	314	367	438	418
Current	218	246	251	263	259	283	288	304	347	336
Capital	32	36	14	18	12	28	26	63	90	83
Expenditures	286	339	316	351	304	322	331	382	508	499
Current	152	186	220	240	233	242	253	265	291	330
Capital	135	153	97	111	71	79	78	117	217	169
Primary surplus	66	60	31	23	26	41	35	39	56	5
Overall balance	**-37**	**-57**	**-52**	**-71**	**-33**	**-10**	**-18**	**-15**	**-71**	**-81**

Source: Central Bank of Belize.

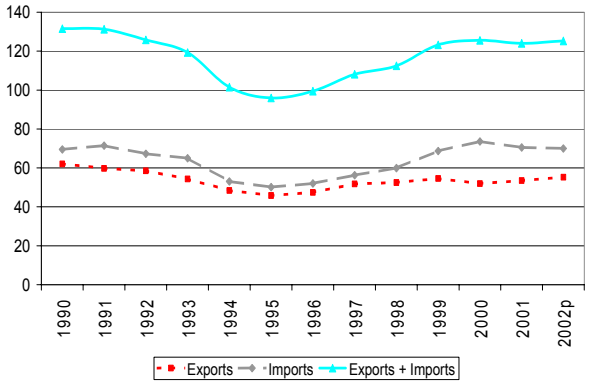
Table 14. Trade of balance
In Bz$ million

	1986	1987	1988	1989	1990	1991	1992
Gross imports (c.i.f)	244	286	362	431	422	502	545
Domestic exports (f.o.b)	149	174	190	188	209	191	233
Re-exports (f.o.b.)	36	32	42	61	49	49	50
Total exports	185	206	233	249	258	239	282
Balance of trade	-59	-80	-129	-182	-164	-262	-263

	1993	1994	1995	1996	1997	1998	1999	2000
Gross imports (c.i.f)	562	516	517	511	572	590	739	905
Domestic exports (f.o.b)	229	255	286	307	318	313	339	399
Re-exports (f.o.b.)	34	47	38	28	35	32	33	31
Total exports	263	302	323	335	353	344	372	430
Balance of trade	-298	-214	-194	-176	-219	-246	-367	-475

Source: Central Statistical Office.

Graph 1. Openess of the economy 1990-2002 (exports and imports of goods & services)
In % of GDP



Source: IMF Statistical appendix, Staff Report for the 2003 Article IV Consultation.

VIII. ANNEX B. PROBIT ESTIMATES FOR THE YEARS 1993, 1996 AND 1999

A. Probit estimates 1993

Probit regression — Number of obs = 33399
LR chi2(25) = 9514.72
Prob > chi2 = 0.0000
Log likelihood = -9136.9977 — Pseudo R2 = 0.3424

poor	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
urban	-.2087157	.0265061	-7.87	0.000	-.2606667	-.1567647
male	-.3590501	.0307254	-11.69	0.000	-.4192708	-.2988295
age	.1802759	.015901	11.34	0.000	.1491106	.2114411
age2	-.0032553	.0003136	-10.38	0.000	-.0038699	-.0026408
age3	.0000185	1.95e-06	9.47	0.000	.0000147	.0000223
av school	-.0228496	.0161897	-1.41	0.158	-.0545808	.0088815
av school2	-.0094217	.0014288	-6.59	0.000	-.0122221	-.0066213
# members	.1017666	.0042676	23.85	0.000	.0934023	.1101309
ratio k/a	.6504587	.0160938	40.42	0.000	.6189154	.6820019
# hs worked	-.0082014	.0007754	-10.58	0.000	-.0097212	-.0066817
corozal	.5987045	.0400338	14.95	0.000	.5202396	.6771693
owalk	.0987027	.0402831	2.45	0.014	.0197494	.177656
cayo	.5517765	.0371991	14.83	0.000	.4788675	.6246854
screek	.2867967	.0423435	6.77	0.000	.203805	.3697883
creole	-.1683987	.0326322	-5.16	0.000	-.2323566	-.1044407
maya	.2567319	.0414025	6.20	0.000	.1755845	.3378793
other eth	.2325227	.0304421	7.64	0.000	.1728572	.2921881
agriculture	.2221536	.04959	4.48	0.000	.1249591	.3193482
manufact	-.3055036	.0582584	-5.24	0.000	-.4196879	-.1913192
construction	-.8849718	.0766956	-11.54	0.000	-1.035292	-.7346513
tourism	-.5336206	.0561143	-9.51	0.000	-.6436027	-.4236386
trans & comm	-.0045947	.0619349	-0.07	0.941	-.1259849	.1167956
public adm	-.228858	.0591973	-3.87	0.000	-.3448826	-.1128333
health & ed	-.5292981	.0783019	-6.76	0.000	-.682767	-.3758291
other sector	.091348	.0526732	1.73	0.083	-.0118896	.1945857
_cons	-4.191385	.2554005	-16.41	0.000	-4.69196	-3.690809

B. Probit estimates 1996

```
Probit regression                                 Number of obs   =      36044
                                                  LR chi2(25)     =    9616.19
                                                  Prob > chi2     =     0.0000
Log likelihood = -12273.574                       Pseudo R2       =     0.2815

------------------------------------------------------------------------------
        poor |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       urban |  -.1033381   .0232724    -4.44   0.000    -.1489511    -.057725
        male |  -.2299321   .0275505    -8.35   0.000    -.2839301   -.1759341
         age |   .0980488   .0122907     7.98   0.000     .0739595    .1221382
        age2 |  -.0019321   .0002378    -8.12   0.000    -.0023982    -.001466
        age3 |   .0000119   1.45e-06     8.17   0.000     9.01e-06    .0000147
   av school |   .0566145   .0141134     4.01   0.000     .0289527    .0842763
  av school2 |  -.0121957   .0011527   -10.58   0.000    -.0144549   -.0099365
   # members |   .1510926    .004144    36.46   0.000     .1429704    .1592147
   ratio k/a |   .5344011   .0149579    35.73   0.000     .5050841     .563718
 # hs worked |  -.0139315   .0007135   -19.53   0.000    -.0153298   -.0125332
     corozal |   .7260109    .034086    21.30   0.000     .6592036    .7928183
       owalk |   .3293202   .0344263     9.57   0.000     .2618459    .3967945
        cayo |   .2242388   .0312446     7.18   0.000     .1630006     .285477
      screek |   .4865771   .0353982    13.75   0.000      .417198    .5559563
      creole |    .193738   .0273357     7.09   0.000     .1401611    .2473149
        maya |   .5078627   .0419128    12.12   0.000     .4257151    .5900104
   other eth |   .0278522   .0297978     0.93   0.350    -.0305505    .0862549
 agriculture |   .3628135   .0456364     7.95   0.000     .2733679    .4522591
    manufact |   .1880377   .0512826     3.67   0.000     .0875256    .2885498
construction |  -.1547338   .0606403    -2.55   0.011    -.2735866    -.035881
     tourism |   .1194696   .0465835     2.56   0.010     .0281676    .2107715
trans & comm |  -.2390372   .0644505    -3.71   0.000    -.3653578   -.1127166
  public adm |  -.3775989   .0590246    -6.40   0.000    -.4932851   -.2619128
 health & ed |  -.5018232   .0703983    -7.13   0.000    -.6398013   -.3638451
other sector |   .4319067   .0457764     9.44   0.000     .3421865    .5216268
       _cons |  -3.176282   .2020315   -15.72   0.000    -3.572256   -2.780307
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C. Probit estimates 1999

```
Probit regression                                 Number of obs   =      41494
                                                  LR chi2(25)     =   10526.80
                                                  Prob > chi2     =     0.0000
Log likelihood =  -10504.53                       Pseudo R2       =     0.3338

------------------------------------------------------------------------------
        poor |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       urban |  -.1694651   .0247491    -6.85   0.000    -.2179724   -.1209578
        male |  -.0853494   .0298358    -2.86   0.004    -.1438264   -.0268723
         age |   .1663431   .0160911    10.34   0.000     .1348051    .1978812
        age2 |  -.0033893   .0003218   -10.53   0.000    -.0040199   -.0027586
        age3 |   .0000211   2.04e-06    10.33   0.000     .0000171    .0000251
   av school |   .4179193    .023371    17.88   0.000     .3721129    .4637257
  av school2 |  -.0478681    .002042   -23.44   0.000    -.0518703    -.043866
   # members |   .1002102   .0041805    23.97   0.000     .0920165    .1084039
   ratio k/a |   .6301309   .0162109    38.87   0.000     .5983581    .6619036
 # hs worked |  -.0167624   .0006745   -24.85   0.000    -.0180844   -.0154404
     corozal |   .8455766   .0400855    21.09   0.000     .7670104    .9241427
       owalk |   .5867886    .040116    14.63   0.000     .5081626    .6654146
        cayo |   .6101144   .0381834    15.98   0.000     .5352764    .6849524
      screek |   .4462314   .0411813    10.84   0.000     .3655176    .5269453
      creole |   .0592898   .0342436     1.73   0.083    -.0078264     .126406
        maya |   .5804995   .0371165    15.64   0.000     .5077526    .6532465
   other eth |   .1301605   .0301106     4.32   0.000     .0711449    .1891762
 agriculture |   .3556071   .0448936     7.92   0.000     .2676173    .4435969
    manufact |   .0537381   .0519149     1.04   0.301    -.0480132    .1554893
construction |  -.2119773   .0621654    -3.41   0.001    -.3338192   -.0901354
     tourism |   .0845465   .0480912     1.76   0.079    -.0097106    .1788035
trans & comm |  -.3332403   .0716872    -4.65   0.000    -.4737447   -.1927359
  public adm |  -.4087672   .0677221    -6.04   0.000    -.5415001   -.2760343
 health & ed |   .1672181   .0660598     2.53   0.011     .0377432    .2966929
other sector |   .3195364   .0491175     6.51   0.000     .2232679     .415805
       _cons |  -5.001839   .2641213   -18.94   0.000    -5.519508   -4.484171
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