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Growth, Employment and Internal Migration Peru, 2003-2007

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Abstract

We analyze trends in regional economic growth, employment and internal migration during one of the best periods of economic boom in Peru's modern history. Migration among departamentos from 2002 to 2007, captured in the last population census, has been consistent with regional labour prospects, such as initial stocks and recent increases in the volumes of adequate employment. The relative size of internal migration has declined compared to the period 1988-1993 due to the virtual elimination of terrorism-led migration, retaking a long run declining trend observed for the South America region. However, migration corridors opened up in the 1980s and 1990s have persisted during this decade. Empirical models show that the migration decision also takes into account potential gains in living standards, through the improved access to economic and social infrastructure. Likewise, the report finds evidence that internal migration flows support the process of conditional convergence across regional per capita GDPs. However, these same flows do not seem to influence significantly the speed of earnings convergence across regions.

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1. Introduction

Peru has experienced a long period of economic boom in recent years, characterized by a high and persistent economic growth rate (6.7% of average annual growth from 2002 to 2008), which has had significantly positive consequences in the well-being of the Peruvian population at large. The reduction in standard poverty indicators driven by this growth process has been analyzed in INEI (2008) and World Bank (2008). For instance, nationwide poverty incidence has fallen from 48.6% in 2004 to 39.3% in 2007. However, the poverty reduction gains have been more sizable in urban areas (with a fall from 37.1% to 25.7% during the same years), especially in Lima and other Coastal cities, than in rural areas (with a relatively modest reduction from 69.8% to 64.6% over the same three-year period). Improvements in labour indicators at the urban level have been documented in Yamada (2008b). While income underemployment² in urban areas shrank rapidly from 58.9% in 2005 to 43.1% in 2007, the open unemployment rate fell at a slower pace from 7.4% in 2004 to 6.3% in 2007.

A careful look at the regional labour markets and the study of internal migration patterns, in the midst of this economic expansion, would be a key input to understand recent labour developments nationwide but it has not been undertaken. This paper tries to fill this knowledge gap for the Peruvian labour market, relying on regional economic accounts and regional labour data, and exploiting the migration information captured by the population and housing census undertaken in October 2007. This study also takes the opportunity to compare migration results coming from the July 1993 population and housing census, which was conducted towards the end of a drastic economic, social and internal security crisis in Peru.

We find that migration among departamentos from 2002 to 2007, captured in the last population census, has been consistent with regional labour prospects, such as initial stocks and recent increases in the volumes of adequate employment. The relative size of internal migration has declined compared to the period 1988-1993 due to the virtual

² Share of labor force holding low income (below the poverty line for income holders) jobs.

elimination of terrorism-led migration, retaking a long run declining trend observed for the South America region. However, migration corridors opened up in the 1980s and 1990s have persisted during this decade. Empirical models show that the migration decision also takes into account potential gains in living standards, through the improved access to economic and social infrastructure. Likewise, the report finds evidence that internal migration flows support the process of conditional convergence across regional per capita GDPs. However, these same flows do not seem to influence significantly the speed of earnings convergence across regions.

Studies on regional economic developments within Peru have been rare due to data shortcomings and limited research efforts undertaken outside Metropolitan Lima. Actually, the most comprehensive economic study on internal migration for Peru was published by the Argentine economist Carola Pessino in the early nineties (1991), taking advantage of the most complete national household survey ever conducted in Peru. Regarding migration information, the 1985 Peruvian Living Standards Measurement Survey had data nationwide on the current and last place of residence, in addition to the location where the person was born. It also had information on the years of residence in the present location. Pessino argued that, in a context of incomplete information about wage prospects, migration can have a “learning” purpose and be a sequential process. According to her dataset, migrants could be classified into three types: primary migrants, repeat migrants and return migrants. She confirmed that movers from rural and less urbanized areas were primary migrants that moved in part for learning reasons. On the contrary, movers from Lima and other cities performed mainly secondary moves.

More recently, Diaz and Rodriguez (2008) exploited the migration and earnings section from the 2005 Employment Specialized Survey, conducted by the Labour Ministry in Lima and 25 main cities, to assess whether there is an earnings premium for migrants in the destination market. According to this dataset and their empirical specification, the migrant condition influenced significantly on earnings only in some segments of the distribution of workers. The migrant condition was significantly correlated with a wage penalty (lower labour earnings) for the lowest decile in the income distribution, whereas

it was associated with a wage premium (higher labour earnings) in the case of the highest decile in the income distribution.

The international literature on the subject of internal migration in developing countries has been comprehensively surveyed in recent years, first by Lucas (1997), and lately by Lall et.al. (2006). Lucas began reviewing data on urban population growth by continents, and showed that this variable has been slowing down in the case of South America (from annual rates of 4.57% in the 1950s to 2.53% in the 1990s) and that it is not the main source of urban population growth anymore. He cited work by Todaro (1984) estimating the contribution of rural-urban migration to the urban population growth at 41.4% (based on work with data of 29 developing countries). Lall et. al. goes further mentioning that migration rates appear to have slowed down in some countries.

Both papers reviewed the theoretical contributions to the subject dating back to Lewis (1954), and Harris-Todaro (1970) models of development. In Lewis model, rural to urban migration is needed and encouraged to transfer low productivity labour in agriculture to more productive manufacturing and services activities in urban areas. On the contrary, in Harris and Todaro model, people migrate to urban areas excessively, because they do so until their expected urban wage (the product of a higher wage in a formal urban job times the probability to be working in it) is equalized to the rural wage, provoking high rates of urban unemployment (migrants waiting to get the formal jobs). Development practitioners have been influenced by this latter model and have advised in the past that internal migration should be discouraged.

These oversimplified macro theories have been surpassed in recent decades by more elaborate microeconomic models and richer empirical evidence. For instance, Fields (1975) and Cole and Sanders (1984) models exploited the fact that one does not need to be openly unemployed in the urban areas to have a chance to get the formal job. Informal sector activities could be part of the menu of options in urban areas. Moreover, some migrants may find the urban informal sector as their best labour option (Maloney, 1999, Yamada, 1996). Recent models have stressed the role of information asymmetries,

incomplete insurance and credit markets in explaining migration patterns. These models have included a finer analysis of job-search, resulting in diverse situations such as repeat and return migration, and have emphasized the positive role of migration on rural development, through remittances from urban migrants back to their rural areas of origin (Lall, et.al., 2006).

With regard to the empirical papers on internal migration, the immense majority of economists have emphasized its labour dimension, trying to measure the earnings premium from the migratory decision (actually, the most common finding has been a short-run penalty at the early stage of migration, and an steeper earnings profile during the assimilation process, as in Borjas, Bronars and Trejo, 1992). Other potentially important sources of welfare improvements which could be gained with migration, such as the access to public services and infrastructure have received less attention in the literature (Lucas, 1997). This is so even though the traditional migration framework has been to classify its potential determinants into “push” and “pull” factors. On one hand, “push” factors would be all negative conditions in the place of origin, such as low wages, scarce job opportunities, poor economic and social infrastructure, high degree of violence and insecurity and so on, “pushing” individuals to leave. On the other hand, “pull” factors would be all positive conditions in the potential place of destination, such as better wages, more job opportunities, sufficient economic and social infrastructure, good record in security, etc., “pulling” individuals to migrate to. There has been a strand of the empirical literature dealing with the consequences of migration on income inequality and poverty, but the effects on the economy as a whole have been hard to handle because they would require structural models of internal migration or calibrated computable general equilibrium models (Lall, et.al. 2006).

Finally, with respect to the policy stance regarding internal migration, Lall, et. al. (2006) concludes that migration restrictions are not desirable. Lucas (1997) stays that the policy concern on rural-urban migration containment may well be misplaced. Internal migration can improve job matches and provides labour demanded by dynamic economic sectors. For instance, Au and Henderson (2006) have shown evidence that migration restrictions

in China maintained surplus labour in rural areas, led to insufficient agglomeration of economic activities in cities, and resulted in GDP losses. Migration is also a way to avoid rural constraints, such as a credit market and insurance imperfections, and hence to promote rural development through remittances.

This report is organized as follows. After this introduction, the paper explores how the booming economy at the macro level has translated into regional GDP growth in Peru. In turn, the third section shows estimates for the recent improvement in labour indicators at the macro and regional level, and their degree of association with output growth data. The fourth section analyses interregional migration patterns in the last five years, and begin to assess how responsive they have been to employment prospects. This task is undertaken more formally with regression analysis in the fifth section. Section 6 compares migration patterns of this decade with those from 1988 to 1993, and from 1976 to 1981, identifying the terrorism rise in the 1980s as a major negative shock altering migration volumes and directions within Peru.

Section 7 updates other standard measures of internal migration such as rural-urban migration flows, labour mobility among the three natural geographical regions in Peru, and the concepts of settled migrant, primary migrant, repeated migrant, and return migrant, to characterize the slowdown of migration in Peru. Section 8 assesses if other welfare indicators, besides the labour prospects, have also been behind the migration decisions during this decade. Section 9 explores whether the internal migration patterns have been conducive to the process of conditional convergence among regional GDPs in Peru. Likewise, Section 10 wonders if migration flows can also shed light on the dynamics of conditional convergence of real earnings across regions in Peru. Section 11 ends the report reviewing its main findings.

2. Recent trends in regional economic growth

The Peruvian economy has had its longest period of expansion in the last five decades starting in 2002 to date. Cumulative GDP growth from 2002 to 2008 has been estimated at 57%, a remarkable average of 6.7% per year. For comparability purpose with the employment data, in this report we will concentrate our analysis comparing the average growth registered from period 2003-2004 to period 2006-2007. As explained in the section 3, the reason for aggregating years in the employment data, for the initial and final period of analysis, was to add more observations in each category in the regional data obtained from household surveys, in order to get more precise estimations.

Table 1, bottom right corner, shows an average annual rate of 7.2% for this period. Growth was quite generalized across economic sectors, as shown in the last row of the table. Construction was the most dynamic activity with 11.3% of average annual expansion, followed by Manufacturing (8%) and Commerce, Restaurants and Hotels (8%). Agriculture and Fishing, and Mining and Electricity were the relatively least dynamic sectors but still showing a sizable 5% of average annual growth.

Central departamentos have had the lead in growth with 7.4% of average rate, surpassing slightly the Southern departamentos which had a 7.3% of average growth, and leaving behind the Northern departamentos with one percentage point less of average growth rate (6.3%). On the other hand, we have grouped together departamentos in Costa, Sierra and Selva regions, according to the predominant natural region within their political boundaries. Considering this approximation, we can say from Table 1 that the Costa region led economic growth in this boom with 7.8% of average economic growth during the last three years, followed by Selva with 6.2% and Sierra with 5.8% average growth rate, respectively. Overall, there has been quite a broad based picture of economic growth for Peru and its regions in the last three years. However, there has been more performance heterogeneity when one looks at the departamento level, ranging from a spectacular growth of 11.2% in the case of Cuzco to a stagnation (0.9% of increase) in the case of Cajamarca (see Table A.3 in the Appendix).

Table 1 – Regional GDP Growth by Natural Geographical Regions and Macro Regions (annual average rates 2003-2007)

Regions \ Activities	Agriculture and Fishing	Mining and Electricity	Manufacturing	Construction	Commerce, Restaurants and Hotels	Government Services	Other Services	TOTAL
Costa	6.4%	9.3%	8.0%	9.7%	8.7%	5.9%	7.2%	7.8%
Sierra	3.2%	2.7%	8.2%	15.2%	5.6%	7.5%	6.1%	5.8%
Selva	5.7%	2.6%	7.1%	9.8%	5.8%	8.3%	6.1%	6.2%
North	6.2%	3.2%	6.7%	11.4%	5.9%	8.2%	6.3%	6.3%
Center	4.1%	4.4%	8.8%	8.9%	8.9%	5.8%	7.2%	7.4%
South	4.9%	8.4%	6.1%	18.6%	5.6%	7.7%	6.2%	7.3%
TOTAL	5.0%	5.0%	8.0%	11.3%	8.0%	6.6%	7.0%	7.2%

Source: National Accounts 2003-2007 (INEI). See Table A.2 in Appendix for definitions.

3. Recent trends in regional employment indicators

Unemployment or lack of employment is usually pointed by the Peruvians (in opinion polls) as one of the main problems facing the country. However, Table 2 shows that only 5.1% of total Peruvian labor force was found openly unemployed nation-wide on average in 2003-2004. To reduce this gap between the official statistics and the perception of the “employment problem” in Peru, INEI has introduced two measures of underemployment and one measure of adequate employment.

Underemployment by hours happens when an individual is working less than full time (35 hours a week) and would like to work more hours. Underemployment by income occurs when a person is working full time but earns less than the cost of a basic household consumption basket divided by the average number of workers per household (hence, it is the labor market counterpart of the standard monetary poverty measure). Adequate employment is a residual variable, subtracting from the total labor force all

categories of unemployment and underemployment. Therefore, adequate employment is a useful summary indicator of the labour market situation³.

The last row of Table 2 for the average period 2003-04 shows that hours underemployment is rather low (1.5% of the total labor force is constrained by hours). On the contrary, income underemployment is the main labor category in Peru, affecting to 62.2% of the population. Therefore, adequate employment is held only by less than a third of the labor force (31.1%).

Table 2 – Labour Force Composition by Regions (2003-2004)

	Unemployed Labor Force	Employed Labor Force		Adequate Employment
	Open Unemployment	Underemployment		
		Visible (by hours)	Invisible (by income)	
Costa	6.9%	1.4%	52.4%	39.3%
Sierra	3.4%	1.8%	72.5%	22.3%
Selva	2.4%	0.8%	73.9%	22.8%
North	3.4%	1.8%	67.7%	27.1%
Center	6.4%	1.1%	57.2%	35.2%
South	4.2%	2.3%	68.0%	25.6%
TOTAL	5.1%	1.5%	62.2%	31.1%

Source: ENAHO 2003-2004 (INEI)

Table 2 shows that the Costa has the highest share of adequate employment in its labour force (39.3%), and Sierra and Selva lag behind with only 22% of proper employment share. Note that low income - low productivity jobs are the main explanation for this situation (three out of every four jobs fall in this category) more than open unemployment (there is almost full employment according to these low percentages) or hour underemployment. The Central macro region has the highest incidence of adequate

³ These concepts are applied by INEI every month to the Permanent Employment Survey for Metropolitan Lima in order to get the official labour statistics for the capital city. This study extends their application for Peru as a whole using the Peruvian Household Survey. Using INEI data for poverty estimations, we considered 82 different costs of consumption baskets by departamento, natural regions (Costa, Sierra and Selva) and urbanization degree (urban or rural) as well as different average number of income earners per household.

employment (35.2%) whereas the North region and South regions show proper employment shares of 27.1% and 25.6%. The larger diversity across departamentos, ranging from 43.7% of proper employment share in the case of Tacna to 10.6% in the case of Huancavelica, is described in Table A.6 in the Appendix.

Growing production should have increasing employment levels as a natural counterpart. However, in countries with high labor informality and low social protection coverage, where open unemployment is a kind of luxury good, employment usually grows at the same rate as the labor force because people create jobs themselves when not available. Hence, the degree of association between GDP growth and employment generation is expected to be rather low or weak. Graph A.2 in the Appendix shows indeed a rather dispersed plot and the numerical correlation is only 0.15. We have argued before that adequate employment growth is more important as a summary variable for the labor performance (because its improvement is the consequence of lower unemployment and/or underemployment). Yet, this variable is even less correlated with GDP growth, at least in this time period. Graph A.3 in the Appendix shows a small negative slope and a correlation of only -0.04. From the point of view of the individuals, it turns out that regional employment developments (and especially adequate employment trends) would be more useful than regional output performance as information to guide any decision for labour mobility, as discussed below.

A crucial labour market test for the positive effects of the longest economic boom in recent decades in Peru would be to have a reduction in the share of labor force experiencing income underemployment, and an increase in the share of the labor force obtaining adequate employment. Indeed, Table 3.2 shows that income underemployment share fell 3.3 percentage points and adequate employment share increased by 3.5 percentage points nation-wide in between 2003-04 and 2006-07 (there was also a reduction in open unemployment rate and an increase in hour underemployment share in both cases amounting to less than a percentage point). As mentioned before, the reason for aggregating years for the initial and final period of analysis was to add more

observations in each category in the regional data obtained from household surveys in order to get more precise estimations.

Table 3.2 shows that the most visible gains in adequate employment happened in Selva with 5.5 percentage points of gain, followed by Costa (3.9%) and Sierra (2.3%). The counterpart of the gains in adequate employment has been mostly a reduction in income underemployment and to lesser extent a fall in the open unemployment rate and the hour underemployment. Likewise, Central Peru experienced the highest gain in adequate employment (4.3%) surpassing the increases in Central and North Peru significantly (around 2.5 percentage points). The counterpart of this development was a significant fall in income underemployment in all macro regions (in about four percentage points) with the exception of the South (reduction of 1.5 percentage points). The diversity of performances at the departamento level, ranging from a gain in proper employment share of 9.3 percent points in Madre de Dios to a loss of 3.4 percent points in Apurimac, is described in the Appendix.

Table 3.1 – Labor Force Composition by Regions (2006-2007)

	Composition 2006-2007			
	Unemployed Labor Force	Employed Labor Force		
	Open Unemployment	Underemployment		Adequate Employment
		Visible (by hours)	Invisible (by income)	
Costa	5.9%	2.0%	48.9%	43.2%
Sierra	2.7%	2.5%	70.3%	24.6%
Selva	2.8%	1.0%	67.8%	28.3%
North	3.4%	2.8%	64.0%	29.8%
Center	5.2%	1.8%	53.5%	39.5%
South	3.4%	2.0%	66.4%	28.2%
TOTAL	4.4%	2.1%	58.9%	34.6%

Source: ENAHO 2006-2007 (INEI)

Table 3.2 – Labor Force Percentage Changes, by Regions (compared to 2003-2004)

	Percentage Changes			
	Unemployed Labor Force	Employed Labor Force		
	Open Unemployment	Underemployment		Adequate Employment
		Visible (by hours)	Invisible (by income)	
Costa	-1.0%	0.6%	-3.5%	3.9%
Sierra	-0.7%	0.7%	-2.3%	2.3%
Selva	0.4%	0.2%	-6.1%	5.5%
North	0.1%	1.0%	-3.8%	2.7%
Center	-1.2%	0.7%	-3.7%	4.3%
South	-0.7%	-0.3%	-1.5%	2.6%
TOTAL	-0.8%	0.6%	-3.3%	3.5%

Source: ENAHO 2003-2007 (INEI)

4. Recent trends in internal migration indicators

Given the heterogeneity in labor market performance at the regional level (both in terms of “stock” of adequate employment and “flow” of adequate employment creation), we would expect significant flows of internal migration in Peru. Unfortunately, the national household surveys used in this study only capture long term migration episodes, i.e.: the difference between the birth place and the location of current residency, regardless the time elapsed. However, we are interested in the migration flows during this last booming period of the Peruvian economy.

General population censuses are undertaken once every decade in Peru. The last census was conducted in October 2007 and a convenient feature is that it included a specific question regarding migration in the last five years. That is, there was a question on current place of residency in October 2007 and another question on the place of residency five years before (October 2002, around the beginning of the booming period). Table 4 summarizes our work with these two questions by departamento. The last row tells us that 4.5% of the Peruvian population moved between 2002 and 2007 within their

departamentos of residency. More importantly, 6.2% of Peruvian population between those years moved out from one departamento of residency in Peru to another one. Table A.11 in the Appendix has comparable numbers collected by the Economic Commission for Latin American and the Caribbean (ECLAC) for 11 Latin American countries, and shows that internal migration in Peru is relatively comparable to the simple latest average for the region (4.9%).

**Table 4 – Internal Migration 2002-2007 by Departamentos
(as percentage of their 2007 population)**

Region	Internal Migration	Outflow	Inflow	Net Migration
Amazonas	4.9%	13.7%	5.9%	-7.8%
Ancash	4.2%	7.0%	4.2%	-2.7%
Apurímac	3.9%	10.0%	4.0%	-6.0%
Arequipa	11.3%	5.8%	7.4%	1.6%
Ayacucho	5.4%	7.9%	4.7%	-3.1%
Cajamarca	3.5%	10.2%	3.1%	-7.0%
Callao	0.0%	8.7%	13.1%	4.4%
Cuzco	8.6%	6.5%	3.6%	-2.9%
Huancavelica	2.2%	10.5%	2.9%	-7.6%
Huánuco	5.5%	9.8%	4.1%	-5.7%
Ica	4.8%	6.6%	6.1%	-0.5%
Junín	7.2%	9.8%	5.7%	-4.1%
La Libertad	6.5%	4.2%	5.1%	0.9%
Lambayeque	3.9%	7.8%	6.5%	-1.3%
Lima	1.7%	3.4%	8.0%	4.5%
Loreto	8.9%	5.5%	3.0%	-2.5%
Madre de Dios	4.2%	6.3%	21.1%	14.8%
Moquegua	3.1%	7.9%	10.1%	2.2%
Pasco	4.2%	11.3%	6.7%	-4.6%
Piura	3.8%	5.8%	2.7%	-3.1%
Puno	4.9%	5.2%	2.0%	-3.3%
San Martín	8.5%	10.3%	10.5%	0.2%
Tacna	8.1%	5.7%	10.2%	4.5%
Tumbes	2.0%	6.7%	9.6%	3.0%
Ucayali	13.8%	8.1%	8.6%	0.5%
Total	4.5%	6.2%	6.2%	0.0%

Source: 2007 Census

The departamento attracting relatively most population was Madre de Dios (in Selva) with 14.8% of net migratory balance (a very high 21.1% of incoming migration only very partially compensated with 6.3% of outgoing migration). Our work with regional national accounts (Table A.3 to A.5 in the Appendix) shows that Madre de Dios had an average

annual economic growth rate one percentage point higher than the already high Peruvian average for this booming period, explained fundamentally by boom in mining (related to gold prospects) and spread to other economic sectors, especially in construction.

From our employment data, we can tell that Madre de Dios had also an adequate employment share higher than the national average at the beginning of the period (37.1% in 2003-04). Moreover, the most salient feature of Madre de Dios in recent years is that it ranked first in terms of increase of proper employment (9.3 percentage points) during this expansion period with important gains in adequate employment in Agriculture, Commerce and Other Services, although not in mining.

In the second and fourth place, we find Lima and Callao (traditionally the main magnet for migration in Peru concentrating almost one third of total Peruvian population), with 4.5% and 4.4% of net migratory balance. In the employment data, Lima (and Callao included) had the second highest adequate employment share (43.0%) at the beginning of the boom, and also experienced significant gains in proper employment (4.5 percentage points) in the last years. Tacna (the bordering region with Chile) placed third with 4.5% of balance. This migratory behaviour is consistent with Tacna being the top region in adequate employment share (43.7%) in 2003-04 and having rather sizeable increases (5.3 percentage points) during this boom. Tumbes (another bordering region, this time with Ecuador) ranked fifth with 3.0% of migratory balance and again, this region was third in the adequate employment balance with 42.4% share and experienced a gain of 4.3 percentage points recently.

In the other extreme of the distribution, the Amazonas region (in Selva) ranked last in terms of migratory balance with -7.8% of net migration (13.7% of its population leaving its territory only partially compensated with 5.9% of population incoming its borders). Amazonas did have an increase in its GDP about equal to the national average, explained mainly by Agriculture, but it performed below average in its labor market both in terms of stock of proper employment (25.9% of share) and flow of the same variable (2

percentage points of gain). Mining contributed negatively to proper employment generation and so did poorly Government Services, Other Services and Commerce.

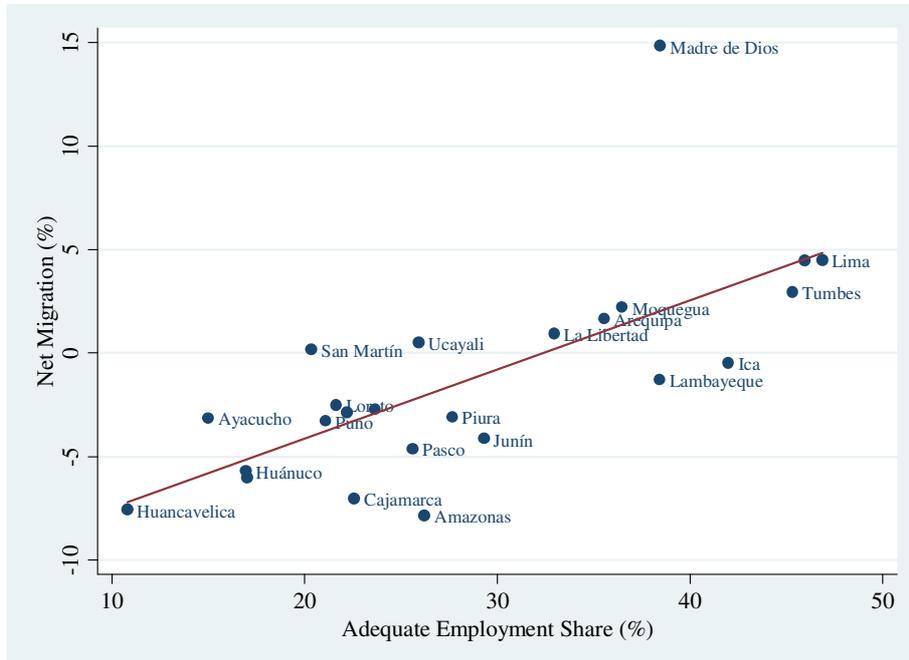
Huancavelica is a sharper example of the linkages of GDP growth, employment performance and migration patterns. This Sierra Sur region ranked next to last in migratory balance, having 7.6% of its population leaving its borders. Huancavelica experienced an economic growth rate which was about half the national average with negative contribution by Agriculture. Furthermore, this impoverished region had the weakest labor indicator in term of stock of proper employment (only 10.6% of its labor force) and below average gain in recent years (3 percentage points) with negative contributions in terms of generation of proper employment by Construction and Other Services.

Cajamarca, a region in Northern Sierra, witnessed a net outflow of 7% of its population in recent years. This departamento has had the weakest economic performance (GDP growth of only 0.9%) due to Mining contraction and sluggish performance in all Services sectors. These negative developments had a significant toll in terms of proper employment (already below the national average with 22.2% share) falling further 1.6 percentage points due to worsening in proper employment generation in Agriculture, Construction and Commerce.

5. Migration and Labour Prospects 2002-2007

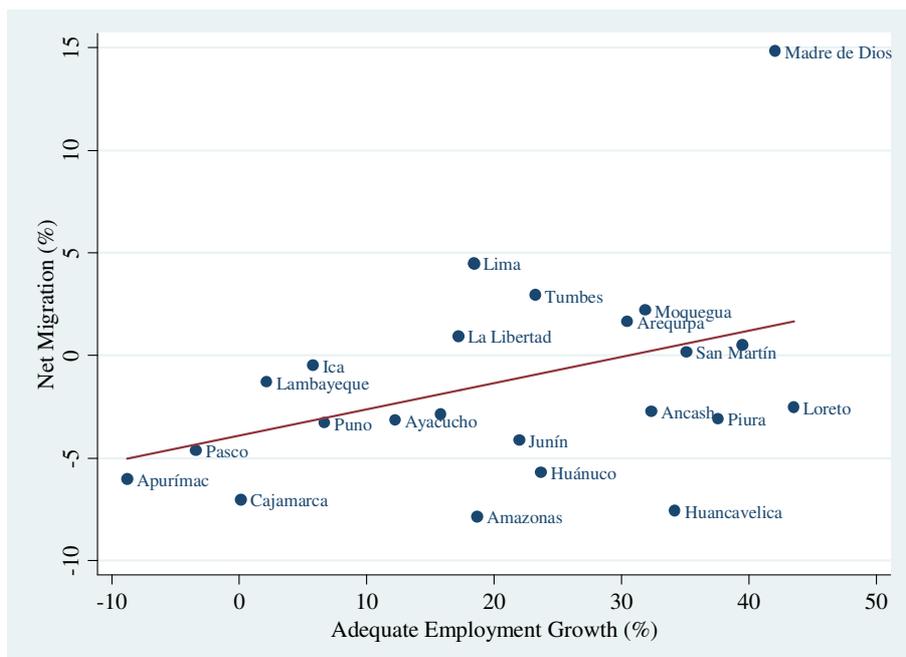
The individual stories by region presented in the previous section seem to support the idea of a strong association between the migratory patterns and the labour market performance of the population-absorbing and population-expelling regions, both in terms of stock (of proper employment) and flow (of generation of adequate employment). The association between the migratory flows and regional GDP seems weaker and indirect precisely because they are channelled through the labour market. Graphs 1, 2 and 3 show these potential associations graphically at the department level.

**Graph 1 – Adequate Employment Share (2002)
and Net Migration Flows (2002-2007)**

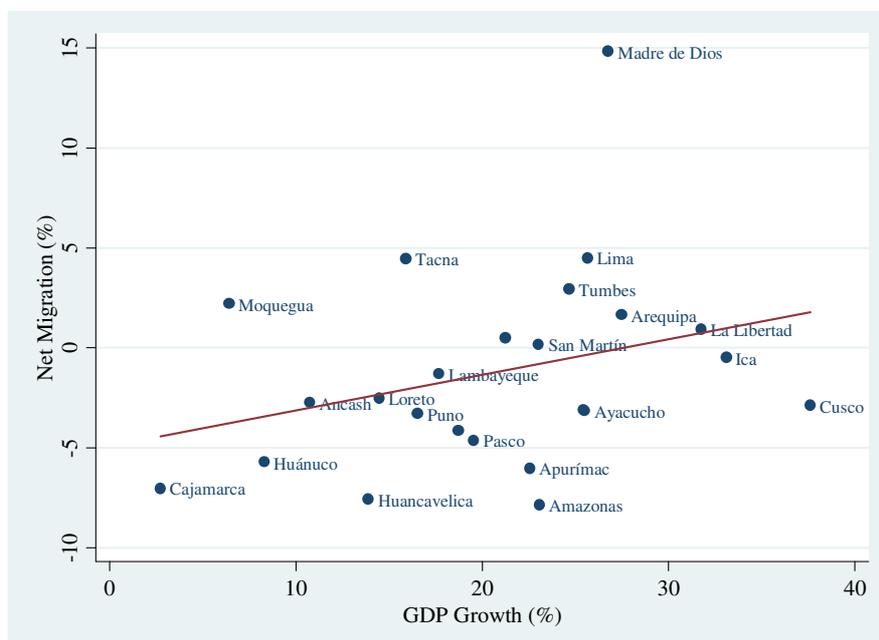


Source: 2007 Census, ENAHO 2002-2007

**Graph 2 – Growth on Adequate Employment
and Net Migration (2002-2007)**



Graph 3 – GDP Growth and Net Migration Flows 2002-2007



Source: 2007 Census, National Accounts 2003-2007 (INEI)

Statistical evidence is tried with multiple regressions analysis, having as a dependent variable the net migratory balance between 2002 and 2007, and as independent variables: total employment in 2003-04, change in total employment from 2003-04 to 2006-07, the share of adequate employment in 2003-04, the variation in this share between 2003-04 and 2006-07, and the growth of regional GDP. This regression is tried for the 24 departamentos (with the desirable feature of having all variables at a representative levels but the shortcoming of two few observations) and for 189 provincias (with the positive characteristic of a much larger sample but with the limitation of non representative numbers for employment variables at the province level).

Table 5 and Table 6 show that the two labour market summary variables emphasized in the first part of this study (stock and flow of adequate employment) proved to be statistically significant in both types of regressions, offering evidence of a migration pattern in this decade driven strongly by economic prospects and the variable Peruvians care the most: the probability to have an adequate job.

Table 5 – Regression on Net Migration by Departamentos

Regressor	Coefficient	St. Dev.	t	P>T
Total Employment	-1.25E-09	4.70E-09	-0.27	0.794
Total Employment Growth Rate	0.1877	0.2114	0.89	0.386
Adequate Employment Share	0.3125	0.0748	4.18	0.001
Adequate Employment Share Growth Rate	0.1203	0.0478	2.52	0.022
GDP Growth	0.0885	0.0856	1.03	0.315
Constant	-0.1569	0.0272	-5.78	0.000
Obs	24			
R ²	0.6666			
Adjusted R ²	0.574			

Table 6 – Regression on Net Migration by Provinces

Regressor	Coefficient	St. Dev.	t	P>T
Adequate Employment Rate	0.2460	0.0484	5.08	0.000
Adequate Employment Share Growth Rate	0.0063	0.0038	1.66	0.099
Constant	-0.0933	0.0131	-7.13	0.000
Obs	189			
R ²	0.1222			
Adjusted R ²	0.1128			

6. Comparison with Previous Migration Patterns

A similar work on five-year migration patterns can be undertaken with data from the 1993 Census. This is presented in Table 7 which shows first that the relative amount of internal migration from 1988 to 1993, both within regions (5.4%) and among regions in Peru (8.4%), were higher than the ones found in recent years.

**Table 7 – Inter-Departmental Migration 1988-1993
(as percentage of their 1993 population)**

Region	Internal Migration	Outflow	Inflow	Net Migration
Amazonas	5.4%	11.1%	7.9%	-3.3%
Ancash	3.9%	10.6%	5.2%	-5.4%
Apurímac	4.8%	12.6%	5.4%	-7.3%
Arequipa	12.9%	8.1%	10.8%	2.8%
Ayacucho	7.6%	16.9%	5.8%	-11.0%
Cajamarca	4.3%	11.1%	3.1%	-8.0%
Callao	0.0%	10.6%	19.8%	9.2%
Cuzco	9.4%	7.6%	5.1%	-2.5%
Huancavelica	3.1%	16.7%	4.0%	-12.6%
Huánuco	7.2%	9.6%	6.6%	-3.0%
Ica	6.9%	9.9%	8.0%	-1.9%
Junín	10.8%	14.1%	7.6%	-6.5%
La Libertad	7.7%	5.8%	7.3%	1.5%
Lambayeque	4.7%	8.2%	8.1%	-0.1%
Lima	1.9%	5.2%	10.7%	5.4%
Loreto	9.7%	8.3%	5.0%	-3.4%
Madre de Dios	3.9%	13.1%	21.7%	8.6%
Moquegua	4.9%	13.4%	17.2%	3.8%
Pasco	6.4%	19.4%	8.8%	-10.6%
Piura	5.6%	6.2%	3.3%	-2.9%
Puno	8.0%	8.5%	3.3%	-5.3%
San Martín	10.1%	11.3%	14.8%	3.5%
Tacna	7.1%	9.0%	21.0%	12.0%
Tumbes	3.2%	8.8%	17.0%	8.2%
Ucayali	5.7%	9.4%	15.9%	6.5%
Total	5.4%	8.4%	8.4%	0.0%

Source: 1993 Census

International literature, especially in the context of the United States (Saks, 2007), has found that volumes of internal migration are pro-cyclical with respect to the level of economic activity⁴. The results in Peru would conflict with this literature since the years 1988-1993 were in the downward side of the business cycle (and showed more volume of internal migration) while the years 2002-2007 were in the upward trench of the economic activity (and evidenced less volume of internal migration).

⁴ We have also correlated the variation overtime in the relative size of internal migration in 11 Latin American countries (as presented in Table A.11 in the Appendix) with the variation in their respective GDPs growth rates and found a statistically significant and positive correlation of 0.21. However, when including Peruvian data in the regression, the correlation coefficient becomes -0.0980 and not statistically significant.

From 1988 to at least the first half of 1993, Peruvian per capita GDP fell continuously in real terms (with the exception of 1991 when it remained constant), accumulating a dramatic fall of 30%. Likewise, there was hyperinflation which reached a peak of 7,650% in 1990. Thanks to a drastic stabilization program, inflation fell to a still moderately high rate of 39.5% in 1993. However, another key feature of the Peruvian society in those years was the high level of internal violence (massive and selective assassinations, kidnappings of authorities and peasants, forced work by youngsters, armed strikes, combat with official and unofficial armed forces), provoked by the terrorism movements, mainly “Shining Path” and to lesser extent “MRTA”, especially in the Sierra departamentos. This situation threatened the lives of thousands of families and restricted radically their economic activities. The way out for many of those Peruvians was migration to relatively safer departamentos.

A first evidence to support this hypothesis of terrorism-led increase in internal migration is to go back to the previous census (1981) and check the levels of internal migration for the years 1976 to 1981. We do not have access to this dataset, but can get the needed numbers from Pessino’s paper Table 1, reproduced here as Table 8.

**Table 8 – Inter-Departmental Migration 1976-1981
(as percentage of their 1981 population)**

Region	Migration Outflow	Migration Inflow	Net Migration	Ranking
Amazonas	9.8%	9.8%	0.0%	9
Ancash	8.2%	4.8%	-3.4%	19
Apurímac	9.3%	4.3%	-5.0%	22
Arequipa	7.8%	9.5%	1.7%	7
Ayacucho	8.9%	4.6%	-4.3%	20
Cajamarca	8.6%	3.0%	-5.6%	23
Cusco	4.8%	4.3%	-0.5%	10
Huancavelica	9.5%	4.9%	-4.6%	21
Huánuco	6.0%	6.8%	0.8%	8
Ica	10.1%	7.1%	-3.0%	17
Junín	8.2%	7.3%	-0.9%	11
La Libertad	6.5%	4.9%	-1.6%	15
Lambayeque	7.4%	6.1%	-1.3%	13
Lima-Callao	5.8%	8.8%	3.0%	5
Loreto	5.8%	4.3%	-1.5%	14

Madre de Dios	9.1%	2.3%	-6.8%	24
Moquegua	14.7%	16.7%	2.0%	6
Pasco	10.8%	8.9%	-1.9%	16
Piura	4.6%	3.5%	-1.1%	12
Puno	6.2%	3.0%	-3.2%	18
San Martín	5.6%	17.5%	11.9%	1
Tacna	9.8%	18.9%	9.1%	2
Tumbes	8.6%	12.5%	3.9%	3
Ucayali	7.4%	10.9%	3.5%	4
TOTAL	6.9%	6.9%	0.0%	

Source: Pessino (1991)

The last row from this table shows a volume of internal migration among departamentos of 6.9% from 1976 to 1981, which is lower than the 8.4% estimated for the period 1988-1993 and supports the hypothesis presented.

Table A.12 in the Appendix shows the number of dead and missing people attributed to terrorism, year by year, according to the records of the “Comisión de la Verdad y Reconciliación” (Truth and Reconciliation Commission). These figures indicate that terrorism in Peru indeed had its most intense activity from 1993 to 2003 (more than a thousand dead or missing people in every single year). Abimael Guzmán, the Shining Path maximum leader, was captured in September 1992, and this was the beginning of the defeat of this terrorist movement in Peru.

Table A.13 in the Appendix shows the same statistics for murdered and missing people due to terrorism, aggregated for the period 1980-2000, and grouped by departamentos (there was no access to this type of statistics for single years). Ayacucho, Junín, Huánuco, Huancavelica and Apurímac were the departamentos hardest hit by terrorism, based on this variable.

Furthermore, for the hypothesis of terrorism-led increase in internal migration to hold, it should be the case that the main increases in migratory outflows from the period 1976-1981 to the period 1988-1993 should have happened in the departamentos hardest hit by terrorism. Indeed, there is a correlation coefficient of 0.55 between these two variables and Table 9 shows that Ayacucho, Huancavelica, Junín, Huánuco and Apurímac were the

most emblematic cases. Likewise, when comparing the migratory outflows from 2002 to 2007 with the ones from 1988-1993, these same departamentos should have shown a significant fall in the pace of outflows once terrorism practically disappeared from Peru. Once again this idea is consistent with the data with a correlation coefficient of -0.48 between these two variables.

**Table 9 – Evolution in Inter-Departmental Migration Outflows
1976-1981, 1988-1993 and 2002-2007
(as percentage of their final population in each period)**

Region	Migration Outflow (1981)	Migration Outflow (1993)	Migration Outflow (2007)	Var. 1981-1993	Var. 1993-2007
Amazonas	9.8%	11.1%	13.7%	1.3%	2.6%
Ancash	8.2%	10.6%	7.0%	2.4%	-3.6%
Apurímac	9.3%	12.6%	10.0%	3.3%	-2.6%
Arequipa	7.8%	8.1%	5.8%	0.3%	-2.3%
Ayacucho	8.9%	16.9%	7.9%	8.0%	-9.0%
Cajamarca	8.6%	11.1%	10.2%	2.5%	-1.0%
Cusco	4.8%	7.6%	6.5%	2.8%	-1.1%
Huancavelica	9.5%	16.7%	10.5%	7.2%	-6.2%
Huánuco	6.0%	9.6%	9.8%	3.6%	0.2%
Ica	10.1%	9.9%	6.6%	-0.2%	-3.3%
Junín	8.2%	14.1%	9.8%	5.9%	-4.3%
La Libertad	6.5%	5.8%	4.2%	-0.7%	-1.6%
Lambayeque	7.4%	8.2%	7.8%	0.8%	-0.3%
Lima-Callao	5.8%	5.7%	2.7%	-0.1%	-3.1%
Loreto	5.8%	8.3%	5.5%	2.5%	-2.8%
Madre de Dios	9.1%	13.1%	6.3%	4.0%	-6.8%
Moquegua	14.7%	13.4%	7.9%	-1.3%	-5.5%
Pasco	10.8%	19.4%	11.3%	8.6%	-8.1%
Piura	4.6%	6.2%	5.8%	1.6%	-0.4%
Puno	6.2%	8.5%	5.2%	2.3%	-3.3%
San Martín	5.6%	11.3%	10.3%	5.7%	-1.0%
Tacna	9.8%	9.0%	5.7%	-0.8%	-3.3%
Tumbes	8.6%	8.8%	6.7%	0.2%	-2.2%
Ucayali	7.4%	9.4%	8.1%	2.0%	-1.3%
TOTAL	6.9%	8.4%	6.2%	1.5%	-2.2%

Source: Pessino (1991), 1993 Census and 2007 Census

In short, terrorism provoked important changes in the volume and patterns of internal migration during the late 1980s and early 1990s. Moreover, it seems that once a major

shock (such as terrorism) opens up important migration corridors, then the following rounds of migration tend to follow basically the same pattern (the volume may fall after the shock ends, but the routes are permanently established),⁵ because family ties and contacts established increase the information and reduce the costs of migration along those corridors.

For instance, when comparing the main migration corridors from the 2007 census and the 1993 one, Tacna, Madre de Dios and Tumbes were the most population-absorbing regions in both cases (Table 10). There has been a switch in specific places comparing the two rankings but they are still the same top three regions. A somewhat similar situation happens at the bottom of the chart: Huancavelica, Cajamarca, Apurimac, and Pasco are the most population expelling departamentos in both contexts. One of the few noticeable differences, however, is the case of Amazonas which did not rank at the bottom of the chart in 1993. Actually, the statistical correlation between the two variables 14 years apart is quite high: 82% in terms of net migration balance and 89% in terms of places in the ranking⁶.

Table 10 – Evolution in Inter-Departamental Net Migration Outflows, 1988-1993 and 2002-2007
(as percentage of their final population in each period)

Departamento	Net Migration 1993 (%)	Net Migration 2007 (%)	Net Migration 1993 (Ranking)	Net Migration 2007 (Ranking)
Amazonas	-3%	-8%	16	25
Ancash	-5%	-3%	19	14

⁵ For sure, regional conflicts in Peru have not completely disappeared in Peru to date. However, current conflicts are less violent, more sporadic and usually linked to disputes between regions and the national government on the distribution of rents from natural resources royalties, and to protests by local communities on alleged environmental risks provoked by new mining operations. Hence, their potentially damaging impact on the population sense of security and their levels of economic activity is not comparable with the years of intense terrorism in Peru at all. Following the suggestion of a commentator, we have gathered data on number of active social conflicts by departamentos in recent years from Defensoria del Pueblo and found very low correlation coefficient (0.14) when associated with recent migratory outflows by departamentos.

⁶ To give a complete perspective on this issue, we report that the correlation coefficient between net migration flows from 1976-1981 and 1988-1993 was 0.63. Moreover, this same coefficient between net outflows from 1976-1981 and 2002-2007 was 0.24.

Apurímac	-7%	-6%	21	22
Arequipa	3%	2%	9	7
Ayacucho	-11%	-3%	24	17
Cajamarca	-8%	-7%	22	23
Callao	9%	4%	2	4
Cuzco	-3%	-3%	13	15
Huancavelica	-13%	-8%	25	24
Huánuco	-3%	-6%	15	21
Ica	-2%	0%	12	11
Junín	-7%	-4%	20	19
La Libertad	1%	1%	10	8
Lambayeque	0%	-1%	11	12
Lima	5%	5%	6	2
Loreto	-3%	-3%	17	13
Madre de Dios	9%	15%	3	1
Moquegua	4%	2%	7	6
Pasco	-11%	-5%	23	20
Piura	-3%	-3%	14	16
Puno	-5%	-3%	18	18
San Martín	4%	0%	8	10
Tacna	12%	4%	1	3
Tumbes	8%	3%	4	5
Ucayali	6%	1%	5	9
Corelation	0.82		0.89	

Source: 1993 Census and 2007 Census

From a longer run perspective, the implied trend from estimates of interregional migration for the 1970s (6.9% for 1976-81) and this decade (6.2% for 2002-2007)⁷ is consistent with the declining rhythm of migration observed by Lucas (1997) for the South America region. The last figure would be positively affected by the recent booming period, but this effect would not be large enough to alter the long term declining trend. For the near future, we would expect a smaller number for internal migration flows because of the impact of a downward part of the business cycle already under way, which would concur in the same direction with the longer run declining trend.

7. An Assessment of Other Migration Characteristics

As discussed in the introduction, most of the literature on internal migration has focused on the rural to urban migration process in developing countries. With the Peruvian census datasets at hand, we can characterize the residence place of origin and destination at the

⁷ This difference is statistically significant at 99% of confidence.

district level⁸ as rural (when less than one third of population in the district is considered as urban⁹), semi-urban (when more than one third but less than two thirds of population in the district is considered as urban) and urban (when more than two thirds of population in the district is considered as urban), and estimate the internal migration flows from and to these three types of districts. Tables 11 and 12 show these tabulations for the 1988-93 and 2002-07 migration periods.

Table 11 – Migration and Degree of Urbanization, 1988-1993

Origin \ Destination	Rural	Semi Urban	Urban	Metropolitan Lima	Total
Rural	5.7%	3.4%	11.3%	5.5%	25.9%
Semi Urban	2.3%	2.0%	6.7%	4.4%	15.3%
Urban	5.1%	4.3%	24.2%	14.8%	48.4%
Metropolitan Lima	1.6%	1.5%	7.3%	0.0%	10.4%
Total	14.7%	11.2%	49.4%	24.7%	100.0%

Source: 1993 Census

Table 12 – Migration and Degree of Urbanization, 2002-2007

Origin \ Destination	Rural	Semi Urban	Urban	Metropolitan Lima	Total
Rural	2.7%	3.0%	9.1%	4.0%	18.8%
Semi Urban	1.7%	2.1%	7.9%	5.2%	16.8%
Urban	3.7%	4.9%	31.0%	15.6%	55.2%
Metropolitan Lima	0.9%	1.3%	6.9%	0.0%	9.2%
Total	9.0%	11.3%	55.0%	24.7%	100.0%

Source: 2007 Census

Peru is already a highly urbanized country and its urbanization rate has kept growing (71.0% and 75.9% of share of urban population in total population in 1993 and 2007). This is why Table 11 shows that 46.3% of 5-year migrations in 1993 were in between urban districts (including Metropolitan Lima as a mega urban unit¹⁰) and this share has risen to 53.5% in 2007. In second place in 1993, there were migrations from rural to

⁸ There are 1825 districts in Peru.

⁹ The INEI defines the urban/rural status at the level of populated centers (districts are composed by several populated centers), selecting as urban all populated centers which have more than 400 houses in it.

¹⁰ Metropolitan Lima hosts around 8 million people which represent 28% of Peru's total population. Nevertheless, it is worth noticing in Table 11 that flows to all urban districts other than Metropolitan Lima (55% of total movements) have represented more than twice the size of flows to Metropolitan Lima (24.7%).

urban districts with 11.3% of total internal movements. This share has fallen to 9.1% in 2007. In third place in 1993, there were migrations from semi-urban to urban districts with 6.7% of total movements. This share has increased further to 7.9% in 2007¹¹.

Alternatively, we can classify migrants' districts of origin and destination according to the geographical natural regions in Peru, and assess another way to look at the migration patterns. Tables 13 and 14 show these tables for 1988-93 and 2002-07. The counterpart of the urbanization process in Peru has been the concentration of the population along the Costa region (53.3% and 55.1% of total population in 1993 and 2007). Therefore, more than 25% of the internal migration episodes happened within urban districts in the Costa (25.7% in between 1988-03 and 27.1% in between 2002-2007). At a slightly higher share, there were movements within Sierra (28.9% of total internal migration in 1988-93 and 27.4% 2002-07). The third place corresponded to migration from Sierra to Costa (21.1% and 18.6% of share in 1988-93 and 2002-07 respectively).

Table 13 – Migration and Geographical Region, 1988-1993

Origin \ Destination	Costa	Sierra	Selva	Total
Costa	25.7%	7.6%	2.2%	35.5%
Sierra	21.1%	28.9%	2.7%	52.8%
Selva	3.3%	1.2%	7.1%	11.7%
Total	50.2%	37.7%	12.1%	100.0%

Source: 1993 Census

Table 14 – Migration and Geographical Region, 2002-2007

Origin \ Destination	Costa	Sierra	Selva	Total
Costa	27.1%	7.1%	2.2%	36.4%
Sierra	18.6%	27.4%	2.6%	48.5%
Selva	4.7%	1.1%	9.4%	15.2%
Total	50.4%	35.6%	14.1%	100.0%

Source: 2007 Census

Finally, we can update for this study some of Pessino's estimations for categories such as "primary migrants", "repeat migrants" and "return migrants". One first task is to add to the analysis the information on district of birth in the Census 2007 together with the

¹¹ Rural to rural migration is a small phenomenon (2.7% of migratory flows) in Peru at least when considering 5-year migration (this paper is not able to capture short term temporary or circular migration). This result is different to Lucas (1997) finding that rural to rural migration is a more predominant case than rural to urban migration in the Third World as a whole.

current district of residence and that one five years earlier. With these simultaneous data, as seen in Table 15, we can classify individuals in the population as “non migrants”, “settled migrants” and “five-year migrants”. In turn, all these “five-year” migrants can be classified as: “primary migrants”, “repeat migrant” and “return migrant”.

Table 15 – Classification of Migrants

Type of Migrant		Place of Birth	Place of Residence 2002	Place of Residence 2007
Non Migrant		A	A	A
Settled Migrants		A	B	B
Five Year Migrant	Primary Migrant	A	A	B
	Repeat Migrant	A	B	C
	Return Migrant	A	B	A

Table 16 shows that thank to the historical process of internal migration in the last decades, 41.5% of Peruvians are migrants in their place of residence: 27.9% are long term “settled migrants” whereas 13.6% are “five-year migrants”. The departamentos with the highest share of migrants are Lima in the Costa (40.9% of “settled migrants” and 18.3% of “five-year migrants”), Arequipa in the Sierra (36.9% of “settled migrants” and 19.0% of “five-year migrants”), and Madre de Dios in the Selva (28.6% of “settled migrants” and 26.1% of “five-year migrants”). Table 16 also shows that within the group of recent “five-year migrants”, “primary migrants” represent 45.6% of them, “repeat migrants” made up 38.0% of them, and “return migrants” add 16.4% to the total. “Repeat migrants” have their highest share in Lima (46.3%), indicating that the capital city would be the end point of a process of sequential migration for a significant part of the population. The highest share of “return migrants” happens in Huancavelica (27.3%), Piura (27.3%) and Apurimac (26.2%) showing potentially unsuccessful migration episodes in some fraction of the population¹². Compared to Pessino finding for 1976-1981, the share of repeat migrants would have increased (it was 27.7% according to Pessino total numbers, Table 3, p.76) whereas the share of return migrants would have decreased (it was 26.6% in Pessino total numbers).

¹² These estimates could also be reflecting episodes of temporary or circular migration, related to seasonal work in agriculture, forestry or mining, but the database does not help to discriminate these hypotheses.

Table 16 – Types of Migration by Department of Residence, 2007

Department of Residence	Non Migrants	Settled Migrants	5 Years Migrants	Primary Migrant	Repeat Migrant	Return Migrant
Amazonas	65.9%	23.2%	10.8%	52.5%	29.4%	18.1%
Ancash	71.9%	19.4%	8.7%	49.2%	28.3%	22.5%
Apurímac	80.3%	11.7%	8.0%	47.9%	25.9%	26.2%
Arequipa	44.1%	36.9%	19.0%	43.8%	41.1%	15.0%
Ayacucho	75.6%	14.2%	10.2%	49.7%	26.4%	23.9%
Cajamarca	79.9%	13.5%	6.7%	52.5%	24.9%	22.6%
Callao	44.3%	39.5%	16.2%	42.9%	41.0%	16.1%
Cuzco	68.6%	18.6%	12.7%	47.0%	33.7%	19.3%
Huancavelica	89.8%	5.1%	5.1%	49.9%	22.8%	27.3%
Huánuco	73.7%	16.6%	9.7%	50.4%	31.9%	17.8%
Ica	63.7%	25.1%	11.1%	48.7%	29.9%	21.5%
Junín	62.3%	24.7%	13.0%	49.2%	32.8%	18.0%
La Libertad	60.7%	27.3%	12.0%	51.4%	31.0%	17.6%
Lambayeque	64.6%	24.7%	10.7%	49.2%	29.9%	21.0%
Lima	40.8%	40.9%	18.3%	41.3%	46.3%	12.4%
Loreto	69.6%	18.3%	12.1%	48.7%	29.6%	21.7%
Madre de Dios	45.3%	28.6%	26.1%	50.6%	35.6%	13.8%
Moquegua	57.1%	29.6%	13.4%	48.2%	31.5%	20.3%
Pasco	74.4%	14.7%	10.9%	48.8%	29.4%	21.8%
Piura	77.1%	16.2%	6.7%	48.7%	24.0%	27.3%
Puno	80.3%	12.7%	7.0%	56.4%	21.8%	21.8%
San Martín	50.1%	30.8%	19.1%	47.1%	36.8%	16.2%
Tacna	42.7%	38.7%	18.7%	49.9%	37.6%	12.5%
Tumbes	64.4%	23.7%	11.9%	55.5%	25.2%	19.3%
Ucayali	56.1%	21.3%	22.5%	49.5%	33.9%	16.6%
Total	58.5%	27.9%	13.6%	45.6%	38.0%	16.4%

Source: 2007 Census

8. Migration and Other Welfare Indicators

We have shown evidence, so far, that differential labour prospects and a major shock, such as the rise and fall of terrorism in Peru, have been significant determinants of the internal migration volumes and patterns in the recent past in Peru. What about the prospect to enjoy a higher living standard due to better access to social services, infrastructure and other public goods? How significant is it for migration decisions? Table 17 shows a tabulation of the percentage of access to public goods such as electricity, water and sanitation, and education in the migrants' district of origin and migrants' district of destination, considering the data for migration from 2002 to 2007.

The observed ex-post welfare improvements measured by the increased access to these services are quite sizable.

Table 17 – Percentage of Population with Access to Basic Services 2007

Percentage of Population with Access to Basic Services	District of Origin for Migrants	District of Destination for Migrants	Measurement of Improvement
Electricity	64.3%	69.9%	5.6
Water	49.2%	53.2%	4.0
Sanitation	44.6%	49.5%	4.8
Years of education	7.5	8.0	0.5

Source: 2007 Census

On the other hand, theoretical models of migration and international evidence have emphasized some personal characteristics of the individuals which would make him or her more likely to undertake a migration investment. Table 18 shows, using data from the migration episodes from 2002 to 2007, that there is a slightly higher proportion of men among migrants (50.7%), with no difference on average age with respect to non-migrants (30.5 years), but a significant difference in the average years of schooling in favour of migrants (9.1 years compared to 7.8 years).

Table 18 – Demographic Characteristics by Migrant Status, 2007

Migration Status	% Men	Average Age	Average Years of schooling
Migrant	50.7%	30.5	9.1
Non-Migrant	49.2%	30.5	7.8

Source: 2007 Census

These stylized facts motivate an empirical model for determinants of migration at the household head level¹³, considering a logistic model for the probability to migrate as a function of a set of individual and district characteristics, following to certain extent the literature on “pull” and “push” factors behind the migration decision. Table 19 lists the ten independent variables whose coefficients resulted statistically significant in influencing the migration probability. In terms of gender, the chance to migrate increases 0.8 percentage points when the household head is male. On the contrary, the age of the

¹³ This choice to run the model at the level of household heads, instead of the population at large, has been made to keep the operational work at a manageable level.

household heads affects negatively the probability to migrate¹⁴, whereas their years of formal education are positively correlated with migration. These two latter results are consistent with the human capital theories of migration. Older migrants have less expected time to reap off the benefits of migration, while more education provides potential migrants access to more information on jobs availability nation-wide, better quality job matching, and more opportunities to enjoy returns to education in larger markets. Another household characteristic, its size, is a proxy variable for the cost of migration and, consistently, it deters the migration decision.

Access to public services in the destination district seems to be an important “pull” factor influencing positively the migration decision, in search for better living standards¹⁵. On the other hand, access to public services in the district of origin functions as a “containment” factor, discouraging potential migration. Regarding labour prospects, the Peruvian censuses have not included earnings questions in recent decades. However, a higher occupation ratio in the destination district seems to be an important “pull” factor, revealing good labour prospects, and it is associated with more migration. In turn, a higher occupation ratio in the origin district works as another “containment” factor correlated with less migration.

Higher levels of education access in the origin district -proxied by the average number years of education in the respective population, seems to be another “containment” factor reducing the incentive to migrate. Finally, based on the discussion in the previous section about the effect of terrorism in opening up permanent migration corridors, we find that a higher number of deaths related with terrorism (in the 1980s and 1990s) in the district of origin was a significant “push” factor inducing more migration still in this decade.

¹⁴ The impact increases at a diminishing rate because the squared term for age was also statistically significant.

¹⁵ In the case of non migrant household heads, we assume that the average availability of public goods in the rest of districts in Peru would be part of the relevant information set considered when assessing a potential migration move (we did try first the highest ranked availability of public goods nation-wide but this model did not produce enough variability to be feasible computationally).

The second column of results in Table 19 shows estimated elasticities for the predicted impact on migration probability by changes in the statistically significant regressors. The labour prospect in the destination district has the most important quantitative effect because a 1% increase in its occupation rate is associated with a 20% increase in the probability to migrate (for instance, increasing from the average probability of 5.3% to 6.4%). The occupation rate in the district of origin does not have any comparable quantitative effect for deterring migration. Next, the availability of public goods in the destination district has the second highest quantitative result, because an increase in 1% in this variable induces a rise of 5.4% in the chance of migration (i.e.: augmenting the average probability to 5.6%). The same variable in the origin district cause a rather small quantitative effect in the migration decision. Likewise, all other variables have little numerical effects on the migration decisions.

Table 19 – Migration Determinants for Household Heads (2002-2007)

Regressor	Coef.	Elasticity	z	P>z
Gender (HH Head is a man)	0.161	0.008*	25.96	0.000
Age (HH Head)	-0.042	-1.843	-44.25	0.000
Age ² (HH Head)	0.0001	0.179	7.54	0.000
Education year (HH Head)	0.006	0.050	8.97	0.000
Household Size	-0.104	-0.396	-72.38	0.000
Acces to public services: Destination	5.228	5.444	550.69	0.000
Acces to public services: Origin	-0.151	-0.279	-24.25	0.000
Occupation Rate: Destination	44.007	20.444	446.17	0.000
Occupation Rate: Origin	-0.372	-0.181	-10.59	0.000
Years of Education: Origin	-0.023	-0.153	-6.66	0.000
Deaths in Terrorism: Origin	0.112	0.013	20.00	0.000
Constant	-27.579	N.A.	-487.18	0.000
Number of obs	6,723,461			
Average Probability	0.053			
LR chi2(11)	3,602,466			
Prob > chi2	0.000			
Pseudo R2	0.733			
Correct Predictions	98.2%			

Source: Census 2007

(*) Marginal effect in this case.

9. Migration and Regional GDP Convergence

Following the standard neoclassical growth model proposed originally by Solow (1956) and the renewed interest in growth models in the last twenty years, there has been a wealth of international empirical literature testing the hypothesis of conditional convergence implied by the Solow model, using cross country data (Barro and Sala-i-Martin, 1995). This would be a process by which poorer countries, in terms of per capita GDP, tend to grow faster (compared to richer countries) in direction towards their country-specific steady-state levels of per capita GDP. Intuitively, this phenomenon is produced by the relative scarcity (abundance) of capital in poorer (richer) countries and the working of the “law of diminishing returns” in neoclassical economics. This same idea has been also tested within countries using cross regional data. For instance, Chirinos (2008) have used Peruvian per capita GDP regional data and other control variables from 1994 to 2007, and found that the conditional convergence among regions is significant in the period 2002-2007, implying a speed of convergence in between 13 to 21% depending of the set of controls included in the specifications.

However, no attention has been paid to the possibility that internal migration of labour might be one of the main channels by which regional convergence takes place within a specific country like Peru. Evidence on this matter is presented in Table 20 which shows an empirical model where the dependent variable in all regressions is the difference in logarithms of regional per capita GDPs in between two years from 2002 and 2007. The first column is a benchmark model, quite similar to one of Chirinos (2008) final specifications. It shows a negative and significant coefficient for the initial level of per capita GDP, i.e.: the existence of regional conditional convergence. The convergence speed is 21.5% which means (from Barro and Sala-i-Martin formula) it takes 3.2 years for each departamento to reduce by half its distance to its own steady state level of per capita GDP. We have included as control variables for the steady state levels in that first column: the telecommunications access by region, as an indicator of physical infrastructure, and the poverty incidence by region, as a summary indicator for human capital stock.

The second to fifth columns add different measurement options for internal migration and interact them with the convergence variable, to assess if migration speeds up the convergence pace or not¹⁶. One first option is to include the net migration variable. However, it has to be done in absolute value (disregarding the sign) because higher net migration levels (both on the positive side or the negative side) should help speed the convergence process in per capita GDP. By the “law of diminishing returns”, relatively capital-abundant richer regions with a net flow of incoming migrants would tend to experience reductions in their levels of average per capita GDP. On the contrary, relatively capital-scarce poorer regions with a net flow of outgoing migrants would tend to experience increases in their average levels of per capita GDP¹⁷. The second column in Table 20 shows that the convergence coefficient keeps the negative sign but loses size and statistical significance. The interaction term of convergence and net migration has the expected negative sign (higher migrations levels speed the convergence process) but fails to pass statistical significance tests at conventional levels.

Alternatively, the third column tries the interaction of the migration inflows with the convergence variable and, this time, the coefficient is negative as expected (larger inflows of migrants to relatively richer regions would accelerate the convergence of their per capita GDP levels), is large and statistically significant at 90% of confidence. The fourth column estimates the interaction of the migration outflows with the convergence variable and, once again, the coefficient is negative (larger outflows of migrants from relatively poorer regions would speed the convergence of their per capita GDP levels), is rather large and statistically significant at 99% of confidence. Finally, the fourth column explores simultaneously the interactions of the migration outflows and inflows with the convergence variable and it is only the latter one which remains statistically significant at 99% of confidence. Therefore, we have partial evidence supporting the idea that internal

¹⁶ To reduce potential endogeneity problems, we have used as instruments for the migration variables in 2002 to 2007 their corresponding values for 1988 to 1993. We have also divided these five-year flows of migration by five to have estimates of annual migration.

¹⁷ Still, the economy as a whole would be benefitted with a net increase in total GDP and per capita GDP because these efficiency enhancing labor mobility. Another mechanism, emphasized in the recent migration literature, which contributes to regional convergence process are the remittances from urban migrants to their original rural areas, unleashing increases in rural productivity (Lall, et.al., 2006)

migration in Peru would help the process of regional conditional convergence in per capita GDP levels¹⁸ in this country.

Table 20 – Internal Migration and Convergence in Per Capita GDP¹⁹
2002-2007

Regressor	Benchmark	Absolute Net Migration	Inflows	Outflows	Outflows and Inflows
	(1)	(2)	(3)	(4)	(5)
Constant	2.4903 (3.18)***	0.2153 (2.13)**	1.2369 (2.03)**	2.5891 (3.6)***	2.5832 (3.57)***
GDP _{t-1} (natural log)	-0.2393 (-2.98)***	-0.0110 (-1.26)	0.0433 (0.49)	0.1725 (1.14)	0.1806 (1.12)
Interaction Net Migration (absolute value)		-0.0159 (-1.40)			
Interaction Migration Inflow			-1.6253 (-1.74)*		-0.1233 (-0.15)
Interaction Migration Outflow				-4.0580 (-2.77)***	-4.0190 (-2.69)***
Access to Phone at home (natural log)	0.0954 (2.99)***			0.1210 (3.80)***	0.1205 (3.74)***
Poverty Rate (natural log)	-0.0385 (-1.43)	-0.0193 (-1.96)*	-0.0706 (-2.33)**		
Convergence Speed (β)	21.5%	N.A.	N.A.	N.A.	N.A.
Adjustment time (years)	3.23	N.A.	N.A.	N.A.	N.A.
Specification	Pool	Fixed Effects	Fixed Effects	Fixed Effects	Fixed Effects
Observations	144	144	144	144	144

Note: *** 1% significant, ** 5% significant and * 10% significant

T statistic in parenthesis

¹⁸ However, conditional convergence does not mean equalization on per capita GDP levels among departamentos, due to sizable inequalities in the distribution of public infrastructure (such as access to telecommunications) and human capital endowments (proxied here by poverty rates).

¹⁹ Specification of the model was selected according to the Hausman and F tests.

10. Migration and Regional Earnings Convergence

There are significant differences in real earnings across regions in Peru. To understand the process of earnings determination in Peru, we used the ENAHO household data to run standard Mincer earnings equations²⁰, and included a set of 24 dummies for each of the departments in Peru. We present the results of this model for 2002 in Table 21.

Table 21 – Mincer Earnings Regression 2002

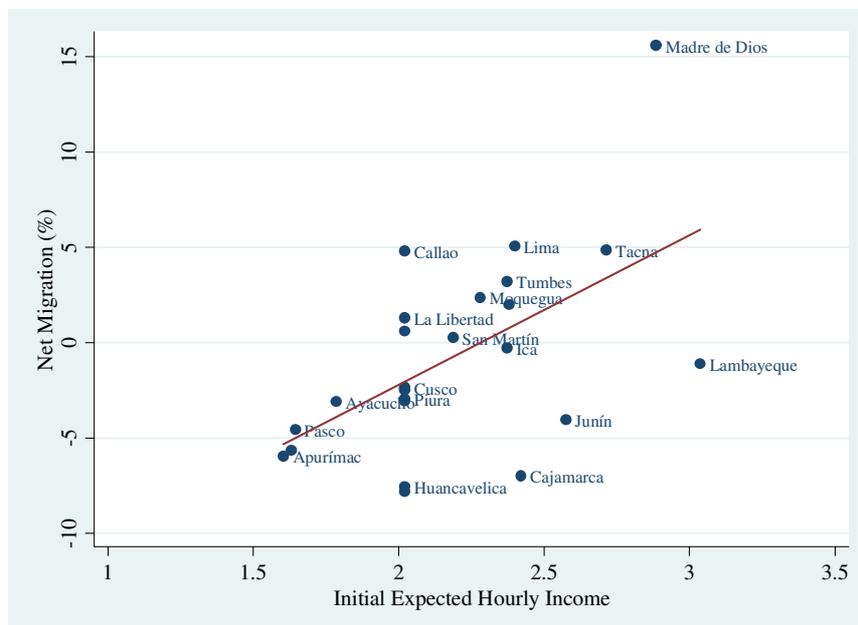
Regressor	Coefficient	Est. Err	T	P>t
Years of Education	0.074	0.003	23.06	0.000
Experience	0.029	0.002	18.62	0.000
Experience ²	0.000	0.000	-13.65	0.000
Married	0.126	0.018	6.84	0.000
Woman	-0.228	0.019	-12.26	0.000
Dependent worker	0.279	0.022	12.97	0.000
Rural	0.035	0.029	1.21	0.227
Agriculture	-0.381	0.032	-11.8	0.000
Mining	0.400	0.068	5.88	0.000
Manufacture	-0.240	0.034	-7.05	0.000
Utilities	0.314	0.129	2.43	0.015
Commerce	-0.215	0.028	-7.67	0.000
Hotels and Restaurants	0.113	0.036	3.12	0.002
Transportation	-0.122	0.038	-3.25	0.001
Finance	0.530	0.127	4.17	0.000
Lambayeque	0.408	0.044	9.35	0.000
Madre de Dios	0.356	0.058	6.17	0.000
Tacna	0.295	0.031	9.57	0.000
Junín	0.242	0.042	5.72	0.000
Cajamarca	0.180	0.052	3.49	0.000
Lima	0.172	0.034	5.1	0.000
Arequipa	0.164	0.035	4.73	0.000
Ica	0.161	0.043	3.73	0.000
Tumbes	0.161	0.044	3.68	0.000
Moquegua	0.121	0.038	3.22	0.001
San Martín	0.079	0.041	1.94	0.052
Ayacucho	-0.124	0.049	-2.52	0.012
Pasco	-0.206	0.049	-4.22	0.000
Huánuco	-0.215	0.049	-4.35	0.000
Apurímac	-0.231	0.059	-3.88	0.000
Constant	-0.326	0.063	-5.22	0.000

²⁰ This is the most utilized empirical model in labor economics and was developed from the view that formal education and on the job training are human capital investments which provide monetary returns in terms of increased labor earnings. The specification has the logarithm of purchasing-power-adjusted hourly earnings as the dependent variable and a set of human capital regressors such as the years of formal education and the years of potential labour experience, and other control variables such as gender, employment type, and economic sector.

Observations	27575
R ²	0.283

This table shows that even after controlling for differences in living costs, human capital endowments and other standard regressors, in 2002 there were departamentos offering wage premiums from 40% (Lambayeque) to 8% (San Martín). On the contrary, there were departamentos which had wage penalties from -12% (Ayacucho) to -23% (Apurímac). We have used these regressions to estimate expected earnings for the average worker in each departamento. Net migratory flows should have been guided by these differential rewards to certain extent (provided that migration costs were not too high and the expectation that these premiums were going to last a significant number of years). Graph 4 shows the graphic correlation between the migratory flows and these expected earnings and a rather high fit with the numbers (correlation coefficient of 56%).

**Graph 4 – Expected Hourly Income (in 2002)
and Net Migration Flows (2002-2007)**



Source: ENAHO 2002 and 2007 Census

On the other hand, migratory flows (in the form of inflows, outflows, or net migratory flows) should help diminish the earnings gaps among departamentos. A suitable empirical methodology to assess this idea would be to adapt the conditional convergence models used in the previous section for regional real earnings data. Table 22 shows our main results considering as dependent variables in all cases the difference in the logarithm of hourly earnings from one year to another.

The first column is a benchmark model which sheds light on a very rapid process of conditional convergence in the average earnings across all regions in Peru: the coefficient on the previous hourly income is negative, large and statistically significant at 99% of confidence. It implies 1.2 years for the regional earnings to reduce by half their distance to their specific steady state values. Access to telecommunications is one of those variables that define differences in the steady state values of real earnings.

The inclusion of the absolute value of net migration interacted with the convergence variable did produce a negative coefficient, as expected, but only statistically significant at 15% confidence level. Results obtained with the interaction of other migration variables kept the negative sign but were less significant. Therefore, the model was not able to provide sufficient evidence of a faster earnings convergence process due to internal migration flows.

Table 22 – Convergence Regression Hourly Earnings Growth²¹

Regressor	Benchmark	Absolute Net Migration	Outflows	Inflows	Outflows and Inflows
	(1)	(2)	(3)	(4)	(5)
Constant	3.42 (6.53)***	3.32 (6.35)***	3.37 (6.30)***	3.43 (6.49)***	3.38 (6.28)***
Hourly Earnings _{t-1} (natural log)	-0.81 (-6.73)***	-0.49 (-2.09)**	-0.62 (-1.58) ⁺	-0.78 (-3.01)***	-0.55 (0.272)
Interaction Net Migration (absolute value)		-26.91 (-1.59) ⁺			
Interaction Migration Outflow			-8.72		-2.61

²¹ Specification of the model was selected according to the Hausman and F tests.

				(-0.50)	(-0.22)
Interaction Migration Inflow				-1.42	-9.48
				(-0.12)	(-0.53)
Access to Phone at home (natural log)	0.35 (2.70)***	0.33 (2.54)**	0.34 (2.56)**	0.35 (2.69)***	0.34 (2.56)**
Convergence Speed (β)	59.2%	N.A.	N.A.	N.A.	N.A.
Adjustment time (years)	1.17	N.A.	N.A.	N.A.	N.A.
Specification	Fixed Effects	Fixed Effects	Fixed Effects	Fixed Effects	Fixed Effects
Observations	125	125	125	125	125

Note: *** 1% significant, ** 5% significant, * 10% significant and +15% significant
T statistic in parenthesis

11. Concluding Remarks

This report has analyzed trends in regional economic growth, employment and internal migration during one of the best periods of economic boom in Peru's modern history. Economic growth has been generally broad based across regions, although there have been supply constraints²² explaining specific low performance for some departamentos. The most visible counterparts of the boom in the labour market were the reduction in the income underemployment rate (the share of low-income jobs), and the increase of the adequate employment share in the labour force.

Migration among departamentos from 2002 to 2007, captured in the last population census, has been consistent with regional labour prospects, such as initial stocks and recent increases in the volumes of adequate employment. The relative size of internal migration has declined compared to the period 1988-1993 due to the virtual elimination of terrorism-led migration, and has retaken a long run declining trend observed for the South America region. However, migration corridors opened up in the 80s and 90s have persisted during this decade. For the near future, we would expect a smaller number for internal migration flows in Peru because of the impact of a downward part of the business cycle already under way, which would concur in the same direction with the longer run declining trend.

²² For instance, the depletion of mineral deposits in some important mines.

Empirical models show that the migration decision also takes into account potential gains in living standards, through the improved access to economic and social infrastructure. Likewise, the report finds evidence that internal migration flows support the process of conditional convergence across regional per capita GDPs. However, these same flows do not seem to influence significantly the speed of earnings convergence across regions.

Overall, the set of results obtained in this report supports the view that recent migration flows within Peru have contributed to the efficient allocation of its resources, and to the welfare enhancement of its inhabitants. Further improvement of migration flows would be obtained with the production and diffusion of more and better information on regional and local availability of good jobs, and improved living standards, throughout the 24 departamentos of Peru.

This initiative would fit very well in the decentralization efforts already underway in Peru during this decade. The national government is transferring a large number of prerogatives to brand new regional governments at the departamento level, including the promotion of private sector activities and employment generation, and the direct investment in economic and social infrastructure within their boundaries.

There has not been a good record in the past in offering nationwide and regional services of labour exchange and labour information in Peru. The Ministry of Labour in Peru has a small labour exchange program in Lima and main cities which intermediates around 2% of jobs vacancies in the economy (Yamada, 2008a). The new regional governments and the local authorities do not have much experience in this service either. Private intermediaries and NGOs have a better record in this area.

The Peruvian state, at its different levels, does not need to replace the private sector in this field, but instead it could form alliances, among its several layers and with these organizations, to interconnect all the programs and web services into a truly national labour exchange program, friendly and easily available in all regions, provinces and

districts in Peru. This type of program usually needs a rather small public budget, yet it has proven to be quite cost-effective in other countries (IDB, 2009), and could improve further job matches and the quality of migration flows within Peru.

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13. APPENDIX

a. Trends in GDP by departamentos

The relative size of the regional economies in Peru is quite diverse. According to Table A.1., the total production of goods and services in the Lima region represents 52% of the national GDP. In the other extreme of the distribution, Madre de Dios' GDP represents only 0.4% of national GDP. In terms of per capita GDP, differences are also rather large. Moquegua has the highest per capita GDP with 14,817.9 soles of 1994, whereas Apurimac has the lowest per capita GDP with 1,999.7 soles of 1994.

Table A.1 – National GDP Share and Per Capita GDP (constant soles of 1994) by Departamentos

Regions \ Years	National GDP Share						Per Capita GDP					
	2002	2003	2004	2005	2006	2007	2002	2003	2004	2005	2006	2007
Amazonas	0.6%	0.7%	0.7%	0.7%	0.7%	0.7%	2,267.3	2,371.3	2,474.6	2,630.6	2,786.7	3,053.3
Ancash	4.3%	4.3%	4.2%	4.0%	3.8%	3.8%	5,352.0	5,429.4	5,547.6	5,687.0	5,769.5	6,104.8
Apurímac	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	1,501.4	1,572.1	1,656.2	1,774.1	1,907.9	1,999.7
Arequipa	5.6%	5.6%	5.6%	5.6%	5.6%	5.9%	6,626.6	6,756.1	7,019.5	7,389.6	7,830.2	8,879.4
Ayacucho	1.0%	1.0%	0.9%	0.9%	0.9%	1.0%	2,118.6	2,199.1	2,151.8	2,314.4	2,486.3	2,721.1
Cajamarca	3.4%	3.5%	3.4%	3.4%	3.1%	2.7%	3,184.6	3,442.2	3,471.2	3,705.3	3,608.6	3,346.8
Cusco	2.2%	2.2%	2.5%	2.5%	2.6%	2.6%	2,443.4	2,573.3	3,008.8	3,248.2	3,591.0	3,878.9
Huancavelica	1.0%	1.0%	1.0%	1.0%	1.0%	0.9%	2,981.7	3,033.6	3,044.5	3,228.3	3,382.2	3,296.6
Huánuco	1.1%	1.2%	1.2%	1.1%	1.1%	1.0%	1,964.4	2,126.7	2,165.8	2,194.8	2,218.1	2,279.9
Ica	2.5%	2.5%	2.6%	2.7%	2.8%	2.7%	4,811.3	4,900.3	5,252.6	5,861.3	6,234.9	6,625.0
Junín	3.5%	3.4%	3.5%	3.3%	3.4%	3.3%	3,822.2	3,858.3	4,052.9	4,016.3	4,392.8	4,651.7
La Libertad	4.5%	4.6%	4.4%	4.5%	4.8%	4.8%	3,839.0	4,027.3	3,936.7	4,260.0	4,834.8	5,123.7
Lambayeque	2.9%	2.9%	2.7%	2.7%	2.7%	2.7%	3,569.9	3,667.6	3,460.5	3,693.8	3,834.4	4,213.5
Lima	50.6%	50.5%	50.7%	50.8%	51.2%	52.0%	6,992.5	7,108.9	7,331.3	7,691.3	8,191.6	8,871.1
Loreto	2.2%	2.2%	2.2%	2.1%	2.1%	2.0%	3,445.0	3,461.0	3,522.4	3,613.3	3,717.6	3,839.7
Madre de Dios	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	5,351.4	5,169.2	5,499.0	5,853.3	5,859.1	6,307.5
Moquegua	1.6%	1.7%	1.7%	1.7%	1.6%	1.4%	13,763.7	14,536.8	15,395.7	15,839.4	15,521.4	14,817.9
Pasco	1.3%	1.3%	1.2%	1.2%	1.2%	1.2%	6,373.5	6,260.7	6,405.1	6,385.6	6,808.9	7,642.9
Piura	4.0%	3.9%	4.1%	4.0%	4.1%	4.1%	3,197.9	3,265.2	3,488.9	3,642.5	3,950.2	4,183.3
Puno	2.4%	2.4%	2.3%	2.3%	2.2%	2.2%	2,560.3	2,560.3	2,603.3	2,712.1	2,812.2	2,998.2
San Martín	1.2%	1.2%	1.3%	1.3%	1.3%	1.2%	2,347.8	2,383.1	2,534.8	2,711.9	2,790.3	2,910.0
Tacna	1.5%	1.5%	1.5%	1.5%	1.5%	1.4%	7,175.4	7,491.9	7,784.5	7,934.0	8,186.0	8,485.5
Tumbes	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	3,224.3	3,312.5	3,487.3	3,917.3	3,868.7	4,157.3
Ucayali	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	3,636.7	3,688.1	3,912.8	4,095.9	4,259.1	4,351.3

Source: National Accounts 2003-2007 (INEI) and Chirinos (2008).

In turn, economic expansion has been uneven across departamentos in Peru, according to the first column of Table A.3. The best performing departamentos were Cuzco (which is located in Southern Peru and has both Sierra and Selva territories) (see Map in Graph A.1) with 11.2% of average annual growth, Ica (in Central Costa) with 10%, and La Libertad (which is situated in Northern Peru with Costa and Sierra provinces) with 9.6%. On the other hand, the worst performing departamentos had low growth rates: Cajamarca (in the Northern Sierra) with 0.9% of average annual expansion, Moquegua (in the Southern Costa and Sierra) with 2.1%, and Huánuco (in Central Sierra and Selva) with 2.7%.

In spite of previous legal efforts and financial incentives to obtain more resources, departamentos in Peru have not been capable to form macro regions. That is the reason why regional statistics are formally presented divided by 24 departamentos (see Graph A.1). Nevertheless, to give a general overview of regional trends, and based on geographical location, we have constructed macro-regions for the North, Center and South of Peru, as follows.

Table A.2 – Macro Regions in Peru by Geographic and Natural Location

North	Center	South	Costa	Sierra	Selva
Tumbes	Ancash	Apurimac	Tumbes	Cajamarca	Amazonas
Piura	Lima	Arequipa	Piura	Ancash	Loreto
Lambayeque	Callao	Moquegua	Lambayeque	Huanuco	San Martin
La Libertad	Ica	Tacna	La Libertad	Pasco	Ucayali
Amazonas	Huanuco	Cusco	Lima	Junin	Madre de Dios
Cajamarca	Pasco	Madre de Dios	Callao	Huancavelica	
Loreto	Junin	Puno	Ica	Ayacucho	
	Huancavelica		Moquegua	Apurimac	
	Ayacucho		Tacna	Cusco	
	Ucayali			Arequipa	
				Puno	

Source: INEI

Table A.3 – Growth in Regional GDP - Total and by Economic Sectors – 2003-2007 (average annual rate)

Regions \ Activities	Agriculture and Fishing	Mining and Electricity	Manufacturing	Construction	Commerce, Restaurants and Hotels	Government Services	Other Services	TOTAL
Amazonas	6.4%	8.3%	9.5%	14.3%	5.7%	8.3%	6.6%	7.2%
Ancash	-2.5%	-0.4%	9.4%	11.0%	5.7%	4.6%	5.9%	3.5%
Apurímac	2.7%	20.4%	8.1%	6.3%	5.6%	10.6%	4.5%	7.0%
Arequipa	5.4%	16.7%	10.3%	17.6%	5.5%	5.9%	5.7%	8.4%
Ayacucho	6.6%	13.8%	5.7%	15.8%	5.4%	9.4%	6.2%	7.9%
Cajamarca	5.5%	-9.4%	7.9%	4.6%	5.4%	8.1%	6.3%	0.9%
Cusco	9.3%	30.4%	6.1%	25.0%	5.9%	9.0%	6.7%	11.2%
Huancavelica	-5.4%	5.4%	5.1%	4.1%	5.3%	10.2%	5.5%	4.4%
Huánuco	-4.4%	-0.2%	6.6%	16.5%	5.2%	7.2%	6.1%	2.7%
Ica	10.4%	11.3%	15.4%	18.4%	5.9%	5.8%	6.8%	10.0%
Junín	3.3%	2.6%	7.0%	15.5%	5.7%	6.9%	6.5%	5.9%
La Libertad	6.0%	36.2%	6.7%	12.6%	5.8%	9.3%	6.6%	9.6%
Lambayeque	0.2%	6.2%	4.1%	14.3%	5.9%	7.9%	5.7%	5.6%
Lima	5.4%	8.1%	8.6%	7.4%	9.5%	5.4%	7.4%	7.9%
Loreto	1.7%	-1.7%	5.4%	10.6%	5.7%	8.7%	5.6%	4.6%
Madre de Dios	5.2%	8.4%	6.5%	23.5%	6.0%	9.5%	8.7%	8.2%
Moquegua	0.1%	-1.0%	-2.7%	21.4%	5.8%	9.1%	7.9%	2.1%
Pasco	4.3%	5.9%	7.5%	10.6%	5.4%	7.2%	6.2%	6.1%
Piura	11.8%	7.1%	6.8%	14.9%	6.1%	7.4%	6.4%	7.8%
Puno	2.6%	2.5%	4.8%	12.8%	5.3%	7.1%	6.2%	5.2%
San Martín	8.5%	4.9%	9.0%	3.4%	5.9%	7.6%	6.1%	7.2%
Tacna	5.1%	-1.4%	6.3%	15.4%	5.8%	6.3%	6.5%	5.0%
Tumbes	8.7%	8.8%	5.8%	10.0%	6.3%	8.0%	7.6%	7.6%
Ucayali	7.1%	3.9%	6.9%	13.0%	5.9%	7.9%	6.0%	6.6%
TOTAL	5.0%	5.0%	8.0%	11.3%	8.0%	6.6%	7.0%	7.2%

Source: National Accounts 2003-2007 (INEI)

Table A.4 – Economic Sectors Weights in Regional GDP

Regions \ Activities	Agriculture and Fishing	Mining and Electricity	Manufacturing	Construction	Commerce, Restaurants and Hotels	Government Services	Other Services
Amazonas	40.5%	0.9%	10.6%	2.3%	12.1%	12.2%	21.5%
Ancash	9.1%	38.6%	12.8%	4.4%	7.9%	5.6%	21.6%
Apurímac	24.8%	5.4%	9.6%	7.9%	17.0%	20.7%	14.7%
Arequipa	15.8%	7.5%	19.6%	7.6%	18.7%	4.4%	26.3%
Ayacucho	22.8%	4.9%	11.9%	8.1%	18.1%	16.6%	17.7%
Cajamarca	17.7%	38.0%	10.4%	4.5%	10.4%	6.8%	12.2%
Cusco	13.2%	8.8%	14.9%	8.5%	22.3%	8.7%	23.5%
Huancavelica	14.4%	52.0%	3.2%	1.3%	7.3%	9.4%	12.3%
Huánuco	33.2%	5.2%	9.5%	1.5%	18.1%	11.1%	21.3%
Ica	18.5%	7.2%	19.9%	4.9%	17.9%	6.5%	25.1%
Junín	15.8%	16.1%	15.5%	5.3%	14.7%	6.7%	25.9%
La Libertad	22.4%	7.2%	20.5%	6.1%	13.2%	5.0%	25.6%
Lambayeque	11.8%	2.2%	12.4%	5.2%	29.6%	6.3%	32.6%
Lima	3.9%	2.8%	18.2%	5.2%	23.3%	6.5%	40.1%
Loreto	18.2%	12.3%	12.2%	4.2%	21.4%	10.1%	21.7%
Madre de Dios	9.7%	39.7%	5.0%	2.5%	15.0%	8.0%	20.0%
Moquegua	7.4%	34.6%	32.2%	6.7%	5.4%	3.3%	10.5%
Pasco	10.4%	58.1%	2.7%	5.5%	7.9%	5.2%	10.2%
Piura	13.5%	7.1%	21.5%	6.0%	20.8%	6.3%	24.8%
Puno	19.4%	10.6%	12.4%	4.4%	15.4%	10.6%	27.2%
San Martín	27.6%	1.0%	13.4%	5.8%	18.6%	11.9%	21.7%
Tacna	8.1%	24.1%	7.8%	5.9%	17.2%	6.4%	30.5%
Tumbes	17.0%	1.6%	5.7%	5.3%	20.3%	13.0%	37.2%
Ucayali	18.8%	8.3%	15.5%	4.1%	23.5%	9.0%	20.8%
TOTAL	10.1%	9.5%	16.8%	5.3%	19.8%	6.9%	31.6%

Source: National Accounts 2003-2007 (INEI)

Table A.5 – Contribution to Regional GDP Growth by Economic Sector (Average Annual Growth Rate)

Regions \ Activities	Agriculture and Fishing	Mining and Electricity	Manufacturing	Construction	Commerce, Restaurants and Hotels	Government Services	Other Services	TOTAL
Amazonas	2.7%	0.1%	1.1%	0.4%	0.7%	1.1%	1.5%	7.2%
Ancash	-0.2%	-0.2%	1.3%	0.5%	0.5%	0.3%	1.3%	3.5%
Apurímac	0.7%	1.3%	0.8%	0.5%	1.0%	2.4%	0.7%	7.0%
Arequipa	0.9%	1.5%	2.2%	1.6%	1.1%	0.3%	1.6%	8.4%
Ayacucho	1.6%	0.8%	0.7%	1.5%	1.0%	1.7%	1.2%	7.9%
Cajamarca	1.0%	-3.3%	0.9%	0.2%	0.6%	0.6%	0.8%	0.9%
Cusco	1.3%	3.5%	1.0%	2.6%	1.4%	0.9%	1.6%	11.2%
Huancavelica	-0.7%	2.9%	0.2%	0.1%	0.4%	1.1%	0.7%	4.4%
Huánuco	-1.4%	0.0%	0.7%	0.3%	1.0%	0.9%	1.4%	2.7%
Ica	2.1%	0.9%	3.4%	1.1%	1.1%	0.4%	1.8%	10.0%
Junín	0.5%	0.4%	1.1%	0.9%	0.9%	0.5%	1.8%	5.9%
La Libertad	1.4%	3.6%	1.4%	0.9%	0.8%	0.5%	1.8%	9.6%
Lambayeque	0.0%	0.1%	0.5%	0.8%	1.8%	0.5%	1.9%	5.6%
Lima	0.2%	0.2%	1.7%	0.4%	2.4%	0.4%	3.1%	7.9%
Loreto	0.3%	-0.2%	0.7%	0.5%	1.3%	0.9%	1.3%	4.6%
Madre de Dios	0.5%	3.5%	0.3%	0.7%	1.0%	0.8%	1.9%	8.2%
Moquegua	0.0%	-0.3%	-0.9%	1.7%	0.3%	0.3%	0.9%	2.1%
Pasco	0.5%	3.5%	0.2%	0.6%	0.4%	0.4%	0.7%	6.1%
Piura	1.7%	0.5%	1.5%	1.0%	1.3%	0.5%	1.7%	7.8%
Puno	0.5%	0.3%	0.6%	0.6%	0.9%	0.8%	1.8%	5.2%
San Martín	2.5%	0.1%	1.3%	0.2%	1.2%	1.0%	1.4%	7.2%
Tacna	0.4%	-0.3%	0.5%	1.1%	1.0%	0.4%	2.1%	5.0%
Tumbes	1.6%	0.2%	0.4%	0.6%	1.3%	1.1%	2.9%	7.6%
Ucayali	1.4%	0.3%	1.1%	0.6%	1.5%	0.8%	1.3%	6.6%
TOTAL	0.5%	0.5%	1.4%	0.7%	1.7%	0.5%	2.3%	7.2%

Source: National Accounts 2003-2007 (INEI)

Graph A.1 – Map of Peru by departamentos and geographical regions



Each row in Table A.3 shows the growth rates by activity within each region, according to National Accounts. Mining and Construction were the most dynamic activities in Cuzco with spectacular average annual increase rates of 30.4% and 25% respectively. Table A.4 shows the share of each activity in regional GDP and Table A.5 combines this information with that of Table A.3 to estimate the absolute contribution of each activity in regional GDP growth. Hence, Mining and Construction contributed with 3.5 and 2.6 percentage points, respectively, out of Cuzco's total growth of 11.2% (i.e.: these two sectors together explained half of Cuzco's total growth for this booming period). The development of the Camisea natural gas project by Pluspetrol consortium, which involves its extraction, transformation, and transportation to the Coast through several pipelines, is the main mining activity in Cuzco nowadays, and explains the high performance in mining and construction in this region (construction has also been activated by public investments in highways, bridges and rural roads).

Construction and Manufacturing were the leading sectors in Ica with 18.4% and 15.4% of average annual growth respectively. However, in terms of contribution to Ica's total increase, Agriculture (with 2.1 percentage points) was the second most important activity (Manufacturing was still first with a contribution of 3.4 percentage points). Once again, two sectors explained half of a specific region (Ica) total growth (10%). The development of both sectors have been intertwined partly because of the boom of new agro-industrial products for exports, based in Ica, in the last ten years: mainly fresh asparagus, grapes, and avocados, which are exported after a first processing stage (cutting, cleaning, cooling, and packing). There is also growth coming out of industrial production of pisco and wine. Agriculture has also been growing out of more traditional products such as cotton, tomatoes, onions and citrus fruits.

Mining's growth in La Libertad outshined the performance of all other sectors with an average annual expansion rate of 36.2% and a contribution of 3.6 percentage points out of 9.6% growth in La Libertad. This is due mainly to new gold developments such as Minera Poderosa, Pan American Silver, Consorcio Minero Nuevo Horizonte, among others. Agriculture and Manufacturing tied in third place in terms of contribution to La

Libertad's GDP growth partly because of the development of agro-industrial products for exports such as asparagus, peppers and other fruits (the shoe industry also has an important cluster in the outskirts of Trujillo, the capital city).

On the other side of the regional growth ranking, Cajamarca experienced a 9.4% contraction in its Mining sector (due to depletion of an important gold deposit of Yanacocha) and this development by itself meant a negative contribution to the region's total growth of 3.3 percentage points. Moquegua had negative growth in Mining (-1%) and Manufacturing (-2.7%) and they contributed negatively with one and two and a half percentage points to Moquegua's weak growth rate. Cuajone's lower production of refined copper was behind these negative trends. Agriculture in Huánuco had a major contraction (-4.4%) which contributed negatively with 1.4 percentage points to this region's low growth rate. There were reductions in production of potato, banana, papaya, yuca, yellow corn, and barley.

b. Trends in employment indicators by departamentos

The rows in Table A.6 show each departamento's labour market situation. Considering the adequate employment share in the labour force as a yardstick, Tacna (the most Southern region in Costa bordering Chile) had the best labour outcomes in 2003-2004 with 43.7% of its labour force properly employed. Lima had the second best indicator with 43.0% of its labour force in adequate employment. Tumbes (the most Northern region in Costa bordering Ecuador) was next with 42.4% of proper employment. Ica (the region next to Lima along the Costa) followed with 39.6%.

In the other extreme of the distribution, Huancavelica was the worst regional labour market with only 10.6% of its labour force properly employed. Ayacucho was next to last with 14.7% properly employed. Both regions belong to the so-called "Andean Trapezoid", the most impoverished zone in Southern Sierra. Huánuco (with most of its provinces in Central Sierra and some in Selva) followed with 16.4% of proper employment.

Table A.6 – Labor Force Composition by Departamentos (2003-2004)

	Unemployed Labor Force	Employed Labor Force		Adequate Employment
	Open Unemployment	Underemployment		
		Visible (by hours)	Invisible (by income)	
Tacna	5.0%	2.0%	49.4%	43.7%
Lima	8.2%	0.9%	47.8%	43.0%
Tumbes	6.5%	3.2%	47.9%	42.4%
Ica	5.8%	1.2%	53.4%	39.5%
Madre de Dios	3.6%	0.6%	58.8%	37.1%
Lambayeque	4.4%	4.0%	54.8%	36.7%
Moquegua	5.8%	1.0%	58.9%	34.4%
Arequipa	9.0%	3.2%	55.5%	32.4%
La Libertad	4.1%	1.6%	62.7%	31.6%
Junín	3.7%	1.4%	66.7%	28.2%
Piura	5.0%	1.9%	66.8%	26.3%
Amazonas	1.3%	2.4%	70.4%	25.9%
Ucayali	3.3%	0.3%	71.4%	25.1%
Pasco	8.3%	2.6%	65.6%	23.5%
Ancash	3.8%	1.1%	72.4%	22.7%
Cajamarca	1.5%	1.0%	75.3%	22.2%
Cusco	3.3%	1.8%	73.4%	21.4%
Loreto	2.7%	0.4%	75.9%	21.1%
Puno	1.5%	2.8%	75.0%	20.8%
San Martín	2.2%	0.8%	77.1%	19.9%
Apurímac	1.7%	0.6%	80.9%	16.7%
Huánuco	3.4%	3.3%	76.9%	16.4%
Ayacucho	1.8%	0.5%	83.0%	14.7%
Huancavelica	1.8%	0.6%	86.9%	10.6%
TOTAL	5.1%	1.5%	62.2%	31.1%

Source: ENAHO 2003-2004 (INEI)

Table A.7 – Labor Force Composition by Departamentos (2006-2007) and Percentage Changes (compared to 2003-2004)

	Composition 2006-2007				Percentage Changes			
	Unemployed Labor Force	Employed Labor Force		Adequate	Unemployed Labor Force	Employed Labor Force		Adequate
	Open Unemployment	Underemployment		Employment	Open Unemployment	Underemployment		Employment
		Visible (by hours)	Invisible (by income)			Visible (by hours)	Invisible (by income)	
Madre de Dios	3.1%	1.0%	49.6%	46.3%	-0.5%	0.4%	-9.2%	9.3%
Ucayali	4.8%	0.6%	62.3%	32.3%	1.5%	0.3%	-9.1%	7.2%
Arequipa	6.2%	2.5%	51.8%	39.5%	-2.7%	-0.7%	-3.7%	7.1%
Piura	5.0%	5.4%	56.5%	33.0%	0.1%	3.5%	-10.3%	6.7%
Ancash	3.3%	3.7%	63.9%	29.0%	-0.4%	2.7%	-8.5%	6.2%
Loreto	3.1%	1.0%	68.6%	27.3%	0.4%	0.6%	-7.2%	6.2%
Moquegua	8.0%	1.5%	50.6%	39.9%	2.3%	0.5%	-8.3%	5.5%
Tacna	4.2%	0.9%	45.8%	49.0%	-0.8%	-1.0%	-3.6%	5.3%
San Martín	2.4%	1.1%	71.5%	25.1%	0.2%	0.3%	-5.6%	5.2%
Junín	2.9%	1.8%	62.0%	33.3%	-0.8%	0.4%	-4.7%	5.1%
Lima	6.5%	1.1%	44.8%	47.5%	-1.7%	0.2%	-3.0%	4.5%
Tumbes	3.6%	4.7%	45.0%	46.7%	-2.9%	1.4%	-2.9%	4.3%
Huancavelica	1.0%	0.9%	84.4%	13.6%	-0.8%	0.3%	-2.6%	3.0%
Huánuco	2.3%	7.5%	71.1%	19.1%	-1.1%	4.2%	-5.8%	2.8%
La Libertad	3.9%	2.0%	60.0%	34.2%	-0.2%	0.4%	-2.7%	2.5%
Cusco	2.9%	1.2%	72.2%	23.6%	-0.4%	-0.6%	-1.2%	2.2%
Amazonas	1.1%	1.5%	69.5%	27.9%	-0.2%	-0.9%	-0.9%	2.0%
Ayacucho	1.8%	1.0%	81.5%	15.7%	0.0%	0.5%	-1.5%	1.0%
Ica	4.6%	2.9%	53.0%	39.5%	-1.3%	1.7%	-0.3%	-0.1%
Puno	1.7%	3.0%	74.7%	20.6%	0.2%	0.2%	-0.3%	-0.1%
Lambayeque	5.7%	3.9%	54.5%	35.9%	1.3%	-0.2%	-0.3%	-0.8%
Pasco	6.7%	1.1%	69.6%	22.6%	-1.7%	-1.5%	4.0%	-0.9%
Cajamarca	1.3%	1.9%	76.2%	20.6%	-0.3%	0.9%	1.0%	-1.6%
Apurímac	1.0%	0.7%	85.0%	13.3%	-0.7%	0.0%	4.1%	-3.4%
TOTAL	4.4%	2.1%	58.9%	34.6%	-0.8%	0.6%	-3.3%	3.5%

Source: ENAHO 2003-2007 (INEI)

According to Table A.7, Madre de Dios (a departamento located in Selva) had the best performance in the labor market with an increase of 9.3 percentage points in the appropriate employment share, actually becoming the fourth best region according to this benchmark (46.3% of proper employment in 2006-07). Ucayali (also in Selva) had the second best performance with an increase of 7.2 percentage points in the proper employment share, although it remained below the national average in this yardstick (32.3%). Arequipa (a Southern region with Sierra and Costa provinces and with the second largest city in Peru) had also a very remarkable performance increasing its proper employment share in 7.1 percentage points (to 39.5% in 2006-07).

Apurimac (another Southern region belonging to the Andean Trapezoid) had the worst labour market performance with a reduction in adequate employment of 3.4 percentage points, actually becoming the poorest labour market in Peru with only 13.3% of proper employment in 2006-07. Cajamarca had a somewhat expected contraction in proper employment (in 1.6 percentage points) due to the contraction in its GDP already commented (driven by the depletion of a major mining deposit). Another significant drawback happened in Lambayeque (a Northern Costa region) which lost 0.8 percentage points of proper employment.

The last row of Table A.8 shows that nation-wide adequate employment grew 19.0% between 2003-04 and 2006-07. Two economic sectors had a much faster expansion rate of proper employment: Government Services with 34.5% of growth and Manufacturing with a 31.7% of increase. These sectors have a higher proportion of workers with proper employment to begin with (77.5% and 38.9%, respectively). On the contrary, Agriculture had about half (10.5%) the growth rate of proper employment compared to the national aggregate. This activity has always had the lowest proportion of workers with adequate employment (12.8%).

Table A.8 – Growth in Adequate Employment by Departamentos– Total and by Economic Sectors – 2003-2007

Regions \ Activities	Agriculture and Fishing	Mining and Electricity	Manufacturing	Construction	Commerce, Restaurants and Hotels	Government Services	Other Services	TOTAL
Amazonas	31.2%	-51.2%	66.4%	117.3%	4.8%	9.8%	4.4%	18.7%
Ancash	67.7%	-55.5%	54.8%	113.1%	26.8%	115.6%	8.5%	32.4%
Apurímac	-10.5%	54.3%	-15.1%	-38.8%	17.7%	-34.2%	-9.6%	-8.8%
Arequipa	57.4%	24.9%	48.5%	-1.1%	29.5%	7.3%	28.1%	30.4%
Ayacucho	11.6%	-27.9%	11.9%	2.2%	11.3%	-10.2%	31.1%	12.2%
Cajamarca	-21.6%	55.3%	0.3%	-23.4%	-12.2%	13.4%	47.5%	0.1%
Cusco	1.4%	270.5%	62.2%	-14.5%	-8.7%	52.6%	21.5%	15.8%
Huancavelica	38.0%	188.9%	14.0%	-9.7%	37.1%	94.8%	-4.0%	34.2%
Huánuco	-1.3%	53.7%	39.3%	150.5%	39.2%	14.0%	29.7%	23.7%
Ica	22.0%	-38.8%	-18.8%	-24.5%	18.6%	24.4%	16.1%	5.8%
Junín	5.5%	5.6%	29.9%	79.3%	21.1%	86.4%	24.2%	22.0%
La Libertad	4.8%	41.7%	8.9%	48.3%	37.5%	-9.0%	14.3%	17.2%
Lambayeque	-13.2%	51.2%	33.6%	22.5%	-9.4%	10.1%	10.2%	2.2%
Lima	-5.8%	55.0%	30.0%	4.6%	14.1%	36.7%	17.4%	18.4%
Loreto	183.9%	16.2%	33.6%	17.0%	79.7%	49.1%	8.3%	43.5%
Madre de Dios	114.9%	-28.6%	49.6%	535.9%	37.6%	-21.5%	46.8%	42.1%
Moquegua	11.0%	33.8%	47.6%	74.7%	42.2%	80.6%	12.5%	31.9%
Pasco	-33.7%	81.7%	15.1%	-13.6%	-11.6%	-0.8%	-10.7%	-3.4%
Piura	29.3%	52.0%	159.4%	57.0%	16.3%	77.4%	37.0%	37.6%
Puno	-1.6%	47.8%	24.1%	-10.1%	3.1%	50.1%	1.3%	6.7%
San Martín	12.7%	110.2%	130.2%	140.2%	50.0%	32.8%	25.1%	35.1%
Tacna	29.3%	-23.5%	64.1%	-5.8%	11.8%	62.7%	12.3%	18.4%
Tumbes	4.2%	69.6%	6.4%	135.2%	16.6%	47.2%	38.4%	23.2%
Ucayali	119.9%	137.2%	86.9%	170.6%	31.4%	-0.4%	19.4%	39.5%
TOTAL	10.5%	19.5%	31.7%	15.8%	15.8%	34.5%	18.1%	19.0%

Source: ENAHO 2003-2007 (INEI)

According to Table A.8, Madre de Dios witnessed a 42.1% increase in the number of workers properly employed due to huge increases in construction (535.9%) and agriculture (114.9%). Table A.9 shows the share of each activity in regional adequate employment and Table A.10 combines this information with that of Table A.8 to estimate the absolute contribution of each activity in regional adequate employment growth. Hence, Agriculture, Other Services, and Commerce, contributed with 14.4 and 13.6 and 11.8 percentage points in the 42.1% increase of proper employment in Madre de Dios. Ucayali had enormous increases in proper employment in Construction (170.6%) and Mining (137.2%), but the largest absolute contributions were due to Agriculture and Commerce with 10.5 and 9.1 percentage points, respectively, in the regional increase of proper employment.

Apurimac had the largest drop in adequately employed workers (-8.8%) because of contractions in this category in most sectors: Construction (-38.8%), Government Services (-34.2%), Manufacturing (-15.2%), Agriculture (-10.5%) and Other Services (-9.6%). The largest absolute contributions in negative terms were due to Other Services with -4.1 percentage points and Government Services with -3.8 percentage points. Pasco (a region located in Central Sierra) had the second largest fall in properly employed workers (-3.4%) because of shrinkages in properly employed workers in Agriculture (-33.7%), Construction (-13.6%), Commerce (-11.6%), and Other Services (-10.7%). The largest absolute negative contributions were due to Agriculture with -5.3 percentage points and Other Services with -4.2 percentage points.

Table A.9 – Regional Weights by Economic Sector (Adequate Employment)

Regions \ Activities	Agriculture and Fishing	Mining and Electricity	Manufacturing	Construction	Commerce, Restaurants and Hotels	Government Services	Other Services
Amazonas	39.9%	2.0%	5.3%	0.9%	20.8%	6.3%	24.8%
Ancash	15.0%	3.8%	9.1%	3.6%	25.1%	4.5%	38.9%
Apurímac	22.2%	0.8%	4.9%	2.7%	15.7%	11.1%	42.6%
Arequipa	11.9%	2.6%	9.1%	4.7%	23.1%	9.0%	39.7%
Ayacucho	26.8%	5.2%	4.2%	2.7%	17.6%	13.2%	30.2%
Cajamarca	39.2%	1.7%	10.8%	2.5%	19.6%	5.5%	20.6%
Cusco	23.8%	0.9%	6.6%	3.6%	25.3%	9.8%	30.0%
Huancavelica	32.9%	5.0%	2.3%	2.6%	13.9%	9.0%	34.4%
Huánuco	33.5%	1.0%	5.2%	2.2%	20.4%	5.8%	32.0%
Ica	17.9%	9.9%	15.5%	3.4%	19.1%	4.4%	29.9%
Junín	21.8%	10.6%	8.3%	1.9%	21.1%	4.8%	31.5%
La Libertad	18.1%	1.8%	14.1%	2.5%	23.4%	6.1%	34.0%
Lambayeque	18.9%	0.9%	9.0%	2.4%	32.4%	5.9%	30.5%
Lima	3.6%	0.8%	13.7%	5.1%	25.3%	6.7%	44.8%
Loreto	8.4%	1.5%	7.1%	2.6%	20.2%	9.5%	50.6%
Madre de Dios	12.5%	9.9%	4.5%	1.0%	31.3%	11.8%	29.0%
Moquegua	22.1%	5.3%	5.3%	4.1%	16.0%	13.9%	33.5%
Pasco	15.6%	10.2%	3.8%	4.9%	18.1%	8.4%	39.1%
Piura	25.9%	1.8%	5.5%	1.9%	31.1%	4.1%	29.7%
Puno	32.9%	4.2%	8.2%	3.0%	18.6%	5.2%	28.0%
San Martín	32.6%	0.3%	4.6%	2.3%	23.0%	7.2%	30.0%
Tacna	9.5%	8.5%	4.7%	3.4%	28.6%	11.7%	33.7%
Tumbes	32.2%	0.4%	5.4%	1.8%	23.1%	8.5%	28.5%
Ucayali	8.7%	0.8%	7.2%	2.6%	28.9%	9.2%	42.6%
TOTAL	14.2%	2.4%	10.7%	3.8%	24.3%	6.8%	37.8%

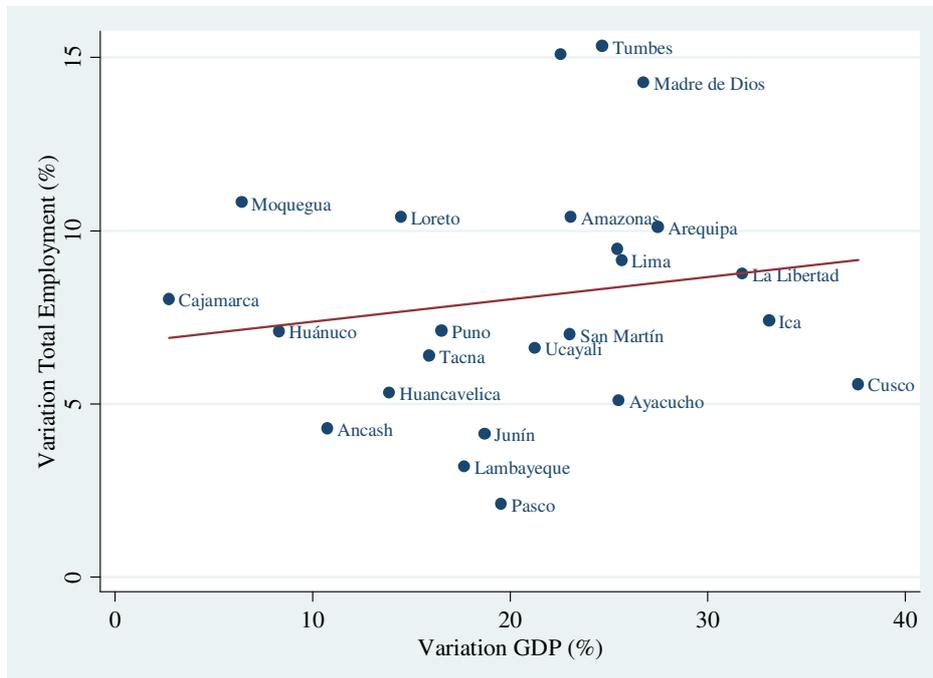
Source: National Accounts 2003-2007 (INEI)

Table A.10 – Weighted Regional Growth in Adequate Employment by Economic Sector (2003-2007)

Regions \ Activities	Agriculture and Fishing	Mining and Electricity	Manufacturing	Construction	Commerce, Restaurants and Hotels	Government Services	Other Services	TOTAL
Amazonas	12.5%	-1.0%	3.5%	1.0%	1.0%	0.6%	1.1%	18.7%
Ancash	10.2%	-2.1%	5.0%	4.1%	6.7%	5.2%	3.3%	32.4%
Apurímac	-2.3%	0.4%	-0.7%	-1.1%	2.8%	-3.8%	-4.1%	-8.8%
Arequipa	6.8%	0.6%	4.4%	-0.1%	6.8%	0.7%	11.2%	30.4%
Ayacucho	3.1%	-1.5%	0.5%	0.1%	2.0%	-1.3%	9.4%	12.2%
Cajamarca	-8.5%	1.0%	0.0%	-0.6%	-2.4%	0.7%	9.8%	0.1%
Cusco	0.3%	2.5%	4.1%	-0.5%	-2.2%	5.1%	6.5%	15.8%
Huancavelica	12.5%	9.4%	0.3%	-0.3%	5.2%	8.5%	-1.4%	34.2%
Huánuco	-0.4%	0.5%	2.1%	3.3%	8.0%	0.8%	9.5%	23.7%
Ica	3.9%	-3.9%	-2.9%	-0.8%	3.6%	1.1%	4.8%	5.8%
Junín	1.2%	0.6%	2.5%	1.5%	4.4%	4.2%	7.6%	22.0%
La Libertad	0.9%	0.7%	1.2%	1.2%	8.8%	-0.5%	4.9%	17.2%
Lambayeque	-2.5%	0.4%	3.0%	0.5%	-3.0%	0.6%	3.1%	2.2%
Lima	-0.2%	0.5%	4.1%	0.2%	3.6%	2.5%	7.8%	18.4%
Loreto	15.5%	0.2%	2.4%	0.4%	16.1%	4.7%	4.2%	43.5%
Madre de Dios	14.4%	-2.8%	2.2%	5.5%	11.8%	-2.5%	13.6%	42.1%
Moquegua	2.4%	1.8%	2.5%	3.1%	6.7%	11.2%	4.2%	31.9%
Pasco	-5.2%	8.3%	0.6%	-0.7%	-2.1%	-0.1%	-4.2%	-3.4%
Piura	7.6%	0.9%	8.8%	1.1%	5.1%	3.2%	11.0%	37.6%
Puno	-0.5%	2.0%	2.0%	-0.3%	0.6%	2.6%	0.4%	6.7%
San Martín	4.2%	0.3%	6.0%	3.3%	11.5%	2.4%	7.5%	35.1%
Tacna	2.8%	-2.0%	3.0%	-0.2%	3.4%	7.3%	4.2%	18.4%
Tumbes	1.4%	0.3%	0.3%	2.5%	3.8%	4.0%	11.0%	23.2%
Ucayali	10.5%	1.1%	6.3%	4.4%	9.1%	0.0%	8.3%	39.5%
TOTAL	1.5%	0.5%	3.4%	0.6%	3.8%	2.3%	6.8%	19.0%

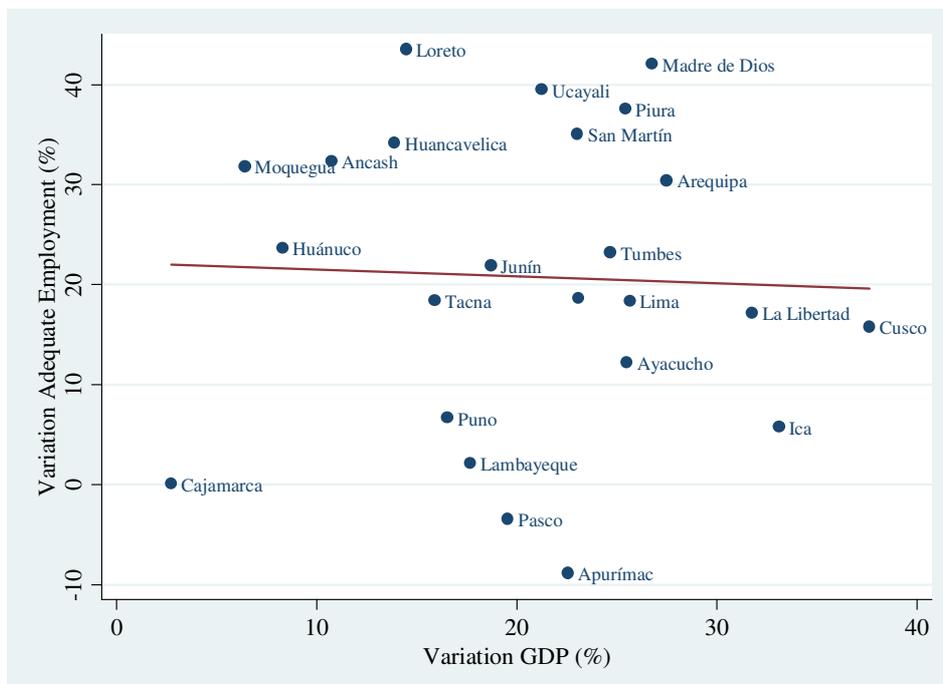
Source: National Accounts 2003-2007 (INEI)

Graph A.2 – Variation of Regional GDP and Total Employment 2003-2007 (%)



Source: National accounts 2003-2007 and ENAHO 2003-2007 (INEI)

Graph A.3 – Variation of Regional GDP and Adequate Employment 2003-2007 (%)



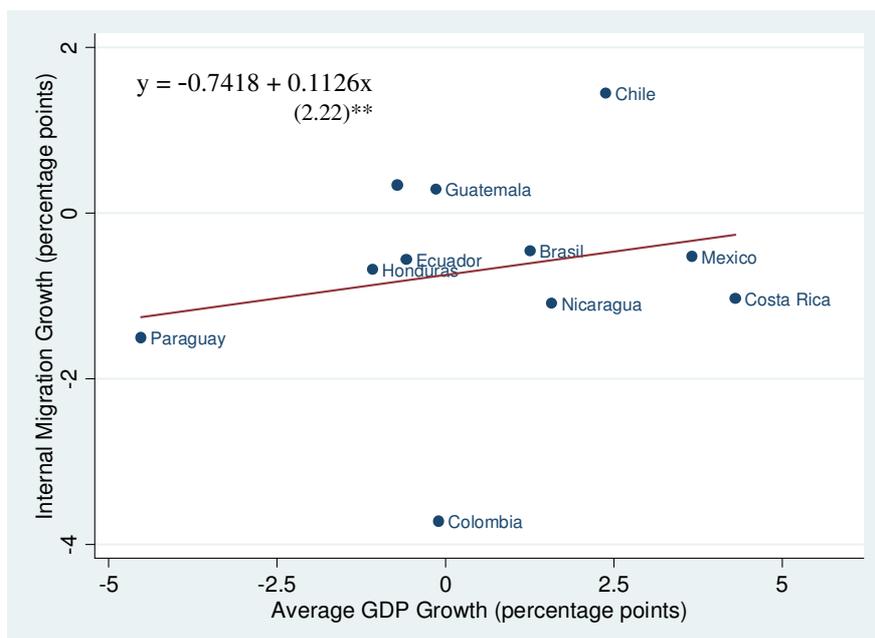
Source: National accounts 2003-2007 and ENAHO 2003-2007 (INEI)

Table A.11 – Internal Migration by Latin American Countries

Bolivia (2001)	6.0%	Bolivia (1992)	5.6%
Brasil (2000)	3.4%	Brasil (1991)	3.9%
Chile (2007)	7.3%	Chile (2002)	5.8%
Colombia (2005)	4.3%	Colombia (1993)	8.1%
Costa Rica (2000)	5.6%	Costa Rica (1984)	6.6%
Ecuador (2001)	5.2%	Ecuador (1990)	5.8%
Guatemala (2002)	2.9%	Guatemala (1994)	2.6%
Honduras (2001)	4.2%	Honduras (1988)	4.9%
Mexico (2000)	4.4%	Mexico (1990)	5.0%
Nicaragua (2005)	2.5%	Nicaragua (1995)	3.5%
Paraguay (2002)	7.6%	Paraguay (1992)	9.1%
Average	4.9%	Average	5.5%

Source: ECLAC

Regression without Peru (correlation coefficient: 0.21, statistically significant)



Regression with Peru (correlation coefficient: -0.0980, not statistically significant)

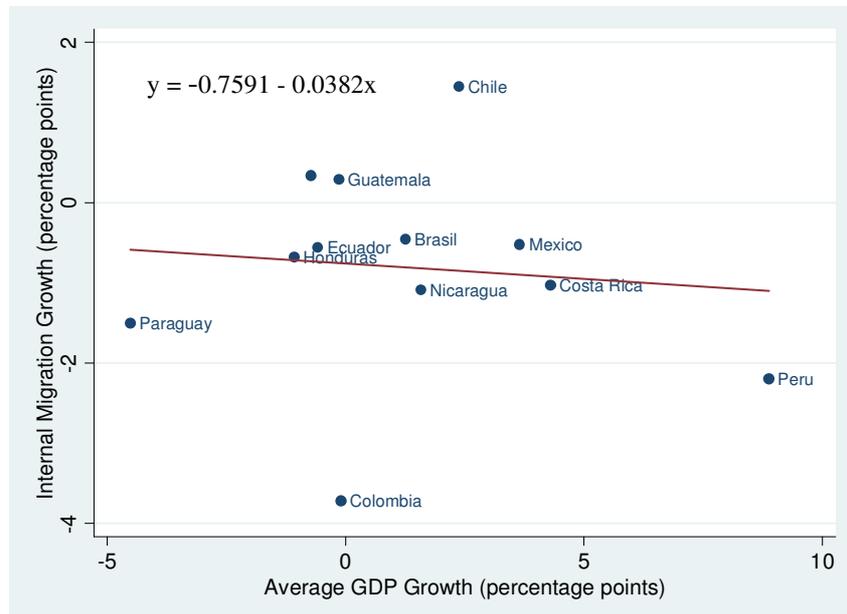


Table A.12 – Dead or Missing People Due to Terrorist Acts, by year

<i>Year</i>	Dead or Missing	<i>Year</i>	Dead or Missing
1980	23	1991	1,837
1981	49	1992	1,771
1982	576	1993	1,016
1983	2,256	1994	411
1984	4,086	1995	290
1985	1,397	1996	177
1986	920	1997	140
1987	1,135	1998	105
1988	1,470	1999	86
1989	2,400	2000	35
1990	2,327	<i>Total</i>	22,507

Source: Comisión de la Verdad y Reconciliación

Table A.13 – Dead or Missing People Due to Terrorist Acts, by departamento

Departamento	Dead or Missing	Departamento	Dead or Missing
Amazonas	21	Lambayeque	23
Ancash	220	Lima	466
Apurímac	1,022	Loreto	54
Arequipa	26	Madre de Dios	1
Ayacucho	10,661	Moquegua	0
Cajamarca	51	Pasco	251
Callao	49	Piura	83
Cuzco	361	Puno	423
Huancavelica	1,681	San Martín	853
Huánuco	2,350	Tacna	2
Ica	50	Tumbes	0
Junín	2,585	Ucayali	412
La Libertad	71	Total	21,716

Source: Comisión de la Verdad y Reconciliación

Table A.14 – Summary statistics for variables in Table 19

Variable	Mean	Std. Dev.	Min	Max
Migrant Dummy	0.12	0.32	0	1
Gender (HH Head is a man)	0.72	0.45	0	1
Age (HH Head)	46.37	16.18	12	98
Age ² (HH Head)	2412	1647	144	9604
Education year (HH Head)	8.76	5.11	0	17
Household Size	4.01	2.18	1	24
Acces to public services: Destination	1.10	0.53	0.003	3.458
Acces to public services: Origin	1.95	1.01	0.003	3.458
Ocupation Rate: Destination	0.49	0.03	0.074	0.935
Ocupation Rate: Origin	0.51	0.08	0.074	0.935
Years of Education: Origin	7.16	2.03	1.753	12.219
Deaths in Terrorism: Origin	0.12	0.40	0	2.527

Source: 2007 Census