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Ecuador- Binding Constraints to Growth

by

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I. Introduction

Ecuador has been an average growth performer within Latin America, with a slightly higher growth average than the region over the last 50 years, attributable to the discovery of vast oil reserves during the 1970s. Like most countries in the region, it has failed to ensure sustainable and high growth rates that would help making strong steps towards poverty reduction. Meanwhile, other regions in the world have been more successful in achieving sustained growth. No unique and magical solution exists for the task, and many diverse hypotheses can be made to explain the lackluster growth results. In recent years, Hausmann, Rodrik and Velasco (HRV, 2005) have proposed a Growth Development Methodology (GDM) to assess the underlying constraints to economic growth, through a systematic examination of the potential reasons behind low growth under a decision-tree approach. The idea is to assess which are the binding constraints to growth: is it because of high external or domestic financing costs, is it because domestic investment bear low returns, either as a result of low social returns or because of appropriability concerns reflecting micro or macroeconomic weaknesses or market failures?

This paper follows the GDM approach, with the aim of identifying the binding constraints to Ecuadorian growth, defined as those constraints whose removal would have the largest payoff in terms of growth. As per the strategy, different potential reasons constraining growth are assessed, in light of the stylized facts characterizing the country's economic performance.

The paper is organized as follows. Section II presents the stylized facts for Ecuador real growth, including the medium-term trends, exports and investment developments, macroeconomics volatility and public policies. Section III summarizes the decision-tree approach guiding the assessment of Ecuador binding constraints to growth. Section IV discusses whether financing costs, both external and domestic, can be considered a critical obstacle to growth. Section V focuses on the role of low social returns arising from natural resources, infrastructure or human capital limitations. Section VI discusses the potential for low appropriability of private returns in Ecuador, which could reflect micro or macro risks related to government failures, and market failures in terms of information or coordination externalities. Section VII provides some conclusions and policy recommendations.

II. Ecuador's real growth: stylized facts

With a GDP per capita estimated at US$3,173 for 2007, Ecuador is an intermediate-income level country within Latin America. While oil is the most important product of the country, its GDP share, close to 20%, makes of Ecuador a less hydrocarbon-dependent country than other countries in the region, such as Venezuela and Trinidad and Tobago. Despite a relatively lower dependence from its commodity, the Ecuadorian economy shares many of the characteristics that tend to affect natural resources rich countries, including a

large growth volatility, public policies with little consistency over time, periods for which the national currency appreciation has constrained exports on non-oil products, and several instances of rent-seeking behavior based on the abundant oil-related revenues during times of high oil prices.

The State controls about half of oil production, providing large revenues. In addition, oil production and exploitation is subject to diverse taxes fuelling fiscal revenues. Thus, the high international oil prices in recent years have allowed fiscal accounts to remain in balance or in surplus. However, this does not imply that Ecuador has solved its recurrent fiscal weaknesses. On the contrary, the unusually high oil prices could mask a markedly procyclical public expenditure. Such procyclicality—one of the main factors fostering the volatility of economic growth—reflects the lack of social consensus to ensure sustainable fiscal policies over time, and the absence of clear incentives or consensus to impede the tendency of governments to exhaust State revenues during periods of high oil prices.

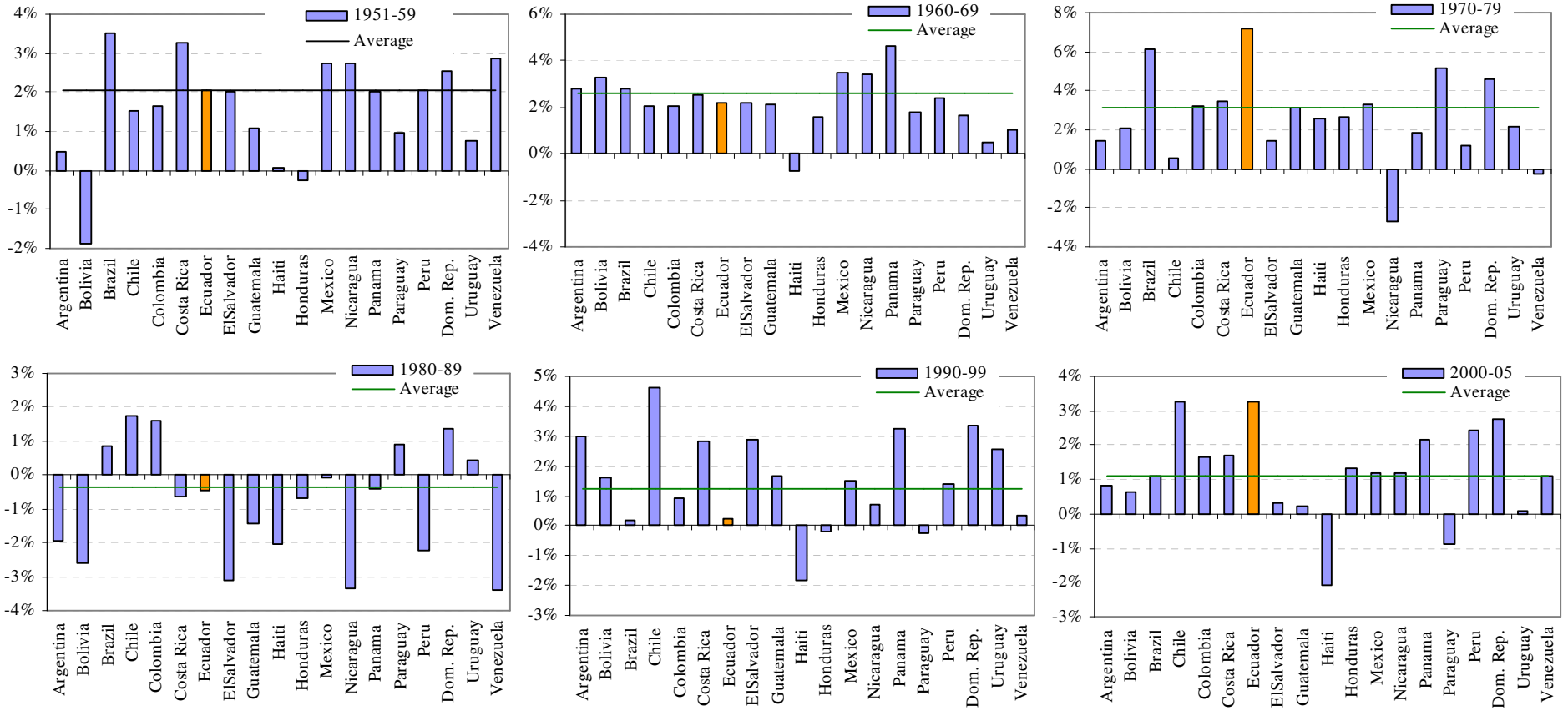
This section offers an overview of growth and external sector performance trends in Ecuador, their stylized facts and structural breaks. It reviews the trends for the real sector and per capita growth, the relationship between growth and exports, private and public investment trends, and macroeconomic volatility.

II.1 An intermediate growth performer within Latin America

During 1951-2005, Ecuador posted an average 4.9% real growth rate, relatively high for Latin American standards during that period, though lower than for best performers such as the Dominican Republic, Costa Rica or more recently Chile. This relatively favorable performance is largely attributable to the oil boom, which boosted Ecuador's average annual growth to 10.4% in the 1970s—the region's highest. Apart from that decade, Ecuador posted growth rates very close to the region's average, excepting for a very weak performance during the 1990s, mainly due to the 1999 financial crisis.

Figure 1. Latin America. Real GDP Per Capita Growth

(Per decade, 1951-2006)

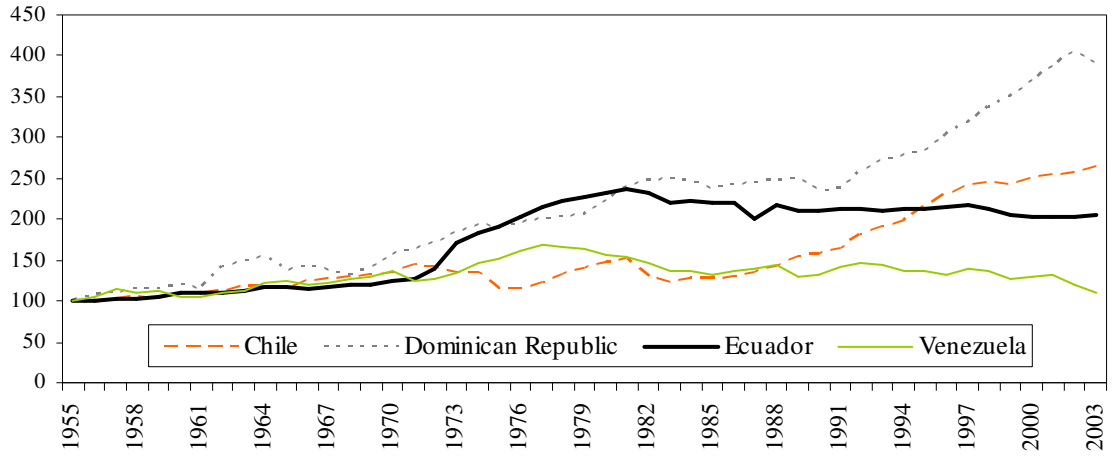


Source: ECLAC

Meanwhile, Ecuador's growth over 2000-05 was again one of the highest in the region, especially reflecting the boost to oil production in 2004, once the new heavy oil pipeline was in place. Ecuador's per capita growth compares in largely similar terms to the performance of other Latin American economies, with a 2.4% average per capita growth over 1951-2005. Annex A details the different phases of economic growth in Ecuador. Overall, oil has been the main driver of economic booms. These growth numbers place Ecuador as an intermediate performer within Latin America. After more than doubling as a result of the 1970s oil boom, Ecuador per capita GDP in constant prices has subsequently been roughly constant, while other Latin American economies, such as Chile or the Dominican Republic, witnessed sustained increases.

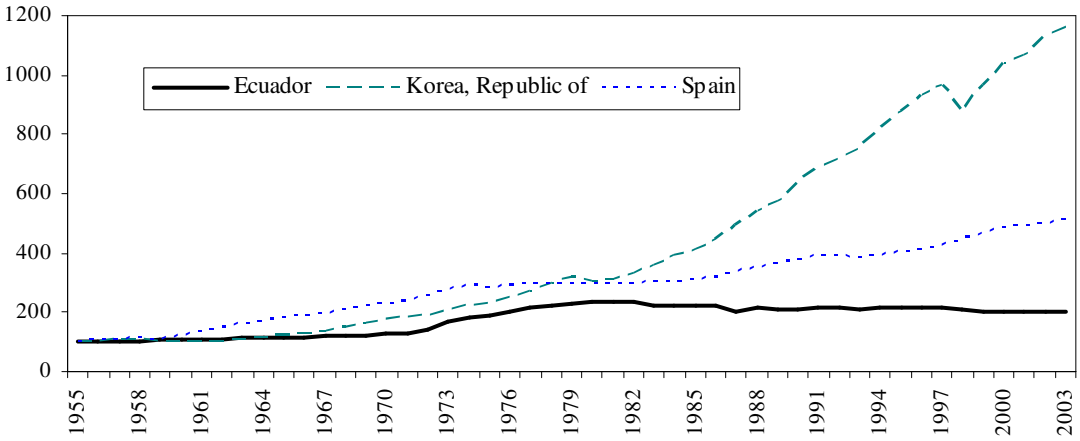
Ecuador has performed poorly in total factor productivity (TFP) and competitiveness indicators; witch is closely related to its lackluster growth performance. An analysis on these indicators can be found in Annex B.

Figure 2. Per capita GDP for Selected Latin American Countries
(In constant prices, 1955=100)



Source: Center for International Comparisons of Production, Income and Prices, University of Pennsylvania

Figure 3. Per capita GDP for Selected Countries
(In constant prices, 1955=100)



Source: Center for International Comparisons of Production, Income and Prices, University of Pennsylvania

On the other hand, one has to bear in mind that Latin America's growth performance itself has been rather disappointing and below the world's

average—see De Gregorio and Lee (2003). As a result, Ecuador's growth performance has been rather poor in comparison to some of the best performing economies, such as Korea or Spain.

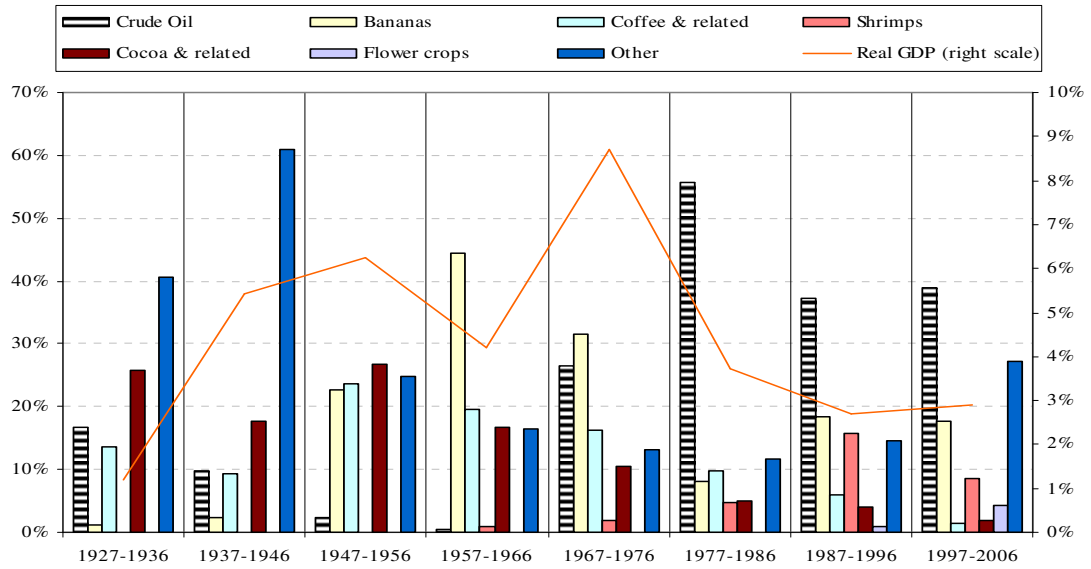
II.2 The external sector as a driver of economic growth

The role of export products as drivers of economic growth can be observed since 1927, thanks to the Central Bank data compilation since its inception. Over 1927-2006, Ecuador's real GDP growth, which averaged 4.4%, has been characterized by a significant volatility and a marked dependence on the fate of diverse primary export commodities over time.

In the early years of the 20th century, the Ecuadorian economy was largely based on agricultural products, particularly cocoa, coffee and related products, whose share on the economy has gradually declined since the mid of the century, despite some occasionally favorable times (in the late 1940s, mid 1950s, mid 1960s or mid 1970s).

From the late 1940s to the 1960s, the banana boom was critical to help modernize Ecuadorian economy (see Section VI.3). In 1954, Ecuador became the leader world banana exporter and banana export proceeds represented over half of the country's total exports in the mid-1960s. While declining as a result of the subsequent oil boom, banana still remains an important export product, accounting for around 18% of total exports in the last decade.

Figure 4. Product Export Shares & Real GDP Growth by Decades
(1927-2006)



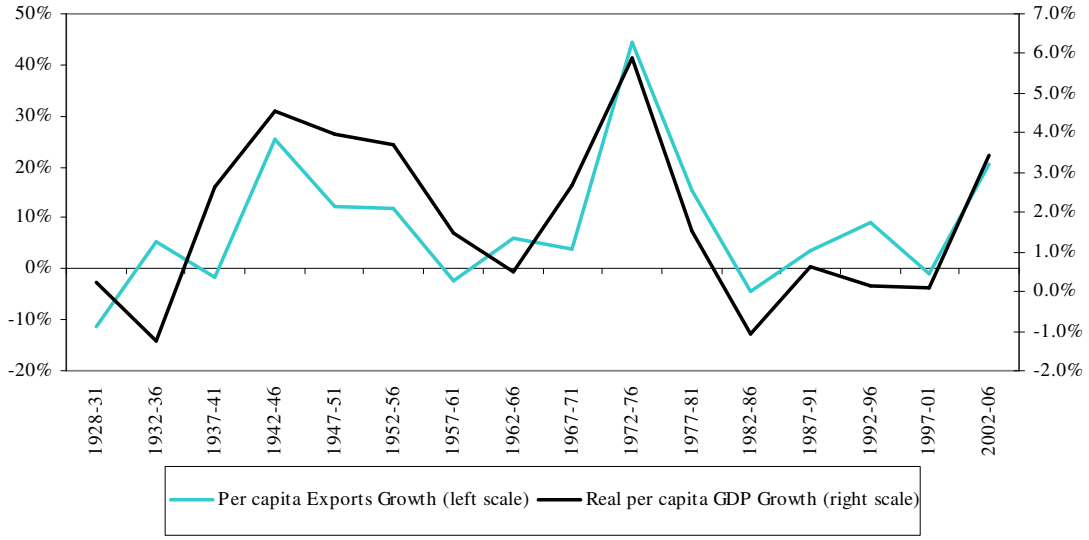
Source: Central Bank of Ecuador

Oil became a critical sector of the economy since the exploitation of important oil reserves in the early 1970s. The oil boom was extremely abrupt, with the export share of oil export proceeds jumping from less than 1% in 1971 to 66% five years later. Oil deeply modified the economy, prompting a urbanization process and the emergence of a middle-class, as well as giving the State a much larger economic role. Since the mid-1970s, oil export revenues have evolved in line with international oil prices and the country's ability to further develop its

reserves, but have never been lower than 19% of total exports.

More recently, a few commodities, such as shrimps and flowers, have also achieved a non-negligible share of the country's exports and boosted growth.

Figure 5. Real GDP and Exports Growth
(Per capita, 1928-2006)



Source: Central Bank of Ecuador

A salient feature of long-term growth trends is the significant correlation between exports and real growth trends, reflecting the high economic dependence on export-oriented primary commodities. Despite such large dependence of the country's growth from agricultural products, Ecuador industrial exports have witnessed a significant growth since 1990: industrial export proceeds have almost matched primary export revenues. The favorable export market for fish-based products and, more recently, vehicles mostly explains the growing trend of industrial over non-oil exports (see Annex C for additional details).

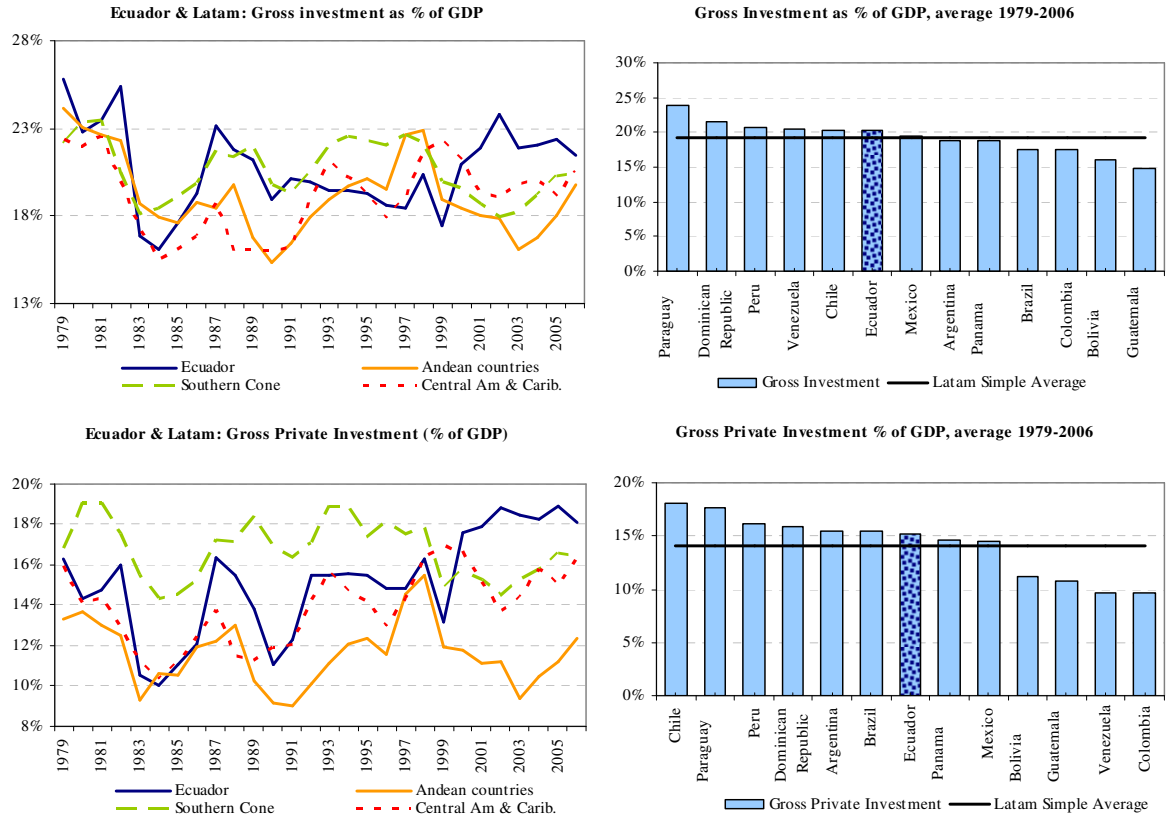
II.3 Investment, capital stock and savings

In recent years, the average investment rate in Ecuador has been relatively large as a percent of GDP on regional comparison. CEPAL (2006) points to high investment/GDP ratios for Ecuador in recent years (the highest out of 19 Latin American economies), while UTEPI (2007) refers to a 15% annual growth of gross domestic investment over 2000-04, a faster pace than for the region. The IMF figures on gross investment for 13 Latin American countries, including the largest ones, show that gross investment as percent of GDP has indeed been high in Ecuador in recent years: the corresponding rate reached 21.6% on average in 2000-06, compared to 18.5% for the other 12 countries.

However, this trend is mostly recent: Ecuador's investment rates over 1979-2006 have been only marginally larger than the regional average, as investment was comparatively low during the 1980s and the 1990s. The recent surge in investment has been driven by private investment, which added up to 18.3% of GDP during 2000-06, compared to 14.1% of GDP in 1979-1999. Although no detailed and reliable data are available regarding the sectoral composition of

investment, the larger private investment has probably been, at least partly, related to the building of the new heavy crude oil pipeline in the early 2000s.

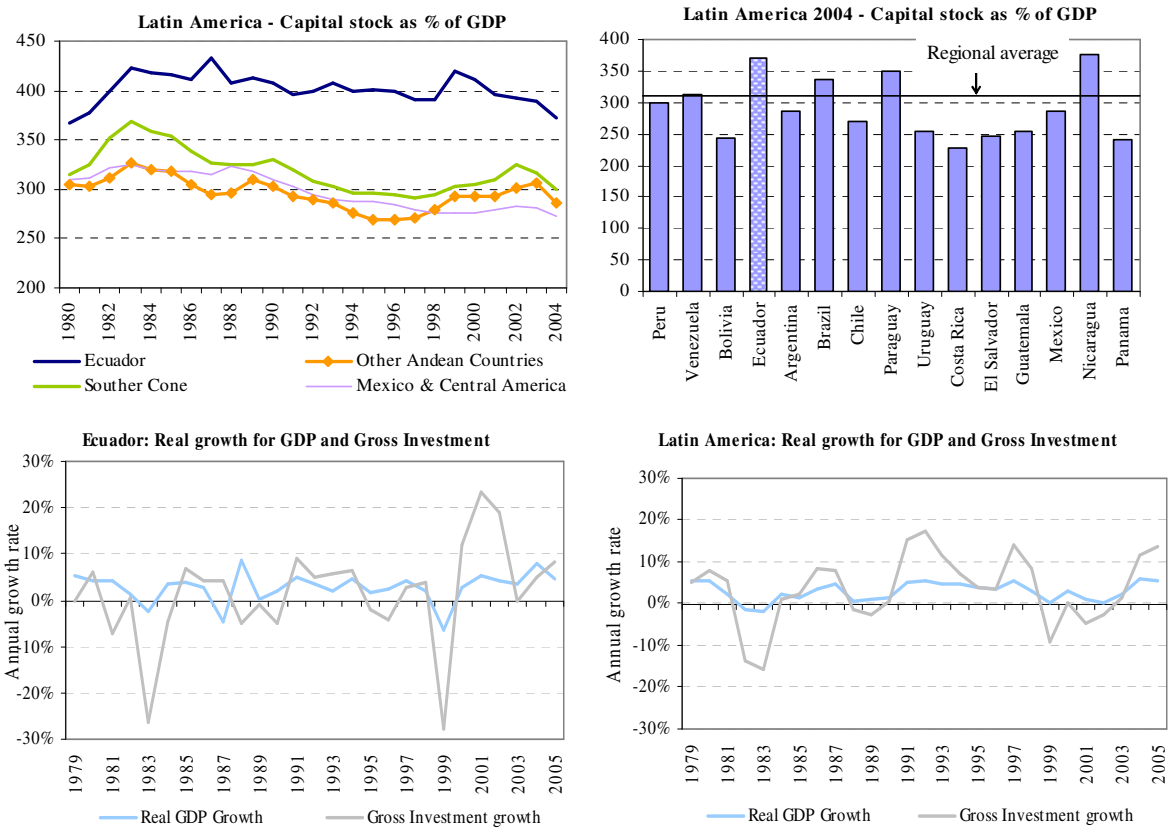
Figure 6. Ecuador and Latin America: Gross Investment



Source: IMF

Meanwhile, investment rates were relatively high during the 1960s and 1970s. According to De Gregorio and Lee (2003), Ecuador's average investment rate during 1965-95 (near 24% of GDP) was only lower than that in Guyana among a large subset of Latin American countries. Similarly, UTEPI (2007) estimates point to capital stock figures for Ecuador only lower to Nicaragua among 17 Latin American countries. Methodologically, UTEPI estimates use a permanent inventory scheme, where the initial (1980) capital stock is obtained by adding gross investments over 1965-79, before applying a formula for accumulating capital with a 4% assumed depreciation rate. The same methodology is used for all 17 countries. The results suggest that investment rates—used in the study to estimate the initial capital stock in 1980—were indeed large before such date. As a result, Ecuador's capital stock has since remained larger than for most countries in the region, with even a slightly faster build up rhythm than for other countries.

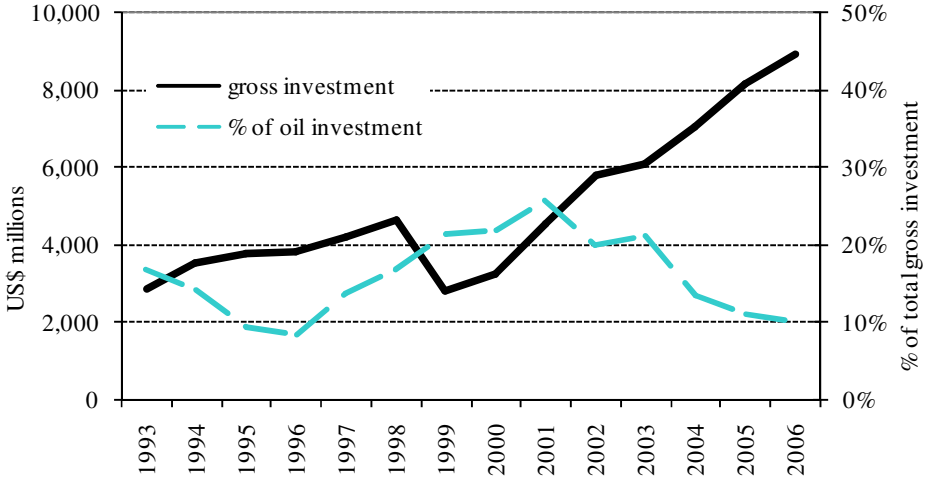
Figure 7. Ecuador and Latin America: Capital Stock and Investment



Source: ECLAC

Although the high levels of Ecuadorian capital stock may be related to the oil sector weight, both because of the large oil investments over the 1970s and early 1980s and because of those related to the heavy oil pipeline in the early 20002, the available data on oil and non-oil investment—building on the data provided by Espinasa (2007)—suggests that only some 13% of gross investment was related to oil during 1993—2006, excepting for the years when the heavy oil pipeline was built (2001-2003). Thus, at least part of the relatively high capital stock levels could reflect some over-investment in low-productivity sectors, as a result of specific protection.

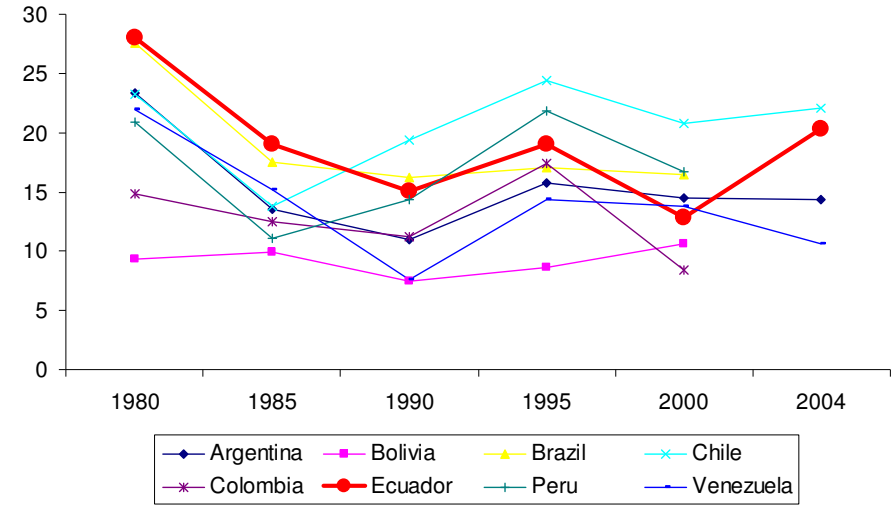
Figure 8. Ecuador: Oil Investment and Total Investment



Source: Central Bank national accounts and Espinasa (2005).

Penn University indicators (Heston, Summers and Aten, 2007) confirm that investment levels in Ecuador are relatively high on a regional basis. A review of the investment share of real per capita GDP for 1980, 1985, 1990, 1995 and 2004 shows that Ecuador, among selected Latin American economies, ranked first in term of investment levels in 1980 and 1985, second in 2004, and third in 1990 and 1995. The year 2000, just after the large financial crisis, was the only exception where Ecuador's investment levels were lower than for most of the analyzed countries.

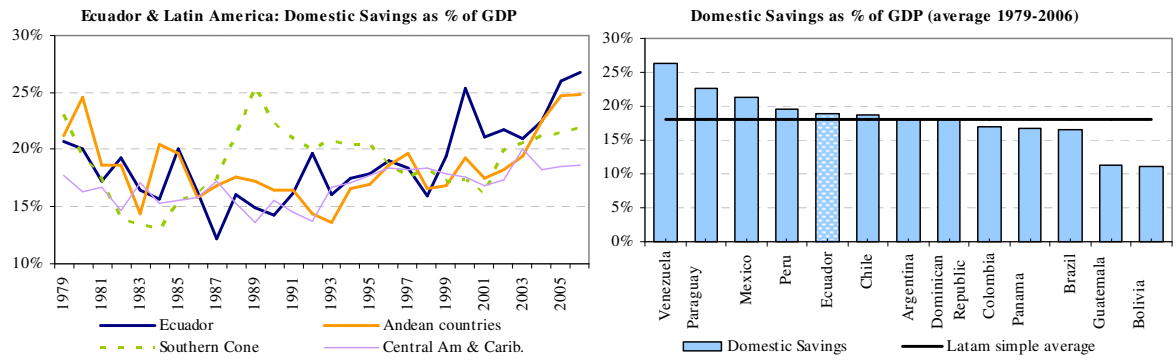
Figure 9. Ecuador: Investment Share of Real GDP per capita (percent)



Source: Heston, Summers and Aten (2007)

Gross investment trends for Ecuador show a larger volatility than for the region, largely reflecting and amplifying the larger swings for the overall economic activity. Meanwhile, Ecuador domestic savings, which used to be low by regional standards since the mid-1980s through the mid-1990s, have consistently grown since then and are now among the highest in the region. This trends reflects, in the late 1990s, the impact of the economic crisis on the private sector forcing it to increase private savings and, in the early 2000s, the favorable impact of oil prices that have allowed an improvement of public savings. Overall, Ecuador domestic savings have remained rather close to the Latin American average.

Figure 10. Ecuador and Latin America: Domestic Savings

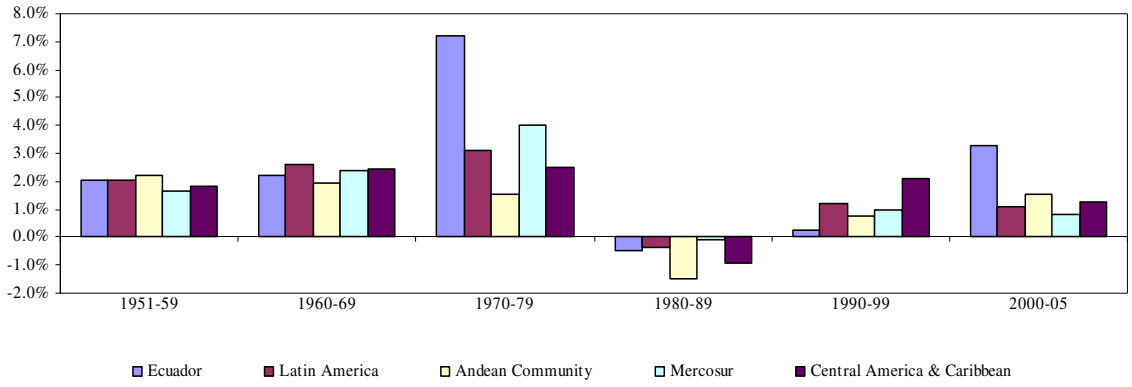


Source: IMF

II.4 Macroeconomic volatility

Even though many Latin American countries share the dependence on export commodities, Ecuador—partly because of its small open economy characteristics—appears to be an extreme case of such feature. While the very large correlation between real GDP and exports growth is for a large part explained by the 1970s oil boom, it remains for the different decades since 1950, both in comparison to regional areas and with individual countries. The only exception appears to be the late 1990s crisis years, when a substantial currency depreciation during the financial crisis helped exports to recover while the economy was still very weak.

Figure 11. Latin America: Real Per Capita GDP Growth by Region



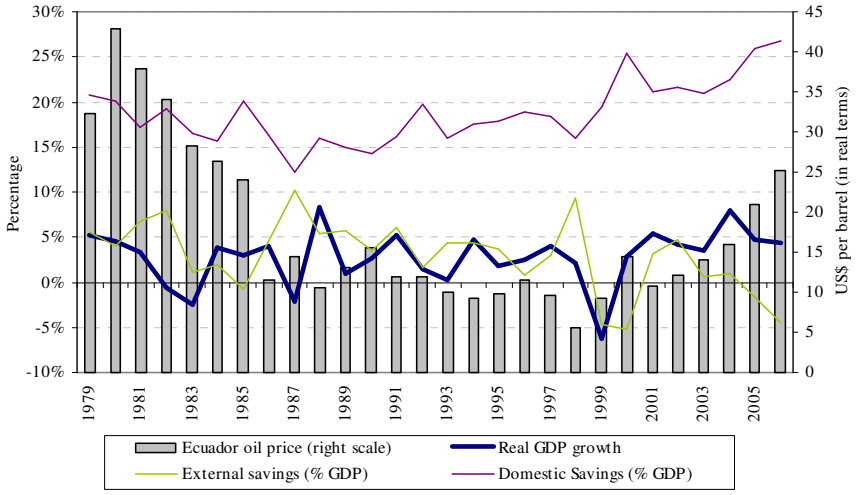
Source: ECLAC

The strong relationship between growth and export performance, combined with the tendency of Ecuadorian exports to be highly volatile explain the volatility of real growth itself. While volatility has characterized several Latin American economies, Ecuador's growth appears to be more volatile than the region's one and larger than most country groups with the exception of the last 5 years. This feature, again, is partly attributable to the oil sector performance. Oil-related activities tend to be more volatile than non-oil sectors (see Annex C). For example, during 1990-2006, the oil economy grew at an average 3.8% annual rate, much faster than the non-oil economy (2.7%), but the standard deviation of growth rates oil-related activities (11.0) was significantly higher than that for the non-oil economy (3.1).

Volatility, fiscal policy and dollarization

While growth volatility partly reflect export dependence and the swings of international commodity prices, the structure of fiscal policy has also contributed to transmit the volatility of export prices to economic growth, as public spending has been highly procyclical (See Section IV.2).

Figure 12. Ecuador: Oil Prices, Savings and Growth



Source: IMF, Central Bank of Ecuador, BLS

The Ecuadorian economy and its public finances are largely dependent on the oil sector. In addition, the country's growth is rather volatile and has suffered several occurrences of severe crisis, which combine fiscal and external challenges. In this context, the evolution of the external current account highlights a weakness of the country. The crisis episodes of the early 1980s and of the late 1990s were both characterized by a situation where fiscal troubles combined with (and were partly caused by) low international oil prices, while access to foreign financing was limited by the difficulties at the root of the crisis. In the 1980s, the unsustainable debt levels implied a reduced willingness from foreign creditors to expand their country exposure. In the late 1990s, the financial system weakness, the related bank freeze and the decision to default on sovereign debt were obviously not conducive to fresh foreign financing. The natural resource based economy, subject by nature to potential and hard to predict shocks, has thus paid a high price in terms of economic stability (and income distribution) because of its lack of access to liquidity in situations of emergency.

As Ecuador formally adopted the U.S. dollar as its official currency in 2000, a natural question would be whether Ecuador has seen its traditional volatility reduced with dollarization. Edwards and Magendzo (2001) analyze the relationship between dollarization, growth, inflation and volatility through a matching estimator technique developed in the training evaluation literature. They conclude that countries that use the currency of another country on which they have no influence tend to have a lower inflation and a slower growth, with the first result (on inflation) being more robust than the second one (on growth). In addition, they find that instability, as measured by GDP growth volatility, is not significantly different between countries with their own currency and those not having it.

In the case of Ecuador, the available information on 6 years under a dollarization regime is too short to provide convincing evidence regarding a structural change of the economic volatility. Moreover, the coincidence in time of the adoption of dollarization, the favorable international environment, and

the marked increase in oil prices makes it very difficult to disentangle the impact of higher oil prices and the economic recovery after the deep 1999 financial crisis from the influence of the dollarization regime.

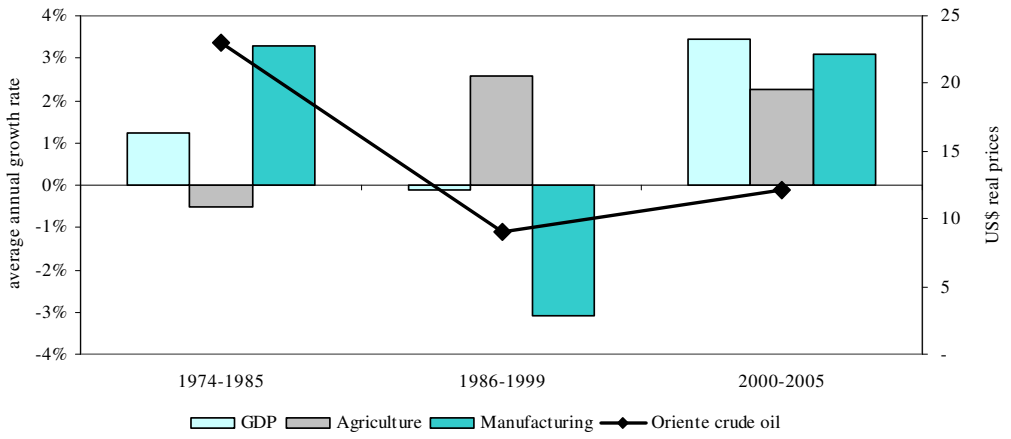
Is there a natural resource curse?

A look at the productive structure of the economy reveals that the primary sector and rent-producing industries remain critical for growth and GDP contributions (see Annex D). With the exception of telecommunications, services have seen their overall GDP share decline, especially after 1987, going from 27.5% in that year to 20.9% in 2005. A similar trend has been seen for the manufacturing industries. Until 1989 industries represented more than 15% of the Ecuadorian GDP, however, after 1990 this share decreased and reached 7.4% in 2005. Following a decline through the 1980s, the GDP share of agriculture and fishing has recovered since, representing, on average, 19.6% of the GDP from 2000 to 2005. Meanwhile, the weight of oil and mining has increased since the oil boom, going from 3.2% in 1972 to 6.9% in 2005.

Evaluating whether Ecuador has suffered from the typical Dutch disease arising from its natural resource wealth—whereby the increasing relative prices of non-tradable goods compared to tradable ones reduces the competitiveness and growth for the non-oil economy—is uneasy. Jácome (1989) notes that during 1972-80, when the oil became a key component of the economy, Ecuador did not suffer from deindustrialization, as would have been the case under a classical Dutch disease. Tariff protection and the large subsidies for the industrial sector helped manufacturing industries to grow faster than the rest of the economy (though such growth was not sustained over time—see Box 3 in section VI.3). Jácome concludes that, while manufacturing industry was not directly affected by oil exports, agriculture was indeed hurt, suggesting some Dutch disease impact on the competitiveness of non-oil sectors.

In fact, during 1974-85, when Ecuadorian oil prices reached their historical peak in real terms, the manufacturing industry grew at its fastest pace while agricultural sectors declined. Over 1986-99, when oil prices were rather low and the economy stagnant, the picture was reversed, as agriculture grew and the manufacturing industry fell. Finally, since 2000, with oil prices recovering in real terms, both industry and agricultural growth were close to that of the overall economy.

Figure 13. Ecuador: Manufacturing, Agriculture and Oil prices



Source: ECLAC, Petroecuador, BLS

On the other hand, a report from the World Bank (2004) uses the Chenery and Syrquin (1989) methodology to assess Dutch Disease through an index measuring the shortfall in the share of tradable goods in the non-oil economy relative to international standard norms. The results point to a strengthening of the non-oil tradable sectors over 1993 – 1999, whereas the situation is reversed during 1999 – 2003. According to this study, construction and services have experienced a strengthening by comparison with some benchmark levels, suggesting that the Ecuadorian economy might be suffering from some Dutch disease.

The abundance of natural resources can become a curse. Sala-i-Martin et al. (2006) document how in Nigeria, a country richer than Ecuador in oil reserves, corruption and institutional weakness related to the presence of significant oil revenues have strongly constrained its growth. The availability of large non-tax fiscal revenues arising from an enclave-style sector such as oil can lead to a State subject to capture by special interests, as it controls significant revenues that can be larger than the taxes paid by a large majority of the population. It also implies challenges to ensure accountability on public spending financed by rent-related revenues. These facts emphasize the risks of vested interests that may potentially influence public decisions.

III. Constraints to Growth and the HRV Decision-Tree

The previous chapter highlighted Ecuador's deceiving growth performance, despite some occasional booms related to the development of export-oriented commodities. What are the main causes behind these lackluster growth results? Based on the GDM decision-tree approach proposed by HRV, we examine in the following chapters the potential reasons behind the low growth: are high external or domestic financing costs to blame; is it because domestic investment bear low returns, either as a result of low social returns or because of appropriability concerns reflecting micro or macroeconomic weaknesses or market failures?

The HRV decision-tree analysis in the next chapters is based on comparisons between Ecuador and its main competitors, geographic neighbors, and countries with similar PPP-adjusted GDP per capita.

We make use of international databases for regional comparison, including the World Development Indicators Database; Transparency International; World Bank data, including the Investment Climate Private Enterprise Survey, kindly provided for this study by the IDB; the Doing Business survey; the Global Competitiveness Report; UNDP data; the Heritage Foundation data; UNIDO and the Ecuadorian Industry Ministry data; and the System of Social Indicators, SIISE. In addition, we extract valuable information from a few data sources: *Indicador* database, the World Bank's Productivity and Investment Climate Private Enterprise Survey, "*Habitus*" micro enterprises database, the Tax Administration and trade databases. Annexes E, F and G provide an overview of the databases and survey results.

A commonly held view in Ecuador is that the public policy decision-making process is unduly influenced by vested interests entrenched in political parties, the judiciary, and several public institutions. From that viewpoint, special interests, rather than a public service perspective, could sometimes drive government decisions, thus potentially affecting the country's growth opportunities. Thus, we have tried to assess, under some of the tree branches, the potential role of vested interest over public decisions, which may lead to inefficient public investment priorities and an unfair environment for market competition.

To guide the reader in anticipation of the next chapters, the proposed decision-tree includes color-based symbols:

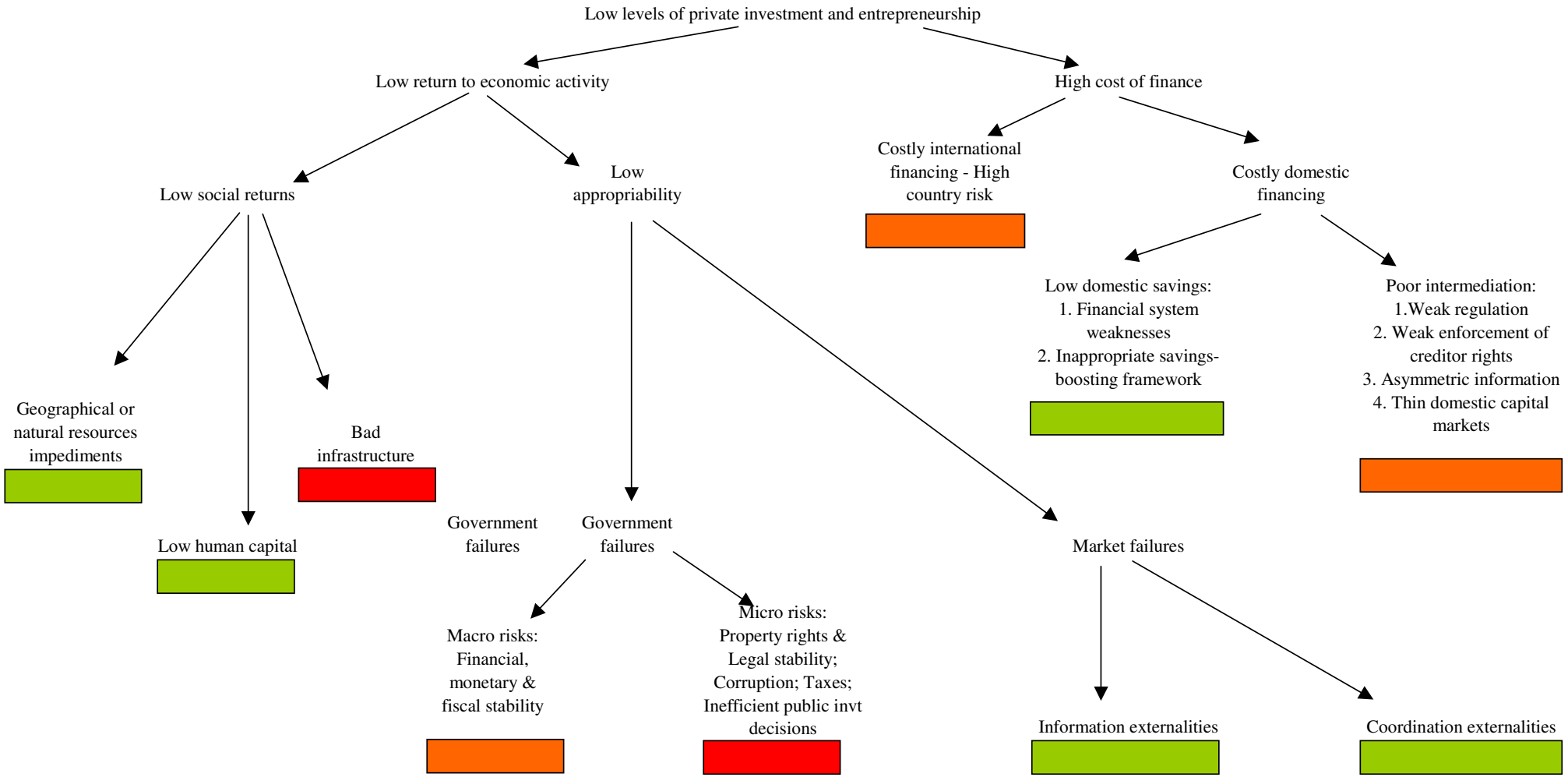
The green ones reflect those individual branches that we believe, based on available data, do not constitute key binding constraints for growth, although that does not mean the absence of weaknesses in those areas.

The orange branches (on macro stability and financing costs) represents our impression that, while the branches may not currently represent a binding constraint to growth in the short-run, they indeed carry enough weight for medium-term growth prospects to represent a significant in view of existing risks over the sustainability of public policies or a reversal of the favorable international environment.

The red branches (micro risks and infrastructure) are constraints that we see as those whose removal would have the largest payoff in terms of growth.

We present in the following chapters a detailed analysis of the different branches.

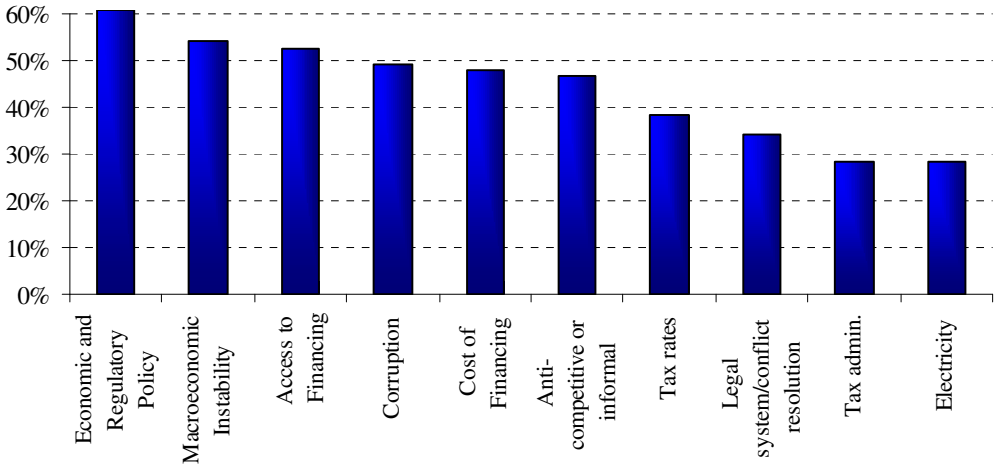
Figure 14. Binding Constraints to Growth: Decision-Tree for Ecuador



IV. Access to finance

Financing costs could be an important constraint to Ecuador's growth. Private sector surveys have usually pointed to the highs costs of finance as a major complaint within the private sector. Access and cost of finance come high in the list of business constraints identified as severe or very severe in the investment climate survey (by 44.9% and 45.8% of the survey respondents). In addition, the *Proyecto Salto* survey on micro enterprises also points clearly to credit access as a significant business constraint, as previously explained.

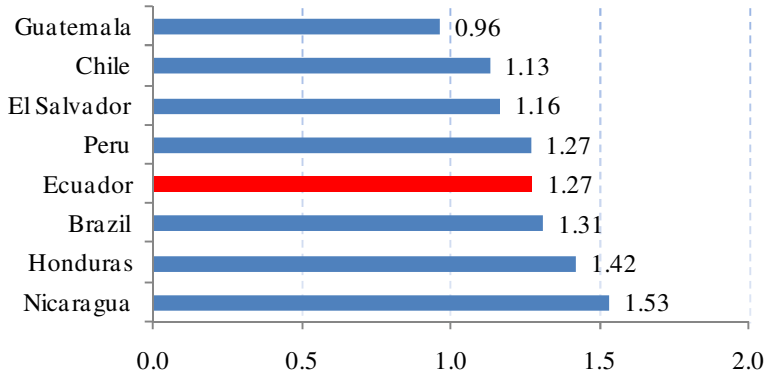
Figure 15. Top 10 Constraints for Firms Investing in Ecuador



Source: Enterprise Surveys, the World Bank

In spite of the current favorable international conditions, 14.2% of firms responding to the World Bank´s Enterprise Survey perceive "access to and cost of financing" as a major or severe obstacle, above the Latin American median (and only lower to Honduras, Nicaragua and Argentina).

Figure 16. Financing constraints as ratio of total constraints



Source: Private Enterprise Survey , World Bank

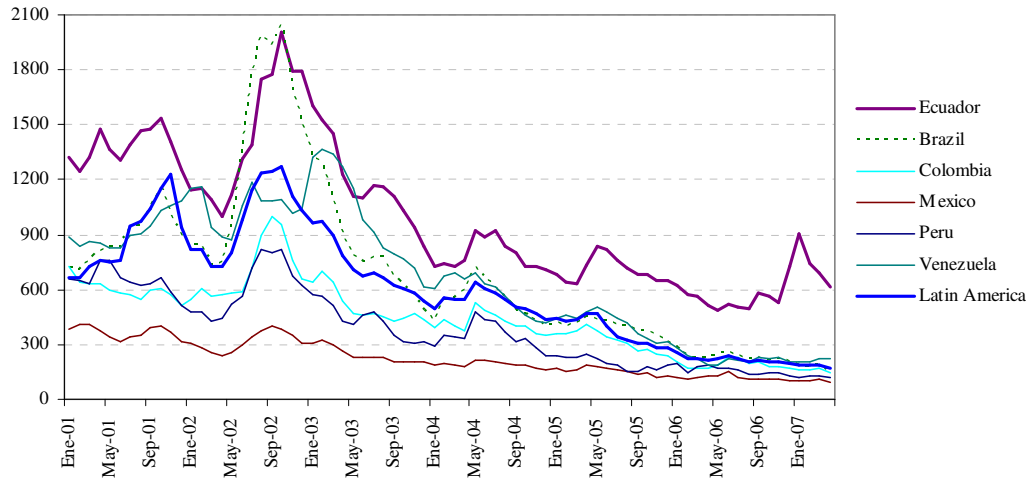
Moreover, access and cost of finance are relatively more binding than the average

constraint: based on the Survey results, the ratio of average marks for financial constraints (average and cost of finance) with respect to average marks for all growth obstacles place Ecuador relatively high within the region.

IV.1 International financing

Political and macroeconomic instability, including a weak credit history, have resulted in high costs of international finance for Ecuador. The country has gone through several episodes of foreign debt default or rescheduling over recent decades. Ecuador has the highest sovereign country risk within Latin America, as measured by EMBI+ indexes, after having peaked above 4,400bp in mid-2000, in the context of a deep financial crisis. With a 739bp average during January-April 2007 (including a period of high volatility reflecting contradictory statements regarding the payment of interests coming due in mid-February), Ecuador's sovereign risk was, on average, 555bp higher than the Latin American index. While some particularities of Ecuadorian sovereign bonds—such as the option for the sovereign to buy back at par the bonds at any of the biannual interest due dates—may partly explain the high risk premium, the difference is large enough to suggest that external financing is much more expensive for an Ecuadorian firm or bank than for its competitors in other regional countries.

Figure 17. Sovereign Country Risk
(EMBI+, basis points)



Source: Bloomberg, Central Bank of Ecuador

In the same vein, Ecuador ranks poorly in credit ratings if compared with its other countries in the region. Although the oil boom makes it easier for the government to service its debt, some announcements threatening international creditors with starting an unfriendly restructuring process hurts Ecuadorian creditworthiness as seen by international markets. Investment banks have reacted downgrading sovereign bonds.

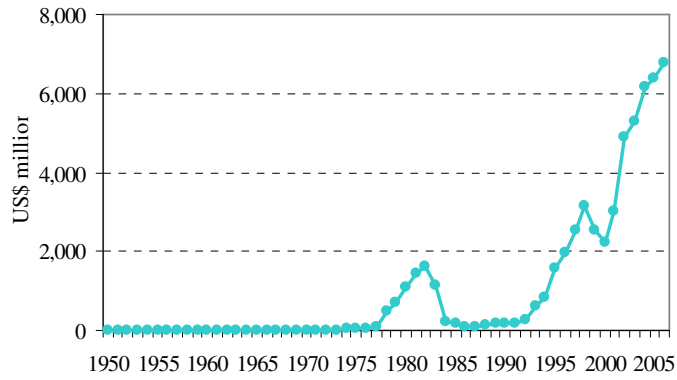
Table 1. Sovereign country ratings by several credit agencies

	Colombia	Chile	Brazil	Peru	Ecuador
S&P	BB	A	BB-	BB	CCC+
Moody	Ba2	Baa1	Ba3	Ba3	Caa1
Fitch	BB	A	BB-	BB	B-

Date: October 2006

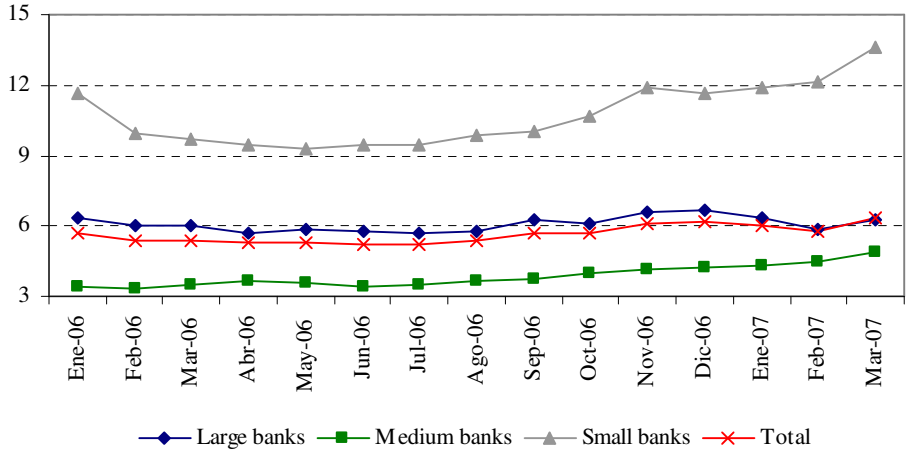
Despite the high international financing costs, their actual impact on domestic creditors and domestic lending rates remains somewhat limited, at least for now. On one hand, the stock of private foreign debt has been growing markedly in recent years, suggesting that foreign financing availability is not scarce. Moreover, a large share of it (though no official data are available) relates to operations backed by foreign deposits, which isolates the country risk impact.

Figure 18. Private Foreign Debt Stock
(1950-2006)



Source: Central Bank of Ecuador

Figure 19. Share of financial obligations over total liabilities
(In percent)

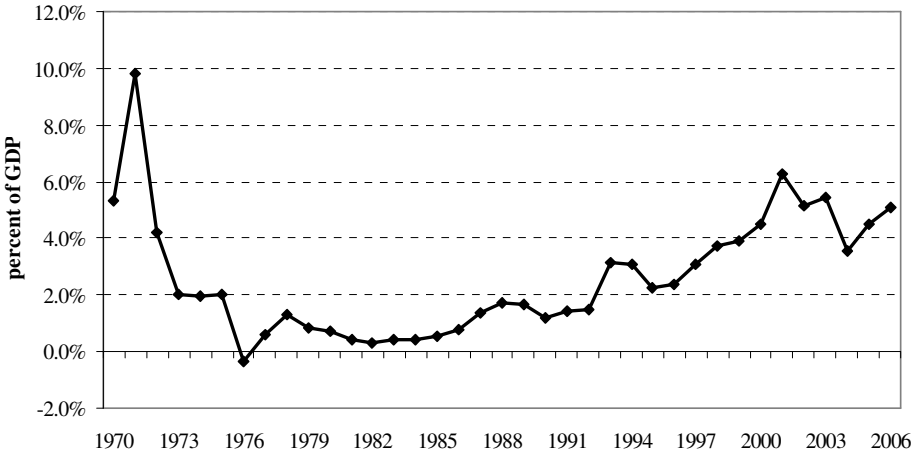


Source: Banking Superintendency

On the other hand, the banks' financial obligations (including liabilities with foreign financial institutions or multilaterals) represent a limited share of the banks' total liabilities. This reflects the upward trends of bank deposits over recent years, which has allowed a significant increase in bank lending.

In addition, FDI flows have been comparable, at per capita levels, to regional standards on average, according to UTEPI. Moreover, FDI flows have grown significantly in recent years. However, the FDI has been heavily concentrated in a few sectors, particularly oil and telecommunications. Meanwhile, FDI attractiveness for other areas, especially manufacturing industries, has been rather limited. This brings an additional consideration, as FDI can be an important channel for the transfer of technological know-how. FDI concentration on one sector—mostly oil—will make it difficult for Ecuador industrial sectors to enhance its technologies and compete in global markets.

Figure 20. Foreign Direct Investment
(As percent of GDP)



Source: Central Bank of Ecuador

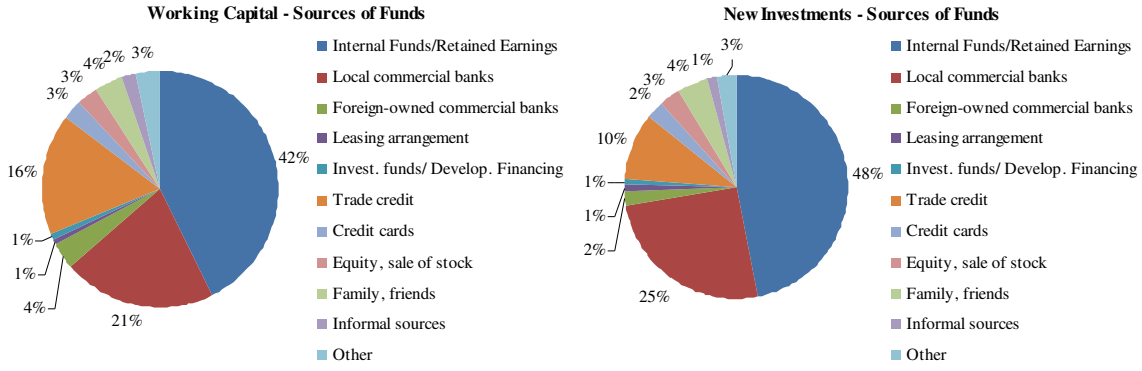
Meanwhile, the high international oil prices have boosted Ecuador exports and allowed an unusual external current account surplus in recent years. Overall, foreign financing costs or availability do not appear, for now, to represent a constraint to ignite further growth. However, Ecuador's economic history shows clearly that the country's difficult access to foreign financing has been an important component in some its worst crises experience. In view of the current benign international environment (which could be reversed by recent troubles with mortgage operations), one cannot discard the risk of a reversal of the situation at some moment, when the high country risk and inconsistent policies regarding foreign financing could bear its cost. In that regard, high international financing costs can be viewed as a moderately high binding constraint to growth.

IV.2 Domestic financing

The evidence regarding domestic financing access and related costs is mixed. While business and micro entrepreneur surveys emphasizes their perception of limited access or too costly financing, data on credit and interest rates points to a lesser actual constraint, although financial intermediation remains limited in Ecuador.

As noted above, the World Bank Doing Business survey positions access and cost of finance as important limitations. Banking credit is a significant source of funds. Combined with leasing arrangements, development financings, trade lines (supplier or customer credit) and credit card financing, it represents 46% of working capital financing requirements and 41% of new investments' financing. Large firms perceive access to financing (e.g. collateral) as a less sensitive issue, with a statistically significant difference.

Figure 21. Source of Funds for Working Capital and New Investments



Source: World Bank

As detailed in Annex F, analysis-of-variance exercises on the survey results tend to confirm that those firms pointing to financing constraints actually perceive the impact of such constraint in their day-to-day business activity and change their business decisions accordingly (while such matching does not necessarily apply to other mentioned constraints). For example, firms with different perceptions about access or cost of finance as a business constraint allocate, on average, statistically different shares of internal funds or retained earnings to finance working capital and new investments. They also statistically differ, on average, on their relative use of local banks' loans or trade credit to finance working capital or new investments.

Meanwhile, access or cost of finance, when perceived as an important limitation for doing business, do not appear to play a significant role in the individual firms' actual innovation attitude, measured by the number of new products introduced to the market in the last 3 years.

The 17,626 micro enterprises covered by the *Proyecto Salto / Habitus* survey on micro enterprises place credit constraint, by far, as the most critical requirement for their business success (see Annex G for detailed results). 39.4% of the firms state

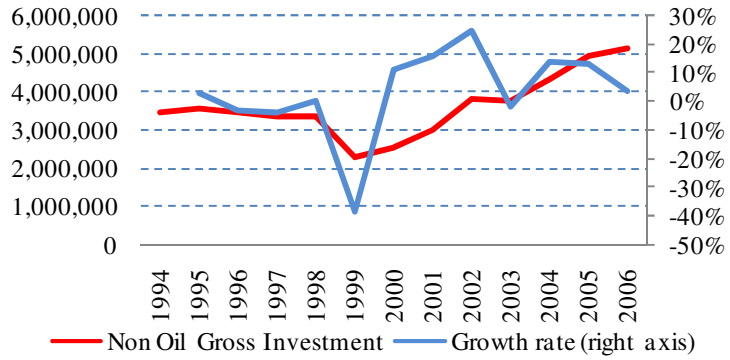
their need for credit to finance intermediate goods and merchandise, while 12.0% would need credit for equipment, machinery and facilities. The survey's universe differ markedly from the larger firms covered by the World Bank survey: 90.4% of the micro businesses finance their activities internally through sales, following by customer credit (2.8%) and provider financing (1.8%), while financing from any type of financial institutions is negligible. Cumbersome and long procedures (38.7%), too high collateral requirements (26.3%) and high interest rates (21.9%) are referred to as the most critical problems with banking loans. Finally, 50.1% of the surveyed would take a loan with a 20% annual interest rate.

Here again, statistical tests (through contingency tables) tend to confirm that those factors that firms declare to be crucial for success—particularly credit constraints—are indeed correlated with business assessment, business expectations, sales problems, or the willingness to take a loan. From that perspective, the survey results point to credit access, either for working capital or for investment purposes, as a critical factor that could foster the micro businesses prospects.

While survey results emphasize credit constraint, Ecuador has seen credit to the private sector grow at double-digit levels over the last 5 years (more than 22% in 2006), in a trend very similar to that of bank deposits, once customers regained confidence in the banking sector after the 1999 crisis. However, financial intermediation measured as deposits as percent of GDP, remains rather low by regional standards. Thus, the overall impression is that access to credit has been clearly expanding within the economy, though a large chunk of the economy—mostly informal—remains limited in credit access.

Admittedly, these favorable trends for deposit and credit growth in recent years have coincided with a very favorable international environment, including global growth trends, favorable terms of trade for Latin America and for Ecuador, and abundant international liquidity. Furthermore, the enhanced credit access over the present expansionary phase of the business cycle has coincided with a faster growth rate for non-oil real gross investment. If oil investments, as measured by Espinasa (2007), are subtracted from the Central Bank figures on gross fixed capital formation, we can obtain a proxy for non-oil investments. Such data series point to a negative (–0.8%) average annual growth for non-oil investment over 1994-1998, before becoming clearly positive (12%) in the post-crisis years (2000-2006). While there could be several potential explanations behind these numbers, one of them is that the lack of credit might have been one of the main driving forces behind the low non-oil investments in the 1990s, thus suggesting that credit access can indeed be a binding constraint to growth.

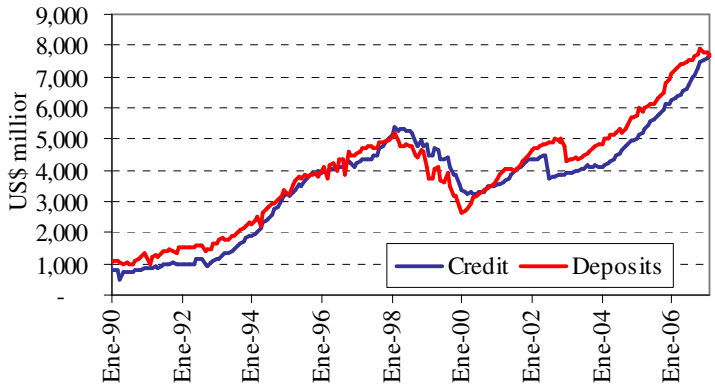
Figure 22. Gross Non-Oil Investments
(In thousands of 2000 U.S. dollars; growth rates in percent)



Source: Central Bank of Ecuador and Espinasa (2007)

The aftermath of the 1999 financial crisis led, following some initial reluctance, to a gradual recovery of depositor confidence in financial institutions. As Ecuador's history show, should the international environment deteriorates, the country could face sudden difficulties for financing access while weakness on the medium-term fiscal front and the rigidities imposed by dollarization would amplify financing troubles.

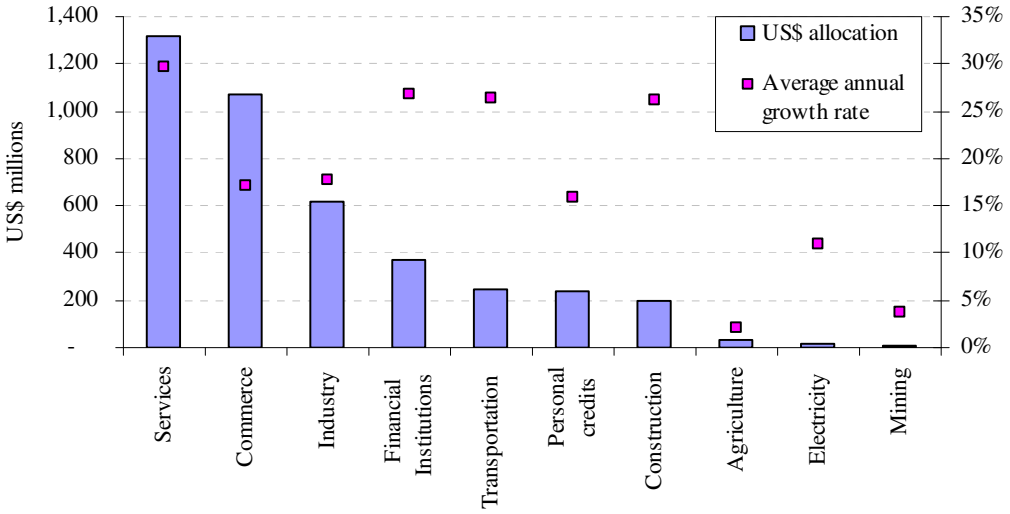
Figure 23. Banking Credit and Deposits



Source: Central Bank of Ecuador

Between 2002 and 2006 (data prior to 2002 is not comparable to recent data), banking credit grew by $4.1 billion. Out of this amount, the largest share was channeled to services, commerce and industry. Those sectors were, even before 2002, the most important destinations of credit in Ecuador. High growth rates can be found for services, transportation and construction, including infrastructure. Agriculture, energy and mining have seen banking credit grow at relatively low rates from already initially low levels. No data is available to distinguish real estate loans from productive investments.

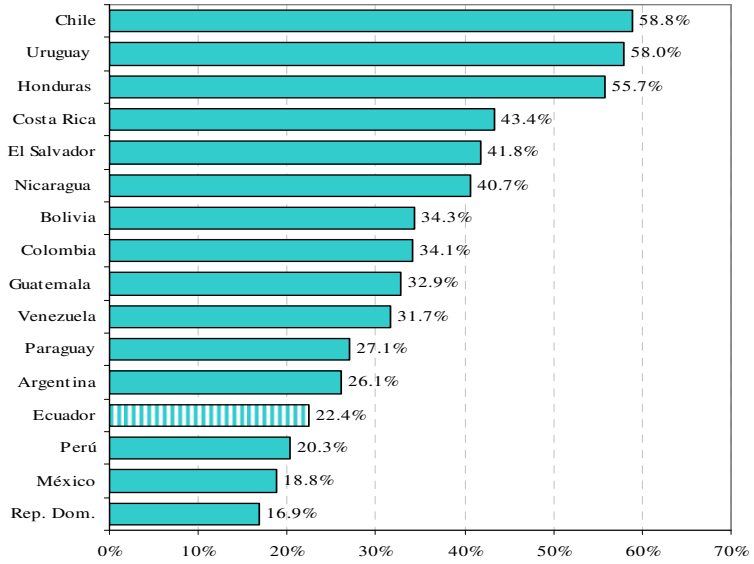
Figure 24. Credit allocation and growth by sector over 2002-06



Source: Banking Superintendency

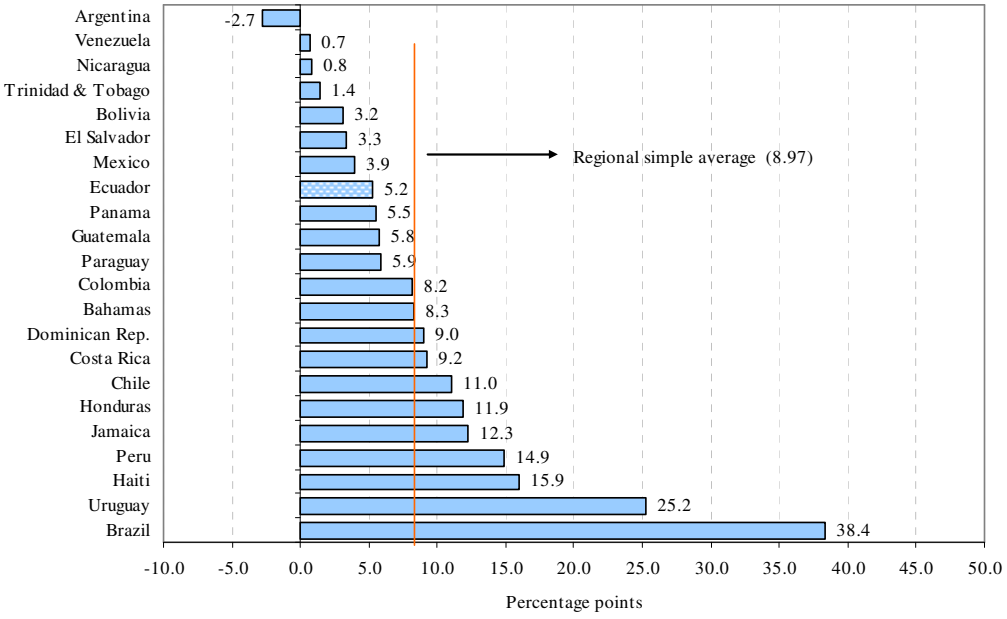
Regarding the cost of financing, real lending rates appear to be relatively low, in the lower range of Latin America. Real rates have been witnessing a gradual but continued decline since the country's adoption of dollarization in 2000.

Figure 25. Financial Intermediation
(Bank deposits as % of GDP, 2006)



Source: FELABAN, ECLAC

Figure 26. Latin America: Real Lending Interest Rates
(2006, in percent)

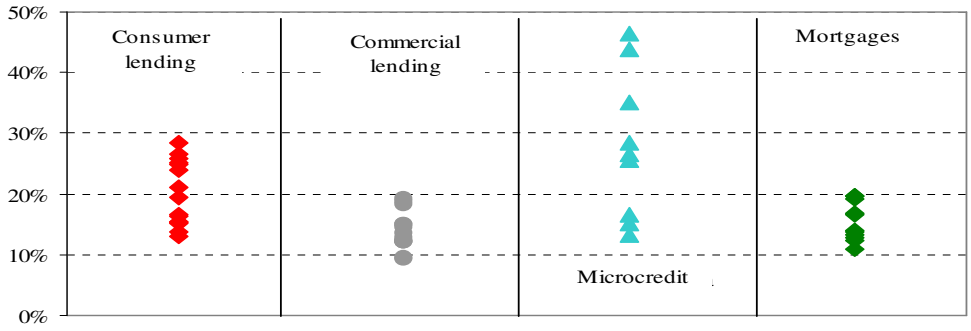


Source: ECLAC

However, these figures are masking part of the financing costs, as the use of banking fees and other costs has gradually been more tolerated in the context of a weak regulatory environment and a limited financial culture by the average customer. An imperfect proxy for actual credit costs can be obtained by comparing several items in the banks' income and losses accounts (including interest revenues, fees, as well as financial advisory and other service revenue) with the stock of their credit portfolio. Such an exercise for end-March 2007 reveals an "implicit interest rate" of 22.5% for the overall financial system, though these costs may be overestimated by including some transaction-related (but not credit-related) fees, such as fees for foreign transactions and related. However, for financial institutions mainly specialized on microcredit or small consumption credit markets (that offer very limited financial transactions beyond credit), the ratio varies from 28% to 84%. This clearly suggests that the size of implicit banking costs charged to customer through indirect means can be substantial. Thus, the system's lack of transparency has made it difficult for the final borrower to assess the actual borrowing costs.

Recent efforts by the Banking Superintendency have helped to clarify the actual cost of credit. As expected, they point to a highly segmented credit market, with rates widely different depending on the existence of valuable collateral (e.g. mortgages) and the informality of the customer. Microcredit rates show a wide variance, partly reflecting very diverse groups, from the rural or very informal market where the costs of putting together credible financial information of the borrower are very high relative to the size of the loan, to small consumer lending.

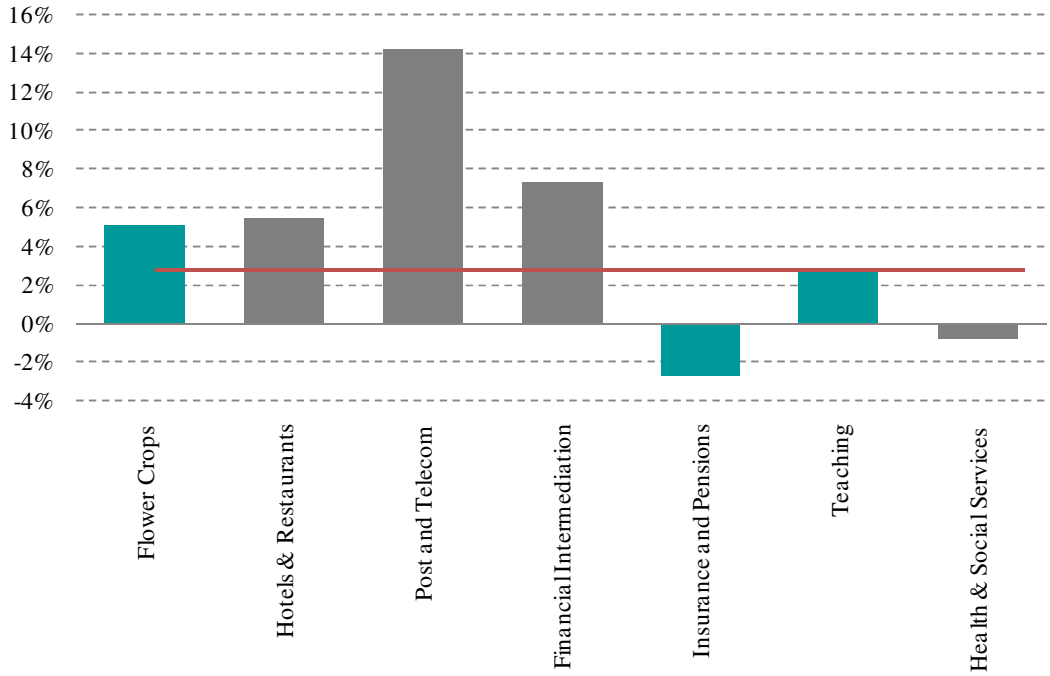
Figure 27. Real Cost of Credit
(Including fees, insurance & other costs; 19 banks; May 07)



Source: Banking Superintendency

Finally, financial intermediation services are an important input for several economic sectors. An approach similar to that proposed by Rajan and Zingales (2005) could be developed to evaluate the potential impact of financing constraints over other economic sectors.

Figure 28. Real Growth and Sectors Relying on Financial Intermediation
(2000-06 real growth for those sectors where financial intermediation represents 1% or more of their intermediate consumption)



Source: National Accounts.

According to the 2005 national accounts figures, the combined value-added of the 7 economic sectors for which financial intermediation represents at least 1% of their intermediate production costs added up to 11% of the national GDP. Out of these 7 sectors, 3 (with combined value added equivalent to 40% of the 7 sectors)

have witnessed growth rates below the national average during 2000-06, 2 sectors have posted growth rates close to the national average, and 2 sectors (post and telecoms, and financial intermediation itself), posted growth rates much larger than the country's average.

For putting together the different pieces of the financing puzzle, a few considerations appear relevant:

The 1999 financial crisis—explained by weak regulatory standards for the sector, entrenched vested interests in the financial sector regulatory agencies over the 1990s and the combination of macroeconomic and external shocks—implied high borrowing costs for the private sector.

The banking system as a whole has seen a gradual improvement in its financial indicators—regarding liquidity, profitability, operational costs and credit quality—since the financial crisis. However, the individual situation of diverse financial institutions is rather heterogeneous while the depositor concentration remains quite high, reflecting the country's inherent income inequality. These two elements emphasize the system vulnerabilities.

The absence of a modern and comprehensive legal and regulatory environment for financial institutions resolution procedures and depositors' protection, particularly in a dollarized economy, has resulted in the decision by private banks to build up large liquid assets funds for precautionary reasons, thus resulting in higher financing costs.

The orientation of existing banking norms to formal sector customers, while banks face a significant informal market (which is largely represented in the *Proyecto Salto* survey respondents, for example), tends to further widen the segmentation between microcredit markets and traditional banking markets. In this context, asymmetric information tends to make it harder to ensure access to finance to the informal sector.

The weak enforcement of creditor rights, not only in the existing legal framework but, more importantly, as a result of the actual and lengthy functioning of the judicial system, both to collect arrears or to seize collateral, plays a significant role in increasing financing costs.

Overall, the general impression regarding domestic financing, both for access and costs of credit, is that the market remains highly segmented, with a much more limited access to credit by informal and small businesses. In addition, several institutional drawbacks (weak regulation, limited transparency, informality, imperfect functioning of the legal system, and creditor rights mechanisms) appear to be critical in the still high financing costs for some market segments, while macroeconomic weaknesses are largely to blame for the high costs of access to international finance. All in all, though its weaknesses largely reflect flaws in other branches, domestic financing is indeed a non-negligible constraint to growth.

V. Low social returns

Low social returns to investment may be the consequence of limited natural resources, poor infrastructure or low human capital. These three areas are discussed below, including separate sections on the oil sector development, considering its importance for the country's economic growth and fiscal position, as well as on the energy sector, in view of its large challenges.

V.1 Abundant natural resources but geographical constraints

It is hard to argue that Ecuador's location and the availability of natural resources should be a binding constraint for growth. Ecuador has diverse and abundant natural resources, both for mining and oil-related activities, which have been critical to sustain fiscal revenues and external accounts, though they may have caused some Dutch-disease challenges over time.

Table 2. Ecuador: Natural Resources Availability

Variable	Quantity	Countries	Ranking
Land			
Surface (km2)	283,561	232	73
Agricultural area (km2)	75,520	219	79
Agricultural area (as % of total area)	27.3	219	145
Arable land (km2)	13,480	215	97
Forestal area (km2)	108,530	218	49
Forestal area (as % of total area)	39.2	205	72
Water			
Renewable sources of fresh water (mill. m3)	264,618	178	35
Per capita renewable sources of fresh water (m3/person)	20,004	177	44
Raining (mill. m3)	582,985	193	36
Hydroelectric generation capacity (MW)	23,467	17	9
Percent of hydroelectric potential capacity used*	7.4	17	13
Biodiversity			
Number of species (mammals)	368	155	14
Number of species (birds)	1,644	155	4
Number of species (plants)	19,362	149	9
Number of species (reptiles)	390	155	8
Number of species (amphibians)	420	153	3
Number of species (fish)	642	154	9
Biodiversity index	0.873	161	5
Oil & Mining			
Oil reserves (in billions of barrels)	4.517	212	24
Copper reserves (in billions of pounds)	47.2	n.a.	n.a.
Gold reserves (in millions of ounces)	19.4	n.a.	n.a.
Silver reserves (in millions of ounces)	27.1	n.a.	n.a.

Sources: UN Stats, UTEPI, UN Environment Program, Convention on Biological Diversity, Energy Information Administration, Ecuador Mining Chamber.

*Actual hydroelectric generation capacity as percent of the potential hydroelectric capacity (not necessarily developed)

Land in Ecuador is mostly productive and the country has a variety of regions with different features than enable the production of different types of crops all year round. As discussed previously, diverse agricultural sectors (cocoa, coffee, bananas, shrimps, flowers) have been drivers of economic activity at different periods of Ecuador history.

A comparison with other countries, based on available data, show that Ecuador ranks favorably in terms of agricultural area, arable land, forestall areas, water resources and hydroelectric generation capacity. Ecuador ranks very high in terms of biodiversity, as well as for oil reserves. The ongoing projects for the ports in Posorja, near Guayaquil, and Manta confirm that Ecuador has a privileged location in South America, not only because it may become the port of entry for the increasing trade from Asia, but also because its relatively closeness to the Panama Channel, which makes it easier for Ecuadorian products to reach Europe and other markets in the Atlantic Ocean.

However, Ecuador's diversity is also a source of geographical constraints. The country has four highly different areas: the Coastal one, the highlands, the Amazonian region and the Galapagos Islands. Despite a relatively high density within South America (not in comparison other regions, including Central America), the country's fragmentation implies increased transportation and infrastructure costs, particularly to overcome natural obstacles in the highlands. Earthquakes and volcano eruptions have also characterized Ecuador's history and affected economic growth and infrastructure over time. Moreover, geographical differences have also partly explained cultural conflicts and regional antagonism, with a tradition bi-centralism around the two largest cities and growing calls for increased decentralization, which, if not properly managed, would cause further strains on the medium-term fiscal stability.

Overall, while we do not consider natural resources as a key binding constraint to growth, geography plays a role in explaining the country's large, and not always fulfilled, infrastructure needs.

V.2 Infrastructure: critical needs in some areas

Infrastructure aspects encompass diverse and different areas. We will examine in more detail two sectors—oil and energy—with a significant impact on the country's growth and prospects, and where infrastructure constraints appear to be the most vulnerable part of Ecuador's provision of basic infrastructure. Putting aside those sectors for now, the general impression is that Ecuador indeed faces some challenges regarding infrastructure, though actions are being taken to gradually address those shortcomings. However, As detailed below, the electric sector may.

The World Bank's enterprise surveys results point to mixed rankings of Ecuador within Latin America. While delays to obtain an electric or telephone connection are longer and the impact of electric outages larger than the regional average,

water supply failures or the average number of electric outages are moderate on regional terms.

Table 3. Ecuador: Infrastructure Indicators

Infrastructure	Ecuador	Region	All countries
Delay in obtaining an electrical connection (days)	29.54	25.75	25.82
Number of electrical outages (days)	9.47	13.50	23.46
Value lost due to electrical outages (% of sales)	5.04	3.66	3.93
Number of water supply failures (days)	4.12	9.13	11.68
Delay in mainline telephone connection (days)	92.65	54.32	34.41
Firms using the Wed in interaction with clients/suppliers (%)	55.41	43.92	44.67

Source: Enterprise Surveys, The World Bank

According to the 2006 CIA World's Fact book, the share of Ecuador's roads that are paved is close to 17%, a relatively low share for Latin American standards, partly reflecting the country's geographical diversity and the natural obstacles posed by the Andean chain. However, UTEPI mentions that 3% of the road network is now under concession, a relatively high number on regional standards, which ensures an enhanced maintenance of the roads. Meanwhile, Ecuador is the country with the lowest number of airplane departures per million habitants, which may partly reflect its relatively high density in South America, which facilitates land transportation. However, the recent renovation of Guayaquil airport and the ongoing construction of the new Quito airport suggests than improvements are underway. In a similar vein, the ongoing concession process to recognized foreign companies for the operation and renovation of the ports of Guayaquil and Manta signal an improvement in the coastal infrastructure. In particular, Manta hopes to take advantage of its favorable geographicla location to become the first mega port for international trans-shipment operations in the Southern Pacific rim.

Regarding telecommunications, according to the WDI and UTEPI in 2004, Ecuador ranked 10th out of 17 Latin American economies, with 124 fixed phone lines per 1,000 habitants, while it ranked 5th (with a remarkable changeover from the 15th place in 2000), with 348 mobile lines per 1,000 habitants. As discussions are held for the renewal of the existing mobile phone concession contracts, mobile telecommunications continue witnessing a very dynamic expansion. Access to personal computers and to the Internet remains relatively difficult for Ecuadorians, with the country ranking in the lowest half of the region, despite some dynamic trends in recent years.

Telecommunications and transportation, while regarded as business constraint in the World Bank's Investment Climate survey, are not considered critical problems, with only 18.1% and 10.6% of respondents, respectively, considering them as severe or very severe obstacles.

The remainder of this section focuses on two critical sectors for the Ecuadorian

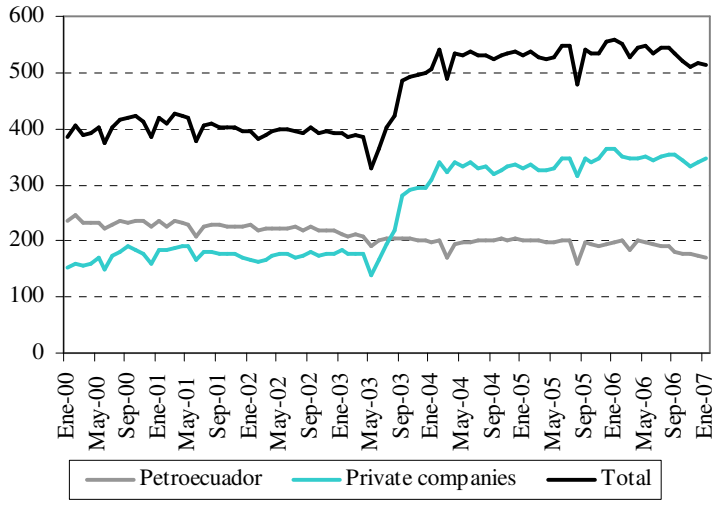
economy: oil and energy. Both are largely controlled or dominated by the public sector, thus highlight the importance of appropriate decisions over public investment (or lack of it) for growth. Both sectors are also examples of highly inefficient sectoral strategies, which have failed to foster the relevant sector's development.

Oil sector development: investment, governance, and natural resources

The oil sector is especially important to Ecuador, and thus deserves a separate analysis on existing constraints to its growth. This section summarizes the importance and recent trends of the oil sector, before reviewing potential limits to its development. The main conclusion is that institutional limitations are the main reasons to the mediocre development of the sector, while endowment of the resource and prices are not binding.

Oil has had a very significant role in Ecuador economy over recent decades. During 1980-2006, oil-related GDP represented on average 12.8% of total GDP (measured in constant prices). In recent years (2000-06), such share has risen to 17%. Oil importance is also reflected in trade developments, as oil exports added up o average to 48.1% of total exports during 1980-2006. Finally, oil is critical for fiscal accounts: throughout 1980-2006, oil revenues represented 36.5% of central government revenues, with some decline of the corresponding share (to 29.5%) in recent years. However, these figures, extracted from official fiscal numbers, underestimate oil revenues, as increasingly large subsidies on oil derivative products are directly financed from oil proceeds, before oil revenues are transferred (on a net basis) to the central government. These subsidies—not included in central government revenues—have been rapidly rising in recent years, reaching close to 6% of GDP in 2007.

Figure 29. Daily oil production (thousand barrels)



* Excluding the impact of the decision to rescind Occidental contract in April

Source: Central Bank of Ecuador

Since oil extraction started in Ecuador's Amazonian region in the early 1970s, production constantly grew until 1994, when an inflexion point was reached, as the state oil production volumes (managed by Petroecuador) starts to fall, while private production grows.

Between 1994 and 2006, the state oil production has fallen at a relatively constant pace, with an annual average decline rate of 4.5%. At the same time, private production posted a moderate growth (16.6% annually, during 1994-2000), before increasing its pace (to 38.2% annually in 2002-04) and subsequently became almost stagnant (with a 2.7% annual growth in 2004-06). These numbers exclude the production of *Bloque 15* oil field, which was operated by US firm Occidental until April 2006, when the Ecuadorian government decided to rescind the contract with Occidental, signaling some contract violations, and the field was moved under Petroecuador control.

The fall in state production, combined with the recent stagnation of private production, clearly signal the problems faced by the oil sector. Which can be the causes behind it? We will review oil reserves, transportation capacity, market prices and institutional limitations as potential causes.

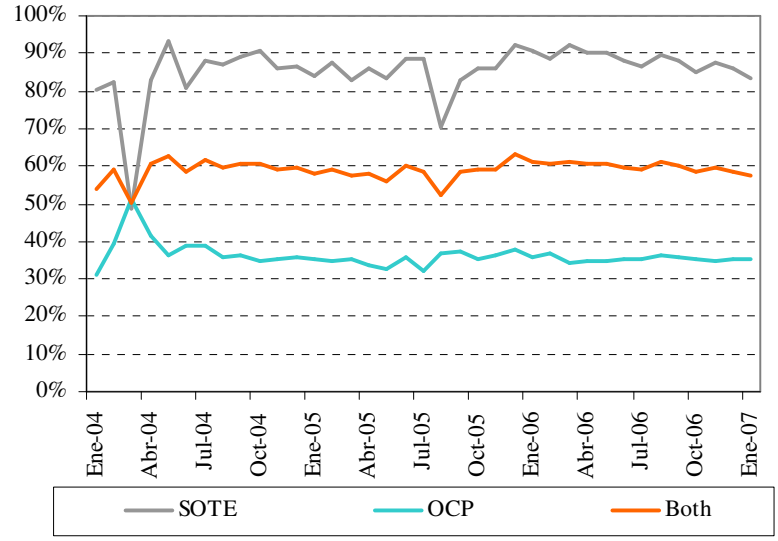
Table 4. Estimates of Ecuador Oil Reserves in 2005

Source	Reserves (Million barrels)
BP Stat. Review of World Energy	5,060
Oil & Gas Journal	4,630
World Oil	5,500
National Hydrocarbons Direction	4,522

Could oil reserves be a constraint to the sector's growth? Different sources provide somewhat diverse estimates for Ecuador's crude oil reserves. Even with the most pessimistic estimate, and assuming no now oil discovery, Ecuador could maintain its 2006 production for 23 years. Thus, proved reserves do not appear to be an immediate constraint to production growth.

According to crude reserves projections by the Oil & Gas Journal, world proved reserves grew by 2.7% annually during 1980-2006, while Ecuadorian reserves increased by 5.7% over the same period. With a shorter timeframe (2000-06), the average growth of Ecuador reserves (13.9%) is even larger than for world's reserves (4.1%). As a result, the share of Ecuador reserves in the world doubled (from 0.17% to 0.34%) from 1980 to 2006. Again, this suggests that the availability of oil reserves is not a constraint to the sector's growth.

Figure 30. Oil Transportation Capacity
(Capacity utilization of existing pipelines)



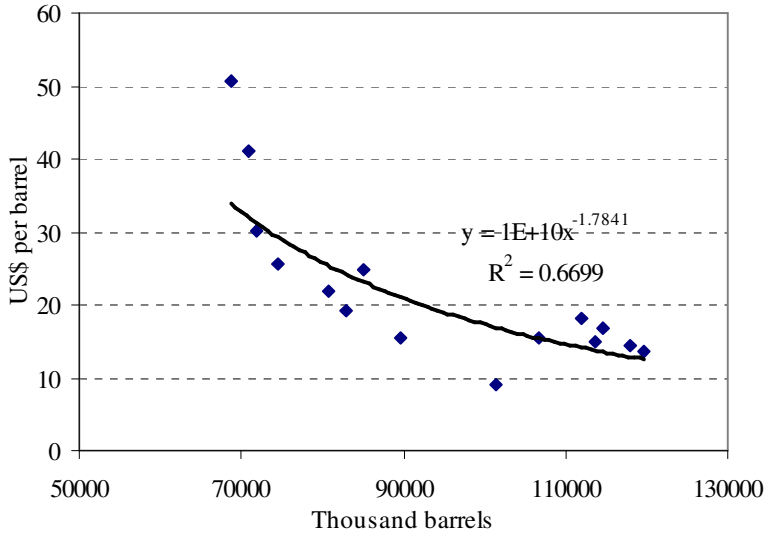
Source: Central Bank of Ecuador, Petroecuador

Could transportation capacity be a constraint to the sector's growth? The Ecuadorian crude oil lies almost exclusively in the country's Amazonian region. Thus, the presence of an oil transportation system to the Pacific Ocean, through the Andes, is critical. The light crude oil pipeline (*Oleoducto Trans-Ecuatoriano*, SOTE) has been functioning since 1975 with a transportation capacity, after several expansions, of 390,000 barrels per day (b/d). Transportation capacity was a key constraint to production growth until late 2003, when the heavy crude oil pipeline (*Oleoducto de Crudos Pesados*, OCP) started to function, with a capacity of 450,000 b/d. This allowed a significant increase in private production, particularly in 2004.

Since January 2004, following an initial step-up, private production has barely grown. Despite the 160,000 b/d step-up in production, the OCP excess transportation capacity (290,000 b/d) remains quite large, at 35% of the pipeline's capacity. In addition, the gradual reduction in public production explains that the used capacity of the existing pipelines has been, on average since January 2005, close to 59% only. In summary, transportation capacity is not a constraint to the sector production growth, at least since late 2003.

Could oil prices be a constraint to the sector's growth? Between 1999 and 2006, the average price of Ecuador oil exports rose from US$9.2 per barrel to US$50.8 per barrel. Over the same period, state production declined from 277,000 b/d to 188,000 b/d. In other terms, production fell by 32% while export prices increased by a factor five. The irrational trend of state production can be emphasized through a simple regression between oil state production and Ecuador's average oil export prices. Instead of a traditional supply curve, the relevant line shows a negative slope. Overall, it appears that oil prices do not explain the sector's mediocre performance.

Figure 31. State Oil Production and Oil Export Prices



Source: Central Bank of Ecuador, own estimates

Turning now to institutional limitations to the sector development, the main problems hampering the oil sector's ability to grow in line with its potential mainly reflect legal limitations, the absence of a clear sectoral strategy, Ecuador's limited attractiveness to foreign investors, and the lack of conditions fostering open competition in diverse areas—see Albornoz, Cueva and Gordillo (2006) for a deeper discussion:

- Since the termination of the oil exploration contract with Texaco in 1992, the laws do not include a contractual way to allow private investments in oil fields in charge of Petroecuador. Such alternative would allow the public company to make deals with private contractors for its own fields, sharing risks and profits of incremental production, helping to overcome the recurrent problems faced by Petroecuador to make a more efficient use of its reserves. Otherwise, the absence of modern technologies and large investments needed to ensure oil recovery and limit the natural declination of oil fields could result in an irreversible impact to the fields' potential production and recuperation factor.

  Shared-management contracts, approved in August 2000, constituted an alternative on that regard. However, their implementation has not been possible, as the Constitutional Tribunal declared them unconstitutional in December 2000. Two alternatives could be explored: either the inclusion in the Hydrocarbons Law of a joint-venture type contract (which may prove politically arduous) or, with some increased probability from a political economy perspective, reforms to the Petroecuador's Founding Law allowing it to develop such type of contracts (without assuming all the risks, naturally).

- The absence of a clear national strategy and an independent business-style management of Petroecuador towards oil production growth are critical. This absence largely results from the significant political instability that Ecuador witnessed in recent years, which has implied—the oil sector being probably the worst hit area—a very rapid changeover in the sector authorities and the lack of policies' continuity.

  In turn, such instability has implied a recurrent political interference in the state firm's activity and has paved the way for strong interest groups to exert an excessive influence over strategic decisions, thus allowing the maintenance of rent-seeking benefits throughout the productive chain. The public firm is also characterized by weak transparency and accountability rules that would allow an objective assessment of its achievements and the quality of its business management.

  The negative impact of this lack of a clear strategy have been reinforced by foreign investors' perception that some recent decisions—such as the rescission of Occidental contract or reforms to the Hydrocarbons Law forcing contractual modifications—have hampered legal stability. Beyond diverse legal interpretations on these issues, the perception of unilateral contractual conditions imply the need to move ahead restoring confidence of the firms currently operating in the country or potential new serious partners.

  This highlights the importance of clear political priorities and national objectives reflected in priorities over public investment decisions; elements to provide some certainty for oil sector decisions beyond potential political changes; an enhanced negotiation capacity for the public sector against private companies; and building the status of the State as a strategic partner in critical areas.

- A third key area relates to the strong constraints to free competition in several sub sectors as a result of the state monopolist position and heavily regulated prices. Areas that are particularly affected by such situation include oil refining, oil derivative commercialization and imports for the domestic market. Beyond legal limitations or the related large fiscal costs, price regulations on oil derivatives have restrained in practice any significant role for the private sector in those areas, thus limiting the room for new private investments, and explain the obsolescence of oil infrastructure.

The recurrent under investment in the oil sector, particularly by Petroecuador, explains the persistent decline in state production, as well as the obsolescence of existing infrastructure in many areas (refining, derivative transportation, stocking). In addition, Petroecuador uses a relatively old technology in comparison with private companies and carries a large environmental impact.

Behind institutional problems and under investment, vested interests combined with coordination failures are partly to blame. Inefficient and non-transparent markets have allowed the maintenance some profitable and non-competitive businesses. Old refineries imply the growing need to import derivatives. The postponement in the construction of pipelines for derivative transportation has permitted costly road transportation schemes to survive. Derivative stocking limitations have implied the constant need to make use of private-controlled stocking and sea transportation systems. The continued use of a sea oil terminal, which was expected to be a provisional one back in 1977, results in the need for manual support for oil derivative loading and unloading operations. The growing costs of subsidies for domestic consumption of oil derivatives are the key driver of smuggling activities to neighbor countries.

The impact of the oil sector inefficiencies for economic growth passes through at least two channels. First, the sector's growth has been rather lackluster in the context of historically high international prices, despite exiting reserves. Second, as the sector is a key provider of public revenues, these inefficiencies have had huge opportunity costs in terms of public savings and public expenditure, in turn restraining the possibility of fostering appropriate growth-enhancing and poverty-reducing policies. Contrary to the electricity, oil is not per se a significant input for other economic activities, excepting for oil refining. Oil derivative prices are low by international standards, as a result of the large state subsidies, thus there is no direct impact in terms of high costs but there are obvious inefficiencies in terms of the best and more equitable use of public funds.

Overall, the oil sector, pretty much as the energy producing and distribution areas (see below), has exhibited a mediocre development as a result of institutional limitations, the lack of long-term state policies, under investment and the presence of strong interest groups benefiting from the lack of transparency. The inability by successive government to tackle upfront the inefficiencies in those sectors has indeed been an important constraint to the country's economic growth.

In 2006, the average daily oil production in Ecuador was 536.000 barrels. In order to achieve an increase in production, and beyond the already mentioned institutional limitations, large investments are required. Espinasa (2007) presents a scenario under which the exploitation of existing light and semi-light oil fields is optimized, in order to reach and maintain a daily oil production close to 890.000 barrels. Reaching such levels would imply investment and maintenance outlays of about US$4.7 billion over 5 years. A second scenario would include the start of operations in the heavy crude oil field ITT, requiring additional investments for US$3.9 billion and providing about 200.000 barrels per day. In summary, reaching a daily average production of 1´090.000 barrels would need investments close to US$8.6 billion and, according to Espinasa, is achievable within an 8 years timeframe.

The electric sector: inappropriate regulation and business environment

The most vulnerable aspect of Ecuador's infrastructure is probably the electric sector. Electricity supply is a major problem and a source of large distortions. Electricity rates are high compared to the region (only lower than in Nicaragua, El Salvador and Panama), despite being subsidized.

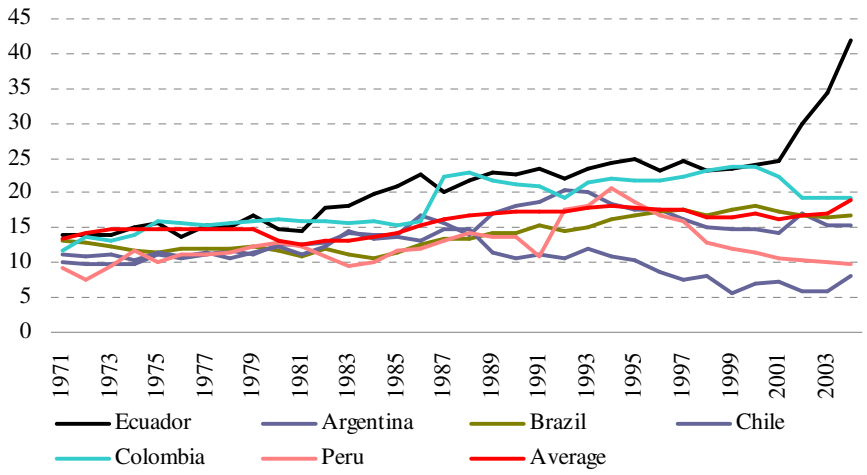
The high costs, by regional standards, of electricity tariffs in Ecuador, coupled with repeated blackouts, have hampered the private sector's competitive position in several sectors. The country has been constantly under the threat of power outages due to lack of generation. Electricity is the business obstacle most commonly cited as a severe or very severe problem (by 28.3% of respondents) in the World Bank's investment climate survey. Moreover, its seems that the sector' problems have become recurrent enough, so as to be considered by some respondents as usual for the country's environment, which would explain why some firms, despite not citing the issue as an obstacle, report having sales losses our of electricity outages (see Annex F).

Table 5. Ecuador: Electricity Prices

Countries	Electricity price for the industrial sector (cents $/kWh)
Nicaragua	12.33
El Salvador	12.25
Panama	9.9
Ecuador	9.81
Guatemala	7.48
Peru	7.44
Mexico	6.92
Costa Rica	6.66
Average	6.61
Colombia	6.4
Chile	5.58
Bolivia	4.09
Uruguay	3.94
Brazil	3.65
Paraguay	3.59
Honduras	3.52
Venezuela	2.8
Argentina	2.11

Source: OLADE, UTEPI

Figure 32. Energy Transmission and Distribution Losses
(Percent of output)



Source: World Bank's WDI, average includes Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Panama, Peru and Uruguay.

Distribution utilities face large and recurrent efficiency issues. Ecuador ranks first among Latin American countries in terms of energy losses (by 2004, almost 42% of the transmitted and distributed energy was lost), a problem that has become more critical in recent years. As pointed by Neira and Ramos (2003), such situation reflects both technical reasons (inherent factors to energy transportation, which partly reflect under investment in transportation facilities) and non-technical ones (energy smuggling, equipment obsolescence, inefficient commercial management).

The expensive energy costs are largely related to the growing dependence on thermoelectric (with much higher marginal costs) rather than hydroelectric generated electricity. Hydroelectric production, which represented close to 86% of total production in 1989, accounted for only 59% of total production in 2004. Meanwhile, the share of oil-related generation grew from 14% in 1989 to almost 33% in 2004. Many large energy generations projects, which were expected to move forward according to the 2000 official electric plan, have been postponed or have not started.

These trends do not reflect natural resource constraints but mostly under investment for hydroelectric plants. According to OLADE, Ecuador uses about 7% of its hydroelectric generating potential, and the country's energy demand is growing faster than the added supply capacity, implying the growing need to import even more costly energy form Colombia and, more recently, Peru.

Table 6. Electric generation projects and implementation since 2000
(Planned projects in 2000 and actual situation)

Project	Generation type	Estimated operation	Annual generation	Current status
EDC1	Gas	Jan 02	838	Operating since Aug 02
EDC2	Heat	Jul 02	634	Postponed to 2008
EDC3	Combined Cycle	Jul 03	789	Postponed to 2011
Termoriente	Thermoelectric	Jan 03	2010	Construction not started; concession in process
San Francisco	Hydroelectric	May 04	1103-1403	Partially started, to be completed by 2008
Mazar	Hydroelectric	Jan 06	569-744	Expected by Mar 09
Molino Mazar	Hydroelectric	Jan 06	677-1042	Would start in Mar 09, depending on Mazar

Source: CONELEC, 2000 and 2006 electric plans; annual generation range for medium and dry hydrology for hydroelectric projects.

The energy sector is largely dominated by the public sector. As pointed out by IDB (2001), Ecuador is the country with lowest private investment in electricity and has one of the lowest participation of the private sector for the generation and distribution areas, while transmission operations are state-controlled.

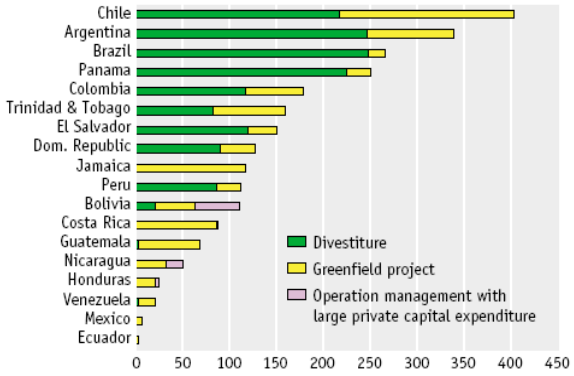
Figure 33. Private Sector Participation in Electricity

Table 12.1 **Share of Private Sector Participation**
(In percent)

	Generation	Transmission	Distribution
Argentina	60	100	70
Bolivia	90	90	90
Brazil	30	10	60
Chile	90	90	90
Colombia	70	10	50
Costa Rica	10	0	10
Dominican Republic	60	0	50
Ecuador	20	0	30
El Salvador	40	0	100
Guatemala	50	0	100
Jamaica	20	0	0
Mexico	10	0	0
Paraguay	0	0	0
Peru	60	20	80
Trinidad and Tobago	40	0	0
Uruguay	0	0	0
Venezuela	20	10	40

Source: Espinasa (2001).

Figure 12.1 **Private Investment in Electricity, 1990-99**
(In millions of US$)



Source: World Bank (2001).

Source: IDB (2001), from Espinasa (2001) and World Bank (2001)

There are 20 firms that take care of energy distribution. All of them are under heavy public sector control. For instance, out of the 20 distribution utilities in the country, 19 have the "Solidarity Fund", a public entity dependent on the Presidency, as their main shareholder, with other minority shareholders, including local governments and regional Chambers of Commerce.

State-controlled distribution utilities can be clearly divided in several groups, with different and consistent levels of energy losses, thus reflecting persistent

inefficiencies and lack of competition rather than a problem affecting in a similar way all market participants. Such inefficiencies reflect a combination of inadequate investment, political considerations, management and governance issues, and regulatory shortcomings:

Under investment, particularly for transmission operation, are partly behind growing energy losses. According to the World Bank (2005), the electricity sector received investments adding up to only 0.16% of the country's GDP over 1996-2000;

Part of the growing debts of the most inefficient utilities with energy suppliers can be attributed to the government's decision to maintain a subsidy on final energy prices, without proper and prompt compensation to distribution utilities. Such decision has led to debts for about US$1b in 2006, which are expected to be taken over by the central government, in line with a new Energy Law approved in 2006. In turn, the growing debt of generation utilities with their main supplier of oil derivatives, Petroecuador, has hurt the national oil company's financial situation, aggravating the already low investments in oil production. Through renewed 2-months emergency decrees, successive governments have maintained Petroecuador's provision of oil derivatives to over indebted generation utilities, mitigating the risk of large energy blackouts but boosting the costs of oil derivative imports;

Management and collection procedures, which are widely heterogeneous for different regional utilities, explain a large share of distribution inefficiencies. The appointment scheme for the companies' boards and managers—by direct nomination from political authorities—raises governance issues. Regional, industrial and business leaders usually play a role in such nominations, while they are also some of the larger utility customers. As a result, enhancing the utilities' poor collection procedures (which would help reducing energy losses and recovering longstanding debts) is challenging. The new Energy Law called for an open system for the nomination of the Board and managerial positions in the distribution utilities, with the aim of ensuring a more professional and independent management. However, the legal reforms have not been implemented so far, as the General Prosecutor has issued a legal opinion stating that electric utilities must follow the legal provisions to private businesses instead of the Energy Law.

The regulatory framework for energy pricing exacerbates existing problems. There are two markets for electricity wholesales: long-term contracts agreed between production and distribution utilities and the spot market. With a clear segmentation (with little changes over time) between inefficient and more efficient distribution utilities, efficient firms typically rely essentially on long-term contracts ensuring them a more predictable and cheaper electricity provision. Meanwhile, inefficient utilities depend more heavily on the spot market, based on a marginal

cost scheme: electricity prices are based on the marginal producing cost for a specific period of time every day, the most efficient producers being called first to supply energy at each period. Spot prices can vary widely from soft-demand periods, when hydroelectric utilities are the main providers, to peak hours, when all production utilities, including expensive thermoelectric ones, are working. Thus, lower cost generating firms—hydroelectric—make their largest profits during peak periods, and have little incentive to increase their production capacity, as this would push out high cost generating firms from the market, lowering their own profits.

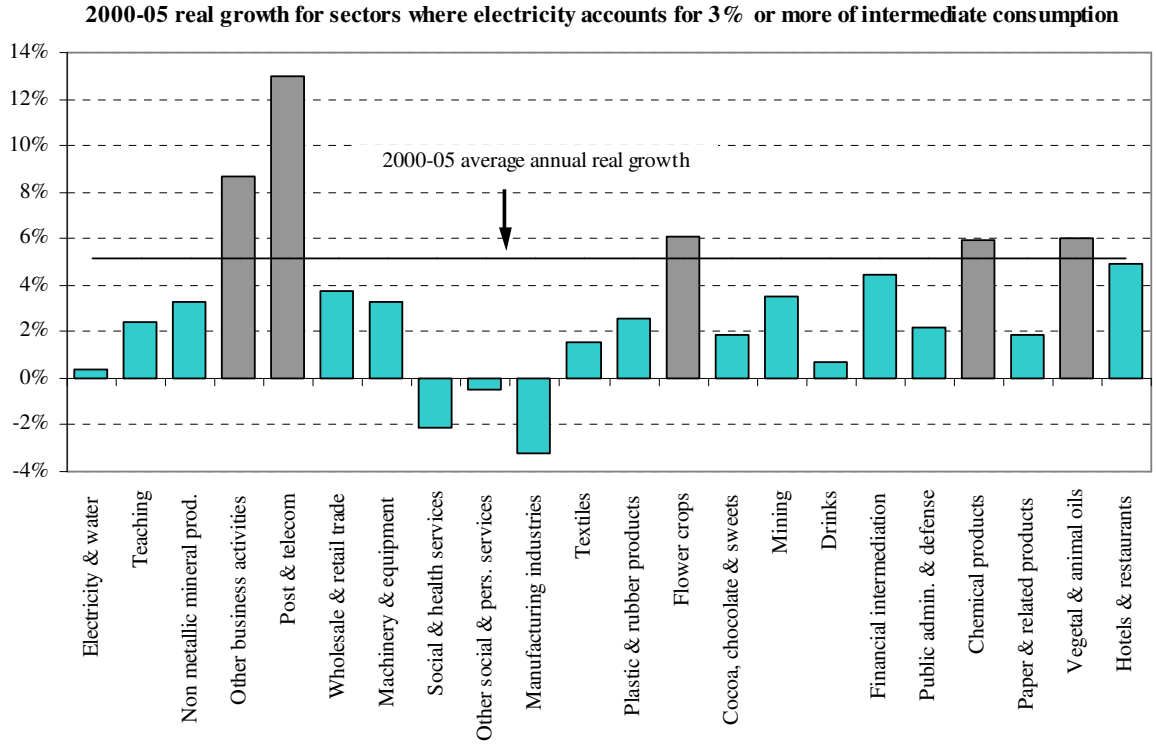
In this context, some private thermoelectric projects—that generally require much lower initial investments and have a shorter investment recovery horizon— have been developed to take advantage of the high spot prices resulting from the sector's under investment and inefficiencies. Some have faced challenges to collect debts from inefficient utilities (the ones mostly relying on the spot market), thus resulting in judicial procedures and a deteriorated environment for new private investments.

Meanwhile, hydroelectric plants requiring large initial investments and long horizons for investment recovery, have been held back, both because public investment priorities have not included them and because private projects face large uncertainties, with the combination of inefficient utilities, growing debts, state-controlled prices, and legal uncertainty.

Such trends have amplified the problems, as energy demand continues to grow while cheap supply does not necessarily follow. In recent years, some private businesses have undertaken to build their own generation utilities to fulfill their own energy needs, highlighting the lack of confidence in the public sector's ability to ensure a credible and efficient service. Finally, the risks of energy blackouts remain, as the country depends heavily on weather factors during some months to ensure a proper coverage of energy demand.

In addition, electricity represents a non-negligible input for several economic sectors: according to the 2005 national accounts figures, the combined value-added of the 22 economic sectors for which electricity represents at least 2% on intermediate production costs added up to 46.6% of the national GDP. Out of those 22 sectors, 17 (with combined value added equivalent to 78.9% of the 22 sectors) have witnessed growth rates below the national average during 2000-05. In addition, at least 2 of the remaining 5 sectors (with average annual growth rates faster than the overall economy) have benefited from specific conditions (the boom of mobile telecommunications from a limited coverage 5 years ago; weather-specific and trade preference advantages for flower crops) explaining their positive performance.

Figure 34. Real Growth and Electricity-Intensive Sectors



In summary, the public sector management of the electric sector has resulted over time in a highly inefficient sector, with high costs, subsidized but expensive tariffs, a growing dependence on expensive thermoelectric energy, entrenched vested interests, financial constraints for Petroecuador and the oil sector development, and a clear impact in the overall economy. It is vital for Ecuador to build new plants with low marginal costs, in order to reduce generation costs and enhance its competitiveness. The weak business environment, combined with inefficiencies and political interference in the operation of power distribution plants, have hampered the country's ability to attract private investment for hydroelectric generation, despite Ecuador's favorable natural environment for such plants.

Overall, infrastructure—particularly in the oil and energy sectors—appears to be a key binding constraint for Ecuador's growth. However, removing the barriers to ensure an efficient implementation of new investment projects involves addressing institutional and legal constraints.

V.3 Human capital

To check if human capital is a binding constraint for growth, we first analyze its accumulation process, then its return. Regarding the process of human capital accumulation in Ecuador, indicators provide mixed evidence. According to WDI data for 2004, the country ranked within the first half of Latin American countries for primary education coverage (with a 99.5% rate as of 2004), just in the region's

average for alphabetization rates (92.7% of the population older than 15 was alphabetized in 2004), but in the lowest half for secondary education coverage (with a 52.2% coverage in 2004) as well for tertiary education (with a 21.8% coverage, according to SIISE indicators for 2001).

According to WDI estimates for 2001, 42% of the working force had primary education studies, 32% secondary–level education, and 24% university-level studies. UTEPI estimates show that the share of workers in manufacturing industries with university-level studies varies from 8.4% in low-technology industries, 12.6% in natural resources based sectors and up to 26.6% in medium and high-technology sectors. While Ecuador ranks poorly within Latin America for R&D spending, research and publications, and the number of US or Europe patents or ISO certifications approved, it is relatively well positioned in terms of training provided by firms to their employees, according the World Business Environment Survey referred to by IDB (2001).

While education quality statistics are scarce, Ecuador has consistently ranked poorly in standardized tests, with 1999 national averages of 8/20 in language skills and 7/20 in mathematical skills (see Luna, 2005). Available data point to favorable student per teacher coverage but to weak teachers' attendance (75%) and academic background—see UTEPI and 2004 World Bank's Poverty Report.

Table 7. Returns to Schooling

Returns to Schooling	
Thailand	0.192
Guatemala	0.136
Ecuador	0.135
Brazil	0.132
Peru	0.129
Paraguay	0.129
Mexico	0.126
Chile	0.123
United States	0.120
Colombia	0.119
Panama	0.116
Bolivia	0.113
Nicaragua	0.110
El Salvador	0.105
Honduras	0.104
Costa Rica	0.098
Argentina	0.091
Venezuela	0.085
Uruguay	0.084
Dominican Rep.	0.068
Taiwan	0.067

Source: Hausmann and Rodrik (2005)

In line with Bils and Klenow (2000), Hausmann and Rodrik (2005) point to high (2nd place) returns on education in Ecuador, compared to the rest of their sample,

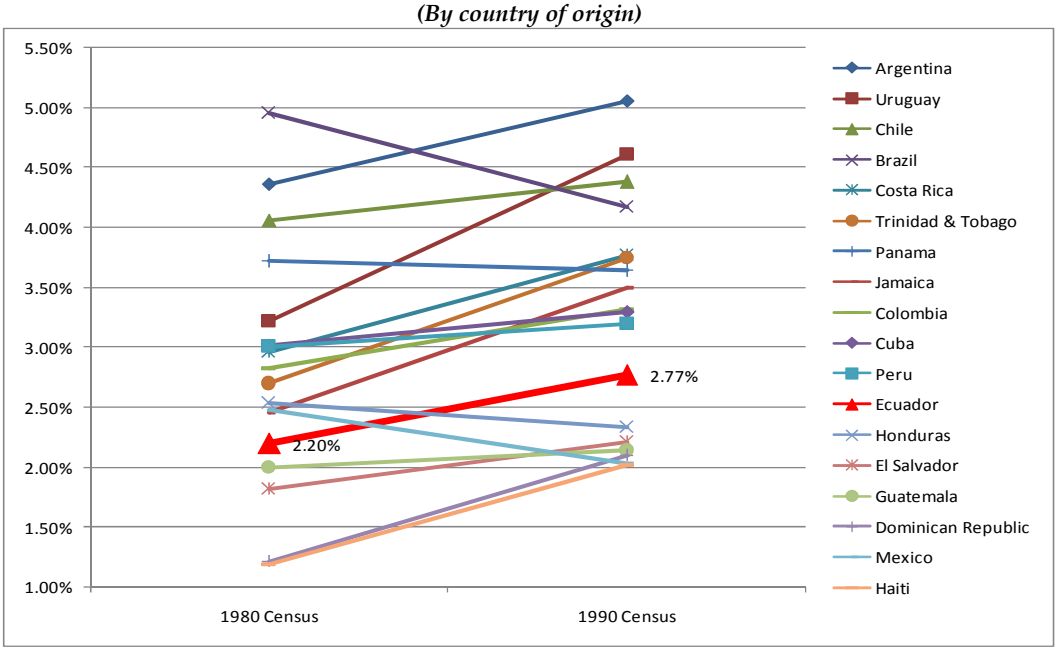
suggesting that human capital is in short supply.

Table 8. Educational Attainment of the Population Over 25
(As percent of the population aged 25 and over)

Year	Population over age 25 (1000s)	Highest level attained							Average years of school
		No schooling	First level		Second level		Post-Secondary		
			Total	Complete	Total	Complete	Total	Complete	
1950	1334	50.4	44.1	14.1	4.7	1.6	0.9	0.6	2.36
1960	1647	37.8	53.7	13.6	7.1	2.6	1.4	1.0	2.95
1965	1881	38.6	52.9	15.7	6.8	2.7	1.6	1.1	3.00
1970	2158	37.6	53.4	18.0	7.0	3.0	1.9	1.3	3.16
1975	2512	31.9	53.7	23.9	11.2	5.3	3.2	2.2	3.99
1980	2980	25.4	51.1	34.1	16.0	7.9	7.6	5.2	5.40
1985	3518	23.2	50.5	19.9	12.8	6.0	13.5	9.2	5.52
1990	4169	20.0	49.5	14.3	13.0	5.9	17.4	11.9	5.94
1995	4934	18.8	47.1	13.6	16.1	7.3	17.9	12.2	6.25
2000	5797	17.7	45.2	13.1	18.3	8.3	18.7	12.7	6.52

Source: Barro and Lee (2000)

Figure 35. Returns to Education for Immigrants to the US
(By country of origin)



Source: Bratsberg and Terrel (2002)

However, Barro and Lee (2001) illustrate that schooling rates have increased steadily since the 60s. They document that average schooling years have grown up, no-schooling rates have come down, and each year a higher fraction of the population goes to school. This last piece of evidence apparently contradicts the high returns to schooling reported earlier. A possible explanation for this puzzle is that although human capital seems to be increasing over time because more people enrolls in formal education, private returns to schooling remain relatively high because the quality of education is deficient, hence workers with "good" human

capital are still scarce.

Bratsberg and Terrel (2002) estimates of the returns to education for a sample of immigrants to the US, coming from 67 different countries reinforce such interpretation. They find a low education quality in Ecuador, as immigrants have a very low return to education (ranking 63rd in 1980 and 60th in 1990) compared to people coming from other states, including Latin American countries

While the evidence suggests that education in Ecuador is of poor quality average, this does not imply that human capital is necessarily a binding constraint to growth, as suggested by at least two pieces of data. First, Ecuador has witnessed a large wave of emigration in recent years, both to the US and Europe. Existing studies highlight that emigrants generally belong to relatively better-educated levels among the poor (Bertoli, 2006), suggesting that the shortage of labor demand has been the driver of emigration and that the scarcity of education quality may not be the most binding limitation to economic growth. Over 1996-2001 (where more detailed information is accessible), Ecuadorians emigrants had, on average, education levels similar to that of the rest of the population. However, the distribution among the different educational levels is different for the emigrants group, where the share of uneducated and that of persons with university education is lower while the proportion of primary and secondary education people is larger.

Table 9. Education levels of migrants vs. whole population
(For people over 23years old)

	Total population 2001	Migrants 1996-2001
None	10.0%	6.5%
Alphabetization center	0.6%	0.6%
Primary	38.5%	40.2%
Basic	2.8%	12.3%
Medium	0.9%	1.6%
Secondary	22.0%	21.7%
Post-school	0.7%	0.6%
University	14.3%	10.2%
Post-graduate	0.3%	0.2%
No answer	9.9%	6.2%

Source: National Census 2001

In addition, according to the World Bank 2006 Enterprise Survey, 629 out of 652 firms consider that the skills of available workers is not an obstacle for the firm's growth, and the remaining 23 firms consider the skills of available workers just a minor obstacle. These results suggest that the quality of the labor force is not a binding constraint. In the previous survey, medium-size firms were the main ones considering the skills and education of available workers as a more severe problem. Overall, while education quality is indeed weak, human capital does not appear to be key constraint to growth,

though its quality and availability seems a more pronounced problem for medium-size firms.

VI. Low appropriability of domestic investment returns

Domestic investment returns may face difficulties for their appropriability as a result of government failures, both at the micro or macro level, or market failures involving information or coordination externalities. We discuss these issues in this chapter.

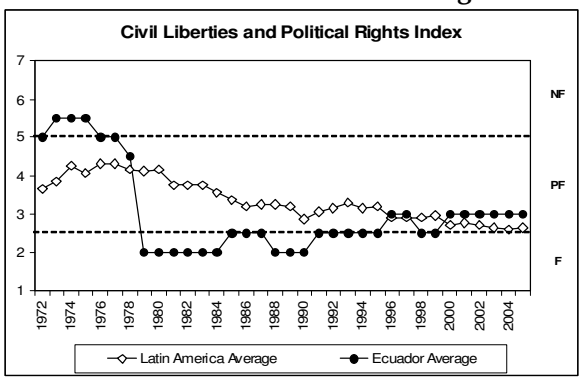
VI.1 Micro risks: the weakest link?

Almost every international survey or competitiveness assessment on Ecuador emphasize on weak institutions and governance issues, which are the focus of this section. We also present a discussion on output concentration and the potential lack of competition that could arise from it or from weak government regulation.

A frontrunner country for individual liberties

Since being the first country to return to democracy in 1979, Ecuador has had more favorable political rights and civil liberties than the Latin American average, which improved with some lag compared to Ecuador. It is interesting to notice that the lowest values (the best ones) of the index are achieved during the rule of left-winged parties while the higher values are generally associated with right-wing parties, especially due to the deterioration of the civil liberties index. While the average index of civil liberties and political rights has slightly deteriorated in recent years—reflecting a period of political instability with some presidential transitions characterized by flexible legal interpretations of the constitutional mandate—Ecuador remains one of the most developed democracies in the region, from the standpoint of individual liberties.

Figure 36. Civil Liberties and Political Rights Index

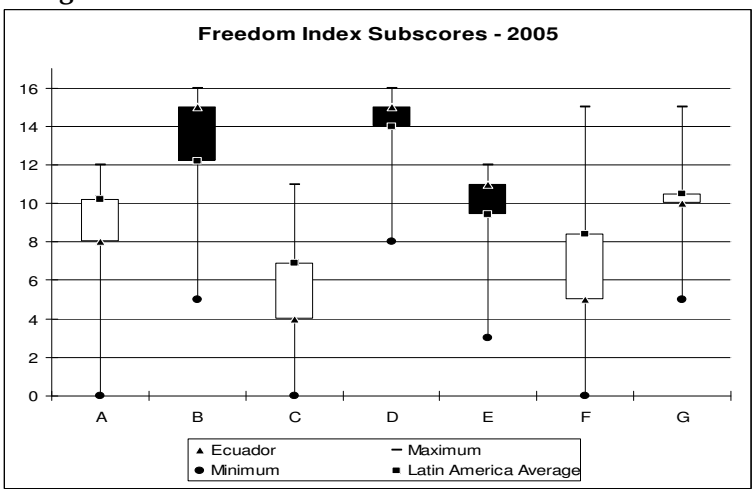


Source: Freedom in the World 2006, Freedom House.
Note: An increase in the index means a deterioration of civil liberties

These trends can be further understood from the decomposition of the overall index in specific categories, presented in the chart below both in terms of political rights—Electoral Process (A); Political Pluralism and Participation (B); and

Functioning of Government (C)—and civil liberties—Freedom of Expression and Belief (D); Associational and Organizational Rights (E); Rule of Law (F); and Personal Autonomy and Individual Rights (G). Ecuador lags behind the region in four out of seven categories. The largest gap relates to the rule of law, while the category showing the lowest value is the functioning of the government. On the other hand, Ecuador is a front-runner for political pluralism and freedom of expression and belief.

Figure 37. Freedom Index Sub scores - 2005

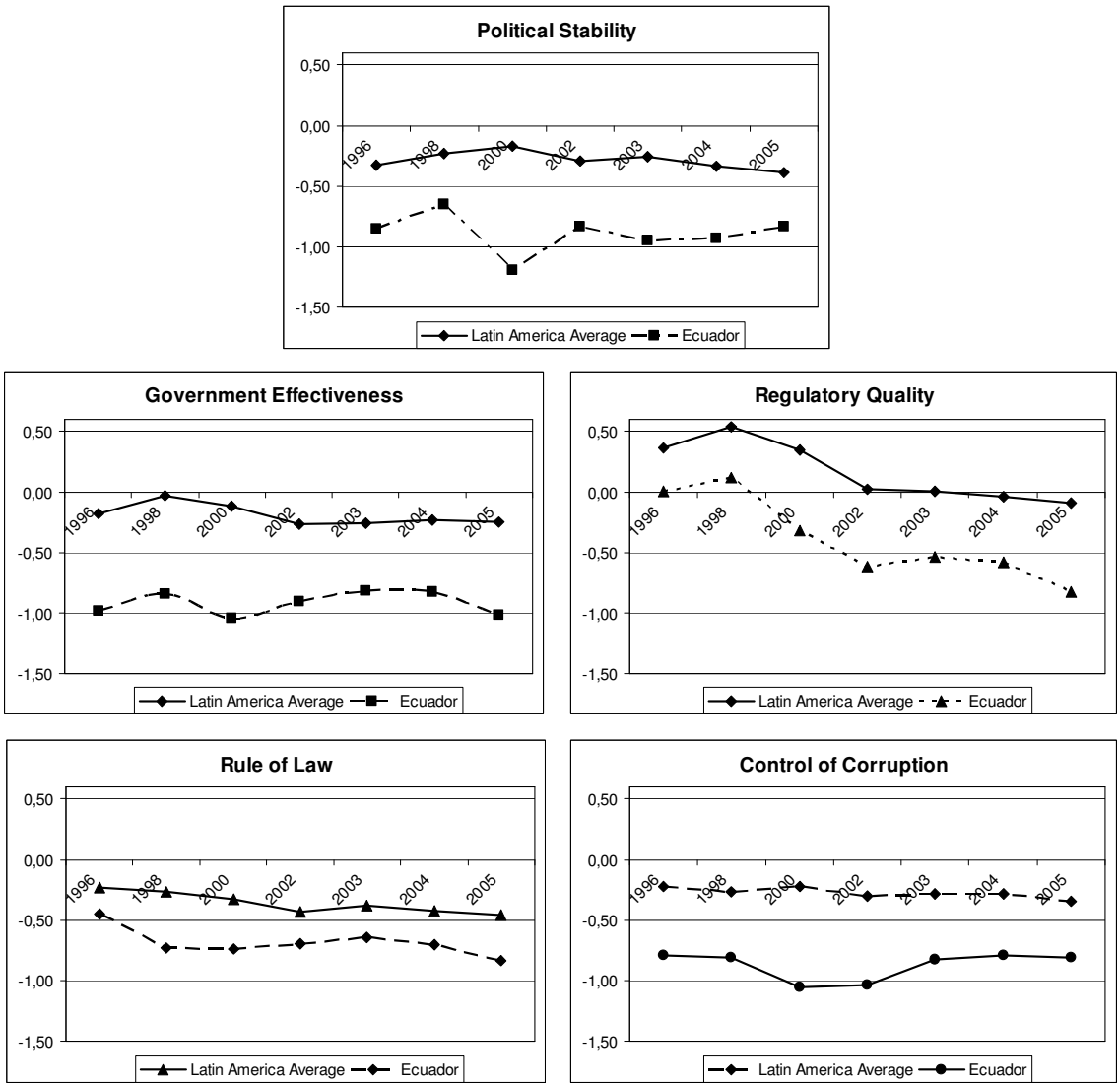


Source: Freedom in the World 2006
Note: An increase in the index sub score means an improvement

Governance and the rule of law: challenging areas

A comparative analysis of World Bank indicators on governance issues—including political stability, government effectiveness, regulatory quality, rule of law, and control of corruption—points to a relatively weak position for Ecuador within the region. Ecuador performs worse than the average Latin American country for all indicators since 1996. However, the differences are larger for some specific indicators, such as government effectiveness and control of corruption.

Figure 38. Governance, Rule of Law and Government Effectiveness
(1996-2005)



Source: World Bank
Note: An increase in the index means an improvement

The deceiving perceptions about the country's institutional environment result from several combined aspects:

With 8 presidents since 1996, instability has become a hallmark of Ecuadorian politics. Following the overthrown of former President Bucaram in 1997, no elected president has finished so far its constitutional mandate. Such instability has also reached key ministries and the management of public enterprises, hindering government effectiveness. Combined with a large financial crisis in 1999, such recurrent political changeovers have reduced the credibility of regulatory bodies as effective and independent institutions.

Successive governments have lost bargaining power with different interest groups.

For example, powerful worker unions have been able to heavily influence political decisions regarding sectors as important as education, health, or Petroecuador, where contracting system and salaries differ from the rest of the public sector.

Table 10. Corruption Perception Index

Year	Ranking	Index
2003	113	2.2
2004	112	2.4
2005	117	2.5
2006	138	2.3

Source: Transparency International

Corruption is generally viewed as an important weakness for Ecuador. The country ranks poorly in the Transparency International index on corruption perceptions. The Investment Climate Assessment highlights the issue while a survey conducted by the World Bank points to corruption as one of the top 3 reasons inhibiting private investment.

Table 11. Ecuador & Latin America: the Judiciary and Corruption

Corruption	Ecuador	Region	All countries
Typical firm to get things done (% of sales)	2.8	1.5	1.2
Firms expected to give gifts in meetings with tax inspectors (%)	1.4	5.9	30.4
Value of gift expected to secure government contract (% of contract)	7.3	4.1	2.2
Confidence level in the judiciary system (%)	29.2	55.5	59.0
Time spent resolving a dispute (weeks)	..	7.7	12.3
No resolutions in courts for overdue payments (%)	71.5	78.1	68.8

Source: World Bank

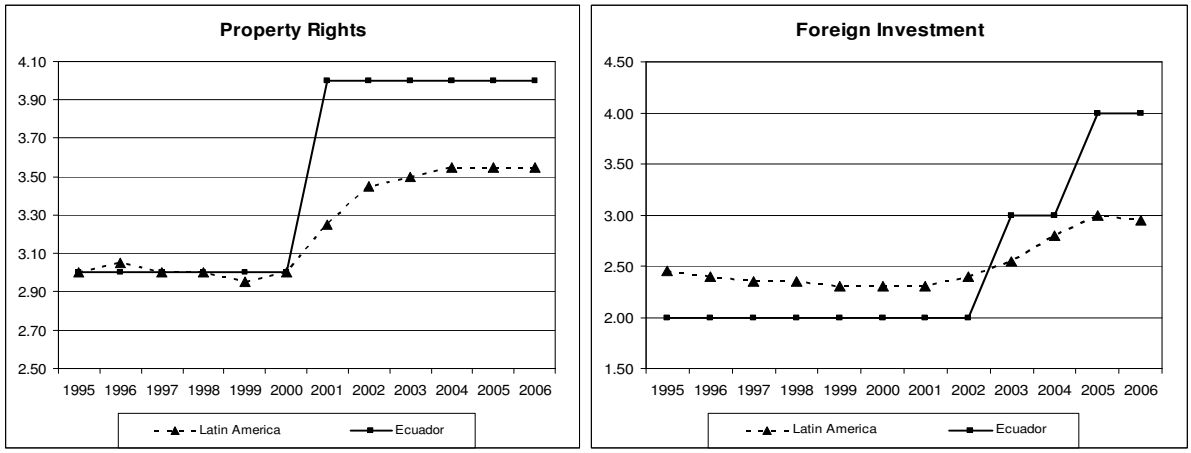
This problem is further worsened by the lack of confidence on the judiciary system. The unequal prevalence of the rule of law appears to be a recurring problem in the country, reflecting the instability in the Judicial System and the lack of consensus regarding its legitimacy. Since 1997, Ecuador has witnessed several Supreme Courts, which have partly reversed previous decisions by their predecessors and faced diverse criticisms regarding their legitimacy. Crime rates have also gone up, and security costs are relatively high in Ecuador.

The business environment hurt by institutional weaknesses

Legal and political instability, including frequent legal changes and diverse legal interpretations, reduce the attractiveness for both national and foreign private investment. This includes hard-enforcing creditor rights and legal procedures for asset recovery. According to the Heritage Foundation indexes (with lower numbers representing improved performances), Ecuador's performance regarding property rights and business environment is rather disappointing. The country has been posting growing lags with Latin America trends, especially after 2000.

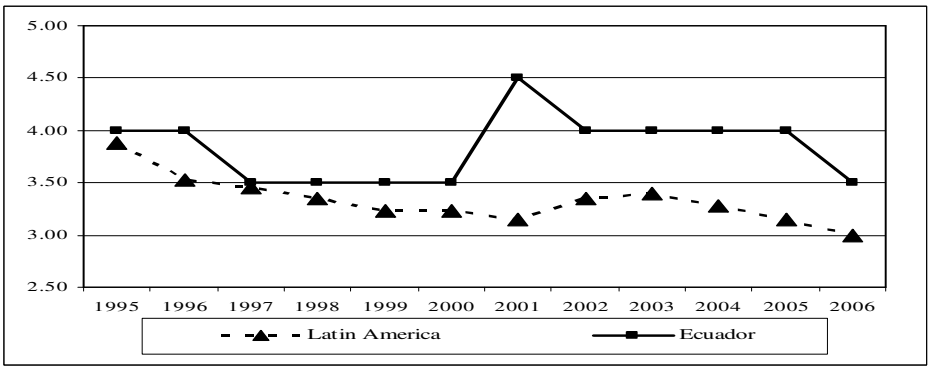
The recent decisions to force changes to the contracts with private oil companies through a new law, and to rescind the contract with US-based Occidental Petroleum Co., beyond the diverse legal positions and interpretations on the matter, have further deteriorated the foreign investment attractiveness of the country. After Argentina, Ecuador is the country facing the largest number of arbitration procedures on foreign investment issues before the World Bank-affiliated International Center for Settlement of Investment Disputes (ICSID). In addition, FDI to Ecuador has been largely concentrated in primary sectors—93.4%, according to UTEPI (2007)—especially oil, and has been extremely low in other areas, such as manufacturing industries.

Figure 39. Property Rights and Foreign Investment



Source: Heritage Foundation
Note: An increase in the index means a deterioration of property rights or foreign investment.

Figure 40. Trade Openness



Source: Heritage Foundation
Note: An increase in the index means a deterioration of trade openness

The trade openness index shows an improvement in import and export swiftness/facilities for the region average, reflecting the adoption of new trade agreements that reduced barriers and enhanced customs administrative processes. Meanwhile, Ecuador's index remained around 1995 levels as the country has signed a relatively low number of trade agreements and has now higher average tariffs than the region, with a shrinking in the trade openness ratio from 68.1% of

GDP in 2000 to 55.4% of GDP in 2004—see UTEPI (2007).

While the global tax burden is not unduly large for regional standards, the tax environment is not the most favorable for attracting foreign investment. In particular, tax-related paperwork involves about 600 working hours while the tax burden on gross profits is about 34%. The efficiency of the tax rate structure can be questioned. Corporations complain that the legal obligation to share 15% of their profits with the labor force is equivalent to a tax on firms' earnings, which cannot always be used for tax credit overseas. Also, export drawback procedures are cumbersome and involve discretionary decisions.

Tax-related problems are mentioned as severe or very severe business constraints by the respondents to the investment climate survey, both in terms of tax administration procedures (28.5%) and in terms of tax rates (34.1%). Over recent years, the Ecuadorian Tax Administration Agency (SRI) has undergone important reforms, leading to a clear improvement in tax collection efficiency, particularly for indirect taxes. President Correa's administration has announced plans to modify tax rates, by reducing VAT and increasing direct taxation, through higher income tax rates or through some tax on assets or net worth that could work as a presumptive level for income tax obligations.

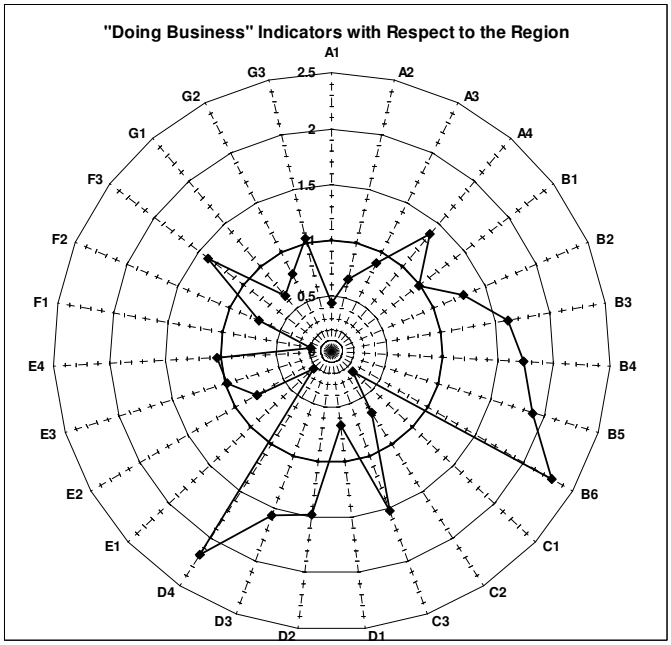
Customs efficiency is affecting Ecuadorian competitiveness, as a result of bad practices and corruption, which tend to increase import and export costs. Rodríguez (2006) highlights the existing limitations and weaknesses, including an old legal framework, heavy political intervention in the daily management of customs, the lack of harmonization of internal procedures with international best practices, weak control procedures and a limited use of technological procedures. Customs and trade regulation are cited by 24.9% of the investment climate survey respondents as a severe or very severe obstacle to doing business, an issue that appears to be more sensitive for medium and large firms. Ecuador posts weak indicators regarding trade procedures, with longer delays for exports clearance and even much longer delays for import procedures than the region averages, themselves already deceiving by international standards.

Table 12. Ecuador: Trade Indicators

Trade	Ecuador	Region	All countries
Avg. time to clear direct exports through customs (days)	5.94	4.45	4.07
Longest time to clear direct exports through customs (days)	9.37	8.79	7.59
Average time to claim imports from customs (days)	15.74	8.59	6.35
Longest time to claim imports form customs (days)	28.66	17.69	12.7

Source: Enterprise Surveys, the World Bank

Figure 41. Ecuador & Latin America: Doing Business Indicators



Main Index	Sub – Categories	
	Code	Indicator
Business Opening	A1	Minimum Capital (% of per capita income)
	A2	Cost (% of per capita income)
	A3	Time (days)
	A4	Number of procedures
Hiring Workers	B1	Hiring Costs (% of wage)
	B2	Contracting difficulty index
	B3	Labor Rigidity Index
	B4	Working Hours Inflexibility Index
	B5	Firing difficulty Index
	B6	Firing Costs (weekly salaries)
Properties Registry	C1	Time (days)
	C2	Cost (% of property value)
	C3	Number of procedures
Credit Access	D1	Lenders and Borrowers Rights Index
	D2	Credit Information Index
	D3	Private Institutions Coverage (% of adults)
	D4	Public Registries Coverage (% of adults)
Investor Protection	E1	Information Dissemination Index
	E2	Investor protection Index
	E3	Manager Responsibility Index
	E4	Shareholder Lawsuits presentation Index.
Tax payments	F1	Payments (number)
	F2	Global tax share (% of earnings)
	F3	Time (hours)
Contract Accomplishment	G1	Cost (% of debt)
	G2	Time (days)
	G3	Number of procedures

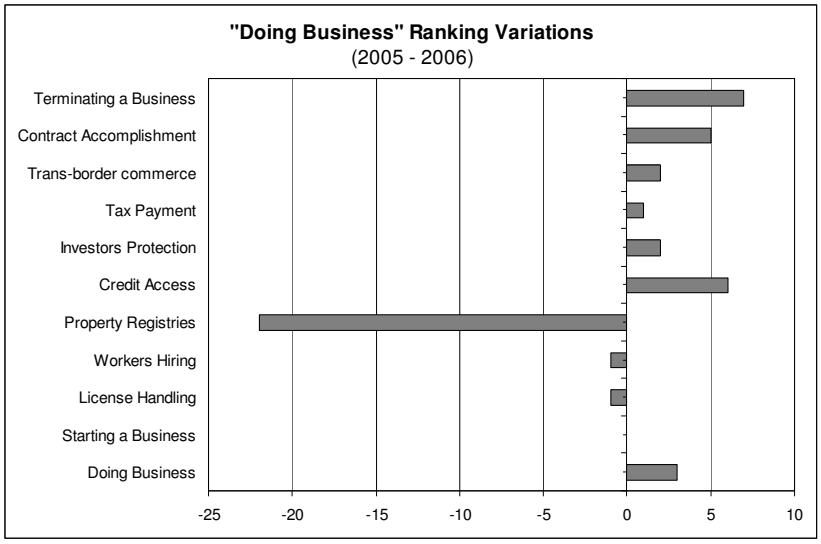
Source: Doing Business, World Bank

Business environment surveys and data—such as the World Bank's Doing Business and UTEPI-- highlight a few facts, some of them reinforcing already made comments:

- Starting a business in Ecuador is relatively fast and inexpensive, compared to the region practices;
- Hiring costs are among the lowest in Latin America while firing costs are particularly high, lower only to Brazil's ones;
- Energy costs are among the highest in the region;
- Credit access is a significant constraint, especially for local entrepreneurs;
- Indicators on investor protection, tax payments and contract accomplishment are close to Latin America averages.

Overall, Ecuador's evolution regarding business environment seems to be worsening in the last year: the country's position has significantly improved in just one area (property registration) while it has deteriorated in seven aspects.

Figure 42. Doing Business Ranking Variations

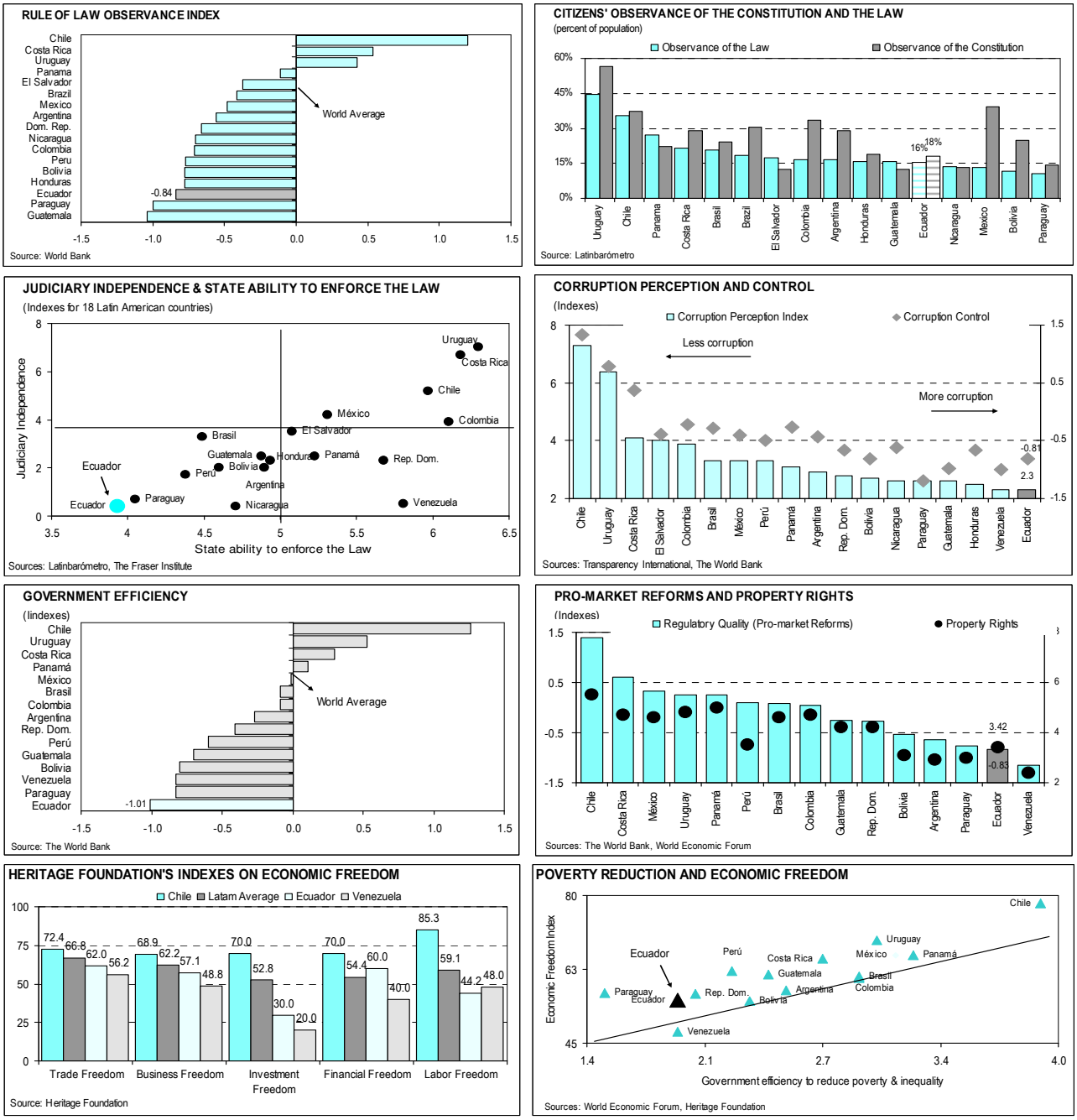


Source: World Bank

Even within Latin America (a region with clear weaknesses in such areas), Ecuador performs poorly in many indicators related to microeconomic risks and appropriability. The worse items appear to be governance, the rule of law and law enforcement, corruption, and political instability. In turn, these factors have been hampering a stronger business environment, the predictability of investment decisions and the country's attractiveness to new businesses. This area is clearly, in our view, a binding constraint to growth. However, overcoming such constraints is a difficult and long-term challenge. Ecuador's recent history of repeated political instability, constitutional changes and power struggle is, in some sense, a reflection of the weaknesses in these areas. Social inequality has been also a factor making it

more difficult to achieve basic consensus in terms of the rule of law and its enforcement. This feature is also apparent when examining Ecuador's difficulties to reach a social consensus in terms of macroeconomic basic equilibriums.

Figure 43. Institutions and Business Environment



Sources: World Bank, Latinobarómetro, the Fraser Institute, Transparency International, World Economic Forum, Heritage Foundation.

Is there an unfair environment for market competition?

In a country with weak institutions, high inequalities and lacking an Antitrust Regulation, the presence of strong economic groups with a large involvement and influence over political decisions could result in inefficient public decisions in terms of ensuring a reasonable framework for free-market competition in diverse economic sectors. Firms related to powerful interest groups could become local monopolies—thus producing less output than the optimal amount under perfect competition—and shield behind regulation or decisions over tariff and non-tariff barriers to deter entry and competition. Public policies could provide an undue protection to specific sectors, privileged financing or lead to over investment in sectors with poor rates of returns and productivity but being able to influence public policies through their political power. However, the presence of powerful groups controlling large sectors of the economy, with concentration of economic assets, does not necessarily result in low growth, as the examples of Chile or South Korea can attest. Also, output concentration and market power might not be undesirable if natural monopolies exist.

We performed several estimates to assess whether empirical connections can be established between economic sectors with a low degree of competition and indications of protective policies and non-competitive behavior, which could hamper growth. Based on firm-level data from the *Indicator* Database, fed annually from balance sheets and income statements 27,606 active firms in Ecuador, a Herfindahl-Hirschman index for market concentration can help to identify sectors where some economic groups have a significant market power. Details are explained in Annex H, with detailed results for the 50 largest private economic sectors (without a strong state regulations), as well as for the 50 largest state-controlled or state-regulated sectors (including publicly-controlled sectors but also minerals extraction, telecommunications, and sectors related to the financial industry as the entry condition is mainly a government-related decision).

Within private sectors, output concentration is not large for 43 sectors (7%), is moderate for 64 sectors (10%), and is significant for 527 sectors (8%). The latter ones account for 40% of total sales in the sample. From another perspective, among the top 50 sectors in sales (adding up to 70% of total sales), 21 sectors are classified as concentrated, 9 sectors are moderately concentrated and 20 do not show evidence of concentration.

Not surprisingly, all of the state-controlled or state-regulated sectors are either concentrated or moderately concentrated, suggesting some evidence of government failure to foster competition in those areas.

Overall, the Ecuadorian economy appears to be characterized by a significant market concentration. Can such concentration be related to sectoral economic performance; are public policies—through trade protection measures—more protective of the more concentrated sectors? To formally explore the link between

market power and economic performance, we estimate a panel equation (across sectors and years, see Annex H) where the economic performance for sector *i* at time *t* depends on several explanatory variables, including the Herfindahl-Hirschman index of output concentration; the sectors' share in total sales; real GDP per capita growth rates for Ecuador and the US (varying with the time but not the sector, to control for an aggregate event that might affect the whole panel); and a fixed-effect estimator, to control for any unobservable constant feature specific for each sector. Different alternative variables were tested to reflect the economic performance variable, to capture profitability or the investment rate for each sector. The weighted return on assets and the weighted return on equity were used as proxies of profitability, while the growth rate of either total assets or net fixed assets was used as a measure of investment at the sectoral level.

The OLS estimation results (see Annex H) suggest that the degree of output concentration is positively correlated with the return on assets and the return on equity, with statistically significant results. As expected, sectors with higher concentration would be more profitable. However, the interpretation of such result is ambiguous. On one hand, a higher concentration, related to a stronger market power, may allow higher margins and increased profitability. On the other hand, more profitable firms may grow faster, thus increasing their market share within their sector, leading to more concentration. From an econometric perspective, disentangling the relationship between market power and economic performance is not easy because of reverse causality.

In addition, the estimates do not find a significant link between the investment rates—measured by assets growth or by net fixed assets growth—and output concentration. In a competitive environment, profitability should translate into higher investment rates, which in turn would help the firms to grow faster. The results suggest that this is not occurring. A potential explanation is that firms may be holding large market power for other reasons (including some over protection from public policies), and that power would allow them to increase profitability without necessarily investing more. However, the results should be taken with caution. Ideally, we should look for instruments for the concentration measure. Unfortunately the *Indicador* database doesn't provide an exogenous variable that can be used as instrument. Also, the database only allows an indirect and imperfect measure of investment (through the growth of the firm's assets or net fixed assets), which involves some degree of approximation. An additional way to assess the preferred economic interpretation is to observe whether public regulation could explain the degree of market concentration.

Subsequently, to assess to what extent powerful economic groups might limit competition within their sectors through unfair regulation, we built up different measures of trade protectionism, as proxies of the state's decision to protect specific sectors. Using CIIU data at the 4 digits level, the variables that capture some degree of protection include: the average tariff by sector; the ratio of mean

tariff to tariff range by sector; an index of trade protection for each sector negotiated under the draft agreement in the FTA negotiations with the U.S.: a similar index of trade protection for each sector under the agreed CAN-MERCOSUR agreement; and an index including the share of forbidden-import merchandise within each sector. The correlations between the protection measures and the market concentration index are not statistically significant, suggesting that those sectors with a strongest output concentration are not necessarily better protected under trade agreement negotiations or through tariff decisions.

Alternatively, trade policy may have been used to protect products or sectors that may have a strategic value, in the Hausmann, Hwang and Rodrik (2005) perspective (see Section VI.3). As for import substitution policies, trade policy has long been thought as a powerful policy tool to protect domestic industries against foreign competition until local industries reach levels of development similar to their competitors. Trade protection indicators and the Hausmann and Klinger (2006) data (see Annexes H and I) are then combined to assess whether trade policy has been somehow effective in terms of protecting those sectors with strategic value. As measures of product sophistication and density in the product space, we use the PRODY and DENSITY variables, as defined by Hausmann and Klinger. The PRODY variable captures the degree of revealed sophistication implicit in each export product. The DENSITY variable assesses the likelihood that a specific product might be exported, by looking at its proximity to a group of products where a comparative advantage has already been established. Those two variables have been aggregated to a CIIU 4-digit level classification (see Annex G), for which trade protection variables are available.

The correlation results suggest that: (i) if anything, trade policy is aimed at protecting the "wrong" sectors, in terms of the sectors' strategic value or sophistication; and (ii) trade policy is protecting sectors with some export potential. However, as Hausmann and Klinger point out, a country might be exporting goods with low strategic value, thus a higher DENSITY level may not necessarily correspond to products with high sophistication. Hence the last result should be taken with caution.

Overall, the statistical review of the individual firms' data shows that Ecuador is indeed characterized by a high degree of output concentration in an important number of economic sectors. A larger output concentration is generally associated with higher profitability, but do not appear to be related to a faster pace of investment. The data analysis is not conclusive enough to support the hypothesis that public policy decisions—measured through trade protection policies—have been particularly protective of highly concentrated sectors. Finally, trade policy does not appear to have been protecting products with a particularly high revealed sophistication. Thus, we have not found strong enough evidence to empirically support the idea that policy decisions have been protecting vested interests and hampering growth opportunities.

Box 1. Vested Interests: Limited Quantitative Evidence on a Pervasive Issue

Vested interests can play a role to influence public policies and the decision-making process in order to maintain existing privileges, over protect existing industries, reduce competition or push for investment in non-priority areas. While this behavior could be pointed out in many countries, several facts discussed across this paper suggest that Ecuador is more vulnerable than others in that area:

- While the 1999 financial crisis can be seen as the result of several combined reasons—weak regulatory standards, macroeconomic shocks, and financial dollarization—it is clear that special interest players had a key role, including an undue influence of special interests on key legislative and executive decisions, large related lending combined with some capture of regulatory institutions—see De la Torre, García-Saltos and Mascaró (2001) as well as Jácome (2004).
- The presence of large oil revenues enhances the risks of State capture by special interests to control significant rent-related revenues. The macroeconomic section emphasizes the influence of special interests in exacerbating budget rigidities and fiscal procyclicality, as well as distorting expenditure decision during the budget implementation process in favor of politically powerful groups rather than the population with the weakest public service coverage.
- Two areas under public control where underinvestment is a clear reason behind low growth—oil and electricity—also suffer from inefficient and non-transparent markets. Delayed and inefficient investments and policy decisions have allowed the survival of lucrative and non-competitive businesses, large-scale smuggling, generalized and regressive subsidies, and longstanding non-recovered debts. Overall, inefficiencies in these sectors have been particularly important to impede a faster growth throughout the economy and to allow more progressive fiscal policies in favor of the most vulnerable population segments.
- Several economic sectors, especially for state controlled or regulated areas, are subject to significant market concentration. Panel data suggest that output concentration is related to higher profitability but not necessarily to (indirectly-measured) investment rates: a potential—while not the only one—explanation would be that firms holding large market power and high profitability benefit from some policy protection shielding competition despite limited investments in the sector. However, we did not find convincing evidence that highly concentrated sectors benefited from special protection under trade agreements.

While the quantitative evidence to analyze and detail the extent and impact of vested interests remains limited, the combination of the above-mentioned factors can potentially imply a significant constraint to economic growth. From that perspective, Ecuador should make every effort to enhance transparency in public decisions and to develop databases to better assess market concentration and the accountability of private businesses. On another front, the absence of strong regulatory institutions that would be widely perceived as technically driven and independent has hurt the ability to foster social consensuses on sound macroeconomic policies and the state's capacity to provide public goods conducive to growth. This highlights the importance of minimizing the risks of capture of critical institutions by special interests.

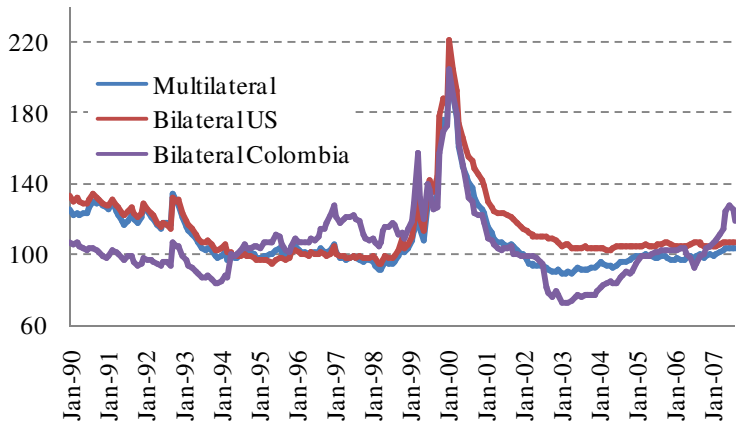
VI.2 Macroeconomic environment: hard to reach social consensus

Since its return to democracy in 1979, Ecuador has faced recurrent difficulties to reach a sustainable consensus on fiscal policy management. This can be observed through the various legal reforms over fiscal management, some of which have been very short-lived. One of the causes behind such instability is the mistrust between the different actors involved in fiscal matters. Such mistrust becomes even more evident by looking at the high number of earmarking regulations regarding both fiscal revenues and fiscal expenditure.

In addition, Ecuador's adoption of full dollarization has helped the country stabilize its economy, expand the timing horizon of economic agents—particularly through the availability of longer term loans—and helping to ensure low inflation. However, dollarization implies medium-term risks and rigidities for macroeconomic management.

So far, Ecuador has benefited from a benign international environment and the depreciating trends of the U.S. dollars, which have helped the country maintaining its external competitiveness, despite the real appreciation trends related to high domestic inflation in the post-1999 years, which counterbalanced the initially very high real depreciation observed over 1999-2000, when Ecuador witnessed a large nominal depreciation of its currency before adopting dollarization. Indeed, real exchange rate figures show that the multilateral real exchange rate so far in 2007 is, on average, 5.5% more depreciated than it was in 1998, before the financial crisis took place.

Figure 44. Real Exchange Rate Trends
(1994=100; increase means depreciation)



Source: Central Bank of Ecuador

However, the lost margin of maneuver for monetary and exchange rate policies would imply, if the country is faced with some external shock, a larger dependence on fiscal and labor flexibility to adapt. This section discusses issues of political

instability and its impact on fiscal issues, fiscal procyclicality, the budgetary process and labor regulation.

Unstable political equilibriums and vulnerable fiscal fundamentals

The relative powers of the different players involved in the budget preparation, approval and implementation have significantly changed in recent years. In 1998, the Constituent Assembly introduced deep constitutional reforms giving the President larger powers over budget issues while limiting Congressional attributions. Congress was forbidden to increase total public revenues or expenditure and was only allowed to introduce budgetary changes at the sectoral expenditure level (instead of the highly detailed changes it was able to introduce previously).

Such changes were accompanied by modifications to the electoral process involving a different regional perspective to Deputies (they became more "provincially marked", as national Parliamentarians disappeared) and a longer tenure (4 instead of 2 years). According to Mejìa et al. (2006), those reforms led to an unintended perverse combination. While the Presidential powers were strengthened (thus removing some incentives to look after legislative coalitions), the reforms also impeded the Parliamentarians the possibility to build up formal links with their constituencies through the budgetary process, as Deputies lack any legal option to direct public funds to their provinces. As a result, political parties were weakened while local governments were strengthened as they took over enhanced responsibilities as intermediaries between the population and the central administration. Such changes rendered the budgetary management more complex, as the distribution aspects behind the budget are not anymore solved in the budget approval process but keep reappearing throughout the budget implementation, when local authorities press for additional financing for local purposes. Thus, the budget ends up being modified extremely often, as pointed by Cueva (2007).

One of the clearest examples of the unstable equilibriums achieved on budgetary issues is the Fiscal Responsibility and Transparency Law (LTRF, by its Spanish acronym). Initially approved in 2002, the law was issued to limit the risks that additional oil revenues could result in risky large increases for public expenditure. The law was indeed approved in a period when a growing oil production was expected (thus boosting fiscal revenues), as the construction of a new heavy crude oil pipeline was moving ahead. Also, Parliamentarians still had clear memories from the 1999 financial crisis. That situation facilitated the achievement of a Congressional consensus over the legal reforms, partly because the changes were to become binding only after the then President and Parliamentarians would end up their tenure by 2003. Thus, none of the involved players was constraining the financing flows at their disposal or their ability to direct such funds with some electoral purposes, including a potential reelection for Deputies.

Three years later, by 2005, the economic environment had changed, mainly

because of the significant increases in oil prices. Both the Palacio administration and the Congress then in place felt constrained by the law and pushed for large reforms, including the rolling-back of some critical aspects of the law. Legal changes were quickly approved, allowing the changes to be effective for the approval of the latest annual budget under the Palacio administration, also the latest budget approval by the Parliamentarians who agreed on the changes. The budget was then approved with a marked increase in public expenditure (13% in real terms), improving the electoral chances of the actors in place.

This story is intended to exemplify how unstable fiscal consensuses are in Ecuador, with a large vulnerability with respect to changing incentives of political actors, and how inconsistent may be the political agents' behavior with respect to a sustainable policy over time aimed at limiting macroeconomic volatility.

These political difficulties to achieve fiscal consensus are partly the reason behind Ecuador fiscal vulnerabilities. In recent years, the country has achieved strengthened fiscal indicators, with fiscal surpluses and declining public debt levels compared to GDP. This has been achieved, in large part, thanks to exceptional oil revenues related to international oil prices. However, Ecuador is prone to fiscal procyclicality (see below) and the fiscal figures mask some vulnerabilities arising from contingent liabilities. For example, Ecuador is subject to a number of ongoing international arbitration procedures that could potentially imply fiscal costs down the road. Additionally, the pension system currently holds excess liquidity as a reflection of the demographic structure but the actuarial structural position of the pension system highlights a large disequilibrium that will need to be corrected over time.

Fiscal procyclicality

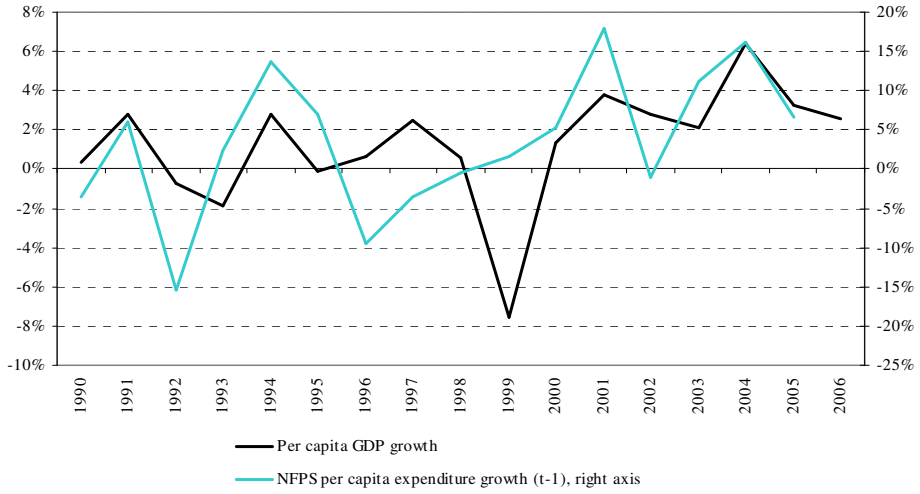
In recent years, and following the 1999 acute financial crisis and the country's adoption of dollarization, macroeconomic risks have become less important, at least in the short-run. Favorable oil prices, a benign international environment and large remittances from workers abroad have helped to maintain generally positive macroeconomic indicators, even in periods of political turmoil. As for other Latin American countries, Ecuador is thus facing a particularly favorable international environment, which may be masking underlying macro vulnerabilities.

Despite these recent improvements, Ecuador's history shows that the country is vulnerable to macroeconomic shocks. Growth trends clearly show the risks that financial or fiscal/external crisis imply for medium-term growth prospects. The combination of a volatile political environment (with the questionable record number of Presidents or Economy Ministers over recent years) with an economy subject to external shocks and dependent on natural resources makes it critical to ensure mechanisms for a prudent macroeconomic management. As discussed in section II.4, Ecuador economic crises have often occurred as a mix of weakened fiscal & debt sustainability, low prices of key commodities, and constraints to

attract foreign savings. In addition, dollarization has reduced the margins of maneuver for monetary policy and amplified the risks arising from foreign developments that could reduce access to international markets while increasing interest rates. In this context, building liquidity and fiscal cushion in good times would enhance the country's ability to successfully address potential shocks.

An obvious step to mitigate macroeconomic risks would be to build savings funds or to repay public debt in good times, so as to set up a cushion for risky situations (another one would be to strengthen the banking system and bank resolution procedures). However, Ecuador has not been precisely characterized by a counter cyclical fiscal policy and by effective mechanisms to channel extraordinary fiscal resources to debt reduction or savings funds. These shortcomings in fiscal policy are clearly one of the issues that the country could address to reduce growth volatility and the large costs related to recurrent macroeconomic crises.

Figure 45. Growth and Public Expenditure



Source: Central Bank of Ecuador

Over 1990-2006, there is a clear correlation between real per capita GDP growth and real per capita public spending (for the non-financial public sector), lagged for one period, with a corresponding correlation coefficient of 0.45. This suggests that a year of faster economic growth is typically followed by a year of faster public spending growth. Thus, public spending policies do not appear to mark a counter cyclical path. Instead, public expenditure tends to reflect the availability of existing funds, which in turn depend on economic activity.

A potential explanation for such trends is the lack of clear incentives for governments to adopt, during economic booms, any kind of counter cyclical fiscal policy boosting savings. On the contrary, public spending tends to follow the availability of public funds, reflecting the lack of social consensus for prudent fiscal policies. The scarce attempts to introduce prudential fiscal rules have been based on fragile political agreements. For example, the Fiscal Responsibility Law

approved in April 2002 aimed at limiting the growth rates of central government spending. However, the Law was largely overhauled in May 2005, de facto eliminating key regulations constraining public expenditure (see Mejía et al, 2006).

Budget rigidity

Public spending in Ecuador is characterized by a highly rigid structure, impeding government to implement active fiscal policies or modify in a significant way fiscal priorities within the General Budget. In recent years, at least three separate studies have reached similar conclusions regarding budget rigidities. World Bank-IDB (2003) mentions earmarking rules and other inflexible elements in the short-run as adding up to 98% of the overall budget, while Almeida et al. (2005) estimates that share at 92%. Finally, Cueva (2007) estimates the budget rigidity at about 96%, depending on the level of fuel subsidies. This large rigidity implies that successive governments, independently of their ideological preferences, have hardly any margin of maneuver to change the structure of public expenditure. A large share of such inflexibility arises from legally established and hard to change earmarked revenue or expenditure. Thus, the recurrent annual budgets reproduce the earmarking of previous years, perpetuating a rent-based system whereby every agent with some political influence tries to ensure some earmarking procedure ensuring revenue flows without any results-oriented system. The earmarking system is one of the main factors behind the deceiving quality of public expenditure, which partly reflects a natural resource course.

In recent years, subsidies on the domestic prices of oil derivative products have become an increasing source of public spending rigidity. In 2007, the total (implicit and explicit) costs of oil derivative subsidies are estimated at US$2,315 million, equivalent to 28.7% of the General Budget (but not explicitly included in the budget, as subsidies are recorded as "negative" revenues, which are retrenched from Petroecuador transfers to the Central Government). In 2002, the subsidies added up to only US$160 millions, equivalent to 3.3% of the General Budget. Such impressive growth of subsidy-related costs can be explained as the consumer process of gasoline and diesel have remained unchanged since January 2003 and that of LGP has not moved since February 2001. As international oil and oil derivative prices have markedly increased in recent years, the State has supported the growing difference between producer and consumer prices, reflecting the governments' political difficulties to gradually adjust consumer prices. Indeed, a decision to increase LPG final process was one of the critical elements behind the ousting of former President Bucaram from power in 1996.

In view of hard to reach political agreements over fiscal policies, can budget rigidities and earmarking act as second-best alternatives to limit procyclical fiscal trends, thus reducing macroeconomic volatility? This view can only be partially sustained, for several reasons:

- Budgetary earmarking implies a reduced margin for governments to take

advantage of favorable economic cycles for developing much-needed infrastructure in sectors with strong state intervention, such as oil and energy. As a result, long-term growth and fiscal revenues end up being affected.

- While budget rigidity hampers an open and transparent discussion of budgetary priorities, it is combined with a highly discretionary budget implementation system, whereby agents with strong political powers, including regional leaders, end up obtaining a largest share of the pie. As growth-enhancing or poverty-reducing programs may end up being sidelined throughout the budget implementation process, they can still face larger constraints in the economic busts and suffer from fiscal procyclicality more than other areas.
- Finally, the procyclicality of fiscal policies is precisely one of the main reasons behind the recurrent political pressures to introduce earmarking schemes and budget rigidity. Regional entities and diverse public sector institutions look after some earmarking features protecting their revenues, as they fear being left unattended in bad economic times. From a political standpoint, a reduction of budget rigidity would probably not be sustainable unless some mechanism ensuring some stability of fiscal accounts can be put in place, so as to provide assurances to the relevant actors that their fiscal-related revenues would not be overly affected in case of a shock. Thus, one could suggest that, should some initial political agreement could be built around it, a Chilean-style scheme targeting a structural fiscal target could reduce incentives for added earmarking systems.

Labor regulation

As mentioned, the stronger rigidities for macroeconomic management imposed by dollarization suggests that, together with a counter cyclical fiscal policy, Ecuador would benefit from labor flexibility for its ability to confront potential shocks. Botero et al. (2004) compile comprehensive measures of labor regulation from a regional perspective. In a sample of 13 Latin American countries, Ecuador is the worst performer in collective disputes and second worst performer in collective relations laws index (the worst performer is signaled thereafter in parenthesis). Ecuador is the third worst performer regarding the cost of increasing working hours (Dominican Republic) and the fifth worst performer with respect to dismissal procedures (Mexico), labor union power (Peru) and old age, disability and death benefits (Mexico). However, Ecuador is ranked over the median for measures like employment laws index (Venezuela), unemployment benefits (Colombia), sickness and health benefits (Argentina) or firing costs (Chile). While Ecuador appears to have room to improve its labor regulation, the evidence is mixed evidence regarding labor regulation and flexibility. Labor rigidities could

indeed affect the country's ability to cope with macroeconomic shocks and imply higher formal unemployment rates and a reduced capacity to implement sectoral reallocation of production factors. However, the large size of the informal and unregulated labor markets reduces such constraint. Considering all that, beyond the constraints posed by labor regulation, labor rigidities do not appear to be a critically binding constraint for growth.

All in all, Ecuador's history highlights the risks for medium-term growth of macroeconomic instability, arising either from fiscal or financial flaws. From that perspective, macroeconomic stability remains an Achilles' heel of the country. While the current benign environment may have reduced its visibility, we are of the view that this is a potentially significant binding constraint to the country's sustained growth prospects.

VI.3 Market failures: coordination or information externalities

As presented in section II.2, export products, especially commodities, have been critical as drivers of Ecuador economic growth. However, as discussed by Hausmann, Hwang and Rodrik (2005), the economic development process partly relies on innovation and self-discovery, including new ideas for profitable areas and new investments. In that, sense, the kind of goods and services produced by each country is important because the production of some specific goods and services can make it easier to "jump" to the production of other merchandises. This topic can be explored from different perspectives: how developed is Ecuador's industrial base and its technological content, how well-positioned in terms of innovation and self-discovery is the Ecuadorian economic structure, and whether there is room for industrial policy.

A weak industrial base

Ecuador has failed to strengthen its manufacturing sector, despite some voluntarism in economic policies during the 1960s and the 1970s (see Box 2 later). According to a recent joint study by UNIDO and the Ecuadorian Industry Ministry, led by UTEPI (2007)—a study with comparisons among 17 Latin American countries, excluding the Caribbean economies, as well as Belize, Guyana and Suriname—Ecuador's manufacturing value-added, at US$231 per capita in 2004, remains one of the lower among Latin American countries (only larger than in Honduras, Paraguay, Nicaragua and Bolivia), despite having witnessed an 8.4% nominal growth rate since 2000, the fastest pace in the region but slower than the nominal growth rate for the overall GDP. Also, the GDP contribution of Ecuador's manufacturing value-added was just below 10% of GDP in 2004 (down from 13.6% in 2000), lowest than for all the Latin American countries but Panama. The manufacturing sector provides about 14% of total employment.

The technological complexity of the Ecuadorian manufacturing industry is limited,

as medium and high-technology activities represent about 15% of the total manufacturing value-added, a proportion placing Ecuador only ahead of Nicaragua, Panama, Honduras and Bolivia among 17 Latin American countries. Finally, as reported in Annex B, average manufacturing labor productivity is very low for Ecuador (only ahead of Bolivia and Guatemala in 2004), despite some recent improvements. These indicators emphasize that Ecuador's industrial base remains rather weak and technologically unsophisticated. UTEPI has prepared an index on industrial competitiveness, which combines 14 different indicators of industrial performance, including productive and export capacity, the complexity of the industrial process, the structure of manufacturing exports, export dynamism and product and market diversification. Ecuador ranks poorly from this perspective: 14th out of 17 countries in 2004, an unchanged ranking from 2000 with a worsening of the quantitative combined index.

Table 13. Latin America, Industrial Competitiveness Index, 2000-04

Latin America ranking		Country	Global Index	
2004	2000		2004	2000
1	1	Mexico	80.9	80.6
2	3	Costa Rica	53.1	47.7
3	2	Brazil	51.1	49.7
4	4	Argentina	43.4	43.0
5	5	Chile	36.9	30.5
6	6	El Salvador	34.0	29.9
7	7	Venezuela	33.7	27.4
8	8	Guatemala	28.9	26.4
9	9	Uruguay	28.4	25.7
10	10	Colombia	26.6	22.5
11	11	Peru	21.8	17.4
12	12	Honduras	20.5	16.0
13	17	Nicaragua	16.5	10.3
14	14	Ecuador	11.8	12.8
15	13	Bolivia	11.4	15.7
16	15	Panama	10.2	12.6
17	16	Paraguay	9.5	10.4

Source: UTEPI (2007), World Development Indicators, UN Comtrade, INDSTAT

Regarding the relationship between export performance and the industrial base, Ecuador's manufacturing exports, measured in US dollars, grew at an average annual rate of 8.4% during 1995-2004, a similar pace than the region's average. Per capita manufacturing exports, at $114 in 2004, place Ecuador at the 12th place among 17 Latin American economies (2 places higher than 4 years earlier).

Regarding diversification, Ecuadorian manufacturing exports are also largely concentrated: 51% of 2004 total manufacturing exports corresponded to only 5 products (fish & seafood preserves and preparations; oil derivative products; oil residual products; fruit preserves and preparations; wood boards & plywood), all of them resource-based and with limited technological content. In addition, manufacturing exports are also geographically concentrated, Latin America, the

US and the European Union being the destination of 94% of all manufacturing exports in 2004 (of which 50% for Latin America alone), while exports to Eastern Asia are only 1.5% of total manufacturing exports.

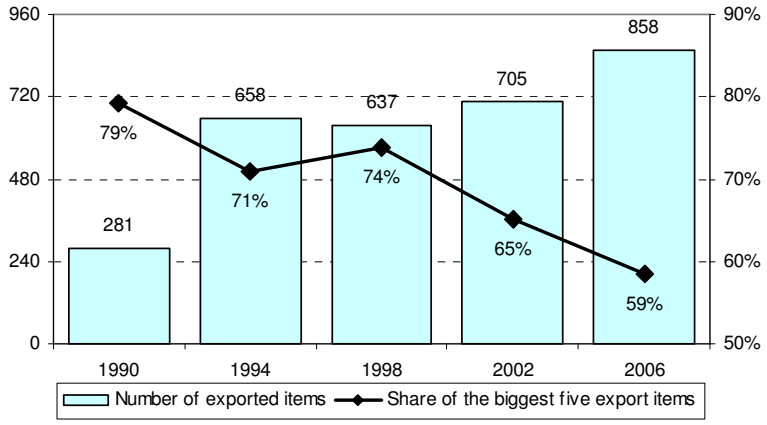
Ecuadorian exports tend to have limited technological content, partly reflecting the dependence on oil and agricultural primary products. Manufacturing exports represented only 20% of total exports in 2004, with the lowest ratio in Latin America but Venezuela. Middle and high technology manufacturing exports were only 3.1% of total exports, placing Ecuador only ahead of Peru and Panama. Moreover, Ecuador's per capita exports for the 20 more dynamic and significant manufacturing products in the global trade, ranking 12 among 17 Latin American countries. According to IDB (2001), Ecuador's expenditure in research and development, access to computers and Internet, and the number of researchers in the labor force tend to be rather low by regional standards. UTEPI (2007) shows that exports with a significant technology component tend to be scarce and are areas where Ecuador is loosing market share in international markets, with the main exception of pharmaceutical and telecommunication products. However, as mentioned in Section II.2, Ecuador industrial exports have seen their share of non-oil exports growing.

Innovation and self-discovery

Ecuador's dependence on a few commodities and its lack of industrial sophistication hampers the country's ability to take full advantage of globalization trends. De facto, Ecuador has been largely specialized in sectors with (i) a limited growth in terms of global trade; (ii) limited value-added and larger risks of increased competition and reduced margins; (iii) lower externalities in terms of innovation, learning-by-doing and knowledge diffusion. In that regard, it appears that Ecuador is among the less-well placed economies in the region in terms of "catching the train" of those sectors with strong prospects in the global trade, way behind regional leaders from that perspective, such as Mexico, Costa Rica or Brazil.

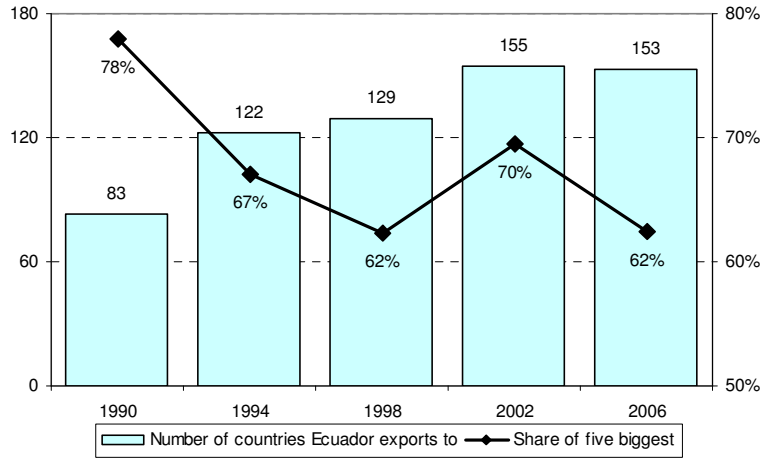
In the last two decades there has been some diversification of Ecuadorian exports. This can be seen in the number of items exported, as well as in the destination of Ecuadorian exports. The share of the largest five non-oil export products declined from 79% in 1990 to 59% in 2006. Over the same period, the number of exported items increased from 281 to 858.

Figure 46. Ecuador: Non-oil export diversification by product
(Number of exported items)



There has also been some diversification in the destination of Ecuadorian exports. In 1990, Ecuador exported products to 83 countries, a number that rose to 154 countries in 2006. The share or the five largest destinations also declined from 78% to 62% between 1990 and 2006.

Figure 47. Ecuador: Non-oil export diversification by destination
(In number of export destinations)



There are few studies on self-discovery for Ecuadorian exports. Hernández et al (2007) analyze the cases of heart of palm, broccoli, flowers, mangoes and tuna in airtight containers. Few similarities can be found between these products, the most relevant ones being that pioneers were well educated entrepreneurs with knowledge of key market information, some access to senior public officers (which helped them pushing some key policy decisions that boosted the pioneering activity) and some public financing from the state-owned second–tier bank, the *Corporación Financiera Nacional* (CFN).

The successful cases appear to be the combined result of creativity and luck, and not the result of a systematic search for new markets. Out of the firms involved, very few were established firms and most were created for the specific purpose of exporting the successful product. In most cases, real exchange rate depreciation helped the new exports, although such policy—that was mainly the result of undisciplined macroeconomic policies in the late 1980's—was not specifically aimed at enhancing international competitiveness. As already mentioned, the only intentionally focused public policies were credits from the CFN.

UTEPI provides a detailed study regarding the exports structure in relation to the world demand for products and their individual trends. This permit to classify exports as champions or "star products" (where Ecuador sees its world market share growing while world demand for the product is above-average), "declining products" (declining Ecuador market share among a limited world demand), "stars in adversity" (when Ecuador market share rises despite a constrained world demand), and underachievers or "lost opportunities" (when Ecuador market share declines in the context of rising world demand trends). From that perspective:

Resource-based exports are generally not among the most dynamic world products, with only two star products (vegetable oil and tubercle preparations) among the 15 largest exports;

Low-technology exports are mostly loosing market share despite a dynamic world demand. Among key exports, star products include basic metals, jewelry and metal containers, while lost opportunities include manufacturing textiles, plastics, iron & steel tubes and pipes, crystal products and furniture;

Middle-technology products hold a very limited world market share (about 0.01%). Several star products exist (including assembled vehicles, bathroom lead products, heaters and plastic plates) but export levels remain very limited;

Pharmaceutical products concentrate three quarters of high-technology exports, though they have tended to loose world market share, while some star products (telecommunication and measurement equipment) are still weakly developed.

This methodology matches in some aspects the strategic value approach, as developed by Hausmann, Hwang and Rodrik (2005) and Hausmann and Klinger (2006). Looking at the current export basket space, the idea is that assets and capabilities needed to produce one good can be close to those needed to produce other goods (see Annex I for details). By using measures of the sophistication of each export product (PRODY), the revealed sophistication of a country's export package (EXPY), and the proximity in the product space, the results provided by Klinger (2007) and presented in Annex I highlight that:

Ecuador's productive capabilities tend to be in relatively sparse parts of the product space, highlighting the challenges the country faces to "jump" from rather peripheral zones—with limited products nearby, requiring similar capabilities—to

other areas of the space, where products with high technology are more prominent;

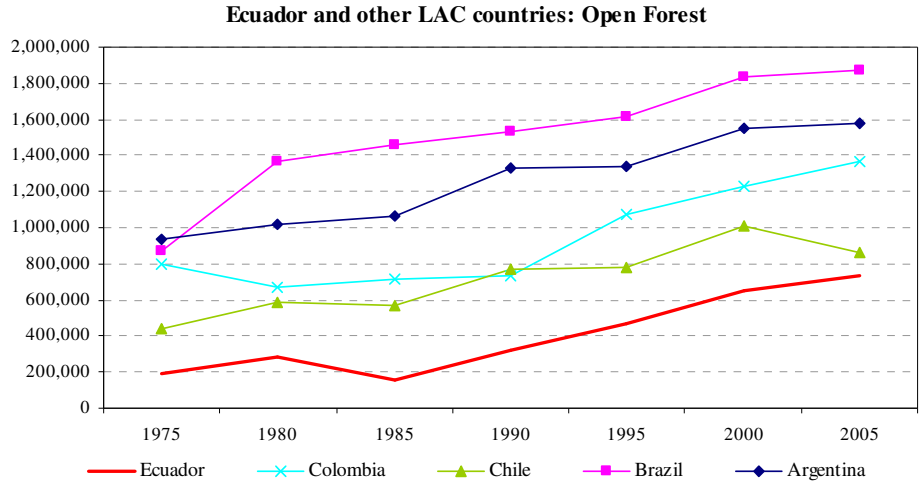
Petroleum, forest products, and tropical agriculture are the three areas where some movement can be identified over recent decades, though they are not in the areas of high sophistication.

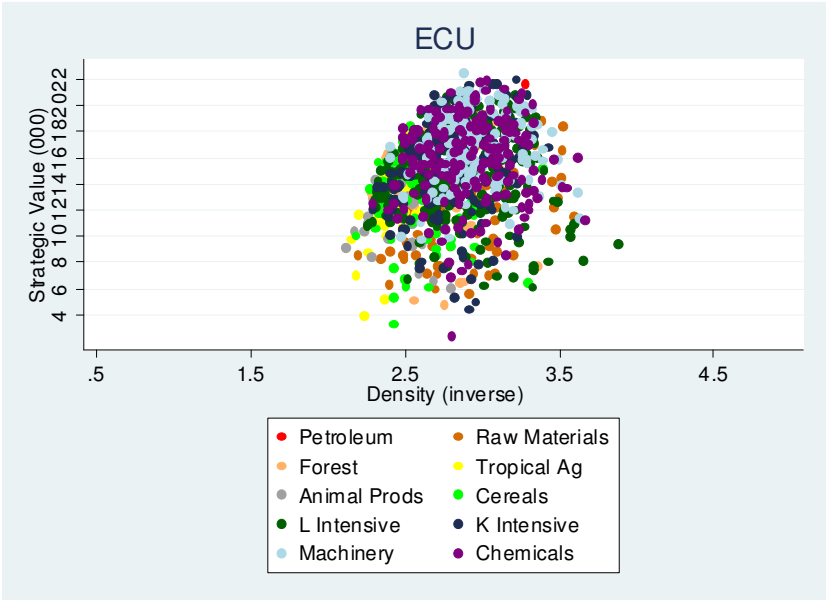
The technological content of Ecuadorian exports is limited, as expected. Out of the 1,242 included products, exports of the 5% products with the highest sophistication (PRODY) represent 0.02% of total exports. Out of the products with exports being larger than 0.01% of total exports, the ten having the highest sophistication include shrimps and most of the products regarded as promising in UTEPI study (vegetable oils, pharmaceutical products, measurement equipment, plastics, iron & steel tubes and pipes, vegetable preparations).

How difficult is it to Ecuador to move towards new productive possibilities, based on its current export basket? The "open forest" proposed by Hausmann and Klinger (2006) is a way of measuring it, by estimating Ecuador's unexploited opportunities, i.e. the distance-weighted sophistication of all the products it could potentially produce. Ecuador's open forest has increased since 1975, roughly in line with other Latin American countries, but remains low by regional standards, highlighting the limited option value of unexploited opportunities. Thus, moving in the product space for Ecuador implies tradeoffs: it would be easier to move toward nearby products, but—precisely because Ecuador exports are in peripheral areas—they may not be in a dense part of the space, i.e. they may not offer capabilities that are easily transferred to a wide range of other goods. Moving towards goods with higher strategic value thus requires more efforts and adaptation but may also generate further opportunities down the road.

In the case of Ecuador, export goods with high strategic value are distant from existing exports: there are almost no products with high density. The products relatively closer to existing ones (cereals, tropical agriculture, labor intensive, animal products) have generally lower strategic values, while products with higher strategic value (capital-intensive, chemicals, machinery) are far away. In comparison with other Latin American countries, Klinger's data highlight that Ecuador appears to have products with higher strategic values but relatively far away. In other words, the country's growth potential would be high but harder to reach.

Figure 48. Ecuador and Latin America: Open Forest and Density





In addition to the cases discussed in Hernández et al (2007), the next section provides some examples of successful export experiences. The overall impression is that there have been multiple cases of self-discovery in Ecuador over recent decades, despite macroeconomic instability, the appropriability risks previously highlighted and a deficient provision of public services, including infrastructure and coordination failures. This would suggest that self-discovery in itself is not a key growth constraint, but also that well targeted public policies could be helpful in overcoming some of the challenges faced by private initiatives.

Is there room for industrial policy?

The previous sections highlight the challenges faced by Ecuador: its dimly sophisticated product structure and weak industrial base makes it more difficult to adapt to globalization trends. In this context, the state could potentially play a role

in guiding and supporting some areas. However, the risks of badly designed or poorly implemented industrial policies are obvious. Ecuador's history includes diverse experiences for different products in terms of state interventionist policies. In the 1950s, government policies to boost banana production—trade openness and enhanced relations with key demand countries, attractiveness of international companies, well targeted lending to small producers—were successful in helping Ecuador become the world banana export leader (Box 2). In the 1960s-70s, import-substitution policies had mixed results for industrialization and employment goals, while they also implied significant fiscal costs. Meanwhile, regional trade agreements appeared to bear some fruits (Box 3). More recently in the 19080s-90s, Ecuador witnessed a boom a subsequent decline, and a later recovery of shrimp production and exports. While the boom was mostly attributable to the private sector dynamism, the lack of public policies may have missed to address coordination failures in the sector, as well as the need for stronger technical expertise (Box 4). The development of two other agricultural crops reflected diverse approaches for public policies: while flower crop growth was mostly attributable to private efforts (Box 5), strawberry plantations have benefited from a successful public-private combined initiative (Box 6).

Some of these successful export experiences—as well as the examples described by the above-mentioned study from Hernández et al (2007)—highlight that well-targeted combined public-private efforts can help overcoming some of the constraints to growth. For example, several cases show the usefulness of establishing well-designed credit access to specific sectors, particularly small producers, provided it is done within clear guidelines while assessing credit risks. Also, the banana boom exemplifies that public leadership can help overcome initial fears that may relate to the perceived low appropriability of private domestic returns. Both flower and shrimp exports have witnessed some challenges to ensure a sustained growth following an initially very successful start. Such challenges were partly related to coordination issues. For example, flower exports were hurt by air transportation costs or the sector's ability to meet sanitary regulations, while competitors in neighbor Colombia were able to address such constraints in a faster way. The subsequently, flower exports have regained impetus as Ecuadorian producers have taken advantage of other experiences and know-how. Also, the 1999-2003 slowdown of shrimp exports was partly due to coordination problems to contain larva contamination in the industry and to weak regulations that could have reduced the environmental impact of shrimp development.

On a separate matter, the low quality of education in the country (see section V.3) can also act as a constraint to self-discovery, as it can hurt the ability to seize opportunities for the development of new products within a fast changing world.

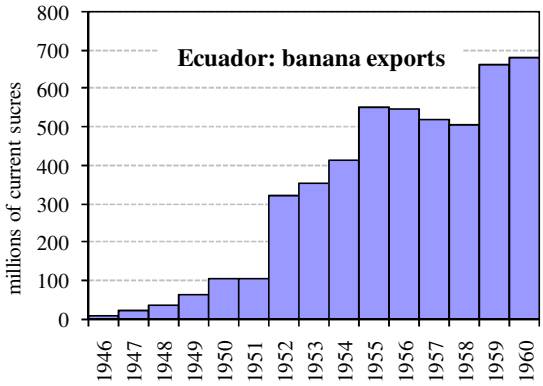
On the other hand, as previously discussed, the experience of economic sectors with a strong state presence (e.g. oil, energy) is not a very good one in Ecuador. The weaknesses in terms of governance, corruption and political instability further

warn that industrial policies could be misguided or distorted if they do not ensure clear rules and a transparent implementation. The evidence suggests that Ecuador indeed has a productive structure strongly based on commodities and low-technology industries, implying challenges to move towards the production of more strategic goods that can fully benefit from globalization trends. From that perspective, public policies supporting human capital development, research and development spending, and foreign investments may help the country build the bridge. However, Ecuador's experience makes it more delicate to suggest sector-specific industrial policies.

While Ecuador has not had any explicit industrial policy since the 1980s, the limited industrial development has also been affected by the largely independent curses observed for agricultural and industrial producers. The former ones tend to give priority to fresh produce output and have neglected the more rigorous post-harvest process required for industrial purposes. This may partly reflect the favorable international environment for raw agricultural products and their prices, but also the limited size of the domestic industrial market for agricultural products, reducing the incentives for undertaking new methods for the harvesting and subsequent process.

Box 2. Bananas: A Success Story of the 1950s 1/

Ecuador moved from being a marginal banana producer in 1948 to leader world banana exporter in 1954. On the back of a very favorable external environment, Ecuador set up clear policies to boost bananas production, which ended up being highly successful for economic growth, modernization and enhanced income redistribution.



In 1948, Central American and Caribbean crops—the main US market providers in the first half of the century—were affected by the "Panama disease" and, thanks to the post-war economic expansion, demand for bananas was rising in the US, Europe and Japan. The average price of Ecuadorian bananas posted a 93.7% increase during 1948-1952 (CEPAL, 1954).

Galo Plaza, Ecuador's President during 1948-52, was atypical on several fronts: with aristocratic ascendance in the highlands and agricultural studies in the US, he held good US relations and was aware of the potential and constraints of the banana sector. Following a 1948 visit from United Fruit high-level staff, Plaza decided to "put a special interest in boosting banana crops" (Velasco, 1983).

A "Commission for the Orientation and Credit for Bananas" channeled S/ 15 millions to producers (equivalent to 5% of 1948 bank deposits or 4.5 million in 2003 U.S. dollars). Some international firms established their own plantations and provided credit to local producers. The government credit, targeted to small producers, reached 992 banana producers, with no loan over S/50,000 and 77% of all loans under S/20,000, amounts equivalent to 15,000 and 6,000 of current dollars, respectively (CEPAL, 1954). The 15.4% nominal currency depreciation in November 1950 was, most likely, aimed at boosting bananas' competitiveness, as the trade balance had been positive since 1941 (excepting in 1949) and posted in 1950 the largest surplus since there are credible trade statistics (1927). In addition, several important banana producers were appointed over the 1960s as diplomats in countries being critical banana buyers.

From an economic perspective, the banana sectoral policies were largely successful. From 1948 to 1955, banana exports grew by 1,390%, while the share of bananas in total exports grew from 5½% to 41%. The "banana boom" boosted economic growth and improved income distribution, as most banana producers were small and medium-size ones—farms below 100 Ha provided about 80% of the market in the mid-1950s, according to Velasco. In addition, the move helped to increase formal labor relations in agriculture (at that time, in some areas of the country labor relations were still non-monetary). Finally, the banana expansion allowed Ecuador to end a deep economic crisis that had started in the mid-1920s with cocoa production challenges, and initiated a period of political stability that would last until the mid 1960s.

1/ See CEPAL (1954), Velasco (1983) and Ayala Mora (1990) for broader discussions.

Box 3. Industrial Policies and Growth in the 1960s-1970s

Out of the five main official objectives of sectoral policies during the 1960s and 1970s, only two (to boost industrial production and industrial exports) were met:

- The average annual real growth of industrial production rose from 5.9% in 1960-72 to 9.5% in 1972-81 (boosted by a dynamic demand during the oil boom), before falling by 1.2% annually during 1981-86, as the economy contracted during the debt crisis.
- Industrial exports grew by 15.6% annually during 1964-86, above the 12.6% average for total exports. The pace of growth is much larger (34.3% against 25.5% for total exports) during 1972-81, period when public incentives were particularly large.

The other three official objectives (to foster employment, increase the use of domestic inputs, and boost net inflows of foreign currency) were not met:

- Industrial employment grew over 1962-82 at a 1.6% annual rate, lower than the 2.3% overall employment growth. While labor laws were already considered inappropriate for Ecuador's environment, with little incentives for employment creation (CEPAL, 1954), subsequent reforms increased labor benefits, at least until the early 1990s.
- The Ecuadorian industry became increasingly dependent on imported raw materials. In 1982, the first devaluation in 11 years prompted a sharp reduction of consumption & capital goods imports with almost unchanged imports of raw materials (Abril, 1990).
- The industrial trade balance—industrial good exports less raw material and capital goods imports for the sector—was negative almost all years during 1964-86. Such balance worsened in 1972-82, when stronger industrial incentives were in place.

Despite unchanged industrial policies over 1964-85, the results were volatile, suggesting other factors behind industrial performance. The strong annual industrial growth in 1972-76 (12.0%) seems closely related to the oil expansion (11.4%); the slower industrial expansion in 1977-81 (7.5%) accompanied the slower overall real growth (5.2%); and the 1982-86 industrial decline (-1.2% annually) was related to the much lower economic growth (2.5%) during the debt crisis.

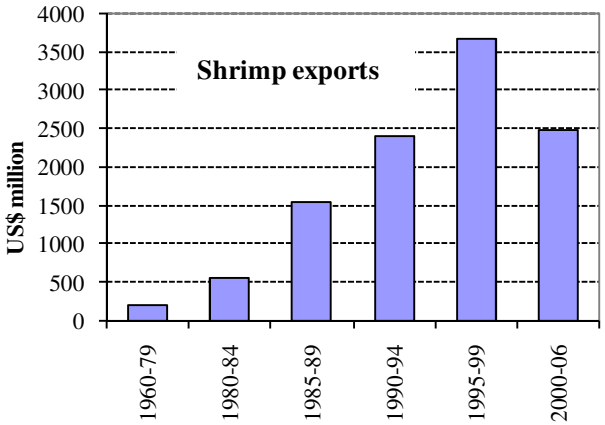
Ecuador's 1969 entrance to the Andean Pact likely contributed to the faster industrial growth in 1969-73 (8.9%), compared with the 5.5% rate in 1965-69. The 1981 border conflict with Peru and the 1982 debt crisis strongly limited trade with other Andean countries, and coincided with both the decline in industrial growth and the overall economic contraction since 1982, making it difficult to disentangle individual impacts.

Excepting for the Andean Pact, public policies do not appear to have had a clear impact on industrial objectives, while industrial policies implied several costs. Tax exemptions reduced fiscal revenues; high tariffs increased consumption goods' prices; artificially low interest rates hampered financial intermediation and domestic savings; larger public spending and tax reductions boosted external financing, with external indebtness surpassing 80% by the late 1980s. While the non-oil primary sector was explicitly sidelined, many institutions and procedures were characterized by largely discretionary and sometimes lax decisions.

1/ Based on Arteta and Albornoz (1996).

Box 4. Shrimps: A Recent Boom 1/

While Ecuador started to export shrimps in the 1960s, exports reached significant levels after 1980, moving from cumulative exports for US$199 million over 1960-70 decades to US$2105 million during the 1980s. In 1997 and 1998, with annual record-high levels over US$870 million, Ecuador became the leader exporter in Latin America and second worldwide after Thailand, while shrimp exports represented 4.5% of the GDP, and the sector provided 250,000 direct and 100,000 indirect jobs in 1998.



The rapid sectoral growth was helped by favorable weather conditions: Ecuador has 3 harvest cycles per year (compared to 2 and 1 in Thailand and China); and the weather allows bigger crustaceans with better texture and taste quality to develop. In addition, private management invested in both plots of land for shrimp sowing and technology to obtain better performance and quality per hectare. By 2000, according to the Central Bank, 2,036 farmers used 152,523 hectares for shrimp breeding.

However, starting in 1999 the industry was deeply affected by the white spot virus and the financial crisis. In 2000, shrimp exports plummeted to a low record of US$285 million, a 67% decline from 1998. Coordination problems within the industry to avoid the introduction of contaminated shrimp larva deepened some financing constraints for new labs to raise virus-free larvae. In addition, the 1999 financial crisis resulted in stricter bank lending regulations and a shortening of banking credit particularly for high-risk productive sectors such as shrimps.

Since 2003, shrimp exports have recovered, despite a formal dumping complaint in 2004 by US shrimp producers leading to the US introduction of a moderate 3.26% related tariff for Ecuadorian shrimps, to be lowered to 2.25% from September 2007, following an Ecuadorian complaint before the WTO.

Shrimp remains a strategic product for Ecuador, since the country could become the worldwide exports leader. Some weaknesses that the government could try to address to improve the sector's performance include limited technical expertise for plague control and some credit access constraints for the sector.

1/ See Marriot (2003) as well as Albornoz and Arteta (2007).

Box 5. Flowers: Benefiting from US Trade Preferences

According to the Association of Flower Producers and Exporters (Expoflores), the flower crop development started in the 1970s, with a 10 hectares plantation. A few years later, the first roses' crops started, before becoming the main export product within the sector. According to the Central Bank, total flower exports moved from US$13.6 million in 1990 to US$435.9 million six years later, of which US$309 are roses.

A study from the Agricultural Census Information estimates at 60,000 jobs, mostly for women, the flower sector's jobs in 2006. Meanwhile, 3,440 hectares were used for flower plantations and flower export volumes added up to 104,172 tons.

Year	Cultivated area (Ha)	Exports	
		Tons	US$ mill. FOB
1996	1,485	62,251	105
1997	2,250	45,952	131
1998	2,700	57,774	162
1999	2,803	60,940	180
2000	2,977	78,830	195
2001	3,208	72,458	238
2002	3,262	83,636	290
2003	3,263	80,368	309
2004	3,397	84,859	355
2005	3,417	122,192	398
2006	3,441	104,172	436

Source: Expoflores, Central Bank of Ecuador.

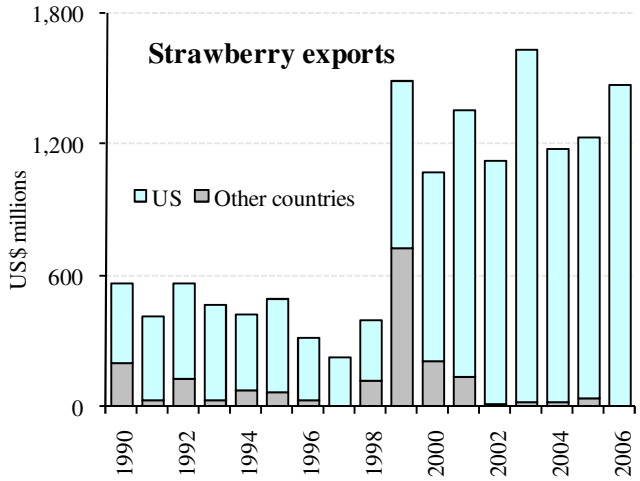
Flower cultivation represented 0.9% of GDP and 16.7% of agricultural GDP in 2005. The favorable trends have mainly reflected private effort rather than specific sectoral public policies. The flower role has mostly been the consequence from efforts from private businesses to reach new markets and enhance the product's quality. However, a relevant area for public policies supporting the sector includes recent government efforts to extend the existing free tariff entrance to the US to diverse products under the Andean Trade Preferences and Drug Eradication Act (ATPDEA).

With 58% of Ecuadorian flowers exported to the US in 2006, renewing ATPDEA preferences is a critical issue for the sector, as roses and other flowers would be subject to a 6.8% tariff otherwise. Thus, reaching a long-term agreement with the US over trade preferences would allow Ecuadorian producers to ensure a constant presence in the US market and the absence on challenging competition from other countries.

Box 6. Strawberries: A Successful Private-Public Coordination Case

Favorable weather and geophysical conditions in Ecuador's Andean region, between 1,200 and 2,700 meters over sea level, have helped the development of strawberries production. While the sector exports remain marginal within non-traditional exports (below 1%), the sector represents a successful experience of the interaction between private and public initiative and cooperation of public entities at the local and national level.

Strawberry crops grew from 50 hectares in 1995 to 225 hectares currently, mainly in some Andean provinces (Pichincha, Tungurahua, Azuay, and Imbabura). 60% of total production supplies the domestic market while exports are mostly oriented to the US, benefiting from zero-tariff under ATPDEA trade preferences.



Part of the crop expansion was the result of small producers' cooperation, such as the Yaruquí Association, with total crops adding up to 150 hectares, which provided credit, training, and intermediate goods to 54 producers. About 300 families have benefited from US$700,000 credits from an entity related to Quito Municipality through a business development area to develop a business plan, facilitate links with the financial sector, and build up a community bank for small lending support. In addition, public sector entities such as Social Ministries and the second-tier development bank CFN financed quality-enhancement and irrigation projects for the crop. However, such successful combined approach cannot be seen as a consistent State policy to support small businesses.

VII. Conclusions and policy recommendations

This review of potential binding constraints to growth in Ecuador suggests some areas (natural resource endowment, geographical impediments, human capital, domestic savings, and market failures) that do not appear to be critical for limiting economic growth, though this does not mean they do not face challenges and shortcomings. Other issues, such as macro stability or access to domestic or international finance, suffer from weaknesses that could potentially bring headaches if no corrective actions are undertaken. A few hot points—mostly related to institutional weaknesses and infrastructure—are hampering the appropriability of private investment returns and the potential for a more dynamic entrepreneurship. Some policy recommendations can thus be proposed within these lines.

Access to finance aspects reveal weaknesses in terms of a high country risk and a regulatory and market environment that is not conducive to effective creditor rights and deep financial intermediation. These areas, which currently benefit from a favorable world economic cycle and terms of trade developments, could become more critical over time if no remedial actions are undertaken to reduce vulnerabilities:

- The benign international environment may be hiding some of the tougher vulnerabilities arising from the market perception of a very high country risk, even by regional standards. Building some bridges with international financing providers—either international institutions or market players—may help healing the recent difficult relations and the past history of Ecuador, and could potentially be critical to ensure access to international financing in case of a reversal of the current favorable environment.
- High financing costs and limited access to finance, repeatedly pointed by business surveys as critical constraints, especially for small and medium firms, largely reflect underlying factors, such as the reduced credibility of the Judiciary, weak creditor protection, informality, and the lack of transparency. Those issues—closely related to micro risks and business environment aspects—require long-term and comprehensive efforts to be overcome. However, some successful export experiences point to the possibility of setting up public-private partnerships and helping to establish well-designed credit access to specific sectors, particularly small producers, within clear guidelines for assessing credit risks.
- Efforts to improve financial market transparency (with some limited but positive steps taken in recent months to limit abuses from some participants and the public lack of awareness), to buttress modern and efficient mechanisms for banking regulation, early prevention and resolution procedures, as well as an enhanced attractiveness to foreign private financial institutions would surely help towards an effective reduction of

credit costs and a larger access to finance.

Macroeconomic stability remains critical to limit the risks of large crisis episodes that have been too common in Ecuador's history. The stylized facts of economic growth highlight the country's vulnerability to external shocks, which in turn can imply large setbacks in terms on medium-term growth. In addition, a reversal of the benign international environment cannot be discarded. Thus, efforts to develop a wider consensus around sound fiscal policies with properly designed counter cyclical features and a strengthening of the financial system are important areas to lower the risk of economic instability and its potential large impact on medium-term growth.

- The development of consensus on prudent fiscal policies with counter cyclical features would strongly help to reduce the country's vulnerabilities while protection social and pro-poor spending during economic recessions. However, some of the structural characteristics of the Ecuadorian budget process make it difficult to ensure sound fiscal policies. In particular, the significant tax revenue earmarking, growing trends towards fiscal decentralization, political instability, the limited transparency and results-oriented perspective in the budget procedures, and weak prioritization policies regarding public investment restrain the central government's ability to implement active fiscal policies in line with the government's political priorities.
- A sound fiscal reform toward more prudent fiscal policies cannot be achieved without a well-designed scheme providing some assurance to the relevant actors that their fiscal-related revenues would be somehow protected in case of economic downturns. Otherwise, pressures for added and continued earmarking schemes would remain. A Chilean-style system targeting a structural fiscal balance could potentially help towards that aim, though its political feasibility is still far away.
- Despite the large economic costs of the 1999 financial crisis, Ecuador has made little progress since then to buttress the financial system regulatory policies and to ensure a sound financial safety net. This has become particularly critical, as dollarization has significantly limited the central bank's ability to act as a lender of last resort, and in view of the maintained deposit concentration in the banking system. The country still lacks a comprehensive legal framework combining a transparent and well-financed depositor protection scheme, with modern and efficient procedures for bank resolution. Despite some progress in recent years, banking supervision remains subject to institutional weaknesses. Achieving broader consensus toward a sound regulatory environment for the financial system would be important to limit the risks of potential financial crisis over the medium-term, which could rapidly unravel any previous growth achievements.

Infrastructure remains a critical constraint for some sectors. Oil and energy are clear examples of the potential impact on growth and fiscal revenues from under investment and inadequate regulation, both for the sector itself and for its consequences in the overall economy, either through the lost fiscal revenues or through the impact on other sectors.

- Ecuador must find ways to channel resources for infrastructure investments in some key areas, including oil, energy, and to a lesser extent telecommunications, without hampering fiscal stability.
- The current fiscal environment provides a real opportunity to prioritize the use of oil-related revenues for hydrocarbon and energy infrastructure, which have been hurt for many years. However, such efforts may be ineffective if they are not accompanied by sectoral reforms to ensure an increased transparency and an enhanced administrative and technical operation of public-controlled enterprises. Transparency and accountability obligations for public-controlled enterprises should be raised to match international best practices, independently of whether such companies have any private shareholders.
- Addressing the large, regressive, and non-targeted oil derivative and electric tariff subsidies, as well as the existing cross-debts in the energy sector would be important to eliminate significant distortions, reduce the incentives for smuggling, and gradually establish a real competitive environment conducive to new investments.
- Introducing a business-oriented and more professional management for energy distribution utilities also implies addressing governance issues and appointing professional managers, with actual independence from the large debtors with the sector.

Microeconomic environment and appropriability issues are critical areas that need structural but hard-to-implement solutions. It seems unquestionable that Ecuador performs poorly in terms of governance, weak institutions, property rights and legal stability, even within a region with below world-average performance. All relevant indicators and perceptions stress its importance, with institutional weaknesses hampering the business environment, as well as financial intermediation and access to finance. However, addressing these issues requires a large overhaul of institutional constraints and includes difficult political changes.

With those large caveats, policy recommendations would include:

- Institutional strengthening through continued reforms in the Judiciary and Customs areas.
- Actions to enhance transparency in public decisions, both in terms of the use of fiscal resources and the efficiency of public investment. Along those lines, fostering accountability and transparency for public spending can be

partially obtained through an enhanced budget process, including a modern financial management system, results-oriented practices, easily understandable budget objectives (for example in terms of education or health coverage rates, or specific infrastructure projects and timeframes), a better integration between planning and budgeting activities, and transparent rules for the attribution of public markets.

- Building stronger regulatory institutions that can be widely perceived as technically driven and independent is critical to minimize the risks of capture by special interests. In parallel, supporting the development of databases to better assess market concentration, corporate governance, and the accountability of private businesses are important areas.

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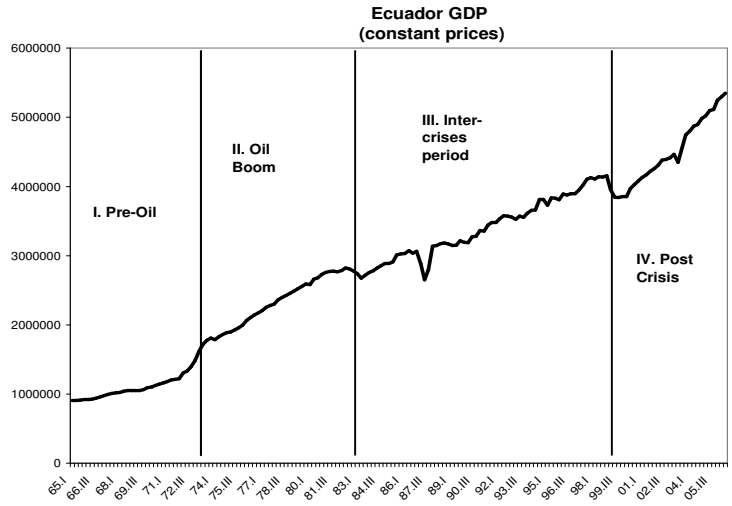
Annex A. Phases of Ecuador economic growth

As quarterly data on Ecuadorian national accounts are available since the mid-1960s, a more detailed description of GDP growth trends can be presented from that date, distinguishing four clear phases with different trends, based on GDP quarterly data measured in dollars at constant prices from the Central Bank National Accounts (see CIEC-ESPOL (2006) for a more detailed presentation).



Source: CIEC- ESPOL 2006

Until 1999, the stylized facts of the Ecuadorian series are those well known to Latin-American economic history, including oil price booms in the 70's and debt defaults in the 80's. Meanwhile, following a deep financial crisis and Ecuador's adoption of dollarization, Ecuador has witnessed more favorable growth trends in the context of a benign international environment during 2000-06. Some of the main aspects of each phase can be briefly summarized:

Before the Oil Boom (1965 – 1973): During the 1950's, 1960's and early 1970's, the Ecuadorian economy was mainly driven by the agricultural export sector. The country's main export products included cocoa and, in the 1950's, bananas. Oil production was limited to the small reserve areas known at the time (in the Coastal areas). During this period, Ecuador's restricted access to international capital markets resulted in a relatively limited indebtedness of the country, unlike other Latin-American economies. Meanwhile, Ecuador political situation could be described as a developing democracy, disturbed by several civil and military dictatorships. The end of this period coincides with the discovery of large oil reserves in the eastern Amazonian region, which largely transformed the Ecuadorian economy.

From the Oil Boom to the Debt Crisis (1973 – 1982): Following the discovery of large oil reserves, Ecuador experienced a major shift from an agricultural-based economy to a relevant oil producer country, as national income reached previously

unsuspected levels. As oil revenues fueled a significant increase in government revenue, Ecuador gained access to financing alternatives, with large capital inflows mostly related to public debt disbursements. As a result, government spending rapidly increased, as well as public debt. The process of "aggressive indebtedness" took place about a decade later than in most of Latin American countries. From the political perspective, Ecuador's oil producing phase started under the rule of a military dictatorship that lasted until 1979, when the country returned to democracy.

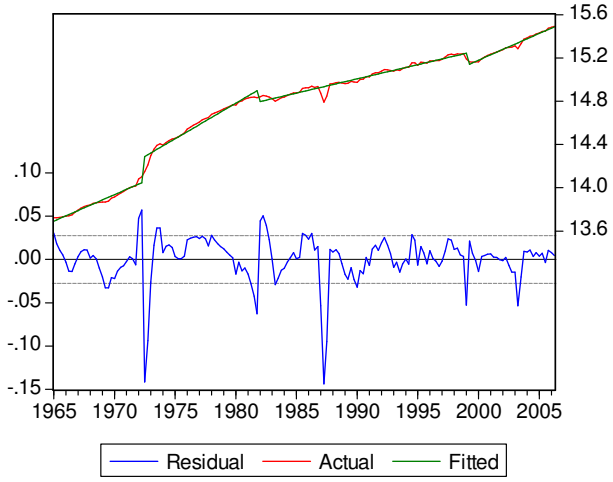
From the Debt Crisis to the 1999 Financial Crisis: The large increases in international interest rates, combined with the recurrent net external financing led, in the early 80's, to unsustainable public and private debt levels. Private debt ended up being partially taken over by the government, further increasing the burden of public external debt. Eventually, the country declared a debt default and faced several attempts to restructure its debt. Ecuador did not fully restart foreign debt payments until 1994, when it joined the Brady plan. Since then, Ecuador has renegotiated its external debt on several occasions—including a large debt default in 1999—and the country only regained full access to international private markets in 2005.

In the early 1990's, Ecuador undertook several structural reforms, liberalizing the financial sector and embracing trade openness, ending with the *import-substitution* era. The lack of access to international capital markets during the 80's, combined with heavy debt repayment obligations in the 90's, were partly responsible for the rather disappointing growth performance during these two decades. In addition, in 1987, an earthquake damaged the main oil pipeline, thus forcing an interruption of oil production for several months, which temporarily hampered real growth. During the 1980's and the early 90's, Ecuador's political situation was somewhat stable under a new democratic environment. However, since 1996, when former President Bucaram was overthrown, the country started a period of recurrent political instability.

The Post 1999 Financial Crisis: The combination of aggressive growth in the financial system since the mid-90s, a weak regulatory and oversight environment, capital account openness, political instability and several external shocks led to a weakened economy and high leverage levels in several financial institutions. Eventually, most banks were bailed out in a disorderly manner—including a banking freeze in 1999, leading to a recurring depreciation of the local currency and a large economic and financial crisis, including a 6.3% real economic contraction in 1999. In January 2000, then President Mahuad decided to formally adopt the U.S. dollar as the official currency, just a few days before being overthrown. Since then, annual inflation has gradually but persistently declined, from a record high near 108% in September 2000 to 1.5% at end-March 2007. Since 2001, recent years have witnessed a rapid increase in international oil prices and a very the favorable international environment, fuelling a domestic recovery.

Dollarization has helped to somewhat isolate the country's economy and the financial system from the persistent political instability, which has continued after the banking crisis. In 2005, former President Gutiérrez was overthrown and replaced by his Vice-president, before general elections led President Correa to take over in January 2007. A Constituent Assembly, which could modify Ecuador's political institutions and economic model, should be elected by September 2007.

These different phases of Ecuadorian growth trends can be clearly observed through a simple regression line of (log) real per capita GDP to a constant and to different trends for each of the above-described phases. The results point to estimated long-run growth averages for each of the phases: about 2.4% before 1973; 2.9% during the oil-boom period, only 0.4% in the inter-crisis period; and 4.2% since 2000, a rate which includes a recovery effect from the major economic and financial crisis of 1999.



Source: CIEC- ESPOL 2006

The defining feature of each phase is not only a change in the trend but also a significant change in the average growth levels. For example, the actual annual growth rates for real per capita GDP moved from 3% in 1971 to around 10% and 20% in 1972 and 1973 respectively. In other words, during the oil boom phase, Ecuador "jumped" and grew faster. Similarly, in 1982 and 1983, Ecuador's GDP went down by 2% and 6% respectively, compared to a 1% growth rate in the previous year. On the other hand, during 1999, real GDP decreased 8%, before starting a new phase of growth recovery.

Annex B. Productivity and competitiveness indicators

This annex focuses on indicators of productivity and competitiveness, two areas where Ecuador ranks rather poorly.

Total factor and labor productivity

Blyde and Fernández-Arias (2005) present an overview of Latin America's growth performance from a growth accounting perspective. They point out that the region's relatively poor performance in comparison with the rest of the world seems mostly explained by a slow growth of total factor productivity (TFP) rather than by the trends for factor (capital and labor) accumulation. They highlight that physical capital intensity did not follow an anomalous path for the region, though it regressed during 1960-99. They also offer some estimates for individual countries. The results for Ecuador during the 1990s show that the country's income gap with developed countries reflected a particularly high TFP shortfall, while the levels of skills and (more markedly) capital per worker were higher than expected when adjusting for development levels. Thus, the general finding that slow productivity growth is the main factor behind the relatively poor growth Latin American performance—also evidenced by Zettelmeyer (2006)—seems even more pronounced for Ecuador.

TFP has been found as a key factor beyond the annual GDP volatility for many countries in the world. In the case of Ecuador, Arteta (2001), Freile (2001) and UTEPI (2007) have estimated TFP contribution to growth. As is common in this type of work, the main difficulty resides on the availability of good quality data for labor and capital stocks, a problem more pronounced at the sectoral level.

While TFP fluctuations for Ecuador haven been very large and explain the large swing in growth trends for different periods, Arteta provides evidence that such TFP fluctuations are widely diverse among different economic sectors and may largely reflect several specific factors of the Ecuadorian history. It also finds that TFP contribution to growth has been larger for oil, mining and manufacturing and strongly negative for services sectors. The large oil-reserves discoveries in the 70s, a 7-months disruption of the main oil pipeline following an earthquake or weather-related events appear to explain a significant share of TPF fluctuations. Arteta's estimates suggest that TFP growth, when corrected from such specific events, has been close to zero over the last 25 years.

According to the results presented by Freile, the TFP contribution to growth has been negative throughout 1966-96 for 20 out of the 24 economic sectors for which data was available, while capital accumulation has been the main driver of economic growth by sector and labor contribution is modest. On a sector-by-sector level, it appears that more than half of the sectors (equivalent to 2/3 of the overall GDP for the observed sectors) that witnessed a declining productivity have also seen declining returns on capital. For the remaining sectors, the returns on capital

have increased despite the declining productivity, potentially suggesting some level of market-power in such industries. Finally, the main macroeconomic factors affecting TFP growth by sector appear to be related to financing costs, credit availability and inflation.

UTEPI provides more recent estimates for TFP fluctuations. In line with Blyde and Fernández-Arias results, they suggest a much more negative growth rate for Ecuador's TFP over 1980-2004 (at –1.23%) compared to the Latin American average (-0.28%). Ecuador would perform only better than Nicaragua and Venezuela for the overall period. However, TFP contribution to growth, which was negative and lower than the regional average over the 1980s and the 1990s, is estimated to become positive and close to the regional first rankings since 2000, probably reflecting the more stable macroeconomic situation under dollarization and the highly favorable external environment.

Competitiveness rankings

Global Competitiveness Index for Latin American Countries

Latin America ranking		Country	Global Competitiveness Index Ranking		Change
2006	2005		2006	2005	06 vs. 05
1	1	Chile	27	27	0
2	3	Costa Rica	53	56	1
3	8	Panama	57	65	5
4	6	Mexico	58	59	2
5	7	El Salvador	61	60	2
6	5	Colombia	65	58	-1
7	4	Brazil	66	57	-3
8	2	Argentina	69	54	-6
9	9	Uruguay	73	70	0
10	10	Peru	74	77	0
11	13	Guatemala	75	95	2
12	11	Venezuela	88	84	-1
13	12	Ecuador	90	87	-1
14	15	Honduras	93	97	1
15	14	Nicaragua	95	96	-1
16	16	Bolivia	97	101	0
17	17	Paraguay	106	102	0

Source: Global Competitiveness Report 2006-2007; World Economic Report

UTEPI also provides estimates about average labor productivity for the manufacturing sector. Ecuador ranks poorly, only ahead of Bolivia and Guatemala in 2004, when average labor productivity was 8 times lower than in Argentina, the best ranked country in the region. However, manufacturing labor productivity rapidly improved from 2000 to 2003, with annual growth rates in the 17-63% range for industries not based on natural resources, which have helped them partly recover the productivity gap with resources based sectors.

Overall, Ecuador ranks poorly in the region based on the Global Competitiveness Report index, and its relative ranking has further declined in 2006. This reflects the country's weak performance in several areas, which are examined more in detail

throughout the paper.

At a glance, Ecuador's mediocre ranking reflect the perception that institutions' credibility is weak, with particularly poor rankings in terms of good governance, transparency and political stability, well-defined property rights and unstable business environment. In addition, the perception of potential favoritism in government policies, corruption and a weak credibility of the judiciary are important factors making it harder for business to compete effectively. While other Latin American countries face similar challenges, Ecuador ranks in the lower range of the region, only ranked above Bolivia, Nicaragua, Honduras and Paraguay, all countries with lower relative income.

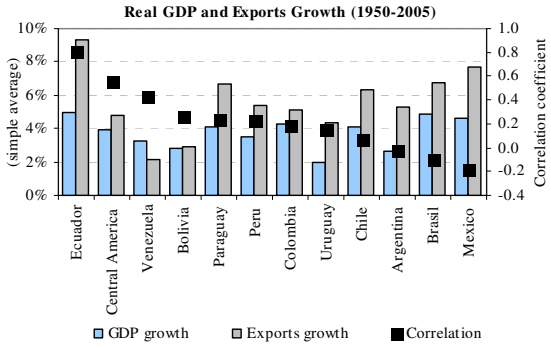
Annex C. GDP and export growth

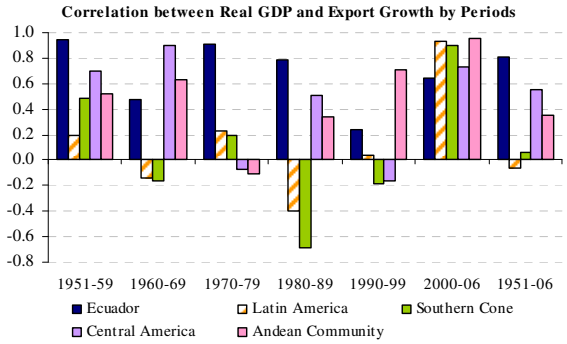
Ecuador: Non-Oil Export Trends
(In US$ millions)

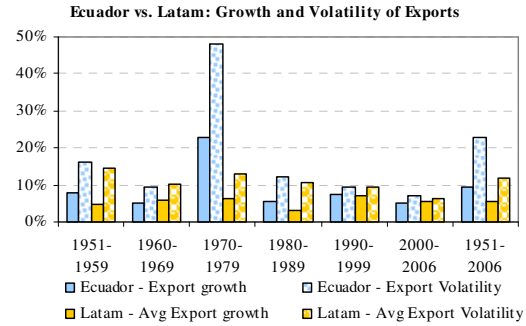
Year	Non Oil exports	Primary exports	Industrial exports	Primary/ Non Oil	Industrial / Non Oil
1990	1,305.7	1,076.5	229.3	82.4%	17.6%
1995	2,850.8	2,160.8	690.0	75.8%	24.2%
2000	2,484.2	1,554.1	930.1	62.6%	37.4%
2002	2,981.1	1,887.0	1,094.2	63.3%	36.7%
2004	3,518.9	2,126.1	1,392.8	60.4%	39.6%
2005	4,230.2	2,455.7	1,774.5	58.1%	41.9%
2006	5,074.0	2,801.7	2,272.3	55.2%	44.8%

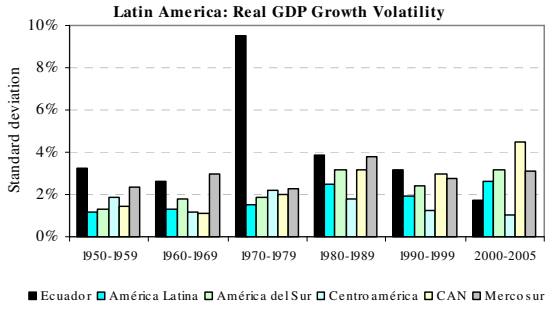
Source: BCE

Ecuador and Latin America: Real Growth and Exports





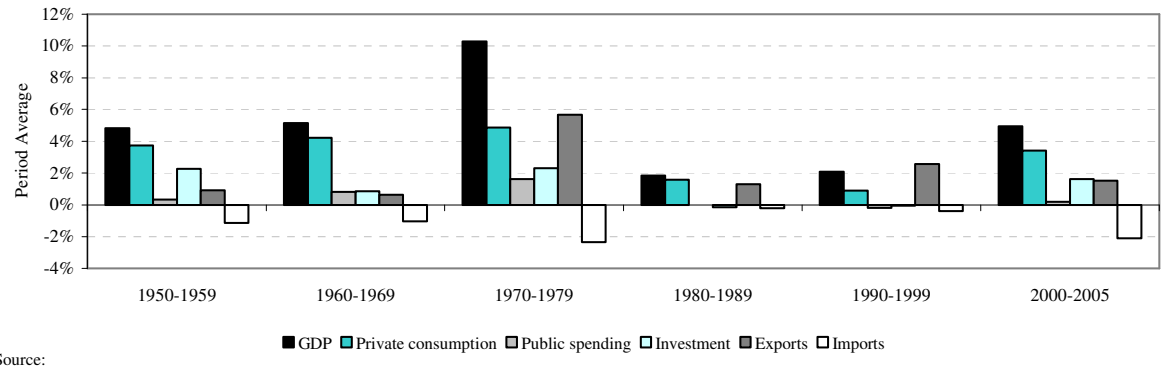




Source: ECLAC

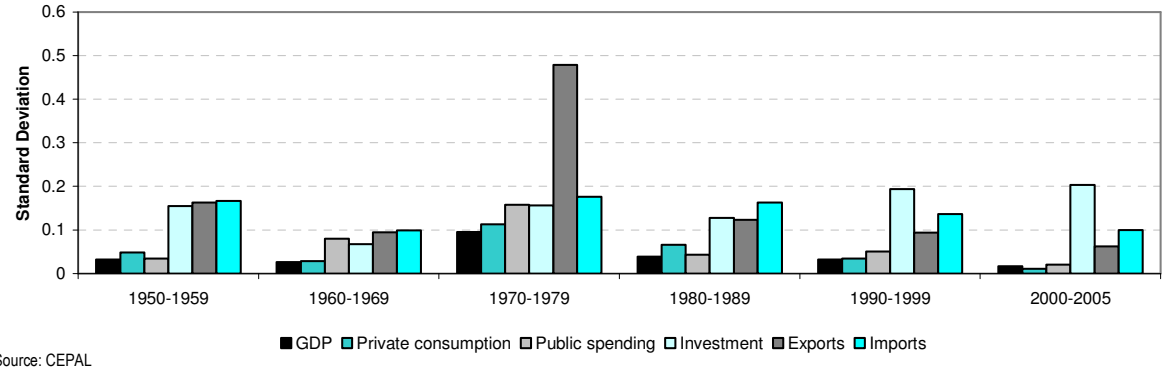
Annex D. Growth by spending components and economic sectors

Ecuador: Contribution to Growth by Spending Component



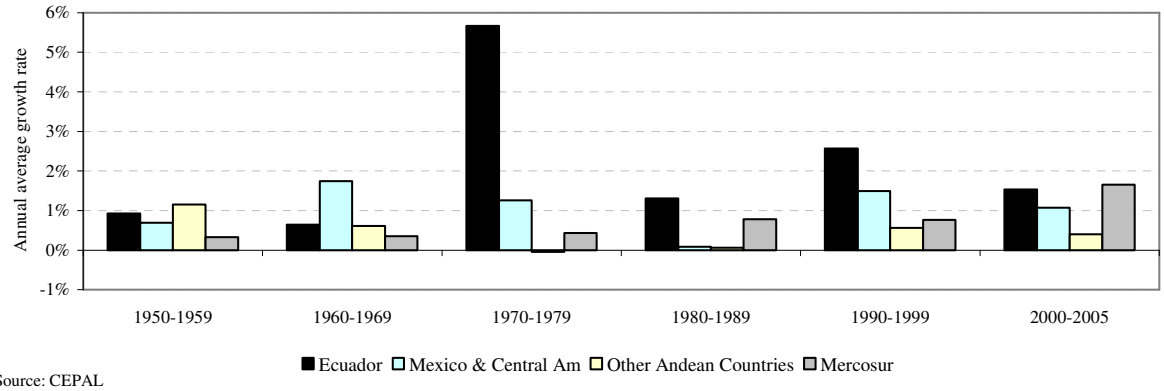
Source:

Ecuador: Real Growth Volatility by Spending Component



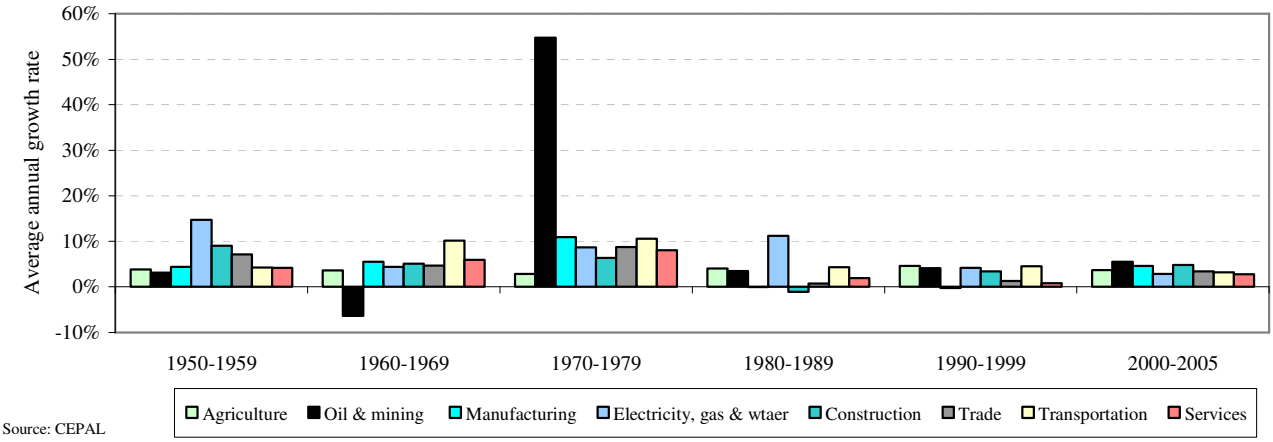
Source: CEPAL

Ecuador and Latin America: Exports Contribution to Growth



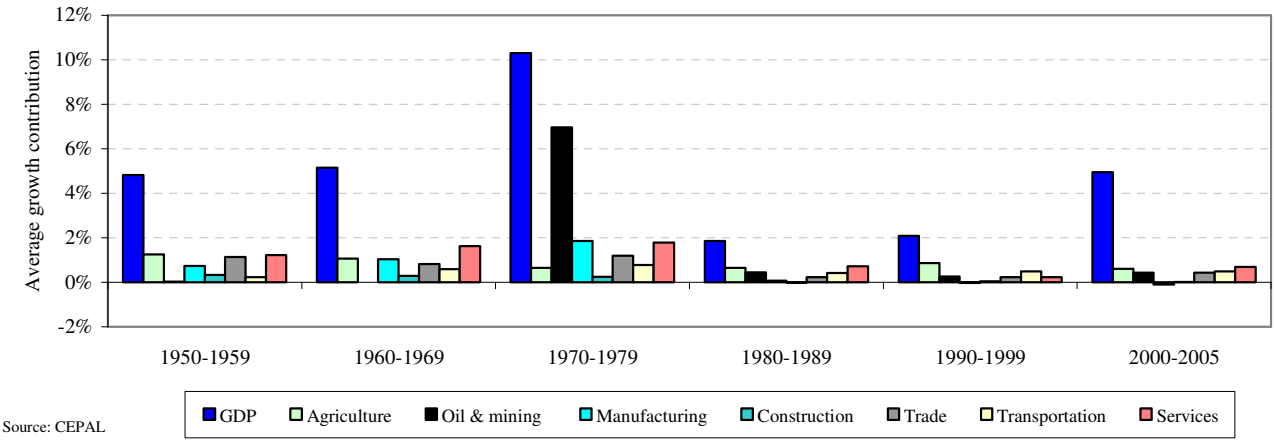
Source: CEPAL

Ecuador: Real Growth by Sector



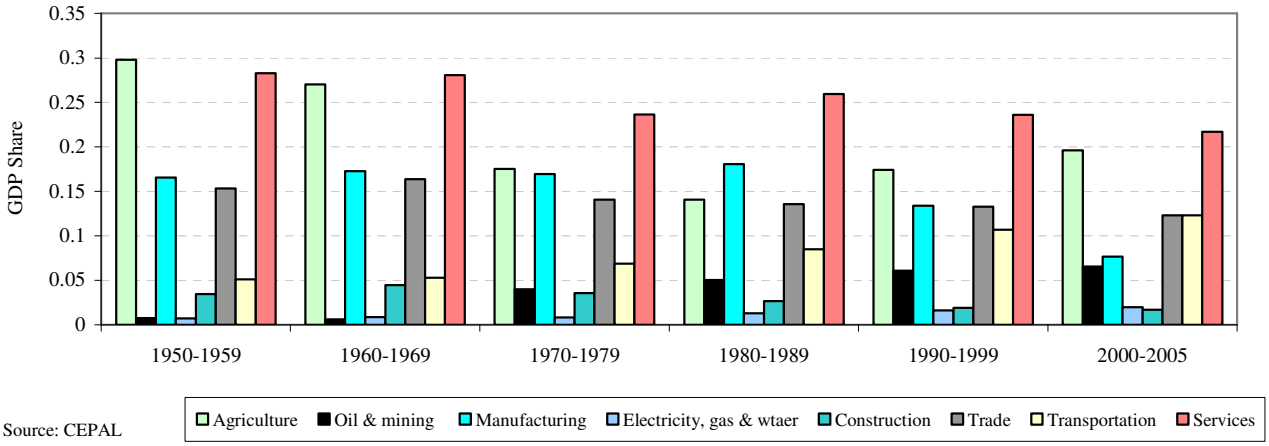
Source: CEPAL

Ecuador: Growth Contribution by Sector



Source: CEPAL

Ecuador: Productive Structure



Source: CEPAL

Annex E. Main databases

"Indicador" database. A data collection provided by *Grupo Context*, in coordination with Ecuador's business registering and regulation agency, the *Superintendencia de Compañías*, it includes annual information covering 1996-2005 for all the companies registered with the regulatory agency, including object, legal representative, contact info, financial accounts, operating balances, sales, liquidity and performance indicators. It allows within and between sectors comparisons and tracking of a business relative position in its sector, including its market-share and concentration indexes, as well as regional comparisons.

The World Bank's Productivity and Investment Climate Private Enterprise Survey. Kindly provided by the IDB for this study, the survey covers about 70 countries, including Ecuador where 453 businesses were surveyed on their assessment regarding doing business constraints.

"Habitus" Micro Enterprises database. Financed from USAID *Proyecto Salto*, this 2004-05 survey of 17,626 micro businesses from diverse regions in Ecuador. The survey—largely unused so far—covered issues such as growth prospects, ownership structure, informality, credit access, and growth constraints. One of its advantages is the coverage of the small business sector, for which investment climate has been rarely assessed.

Tax administration and trade databases. The statistical information compiled by the Tax Administration, the Central Bank of Ecuador and the Industry and Trade Ministry is useful on issues regarding corporate taxation, particularly for the largest economic groups, as well as trade, tariff protection by product and industry and export performance.

Annex F. The World Bank's Enterprise Survey

The 453 observations from the Productivity and the Investment Climate Private Enterprise Survey gives clear indications of private business views on doing business environment. The survey defines the following variables as business climate constraints, ordered by decreasing severity of the perceived obstacles in Ecuador:

Share of respondents identifying the related business constraint ar a severe or very severe obstacle for doing business	
economic & regulatory policy uncertainty	60.7
macroeconomic instability	54.3
corruption	49.2
anti-competitive/informal practices	46.8
cost of finance	45.8
access to finance	44.9
tax rates	38.1
legal system	34.1
tax administration	28.5
electricity	28.3
crime, theft	27.8
customs and trade regulations	24.9
skills of available workers	22.3
telecommunications	18.1
labor regulations	14.1
licensing and operating permits	13.0
transport	10.6
access to land	8.0

Source: World Bank's Productivity and the Investment Climate Private Enterprise Survey.

The business constraints perceived as the most severe, include the macroeconomic and regulatory environment and uncertainty; corruption and informality; financing constraints (both for access and cost); taxation issues; and the legal system functioning. In relation to the regional average, obstacles related to regulatory and economic policy uncertainty and macroeconomics are the ones for which Ecuador appears to be particularly weak. The detailed results for each constraint are presented separately below.

Different statistical exercises, which we present hereafter, can be performed to deepen the analysis of the survey's results.

Consistency of survey answers

Analysis-of-variance models can be helpful to cross-check that those firms having, according to the survey, different perceptions on specific business constraints, actually perceive the impact of such constraints in their day-to-day business activity or make their business decisions according to those different perceptions.

Analysis-of-variance (ANOVA) models can be useful to establish if there are significant differences between the actual results or decisions of firms that have signaled different perceptions for business constraints. The presence of those

statistically significant differences would reinforce the confidence in the survey results and consistency. The following statistical results go in that direction:

- The percentage of sales lost due to unavailable telephone service is indeed higher for firms that report Telecommunications as a problem for their operation and growth, at the 5% significance level;
- The percentage of sales lost due to transport failures is indeed higher for firms that report Transportation as a problem for the operation and growth of their businesses, at the 5% significance level;
- Firms with different perceptions about tax rates as a business constraint allocate, on average, different shares of internal funds / retained earnings to finance working capital, at the 1% significance level;
- Firms with different perceptions about access to finance as a business constraint allocate on average different shares of internal funds / retained earnings to finance working capital, at the 5% significance level;
- Firms with different perceptions about access to finance as a business constraint allocate on average different shares of internal funds / retained earnings to finance new investments, at the 10% significance level; and

Firms with different perceptions about cost of finance as a business constraint allocate on average different shares of internal funds / retained earnings to finance working capital, at the 1% significance level.

Striking results

Other statistical findings are harder to interpret. In particular, the following findings can be highlighted:

- No significant statistical difference can be found in the percentages of declared sales lost due to power outages for firms having different perceptions regarding the acuteness of electricity as a business constraint. In other words, those firms viewing electricity as a marginal constraint still declare to suffer sales lost due to power outages in similar (or non-statistically different) proportions than firms viewing electricity as a severe business obstacle.
- There is no significant difference in the percentages of average cargo value lost in transit for firms holding diverse perceptions regarding customs, corruption or crime/theft as important business constraints.
- There is no significant difference in the declared costs for security provision (as % of total sales) for firms having different perceptions regarding crime/theft as a business constraint.
- There is no significant difference in the number of new products introduced to the market in the last 3 years on average—a proxy for innovation spirit—for firms having diverse perceptions about access to finance, cost of finance, policy

uncertainty, macroeconomic instability, corruption or crime as business constraints.

The first three findings could be interpreted as a signal that some business constraints—namely electricity provision, customs-related issues, corruption or crime/theft perceptions—may be considered by some firms as so entrenched that they have become "business as usual".

The last item could show that, while perceived as important for doing business, some constraints—access to finance, cost of finance, policy uncertainty, macroeconomic instability, corruption or crime—may not play a significant role in the individual firms' actual innovation attitude.

Small vs. large firms

Statistical tests can also be performed to discriminate whether the perception on business constraints differ depending on the firms' size (small firms up to 20 employees; medium firms having 21 to 99 employees; and large firms employing at least 100 people).

Business constraints and perceptions by firms of different size
Is the null hypothesis (the mean answer by firms of different size for a specific business constraint differ) rejected, with a 96% confidence level?

	Between Small & Medium Firms	Between Medium & Large Firms	Between Small & Large Firms
Telecomunications	NO	NO	NO
Electricity	NO	NO	NO
Transportation	NO	NO	NO
Access to Land	YES	NO	YES
Tax rates	NO	NO	NO
Tax administration	NO	NO	NO
Customs and Trade Regulations	YES	NO	YES
Labor Regulations	NO	NO	NO
Skills and Education of Available Workers	YES	YES	NO
Business Licensing and Operating Permits	NO	NO	NO
Access to Financing (e.g. collateral)	NO	NO	YES
Cost of Financing (e.g. interest rates)	NO	NO	NO
Economic and Regulatory Policy Uncertainty	NO	NO	NO
Macroeconomic Instability	NO	NO	NO
Corruption	NO	YES	NO
Crime, theft and disorder	NO	NO	NO
Anticompetitive or informal practices	NO	YES	NO
Legal system/conflict resolution	NO	NO	NO

The results for Ecuador point to following findings:

- Access to land is perceived to be a more acute issue by small firms;
- Small firms perceive customs and trade regulations as a less sensitive business constraint;
- Medium-size firms consider the skills and education of available workers as a more severe problem;
- Large firms perceive access to financing (e.g. collateral) as a less sensitive issue;

- Small firms appear to perceive corruption and anticompetitive or informal practices as less acute constraints.

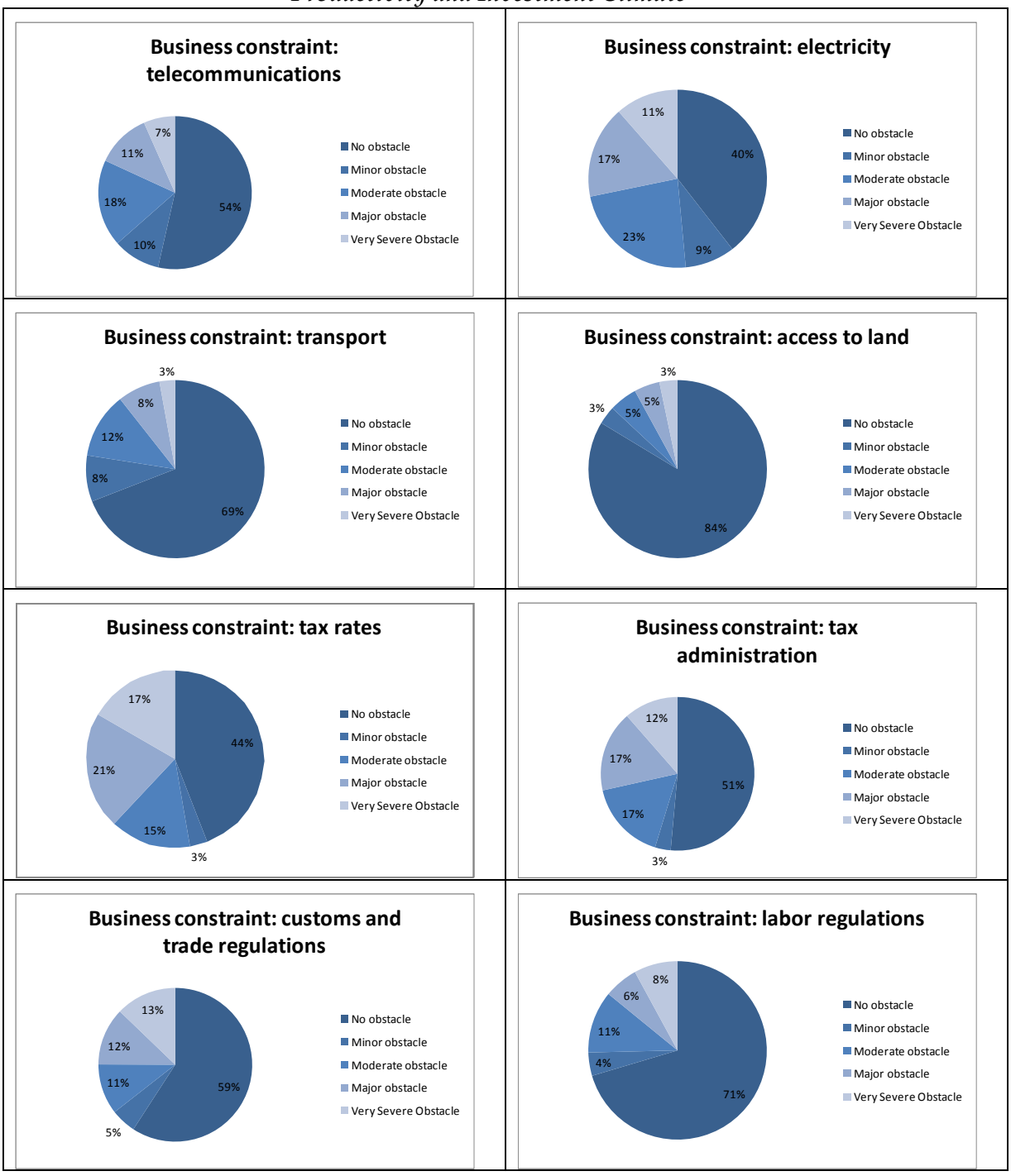
Financing issues

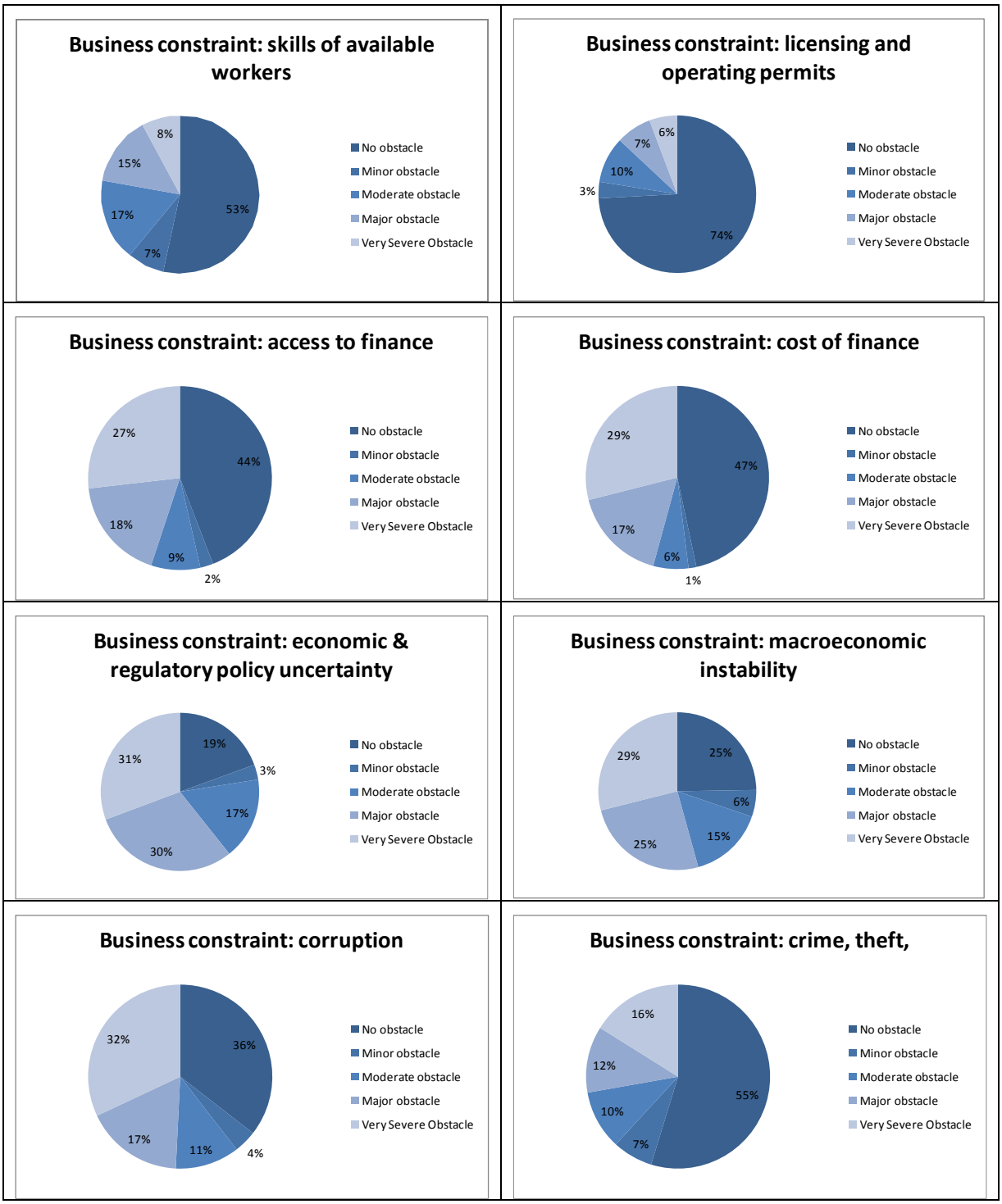
Internal funds or retained earnings, local commercial banks (loan, overdraft) and trade credit (supplier or customer credit) are the three most important sources of funds for either working capital or new investments in this sample. Together, these three categories represent at least 80% of the financing sources, while any of all other categories corresponds to 4% or less of total sources of funds.

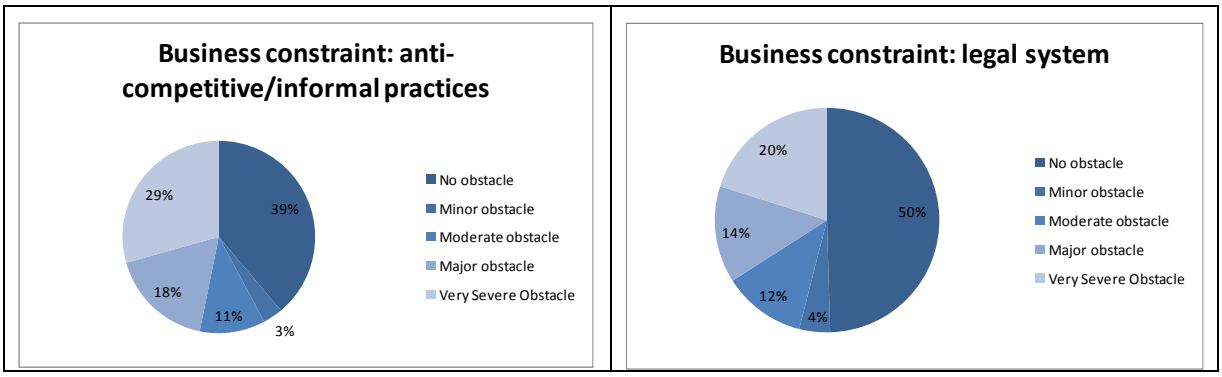
In addition, the severity of business climate constraints, as perceived by individual firms, appears to be linked with the decisions made by firms regarding financing sources, either for new investments or for working capital. For example:

- Firms with different perceptions either about access to finance or about cost of finance as a business constraint also differ, on average, on their relative use of local banks' loans to finance working capital, at the 10% significance level.
- Firms holding different perceptions about tax rates as a business constraint also differ, on average, on their relative use of trade credit to finance working capital, at the 1% significance level.
- Firms with diverse perceptions about either access to finance or economic and regulatory policy uncertainty as a business constraint also differ, on average, on their relative use of trade credit to finance new investments, at the 5% significance level.
- Firms having different perceptions about macroeconomic instability as a business constraint also differ, on average, on their relative use of trade credit to finance new investments, at the 10% significance level.

Business constraints assessed by the World Bank's Private Enterprise Survey on Productivity and Investment Climate



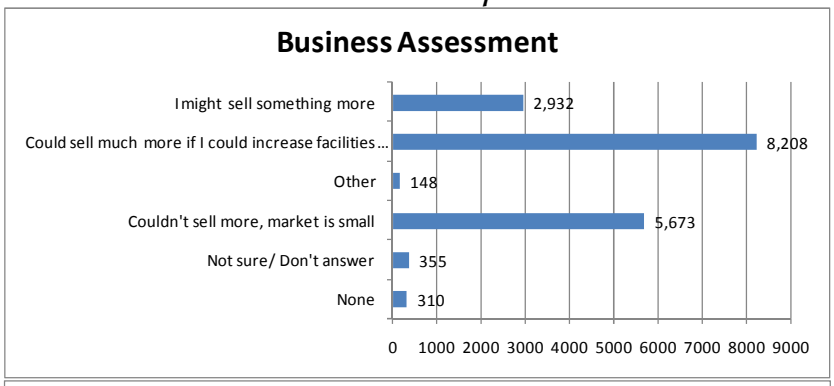

Business constraint: skills of available workers
53%
7%
17%
15%
8%
No obstacle
Minor obstacle
Moderate obstacle
Major obstacle
Very Severe Obstacle
Business constraint: licensing and operating permits
74%
3%
10%
7%
6%
No obstacle
Minor obstacle
Moderate obstacle
Major obstacle
Very Severe Obstacle
Business constraint: access to finance
44%
2%
9%
18%
27%
No obstacle
Minor obstacle
Moderate obstacle
Major obstacle
Very Severe Obstacle
Business constraint: cost of finance
47%
1%
6%
17%
29%
No obstacle
Minor obstacle
Moderate obstacle
Major obstacle
Very Severe Obstacle
Business constraint: economic & regulatory policy uncertainty
19%
3%
17%
30%
31%
No obstacle
Minor obstacle
Moderate obstacle
Major obstacle
Very Severe Obstacle
Business constraint: macroeconomic instability
25%
6%
15%
25%
29%
No obstacle
Minor obstacle
Moderate obstacle
Major obstacle
Very Severe Obstacle
Business constraint: corruption
36%
4%
11%
17%
32%
No obstacle
Minor obstacle
Moderate obstacle
Major obstacle
Very Severe Obstacle
Business constraint: crime, theft,
55%
7%
10%
12%
16%
No obstacle
Minor obstacle
Moderate obstacle
Major obstacle
Very Severe Obstacle

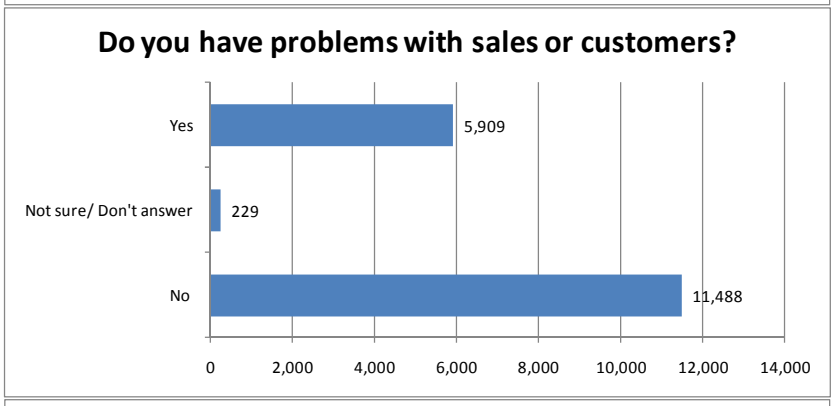

Business constraint: anti-competitive/informal practices
39%
3%
11%
18%
29%
No obstacle
Minor obstacle
Moderate obstacle
Major obstacle
Very Severe Obstacle
Business constraint: legal system
50%
4%
12%
14%
20%
No obstacle
Minor obstacle
Moderate obstacle
Major obstacle
Very Severe Obstacle

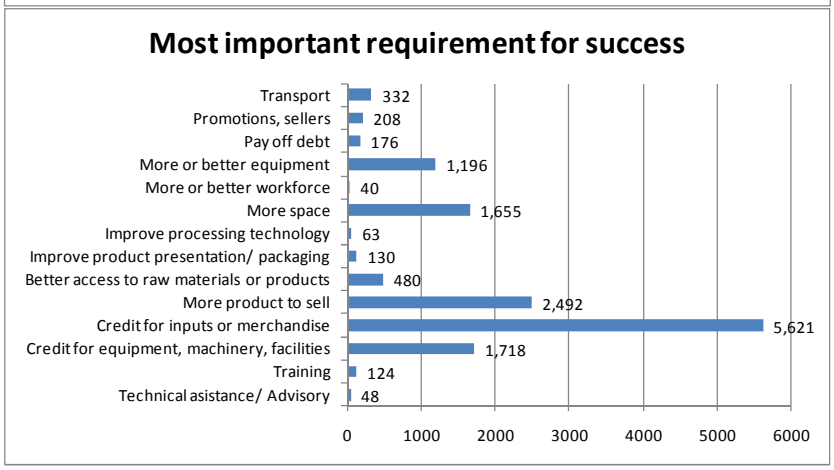
Annex G. The *Proyecto Salto* Survey on Micro Enterprises

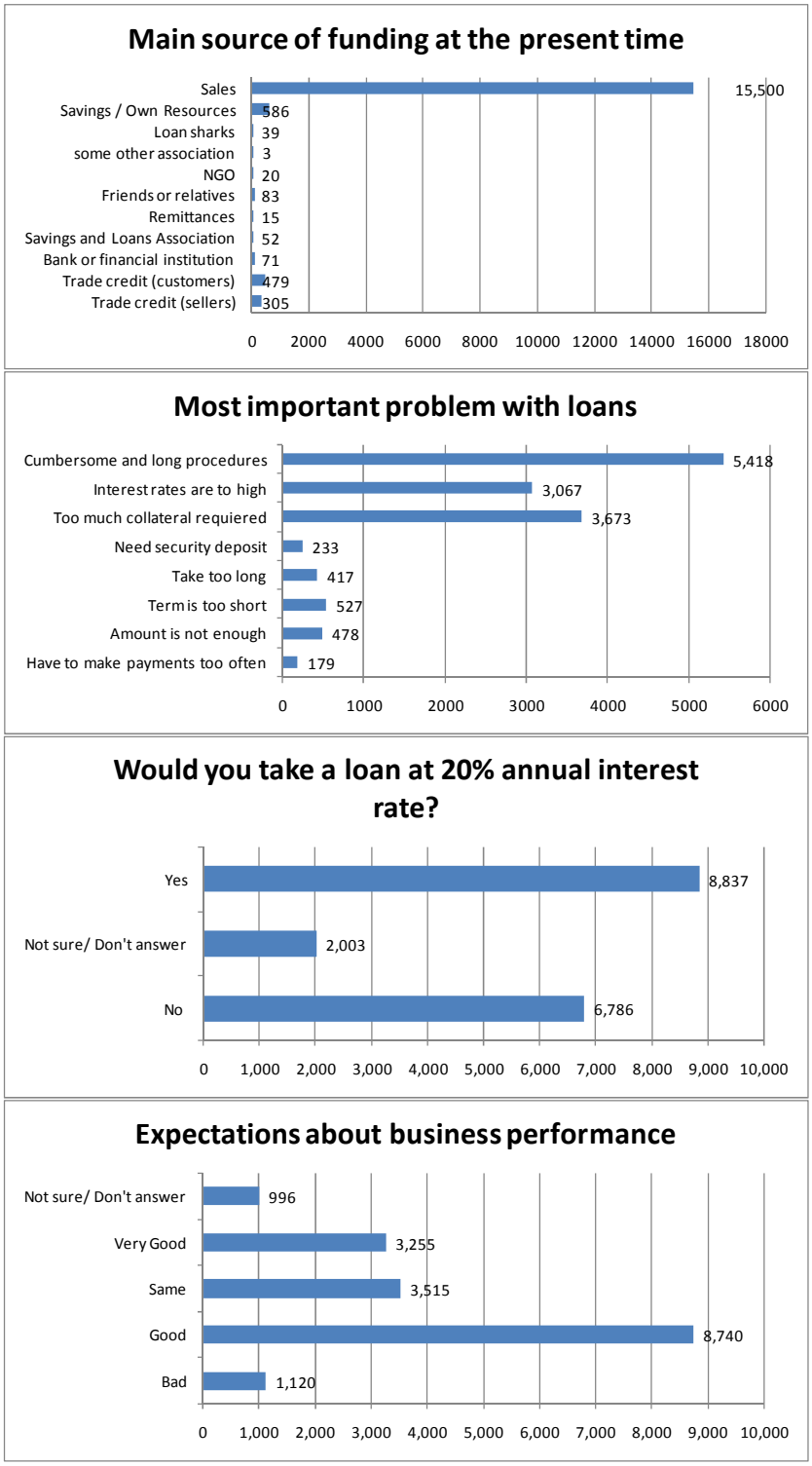
The 17,626 observations from the *Proyecto Salto / Habitus* survey on micro enterprises distributed along the whole country offers a rare perspective on micro businesses and their characteristics.

Selected Business Constraints Assessed by the Proyecto Salto Survey on Business Climate and Micro Enterprises








Main source of funding at the present time
Sales
Savings / Own Resources
Loan sharks
some other association
NGO
Friends or relatives
Remittances
Savings and Loans Association
Bank or financial institution
Trade credit (customers)
Trade credit (sellers)
15,500
586
39
3
20
83
15
52
71
479
305
0 2000 4000 6000 8000 10000 12000 14000 16000 18000
Most important problem with loans
Cumbersome and long procedures
Interest rates are to high
Too much collateral requiered
Need security deposit
Take too long
Term is too short
Amount is not enough
Have to make payments too often
5,418
3,067
3,673
233
417
527
478
179
0 1000 2000 3000 4000 5000 6000
Would you take a loan at 20% annual interest rate?
Yes
Not sure/ Don't answer
No
8,837
2,003
6,786
0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000 10,000
Expectations about business performance
Not sure/ Don't answer
Very Good
Same
Good
Bad
996
3,255
3,515
8,740
1,120
0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000 10,000

Some of the key survey results can be summarized as follows:

- ***Business Assessment***: 32.2% of firms declare that they cannot sell more because of market size, while 46.4% of them say they could sell more if they were able to increase the size of their facilities.
- ***Problems with sales or customers***: 33.5% of firms have problems with sales, 65.2% of them don't have any problem.
- ***Most important requirement for success***: Credit is by far seen as the most important requirement for success in the sample, 39.4% of the firms stating their need for credit to finance intermediate goods and merchandise, while 12.0% would need credit for equipment, machinery and facilities.
- ***Main source of funding at the present time***: 90.4% of the surveyed firms finance their activities internally through sales. Customer's credit (2.8%) and providers' financing (1.8%) are the next financing categories, while financing from any type of financial institutions is negligible.
- ***Most important problem with loans***: Cumbersome and long procedures (38.7%), too high collateral requirements (26.3%) and high interest rates (21.9%) constitute the main problems with loans according to our sample.
- ***Take a loan at 20% (annual)***: 50.1% of the surveyed would take a loan with a 20% annual interest rate, whereas 38.5% would not take it.
- ***Expectations about business performance***: 18.5% of the firms are very optimistic, 49.6% of them are optimistic while 19.9% expect things to remain the same and 6.4% are pessimistic about the future.

Statistical tests can be performed to assess whether those factors that firms declare to be crucial for success are indeed correlated with business assessment, business expectations, sales problems, or the willingness to take a loan. We also examine whether there is any statistical connection between the main financial sources of funds and the problems considered to represent the most relevant ones for loans. Through contingency tables crossing the answer to different questions, the Pearson statistic to test for stochastic independence can be computed. We can then reject, at the 1% significance level, the null hypothesis of stochastic independence for several cases, suggesting there is a statistical relationship between the following variables:

- Business assessment and the most important factor for success.
- Problems with sales or customers and the most important factor for success.
- Willingness to take a 20% loan and the most important factor for success.
- Expectations about business performance and the most important factor for success.

- Most important problem with loans and the main source of funds.

Overall, these results suggest that, if we interpret the most important factors for success as binding constraints for the firms' growth, there might be chances of achieving higher growth if these constraints are somehow relaxed. From that perspective, the survey results point to credit access, either for working capital or for investment purposes, as a critical factor that could foster the micro businesses prospects.

Annex H. Output concentration and economic sectors

Degree of Concentration for the 50 Largest Economic Private Sectors (1996 – 2005)

	Top 50 Private Sectors by Sales	Concentration*
1	IMPORTADORES	NC
2	EXPORTADORES	NC
3	PRODUCCION Y DISTRIBUCION DE ENERGIA ELECTRICA	MC
4	OTROS SERVICIOS PRESTADOS A EMPRESAS N.E.P.	NC
5	COMERCIO AL POR MAYOR NO CLASIFICADO EN OTRA PARTE	NC
6	SUPERMERCADOS	C
7	CONSTRUCCION DE CAMINOS, PUENTES, AEROPUERTOS, OBRAS PUBLICAS …	MC
8	ESTACIONES DE SERVICIO O GASOLINERAS, (VENTA DE COMBUSTIBLES)	MC
9	ELABORACION Y CONSERVACION DE PESCADO Y CRUSTACEOS	MC
10	DISTRIBUIDORES DE AUTOMOVILES, CAMIONES Y CAMIONETAS, MOTOS, BICICLETAS...	NC
11	INDUSTRIAS ALIMENTICIAS NO CLASIFICADAS EN OTRA PARTE	C
12	FABRICACION DE PRODUCTOS FARMACEUTICOS Y MEDICAMENTOS	NC
13	COMPRA VENTA DE VEHICULOS MOTORIZADOS	NC
14	FABRICACION Y MONTAJE DE VEHÍCULOS MOTORIZADOS	C
15	CRIA DE AVES PARA PRODUCCIÓN DE CARNES Y HUEVOS	C
16	ARRENDAMIENTO DE BIENES INMUEBLES	NC
17	ARTICULOS DEL HOGAR: COCINAS, MAQUINAS DE LAVAR, VENTILADORES...	MC
18	FABRICACION DE OTROS PRODUCTOS DIVERSOS DERIVADOS	C
19	DISTRIBUIDORES DE CEMENTO	C
20	FABRICACION DE CAJAS Y ENVASES DE PAPEL Y CARTÓN	MC
21	OTROS SERVICIOS RELACIONADOS CON EL TRANSPORTE N.E.P	C
22	FABRICACION DE OTROS PRODUCTOS DE PLASTICO	NC
23	LAMINADORAS Y OTRAS INDUSTRIAS BASICAS DE HIERRO Y ACERO	C
24	FABRICACION DE CEMENTO	C
25	DISTRIB. DE MOTORES, MAQUINAS Y EQUIPOS INDUSTRIALES, COMERCIALES...	NC
26	AEREOEXPRESOS	C

27	MAYORISTA AGRICOLA, FRUTICOLA Y LECHERO	NC
28	DISTRIBUIDORA DE PRODUCTOS FARMACEUTICOS	MC
29	PESCA EN GENERAL	MC
30	CAMARONERAS	NC
31	FLORES	NC
32	CONSTRUCCION Y/O INSTALACIONES DE OBRAS N.E.P	MC
33	BANANO	NC
34	ELABORACION DE CERVEZA, MALTA Y OTRAS BEBIDAS MALTEADAS	C
35	ELABORACION DE ACEITES Y GRASAS VEGETALES Y SUBPRODUCTOS	C
36	OTROS PRODUCTOS AGRÍCOLAS NO CLASIFICADOS	NC
37	AGENCIAS DE TURISMO (INCLUYE VENTA DE PASAJES)	NC
38	FABRICACION DE TELAS Y TEJIDOS	NC
39	FABRICACION DE PAPEL Y CARTÓN	C
40	FABRICACION Y REFINACION DE AZUCAR	C
41	IMPORTADORES Y EXPORTADORES	C
42	ELABORACION DE BEBIDAS NO ALCOHOLICAS Y GASEOSAS	C
43	DISTRIBUCION DE OTROS PRODUCTOS ALIMENTICIOS	NC
44	GRANDES TIENDAS DE COMERCIO MINORISTA DIVERSO	C
45	MAYORISTA EN TABACOS Y CIGARRILLOS	C
46	ADMINISTRADORES	C
47	FARMACIAS	C
48	OTROS NO CLASIFICADOS EN OTRA PARTE	C
49	SERVICIOS Y AGENCIAS DE PUBLICIDAD	NC
50	HOTELES	NC

*Concentrated (C), Moderately Concentrated (MC), Non-Concentrated (NC)
Source: Indicator Database

Degree of Concentration - Publicly Owned, Controlled or Regulated Sectors

	Sectors Ranked by Sales	Concentration*
1	COMUNICACIONES	C
2	PRODUCCION Y EXTRACCION DE PETROLEO CRUDO	C
3	PERFORACION DE POZOS PETROLEROS	C
4	EXTRACCION DE GAS NATURAL	C
5	EMISIONES DE TELEVISIÓN	MC
6	ENVASAMIENTO Y DISTRIBUCION DE GAS	C
7	EXTRACCION DE MINERALES NO CLASIFICADOS EN OTRA PARTE	C
8	AGENTES AFIANZADOS DE ADUANA	MC
9	EXTRACCION DE ORO Y PLATA	C
10	EMISIONES DE RADIO	NC
11	ADMINISTRADORAS DE FONDOS	C
12	CASAS DE VALORES	MC
13	EXTRACCION DE PIEDRA CALIZA Y YESO	C
14	ADMINISTRACION PUBLICA Y DEFENSA	C
15	INSTITUCIONES MONETARIAS	C
16	REFINERIA DE PETROLEO	C
17	EXTRAC. DE MINERALES PARA LA FABR. DE ABONOS Y PDTOS QUIMICOS	C
18	BOLSA DE VALORES	C
19	EXTRACCION DE MINERALES DE HIERRO	C
20	EXTRACCION DE MINERALES DE COBRE	C
21	FINANCIERAS	C

*Concentrated (C), Moderately Concentrated (MC), Non-Concentrated (NC)
Source: Indicator Database

Market concentration and economic performance

For 2005 data, market concentration is assessed for 259 economic activities, through the *Herfindahl-Hirschman Index (HHI)*:

$$H = \sum_{i=1}^{n} s_i^2$$

Where s_i is the market share of firm *i* in the market and *n* is the number of firms. We will follow the traditional thresholds from the relevant literature to interpret

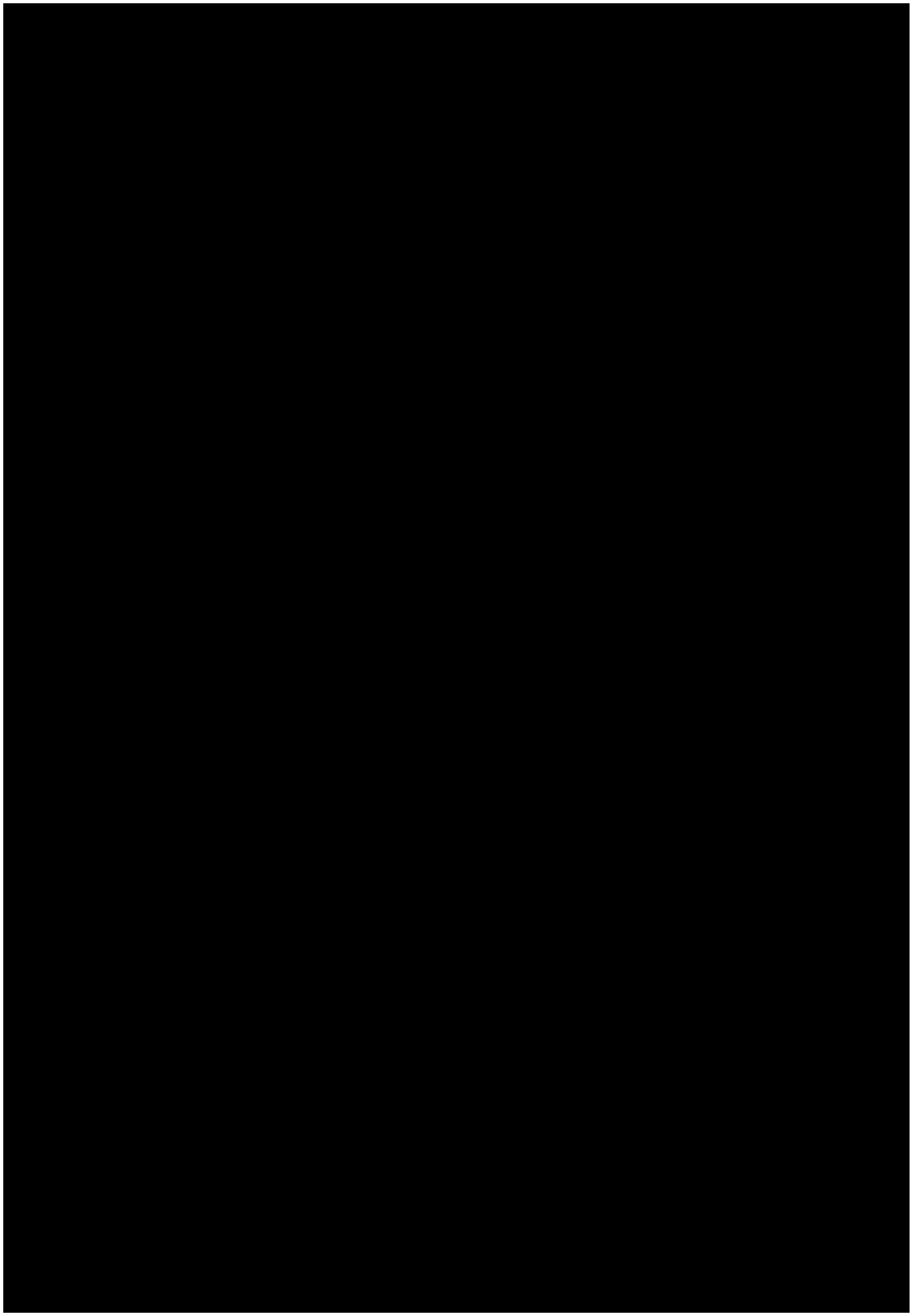
the *HHI* index: no concentration if the index is lower than or equal to 0.1, moderate concentration if the index is between 0.1 and 0.18, and high concentration if the index is greater than 0.18. The data is obtained from the Indicador database, fed annually from balance sheets and income statements 27,606 active firms in Ecuador, which report them to the *Superintendencia de Compañías* (Superintendency of Firms).

We subsequently estimated through OLS the following panel equation:

$$Perf_{i,t} = \beta_1 + \beta_2 HERF_{i,t} + \beta_3 size_{i,t} + \beta_4 USA_t + \beta_5 ECU_t + \omega_{i,t}$$

Where $Perf_{it}$ is a measure of economic performance for sector *i* at time *t*, $HERFf_{it}$ is the Herfindahl-Hirschman index for the sector *i* at time *t*, $size_{it}$ represents the share in total sales of sector *i* at time *t*, and USA and ECU are the US and Ecuadorian real GDP per capita growth rates. These latter variables change with *t* but not with *i*, and allow us to control for an aggregate event that might affect the whole panel (in a similar way as year dummies, but with a stronger theoretical basis). Additionally, the above equation was estimated using a fixed-effect estimator, in order to control for any unobservable constant feature specific for each sector. Different alternative variables were tested to reflect the economic performance variable ($Perf_{it}$), in order to capture the profitability or the investment rate for each economic sector. The weighted return on assets and the weighted return on equity were used as proxies of profitability, while the growth rate of either total assets or net fixed assets was used as a measure of investment at the sectoral level.

OLS Fixed-Effects Regressions



Market concentration and trade protection

To assess to what extent powerful economic groups might limit competition within their sectors through unfair regulation, we built up different measures of trade protectionism, so as to use those variables as a measure of the state's decision to protect specific sectors. Using CIIU data at the 4 digits level, the variables that capture some degree of protection are:

- Average tariff by sector;
- Ratio of mean tariff to tariff range by sector;
- U.S. FTA Protection Index: The number, between 0 and 1, captures the degree of trade protection for each category under the CIUU 4-digit level classification, by looking at the tariffs schedules in the draft agreement in the FTA negotiations with the U.S. Protection increases as the index is closer to 1;
- CAN-MERCOSUR Protection Index: The number, between 0 and 1, captures the degree of trade protection for each category under the CIUU 4-digit level classification, by looking at the tariffs schedules in the CAN-MERCOSUR agreement. Protection increases as the index is closer to 1;
- Forbidden-import merchandise: share of those categories within each sector for which imports have been forbidden.

As the trade protection data are only available for a point in time (2005), no time series estimate can be performed here. However, at the 4-digits CIUU level, correlations between the protection measure and the HHI market concentration index can be measured. All of the computed correlation coefficients are not statistically significant. Thus, the results do not support the hypothesis that the sectors with a strongest output concentration are more protected under trade agreement negotiations or as a result of tariff decisions.

Correlation of Trade Protection with Output Concentration

Mean Tariff over Tariff Range	0.0724
Average Tariff	-0.1352
FTA Protection	-0.0578
CAN-MERCOSUR Trade Protection	-0.1629
Forbidden Imported Categories	-0.006

Another use of the data may be to check whether trade policy has been actually used as an effective tool to protect products or sectors that may have a strategic value, in the Hausmann, Hwang and Rodrik (2005) perspective. Trade policy has

long been thought as a powerful policy tool to protect domestic industries against foreign competition until local industries reach levels of development similar to their competitors. That has been the rationale behind the import substitution story. By combining the trade protection indicators and the Hausmann and Klinger (2006) data, one can try to assess whether trade policy has been somehow effective in terms of protecting those sectors with strategic value, either because they have a high revealed sophistication and thus may be helpful to move faster in the process of structural transformation, or because they are in the dense part of the product space, thus facilitating to jump to a nearby path of goods with increasingly higher value.

As measures of product sophistication and density in the product space, we use the PRODY and DENSITY variables, as defined by Hausmann and Klinger. The PRODY variable captures the degree of revealed sophistication implicit in each export product. The DENSITY variable assesses the likelihood that a specific product might be exported, by looking at its proximity to a group of products where a comparative advantage has already been established. Those two variables have been aggregated to a CIIU 4-digit level classification (see Annex G), for which trade protection variables are available.

Correlation of Trade Protection with Output Concentration
(Correlation Coefficients)

	PRODY	DENSITY
CAN-MERCOSUR Protection Index	-0.22	0.28
Number of forbidden import categories	0.14	-0.15
Average Tariff	-0.20	0.21
FTA USA Protection Index	-0.21	0.35
Average Tariff/ Tariff Range	-0.42	0.46

The correlations between the trade protection indexes and PRODY are mostly negative (though moderate), suggesting that, if anything, trade policy is aimed at protecting the "wrong" sectors, in terms of the sectors' strategic value or sophistication. On the other hand, the correlations between trade protection indexes and DENSITY appear to show that trade policy is protecting sectors with some export potential. However, as Hausmann and Klinger point out, a country might be exporting goods with low strategic value, thus a higher DENSITY level may not necessarily correspond to products with high sophistication. Hence the last result should be taken with caution.

Measures of trade protection

Different variables have been used to provide proxies for trade protection measures. This section details the methodology used to construct the relevant variables. Also, some variables from Hausmann and Klinger (2006) and Klinger (2007) have been used. In order to reach the same degree of sectoral detail as the

Indicador database, they have been aggregated as detailed below.

Trade protection (FTA Negotiations)

Under the FTA negotiations with the US, Ecuador proposed an initial offer in terms of tariff reduction by economic sector and product. Products were classified under different categories for trade liberalization, from basket A (immediate trade liberalization) to basket D (trade liberalization over 15 years). A proxy for trade protection policy was built upon such proposal. The FTA negotiations were undertaken for different items subject to tariffs, under the NANDINA (Harmonized System 2002) classification at the 8 and 10 digit levels. Such information was transformed into CIIU Second Revision economic activity classification, by using the relationships provided by the World Integrated Trade Solution (WITS) from the World Bank.

As ever economic sector (at the CIIU level) can regroup diverse individual tariff item, the protection index was built as follows. For each sector, we calculated the percent of products or items that were included in each one of the tariff liberalization baskets. Each sectoral average was weighted by the tariff liberalization timing for each basket. Thus, the weights were set for baskets A(0); B(30); C(25); D(15); and D*=(10). The highest result would then correspond to the most protected sector and the lowest the least protected one. However, to obtain an indicator between 0 and 1, it has been standardized: for each sector's CIIU reference, the result was retrenched by the minimum tariff value and then divided by the difference between the maximum and the minimum tariff.

Trade protection (CAN-MERCOSUR Negotiations)

The protection index was based on CAN-MERCOSUR negotiations, in a similar way than for Ecuador's first offer under the FTA negotiations. However, as the trade negotiations were based on the ALADI's NALADISA 96 classification, as an initial step for the transformation to CIIU. The subsequent transformation was identical to that one used for the negotiations with the US.

Tariff protection

Tariff protection was measured through the average sectoral tariff, the maximum and minimum values, and the range of tariff where they actually are. An aggregation of most tariff items (initially at the NANDINA 8-10 digits) was made to CIIU Rev. 2-4 digits level.

Import-forbidden merchandise

All import-forbidden merchandises are included in Foreign Trade Council (COMEXI) Resolution 182 from January 2003. They were transformed to the CIIU by using the correspondence included in the World Bank's World Integrated Trade Solutions (WITS).

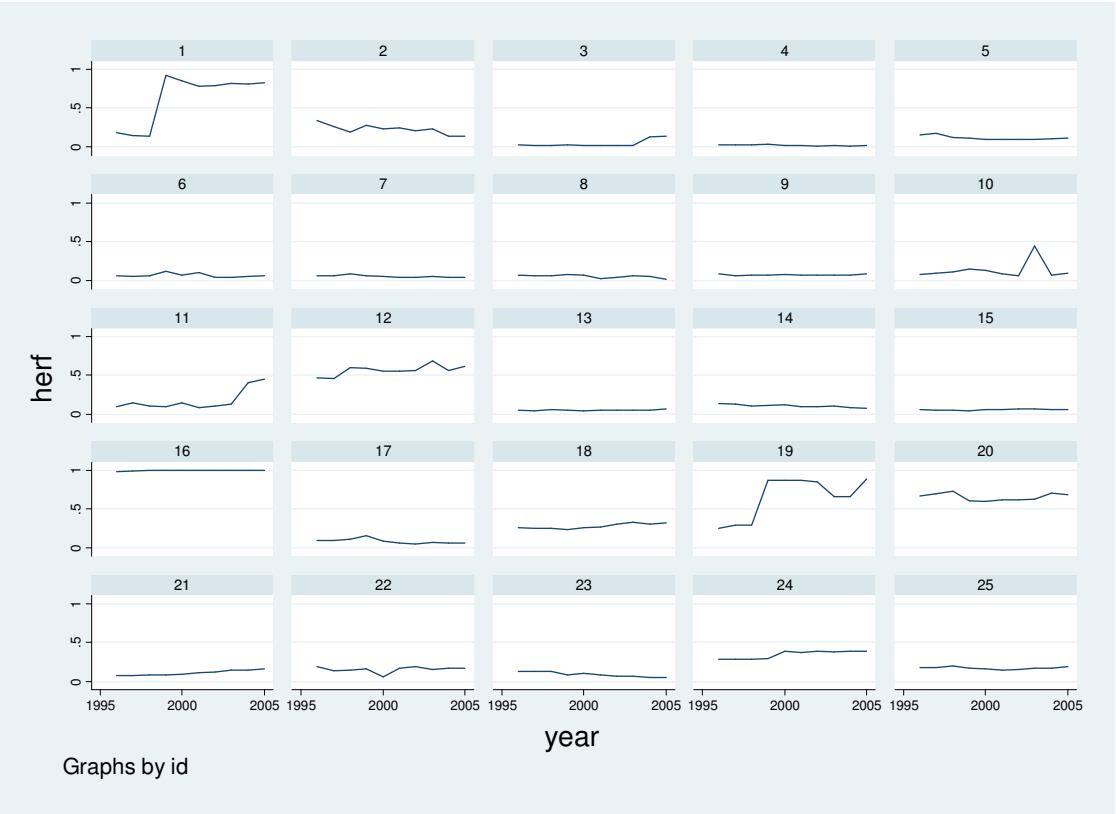
Exports under CIIU Rev. 2 classification

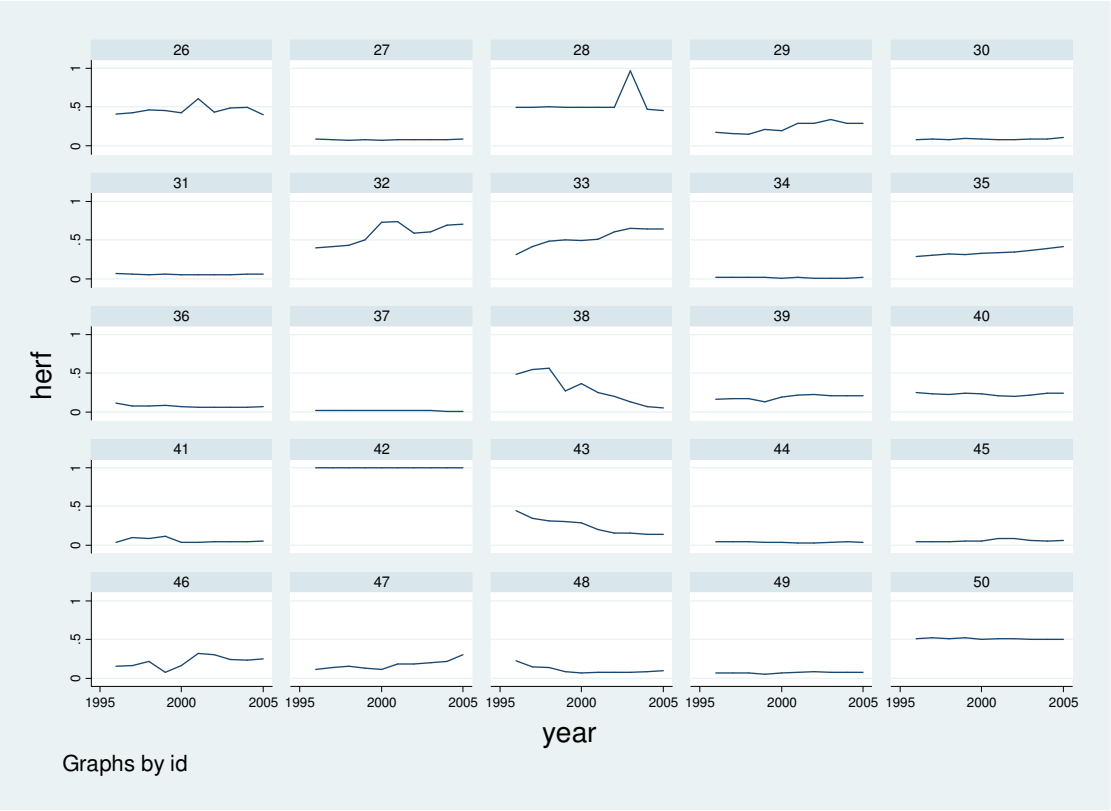
The World Bank's World Integrated Trade Solutions (WITS) permits an extraction of the export data at the CIIU Rev.2 aggregation level.

Hausmann and Klinger (2006) data

The data on product strategic value and product space (density, paths, prody and prodyppp) from Hausman and Klinger (2006) were transformed again using the World Integrated Trade Solutions (WITS). For each economic activity including diverse items, the maximum, minimum, as well as the average value were calculated for each variable.

Output concentration evolution by sector – 50 largest sectors

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1995
2000
2005
year
Graphs by id

ID correspondence for each sector

1	ADMINISTRADORES
2	AEREOEXPRESOS
3	AGENCIAS DE TURISMO (INCLUYE VENTA DE PASAJES)
4	ARRENDAMIENTO DE BIENES INMUEBLES
5	ARTICULOS DEL HOGAR: COCINAS, MAQUINAS DE LAVAR, VENTILADORES, ENCERADORAS
6	BANANO
7	CAMARONERAS
8	COMERCIO AL POR MAYOR NO CLASIFICADO EN OTRA PARTE
9	COMPRA VENTA DE VEHICULOS MOTORIZADOS
10	CONSTRUCCION DE CAMINOS, PUENTES, AEROPUERTOS, OBRAS PUBLICAS EN GENERAL
11	CONSTRUCCION Y/O INSTALACIONES DE OBRAS N.E.P
12	CRIA DE AVES PARA PRODUCCION DE CARNES Y HUEVOS
13	DISTRIBUCION DE OTROS PRODUCTOS ALIMENTICIOS
14	DISTRIBUIDORA DE PRODUCTOS FARMACEUTICOS
15	DISTRIBUIDORES DE AUTOMOVILES, CAMIONES Y CAMIONETAS, MOTOS, BICICLETAS, ETC.
16	DISTRIBUIDORES DE CEMENTO
17	DISTRIBUIDORES DE MOTORES, MAQUINAS Y EQUIPOS INDUSTRIALES, COMERCIALES
18	ELABORACION DE ACEITES Y GRASAS VEGETALES Y SUBPRODUCTOS
19	ELABORACION DE BEBIDAS NO ALCOHOLICAS Y GASEOSAS
20	ELABORACION DE CERVEZA, MALTA Y OTRAS BEBIDAS MALTEADAS
21	ELABORACION Y CONSERVACION DE PESCADO Y CRUSTACEOS
22	ESTACIONES DE SERVICIO O GASOLINERAS, (VENTA DE COMBUSTIBLES)
23	EXPORTADORES
24	FABRICACION Y REFINACION DE AZUCAR
25	FABRICACION DE CAJAS Y ENVASES DE PAPEL Y CARTON
26	FABRICACION DE CEMENTO
27	FABRICACION DE OTROS PRODUCTOS DE PLASTICO
28	FABRICACION DE OTROS PRODUCTOS DIVERSOS DERIVADOS
29	FABRICACION DE PAPEL Y CARTON
30	FABRICACION DE PRODUCTOS FARMACEUTICOS Y MEDICAMENTOS
31	FABRICACION DE TELAS Y TEJIDOS
32	FABRICACION Y MONTAJE DE VEHICULOS MOTORIZADOS
33	FARMACIAS
34	FLORES

35	GRANDES TIENDAS DE COMERCIO MINORISTA DIVERSO
36	HOTELES
37	IMPORTADORES
38	IMPORTADORES Y EXPORTADORES
39	INDUSTRIAS ALIMENTICIAS NO CLASIFICADAS EN OTRA PARTE
40	LAMINADORAS Y OTRAS INDUSTRIAS BASICAS DE HIERRO Y ACERO
41	MAYORISTA AGRICOLA, FRUTICOLA Y LECHERO
42	MAYORISTA EN TABACOS Y CIGARRILLOS
43	OTROS NO CLASIFICADOS EN OTRA PARTE
44	OTROS PRODUCTOS AGRÍCOLAS NO CLASIFICADOS
45	OTROS SERVICIOS PRESTADOS A EMPRESAS N.E.P.
46	OTROS SERVICIOS RELACIONADOS CON EL TRANSPORTE N.E.P
47	PESCA EN GENERAL
48	PRODUCCION Y DISTRIBUCION DE ENERGIA ELECTRICA
49	SERVICIOS Y AGENCIAS DE PUBLICIDAD
50	SUPERMERCADOS

Annex I. Ecuador export basket in the product space

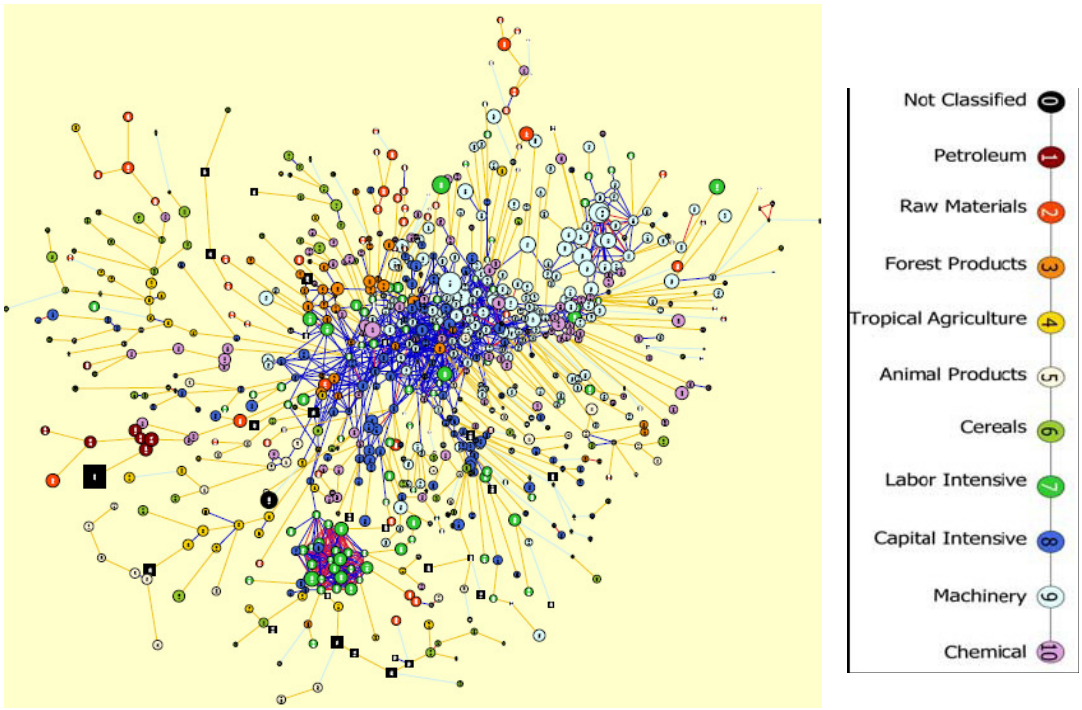
The strategic value approach, developed by Hausmann, Hwang and Rodrik (2005) and Hausmann and Klinger (2006), is based on the idea that, based on the current export basket space, assets and capabilities needed to produce one good can be close to those needed to produce other goods. By using a measure of revealed proximity between products and mapping the density of the product space, one can then observe where does a specific country lies in the space. Its location will help measuring whether it has a nearby path of goods with increasingly higher value, which would help it move faster in the process of structural transformation.

The methodology is based on a measure of the combined sophistication of Ecuador exports, based on the revealed sophistication of each individual export product. Hausmann, Hwang and Rodrik (2005) measure the sophistication of each export product (called PRODY) by calculating the weighted GDP per capita of countries exporting that good, where the weights are related to the countries' revealed comparative advantage in that good. The revealed sophistication of a country's export package (called EXPY) is then calculated as the weighted average of the PRODYs of the products exported by the country. They find a very strongly positive relationship between EXPY and GDP per capita.

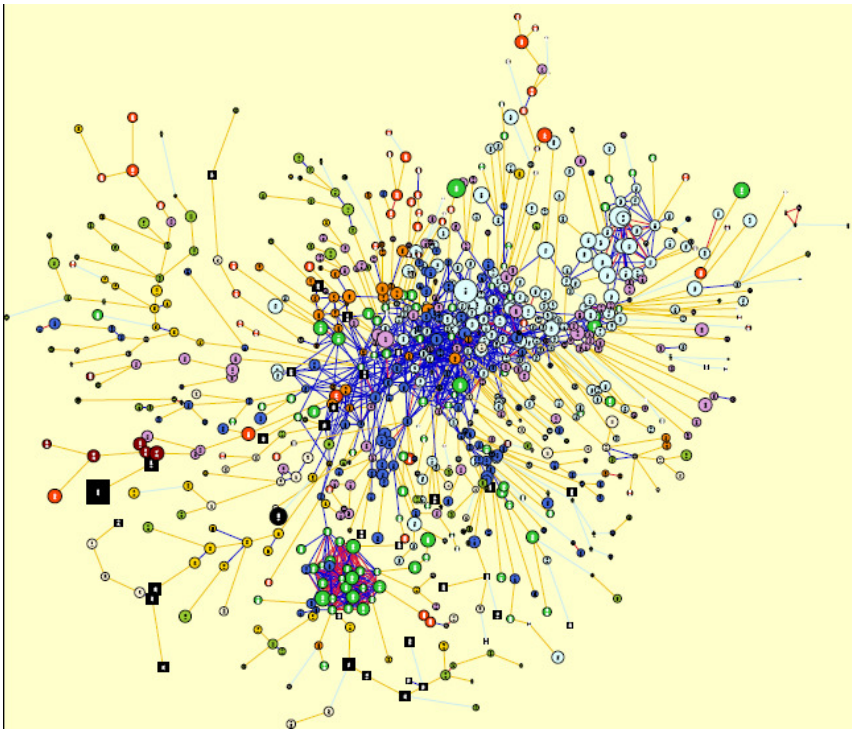
Combining such measure with the proximity in the product space, the results provided by Klinger (2007) are presented below. They suggest that Ecuador's productive capabilities tend to be in relatively sparse parts of the product space, highlighting the challenges the country faces to "jump" from rather peripheral zones—with limited products nearby, requiring similar capabilities—to other areas of the space, where products with high technology are more prominent. Petroleum, forest products, and tropical agriculture are the three areas where some movement can be identified over recent decades, though they are not in the areas of high sophistication.

In the following charts, from Klinger (2007), black squares represent goods for which Ecuador has achieved comparative advantage

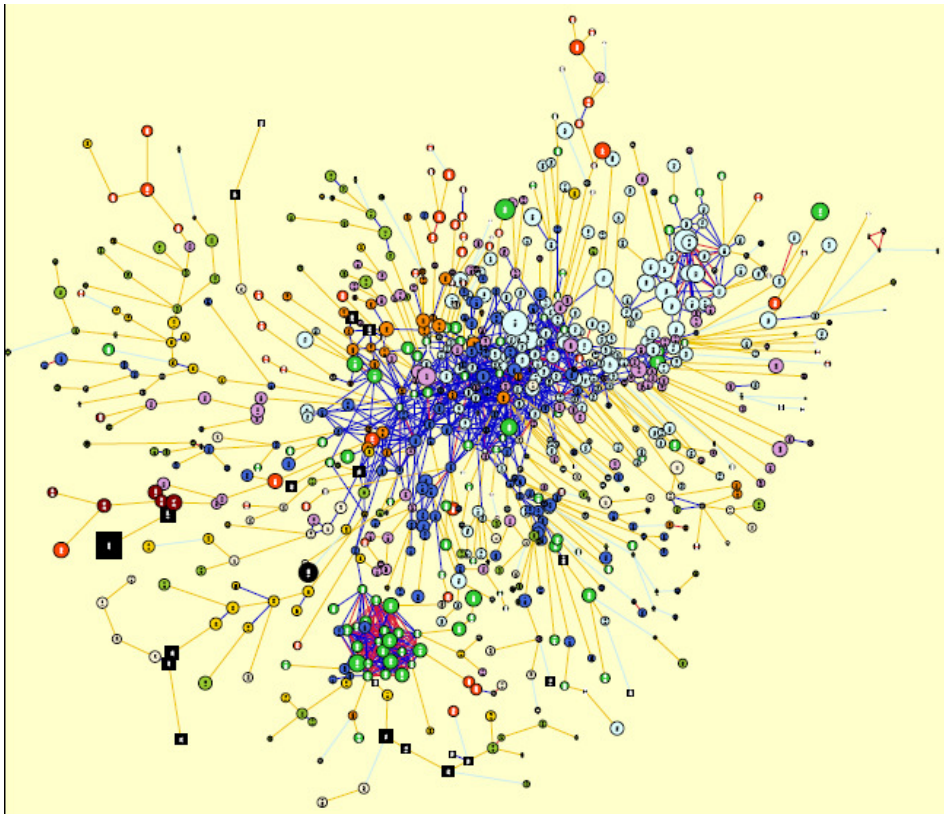
Ecuador 1975



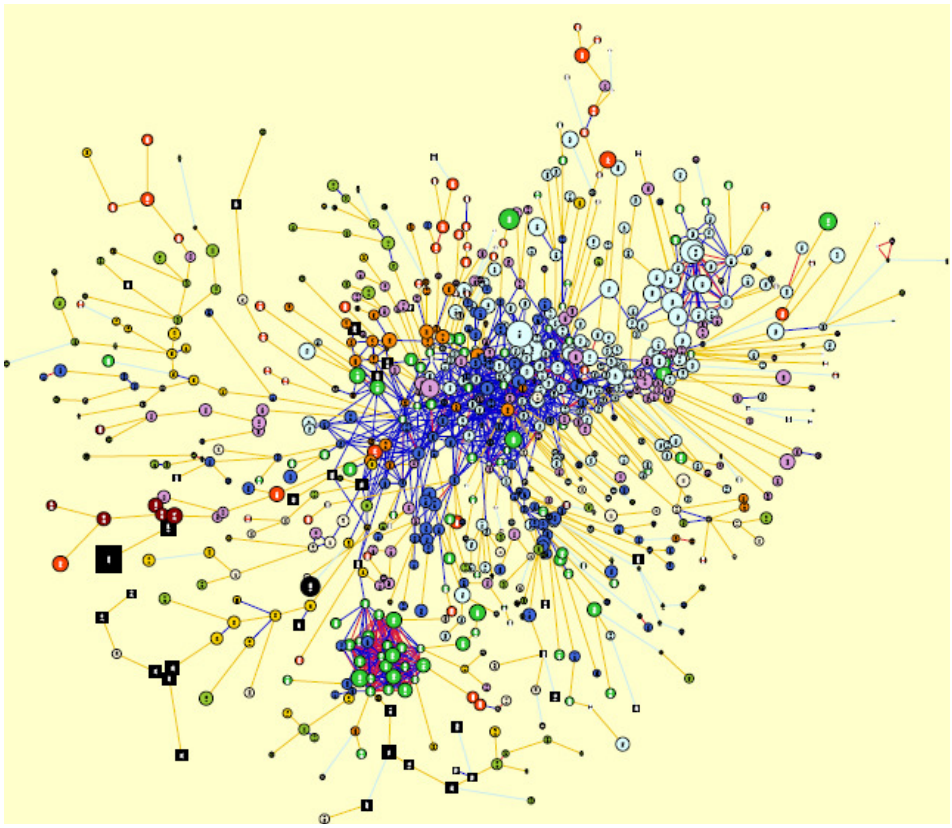
Ecuador 1980



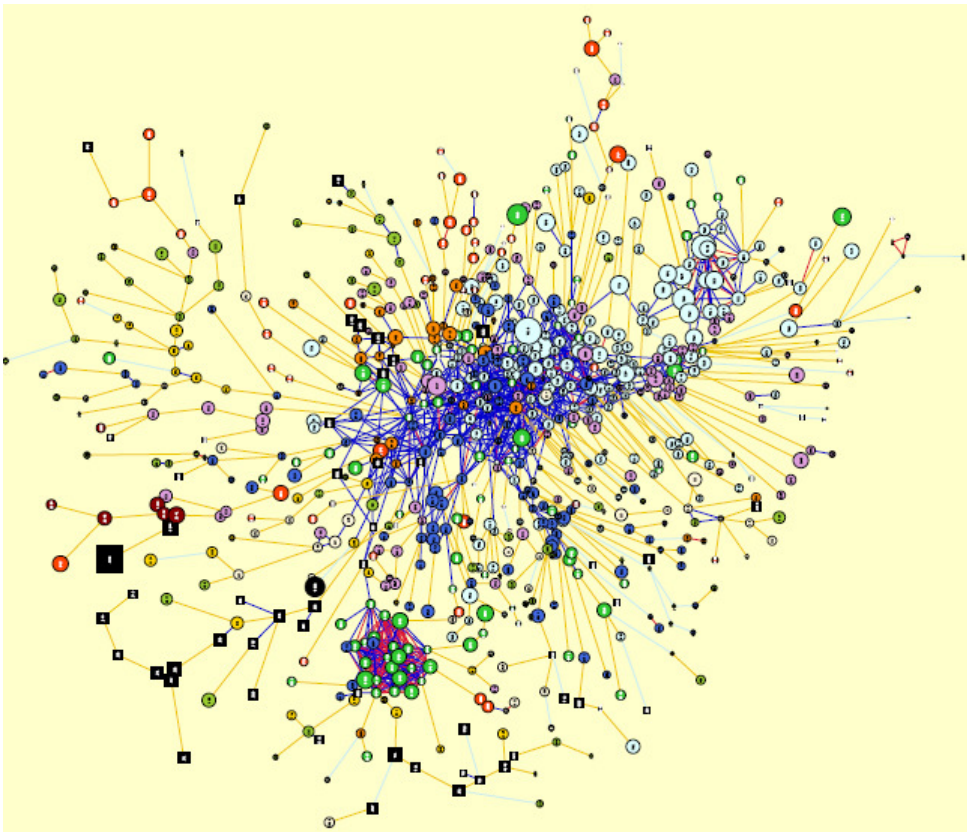
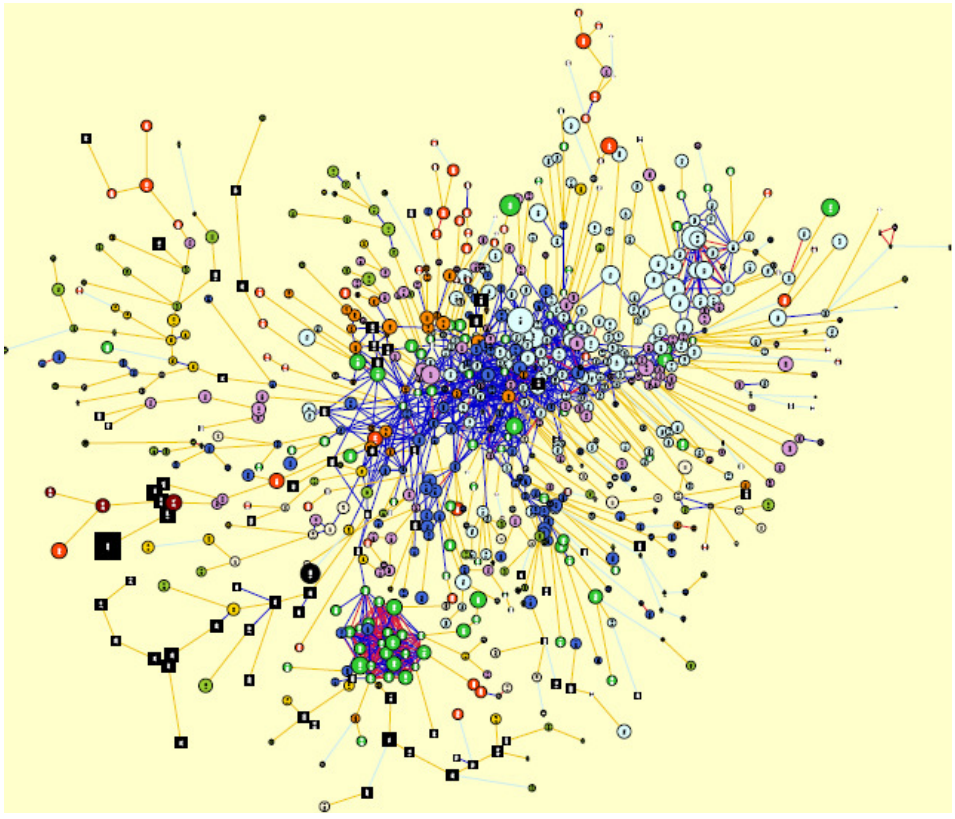
Ecuador 1985



Ecuador 1990



Ecuador 1995



Ecuador 2000