VALUE AND QUALITY CREATION: NATURAL RESOURCES, INDUSTRIALIZATION AND STANDARDS OF LIVING IN PERU 1950 TO 1997*

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P eru's recent economic policy, like that of most Latin American countries[1] has followed the paradigm of the so-called "Washington Consensus". Such paradigm precludes the implementation of "strategic" industrial policies as well as the active and deliberate construction of competitive advantages through measures that foster certain sectors or activities. "Washington-Consensus" thinkers hold that the "magic of the market" and its indiscriminate opening will allow countries to acquire the necessary long-term external competitiveness, promote economic growth and enhance standards of living, regardless of the country's productive specialization.

This paper seeks to evaluate whether the type of productive specialization and trade in specific products has impacted economic growth and standards of living in Peru. It seeks to determine whether the prevalence of producing or trading goods from specific branches or sectors, whether natural resources, industrial or services, have either a positive or negative impact on the people's standard of living and well-being. To this end, we analyze Peruvian data for the last 50 years, paying special attention to the expansion and recession cycles, and to industrialization policies implemented in Peru's economy since the end of the 1950s.

Our two core hypotheses are that: i) the standard of living is inversely related to the level of "primary" activities. In other words, the general well-being of the

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1 Rosenthal (1996) provides a historical overview of how development ideas and policies have evolved in Latin America in the last half century.

population will decline as national eco-
nomic activity is increasingly directed
towards the development of raw materials
or extractive activities; and ii) the economy
will become increasingly fragile if, as a
result of productive specialization, there
is an "uncoupling of quality and value"
between the country's exports and im-
ports. In other words, the country will
become increasingly fragile if it trades an
increasing amount of simple goods in
exchange for the same or a smaller amount
of more elaborate foreign goods.

In the first section we present a brief
overview of the theoretical framework that
explains how economic activities differ-
entiate one from the other and why countries
that specialize in producing and trading
goods of "lower quality or value" even-
tually also lower their own living standards
and well-being. The second section shows
quantitative data on standards of living and
the main types of activities that have
prevailed in Peru over the last half-cen-
tury. The main findings concerning the
relationship between primarization, indus-
trialization and standards of living appear
in the third section, while the fourth section
provides a first evaluation of the "uncou-
pling of quality and value" between
Peruvian exports and imports. Lastly, we
give some recommendations for Peruvians
to benefit from the new era of globalization
and trade.

1. THEORETICAL CONSIDERATIONS

Most classical literature about economic
growth holds that economic activities do
not matter and that economic growth
depends on the abundance and best use
of capital, labor or natural resources, as
well as technology, infrastructure, free

trade, government's efficiency, savings
and investment, education, individual
effort, driving force of the people, etc.
However, little or even no attention has
been paid to economists who underscore
the type of products a country turns out
as a main factor for economic growth.
Reinert (1993, 1995) has explored more
than 500 years of economic history to
show that economic growth and standards
of living depend on the type of activities
performed by nations. Graham (1923)
presents one of the soundest arguments
that specialization in one type of activity
or another is crucial for growth and
commerce. Based on a simple, before-and-
after numerical trade example, Graham
showed that the standard of living and
level of income for two countries who
specialize in production and engage in
trade on the basis of their comparative
advantages will improve for such two
nations and the world at large if and only
if both countries can produce at similar
returns.

If a country specializes in producing
goods with increasing returns while the
other country specializes in producing
goods with diminishing returns, the world
at large will also increase its income but
revenues in the country specialized in
goods that are produced at diminishing
returns will decrease, while revenues in
the country with growing increasing re-
turns will rise. This means one country
will be wealthier and the other poorer
although the world will become wealthier
as a whole[2]. Graham, and many previous

2 Almost all classical and neoclassical interna-
   tional trade theory –since Adam Smith and
   David Ricardo to our days– is based on the
   assumption that constant returns and perfect

thinkers in past centuries like Serra (1613), Colbert (1651), Rosher (1882), Raymond (1820), hold that raw materials and natural resources intrinsically provide diminishing returns while manufactured products show increasing returns. In *Annex 1* we have further elaborated on Graham's initial exercise to show that trade between countries with similar returns favors both, but that if one has growing or constant returns and the other has diminishing returns, the first one will prosper to the disadvantage of the second one, where standards of living and revenue will fall despite a larger world product.

Another argument underscoring the fact that the type of productive activity has an influence on economic growth, though from a different vantage point, was advanced in the 1950s and 1960s by authors including Hirschman (1961), Prebish (1970), Singer (1981), Seers (1975) and Myrdal (1963), to mention just a few. Prebish holds that countries specializing in raw materials and natural resources are harmed because the prices of raw materials grow relatively less rapidly than prices of manufactured products. Hirschman holds that agriculture lacks the upstream and downstream linkages or the complex division of labor that characterizes manufacturing. Myrdal mentions the "cumulative causation" present in manufacturing,

but not found in natural resources development. Others point to higher income elasticity and increased growth of demand for manufacturing goods compared to primary products.

More recently, in the 1990s, Matsuyama (1992) and others pointed to the fact that manufacturing shows positive growth effects that are absent in agriculture and stem from higher, "induced learning." In other words, there are a number of learning externalities that neither agriculture nor the service sector can provide.

Sachs and Warmer (1995) made an empirical, comparative world survey showing that countries richly endowed with natural resources grow less than countries specializing in tradable manufactured products. However, they fail to explain the reasons underlying those differences and then argue that free trade is beneficial for all the involved parties.

Within the theory of trade, Krugman (1991), and Krugman and Obsteld (1995) hold that an economic activity may be better than another only if there are market imperfections that include positive externalities originating in technological innovation or the existence of rents in highly concentrated oligopolistic industries[3].

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competition will prevail. From this theory, we can infer that international commerce will bring benefits to all nations that trade under such conditions. In the 1980s, Krugman focused on part of Graham's work to redesign the whole theory of trade under the assumption of increasing returns and verified that in this case trade would also benefit all countries. However, he failed to consider, as correctly pointed by Reinert

(1996), the possibility that one country would show growing returns and the other decreasing ones, in which case the former becomes richer and the latter poorer, as demonstrated by Graham in 1923.

3 If undertaking an economic activity results in knowledge used by other sectors without payment, Grossman argues, the industry will pro-

Reinert (1993, 1996) takes a more dynamic, encompassing and integrating viewpoint of economic history that approaches and complements theories about competitiveness and corporate strategies by authors including Porter (1990), Marrus (1984), David (1986) and others. Reinert argues that economic activities are different from a qualitative vantagepoint, and that they determine economic growth and income disparities among nations. In this respect, Reinert proposes a "quality index" for economic activities whereby countries that grow are those that focus on producing "high quality" goods while nations that produce "low quality" grow less or move backwards.

"High quality goods" typically feature increasing returns and are performed under conditions of imperfect competition with steeply sloping learning curves, rapid technological changes, large-scale R&D and investment, high growth and income demand elasticity rates, economies of scale, numerous linkages, a high and complex division of labor, a significant need to "learn by doing," high industrial concentration, imperfect and at the same time extremely dynamic information flows, high barriers to market entry and exit, high salaries, etc. These are all industries that closely follow the assumptions of Schumpeter's theory of imperfect though dynamic and changing competition.

Low quality goods are characterized by decreasing returns, perfect competition, flat learning curves, slow technological development, small R&D investment, low growth and demand income elasticity, falling economies of scale, few linkages, scant division of labor, reduced requirement for institutional learning, a fragmented industry, perfect information, low entrance and exit barriers, low wages, etc. In other words, all those activities that closely reflect the traditional assumptions of the Neoclassical theory of production, trade and growth.

According to Reinert (1996), trade among industrial and non-industrial nations is characterized by asymmetrical exchanges between industries that on the one hand, feature large economies of scale and evolve under conditions of imperfect competition and, on the other industries characterized by diminishing returns and perfect competition. Moreover, he holds that present, industrial economies historically chose to follow an active and deliberate path to "high quality goods production," by enforcing highly successful "industrial and commercial strategies" which they, having now achieved productive excellence, no longer recommend as a recipe for growth to developing nations.

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duce a marginal social benefit or will generate positive externalities that spread to the rest of the economy. In such cases, there should be in theory some subsidy mechanism to allow the high-technology industries (v.g. biotechnology, electronics, space industry, etc.) to capture some of those social benefits and thus further foster its own development (Grossman, 1991). In the case of oligopolistic industries, given the small number of companies that trade on a world scale,

windfall profits are a logical consequence. Under such circumstances, a country may likely subsidize its own company so as to push other countries' companies out of the market. This is commonly called *strategic commercial policy*. However, such policy may unleash a trade war if all the other countries react likewise (Brunder, 1991). Despite these arguments, the fundamental implications for economic policy derived from such proposals are still valid. Thus, for instance,

2. STANDARD OF LIVING AND TYPE OF ECONOMIC ACTIVITY. PERU 1950-1997

In the hypothesis that growth and standards of living depend on a country's productive specialization, this section analyzes the evolution of standards of living and the main economic activities that have characterized Peru's last half century.

2.1 Legal and institutional aspects. Industrial and labor policies

Both the type of economic activity and the standard of living of any economy are influenced not just by economic and market cycles, but also by industrial, labor and income policies and by institutional factors and diverse cultural elements. We do not aim here at identifying each and every one of these factors, but it is necessary to take into account the wider trade, industrial and income policy periods that Peru has evolved in the last 50 years.

Since 1959, Peru's productive activities were, to varying extents influenced by the Industrial Promotion Law (Law No. 13270) which introduced substantial incentives to industrial investment, particularly those in basic and decentralized activities. Some of the schemes included in this law underscored tax incentives to

it is held that no conclusive empirical evidence allows to hold that markets will necessarily fail. Additionally, even if this were true, the criteria selected to foster new activities are not clear, nor is there sufficient information to evaluate and determine what industries should be promoted. Lastly, it is also held that this policy is not free from various pressures which would, in the best of cases, hamper making final decisions (Grossman, 1991).

reinvestment and growing effective protection for the manufacturing industry by reducing tariffs to imports of capital goods and inputs, while more heavily taxing imports of consumer goods (see Ferrari, 1992; Portocarrero and Nunura, 1984).

The first law enacted in 1959 was followed by the 1970 Industrial Promotion Act (Law No. 18350) and the corresponding 1981 and 1986 bills that slightly modified the initial regulations without canceling the crucial role afforded to incentive policies, and to the State's role as regulator, planner and even producer, as was characteristic of the industrial policy introduced in 1970 when State-owned companies started to expand.

The concept of priority industries was introduced in 1970 to underscore and foster through tax, tariff, credit and administrative schemes, the development of basic industries including cement, paper, basic chemicals, steel, fertilizers and oil refining, all of which were reserved exclusively to the State. In 1981 and 1986, although the existing industrial policy was largely preserved, the State's monopoly and the definition of priority industries were canceled, as well as tax exemptions for reinvested profits. Occasionally, also the option to repatriate profits and royalties was suspended.

Generally speaking, from the 1960s to the 1980s, industrialization policies favored permanent protection for all types of industries devoted to producing final-goods for the local market where there was little internal competition. There existed no "learning" processes or linkages with foreign countries, technology was imported, and the policy as a whole was enforced with a static planning vision

of the world and business. This view sought to create an industry to assemble imported parts and components without paying attention to education, creativity and training. It thus had scarce possibilities of linking up with a broader market. Income and job allocation in industry were ruled by static rent and profit seeking attitude, and by a culture based on nepotism rather than merit. Government assumed an oversized entrepreneurial role that lacked synergies and eventually excluded and displaced domestic and foreign private investment.

On the side of revenue policies, the first half of the 1970s saw the emergence of measures and reforms that initially fostered wage and salary growth and which were related to the land and company reforms. Likewise, a number of labor regulations enacted in that period made lay-off more difficult while giving workers job tenure and strengthening unions.

In 1990's all, the previous industrial, labor and income policy schemes were cancelled. The new government policy suspended the main tax exemptions, reduced tariff structure, and lifted price controls while financial, exchange and trade regulations were liberalized. Job tenure was also eliminated and the whole labor legislation was made more flexible, thus reducing union power. A radical government downsizing program through privatization and/or the sale of State-owned assets was introduced and, all restrictions to the inflow or outflow or foreign private capital were lifted.

As we shall see below, the relative importance of the manufacturing sector grew through the enforcement of industrial policies only until the mid-1970s, and was later reduced in the wake of earlier stabilization programs. To the extent that industrial development was based on developing the domestic market through industrialization focusing on import substitution, the enforcement of adjustment programs inevitably led to receding national industrialization.

Concurrently, standards of living and income levels fell as a consequence of booming population growth and lower factor productivity.

2.2 GDP evolution and main economic activities

Peru's economy grew at an annual 3,3% average rate[4] from 1950 to 1997 but its annual performance was very irregular and less than satisfactory (see *Figure 1*). In the initial 20 years from 1950 to 1970, the annual average growth rate reached 5% with only two years of stagnation and recession in 1958 (–0,6%) and 1968 (0,4%).

Between 1970 and 1990, annual growth was 1,7% including several periods of strong economic contraction due not only to weather difficulties such as the 1983 El Niño weather anomaly (–12,6%) and drought in 1992 (–1,4%), but also as a result of adjustment and stabilization programs in 1976-78, 1988-89 and 1990. Finally, in the last 7 years, the economy has grown at an annual 5,7% rate despite which production in 1997 was only 13% larger than in 1987.

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4   The annual average growth rate was computed from the ln $(Y) = a0 + a1 \times$ time, regression where the a1 coefficient is the annual average rate for the period under consideration. Prepared by the authors.

Figure 1: GDP(Δ% ANNUAL)
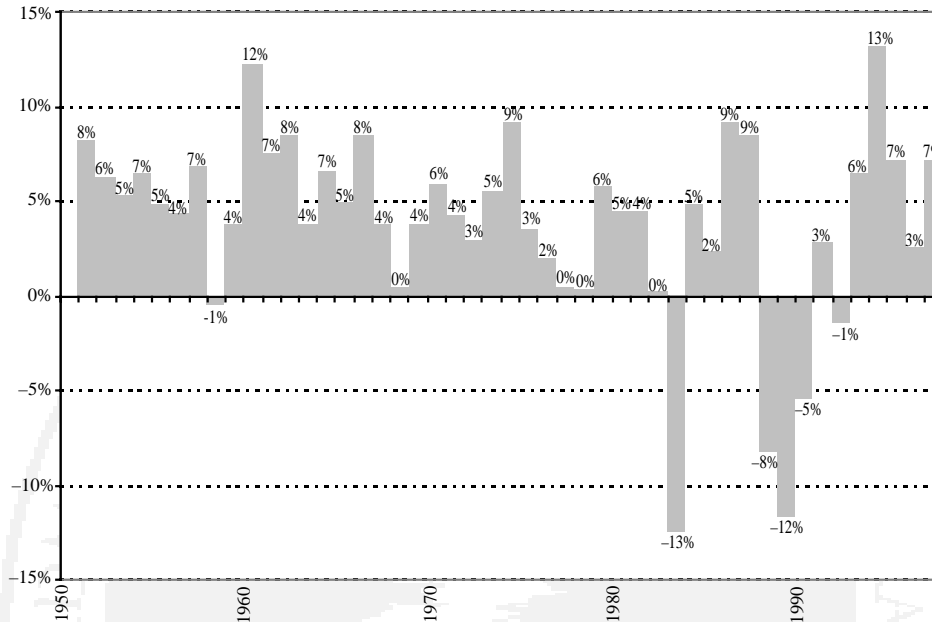
A breakdown of GDP by period and economic sector in the 1950s and 1960s reveals that fisheries activities led growth at an annual average rate of 19% and 9,3% respectively, where energy (electricity, gas and water) grew 8,8% and 7,4%, and manufacturing expanded 7,1% and 5,5%, for the respective years. Such levels of growth gave these productive sectors a significatively larger share in global GDP in the first two decades of the periods under consideration.

In the mid 1970s, macroeconomic imbalances and stabilization policies reduced the pace of economic growth to 3,6% per annum. The most dynamic industries in that period were energy (+9,4% a year), mining (+7,8%) and government services (+4,7%). However, fisheries fell (–4,6%), agriculture stagnated (+0,5%) and manufacturing grew barely above population growth (+2,9%). Evolution in the 1980's was even more dramatic, given the higher vulnerability of the external sector. To this we may add populist policies enforced during 1985-1989 that eventually led to a –0,3% yearly drop of GDP. Excepting fisheries and energy, all other economic activities performed poorly, in particular mining (–3,3% a year), construction (–0,5%) and manufacturing (–0,4%).

So far in the current decade, annual average growth has reached (5,7%) with construction leading growth at +12,1% per year, followed by electricity, gas and water (+6,6%) and commerce and services (6,3%). The most obvious laggards sectors were government services (+0,7%), rental housing (+1,4%) and mining (+2,8%). Product mix in the last seven years has also gone through substantial restructuring

Table 1 GDP ANNUAL AVERAGE GROWTH BY ACTIVITIES						
Industries	**1950-60**	**1960-70**	**1970-80**	**1980-90**	**1990-97**	**1950-97**
Global	5,0%	5,0%	3,6%	–0,3%	5,7%	3,3%
Agriculture	1,5%	3,1%	0,5%	2,4%	5,7%	2,0%
Fisheries	19,0%	9,3%	–4,6%	9,3%	5,1%	5,5%
Mining	7,2%	3,8%	7,8%	–3,3%	2,8%	3,8%
Manufacturing	7,1%	5,5%	2,9%	–0,4%	5,4%	3,4%
Electricity, gas and water	8,8%	7,4%	9,4%	3,0%	6,6%	7,1%
Construction	4,9%	3,5%	3,1%	–0,5%	12,1%	3,1%
Housing	3,4%	2,9%	2,9%	1,6%	1,4%	2,6%
Government	4,7%	5,4%	4,7%	0,7%	0,7%	3,5%
Other	5,2%	6,0%	3,8%	–0,9%	6,3%	3,5%

Source: National Statistics Institute (INEI).

to the benefit of agriculture and construction with less importance attributed to mining and government services.

Generally, the industrial policy enforced since the end of the 1950s led to the development of the manufacturing industry that increased its share from 19% in 1950 to a maximum 25,5% in 1976. However, together with poor management of the agricultural companies created by the state, this industrial policy led to the relative fall of agriculture, which dropped from 23,7% in 1950 to 9,9% of GDP in 1980.

In the 1980s and 1990s, manufacturing took a step backwards compared to the 1970s with a clear trend towards de-industrialization. The reasons can be found in the effects of the recession provoked by stabilization programs and by the suspension since 1990 of various industrial promotion and protection schemes and incentives that had been in place since 1959. Evolution in most other sectors was basically influenced by exogenous factors,

be they foreign (as in mining), weather (fisheries), population (electricity, gas and water) or relating to the expansion of government expenditure (as in construction and government services).

An easier way to classify productive specialization in Peru over the past half century is by dividing GDP into four large economic groups or sectors: (i) extractive or primary activities (agriculture, fisheries and mining); (ii) basic transformation or infrastructure (construction); (iii) intermediate or industrial transformation (manufacturing); and (iv) services (home rentals, government, electricity, gas and water, commerce, services and others).

Although this standardized classification is rather broad and does not accurately reflect the "quality index for economic activities" proposed in the theoretical framework, we still do not have a methodology that will allow to classify economic activities by use-intensity and technological upgrading capabilities, nor from the viewpoint of their relationship

Table 2 GDP STRUCTURE BY ACTIVITY (%)						
Industries	**1950**	**1960**	**1970**	**1980**	**1990**	**1997**
Agriculture	23,7%	17,1%	14,2%	9,9%	13,4%	13,2%
Fisheries	0,2%	1,0%	1,9%	0,5%	1,3%	1,1%
Mining	7,6%	10,3%	9,1%	12,9%	10,1%	8,3%
Manufacturing	19,0%	23,6%	24,9%	23,8%	22,1%	22,0%
Electricity, gas and water	0,3%	0,5%	0,6%	1,1%	1,6%	1,8%
Construction	5,9%	5,4%	5,3%	5,5%	5,9%	8,8%
Housing	4,1%	3,3%	2,6%	2,4%	3,2%	2,5%
Government	5,9%	5,5%	5,7%	6,4%	6,7%	4,6%
Others	33,2%	33,4%	35,7%	37,5%	35,7%	37,8%

Source: INEI. Prepared by the authors.

to increasing, constant or diminishing returns[5].

Despite these constraints, we can assume that on average, natural resources activities are extractive and create goods with diminishing returns in perfectly competitive markets with low salaries. Infrastructure and manufacturing activities are processes with increasing returns, operating in imperfect markets, with larger technology investments, higher salaries, etc. The service sector sits somewhere between the two[6].

Table 3 shows GDP structure according to the four suggested sectors. Clearly,

in the first quarter century, the primary sector's participation decreased by a significant 13%, from 32% in 1950 to 19% in 1975. In the 80s and 90s, these sectors' importance increased again, to between 22% and 25%.

Manufacturing activities (including processing of primary resources such as fishmeal, frozen fish, sugar, non-ferrous metals and refined oil) also increased their share as a result of industrialization policies and reached a maximum 25% of GDP in 1975 to then fall again to 23,8% in 1980, 22,1% in 1990 and 22% in 1997.

5 More recently, the Organization for Economic Cooperation and Development (OECD, 1992) suggested a difference between supplier-driven activities, economy-of-scale intensive activities and those based on science. However, so far national statistics bureaus continue to use the International Industrial Uniform Classification presented in Tables 1 and 2 and proposed by the United Nations.

6 Obviously, this classification implies some over simplification that must be corrected in later

work. For instance, the garment and electronic industries are not comparable from a qualitative viewpoint for their effect on technological development, use of R &D, level of salaries, economies of scale, externalities, etc. Likewise, there is a substantial difference between extensive agriculture, and capital and technology-intensive mining or fisheries. Despite these constraints, this type of classification makes it possible to establish the differences between and quantify those activities that generally allow to reach increasing returns compared to those where only diminishing returns are possible if we follow Ricardo's terminology.

Throughout the period under consideration, construction never increased its share of GDP above 7% except in 1955 when it reached 7,9% and in recent years when, propelled by government expenditures and expanded home building in the private sector, it reached almost 9% of GDP.

Lastly, services increased their relative share from 43% in the 1950 to 47% in the 1990s.

2.3 Standard of living: per capita product, per capita consumption and remuneration

A simple way to classify levels of income and standards of living is through indicators like per capita product and consumption, and wages (white-collar income) and salaries (blue-collar income). Although it is true these indicators may hide inequality and income distribution disparities, they do constitute reasonable criteria for this paper.

Taking into consideration population has grown at an annual average rate of 2,6%, GDP per capita from 1950 to 1997 grew annually at a 0,7% rate, and private per capita consumption grew by 0,6%. At these rates for income per capita and population's purchasing power to double, we would have to wait at least one hundred years.

Despite such overall poor performance, we can observe rapid growth in the first 25 years of the period under study, which led GDP and consumption per capita in the mid-1970s to rise 80% above the corresponding 1950 figures. However, in subsequent years there was a notorious falling trend so that per capita income in 1997, although 69% higher than in the 1950s, was 11% lower than the historical record reached in 1981. Moreover, current per capita private consumption is 52% higher that of the 1950s but 17% below the historical record achieved in 1975 (see *Figure 2*).

		Table 3		
		GDP STRUCTURE BY ACTIVITY (%)		
Years	**Primary**	**Industrial**	**Construction**	**Services**
1950	31,6%	19,0%	5,9%	43,5%
1955	27,5%	21,7%	7,9%	42,9%
1960	28,4%	23,6%	5,4%	42,6%
1965	24,9%	24,6%	5,8%	44,6%
1970	25,2%	24,9%	5,3%	44,6%
1975	19,2%	25,1%	6,7%	49,0%
1980	23,3%	23,8%	5,5%	47,4%
1985	25,1%	21,8%	4,6%	48,5%
1990	24,7%	22,1%	5,9%	47,2%
1995	22,7%	22,2%	8,5%	46,5%
1997	22,5%	22,0%	8,8%	46,7%

Source: INEI. Prepared by the authors.

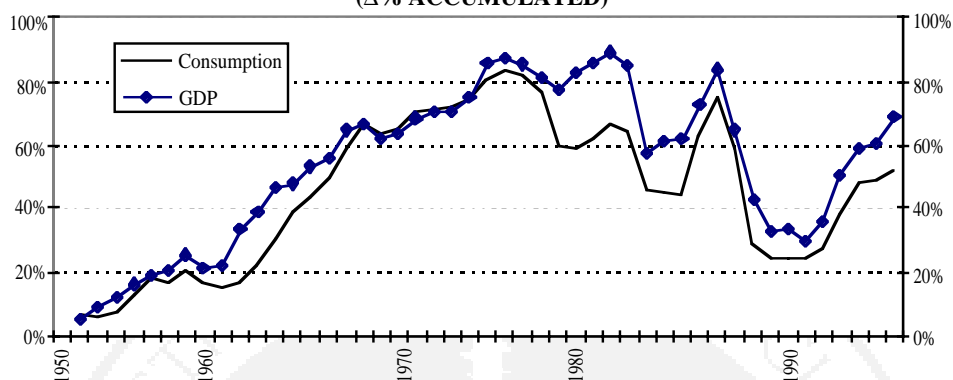**Figure 2: GDP AND PRIVATE CONSUMPTION PER CAPITA**
(Δ% ACCUMULATED)

Table 4 shows that GDP and per capita consumption growth have not evolved in parallel. Quite the contrary, there have been alternating periods where income growth exceeded consumption growth and, conversely, in other periods consumption exceeded the growth of income. Thus, in the 1950s, 1970s and 1990s per capita GDP growth exceeded the growth of private consumption while it was lower in the 1960s and 80s.

Between 1960 and 1997, real wages (white-collar) and salaries (blue-collar) fell at an average annual –4,2% and –3,7%

rates, respectively, thus diminishing more steeply than per capita revenues and consumption. Workers' earnings were most severely hit during the 1980s when they fell between 9% and 10% a year so that earnings in 1990 were scarcely between 21% and 29% of those prevailing 1960 (*Figure 3*).

Economic growth in the 1990s has basically been reflected in higher compensation for white collar employees (wages), and to a lesser degree in blue collar laborers' (salaries). The former grew at an annual average of 6,6% and the latter

	Table 4
	ANNUAL AVERAGE GROWTH: GDP, PRIVATE CONSUMPTION AND REMUNERATIONS

	1950-60	1960-70	1970-80	1980-90	1990-97	1950-97	1960-97
GDP per capita	2,4%	2,2%	0,9%	–2,5%	3,9%	0,7%	–0,06%
Consumption per capita	1,5%	3,8%	–0,7%	–1,8%	3,5%	0,6%	–0,2%
Real wages (white-collar)	NA	–1,0%	–5,8%	–9,0%	6,6%	NA	–4,2%
Real salaries (blue-collar)	NA	0,6%	–2,2%	–10,5%	0,9%	NA	–3,7%

Source: INEI. Prepared by the authors.

Figure 3: REAL REMUNERATION (Δ% ACCUMULATED)
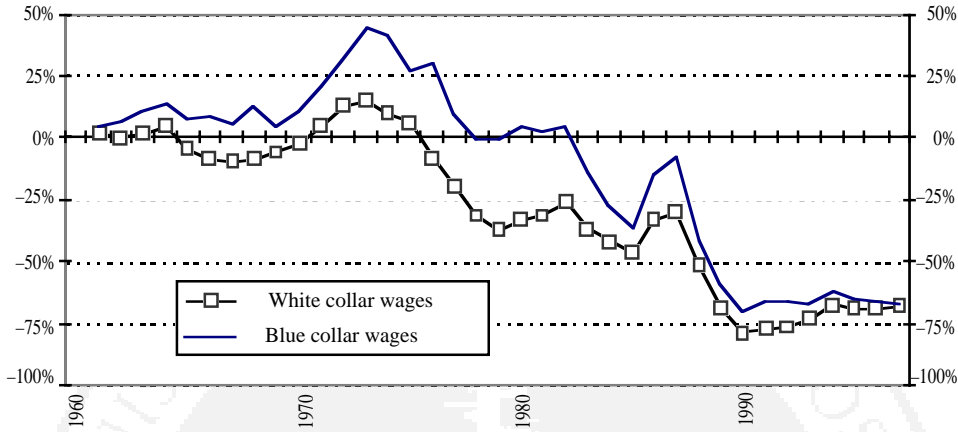
at a scant 0,9% per year. Real wages in 1997 are 50% higher than in 1990 while salaries only 10% so. Despite growth in recent years, real earnings in 1997 have fallen overall by 68% compared to 1960.

Generally, living standards over the last half century measured either on the side of per capita private consumption or real wages and salaries were characterized by an upward trend until the mid-70s, and then, by a strong contraction with the introduction of economic stabilization programs. However, wages and salaries have suffered a stronger decline (–75% since 1973) than per capita consumption (–17% since 1975) showing those white and blue-collar wage and salary earners bore the brunt of economic adjustment.

3. The relationship between primary activities, industrialization and standard of living

This section analyzes the relationship between Peru's productive specialization categorized by product as proposed in

Section 2.2, and the population's standard of living and income estimated in Section 2.3. More specifically, it determines whether higher relative development of primary goods, infrastructure, manufacturing or services is linked to higher living standards measured through wages and salaries or per capita private consumption.

A relationship between productive specialization and standard of living is proposed both for the long and short-term periods. In the long run economic growth factors most relevant are: increased productivity, economies of scale, technological innovation, labor specialization, capital stock increases, etc. In the short term macroeconomic fundamentals and imbalances are the major key factor.

3.1 The long term factor: Specialization in sectors with diminishing returns and poor technological development

By plotting the percent variation in living standards to the vertical axis and the changes in primary activities as a percent-

age of GDP to the horizontal axis (*figures 4, 5* and *6*) we observe an inverse (or negative) relationship between the relative importance of primary or extractive activities (such as agriculture, fisheries and mining) and private per capita consumption or real earnings. In other words, higher participation of primary activities leads to lower private per capita consumption, salaries and wages.

Figures 7, 8 and *9* show a similar but opposite relationship for manufacturing. As industrialization increases, higher per capita consumption and earnings (salaries and wages) are observed, meaning that increases in the industrialization index would imply higher standards of living.

A simple regression analysis by least squares (see *Annex 2*) shows that for every incremental percent point of extractive activities, private consumption falls by approximately –2,6% while white-collar wages fall by –5,4% and blue-collar salaries by –7,4%. In other words, the adverse impact is greater on earnings as a whole than on consumption.

On the other hand, an extra percent point in the share of manufacturing activities would increase per capita consumption by 4,2%, white-collar real wages by 10,6% and blue-collar real salaries by 15,5%. This means that manufacturing specialization not only increases standards of living but has a proportionally larger impact on blue-collar salaries, thus leading to a positive effect on income distribution.

In the construction industry, the impact on the various standard of living indicators would also be positive although the respective parameters are substantially smaller than those for manufacturing and are of little statistical significance[7]. Lastly, impact in the service sector would be close to zero with little statistical significance in either private consumption or earnings.

If economic primarization has the long-term effect of reducing the population's standard of living, why has there been such a long term insistence on producing primary goods? Two fundamental explanations are in order. The first, presented below, deals *with the way the country participates in the world economy*. The second relates to macroeconomic imbalances and will be analyzed later when we deal with the short-term factors affecting industrialization.

Peru's conventional exports and a large portion of its non-conventional exports are resource-based. Approximately 80% of total exports are related to agricultural, mining and fisheries industries while only 20% are related to manufacturing (*Annex 3*). This *type of participation in international trade* based on the use of natural resources has led the growth of exports in the last 50 years. It has also led to increasing economic primarization, a fact confirmed by a positive correlation (r2=0,36) between primarization and exports as a percentage of GDP (*Figure 10*). Likewise, there is a positive correlation between real exchange rate and primarization, where r2=0,29 (*Figure 11*). This shows that devaluation in real terms would increase the relative importance of primary activities.

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7   Impact is statistically significant only at 5% per capita consumption but not for earnings, where statistical significance starts at 15%.

Figure 4: CONSUMPTION PER CAPITA AND PRIMARIZATION
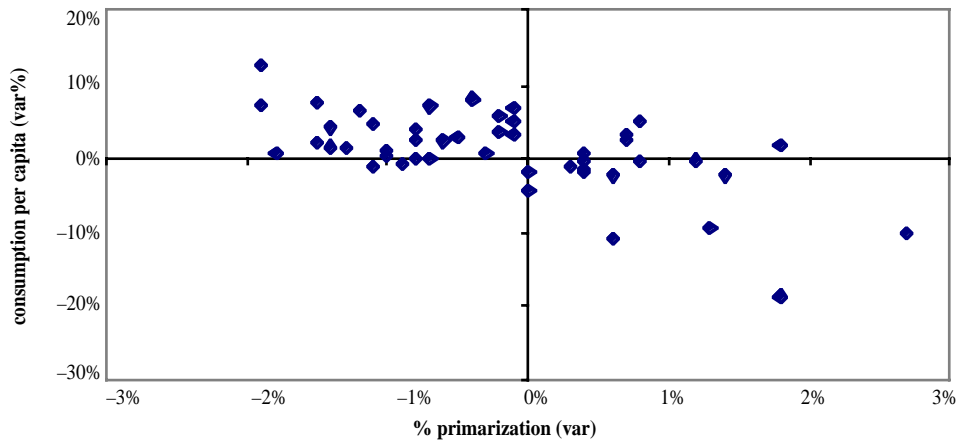

Figure 5: WHITE COLLAR WAGES AND PRIMARIZATION
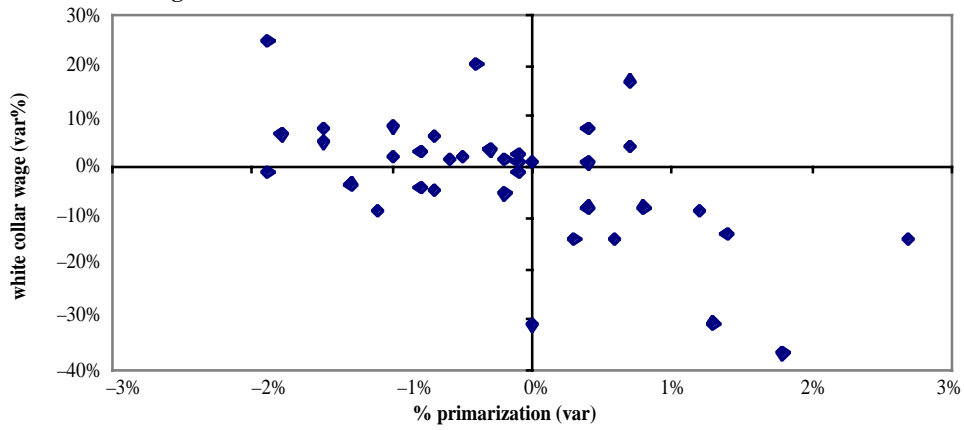

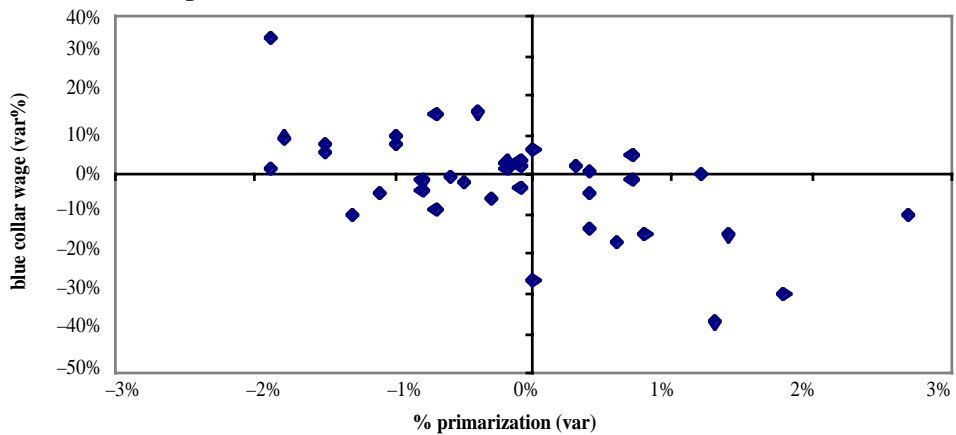**Figure 6: BLUE COLLAR WAGES AND PRIMARIZATION**

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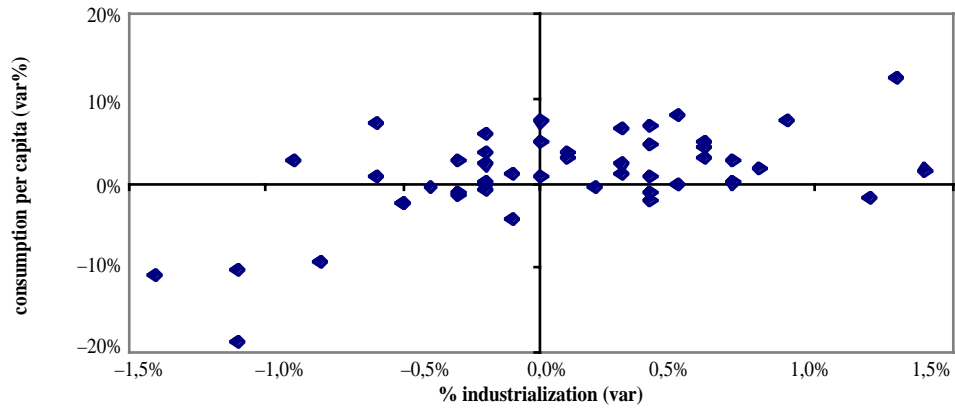**Figure 7: CONSUMPTION PER CAPITA AND INDUSTRIALIZATION**
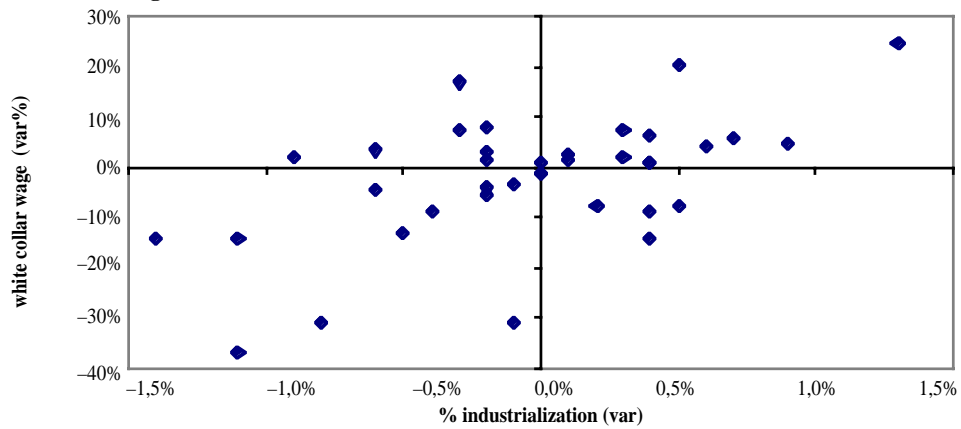

Figure 8: WHITE COLLAR WAGES AND INDUSTRIALIZATION

Figure 9: BLUE COLLAR WAGE AND INDUSTRIALIZATION
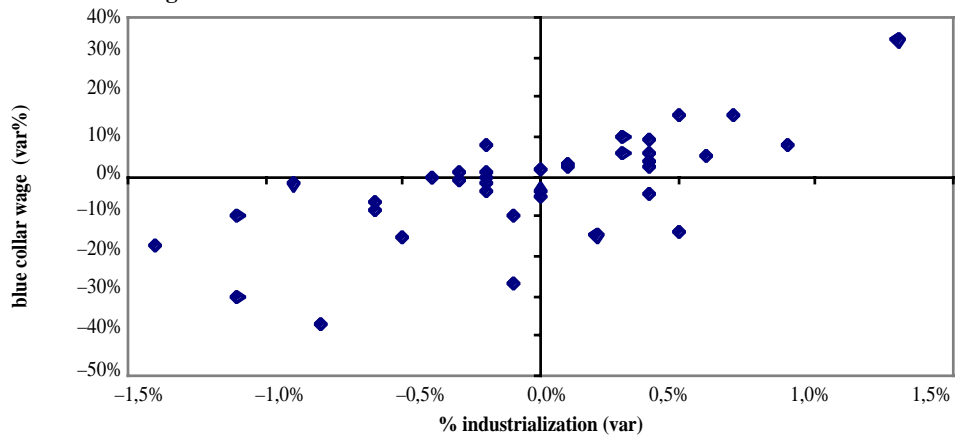
Table 5				
IMPACT OF PRODUCTIVE SPECIALIZATION ON STANDARDS OF LIVING				
ACTIVITIES: **STANDARDS OF LIVING:**	**Primary**	**Manufacturing**	**Construction**	**Services**
Per capita consumption	–2,58[1]	4,22[1]	3,12[1]	0,05[2]
Real wages	–5,41[1]	10,60[1]	5,79[2]	0,28[2]
Real salaries	–7,36[1]	15,52[1]	6,97[2]	0,54[2]

1/ Statistically significant at 5%
2/ Statistically not significant at 5%
Source: See Annex 2.

Why would a higher real exchange rate lead to the increased relative participation of primary activities? Three reasons explain this result: 1) the physical quantity of raw material exports would increase as higher real exchange rate increases their profitability; 2) the increase of raw materials exports is higher than the expansion of manufacturing product (for either the domestic or external market) which would also grow as the real exchange rate increases; and, 3) indirectly, primarization grows as manufacturing output is reduced given the eventual negative impacts of higher real exchange rates on domestic demand. In these three instances real term devaluation would reduce the manufacturing to GDP ratio, which would in turn translate into higher participation of primary activities.

This happens because the country's industrialization process revolved around the domestic market and not the external market. In other words, it was not supported by the active and efficient promotion of manufacturing exports. If industrialization and the implicit trade policy were export-oriented, the slope of the curve in *Figure 11* would be steeper and may even become negative because devaluation would eventually reduce economic primarization. For this to happen, however, the whole national industrial and trade strategy would have to be redefined, compared to recent decades.

3.2 Short term factors: Macroeconomic imbalances

A second reason explaining why it has not been possible to revert economic primarization relates to short term macroeconomic imbalances.

Although we showed that in the long term industrial development would lead to increased standards of living and revenues (earnings and per capita consumption), there is a fundamental difficulty in maintaining basic macroeconomic balances. This difficulty determines swings between industrialization and primarization or, seen from the other side, between primarization and de-primarization of economic activities (see *Figure 12*)[8].

8   A broader view integrating political and social factors other than purely economic considerations can be found in Gonzáles de Olarte and Samamé, 1991.

Figure 10: EXPORT/GDP AND PRIMARIZATION
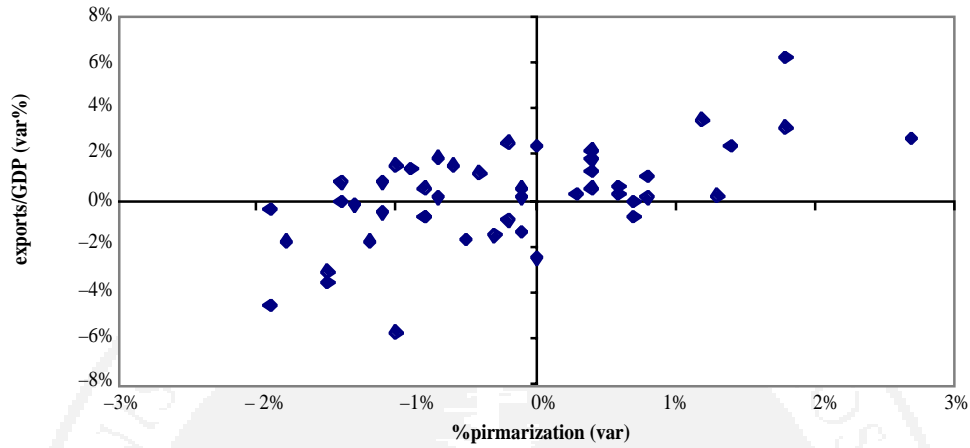
Figure 11: REAL EXCHANGE RATE AND PRIMARIZATION
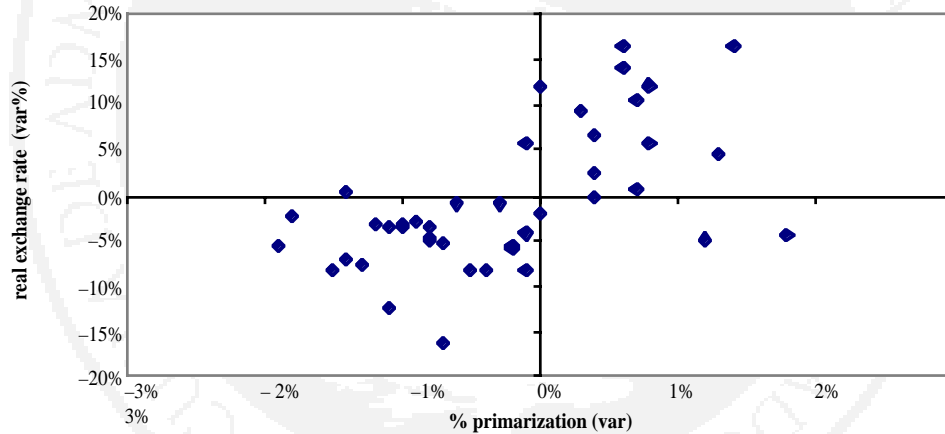
If we separate in three periods the relationship between per capita consumption and primary activities to GDP, 1971-1978, 1979-1984 and, 1985-1990, we may see that within each period there are years when primary activities contract and therefore industrialization and standards of living increase, followed by other years where the reverse process occurs, that is the relative importance of extractive activities grows again, with the consequent reduction in living standards.

For example, from 1971 to 1975 *(Figure 13)*, the rate of primary activities to GDP fell from 23,4% to 19,2% while per capita consumption increased by 6,9% (from 136 to 146, in 1979 soles). However, in the three years that followed, primary activities grew again to 23,7% while consumption dropped by 8,7%, for a standard of living that was 7% lower than at the beginning of this stage in 1971 –despite quite similar primarization levels.

Figure 12: CONSUMPTION PER CAPITA AND PRIMARIZATION, 1971-1997
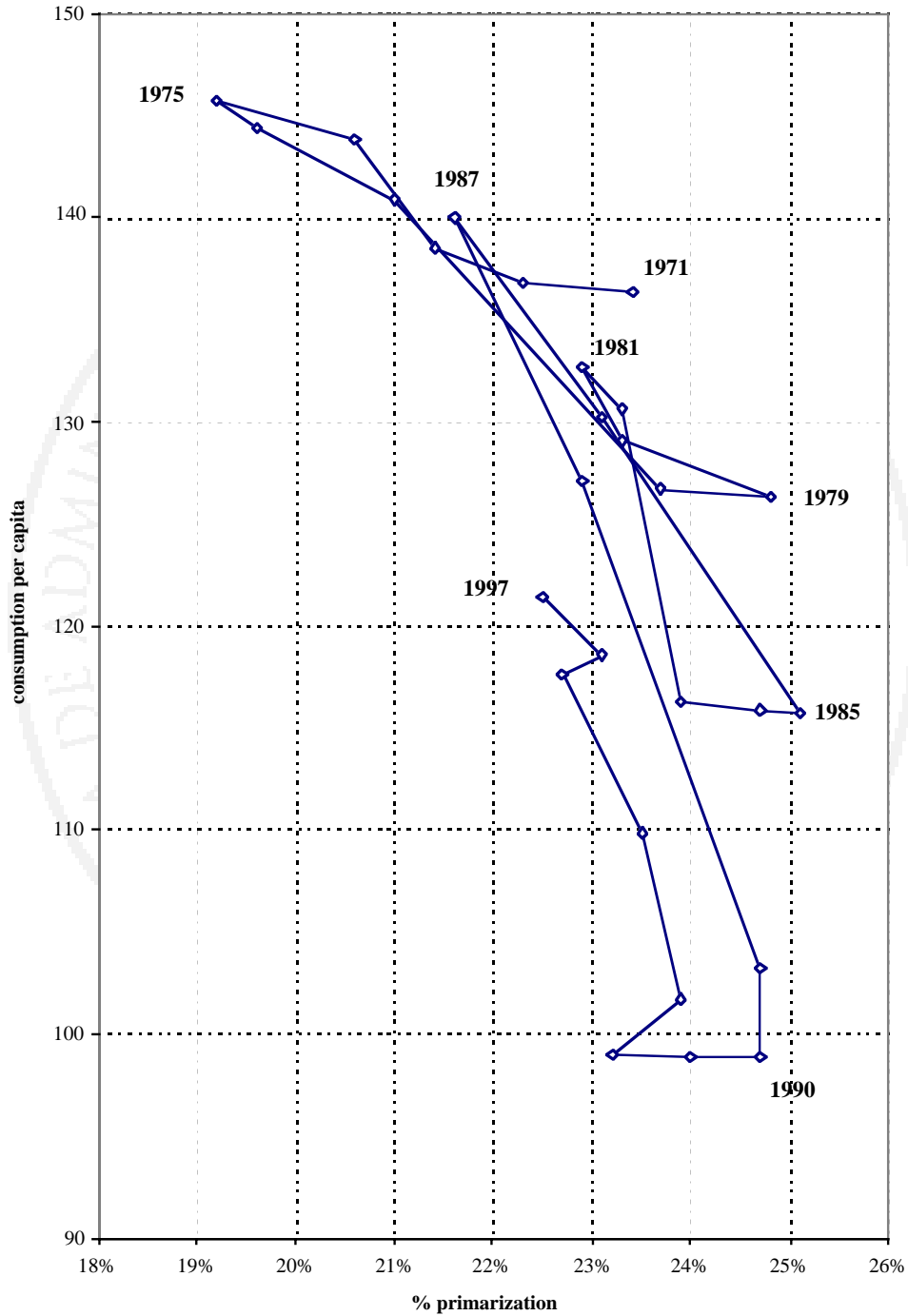
Figure 13: CONSUMPTION PER CAPITA AND PRIMARIZATION, 1971-1978
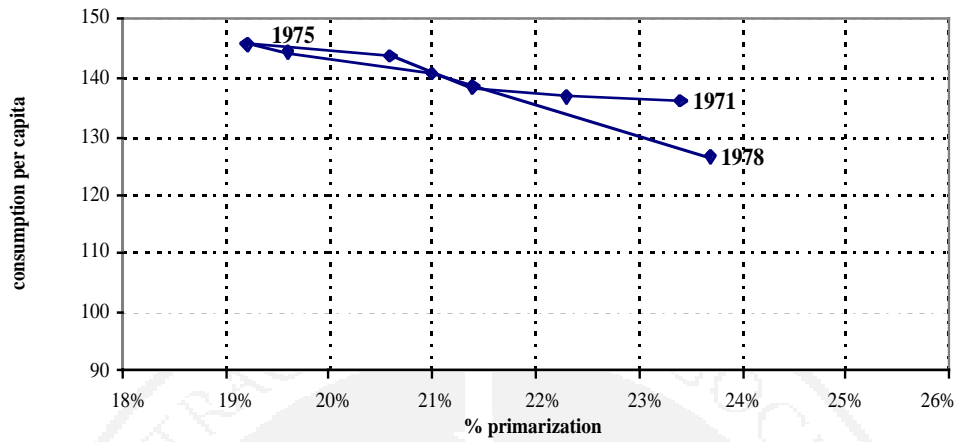
Figure 14: CONSUMPTION PER CAPITA AND PRIMARIZATION, 1979-1984
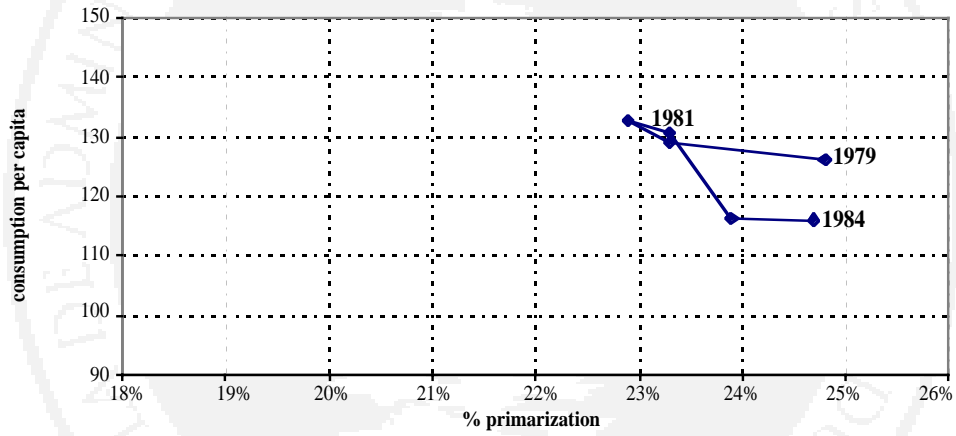
Figure 15: CONSUMPTION PER CAPITA AND PRIMARIZATION, 1985-1990

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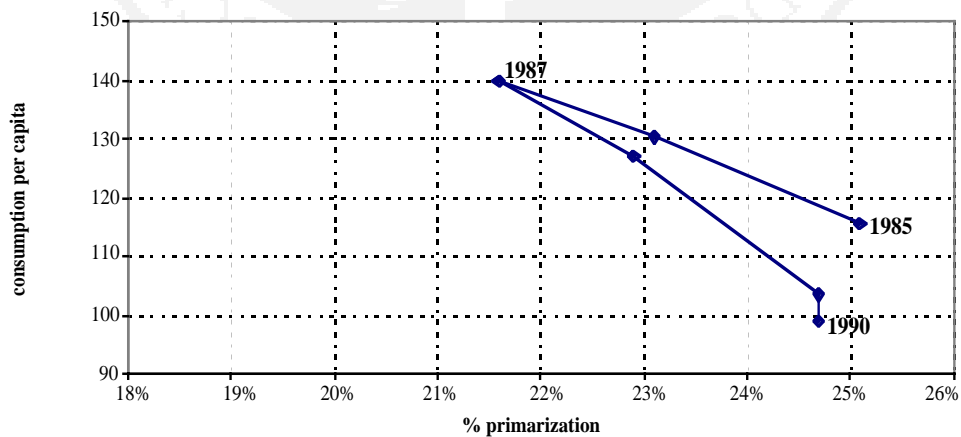
In the second case (*Figure 14*), we observe that from 1979 to 1981, participation of the primary sector dropped from 24,8% to 22,9% pushing consumption up by 5%. In subsequent three years, primary activities grew again to 24,7% while consumption fell by 12,7%, even below 1979 consumption levels. The effects of the 1983 El Niño weather phenomenon though could largely account for this fact.

Lastly, in *Figure 15*, our third example shows that primary activities as a percentage of GDP fell by 3,5% points (from 21,5% to 21,6% between 1985 and 1987) while per capita consumption increased strongly by 20%. However, in the four years after that, the importance of extractive activities rose again to 24,7% of total GDP while per capita consumption plummeted by 29,4% or below its 1985 level when the process started.

In these three instances, such pendulum movement led the level of primarization almost to its point of departure. However, per capita consumption ultimately fell to a significantly lower level than its initial point. Consequently, these processes are extremely damaging to the standards of living of the population at large, because besides the pendulum swing from right to left, we can also notice a downward trend. By comparing the coordinates for 1979, 1985 and 1990, we see that the level of primary activities to GDP is roughly similar. Still, per capita consumption was significantly lower in 1990 than in 1985 and 1979. In other words, from the viewpoint of standards of living, the progress made in the 1980s was totally wasted.

The trend towards economic re-primarization started in 1976, 1982, and

1988, when the trade gap became unbearable and the country's foreign currency reserves did not suffice to sustain the imports of goods and services (See *Table 6*)[9] [10].

In the present decade (see *Figure 16*), the liberalization policy has translated into a slight decrease in the level of primary activities from 24% in 1991 to 22,5% in 1997, parallel to an increase in per capita consumption of 22,7% propelled by higher earnings and expanded consumer loans.

An important factor in the 90's leading to falling primary activities to GDP ratio is the strong growth of the construction industry to reconstruct the basic social infrastructure damaged by external factors such as weather and terrorism. Also influential was the opening of the economy

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9   Insufficiency of foreign currency reserves can be partly accounted for by excess domestic demand which in the periods before the adjustment grew more than GDP. An important factor generating this growth of demand is obviously the increased private consumption, meaning that such swings are also explained by increased standards of living that create bottlenecks in the external sector. Of similar importance is the adverse impact of external shocks, such as falling terms of trade or higher international interest rates during the 1980s. Thus, for instance, a drop in terms of trade in 1975 (–31%), in 1981 and 1982 (–32%) and again in 1986 (–27%) also had a substantial impact on the trade balance and the amount of net foreign reserves which eventually sparked the stabilization programs.

10   The gap model used for Peru (Canales and Fairlie, 1996), for the last 20 years, shows that external constraints were the basic factor limiting growth. This occurred even in the 1990s despite capital inflows, which did not necessarily lift the restriction but may have off set it temporarily, and effect similar to that of increased foreign flows during the 1970s.

	Primary Activities to GDP (%)	Inflation (%)	GDP (Δ%)	Domestic Demand (Δ%)	Trade Balance (US$ million)	Foreign Reserve (US $ million)	Foreign Reserves (As a % of imports)	Terms of Trade (Δ%)	Prime Rate (%)
Table 6									
MAIN ECONOMIC INDICATORS 1974 -1997									
1974	20,6%	19,2%	9,2%	14,1%	(405)	693	28,2%	4,6%	10,80
1975	19,2%	24,0%	3,4%	2,0%	(1.097)	116	3,8%	−31,0%	7,86
1976	19,6%	44,7%	2,0%	−1,8%	(675)	(752)	−30,1%	12,7%	6,84
1977	21,0%	32,4%	0,4%	−1,9%	(422)	(1.101)	−43,2%	2,3%	6,82
1978	23,7%	73,7%	0,3%	−7,9%	304	(1.025)	−49,9%	−18,8%	9,06
1979	24,8%	66,7%	5,8%	4,3%	1.722	554	22,5%	31,9%	12,67
1980	23,3%	60,8%	4,5%	14,0%	826	1.276	32,1%	10,2%	15,27
1981	22,9%	72,7%	4,4%	8,9%	(553)	771	15,8%	−18,1%	18,87
1982	23,3%	72,9%	0,2%	−0,6%	(429)	896	18,6%	−17,5%	14,86
1983	23,9%	125,1%	−12,6%	−17,6%	293	856	23,2%	7,4%	10,79
1984	24,7%	111,5%	4,8%	−1,4%	1.007	1.103	36,4%	−8,8%	12,04
1985	25,1%	158,3%	2,3%	−0,3%	1.172	1.383	49,6%	−10,2%	9,93
1986	23,1%	62,9%	9,2%	16,8%	(65)	866	24,0%	−26,7%	8,35
1987	21,6%	144,5%	8,5%	13,1%	(577)	81	1,9%	0,8%	8,21
1988	22,9%	1.722,3%	−8,3%	−8,7%	(99)	(317)	−8,0%	8,2%	9,32
1989	24,7%	2.775,3%	−11,7%	−19,7%	1.197	546	15,9%	−3,5%	10,92
1990	24,7%	7.649,7%	−5,4%	0,1%	346	682	16,8%	−9,7%	10,01
1991	24,0%	139,2%	2,8%	3,9%	(166)	1.933	40,8%	−4,9%	8,46
1992	23,2%	56,7%	−1,4%	1,2%	(566)	2.425	44,4%	−1,8%	6,25
1993	23,9%	39,5%	6,4%	5,9%	(599)	2.910	52,6%	−8,1%	6,00
1994	23,5%	15,4%	13,1%	14,2%	(1.022)	6.025	84,1%	10,4%	7,14
1995	22,7%	10,2%	7,2%	11,5%	(2.185)	6.693	69,2%	6,5%	8,83
1996	23,1%	11,8%	2,6%	−0,0%	(1.967)	8.862	88,9%	−5,2%	8,27
1997	22,5%	6,5%	7,2%	6,7%	(1.738)	7.982	73,6%	5,2%	8,44

* GDP fell strongly influenced by El Niño weather anomaly.
Source: INEI, Central Reserve Bank, IMF. Prepared by the authors.

and privatization that led to substantial investment growth, in particular foreign investment, in non-tradable activities such as commerce, transportation, communications and energy which for purposes of this paper, have been grouped as services.

However, falling primary activities has not led to the growth of the manufacturing industry, implying that the economy is de-industrializing because construction and services are expanding their respective shares. The standard of living improves and incomes grow because construction and services are activities of "higher quality" than primary ones.

If we determine the *speed* at which the economy reduces its primary level of activities during the various periods when the phenomenon effectively occurred, we may observe that in the recent economic liberalization period from 1991 to 1997 primary activities fell by 0,25 points per year. In those periods where import-substitution industrialization policies were enforced, the drop was of 1,0 point per year between 1971 and 1975 and 1979

Figure 16: CONSUMPTION PER CAPITA AND PRIMARIZATION, 1991-1997
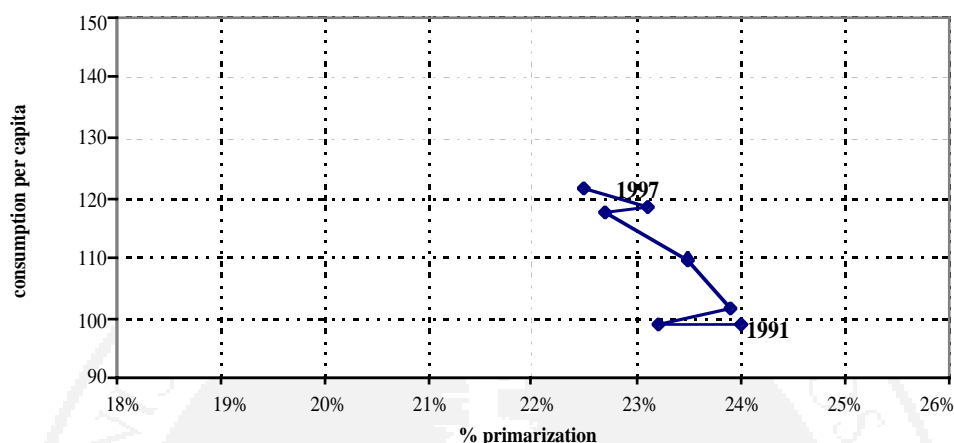
to 1981, and of 1,7 points per year from 1985 to 1987. This means that in the nineties market and liberalization policies lead to lower primarization ratios but at a significantly slower speed than when the process was induced or strategically driven by industrialization policies –in the seventies and eightees.

Such "slow" reduction of primarization during the period when the economy opened up has not been exempt of "macro-economic imbalances" which were also present during the industrialization processes analyzed above. It is worth noticing, for instance, that in 1993 and 1996, the primarization index rose rather than fall (see *Figure 16*) because of the 1992 drought, in the first case, and due to excess domestic demand in 1994 and 1995 in the second case. This led to macroeconomic adjustment to prevent a further widening of the trade gap. In other words, primarization grows precisely when there is imminent danger of macroeconomic instability and because of prudent short term managing of macroeconomic funda-

mentals. If macroeconomic imbalances were not immediately prevented, it is fully possible that primary activities would have diminish further on, thus making possible a strong pendulum come back towards greater primarization at the time the economy finally gets adjusted.

Sustained growth of foreign currency reserves in recent years largely contributed to revert primarization in 1992, 1994, 1995 and 1997. An extremely favorable international environment accounts for larger foreign reserves. Terms of exchange have remained relatively stable, interest rates dropped and capital flows became increasingly global and international. These factors allowed financing a large trade gap. These wider options between 1991 and 1997 permitted to make progress, albeit slowly, towards diminishing the ratio of primary activities to GDP.

It is therefore of particular importance to underscore that macroeconomic stability and good management of macroeconomic fundamentals (whether through

industrialization-promoting policies or in an openly neo-liberal framework), *are necessary conditions* to achieve the long-term objective of reaching a lower economic primarization index on a sustained basis. Thus improving standards of living.

Peru's case shows though that to reduce the level of primary activities may be much faster if carried out through the active and deliberate design of industrialization policies, as was the case in 1971-1975, 1979-1981, and1985-1987, than if guided by the hand of free markets and liberalization, as occurred in 1991-1997. What went wrong in the last 50 years, was the lack of consistency and coherence between short-term macroeconomic management and industrialization policies. In other words, the type of industrialization policies implemented in Peru failed to prevent trade balance deficits.

4. UNCOUPLING DEMAND AND SUPPLY STRUCTURES, THE QUALITY OF ECONOMIC ACTIVITIES AND VIABLE ECONOMIC GROWTH

If a country increasingly produces goods with a lower level of processing, quality and value, and on the other hand, consumes foreign goods that include a larger amount of knowledge, undoubtedly it will exchange growing amounts of simple goods for the same (or a smaller) amount of elaborate goods.

If domestic supply, including exports shifts towards primary products with diminishing returns, simple processing or minimum know-how, while demand moves towards increased consumption of sophisticated, complex and always newer products, there will be a gradual uncoupling of quality and value between what the country produces and what it consumes. This uncoupling occurs because not all the economic products and/or activities are alike. It is precisely the more elaborate goods or services that eventually translate into higher standards of living. Elaborate goods incorporate a higher degree of technology and knowledge, show positive externalities, and generate a higher value and have a larger systemic and synergistic effect over the rest of the economy.

Further degradation can be expected conditions will deteriorate even further if the terms of trade fall because of market effects. Declining terms of trade imply prices of exported goods growing more slowly than the prices of imported goods. Although it is true that the terms of trade reflect a difference in the quality and value of economic activities, it is also true that these prices are subject to short term fluctuations that are not related to these factors.

Short term macroeconomic stability and the viability of long term sustained growth become ever more complex if the uncoupling described above is reproduced in supply and demand patterns. This is true to the extent that in this kind of trade increasingly larger exports of simple products will be required to finance similar purchases of more elaborate goods, given the diminishing returns of the first type of products. If under those circumstances exports fail to grow, the emerging external account deficits will eventually hamper all attempts at sustained economic growth, as mentioned in Section 3.2.

Depending on available resources and the country's capacity to produce an increasing amount of simple or primary

goods, from a long-term perspective the nation will quite likely end up producing and working more but living under worsening conditions.

What evidence is there for Peru? Is the uncoupling of quality and value between supply and demand taking place already? How will this uncoupling hamper economic growth?

A review of the composition of Peru's domestic demand leads to the following remarks:

i) *Figure 17* shows that imports as a percentage of domestic demand, after having plummeted to 16% at the end of the 1980s, climbed back to 28% in 1997, thus implying that generally speaking Peruvians today consume more imported goods as a percentage of their demand than in the late 1980s.

ii) *Table 7* shows that imports of durable and non-durable consumer goods followed by purchases of capital goods for industry recorded the largest relative share increase. These three items together accounted for 46,1% of imports in 1997 while they were only 26,8% in 1988. A difference of 19 percent points

iii) On the contrary, the share of inputs and raw materials for industry fell from 43,4% in 1988 to 28,7% in 1997, about 15 percent points less.

iv) A flat review of the list of durable and non-durable inputs and of capital goods for industry shows that these goods incorporate relatively more knowledge and require a more complex technical manufacturing process, showing therefore a greater capacity to create value. On the

other hand, raw materials for industry are less sophisticated and so create less value.

Some preliminary conclusions may be drawn from the above observations. First Peru is increasing its demand of imported products. Secondly, if we analyze the mix of imports, it becomes obvious that we are importing increasingly sophisticated products with a higher technology or knowledge component (durable consumer goods and capital goods for the industry) while imports of less sophisticated products continue to fall (imports of raw materials for industry). This means that we increasingly buy abroad products of higher quality and value content for which we must pay more.

Such a demand bias is a consequence not only of Peru´s commercial and financial opening but also of increased globalization and communications which is promoting consumption of "cutting edge" or "innovative" products.

At the micro economic level, this demand trend has been confirmed through household surveys that measure increasing ownership of electric appliances in recent years. *Table 8* shows not only the growing number of households that own such appliances but also how bottom-end products have been replaced by more elaborate and complex goods. Thus, for instance, color TVs equipped with remote controls have progressively substituted for black and white television sets and those without a remote control. Likewise with the VHS videocassette recording system which replaced BETAMAX or stereo sets that substituted for radios. This is evidence of demand propensities for innovative and improved-quality products that are not produced internally but imported.

Figure 17: IMPORTS/DOMESTIC EXPENDITURE (%)
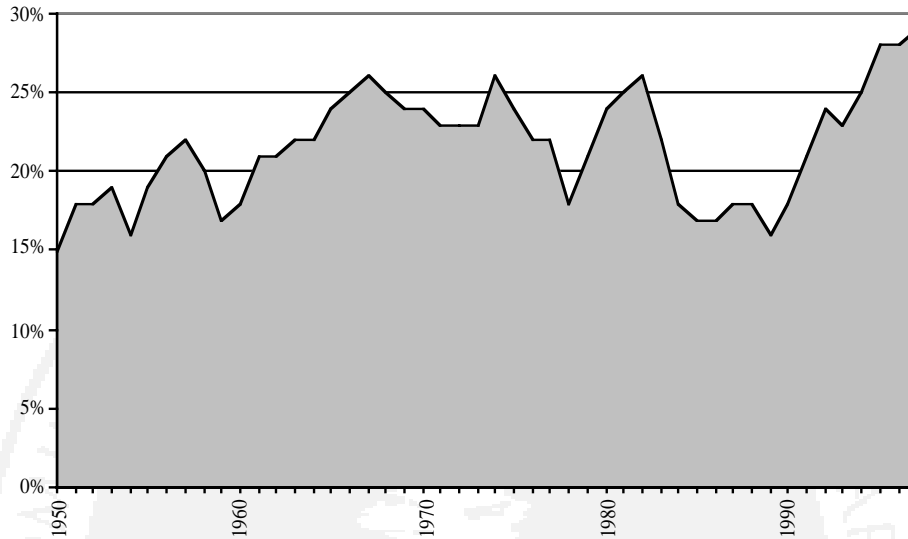
Table 7
FOB IMPORTS BY ECONOMIC USE

	US$ Million			Structure %		
	1988	**1993**	**1997**	**1988**	**1993**	**1997**
Consumer goods	273	934	1.910	9,5%	22,7%	22,3%
Non durable	244	555	1.107	8,5%	13,5%	12,9%
Durable	29	379	803	1,0%	9,2%	9,4%
Inputs	1.593	1.859	3.437	55,6%	45,1%	40,2%
Fuels, lubricants and related	253	322	780	8,8%	7,8%	9,1%
Row materials for agriculture	98	116	202	3,4%	2,8%	2,4%
Row materials for industry	1.243	1.422	2.455	43,4%	34,5%	28,7%
Capital goods	728	1.143	2.816	25,4%	27,7%	32,9%
Construction materials	24	68	244	0,8%	1,6%	2,9%
Goods for agriculture	40	37	28	1,4%	0,9%	0,3%
Goods for industry	496	704	2.037	17,3%	17,1%	23,8%
Transportation equipment	168	334	507	5,9%	8,1%	5,9%
Other goods	272	187	390	9,5%	4,5%	4,6%
Total	2.866	4.123	8.552	100,0%	100,0%	100,0%

Source: Central Bank. Prepared by the authors.

Table 8
PERCENTAGE OF LIMA HOUSEHOLD OWNING THE FOLLOWING APPLIANCES

	1997	1991	Δ%
Stoves	98	90	8
Gas Stoves	69	54	15
Kerosene Stoves	52	54	–2
Electric Stoves	9	14	–5
Television	93	89	4
Black/White	52	66	–14
Color W/Remote Control	46	18	28
Color WO/ Remote Control	27	28	–1
Electric Irons	81	78	3
Refrigerator	66	58	8
Telephones	40	23	17
Celular Telephone	NA	7	
VHS	21	9	12
Betamax	3	8	–5
Radio	79	90	–11
W/Cassette Player	47	69	–22
WO/Cassette Player	NA	63	
Stereo Set	55	34	21
Micro Wave Oven	9	4	5
Personal Computers	9	7	2

Source: Apoyo S.A. Prepared by the authors.

These phenomena are not necessarily negative in themselves because progress always comes with increased demand for products that provide a higher level of comfort and quality. The problem emerges when the country has not sufficient capacity to import. At the heart of the matter seems to be the capacity to produce and export goods that are "similar in value and quality" to the imported ones. For this the quality structure of imports should match the value of exports. If this occurs, there is a virtuous circle of growth through international trade that in Graham's model leads to exchange among countries that specialize in activities with constant returns.

But if the structure of production and/or exports shows that production of pri-mary goods with little or no incorporated knowledge continues to grow, that is of goods with little value added, it is obvious that we will have to work more to meet the observed trend in demand patterns.

A review of the structure of domestic supply (Section 3 in this article) shows that liberalization in the 1990s led to a slower fall in economic primarization when compared to the period of active industrial policy. On the other hand, industrial policies or free market schemes that ignore basic macroeconomic principles, will unfailingly abort if there is lack of coherence with fiscal, external and/or monetary balances.

Empirical evidence shows that when the market is left on its own, economic

primarization diminishes very slowly leading to the emergence of activities not necessarily in the manufacturing sector but in the services (telecommunications, commerce, financial and energy services) or construction industries. In other words, the economy will move towards producing slightly more elaborate non-tradable services due to growing demand by consumers, but never managing to produce the industrial-type tradable goods that consumers demand. Thus, because the demand for manufactured goods cannot be met by domestic supply, those goods are imported. And because domestic production of primary goods exceeds local consumption, they are exported. However, the process originates a growing "uncoupling of quality and value" given that the world's demand for the goods we export grows at a lower pace than our imports.

Figure 18 shows that Peru's terms of trade from the beginning of the 1950 to date fell towards the end of 1996 and in 1997 to a fifth of their value at the beginning of the 1970s and currently stand where they were in the mid-1950s.

This means that prices of our exports since 1972 have grown considerably less (or have decreased) compared to the price of our imports, leading to the most substantial fall in standards of living and income ever, excepting the periods from 1975 to 1977, and from 1979 to 1980. In other words, we export products the price of which falls more or rises less than that of our imports, with the subsequent negative effect on domestic revenues and standards of living of Peruvians who have to work more but are worse off.

The question arises then of what made terms of trade improve in the 60s and at beginning of the 70s to then decline since 1972.

Figure 18: TERMS OF TRADE 1979=100
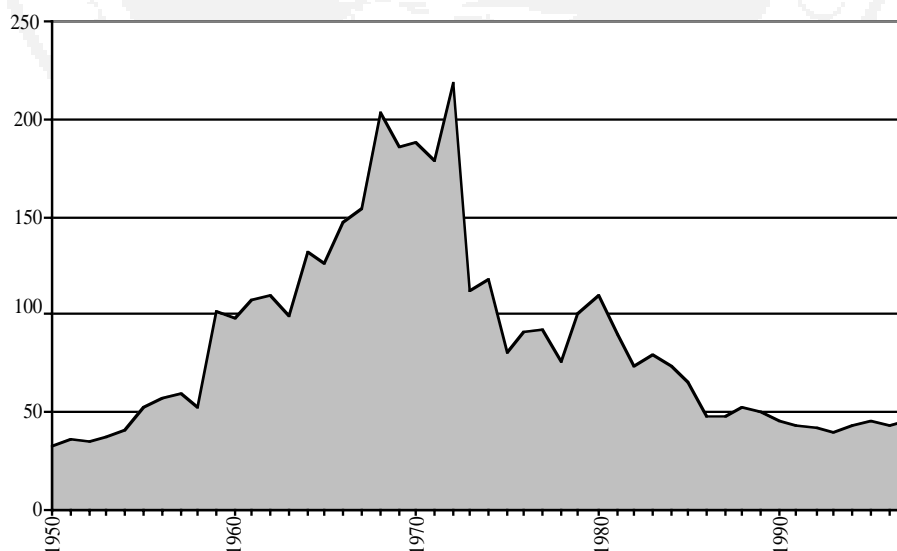
An explanation may be found in that at the beginning of the 1960's given productivity levels and demand for materials, inputs and technology, there was an increase in demand and prices of minerals. In the seventies, world oil crisis led to radical technological changes in energy conservation and more efficient use of raw materials which diminished demand and prices of raw materials. Later, in the 1980s and 90s, the communications, electronics and information revolutions introduced massive use of knowledge to produce goods in industrial countries that put Peruvian production and exports at a disadvantage because local industries were unable to incorporate new knowledge at the required speed.

Another hypothesis refers to the extremely poor management of fundamental economic balances since 1970 and the lack of a truly coherent industrial policy that would diversify the supply of exports and promote new activities for which world demand and prices would not fall steadily.

A review of the Japanese experience from 1950 to 1970 shows that the key to higher exports is found not only in their ability to produce better quality exports but principally in their capacity to adjust their export mix by introducing goods for which world demand was growing. In other words, Japan stopped producing and exporting those goods, for which the world's demand was falling and had therefore lower value, and shifted towards production of goods with higher demand.

These are however hypotheses that must be further explored. The concrete fact is that Peru is not producing or exporting the types of good that would ensure and

allow it to finance its new consumption structure, a structure that is constantly evolving as the world's demand fluctuates and changes.

5. WORK MORE AND LIVE BETTER: SOMETHING PERUVIANS MUST YET DISCOVER

5.1 Major conclusions

This paper has demonstrated that primarization of economic activities is intimately linked to declining standards of living. For each additional percentage point of primarization, per capita consumption fell by –2,6% while white-collar real wages dropped by –5,4% and blue-collar salaries by –7,4%. The impact on manufacturing industry is in the opposite direction since for each point of increased industrialization, per capita consumption grew by 4,2% and white-collar and blue-collar earnings rose 10,6 and 15,5% respectively (See Section 3).

If wages, salaries and standards of living increased with growing industrialization, why hasn't Peru gradually moved towards the production of manufactured goods? The answer is three-pronged:

In the first place, Peru wrongly participates in the world economy basically as an exporter of raw materials and natural resources with diminishing returns.

In the second place, an erroneous industrial policy has favored permanent protection for all types of industries aimed at producing final goods for the domestic market without link ups to other processes and no learning curve. Technology was imported as a package revealing a static

business view of the world. There was an insufficient emphasis on education, creation of value and training, few possibilities of tuning up to a broader market, a static rent-seeking attitude, and total despise for "merit-based" promotion. In addition the government sector lacked synergies with private investment and failed to understand the critical role played by the market forces. In summary, an industrial policy illustrated by the slope of the PRO curve in *Figure 19*.

Thirdly, managing macroeconomic stability and fundamentals is extremely important. Section 3.2 has proven that as the current account, government accounts and/or private deficits became unbearably large, a crisis emerges leading to the corresponding reversal of the industrialization process.

If to these three characteristics we add events on the demand side, a fast-deteriorating situation emerges. Section 4 shows how the structure of demand shifted towards consumption of foreign goods of higher quality, value, knowledge and technology. Moreover, if these changes in demand are accompanied by supply that continues to favor the production and export of primary goods, then the country will inevitable end up with a "value or quality mismatch". It will end up working harder to earn the same units of imports. The country therefore specializes in producing and exporting goods with diminishing returns that are exchanged for products with increasing returns. As average productivity falls, so do standards of living (*Annex 1* and Sections 1, 3 and 4).

Our most important conclusion is that contrary to most neoclassical theory, we hold that growth and standards of living

depend on the types of goods and services produced by a country. A country may master all the exogenous and endogenous factors that are responsible for economic growth, as highlighted by neoclassical theory, i.e. labor, capital, natural resources, savings, investment, technology, efficient use of resources, financial markets, infrastructure, sound macroeconomic indicators, efficient government, etc. However, if all these elements are directed towards producing the *wrong types of products*, the nation may end up working harder and living worse off.

5.2. A framework to design a strategy for growth and increasing standards of living

Peru needs to devote time and energy to "rethink" or review the goods it produces.

Figure 19 is a good initial framework for this analysis. The right-hand quadrant shows the reverse postulated relationship between primarization[11] and standards of living. In the left-hand quadrant, we show the positive relationship between the real exchange rate and the primarization ratio, as explained in *Figure 18*.

Curve *NV* graphs the negative impact of primary activities on standards of living. It has as implicit parameters a given level of technology, productivity, returns to scale, externalities and other elements that may be grouped as factor "T". Likewise, curve *PR* describes the positive impact of the real exchange rate on primarization.

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11 The relative importance of manufacturing can be measured by moving in the opposite direction (downwards) along the axis.

Figure 19: EXCHANGE RATE, PRIMARIZATION AND STANDARD OF LIVING
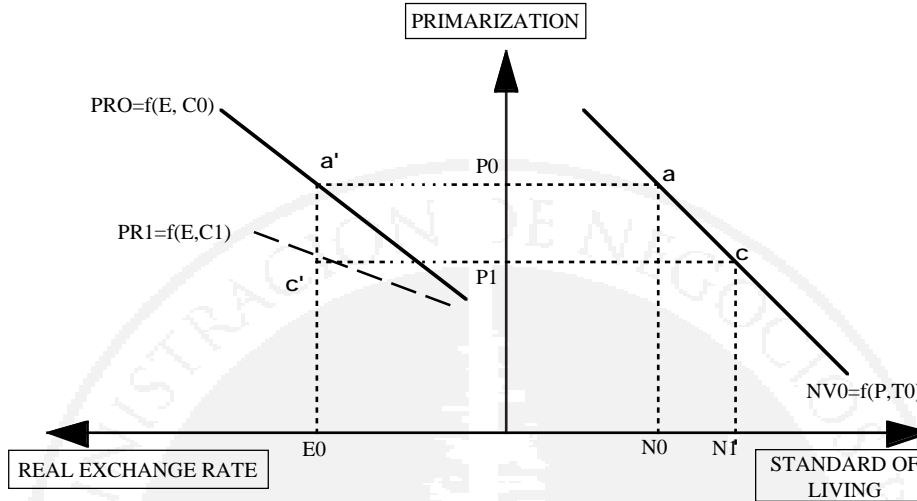
It involves parameters related to the type of participation in the world economy and the country's industrial development policy, which depend on the varying focus on the domestic or external markets. These parameters are summarized by factor "C". Thus, for instance, if the country's participation in global trade is based on using natural resources or if the national industrial strategy is basically directed towards its domestic market, PR's slope increases. On the contrary, if industrialization shifts towards promoting manufacturing exports, the slope drops (PR1 in *Figure 19*).

A close look at these relationships reveals that standards of living would increase, ceteris paribus, by developing an outward industrialization process, which would imply a change in the *type of participation* in the international economy. In terms of *Figure 19*, curve PRO would shift downward to PR1 when the strategy to participate in the world economy moves away from the advantages derived from

natural resources to the dynamic competitive advantages provided by manufacturing (from C0 to C1). Under these circumstances, given a certain real exchange rate (E0), primarization will fall from PR0 to PR1, from a' to c', and standards of living would increase from N0 to N1 sliding along the NV0 curve, from a to c.

Alternatively, we could introduce a qualitative transformation in primary activities to gradually include technological development in them. Curve NV0 would move to the right, to NV1 (See *Figure 20*). For the same level of primarization (PO), the population's standard of living would rise from N0 to N1[12]. Technological upgrading (from T0 to T1) in agriculture and mining, for instance, would improve standards of living, given

12 Technological change probably will turn PRO around point a, slightly increasing the impact of the real exchange rate on the degree of primarization.

Figure 20: EXCHANGE RATE, PRIMARIZATION AND STANDARD OF LIVING
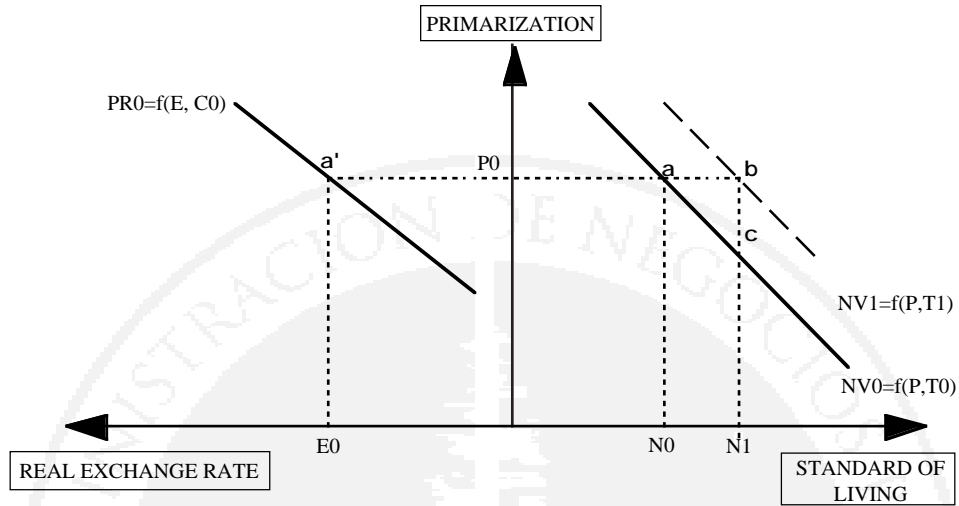
Figure 21: EXCHANGE RATE, PRIMARIZATION AND STANDARD OF LIVING
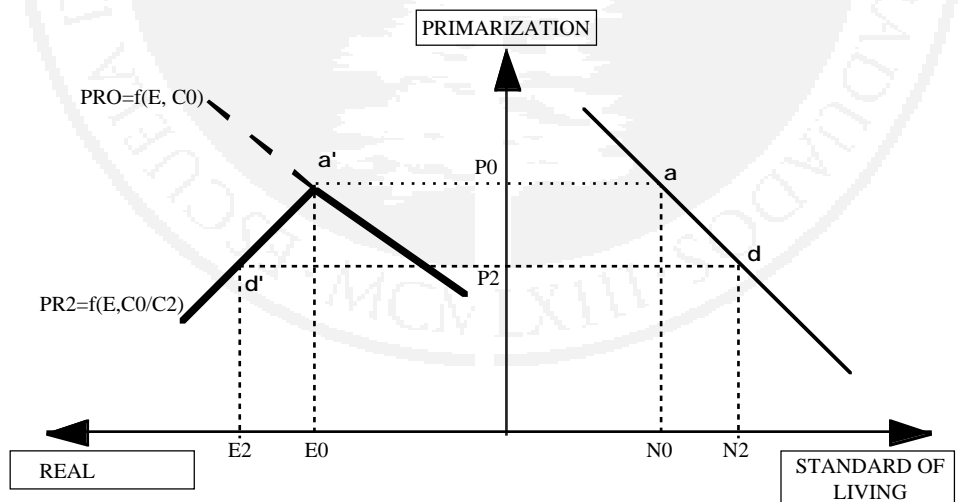
a certain level of primary activities. For this process to be sustainable, technological progress in these primary activities would have to take place on an ongoing basis so as to set off the eventual negative weight of diminishing returns in extractive activities, if this variable is effectively the key factor separating industrial from extractive processes[13].

A third option much in the style of countries with large endowment of natural resources such as Australia, New Zealand and Canada, is to resort to primary comparative advantages at relatively low real exchange rate levels while at the same time promoting manufacturing exports at higher real exchange rates[14]. In terms of *Figure 21*, this would mean that *PR* would be an upside down "V", so that at low exchange rates, below EO, primarization would increase. Conversely, with higher rates of exchange, above E0, primarization would fall. The fundamental precept is to curtail total specialization on primary resources and thus prevent the spreading of this sector's diminishing returns throughout the economy[15].

In this case, by shifting parameter C from CO to C2, starting at point a', an increase of the exchange rate above EO

13 We must bear in mind that a key element separating primary from manufacturing activities is the former's diminishing returns and the latter's increasing returns.

14 It is also possible to develop a manufacturing sector on the bases of the internal market if this is sufficiently large to benefit from economies of scale as Friederich List proposed in the last century.

15 Total de-industrialization, as can be seen in Figure 21, would appear if we continue along the PR0 dotted line, given parameter C0.

would lead to a declining primarization quotient and to increased industrialization. For this reason, given an E2 exchange rate, if manufacturing output has been efficiently directed toward either the external or domestic market, manufactured products would be competitive and primary products would be significantly profitable. However, the higher profitability of the primary sector would have to be offset to prevent new entrants or expansion of incumbents in areas of diminishing returns. Usually, countries with abundant natural resources that have successfully increased their population's living standards have regulated and restricted the use of their resources for both strategic and environmental reasons. In this case, developing a complementary manufacturing sector, with either an inward or outward orientation depending on the size and volume of the market, is crucial for any such economy to improve its standards of living.

Obviously, it is possible to combine the three approaches mentioned above or try other paths which will modify the implicit parameters on both the left and right quadrants.

One initial proposal for Peru would make it devote itself to primary activities at low real exchange rate levels preventing the country from entering into areas with diminishing returns when the real exchange rate increases. As real exchange rate rises, it should speed up promotion of a strong export-oriented manufacturing sector very much in the style of the inverted "V" curve shown in *Figure 21*. Rents should be extracted from primary activities when real exchange rate increases like in Canada, Australia and New Zealand, as a way to limit their expansion

and address environmental concerns. The other two approaches appearing in *Figures 19* and *20* could also be followed but with much more limited results.

5.3 Free markets and strategic supply policies in a global world

How should Peru therefore face the new era of globalization and free trade that is promoted by multilateral organizations and the industrial economies?

Assuming that "free markets" by themselves will automatically lead Peru to the kind of specialized productive structure implicit in point d' of *Figure 21* above is a fallacy that was tested in the liberalization of the 1950s and 1990s. On the other hand, assuming that any kind of industrial policy will ensure that this path will be followed is another fallacy tested in the 60s, 70s and 80s. Peru needs to design productive strategies that will consciously and deliberately allow us to

"create" and "ensure" permanent increasing returns and dynamic competitive advantages over time, by producing higher value goods and services and maintaining well-balanced macroeconomic fundamentals.

Peru must therefore enter the new global and trade era not necessarily following the dictum of multilateral organizations and developed economies but ensuring the production of those goods and services that will generate faster growth and increased standards of living.

Neither free trade and free markets per se, nor industrial and commercial policies that are inconsistent with market forces will prove successful in this venture. To improve Peru's standards of living there is a need to combine strategic policies and market orientation in order to create dynamic competitive advantages in the production of high value/quality goods.

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VALUE AND QUALITY CREATION:
Natural Resources, Industrialization and
Standards of Living in Perú 1950 to 1997

Annexs
1. Graham's Model
2. Impact of Productive Specialization on
   Standards of Living
3. Tables

In an initial situation of autarchy (case 1), Country A produces and consumes 800 units of wheat and 800 units of watches. Average productivity of both activities is 4 units per worker-day and the labor used in each activity is 200 worker-days.

Country B produces and consumes 800 units of wheat and 600 units of watches. Wheat productivity is 4 units per worker-day and that of watches is 3 units per worker-day. Each activity employs 200 worker-days.

Based on these assumptions, the world's wheat production would be 1.600 units and 1.400 watches or a total production of 3.200 units in wheat terms, given the relative price of the two products. Country A's product is 54% of the world's production (or 1.714 wheat units) while Country B accounts for 46% of the total (or 1.486 wheat units).

Case 1: Without trade

	Country A			Country B			World
	Man-days	Output-man	Product	Man-days	Output-man	Product	Product
Wheat	200	4	800	200	4	800	1.600
Watches	200	4	800	200	3	600	1.400
Total	400			400			

Price: 1 wheat = 0,875 watches.

Product**	(%)	
Country A:	1.714	54%
Country B:	1.486	46%
World:	3.200	100%

** In wheat terms.

When opening trade (case 2), and given their respective comparative advantages, Country A specializes partially in watch making while Country B turns to wheat production. Presumably, Country A will transfer 100 worker-days from wheat cropping to watch making, while country B transfers labor in the opposite direction, i.e. from watches to wheat.

Since both activities show constant returns, world's watch output should increase by 100 units while wheat's remains stable. Consequently, global world production in wheat terms grows by 114 units, or 3,6%.

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1 Based on Reinert, 1996. p. 133.

Increased world production (equivalent to the added balance of commerce between the two countries) is distributed equally, thus demonstrating that the specialization through trade, given each nation's comparative advantages, is beneficial for both countries, to the extent both activities show constant returns.

Case 2: With trade

+   Specialization by comparative advantage.
     Country A transfers workers from wheat to watches.
     Country B transfers workers from watches to wheat.
+   Constant returns in both activities.

	Country A			Country B			World
	Man-days	Output-man	Product	Man-days	Output-man	Product	Product
Wheat	100	4	400	300	4	1.200	1.600
Watches	300	4	1.200	100	3	300	1.500
Total	400			400			

Price: 1 wheat = 0,875 watches

Product**	(%)	(+/–)	(+/–)%var	
Country A:	1.771	53%	57	3,3%
Country B:	1.543	47%	57	3,8%
World:	3.314	100%	114	3,6%

	Country A			Country B			World
	Domestic demand*	Product	Trade balance	Domestic demand*	Product	Trade balance	Trade balance
Wheat	800	400	(400)	800	1.200	400	0
Watches	800	1.200	400	600	300	(300)	100
Total**	1.714	1.771	57	1.486	1.543	57	114

* Production before trade.
** In wheat terms.

However, if wheat has diminishing returns and watches, increasing returns (case 3), international trade, based on comparative advantages, will be beneficial only for Country A, i.e. product will grow by 16,3% when compared to the autarchic situation, while B will hurt from a 13,9% production fall.

In this example, the world's wheat production drops by 100 units, and that of watches grows by 150 units. Consequently, product and world trade, in wheat terms, will grow in 2,2% (or 71 units).

Graham's model predicts that the country specializing in production of goods with diminishing returns will experience both, a drop in its GDP and a trade gap. Just the opposite will happen to the country specializing in goods with increasing returns.

Case 3: With trade

+ Specialization by comparative advantage.
  Country A transfers workers from wheat to watches.
  Country B transfers workers from watches to wheat.
+ Increasing returns in watches and diminishing returns in wheat.

	Country A			Country B			World
	Man-days	Output-man	Product	Man-days	Output-man	Product	Product
Wheat	100	4,5	450	300	3,5	1.050	1.500
Watches	300	4,5	1.350	100	2	200	1.550
Total**	400			400			

Price: 1 wheat = 0,875 watches

Product**		(%)	(+/–)	(+/–) % var
Country A:	1.993	61%	279	16,3%
Country B:	1.279	39%	(207)	–13,9%
World:	3.271	100%	71	2,2%

	Country A			Country B			World
	Domestic demand*	Product	Trade balance	Domestic demand*	Product	Trade balance	Trade balance
Wheat	800	450	(350)	800	1.050	250	(100)
Watches	800	1.350	550	600	200	(400)	150
Total**	1.714	1.993	279	1.486	1.279	(207)	71

* Production before trade.
** In wheat terms.

That is, if one of the activities shows either increasing or diminishing returns, trade will hurt one of the two countries. Otherwise said, trade will not be equal if there are differences in returns.

Should wheat have diminishing returns and watches constant returns (case 4), trade specialization reduces Country B's GDP leading to a trade gap. To wit, trade will adversely impact the nation with comparative advantages in the good with diminishing returns.

The world's production would grow very slightly, and so would commercial exchanges, and, in general, the gain in Country A almost equals Country B's loss.

Case 4: With trade

+   Specialization by comparative advantage.
    Country a transfers workers from wheat to watches.
    Country B transfers workers from watches to wheat.
+   Constant returns in watches and diminishing returns wheat.

	Country A			Country B			World
	Man-days	**Output-man**	**Product**	**Man-days**	**Output-man**	**Product**	
Wheat 100	4,5	450	300	3,5	1.050	1.500	
Watches	300	4	1.200	100	3	300 1.500	
Total 400			400				

Price: 1 wheat = 0,875 watches.

Product**		(%)	(+/–)	(+/–) %var
Country A:	1.821	57%	107	6,3%
Country B:	1.393	43%	(93)	–6,2%
World:	3.214	100%	14	0,4%

	Country A			Country B			World
	Domestic demand*	**Product**	**Trade balance**	**Domestic demand***	**Product**	**Trade balance**	**Trade balance**
Wheat	800	450	(350)	800	1.050	250	(100)
Watches	800	1.200	400	600	300	(300)	100
Total**	1.714	1.821	107	1.486	1.393	(93)	14

* Production before trade.
** In wheat terms.

If watch production shows increasing returns and that of wheat, constant returns (case 5), the final solution would be quite similar to the previous example, since the production in Country B would fall and in Country A it would grow. A's trade balance would show a surplus while B's would be negative.

In spite of this similarity, the world's product and commercial trade would grow more than in the previous case.

Case 5: With trade

+   Specialization by comparative advantage.
    Country A transfers workers from wheat to watches.
    Country B transfers workers from watches to wheat.
+   Increasing returns in watches and Constant returns in wheat.

	Country A			Country B			World
	Man-day s	**Output-man**	**Product**	**Man-days**	**Output-man**	**Product**	**Product**
Wheat	100	4	400	300	4	1.200	1.600
Watches	300	4,5	1.350	100	2	200	1.550
Total	400			400			

Price: 1 wheat = 0,875 watches.

Product**	(%)		(+/–)	(+/–)% var
Country A:	1.943	58%	229	13,3%
Country B:	1.429	42%	(57)	–3,8%
World:	3.371	100%	171	5,4%

	Country A			Country B			World
	Domestic demand*	**Product**	**Trade balance**	**Domestic demand***	**Product**	**Trade balance**	**Trade balance**
Wheat	800	400	(400)	800	1.200	400	0
Watches	800	1.350	550	600	200	(400)	150
Total**	1.714	1.943	229	1.486	1.429	(57)	171

* Production before trade.
** In wheat terms.

Annex 2
IMPACT OF PRODUCTIVE SPECIALIZATION ON
STANDARDS OF LIVING

IMPACT ON CONSUMPTION PER CAPITA

Primary sector
LS // Dependent Variable is SER37VP
Date: 11/20/98   Time: 19:31
Sample (adjusted): 1952 1997
Included observations: 46 after adjusting endpoints
Convergence achieved after 6 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0,463026	0,883386	0,524149	0,6029
D(SER33)	–2,580097	0,619951	–4,161778	0,0001
AR(1)	0,293809	0,148946	1,972585	0,0550
R-squared	0,414515	Mean dependent var		0,928309
Adjusted R-squared	0,387283	S.D. dependent var		5,370544
S.E. of regression	4,203861	Akaike info criterion		2,935000
Sum squared resid	759,9152	Schwarz criterion		3,054259
Log likelihood	–129,7762	F-statistic		15,22167
Durbin-Watson stat	1,854775	Prob (F-statistic)		0,000010
Inverted AR Roots	0,29			

Manufacture
LS // Dependent Variable is SER37VP
Date: 12/01/98   Time: 11:05
Sample (adjusted): 1952 1997
Included observations: 46 after adjusting endpoints
Convergence achieved after 7 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0,664635	0,986129	0,673984	0,5039
D(SER41)	4,221452	0,975329	4,328234	0,0001
AR(1)	0,378628	0,139948	2,705492	0,0097
R-squared	0,429092	Mean dependent var		0,928309
Adjusted R-squared	0,402538	S.D. dependent var		5,370544
S.E. of regression	4,151198	Akaike info criterion		2,909787
Sum squared resid	740,9950	Schwarz criterion		3,029046
Log likelihood	–129,1963	F-statistic		16,15931
Durbin-Watson stat	1,825283	Prob(F-statistic)		0,000006
Inverted AR Roots	0,38			

Construction

LS // Dependent Variable is SER37VP
Date: 12/01/98   Time: 11:06
Sample (adjusted): 1952 1997
Included observations: 46 after adjusting endpoints
Convergence achieved after 4 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0,680856	1,194115	0,570177	0,5715
D(SER42A)	3,122543	1,277982	2,443339	0,0187
AR(1)	0,423645	0,137006	3,092160	0,0035

R-squared	0,282018	Mean dependent var	0,928309
Adjusted R-squared	0,248623	S.D. dependent var	5,370544
S.E. of regression	4,655295	Akaike info criterion	3,139004
Sum squared resid	931,8863	Schwarz criterion	3,258263
Log likelihood	−134,4683	F-statistic	8,445025
Durbin-Watson stat	1,654441	Prob(F-statistic)	0,000806
Inverted AR Roots	0,42		

Services

LS // Dependent Variable is SER37VP
Date: 12/01/98   Time: 11:07
Sample (adjusted): 1952 1997
Included observations: 46 after adjusting endpoints
Convergence achieved after 5 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0,859997	1,265832	0,679393	0,5005
D(SER44)	0,048174	0,832208	0,057887	0,9541
AR(1)	0,420857	0,140083	3,004335	0,0044

R-squared	0,182393	Mean dependent var	0,928309
Adjusted R-squared	0,144364	S.D. dependent var	5,370544
S.E. of regression	4,967784	Akaike info criterion	3,268941
Sum squared resid	1061,192	Schwarz criterion	3,388201
Log likelihood	−137,4568	F-statistic	4,796240
Durbin-Watson stat	1,644385	Prob(F-statistic)	0,013174
Inverted AR Roots	0,42		

Variables

SER37VP	Private consumption per capita (Δ%)
SER33	Primary sector (% of GDP)
SER41	Manufacture sector (% of GDP)
SER42A	Construction sector (% of GDP)
SER44	Services sector (% of GDP)
D(X)	$X(t)-X(t-1)$
AR(1)	Correction of autocorrelation

IMPACT ON WHITE COLLAR WAGES

Primary sector
LS // Dependent Variable is SER6VP
Date: 11/20/98   Time: 19:43
Sample (adjusted): 1962 1997
Included observations: 36 after adjusting endpoints
Convergence achieved after 5 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	–3,161690	2,704991	–1,168836	0,2508
D(SER33)	–5,413849	1,736494	–3,117690	0,0038
AR(1)	0,358559	0,167481	2,140894	0,0398
R-squared	0,393680	Mean dependent var		–2,280831
Adjusted R-squared	0,356934	S.D. dependent var		12,91490
S.E. of regression	10,35664	Akaike info criterion		4,754912
Sum squared resid	3539,583	Schwarz criterion		4,886872
Log likelihood	–133,6702	F-statistic		10,71337
Durbin-Watson stat	1,893578	Prob(F-statistic)		0,000260
Inverted AR Roots	0,36			

Manufacture
LS // Dependent Variable is SER6VP
Date: 12/01/98   Time: 11:09
Sample (adjusted): 1962 1997
Included observations: 36 after adjusting endpoints
Convergence achieved after 6 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	–1,663838	3,293716	–0,505155	0,6168
D(SER41)	10,59519	2,649683	3,998662	0,0003
AR(1)	0,509155	0,150606	3,380714	0,0019
R-squared	0,469500	Mean dependent var		–2,280831
Adjusted R-squared	0,437349	S.D. dependent var		12,91490
S.E. of regression	9,687482	Akaike info criterion		4,621324
Sum squared resid	3096,961	Schwarz criterion		4,753284
Log likelihood	–131,2656	F-statistic		14,60274
Durbin-Watson stat	1,782727	Prob(F-statistic)		0,000029
Inverted AR Roots	0,51			

Construction

LS // Dependent Variable is SER6VP
Date: 12/01/98   Time: 11:11
Sample (adjusted): 1962 1997
Included observations: 36 after adjusting endpoints
Convergence achieved after 4 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	–2,707635	3,313459	–0,817163	0,4197
D(SER42A)	5,788838	3,949948	1,465548	0,1522
AR(1)	0,424074	0,163881	2,587691	0,0143
R-squared	0,264485	Mean dependent var		–2,280831
Adjusted R-squared	0,219909	S.D. dependent var		12,91490
S.E. of regression	11,40680	Akaike info criterion		4,948075
Sum squared resid	4293,799	Schwarz criterion		5,080035
Log likelihood	–137,1471	F-statistic		5,933271
Durbin-Watson stat	1,779658	Prob(F-statistic)		0,006292
Inverted AR Roots	0,42			

Services

LS // Dependent Variable is SER6VP
Date: 12/01/98   Time: 11:11
Sample (adjusted): 1962 1997
Included observations: 36 after adjusting endpoints
Convergence achieved after 6 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	–2,327721	3,644633	–0,638671	0,5274
D(SER44)	0,280807	2,195485	0,127902	0,8990
AR(1)	0,458819	0,156451	2,932663	0,0061
R-squared	0,214649	Mean dependent var		–2,280831
Adjusted R-squared	0,167052	S.D. dependent var		12,91490
S.E. of regression	11,78692	Akaike info criterion		5,013635
Sum squared resid	4584,735	Schwarz criterion		5,145595
Log likelihood	–138,3272	F-statistic		4,509711
Durbin-Watson stat	1,705693	Prob(F-statistic)		0,018559
Inverted AR Roots	0,46			

Variables

SER6VP	White-collar wages (Δ%)
SER33	Primary sector (% of GDP)
SER41	Manufacture sector (% of GDP)
SER42A	Construction sector (% of GDP)
SER44	Services sector (% of GDP)
D(X)	X(t)–X(t–1)
AR(1)	Correction of autocorrelation

IMPACT ON BLUE COLLAR SALARIES

Primary
LS // Dependent Variable is SER7VP
Date: 11/20/98   Time: 19:46
Sample (adjusted): 1961 1997
Included observations: 37 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	–3,220570	1,790782	–1,798416	0,0807
D(SER33)	–7,359915	1,677699	–4,386911	0,0001
R-squared	0,354779	Mean dependent var		–2,059666
Adjusted R-squared	0,336344	S.D. dependent var		13,22445
S.E. of regression	10,77331	Akaike info criterion		4,806682
Sum squared resid	4062,248	Schwarz criterion		4,893759
Log likelihood	–139,4243	F-statistic		19,24498
Durbin-Watson stat	2,127444	Prob(F-statistic)		0,000101

Manufacture
LS // Dependent Variable is SER7VP
Date: 12/01/98   Time: 11:12
Sample (adjusted): 1962 1997
Included observations: 36 after adjusting endpoints
Convergence achieved after 5 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	–1,435903	2,114486	–0,679079	0,5018
D(SER41)	15,51529	2,841962	5,459360	0,0000
AR(1)	0,229994	0,170252	1,350901	0,1859
R-squared	0,499829	Mean dependent var		–2,207953
Adjusted R-squared	0,469516	S.D. dependent var		13,38081
S.E. of regression	9,745828	Akaike info criterion		4,633334
Sum squared resid	3134,378	Schwarz criterion		4,765294
Log likelihood	–131,4818	F-statistic		16,48871
Durbin-Watson stat	1,971463	Prob(F-statistic)		0,000011
Inverted AR Roots	0,23			

Construction

LS // Dependent Variable is SER7VP
Date: 12/01/98   Time: 11:13
Sample (adjusted): 1962 1997
Included observations: 36 after adjusting endpoints
Convergence achieved after 5 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	–2,731320	2,636522	–1,035956	0,3078
D(SER42A)	6,966229	4,584695	1,519453	0,1382
AR(1)	0,171557	0,176170	0,973812	0,3372
R-squared	0,109188	Mean dependent var		–2,207953
Adjusted R-squared	0,055199	S.D. dependent var		13,38081
S.E. of regression	13,00626	Akaike info criterion		5,210517
Sum squared resid	5582,375	Schwarz criterion		5,342477
Log likelihood	–141,8711	F-statistic		2,022421
Durbin-Watson stat	1,920602	Prob(F-statistic)		0,148413
Inverted AR Roots	0,17			

Services

LS // Dependent Variable is SER7VP
Date: 12/01/98   Time: 11:13
Sample (adjusted): 1962 1997
Included observations: 36 after adjusting endpoints
Convergence achieved after 6 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	–2,309896	2,824288	–0,817868	0,4193
D(SER44)	0,537742	2,953857	0,182048	0,8567
AR(1)	0,197867	0,184338	1,073392	0,2909
R-squared	0,046205	Mean dependent var		–2,207953
Adjusted R-squared	–0,011600	S.D. dependent var		13,38081
S.E. of regression	13,45820	Akaike info criterion		5,278832
Sum squared resid	5977,060	Schwarz criterion		5,410792
Log likelihood	–143,1008	F-statistic		0,799324
Durbin-Watson stat	1,895026	Prob(F-statistic)		0,458147
Inverted AR Roots	0,20			

Variables

SER7VP	Blue-collar salaries (Δ%)
SER33	Primary ector (% of GDP)
SER41	Manufacture sector (% of GDP)
SER42A	Construction sector (% of GDP)
SER44	Services sector (% of GDP)
D(X)	X(t)–X(t–1)
AR(1)	Correction of autocorrelation

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GDP BY ACTIVITIES*

	Global GDP	Agriculture	Fisheries	Mining	Manufacture	Electricity, Gas & Water	Cons-truction	Housing	Government	Other
1950	865,58	205,55	2,10	65,56	164,74	2,90	50,92	35,39	51,09	287,34
1951	936,45	211,72	2,17	70,73	181,17	3,00	59,82	36,02	53,48	318,34
1952	994,86	217,86	2,35	73,07	190,90	3,12	73,89	36,78	55,96	340,94
1953	1.047,95	222,87	2,04	68,83	215,62	3,93	77,88	37,66	58,54	360,58
1954	1.115,56	227,32	2,68	91,96	236,00	4,00	87,46	39,02	61,21	365,90
1955	1.168,84	225,51	3,12	92,60	253,74	4,36	92,62	40,42	64,18	392,30
1956	1.218,97	214,68	3,90	102,42	261,51	4,65	103,74	41,96	67,33	418,79
1957	1.301,27	215,54	4,36	112,25	288,26	5,24	106,54	43,81	70,67	454,60
1958	1.293,88	230,41	6,53	101,70	280,54	5,93	96,74	45,65	74,30	452,10
1959	1.341,45	241,70	10,51	103,93	306,77	5,97	85,23	47,34	78,02	461,98
1960	1.504,74	257,17	14,31	155,38	355,79	6,86	81,82	49,23	82,03	502,16
1961	1.615,81	264,89	20,16	169,83	383,47	8,52	100,55	50,76	92,70	524,95
1962	1.750,84	271,24	26,00	161,51	414,99	8,87	109,70	52,33	99,31	606,88
1963	1.815,55	275,31	27,09	171,85	438,39	9,43	94,78	53,95	106,67	638,08
1964	1.935,37	288,80	34,90	180,44	469,17	10,08	104,83	55,62	114,57	676,95
1965	2.030,90	294,58	28,86	183,14	500,04	10,91	118,46	57,35	120,95	716,61
1966	2.201,56	310,49	34,05	201,09	538,74	11,89	129,00	59,12	128,32	788,85
1967	2.284,92	322,60	38,89	203,51	559,97	13,00	128,23	60,96	132,68	825,09
1968	2.293,03	311,63	39,59	216,12	570,61	13,74	109,76	62,85	135,73	832,99
1969	2.379,35	332,19	35,55	214,61	577,06	14,43	117,12	64,80	138,45	885,15
1970	2.518,57	358,10	47,25	229,85	626,74	15,09	133,04	64,93	144,41	899,16
1971	2.623,78	365,27	32,60	215,89	662,40	16,74	145,31	67,38	151,16	967,04
1972	2.699,22	356,50	17,34	229,41	676,13	18,23	160,93	70,16	162,05	1.008,47
1973	2.844,33	357,93	12,55	238,09	720,14	20,31	176,29	73,44	169,62	1.075,96
1974	3.107,39	371,17	17,54	251,34	780,82	22,22	211,93	77,11	177,76	1.197,50

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	Global GDP	Agriculture	Fisheries	Mining	Manufacture	Electricity, Gas & Water	Cons-truction	Housing	Government	Other
1975	3.213,06	371,05	15,56	231,85	805,20	23,92	216,43	79,48	191,11	1.278,46
1976	3.276,07	376,61	18,33	245,68	834,35	27,18	216,59	81,10	204,45	1.271,78
1977	3.289,33	376,23	16,00	296,96	820,26	30,65	192,24	82,18	213,29	1.261,52
1978	3.298,58	370,59	20,20	389,94	787,15	31,95	172,44	83,03	213,25	1.230,04
1979	3.490,13	385,04	22,67	459,11	819,79	34,26	181,44	84,15	214,51	1.289,17
1980	3.646,73	362,63	18,88	468,79	866,76	39,02	202,29	88,58	233,49	1.366,29
1981	3.807,70	395,42	20,60	454,28	872,61	41,87	224,99	90,61	239,79	1.467,54
1982	3.815,76	404,16	24,19	459,87	862,36	45,29	229,50	92,18	241,73	1.456,48
1983	3.334,32	365,23	17,00	414,73	705,89	38,04	181,69	93,18	257,94	1.260,61
1984	3.494,78	402,60	24,86	434,54	746,33	38,15	183,15	94,50	277,62	1.293,03
1985	3.573,92	414,33	29,10	453,22	779,90	40,50	163,96	95,31	279,04	1.318,57
1986	3.904,23	432,29	38,45	432,92	901,54	47,64	199,04	98,11	302,46	1.451,78
1987	4.234,70	460,77	33,88	420,01	1.017,08	51,32	234,33	101,51	316,85	1.598,95
1988	3.881,52	493,39	40,13	357,05	903,08	51,59	218,49	101,60	288,45	1.427,74
1989	3.428,62	465,76	42,24	339,67	761,61	50,91	186,40	102,58	247,48	1.231,97
1990	3.243,58	433,44	41,96	326,84	717,44	51,10	192,29	103,59	217,43	1.159,50
1991	3.334,52	447,13	37,48	316,76	761,72	53,12	195,58	104,30	202,65	1.215,78
1992	3.287,20	412,71	42,31	308,53	743,67	54,27	204,14	104,52	205,10	1.211,95
1993	3.497,23	450,96	51,20	333,65	779,43	60,14	233,42	105,47	211,17	1.271,79
1994	3.953,93	513,06	66,02	348,42	902,19	65,59	308,44	106,54	217,61	1.426,07
1995	4.240,31	554,15	53,43	356,15	943,09	69,46	361,50	107,43	222,94	1.572,16
1996**	4.350,84	584,90	53,10	365,43	966,43	70,64	344,87	109,21	218,38	1.637,88
1997**	4.664,10	613,56	47,90	386,62	1.024,42	82,01	410,05	117,07	214,55	1.767,92

* Nuevos soles of 1979.
** Estimate.
Source: INEI.

GDP BY TYPE OF EXPENDITURE*

	Global	Consumption	Government Expenditure	Investment	Exports	Imports
1950	865,58	608,03	53,02	158,10	168,08	121,65
1951	936,45	664,08	54,56	217,45	164,72	164,35
1952	994,86	677,02	60,70	250,15	189,26	182,27
1953	1.047,95	705,34	61,94	271,20	207,24	197,76
1954	1.115,56	759,86	73,45	234,55	221,33	173,64
1955	1.168,84	813,81	73,41	271,60	232,27	222,25
1956	1.218,97	828,25	77,71	322,62	251,39	261,00
1957	1.301,27	874,02	89,94	365,52	258,68	286,89
1958	1.293,88	876,95	89,86	319,81	260,46	253,21
1959	1.341,45	885,58	100,69	272,47	294,58	211,87
1960	1.504,74	926,61	118,34	334,58	378,60	253,39
1961	1.615,81	989,40	136,74	351,07	446,75	308,14
1962	1.750,84	1.092,34	143,66	385,54	476,87	347,58
1963	1.815,55	1.200,98	152,05	378,62	468,29	384,38
1964	1.935,37	1.274,22	171,10	400,00	500,60	410,56
1965	2.030,90	1.371,07	182,66	442,00	515,12	479,94
1966	2.201,56	1.490,97	182,90	532,46	539,21	543,97
1967	2.284,92	1.609,15	189,24	518,78	570,95	603,19
1968	2.293,03	1.625,76	201,32	387,01	627,29	548,36
1969	2.379,35	1.683,05	212,44	412,59	616,22	544,95
1970	2.518,60	1.785,39	222,98	441,01	651,43	582,23
1971	2.623,88	1.848,78	238,37	512,93	632,35	608,55
1972	2.699,22	1.908,83	254,13	452,00	691,14	606,88
1973	2.844,35	1.987,14	269,44	706,16	563,18	681,57
1974	3.107,39	2.122,12	285,60	973,85	592,48	866,66

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	Global	Consumption	Government Expenditure	Investment	Exports	Imports
1975	3.213,04	2.209,67	317,25	921,92	606,11	841,91
1976	3.276,07	2.249,32	332,49	803,25	626,88	735,87
1977	3.289,34	2.254,32	380,43	684,95	708,08	738,45
1978	3.298,59	2.081,67	332,20	643,50	799,69	558,46
1979	3.490,14	2.130,72	300,68	756,81	968,16	666,22
1980	3.646,64	2.236,39	367,83	1.030,81	879,34	867,72
1981	3.807,72	2.355,77	362,03	1.242,24	853,50	1.005,82
1982	3.815,75	2.376,39	410,18	1.151,48	905,74	1.028,04
1983	3.334,22	2.167,11	374,20	704,19	812,09	723,37
1984	3.494,78	2.209,01	357,09	634,37	886,13	591,83
1985	3.573,93	2.255,69	369,70	564,06	925,08	540,60
1986	3.904,22	2.592,61	382,28	748,97	831,08	650,72
1987	4.234,71	2.847,16	404,79	959,42	770,70	747,35
1988	3.881,28	2.636,46	340,70	869,54	714,97	680,38
1989	3.428,61	2.185,85	315,74	586,57	848,82	508,36
1990	3.243,76	2.132,61	285,75	672,08	722,04	568,72
1991	3.334,50	2.173,17	291,18	747,87	805,09	682,80
1992	3.287,20	2.212,50	299,62	739,73	811,50	776,15
1993	3.497,23	2.312,50	309,03	821,29	840,42	786,01
1994	3.953,93	2.542,60	335,60	1.052,34	997,57	974,18
1995	4.240,31	2.767,17	368,66	1.247,50	1.074,21	1.217,22
1996**	4.350,84	2.837,66	361,66	1.183,17	1.195,89	1.227,53
1997**	4.664,10	2.951,17	378,29	1.346.65	1.351.35	1.366,24

*Nuevos soles of 1979.
** Estimate.
Source: INEI.

	Population 1/	White C. Wages 2/	Blue C. Salaries 2/	Traditional Exports 3/	Non Traditional Exports 3/ 5/	Non Financ. Services Exports 3/	Imports 3/	Non Financ. Services Imports 3/	Banking System Nir 3/	Terms of Trade 4/	Real Exchange Rate 4/
1950	7.632,5			169	29		175		139	33,3	103,8
1951	7.826,3			214	45		262		146	36,0	100,5
1952	8.025,7			208	38		288		144	35,5	97,4
1953	8.232,2			191	37		293		138	36,6	97,8
1954	8.447,0			209	46		249		145	41,1	109,7
1955	8.671,5			239	42		300		141	52,6	101,8
1956	8.904,9			271	49		384		156	57,8	98,0
1957	9.146,1			281	50		450		122	60,4	93,4
1958	9.396,7			248	44		384		109	53,0	108,9
1959	9.657,8			279	44		317		126	101,2	111,4
1960	9.931,0	473,0	338,6	403	41		373		156	98,2	106,4
1961	10.217,5	480,7	349,6	456	54		467		190	107,8	100,0
1962	10.516,5	476,0	356,7	496	60		542		222	109,1	94,6
1963	10.825,8	482,2	369,8	503	52		579		257	99,9	90,6
1964	11.143,5	495,5	379,6	629	56		587		300	132,0	83,3
1965	11.467,3	453,5	362,8	640	45		718		308	125,7	72,9
1966	11.796,4	430,4	367,8	745	43		818		264	146,8	69,0
1967	12.132,2	426,6	356,4	717	25		819		107	154,4	72,8
1968	12.476,0	431,9	379,2	810	30		631		133	203,1	81,4
1969	12.829,1	447,0	355,0	846	34		601		166	186,1	80,7
1970	13.192,8	465,0	374,2	1.000	34	178	700	260	423	188,0	81,3
1971	13.568,3	495,8	409,2	858	31	179	730	286	347	179,1	79,4
1972	13.954,7	534,5	442,8	895	50	208	812	291	397	218,0	76,7
1973	14.350,3	544,3	486,1	998	114	235	1.033	367	411	112,1	74,3
1974	14.753,1	521,2	479,4	1.352	151	325	1.908	553	693	117,3	70,5

Continue…

	Population 1/	White C. Wages 2/	Blue C. Salaries 2/	Traditional Exports 3/	Non Traditional Exports 3/ 5/	Non Financ. Services Exports 3/	Imports 3/	Non Financ. Services Imports 3/	Banking System Nir 3/	Terms of Trade 4/	Real Exchange Rate 4/
1975	15.161,2	504,4	431,3	1.234	96	412	2.427	643	116	80,9	65,1
1976	15.577,7	433,7	440,8	1.204	137	375	2.016	479	(752)	91,2	71,2
1977	16.003,5	377,2	372,8	1.502	224	377	2.148	403	(1.101)	93,3	83,0
1978	16.434,6	323,9	335,9	1.619	353	434	1.668	386	(1.025)	75,8	105,1
1979	16.866,6	295,8	336,2	2.866	810	522	1.954	512	554	100,0	100,0
1980	17.324,1	317,7	355,7	3.071	845	714	3.090	880	1.276	110,2	91,8
1981	17.758,9	323,9	348,1	2.548	701	770	3.802	1.088	771	90,3	84,4
1982	18.195,4	348,5	351,9	2.531	762	784	3.722	1.098	896	74,4	89,9
1983	18.631,4	299,0	291,5	2.460	555	711	2.722	964	856	79,9	102,7
1984	19.064,5	275,4	248,1	2.421	726	670	2.140	891	1.103	72,9	108,5
1985	19.492,4	253,7	214,2	2.264	714	814	1.806	984	1.383	65,5	135,0
1986	19.915,5	316,6	287,7	1.886	645	836	2.596	1.013	866	48,0	98,2
1987	20.335,2	332,0	311,3	1.889	716	793	3.182	1.164	81	48,3	66,2
1988	20.751,2	229,8	195,3	1.944	747	831	2.790	1.164	(317)	52,3	69,2
1989	21.162,7	145,2	136,8	2.509	979	836	2.291	1.143	546	50,5	42,9
1990	21.569,3	100,0	100,0	2.265	966	799	2.885	1.164	682	45,6	42,1
1991	21.966,4	105,9	115,2	2.378	951	826	3.495	1.239	1.933	43,4	35,3
1992	22.354,4	109,0	111,1	2.472	1.013	836	4.051	1.411	2.425	42,6	34,0
1993	22.740,2	127,3	110,1	2.334	1.189	837	4.123	1.412	2.910	39,1	37,5
1994	23.130,3	153,0	127,4	3.153	1.420	1.064	5.595	1.565	6.025	43,2	34,4
1995	23.531,7	146,1	116,7	3.981	1.595	1.131	7.761	1.904	6.693	46,0	32,6
1996	23.931,7	147,5	111,2	4.213	1.685	1.414	7.866	2.099	8.862	43,6	32,6
1997*	24.338,5	149,6	110,3	4.692	2.122	1.540	8.552	2.288	7.982	45,9	32,2

1/ Thousands
2/ Real, base 1990 = 100
3/ US$ millions
4/ Base 1979 = 100
5/ Include other exports of good
* Estimate.
Source: INEI, BCRP.

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