

# Illegal Drugs, Economy, and Society in the Andes



Francisco E. Thoumi



Some countries develop illegal drug industries, and others do not. Discerning the distinguishing characteristics—social, economic, and political—of countries with these industries forms the subject of this sophisticated and humane study.

The author, Francisco E. Thoumi, though trained as an economist, rejects simplistic economic solutions as well as simplistic moral ones as he addresses the Andean countries of Peru, Colombia, and Bolivia and the attitudes and responses of the United States. He investigates how the United States and the Andean countries perceive drug issues; the history, structure, and evolution of drug industries in the Andes; the size of the industries in Peru, Colombia, and Bolivia; and their economic, political, and social effects in each country.

Thoumi also addresses the political systems and social characteristics of these countries and why they have been so vulnerable to influence from these industries. In addition, he offers case studies of a variety of anti-drug efforts including crop substitution and alternative development, eradication, interdiction of illicit traffic and manufacturing facilities, and extradition to the United States of traffickers.

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Woodrow Wilson  
Center Press  
Washington, D.C.



The Johns Hopkins University Press  
Baltimore and London

ISBN 0-8018-7854-3



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Cover design: Naylor Design, Inc.



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## The Size of the Illegal Drug Industry

The size of the illegal drug industry is a key determinant of the industry's effects on a society. But estimates of illegal drugs' total revenues, inputs, value added, employment, exports, the amount of narco-dollars that enter a country's economy, and other related economic indicators are highly uncertain and difficult to ascertain. Data on the size and ownership structure of the industry are inaccurate, difficult to obtain, and frequently derived from secondary and indirect sources that provide, at best, a fuzzy approximation to reality. This inaccuracy is mainly due to the industry's illegality, which challenges scholars in their research. Obviously, researchers cannot go to the industry's association or government statistics office and ask for balance sheets and other relevant data. Indeed, they are reduced to largely indirect and highly speculative estimates.

The difficulties inherent in the data and the estimates based on them are well known (e.g.: Thoumi 1993, 1995d; Clawson and Lee 1996; Reuter 1996; and Steiner 1997). Still, the pressures on some entities to produce data and the publicity benefits that can be obtained by doing so



lead sometimes to arbitrary estimates. Three cases illustrate this point. Freemantle (1986, 211) claimed that "drugs provide Colombia's biggest source of foreign income, nearly 36 percent of its total gross national product." Giorgio Giacomelli, the United Nations Drug Control Program (UNDCP) executive director in 1996, gave \$500 billion a year as the size of the world illegal drug economy. UNDCP's (1997) *World Drug Report* provided a lower figure (\$400 billion). More recently, in a late 1999 speech, Michel Camdessus, the International Monetary Fund executive director, claimed that the money-laundering volume was between 2 and 5 percent of the world's gross product. These figures are credible because they came from apparently authoritative sources. Still, none of these statements were backed by serious research, but they have been widely used and abused.<sup>1</sup> Steiner (1997) provided an excellent review of such estimates and charitably referred to them as "folkloric estimates."

A listing of the steps required to estimate the size of the illegal coca and cocaine industry will highlight the uncertainties found at each stage of the business. To estimate coca and cocaine value added in each of the three Andean countries studied, it is necessary to first figure out the size of the coca crop in Bolivia, Colombia, and Peru. One must then estimate conversion factors from coca leaves to coca paste, coca paste to cocaine base, and cocaine base to cocaine. These vary depending at least on the following factors: the type of coca plants and their age; weather conditions; coca plant density per hectare; the amount and types of fertilizers and herbicides used; the frequency of pruning; the skills of chemists and the type and quality of the chemicals used; and the time between the moment leaves are harvested and the actual refining process begins. Furthermore, because improved varieties have been developed and yields have increased, it is also necessary to continuously update the conversion factors to take technological improvements into account.

Other data requirements to estimate the industry's value added are the actual inputs used in the chemical and agro-industrial processes and their

<sup>1</sup>E.g., this occurred at an international conference in September 1998 organized by the U.N. International Scientific and Professional Advisory Council in Courmayeur Mont Blanc, Italy. Some participants contested the United Nations Drug Control Program's (UNDCP's) \$500 billion a year figure frequently reported by the media. A high-level U.N. official at the conference had to humbly explain that such a figure was just a back-of-the-envelope estimate that he had made under pressure a few years earlier when he had to provide a figure for a U.N. speech. In early December 1999, I interviewed several International Monetary Fund officials in Washington and could find no source for Camdessus's estimate or anyone working on money laundering.

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prices;<sup>2</sup> price data on coca paste, cocaine base, and cocaine;<sup>3</sup> the share of the Bolivian and Peruvian paste and base that is controlled and internationally marketed by Bolivians, Colombians, and Peruvians; and the share of each country's traffickers in the value added generated by smuggling drugs within the Andean countries and outside the region. These figures hinge on the availability of data on the amounts paid to foreign pilots and smugglers, in bribes, and for other transportation costs. The shares of each foreign market where wholesale prices are different (European countries, Japan, the United States, and other countries) that are controlled by traffickers of each Andean nationality need to be known. And data on losses in the production process, and through law enforcement seizures, are also needed. Every estimate adds uncertainty to the final figure.<sup>4</sup>

Other drugs present different estimation problems. For example, the estimation of poppy hectareage must be made quite rapidly and frequently over all the area of a country because it takes only 4 months from planting to harvesting.

A simple example illustrates the problems encountered in these estimations. Cultivated hectareage can be estimated in two ways. The first is by using reports made by government officials, journalists, or researchers who either reside in or have visited the growing areas. These secondhand reports do not and cannot use accepted sampling techniques but must rely on interviews with informers, law enforcers, and other area residents.

The second approach uses satellite photography. This method is more sophisticated, but it is not necessarily more accurate, because it depends on the observers' often diverging perceptions. Air photography does not reveal plants grown under tree cover; moreover, it is quite inaccurate in the many spots where illicit crops are mixed with other legal plants or when they are grown in the shade of other plants. Similar examples can be given for each of the estimation steps needed to obtain final figures. In spite of these limitations, there have been numerous estimates of the size of the illegal industry in the Andean countries. In fairness to the estimators, it must be acknowledged that most of them are aware of

<sup>2</sup>All inputs used to produce cocaine can be substituted. When one input market is controlled, producers use others or develop new ways to obtain the same input.

<sup>3</sup>It is recognized that price data, collected in undercover transactions, are more accurate than volume data.

<sup>4</sup>Similar estimation problems arise in poppy-opium-morphine-heroin, marijuana, and synthetic drugs.



the limitations of their own estimates and that in spite of the obstacles confronted, these estimates are probably more sophisticated than those made in other regions of the world.

The industry's size may also be estimated from the consumption side. Such a calculation would have to be based on consumption estimates, from which one would then derive the market share that corresponds to each of the Andean countries. This approach also presents myriad weaknesses. Little is known about consumption in any market, and prevalence data based on surveys do not provide detailed consumption information.<sup>5</sup> It is well known that consumption-based estimates are substantially lower than production based ones, which suggests a permanent oversupply condition and raises further doubts about the estimates' accuracy (De Rementería 1995; Steiner 1997; Reuter 1996). Consumption estimates first establish a figure for drug addicts and drug users in the main markets. The various doses demanded by addicts and the frequency of use of addicts and nonaddicts are then estimated. Total consumption is figured out from these figures. Yet, a comparison of this figure with some production and smuggling estimates may lead to absurd conclusions. Some estimates of marijuana produced in Mexico and smuggled to the United States require for example, that about one-third of Americans 15–50 years of age be marijuana addicts (Reuter 1996)!

The impact of the industry on a country depends not only on the industry's value added within that country, but also on the amount of illicit revenues that its nationals generate abroad and repatriate—and, conversely, on the amount generated domestically that is transferred out of the country. Further methodological problems arise if one takes into consideration the involvement of Andean expatriates, mainly Colombian, in drug-marketing activities outside the country. Their profits are not Andean value added, but they can be invested in the Andean region, and as evidence indicates, at least a share of them are (Thoumi 1995d).

A very large share of the industry's value added captured by Andean residents is generated by the roughly tenfold increase in the cocaine price

<sup>5</sup>Some typical questions asked in these surveys: Have you ever consumed a particular drug? Within the last year? Within the last month? These questions do not provide good data about frequency, patterns, amounts, and environments in which drugs are consumed. Indeed, they are not conceived to determine drug consumption volume and causality but rather to identify lawbreakers and are reminiscent of those asked by Catholic priests at confession who aim to find out what sins were committed but not much more than that.

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between Andean and U.S. wholesale prices, and an even larger difference between Andean and European wholesale prices. To illustrate this point, it is useful to take a look at the Colombian cocaine industry's price structure circa 1995.<sup>6</sup> The coca leaves required to produce a kilogram of cocaine cost from \$400 to \$600. A kilogram of coca paste cost about \$800, and a kilo of cocaine base \$1,000. Cocaine wholesale prices were in the range of \$1,500 to \$1,800 per kilogram. Wholesale cocaine sales of 200 or more kilograms, at the U.S. port of entry sold for about \$18,000. This price increases rapidly with each subsequent transaction.<sup>7</sup> At the retail level, a kilogram of cocaine sold by the gram cut to 60 to 70 percent purity can fetch \$120,000.<sup>8</sup> European prices have been significantly higher. Cocaine wholesale prices in many European cities can be about \$25,000 per kilogram, though recent reports indicate that they have been falling to levels similar to those in the United States, and that in such cities as Amsterdam, cocaine prices are already comparable to those in the United States (Thoumi 1999).

This price structure has three important implications. First, drug profits in mainly producing countries strongly depend on who does the smuggling to external markets. If it is country nationals, country profits are dramatically larger than otherwise. In spite of high transportation costs between Latin America and the United States—which reach from \$2,500 per kilogram (Zabludoff 1997) to even 50 percent of the drug weight—the profits that traffickers make at this stage of the business are extremely large compared with those made at earlier stages.

Second, Andean cocaine and heroin exporters do not need to bring back to their countries most of their profits to pay for the drugs they export. Most of their profits can be laundered and invested anywhere. It is not surprising that studies show difficult-to-explain capital flows in the Colombian balance of payments, a significant share of which are likely to be funded by illegal drug money (Correa 1984; Urrutia and Pontón 1993; Rocha 1997), showed that they are statistically explained by interest-rate differentials in the United States and Colombia, and by devaluation expectations in Colombia. Drug traffickers are good capitalists, and illicit

<sup>6</sup>These figures are based on Rocha (1997) and (S. Uribe (1997) and are comparable to those used by UNDCP (1997, 126).

<sup>7</sup>U.S. intelligence services indicate that there are four to five transactions before cocaine reaches its final consumer.

<sup>8</sup>This figure exaggerates the traffickers' income because many dealers are also users or addicts who sell to support their habit.



drug capital flows behave in a way similar to any other international capital flow: They are influenced by macroeconomic conditions in the Andean countries, the United States, and other countries, as well as by fiscal and monetary policies in the Andean and other countries.

Third, it is necessary to point out a "political" source of estimate bias. The estimates of the size of the drug industry are not only of analytical interest, but they also have policy and political implications. During the past 25 years, for instance, coca-growing countries have received foreign aid to help eradicate coca plantings. Hence, many local politicians believe a successful foreign aid request is directly related to the size of the illegal industry. In Bolivia, this is particularly noticeable, and it is not surprising that past Bolivian estimates by researchers close to the government tended to be substantially higher than estimates made by the United States.<sup>9</sup>

All the methodological issues and difficulties discussed raise warning flags about the figures frequently used, particularly when there is no detailed description of the successive steps used to ascertain them. There is no question that any analysis of the illegal drug industry should use extreme caution when using any data.

### The Colombian Estimates

During the last 25 years, there have been several attempts to establish the size of some parts of the illegal drug industry (e.g.: Junguito and Caballero 1979; Ruiz-Hernández 1979; Gómez 1985, 1988, 1990; Gómez and Santa María 1994; C. Caballero 1988; Kalmanovitz 1990; Sarmiento 1990; Urrutia 1990; Kalmanovitz and Bernal 1994; Vargas and Barragán 1995; Steiner 1997; Rocha 1997; and S. Uribe 1997). These are the more serious studies in this field, and they were surveyed by Thoumi (1993, 1995d), Steiner (1997), and Rocha (1997, 1999). There have been other estimates and journalistic reports that give much higher figures, which sometimes are drastically out of the realm of possibility (e.g., Freemantle 1986 mentioned above).

<sup>9</sup>E.g., Machicado (1992, 93) estimated that the coca produced in Bolivia in 1988 was sufficient to produce 546.9 tons of cocaine. The U.S. Department of State, Bureau of International Narcotics Matters (1990) estimated worldwide cocaine production in 1988 at about 750 tons, and maximum coca production in Bolivia at 34 percent of the world total, a much lower figure.

Table 5.

Year	Coca
1980	1,38
1981	1,93
1982	1,86
1983	1,86
1984	4,09
1985	2,93
1986	93
1987	1,31
1988	1,39
1989	2,48
1990	2,34
1991	1,40
1992	1,82
1993	3,63
1994	1,17
1995	1,44

Sources: Steiner

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Table 5.1. *Illegal Drug Income in Colombia (billions of U.S. dollars)*

Year	Steiner				Rocha				Total	
	Cocaine	Heroin	Marijuana	Total	Cocaine	Cocaine	Heroin	Marijuana	Minimum	Total
					Minimum	Maximum				Maximum
1980	1,386			1,386						
1981	1,933		137	2,070	1,358				1,358	
1982	1,819		65	1,884	2,484			133	2,617	
1983	1,868		79	1,947	1,294			133	1,427	
1984	4,093		79	4,172	671			83	754	
1985	2,933		20	2,953	947	3,817		26	973	3,843
1986	939		34	973	845	3,340		21	866	3,361
1987	1,311		152	1,463	493	2,386		57	550	2,443
1988	1,395		290	1,685	533	3,658		49	582	3,707
1989	2,485		94	2,579	677	6,677		22	699	6,699
1990	2,341		48	2,389	503	6,435		20	523	6,455
1991	1,400	756	83	2,239	161	3,965	27	45	233	4,037
1992	1,822	756	89	2,667	331	3,323	163	53	547	3,539
1993	1,363	756	368	2,487	357	2,999	270	140	767	3,409
1994	1,176	756	329	2,261	194	2,625	424	182	800	3,231
1995	1,446	756	333	2,535						

Sources: Steiner (1997) and Rocha (1997).

Most serious estimates are based on U.S. government figures of coca hectareage in the Andes. However, the assumptions about each required variable mentioned above vary widely, so the estimates fall within a very wide range. Table 5.1 presents the results of the most recent studies (Steiner 1997; Rocha 1997). Steiner's estimate of total illicit drug income for the early 1980s was about \$2 billion a year; it rose dramatically to more than \$4 billion in 1984 and fluctuated widely between \$1 billion and \$3 billion for the rest of the decade. From 1989 to 1995, it tended to be stable at about \$2.5 billion.

Rocha estimated total income from 1981 to 1994. For the 1985–94 period, he also produced minimum and maximum estimates, depending on what assumptions were made about cocaine. The minimum figures were quite low; after 1983, they never exceeded \$1 billion. Rocha's maximum estimate was in the range of \$2.5 to \$4 billion for the 1984–88 period, then rose to \$6.5 billion during the next 2 years, and then fell to \$3 to \$4 billion for the last 4 years. Rocha's estimate also showed the importance of possible alternative assumptions because for several years his maximum estimate was ten or more times larger than his minimum one.

Steiner's (1997) and Rocha's (1997) figures highlight the importance of the sharp drop in cocaine prices from the early 1980s on, which reduced total cocaine income. The figures also coincide in showing a decline in



the importance of marijuana during the 1980s, then a rebounding of that illegal industry branch in the 1990s. Both caution the reader about the greater uncertainty about heroin revenues. Indeed, none had estimates for the years before 1991, in spite of police reports about the existence of poppy plantings (see chapter 4), and Steiner considered that it was not feasible to develop a good estimate and opted for a constant figure for all years.

As was noted above, drug income estimates are very uncertain and frequently contradictory. For example, S. Uribe's (1997) study—based on the usual hectareage estimates plus fieldwork in illegal crop regions—estimated cocaine and heroin domestic value added generated in the processing of locally grown coca and poppies at \$1.2 billion (excluding coca paste and cocaine base imports from Peru and Bolivia). This estimate only covered value added generated in the production process up to the point at which laboratories sell their drugs in Colombia. It provided an order of magnitude of the value added generated in the illicit crop regions by peasants, collectors, chemists, refiners, and so on. Uribe's estimate was higher than the minimum cocaine estimates of Rocha and similar to total cocaine income as estimated by Steiner. Because Uribe's estimate did not include the most profitable smuggling part of the business, it clearly implied substantially higher total cocaine revenues.<sup>10</sup>

As was noted in chapter 4, the illicit industry's structure has changed substantially in the past few years as illegal hectareage has exploded, the Colombian Revolutionary Armed Forces (FARC) guerrillas were granted control of the "distension zone," and paramilitary forces increased their role in drug production and trafficking. These changes led to significant changes in illicit revenues and their distribution, but they have not been researched.

All estimates have important biases, among which five come easily to mind: First, reliable data on actual transportation costs throughout the Caribbean and Central America to the United States are not available. As was discussed in chapter 4, Mexicans can be charging Colombians up to 50 percent of the cocaine to smuggle it from Mexico to the United States. Traditionally, the U.S. Drug Enforcement Administration has estimated

<sup>10</sup>Rocha's and Uribe's studies were part of the same United Nations Development Program-sponsored project that I coordinated. Each author had very strong convictions, and because I simply did not succeed in having both authors agree to a common set of assumptions about the variables discussed above, I opted to publish both studies in the same book in spite of these obvious inconsistencies.



transportation costs in the range of 10 to 15 percent of the wholesale price at American ports of entry. These estimates, however, crucially hinge on what proportion of the exports is assumed to go through Mexico. In any case, this means that those who transport cocaine make as much as all producers and traffickers up to the point at which the drug is exported from the Andean countries.

Second, the large number of Colombians jailed around the world on narcotics charges evidences involvement in trafficking within the United States, Europe, and other markets, but there are no studies that estimate these Colombians' income or the proportion that they send back to Colombia. Third, Colombians are also involved in Bolivia and Peruvian exports. Moreover, Steiner's and Rocha's estimates focused on Colombian value added and did not include either Colombians' profits from trafficking within the United States, Bolivia, or Peru.

Fourth, the estimates did not include illegal industry revenues from domestic sales in Colombia. Fifth, both sets of estimates deducted money-laundering costs from gross revenues. This implicitly assumes that the costs of money and asset laundering are foreign value added and/or that money laundering is not part of the illegal drug industry. Either way, this assumption creates a downward bias in the estimates, particularly because there is no doubt that many Colombians participate in and profit from asset laundering activities (as will be shown in chapter 7).

If one is interested in studying the impact of the illegal drug industry on a country, one should not look only at domestic illegal value added but also at the amount of resources that the industry can command at one particular moment in time. The point is simply that estimates of illegal revenues relevant to the Colombian economy should include the industry's value added that ends in Colombians' hands in and out of the country. It may be argued that domestic value added is likely to have a greater impact on Colombia than value added accruing to Colombians outside the country. In this case, it would be necessary to determine a proportion of the foreign value added that could be transferred to the country and its impact on the Colombian economy.

A further point should be made about the income generated by drug industry funds already laundered. Some estimates show higher illicit income in the early 1980s than in the 1990s due to the approximate 75 percent decline in international cocaine prices. However, by the 1990s the illegal drug industry had accumulated large investments that were producing income. These revenues are also part of the industry's economic base and



influence its ability to affect the Colombian economy. Unfortunately, it is very difficult (if not impossible) to assess this share of the illicit industry's income, and no estimates are available.

To evaluate the estimates of the size of the illegal industry's revenues, it is necessary to compare the undervaluation arising from not considering the income generated by heroin, cocaine, and other drugs marketed outside Colombia that can be transferred to the country, which is likely to be "large," against the possibly underestimated costs paid by Colombian traffickers in the smuggling stage. On balance, it is likely that the studies of the size of the illicit drug industry underestimated the relevant Colombian drug income, which could have been somewhere around \$4 billion a year, without including income from laundered assets.

It is interesting to point out that the size estimates indicate a declining weight of the illegal drug industry on both exports and gross national product (GNP). In the early and mid-1980s, GNP was about \$36 billion, measured in current dollars. During the 1990s, it grew substantially, to \$68.6 billion in 1994 and \$96.3 billion in 1997.<sup>11</sup> According to these estimates, the value added generated by the illegal drug industry in the early 1980s was in the range of 7 to 10 percent of GNP, but by the late 1990s it dropped to 3 to 4 percent.

A similar conclusion is obtained when illicit drug revenues are compared with total exports of goods and services. In the early 1980s, they fluctuated between \$4 and \$5 billion. Beginning in 1987, total exports increased and reached \$12.1 billion in 1994 and \$15.9 billion in 1997. There is no question that in the early 1980s illegal drug exports were a much higher proportion of total exports than in the late 1990s.

Employment is another important drug industry size variable. As would be expected, employment estimations are also subject to large error margins. In spite of measurement difficulties arising from the natural reluctance of both employers and employees to give information, the seasonality of many drug jobs, and the multiproduct nature of many small family farms where family members work on several crops, S. Uribe (1997) estimated that in 1995 coca and poppy production generated the equivalent of 40,000 full time jobs.

<sup>11</sup>All data on GNP, total exports of goods and services, population, and economically active population for Bolivia, Colombia, and Peru used in this chapter are from the Inter-American Development Bank online database. All data are in current dollars. The bank's export data come originally from the International Monetary Fund.



Zabludoff (1997), using U.S. intelligence data, estimated that the managerial core of the 10 largest Colombian "cartels" was made up of about 500 people. These also employed 5,000 people, counting laboratory employees, transport personnel, money launderers, and order and contract enforcers. One should add to these 1,000 specialized free-lancers: pilots, chemists, lawyers, assassins for hire (*sicarios*), financial advisers, and the like. Some of these are permanently employed, but many work only part time for the illegal industry. The drug industry also used the services of about 10,000 technical and nonqualified personnel.<sup>12</sup> These were also employed on a permanent and part-time basis, and included guards and bodyguards, "mules," radio operators, messengers, heavy equipment operators, surveillance teams, and "smurfs." (Smurfs are individuals used to break down a large quantity of cash to be deposited into several smaller deposits that can be made in various financial institutions, thereby avoiding the requirement that the financial institution report large deposits to the authorities. For example, the United States requires banks to file reports on every cash deposit in excess of \$10,000. Smurfs take a large amount and make several deposits of less than \$10,000 in accounts in several institutions, avoiding the reporting requirement.) Moreover, an indeterminate number of people serve in airlines, airplane and communications equipment maintenance, banks and other financial institutions, chemical input suppliers, and the like.

There is no question that there is a complex job structure related to the illegal drug industry. The industry, however, was not a large employer in the country until the mid-1990s. The total population in 1995 was 35.8 million, and the economically active population was more than 23.7 million. These figures show that the illegal drug industry's employment in Colombia was not important at a global level, although it was extremely important in coca- and poppy-growing regions. The changes that have taken place since 1999 might have changed this. The explosion in coca plantings increased the importance of the illegal industry for rural employment but, as noted in chapter 4, the increased involvement of guerrilla and paramilitary organizations in the illegal trade and the intertwining of illegal drugs and armed conflict have prevented rigorous research on these topics. However, it is safe to state that illegal crop employment in Putumayo, Caguán, Guaviare, and a few other regions could

<sup>12</sup>The roundness of these figures, all thousands that are multiples of 5 and 10, makes me question whether they are anything more than educated guesses.



have accounted for 200,000 jobs by 2001. These figures are consistent with reports that total coca cultivation exceeds 130,000 hectares.

### The Bolivian Estimates

It is not surprising that the estimates of the size of the illegal drug industry in Bolivia also fluctuate over a wide range.<sup>13</sup> Most these estimates are based on assumptions that, according to the estimators, reflect the country's peculiar involvement in the illegal trade. The estimates assume that all illicit coca is converted into coca paste in Bolivia and that the value added generated in this process is Bolivian. They also assume that non-Bolivians buy and export part of the paste output and that the rest is processed into cocaine base in Bolivia. Part of the value added of this process is Bolivian, and part is attributed to foreigners. Part of the cocaine base is exported, and part is processed into cocaine, and again the value added is divided among Bolivians and foreigners.<sup>14</sup> Most estimates assume that the foreigners involved are Colombian.

These studies also make another peculiar assumption: that a significant proportion of the Bolivian value added and profits obtained in cocaine base and cocaine manufacturing are invested abroad and never get back into the national economy. This assumption is based on the beliefs that part of this value added ends up in foreign hands and that the absorptive capacity of the Bolivian economy is very small—that is to say that there are not enough domestic investment opportunities for all the capital accumulated by Bolivian traffickers.

Bolivia is a small, poor economy that historically had been subject to large international price fluctuations of its main exports. Its governments did not manage these external shocks well and during the 1970s borrowed heavily in international markets. During the early 1980s, a combination of very high international interest rates, a collapse of international tin prices, and a free-spending populist government produced hyperinflation and a deep recession.

<sup>13</sup>J. Painter (1994, chap. 3) summarized the available estimates a few years back. See also Doria-Medina (1986). More recent estimates are found in Ayala (1999), Joel (1999), and Steiner (1997).

<sup>14</sup>All these estimates have a key weakness because there is no solid basis to figure out the proportions of Bolivian and foreign controlled processes. These amount to "educated guesses."

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The country's GNP in the early 1980s fluctuated between \$4 and \$7 billion, depending on international prices for its exports and the availability of borrowed funds. In 1985, a new government introduced drastic adjustment reforms. The 1986 GNP was \$4.5 billion. The late 1980s was a period of slow growth, with GNP reaching \$4.8 billion by 1990. Afterward, the economy grew steadily, with GNP reaching \$7.8 billion in 1997, a level only slightly higher than the \$7.2 billion of 1984!

Official exports of goods and services were \$1.030 million in 1980 and declined steadily to \$650 million in 1987. From then on, they recovered slowly, reaching \$1.181 million in 1994, the first year that they exceeded the 1980 level! In 1997, they reached \$1.362 million.

The longest series of Bolivian drug exports covers the 1980–93 period and was produced by Steiner (1997, 43). Shorter series, none exceeding 8 years, are found in J. Painter (1994), Alvarez (1993), De Franco and Godoy (1992), and Antezana (1995). All series showed a sharp decline in value added and exports during the mid-1980s.

Steiner's (1997) figures were total export estimates independent of the amount actually repatriated to Bolivia, although they included a 20 percent laundering deduction, which implied that there were no Bolivians involved in money laundering. These also assume that exporters get only the free-on-board price, that is, that they did not benefit from the highly profitable international smuggling and marketing operations. These figures during the early 1980s oscillated between \$700 and \$800 million, a level of the same order of magnitude as official exports. From 1985 to 1993, they were at the level of \$300 to \$400 million.

The declining trend was due to lower coca and cocaine prices and not to a decline in the coca cultivated area,<sup>15</sup> and it has been maintained even as productivity in the coca farms has increased (Ayala 1999). All coca hectareage estimates showed a substantial increase from 1985 to 1993, from about 15,000 to 50,000 hectares. Coca acreage remained stable through 1997 and declined sharply after 1998, when the newly elected Hugo Banzer government implemented its forced eradication plan.

Joel (1999) presented relatively low figures. He estimated direct Bolivian value added in the illegal industry in the range between \$152 and \$204 million. His estimates of the value added that actually remained in

<sup>15</sup>E.g., see Antezana's (1995) study. This author is the economist who followed the illicit industry at the U.S. Agency for International Development office in La Paz.



the country were only between \$115 and \$133 million. All these estimates assumed that all Bolivian exports were made free on board. Ayala's (1999) estimates were in the range of \$200 to \$300 million, as were Antezana's (1995).

Joel also estimated direct plus indirect value added, which included the industry's multiplier effects on the rest of the economy. These were in a range between \$227 and \$263 million, or between 3.8 and 4.4 percent of GNP. Joel also considered a few scenarios in which Bolivians controlled a proportion of their exports and sold them on American and European markets. Assuming that a quarter of Bolivian drug exports are handled by Bolivians, and that one half of the profits from international marketing are repatriated, Joel found that the direct contribution of the industry increased to somewhere between 4 and 7 percent of GNP.

The same study estimated gross coca paste, cocaine base, and cocaine exports at \$156 to \$242 million. Of these, between \$73 and \$109 million actually entered the country. These figures were only between 8.8 and 13.2 percent of official export figures.

Summarizing the evidence, there is no doubt that in the early 1980s the illegal drug industry generated an important share of GNP, somewhere in the range of 10 to 15 percent, and higher if Bolivians themselves did any drug exporting. At that time, the illegal industry's importance as a foreign exchange generator was much greater because illegal exports were similar in magnitude to official ones.

The sharp coca price fall of the mid- and late 1980s combined with the renewed growth of the Bolivian economy during the 1990s resulted in a notable decline in the magnitude of the illegal industry relative to the rest of the economy. The illegal industry was more important as a foreign exchange source than as an income generator, and in the 1990s it accounted for export revenue levels of 15 to 25 percent of total official exports. The issue of export revenue repatriation has been important in Bolivia, and there is a consensus among researchers that a significant proportion of exports' revenues remained abroad. Unfortunately, there is no solid evidence to determine the correct proportion, and all researchers use rules of thumb.

Employment in illegal coca and cocaine in Bolivia has been more important than in other Andean countries. According to Joel (1999), the illicit industry generated 71,300 direct jobs in Chapare and estimated total direct and indirect employment of between 107,000 and 135,000, or the equivalent of between 5 and 6.4 percent of the licit employment in the country.

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Earlier employment estimates placed direct coca-cocaine employment at between 120,000 and 300,000. Most of these jobs were agricultural. These figures imply that the coca-cocaine industry employed between 6.7 and 13.5 percent of the economically active population. Ayala's (1999) figures were somewhat higher than Joel's. Independent of the accuracy of these estimates, there is no question that Bolivian employment depended heavily on the illicit industry and that its reduction through the implementation of Plan Dignidad has had grave social and economic implications.

It is quite clear that assumptions about the proportion of illicit value added and profits that remain in the country are key determinants of the effects of the illegal industry in Bolivia. If the large majority of the illicit income that remained in the country was generated by coca growing and was distributed among poor peasants, the industry had very positive effects on the country and did not cause significant changes in its power structure. If this was the case, most illegal income was spent on consumer goods, rural home improvements, and education, and it did not alter the property structure of manufacturing, real estate, and other urban sectors. If Bolivians are involved in international cocaine trafficking, a few individuals will make large fortunes that will allow them to gain great clout on the formal economy and the country's government. In this case, the effects of the illicit activity will prove substantially more complex.

The successful eradication program of the Banzer administration has dramatically changed the structure of the illegal drug industry in Bolivia. Peasant income and employment in coca declined sharply. However, because there is no solid evidence about the extent of the Bolivians' participation in drug manufacturing and trafficking, it is not possible to determine the current impact of the illegal industry on the country's economy, although it is possible to assert that it is certainly significantly lower than in the past.

### The Peruvian Estimates

As was noted above, until recently Peru has been the main world coca producer and a main exporter of coca paste and cocaine base to Colombia. Traditional coca plantings were concentrated in a few Sierra locations. During the 1970s and 1980s, coca plantings expanded significantly and spread to about ten departments. The main concentration of illegal coca was found in the Upper Huallaga River Valley. Morales (1989),



after doing extensive fieldwork in five peasant communities, estimated that in 1985 there were 100,000 hectares of coca. CUÁNTO S.A. (1993, 20) surveyed all available data and produced a series from 1980 to 1992.

This series showed coca hectareage of about 128,000 for 1980 to 1983, about 150,000 hectares for the following 6 years, a sharp increase to 207,000 hectares in 1990, and further increases to 257,000 hectares in 1992. It also estimated increases in coca productivity from 1985 on due to increased use of fertilizer, herbicides, and better agriculture techniques. CUÁNTO S.A.'s methodology probably overestimated the area cultivated. It first estimated the total population of the coca-growing regions, then estimated the population needed to produce the legal crops reported in those regions, assuming that everyone who is not employed in legal crops is engaged in coca production. In other words, it assumed that land supply is infinitely elastic and that the only constraint on production is a labor shortage.

Alvarez and Associates<sup>16</sup> (1996), on the basis of a detailed revision and evaluation of available estimates, and particularly on fieldwork, produced what are likely to be more reliable estimates. For 1993, they figured coca cultivation in the range of 145,000 to 175,000 hectares.

Since the early 1990s, there had been several police and journalistic reports about the presence of poppy fields in Peru. Some of these reports also suggested that poppy plantings were not very successful. Alvarez and Associates simply could not find data, nor could they safely visit suspected poppy regions. Whatever poppy fields existed at the time, therefore, could not be studied.

As was the case in the other coca-growing countries, coca hectareage grew substantially from 1980 on. However, the relative weight of the coca and coca products industries in the Peruvian economy has declined drastically, due to a combination of factors. On the one hand, coca and coca products' prices declined sharply. On the other hand, during the late 1980s during the Alan García presidency, Peru suffered a depression cum hyperinflation. During the 1990s, the Peruvian economy recuperated and grew at relatively high rates. MACROCONSULT S.A. (1990) estimated that the GNP contribution of the coca-cocaine industry in the early 1980s could have been as high as 11 percent. Alvarez and Associates (1996) estimated, due to the changes mentioned, that coca and its products

<sup>16</sup>That included the authors of CUÁNTO S.A. study.



accounted for approximately 8 percent of the country's GNP in 1988, and fell to less than 2 percent in 1995.<sup>17</sup>

As was mentioned above, a combination of factors contributed to a sharp coca price decline during the mid- and late 1990s. As it happened, in the other coca growing countries, coca growers have evolved into producers of coca paste and cocaine base, and on occasion even into cocaine refiners. Another important change occurred in the geographical distribution of coca plantings, which are present in an increasing number of departments, a development that makes any eradication strategy more and more difficult.

The contribution of the illegal drug industry to the balance of payments was, at least during some periods, a lot more important than its contribution to GNP. Steiner (1997, 43) produced a series of total gross drug revenues for Peru from 1980 to 1995. In the early 1980s, these revenues increased while official total exports of goods and services declined. In 1980, illegal revenues were 16 percent of total exports registered in the balance of payments. Their share increased steadily, and in 1985 and 1986 they exceeded 26 percent. From then on, total official exports recuperated and illegal revenues declined, so that in 1995 illegal revenues were only 6 percent of legal exports.

It was not surprising that coca-growing families enjoyed higher incomes than other peasants did. Alvarez and Associates (1996) placed coca peasants' family per capita income at about \$1,500, a level close to the national average.

CUÁNTO S.A. (1993, 22) estimated direct rural employment for 1980 to 1992. Its series started at 123,300 in 1980 and increased continuously to a hefty 293,800 in 1990. It assumed that every family has 1.9 members employed in coca-cocaine, resulting in a series from 64,900 families in 1980 to 154,600 in 1992. Alvarez and Associates (1996) estimated 1993 direct rural employment in the illicit industry at between 150,000 and 174,000 jobs, or about 7 percent of the rural economically active population or 2 percent of the countries' economically active population.

Backward linkages of the illegal industry with the rest of the Peruvian economy are not very large but are significant. Alvarez and Associates

<sup>17</sup>These figures are consistent with those used by Steiner (1997, 43). Alvarez and Cervantes (1996) and Alvarez (1998) summarized the results of Alvarez and Associates (1996). However, Alvarez (1998) gave a figure of less than 1 percent for the 1995 share of Peruvian GNP generated by the illegal industry.



(1996) estimated them at between 13 and 18 percent of the illicit industry's intermediate goods' demand.

To conclude, in the early and mid-1980s, the illicit industry in Peru was an important source of foreign exchange and income, and there is no doubt that it helped the country maintain some of its populist policies of the time. However, the weight of the illegal industry on the Peruvian economy dropped substantially, and similar to Colombia's, Peru's economy on the whole could do well without drugs. In the mid-1990s, the illegal industry still represented an important source of rural employment in all coca-growing regions that attracted migrants.

As in Bolivia, coca hectareage declined sharply in the late 1990s. There is no doubt that the weight of the illegal industry on the Peruvian economy also fell sharply, but as in Bolivia, little is known today about the magnitude of the decline.

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