Spatial Inequity after Reforms in Chile:

Where do we stand?

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1.   *Introduction*

In the past twenty years Chile's has pursued an aggressive strategy of market liberalization, trade opening and other structural transformations. Two decades after the reforms, there is a consensus that the subsequent period of high and sustained growth was the direct outcome of those policies (Gallego and Loayza, 2002; Morandé and Vergara, 1997). At the same time, there is a consensus that growth has not benefitted regions equally. In this paper we explore the reasons for this uneven regional pace and its impact on the spatial dimensions of poverty and income inequality.

As a result of high growth, unemployment declined, wages rose, and poverty diminished markedly (World Bank, 2002). Policies, targeted at low-income groups, were also instrumental in bringing down poverty from 38.0% of the population in 1987 to 17% in 1998. Extreme poverty declined from 13% to around 4% in the same period. Concomitant demographic changes in this period include a marked reduction in the rate of growth of the population (from 2.0% to 1.2% per year) and the size of the families, an increase in life expectancy (to 76 years), and widespread improvements in the standard of living (Anríquez et al., 1998).

Economic growth, nevertheless, has not been smooth in time and has had a differential effect across segments of the population. While poverty diminished, income inequality did not decline and indicators –such as Gini coefficients– remained stagnant in the 1990s (Beyer, 1997). Moreover, Chile ranks comparatively high in income inequality among Latin American countries when income measures exclude government transfers. According to the World Bank (2002), however, Gini coefficients improve from 0.56 to 0.50 when the latter are taken into account.

This, among other reasons, explains why income distribution is increasingly being raised as an issue, despite the marked decline in absolute poverty. In particular, social and political organizations at the regional level have been actively claiming for a more equitable spatial distribution of the benefits of sustained growth. Evidence shows that economic growth has not been balanced among regions and that spatial differences in per-capita income remain significant (Morandé et al., 1997). Likewise, symptoms of inequality are apparent in poverty strongholds in some regions of the country, among ethnic minorities, and in rural areas.

Studies on this respect are scarce in part due to lack of regional data but also because researchers tend to concentrate on cross-sections of households as their unit of analysis. For several questions, focusing on the distribution of family income is adequate because its determinants are under the control of –or directly related to– households' decisions. However, issues such as long run growth, migration flows, productivity changes, or best policy responses to regional demands require to use regions as the unit of analysis, despite its reduced number (only 13 in the country). Section 2 of the paper briefly describes the reforms and the evolution of regional economic growth, poverty, and income inequality.

Research on regional economic growth in Chile has focused mainly on convergence (absolute vs. conditional) and the speed toward the steady state, and less on what such convergence entails in terms of welfare, poverty reduction, and inequality.[1] This is a major limitation of current research that we intend to overcome. Section 3 of the paper presents an econometric analysis of convergence in regional income levels and its quantitative relationship with the decline in poverty levels and inequality. Moreover, none of the papers address the important question of what are the determinants of the speed of convergence and whether economic policies can affect it.

From a policy point of view, our understanding of convergence and the speed at which regions will eventually reach their steady state is important insofar it provides meaningful guidance for policy choices. In the Chilean case, the speed of convergence may be deemed too slow to provide an adequate answer to the pressing needs of those in poverty. In fact, convergence in *average* income levels is of secondary interest for policy purposes if one is interested in poverty; it is the dynamics of poverty and its eventual convergence to steady-state levels that should be the focus of the analysis. This issue –which is the core of our paper– has not been studied in a rigorous manner in Chile.

There are several reasons why governments should care about differences in growth rates and inequality between regions. First, regional inequalities may induce misallocation of government funds via lobbying and political pressure. Political representation in the Chilean Congress is ordered evenly by regions and not by population, which allows political pressure and lobbying to be successful. A region that "feels" is lagging behind the rest of the country

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[1] There are only five studies with original results for the Chilean case: Fuentes (1997), Morandé et al (1997), Aroca and Bosch (2000), Riffo (2001) and Oyarzún and Araya (2001).

could have enough voting power to press the government for subsidies. This, in turn, could have an adverse impact on the efficiency and fairness of policies and, more important, a regressive effect on income distribution. Section 4 of this paper discusses regional policies that tend to increase poverty levels and maintain inequality as a result of lobbying or political.

Second, even if regions should converge to the same long-run average income level (and theoretically they should if they share tastes, technologies, and institutional set-up), there remain important, unresolved policy issues. First, policy makers may find that a slow speed of convergence is inadequate given some social rate of discount and an overall objective of a more egalitarian distribution of wealth.[2] Second, even if average income levels converge, it is unclear that poverty levels and inequality should converge, as amply suggested by cross-country analyses. Morandé et al. (1997) and Aroca and Bosch (2000) present evidence that inequality will reduce in Chile as a result of economic growth but regional steady-state income levels will remain unequal.

A third reason relates to the mechanics of the convergence process itself. A well known result of economic growth is the migration of workers with low levels of human-capital from poor to rich regions. This should accelerate the convergence of per-capita income and reduce regional inequality. Yet migration is a costly process and may be affected by a number of factors, including policies. Section 4 of the paper explores the role of housing policies and specific sectoral policies as deterrents of migration in Chile and a likely source of persistence in poverty.

This paper first explores whether regions could converge in the long run, to a common level of per-capita income, what is the rate of convergence, and if there are initial conditions that could influence the steady-state income level. A second question we address relates to expected convergence in regional poverty levels, that is, whether there would be convergence towards similar degrees of inequality between and within regions. This information will give us an idea of how much out-of-line are current and/or proposed policies, both in terms of "wrong" regions being helped or "wrong" policy variables being applied.

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[2] Morandé et al., (1997) estimated regional convergence in the range of 4-5% per year, substantially faster than Fuentes (1997) which estimated it in the 2-3% range. Aroca and Bosch (2000), on the other hand, estimates annual convergence rates at around 8%.

The third part of the paper focuses on the fact that lack of convergence of regional income in the Chilean economy is largely associated with low levels of interregional migration. We document that migration has become increasingly less significant as an equalizing force for regional disparities. We provide evidence that this is not a market-driven result. This observation leads us to focus on the role that policies may play in slowing convergence between regions in income and poverty levels. We study two policies that have sufficient power to affect in a systematic way interregional migration, per capita income growth, and the speed of convergence. These policies are public housing and regional development programs.

2.   Growth, Poverty, and Spatial Inequity

The last decades have certainly been the most successful period of economic growth in Chile since the Big Depression of the 1930s. Between 1975 and 2000, the economy grew at an average rate of 5.2% and per-capita GDP increased by 150%, reaching US$ 4,500. This vigorous expansion in production has been accompanied by declining levels of unemployment, rising real wages, decreasing inflation, and a buoyant external situation. Table 1 presents a set of selected macroeconomic indicators for the 1975-2000 period.

The engine of this spectacular transformation of the Chilean economy has undoubtedly been the reform program initiated in the mid 1970s.[3] The main reasons for the radical transformation brought about by the reforms was the clear failure of the import-substitution, state-led strategy in providing the basis for sustained growth and, in particular, for improving welfare. The abandonment of the most conservative import-substitution regime in Latin America transformed Chile into a dynamic, export-oriented economy and a leading example of the widespread benefits of deregulation and competition.

Initial reforms included market liberalization, exchange rate unification and the elimination of most non-tariff barriers (quotas and prohibitions), which effectively reduced inflation, eliminated black markets, and reduced speculation. Fiscal balance was also achieved early in this stage. A second round of reforms included the privatization of public enterprises,

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[3] The Chilean economic transformation has been extensively documented. See for example Edwards and Cox-Edwards (1987) and Bosworth, Dornbusch, and Labán (1994).

deregulation of labor markets, social security reform, and partial transferring of health and public education responsibilities from the ministries to the county levels or the private sector.

Table 1
Chile: Selected Macroeconomic Indicators
Averages

	1975-2000	*1975-1986*	*1987-2000*
Annual GDP growth	*5.1%*	*3.3%*	*6.5%*
Real wage growth	*3.9%*	*4.1%*	*3.4%*
Unemployment rate	*9.8%*	*13.2%*	*7.2%*
Annual Inflation	*40.6%*	*77.1%*	*11.4%*
Annual Exports (US$ mill.)	*7,891*	*3,326*	*11,804*

Source: Central Bank of Chile.

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Although the benefits of reforms have been substantial, they have had a differential impact on the regions and, more importantly, on different segments of the population. First, growth has not been a smooth process. While on average GDP grew at 5.1% between 1975 and 2000, the growth rate of the second half of the period was much higher and less volatile than in the first half. Declining instability also led to lower unemployment rates and inflation. Second, different sectors have contributed in different proportion to growth (see Table 2). While fishing and services have expanded significantly (10.8% and 6.8% per year on average), industry and the agricultural sector have been less dynamic (both sectors grew at around 5% per year).

Table 2
Annual Average Growth Rate of Real GDP by Sector (%)

	1975-2000	*1975-1986*	*1987-2000*
Agriculture	4.0	2.8	4.6
Fishing	11.7	14.1	9.8
Mining	5.7	4.4	7.3
Industry	4.4	3.4	5.1
Utilities	5.8	4.8	6.6
Construction	4.9	3.3	5.9
Services	6.6	4.9	7.8
Transport	7.2	4.2	9.7
Other	4.1	3.2	5.0

Source: Central Bank of Chile.

This asymmetrical expansion in sectoral activity, in turn, has had a differential impact on regional growth since there is substantial heterogeneity in regional economic structures: in some regions –as in the north of the country (regions II and III)– mining comprises over 45% of regional GDP, while in the south (regions VIII to X) agriculture is the dominant economic activity. The Metropolitan Region of Santiago (RM) concentrates around 50% of total GDP and its sectoral composition is largely dominated by industry and services. In the extreme south (region XII) petroleum related industries are important (see Table 3).[4]

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[4] National accounts at regional level are provided by the Central Bank of Chile only for the 1980-1998 period. CIEPLAN-SUBDERE (1994) extended backwards the data until 1960, but these figures should be taken with caution because regions as such did not exist. For the econometric sections of the paper we work with regional data for the 1980-98 period.

Table 3
Regional per capita GDP Growth and Composition by Sector
(percentage)

	Per capita GDP growth			Average Sector Share in Regional GDP				
Region	*1975-98*	*1975-87*	*1988-98*	*Agriculture Fishing*	*Mining*	*Industry*	*Services*	*Other*
I	3.5	2.1	4.8	6.4	7.9	23.2	47.4	15.1
II	5.0	2.1	7.9	0.6	65.3	5.4	12.3	16.3
III	5.6	2.6	8.7	16.2	46.9	1.9	19.8	15.1
IV	3.3	1.1	5.7	25.3	17.9	11.3	26.7	18.8
V	2.1	0.4	4.0	10.4	9.4	18.4	32.7	29.1
VI	2.5	2.2	2.7	28.2	24.7	10.3	22.6	14.2
VII	3.9	2.5	5.2	29.9	0.4	22.6	24.8	22.3
VIII	2.6	2.1	2.9	10.9	0.3	35.8	29.4	23.5
IX	3.6	2.1	5.1	18.7	0.4	14.3	44.6	22.1
X	4.2	2.5	5.8	34.2	0.4	13.3	32.4	19.8
XI	2.9	1.5	4.2	27.5	8.3	4.3	37.4	22.6
XII	1.9	2.6	1.0	11.3	17.9	27.5	32.7	10.5
RM	3.7	1.7	5.8	2.2	0.8	20.0	59.1	17.9

Note: Other include transportation, telecommunications, gas, electricity and water.
Source: Own elaboration using data from Central Bank and INE.

This uneven path of regional development also had important effects on regional inequalities and poverty. As shown in Table 4, between 1987 and 1998, total poverty reduced from 38% to less than 17%, while indigence declined from 13.3% to 3.7%.[5] This substantial reduction in poverty levels, however, has not been accompanied by a similar decline in inequality as indicated by constant Gini indices.

Among regions, nevertheless, poverty, indigence, and inequality evolved in dissimilar ways. As expected, in all regions poverty levels declined markedly, but some regions benefitted the most (e.g., II, V and VIII), while others improved less substantially (e.g., XI and XII). In terms of indigence, three regions (VIII, IX and X) benefitted substantially more than the rest of the country, largely because they had initially high levels of extreme poverty and social assistance policies have been targeted primarily to poor families. Finally, within-region income

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[5] Consistent poverty measures are available only since 1987.

inequality remained stagnant in most regions (measured by Gini indices), but it improved notoriously in regions I, III, VII and X, while it worsened clearly in region XI.

To a large extent the decline in total poverty and indigence is associated with the period of sustained economic growth observed in the 1990s as discussed in World Bank (2002) and Beyer (1997). However, policies were also instrumental in reducing poverty by an efficient targeting of transfers in the form of housing, education, and health as well as by direct monetary support for extremely poor families.

Table 4
Poverty, Indigence, and Income Inequality in the Regions of Chile
(percentage)

Regions	1987			1998		
	Poverty	Indigence	Income Inequality	Poverty	Indigence	Income Inequality
I	36.1	11.5	55.0	16.7	3.3	49.0
II	34.1	11.1	53.0	11.6	2.8	53.0
III	34.7	9.2	55.0	19.0	4.3	50.0
IV	44.2	14.5	54.0	20.2	4.9	55.0
V	35.9	12.1	55.0	15.4	3.6	53.0
VI	40.7	14.3	52.0	17.1	4.4	53.0
VII	41.6	14.7	61.0	20.9	6.0	53.0
VIII	51.9	22.5	58.0	22.0	8.3	59.0
IX	51.3	22.8	60.0	26.6	8.8	63.0
X	47.5	18.7	61.0	20.5	7.3	55.0
XI	23.1	4.5	52.0	12.1	1.6	59.0
XII	21.4	5.4	54.0	8.3	1.0	55.0
RM	33.8	11.3	57.0	12.7	3.0	58.0
Country Average	38.0	13.3	58.0	16.6	3.7	58.0

Note: Poverty (indigence) is measured as the percentage of families below the poverty (indigence) line, while income inequality is measured by Gini indices.
Source: Own elaboration on the basis of CASEN surveys.

It should be noted, nevertheless, that there remains an important degree of heterogeneity among regions in terms of poverty levels and income inequality. Certainly, uneven growth in different sectors could explain to some extent why some regions benefitted more than others. For example, in regions I and II mining expanded at an impressive rate in the 1990s and, given its share in regional GDP, most likely led to generalized welfare gains for workers. This claim is, nevertheless, incapable of explaining why poverty declined in similar amounts in other regions where mining is less important (e.g., regions VIII or X). Moreover, these simplistic explanations tend to overlook important additional aspects such as changes in income inequality. It can be seen in Table 4 that in those regions benefitted by the mining boom (regions II, III, IV, VI and II), income inequality did not improve and in some cases it even worsened. Hence, the connection between growth, poverty, and inequality requires the more elaborated treatment we provide in section 3 of this paper.

The dynamic evolution of regional income and poverty in Chile also calls for an analysis of the eventual convergence of per-capita income levels to long run (or steady state) levels. Economic theory provides a wealth of models suggesting that per-capita income in different countries should tend to converge in the long run. From the pioneering work of Solow (1956) and Swan (1956) on exogenous growth to the more elaborate models of endogenous growth (Lucas, 1988; Romer, 1986), economists predict that, absent rigidities, rational agents would arbitrage out disparities and, consequently, economies should converge. Applied work suggests that convergence cannot be dismissed as an explanation of long-run growth rates, but also indicates that numerous elements condition actual growth and the speed of convergence. These include idiosyncratic elements (e.g., institutions) as well as government policies.[6]

At the regional level, arbitrage of income differentials should operate faster and more efficiently as one expects within-country rigidities to be less important than between countries. Perhaps due to lack of data, however, the study of regional income convergence tends to be displaced by the analysis of labor market flows and migration (see Greenwood (1997) for developed economies and Lucas (1997) for developing economies). This suggests that economists expect migration to be the primary force in the convergence of per capita income levels. Only recently, space has become to be seen as an important determinant of economic

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[6] See Loayza and Soto (2002) for a summary of the main empirical findings in the literature.

activity and productivity although mainly at the city or global, but not regional, level (see Lucas, 2001 and Fujita et al., 1999). In the next section of the paper we provide some stylized facts on regional growth in Chile based on estimated correlations obtained from the data we have already discussed.

3.   Spatial Inequity and Long Run Convergence

Chile is a highly centralized country where, usually, political as well as economic decisions are taken by central government. Before 1980 the country was divided into 25 provinces, which were mere extensions of central political authorities. By the end of 1970s provinces were regrouped into more comprehensive units in terms of population, economic activity, and resources. These regions have a relative administrative and financial autonomy from the central government, but the governor (*Intendente*) is still appointed by central authorities.

Neoclassical growth models predict that each region within a certain geographical area will converge to a common steady-state in terms of per capita income and product (Solow, 1956). Regions further apart from their steady-state will grow faster than the rest. If all regions share the underlying factors determining individuals' and firms' optimal choices (such as technology, preferences, and the institutional set-up) and only differ in terms of their initial capital stock per unit of labor, then the prediction is even stronger: steady state per capita income will be the same for every region and then poorer regions will grow faster to catch-up rich ones. This is called "absolute convergence". New classical models, on the other hand predict "conditional convergence", that is the convergence of each region to its own steady-state in terms of per capita income and product (Romer, 1986; Lucas, 1988). Each region's steady-state will then depend on initial conditions and other idiosyncratic variables (e.g., endowment of natural resources or location).

In this paper, the path of growth and convergence of these regions is explored under the assumption they share similar preferences, social and political institutions and technological parameters. Per-capita GDP is the variable commonly used in growth studies. But, given that our goal is to study the relationship between economic growth and poverty, it seems preferable

to include a variable more closely related to the working force and labor market conditions, such as labor productivity.

Table 5
Regional Labor Productivity and per capita GDP in selected years
(millions of Ch$ of 1986)

| Regions	Labor Productivity			Per capita GDP		
	1980	1990	1998	1980	1990	1998
I	1.402	1.146	1.603	377	391	627
II	2.293	2.165	3.689	585	683	1.294
III	863	988	1.722	245	309	651
IV	696	680	912	166	217	317
V	896	833	1.094	257	280	368
VI	954	865	1.107	258	295	396
VII	493	536	840	137	195	301
VIII	807	731	920	210	242	299
IX	358	389	594	98	126	188
X	424	547	766	128	173	274
XI	667	651	941	228	248	378
XII	2.269	2.218	2.214	746	825	870
RM	952	929	1.356	304	338	540
Coefficient of variation	0.62	0.59	0.61	0.65	0.61	0.61

Source: Own calculations using data from Central Bank of Chile and INE.

Table 5 shows that substantial increases in average labor productivity fueled the growth in income per-capita in Chile. On average, labor productivity expanded at around 1.9% per year, but for several regions this increase was much higher (e.g., almost 3% in region II) while in others productivity expanded very little or did not increase at all (e.g., region XII). Consequently, labor productivity –and therefore per-capita GDP– shows an important degree of heterogeneity at the regional level. Differences between minimum and maximum values range more than six times in all years. The coefficient of variation, on the other hand, shows

that standard deviations amount about 60% of the average value of the variable, which can be considered as a weak overall variation in relative terms.

A first look at the evidence for Chile, as reflected in Figure 1, would indicate that the stronger hypothesis of absolute convergence has a chance: indeed, for average GDP growth rates spanning 1980 to 1998 for the thirteen administrative regions, the association between the average growth rates and initial (1980) per capita GDP per region is clearly negative.

Figure 1
Per Capita GDP Growth and Initial GDP level
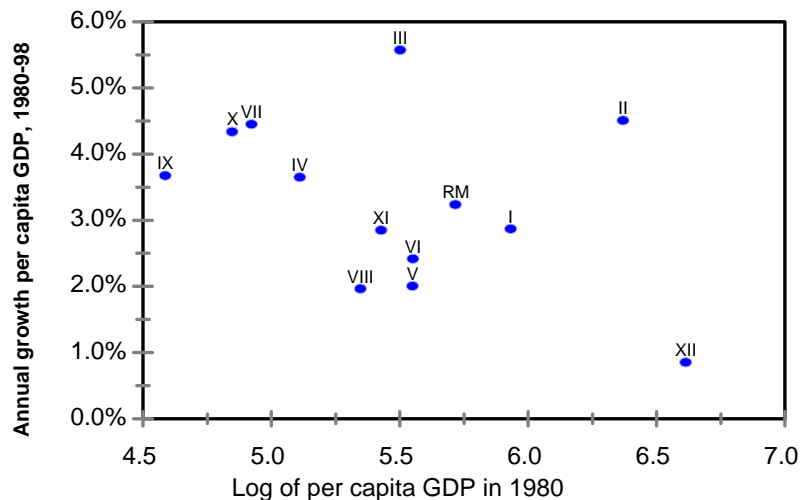
However, two reasons conspire against this conclusion. First, the sample is arguably small so that singular data points can become very influential, as is the case of region XII, biasing the results. Second, if one computes regional per-capita GDP net of value added in mining, evidence becomes less clear. The justification for subtracting mining is that this activity generates value added that is not directly commandeered by the region because most profits are either controlled by foreigners or taxed away by the government. We undertake a formal econometric analysis of these issues, raising serious doubts on the convergence hypothesis. We use the following generic econometric model:

$$\frac{1}{T}\Delta \log\left(\frac{GDP_t}{n_t}\right) = \alpha_0 + \alpha_1\left(\frac{GDP_0}{n_0}\right) + \alpha_2 z_t + \nu_t \tag{1}$$

where Δ is the first difference operator (thus $\Delta\, log\, x$ is the growth rate) and ν_t is a white noise innovation. Since n_t is regional population at time t, the left hand side corresponds to the average growth rate of per capita GDP in the [0,t] period. Naturally, variables indexed at time 0 are initial conditions. Finally, variables z_t are other conditioning variables we use to test for, hence the name, conditional convergence. Evidence of convergence obtains whenever parameter α_1 is negative. The results presented in table 6 include also the estimates for convergence in average labor productivity.

The results in Column (1) of Table 6 show that there is no evidence of absolute convergence in per capita GDP at regional levels when considering total value added. Parameter α_1 becomes statistically significant when excluding value added in the mining sector. The size of the estimated parameters is very small, suggesting that convergence will eliminate half of the differences in about 70 years (half-life). Naturally, the latter is equivalent to non-convergence from all practical purposes. The evidence for labor productivity (column 2 of the table) supports absolute convergence at rates of 1.2% to 1.4% per year suggesting again a very slow speed of convergence and a half life of around 68 years.

As documented in other papers, conditional convergence models seem to be a better representation of the regional growth data in Chile (Morandé et al., 1997; Fuentes, 1997; and Aroca and Bosch, 2000). Initial conditions reflect what the neoclassical theory calls "tastes, environmental, and institutional set-up", which can be proxied by measurable welfare and policy indicators. We use infant mortality rates and the share of workers affiliated to social security as indicators of quality of life and the distance between each region and the capital of the country (Santiago) and geographical area as space variables.[7]

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[7] Chile lends itself nicely to the use of distance as a proxy of transportation costs, since it is long and very narrow, so that regions are located alongside from north to south. Santiago, in the RM region, is approximately at the geographical center of the country.

Table 6
Cross-section Tests of Regional Convergence in Chile, 1980-1997
(13 observations)

	Absolute Convergence		Conditional Convergence	
	Per capita GDP	Labor Productivity	Per capita GDP	Labor Productivity
Total Regional GDP				
Constant	0.076 (2.42)	0.087 (2.49)	0.198 (6.01)	0.213 (5.08)
Initial per capita GDP	-0.008 (-1.46)	-	-0.034 (-4.91)	-
Initial productivity per worker	-	-0.010 (-1.99)	-	-0.030 (-3.79)
Infant mortality	-	-	-0.0004 (-3.27)	-0.0004 (-3.15)
Social security affiliates	-	-	0.0005 (1.90)	0.0003 (0.84)
Geographical area	-	-	0.0005 (5.65)	0.0005 (5.56)
Distance to center	-	-	-0.0002 (-4.34)	-0.0151 (-4.06)
R²	0.16	0.26	0.87	0.87
Excluding mining from GDP				
Constant	0.099 (3.76)	-	0.181 (5.77)	-
Initial per capita GDP	-0.013 (-2.57)	-	-0.025 (-4.53)	-
Infant mortality	-	-	-0.0003 (-2.63)	-
Social security affiliates	-	-	-0.00002 (0.11)	-
Geographical area	-	-	0.0006 (0.75)	-
Distance to center	-	-	0.0000 (0.81)	-
R²	0.38		0.78	

Source: Own calculations using data from Central Bank of Chile and INE.
Note: t-statistics in parenthesis

Cross section analysis is limited by the small number of regions in Chile (13). In addition, important information is eliminated when working with time averages. In particular, the within-period variation of growth and its determinants. A useful alternative is to estimate our model of convergence using a panel including data for the entire period 1980 to 1998. Nevertheless, it is important to control for transient shocks that may affect growth rates. Following Loayza and Soto (2002) we include unemployment as a proxy for the business cycle.

We use the dynamic panel-data GMM estimator of Arellano and Bond (1991) to obtain the estimates shown in Table 7. This estimator avoids eventual simultaneity biases in the dynamic models and biases arising from the existence of region-specific effects. It can be seen that these estimates show a higher speed of convergence than cross-section estimates reported in Table 6, ranging between 3.2% and 3.7% on an annual basis. These estimates indicate a half life of around 20 years while, as mentioned, a 1% rate suggests a half-life of around 70 years. Obtaining faster adjustment in panel-data models is customary –as discussed in Loayza and Soto (2002)– and these estimates are consistent with those of Aroca and Bosch (2000). The higher rates of convergence are explained by the ability of dynamic models to incorporate in the convergence process toward steady state, the changes in the steady states themselves. In this sense, the convergence parameters measure changes in output growth more than speed of convergence properly considered. A second interesting result is the role of unemployment as a control for cyclical shocks: a negative parameter indicates that regions in the lower part of their activity cycle (recession) tend to grow faster than those in booms. Third, the results on the two geographical variables (size and distance to the center, Santiago) are interesting. Distance to the center is not significant when using GDP net of mining or labor productivity. Area, on the other hand, is not significant when GDP excludes mining, indicating that most likely the significance observed in the other two specifications is spurious. This would result since the share of mining in GDP is substantial higher in the biggest regions (II, III and XII). Finally, two variables were used to capture initial conditions; poverty (proxied by infant mortality) and labor market informality (affiliation to social security).

In summary, when discussing growth regressions we ought to separate between the analysis of the time needed to reduce differences in per-capita GDP between regions (that is better represented by cross-section analysis) from the dynamics of per capita GDP growth more properly, which are better described by the dynamic model.

Table 7
Panel-data Tests of Conditional Convergence in Chile, 1980-1997
(272 observations)

	Growth in Per Capita GDP	Growth in Per capita GDP excluding mining	Growth in Labor Productivity
Constant	0.247 (3.79)	0.282 (4.22)	0.286 (2.48)
Initial per capita GDP	-0.032 (-2.66)	-	-
Initial per capita GDP excluding mining	-	-0.037 (3.25)	-
Initial Labor Productivity	-	-	-0.037 (1.92)
Unemployment Rate	-0.005 (-6.18)	-0.006 (-6.98)	-0.003 (3.12)
Area	0.0002 (2.63)	0.0001 (0.13)	0.0001 (2.11)
Distance to Santiago	-0.0001 (-3.12)	-0.000 (-1.02)	-0.0001 (-1.76)
Initial Infant Mortality	-0.001 (-2.45)	-0.001 (-2.07)	-0.001 (-1.85)
Social Security affiliates (% of EAP)	0.001 (1.55)	0.001 (1.56)	0.001 (0.91)
R^2			

Source: Own calculations using data from Central Bank of Chile and INE.
Note: t-statistics in parenthesis

4.   *Poverty and Spatial Inequity*

As mentioned in the introduction, while convergence in per capita GDP is an interesting phenomenon, it is the evolution of poverty and welfare what is important from the point of view of policy analysis. In particular, we are interested in studying whether GDP growth translates into declining levels of poverty. Since economic theory has not provided a first-principle model to study this relationship, we focus on a simple specification for the correlation between poverty levels and economic growth, in which we control for a set of z_t variables that may be of importance to avoid biases in the estimation (e.g., unemployment).

$$Log\,Poverty_i \;=\; \alpha_0 + \alpha_1\left[Log\,\frac{GDP_0}{n_0}\right] + \alpha_2\,z_i + \mu_i \qquad\qquad \textbf{(2)}$$

In table 8, we present the results of estimating this model for the 1987-2000 period where fully comparable data on poverty at a regional level is available. It can be seen the crucial impact of economic growth on poverty levels: the actual increase of 150% in per capita GDP between 1986 and 1998 would account for a decline in poverty of around 30%. When studying this relationship using productivity levels, the point estimate of the effect is of similar size (-0.285 vs. -0.219). On the other hand, inequality measured by Gini coefficients is not significant in any of the regressions. This is an important result that contradicts the presumption usually expressed by politicians that inequality leads to slower growth and that distributive policies would also lead to faster convergence.[8]

Table 8
Determinants of Poverty Incidence at the Regional Level
(65 observations, 1987-1998)

Constant	6.366	8.67
	(8.85)	(11.64)
Per capita GDP	-0.285	-
	(3.04)	
Labor Productivity	-	-0.219
		(2.21)
School attainment	-0.174	-0.207
	(3.36)	(3.96)
Income inequality	-0.005	-0.002
	(0.53)	(0.21)
Unemployment rate	0.049	0.056
	(3.77)	(4.29)
R^2	0.64	0.62

Source: Own calculations using data from Central Bank of Chile and INE. Note: t-statistics in parenthesis.

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[8] We are certainly abusing to some extent correlations by concluding in causal terms.

School attainment is used as a proxy of the stock of human capital; in both regressions we obtain a negative and significant relationship which indicates that lower poverty levels are associated with higher education. In particular, this effect goes beyond labor productivity, since schooling is still significant once we control for productivity levels. Finally, unemployment shows a significant correlation with poverty, suggesting that the benefit of sustained growth may be channeled by the labor market.

5. *Spatial Inequity, Migration, and the Role of Policies*

As documented, there are substantial differences in per-capita income levels among regions. Likewise, poverty levels are very different among regions and have evolved in dissimilar fashion in the last two decades. Contrary to what neoclassical economic theory predicts, the evidence presented in section 3 suggests that there is no convergence in regional per-capita income levels or, at best, that they converge to heterogenous conditional levels at a slow pace. This is at odds with substantial empirical evidence as documented for the 50 states of the US by Barro and Sala-i-Martin (1991) and, to a lesser extent, for 118 European regions by Canova and Marcet (1995).

Lack of convergence in the Chilean case seems to be largely associated with low levels of interregional migration. In section 5.1 we document this fact and show, more important, that migration has become increasingly less significant as an equalizing force for regional disparities. We also provide evidence that this is not a market-driven result. This observation leads us to concentrate on the role that policies might have played in slowing convergence between regions in income and poverty levels. Certainly, idiosyncratic elements may affect the speed of convergence. Nevertheless, in sections 5.2 and 5.3 we study two policies that have sufficient power to affect in a systematic way interregional migration, per capita income growth, and the speed of convergence. These policies are public housing and regional development programs.

5.1   Migration

Interregional migration in Chile is very reduced for international standards, in particular when one considers that the country is small, population is very homogeneous, and urbanization levels quite high (by 2,000, urbanization was around 85%, comparable to European countries). On average, in the 1965-2000 period only 1.3% of the population moved between regions every year. Because assessing relative mobility is difficult, we provide estimates of regional migration for several developed and developing countries in Table 9. These figures should be taken with caution as they are negatively affected by the size of regions and positively affected by the number of regions. We can see that migration rates in Chile –as in other Latin American economies– are substantially lower than those in developed economies, with the only exception of Spain.

Table 9
Inter-Regional Annual Migration Rates
and Other Demographic Indicators

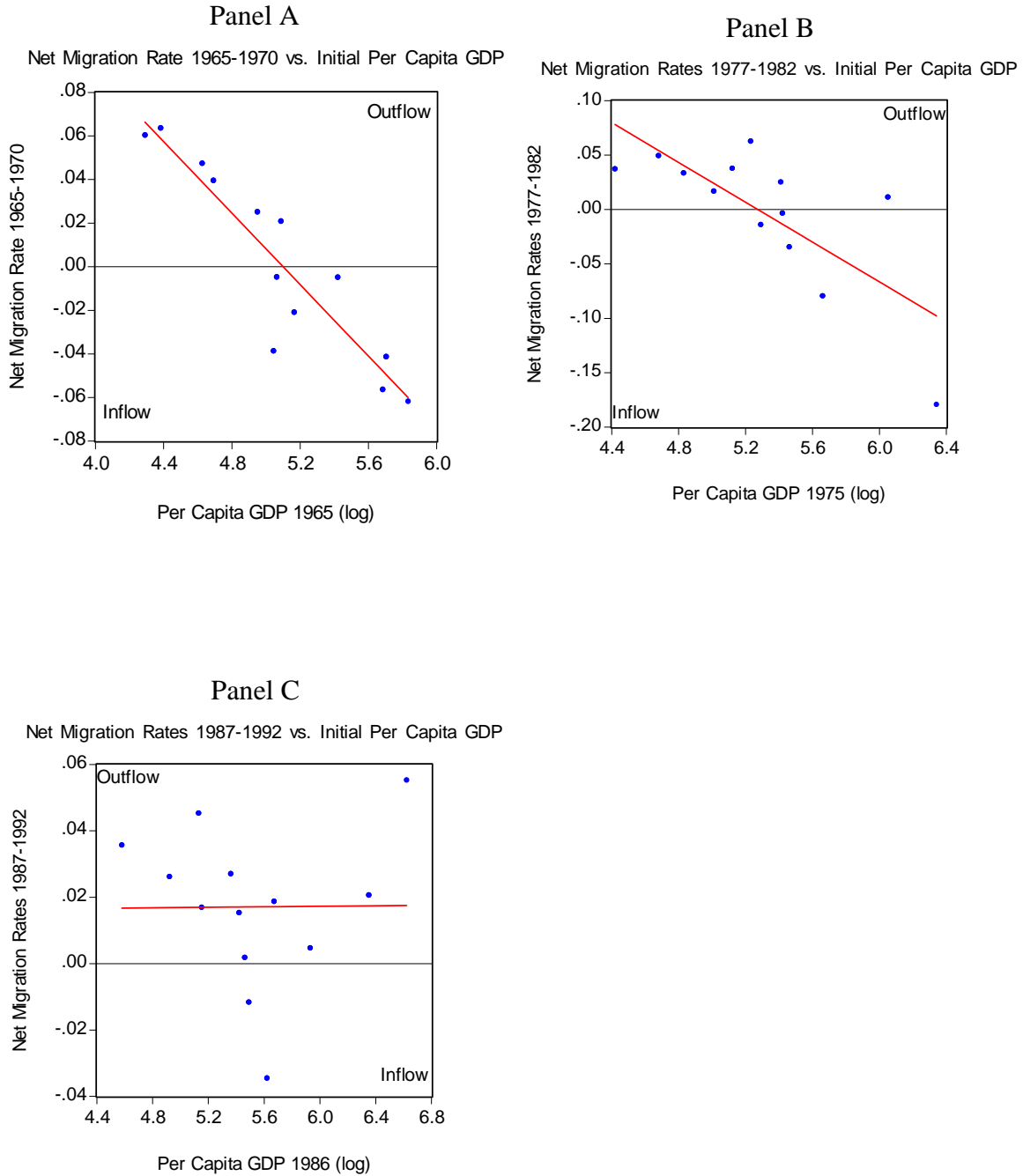| Country	Urbanization levels (%)	Number of regions	Average regional population (thousands)	Annual migration rate (%)
USA (1990s)	75.0	48	5,000	6.6
Australia (1986-91)	86.0	8	1,100	2.5
UK (1981-91)	89.0	12	5,000	3.1
Spain (1988-98)	79.0	17	2,300	1.6
Argentina (1975-80)	85.0	24	1,100	1.2
Uruguay (1991-96)	89.2	19	145	1.3
Costa Rica (1979-84)	45.0	6	350	1.0
Chile (1965-70)	75.0	13	680	1.4
Chile (1977-82)	81.1	13	850	1.2
Chile (1987-92)	82.8	13	1,000	1.5

Source: CELADE for Latin American Economies, Cameron and Muellbauer (1998) for the UK, Greenwood (1997) for the US, Industry Commission (1993) for Australia and Lindley et al. (2002) for Spain.

In addition to displaying low levels of internal migration, a striking feature of Chilean demographics is the observed change in the direction of migratory flows. In the 1965-1980 period, migration was predominantly from low income regions towards high income regions. In the last twenty years, however, population in low income or low growth regions does not seem to migrate any longer to higher income or higher growth regions. In figure 2, we plot net migration rates at the regional level conditional on initial per capita income levels (data come from the 1970, 1982 and 1992 censuses). If migration is a significant equalizing force for per capita income levels, one should expect negative, significant correlations. That is precisely what is observed in Panel A: low income regions in 1965 displayed clearly higher outflows of population in the following five years, while higher income regions were net recipients of migrants. We have estimated this correlation at -0.89. When we replicate this exercise for the 1977-1982 period, the correlation becomes less strong (-0.74) but remains still significant. However, when this exercise is undertaken in 1992, one observes zero correlation and no clearly discernable relocation patterns.

Evidently, something changed in the migrating patterns of the population in the 1980s. Migration became less significantly correlated to income differentials. Since migration in Chile has not been a powerful equalizing force, one should focus on those market factors and policies that may have inhibited the movements of workers towards higher income regions. Before turning towards policies, we check market factors that might have inhibited mobility.

One obvious alternative is that migration stopped because income differentials became less important on time. As documented in section 3, this is not the case. When comparing per-capita income levels, the evidence shows little tendency towards a reduction in the dispersion of per capita income levels in the 1960-1998 period. In particular, the standard deviation in per capita income among regions increased by 20% in the 1980s and 1990s when compared to the previous two decades. These results and the rest in this chapter are not sensitive to excluding mining from GDP or using households –as opposed to per capita– income.
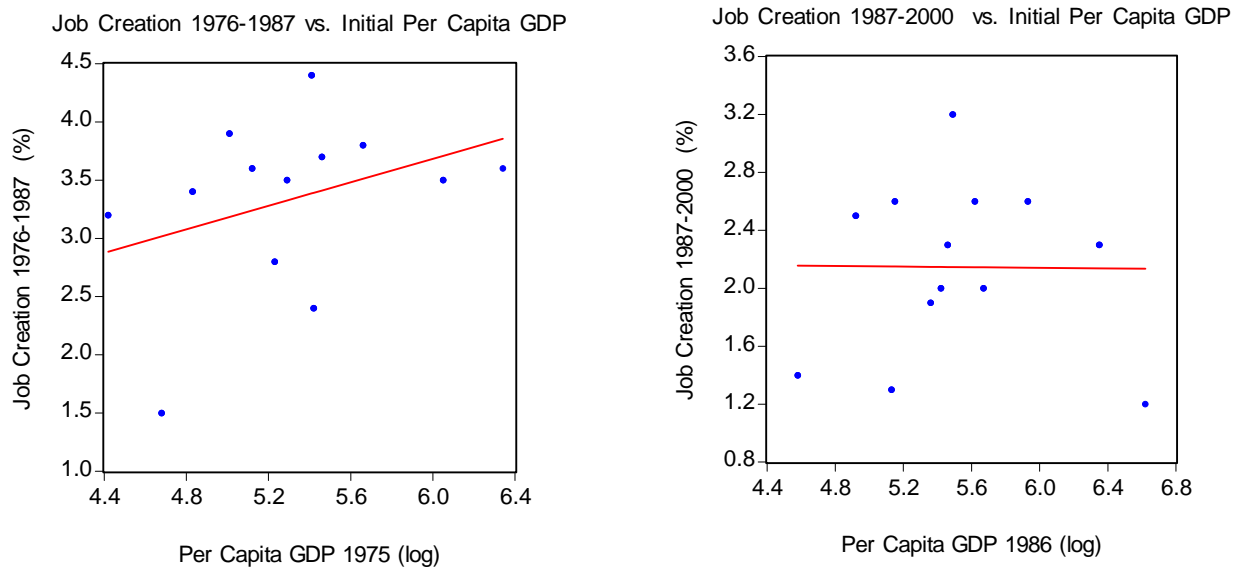
Figure 2
Net Inter Regional Migration Rates and Initial per capita GDP

Panel A

Net Migration Rate 1965-1970 vs. Initial Per Capita GDP

Panel B

Net Migration Rates 1977-1982 vs. Initial Per Capita GDP

Panel C

Net Migration Rates 1987-1992 vs. Initial Per Capita GDP

Note: net inflows and outflows correspond to changes in residence between each census (1970, 1982 and 1992) and the previous fifth year (1965, 1977, and 1987). Source: INE and CELADE.

A more promising venue is to focus on labor market conditions that may affect migration. One alternative is that high-income regions were not able to create jobs at a similar rate than low-income regions and, thus, did not become a powerful attractor to induce migration. This should be apparent in relatively lower rates of job creation and/or higher unemployment rates in high income regions. These hypotheses, however, are not consistent with the data. First, as shown in Figure 3 there is a positive correlation between job creation and initial per capita regional GDP in the 1976-1986 period (correlation is 36%). In the 1987-2000 period, on the contrary, this correlation is zero. Again, note the important change in conditional migration patterns in the 1980s.

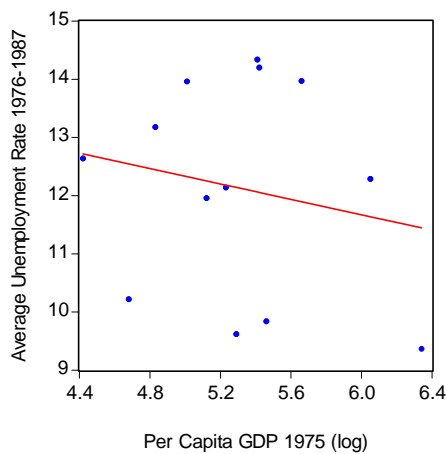**Figure 3**
Job Creation and Initial per capita GDP

Second, we do not observe the positive correlation between average unemployment rates and initial per capita GDP that is necessary to support the notion that market forces inhibited migration. On the contrary, as shown in figure 4, the correlations in both periods are clearly negative, showing that high income regions have lower unemployment rates. Moreover, unemployment levels are very different between the 1980s and the 1990s. Lower unemployment rates in high-income regions should have induced larger migrating flows but that did not happen.

In summary, if migration is to a large extent determined by the arbitrage of expected income differentials, as suggested by theory and international evidence, the observation that
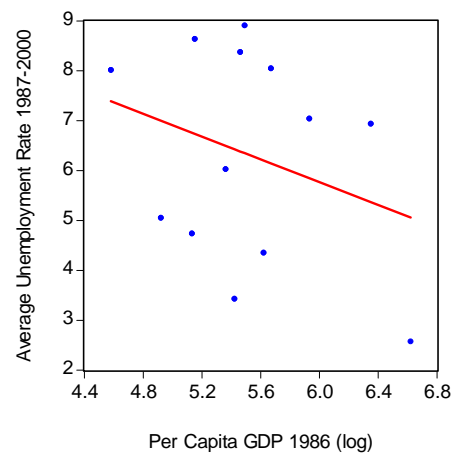
Chilean workers did not migrate significantly in the last decades is an important puzzle for our understanding of spatial inequity and poverty alleviation. Workers in low income regions in the mid 1970s or 1980s would have preferred to migrate to high income regions as their expected income levels were markedly higher[9]. One should expect labor mobility to be much more important within a country than between countries. After all, in a political and cultural homogenous country like Chile there should not be significant barriers to the movement of capital, labor, and technology between regions.

<div align="center">

Figure 4
Unemployment and Initial per capita GDP

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5.2   The role of housing subsidies

In this section we provide econometric evidence that insufficient movement of workers could be the result of housing policies that tie families and workers to their original location. Housing policies in the 1960s in Chile rested on the principle that each family was entitled to own a house and that it was the government's duty to satisfy such right. Until 1970, the main instruments to accomplish such policy were market subsidies to the supply of housing. Benefits

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[9] Expected labor productivity (i.e., labor productivity weighed by the probability of finding a job) is very heterogenous, even if mining is excluded, with low productivity regions (e.g., region X) exhibiting one fifth of the productivity of regions II or RM..

to target groups included subsidized mortgage rates, periodic bail outs for debtors, direct subsidies to dividends, less-than-perfect indexation of dividends to inflation, and tax exemptions. These policies were not successful in reducing the housing deficit, estimated at 600 thousand units in 1965, mostly because of lack of targeting and poorly designed operating procedures.[10] By 1969, they had eliminated only 35% of the deficit. In the 1970s, the failure of previous housing policies led to replace market mechanisms by massive –and overly inefficient– state-led housing policies. The government froze dividends, reduced minimum saving requirements for borrowers, enacted progressive tax reductions, kept mortgages at negative real interest rates, and opened bank credit at subsidized rates for small size housing projects. These policies were also quite inefficient and less than 100 thousand houses were initiated –mostly never finished– in the 1970-74 period.

Reforms in the housing sector initiated in Chile in 1975 were based on two guidelines. First, the government abandoned the principle that housing was the right of each family but the result of systematic saving and, second, subsidies were to be allocated to demand using market mechanisms. These policies provided ample space to private-sector initiative and confined the government only to subsidizing the access of those in poverty to housing. In the 1975-79 period, however, policies were mostly directed toward improving the efficiency of public agencies, concluding housing developments left unfinished by previous administrations and eliminating restrictions in the use of land (zoning). In 1980 the government improved targeting significantly by introducing a standardized form (called CAS) that identified poor families and inhibited the access of middle and higher income families to subsidies.[11] In addition, the government implemented specific subsidies for rural housing projects and streamlined procedures to process applications and grant subsidies. The new mechanism became the main instrument to allocate public housing and, with minor modifications, has remained in place since. Between 1990 and 2000, the government expanded substantially the resources devoted to public housing (10% on average in real terms) and enacted additional subsidies on sewerage and electricity for poor neighborhoods and rural areas.

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[10] See Silva (1997) for a description of housing policies in the 20th century in Chile..

[11] The CAS form is largely based on housing criteria (quality, crowding, access to potable water, etc.) and as such provides an adequate benchmark for targeting housing policies, but its efficiency for other social programs is less clear (see World Bank, 2002).

Figure 5 shows that public housing has been effectively targeted toward regions with higher shares of population in extreme poverty. Those regions that concentrated the largest quantity number people in extreme poverty in either 1982 or 1992, obtained larger shares of housing subsidies in the subsequent decade. Since other public policies (e.g., transfers) were also allocated using the CAS form, those policies became complimentary to housing policies as they were also allocated to areas with higher levels of extreme poverty.

Figure 5
Regional Subsidized Housing and Initial Poverty

Panel A: 1982-1992 *Panel B: 1992-2000*
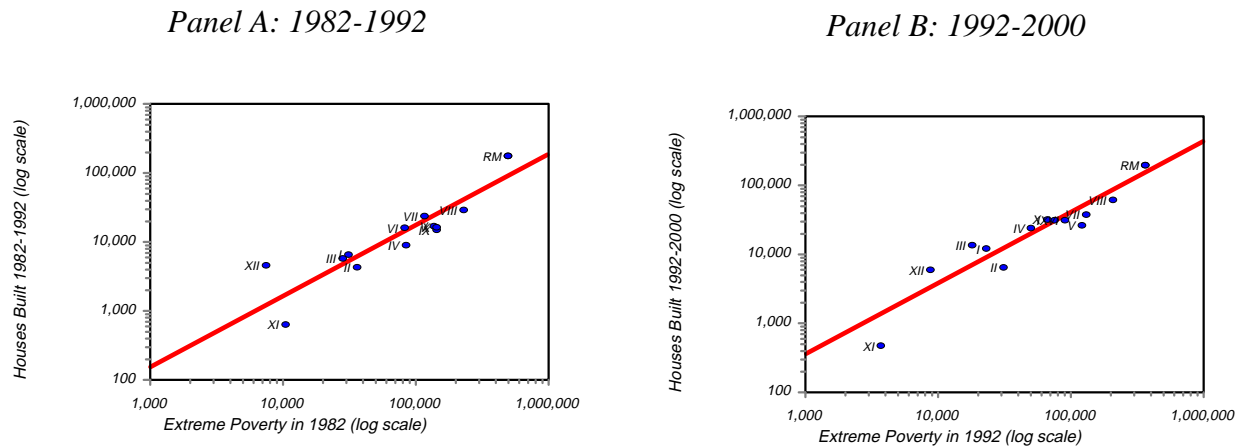
In addition to improving the allocation of subsidies, the new targeting policies implemented since 1980 also considered important limitations to beneficiaries to avoid leakages of subsidies to non-targeted groups (i.e., high income quintiles). The most important limitation was the outright prohibition to sell or rent subsidized houses (until 2001) and the rigid norms to determine the location of subsidized housing.

Our hypothesis is that after reforms the combination of improved targeting and the prohibition to sell or rent subsidized houses effectively tied families to their original location and, thus, inhibited migration. Since their original location was in poor areas where unemployment was high and labor productivity was low, workers could not arbitrage out income differentials in an effective way.[12]

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[12] In addition, the government purchased the cheapest land plots to build subsidy housing, i.e., those in areas away typically far from production centers and employment opportunities.

In Table 10 we provide an econometric test of this hypothesis using panel data models for the 1965-2000 period. The dependent variable in these models is the net migration rate for the 13 regions in Chile in three five-year periods (1965-1970, 1977-1982, and 1987-1992); using absolute migration levels does not change the qualitative results. Thus, the sample consists of 39 observations. A positive migration rate implies that the region was a net recipient of migrants. In addition to housing subsidies, we control for initial poverty levels and average per-capita GDP growth.[13] Based on economic theory we expect a negative correlation between migration and initial poverty levels (a push factor), positive correlation between migration and GDP growth (a pull factor) and, if our hypothesis is correct, a positive correlation between migration and housing policies. Given the evidence in Figure 5, we expect the correlation between economic growth and migration to be different before and after reforms and, thus, we include an interaction term with a dummy variable (1 for 1965-1982 and 0 elsewhere).

Table 10
Migration Rate Determinants
Panel Data Models, 1970–2000

	Pool	Fixed Effects	Pool	Fixed Effects
Share of region i in housing subsidies	0.078 (2.87)*	0.063 (1.98)*	-	-
Number of houses built in region i (thousands)	-	-	0.000217 (2.47)*	0.000197 (2.43)*
Share of Initial Extreme Poverty on Population of Region i	-0.004 (-1.81)*	-0.004 (-1.72)*	-0.004 (1.79)*	-0.004 (1.77)*
Annual average GDP growth rates of region i	0.008 (1.04)	0.002 (0.36)	0.009 (1.08)	0.003 (0.39)
Dummy 1965-70 * Annual GDP growth	-0.013 (-1.24)	-0.013 (-1.69)*	-0.014 (-1.31)	-0.013 (-1.69)*
R²	0.24	0.35	0.25	0.35

Note: (*) Significant at 90% confidence. Panels were weighted by cross-section. *t* statistics in parenthesis were calculated using White's heteroskedasticity-consistent standard errors.

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[13] It is customary to add "distance" and regional area to migration regressions as proxies for transportation costs and density respectively. We have excluded both to avoid colinearity because they are highly correlated with initial poverty levels (up to 60%).

The results presented in Table 4.2 strongly support our hypothesis as both pool and fixed effects models display a positive correlation between housing subsidies and migration rates. A positive and significant parameter indicates that migration is correlated with the availability of housing subsidies. Since higher subsidies were allocated to the relatively poorest regions, families did not migrate towards higher income regions (that obtained proportionally less subsidies). This evidence also suggests that concentration of subsidies in Santiago may have induced its excessive size (40% of total population). Migration was also determined by initial poverty levels: the poorest regions tend to expel workers and their families. Finally, economic dynamism –measured by the rate of growth of per capita GDP– did not play a significant role in the 1982-1992 period as the parameter is never different from zero. On the contrary, except in the 1965-1980 period one observes the negative sign associated with migration from less dynamic regions to those that grew faster.

In conclusion, public housing policies have been very important in reducing poverty levels and improving welfare levels. Nevertheless, an unexpected negative outcome of the way in which subsidies were allocated and managed was that they may have inhibited migration from low-income regions towards high-income regions. A direct implication of this observation is that subsidies ought to be more flexible and/or that the allocation mechanism should consider that families migrate in order to improve their quality of living and, consequently, be more forward looking. In addition, policies should also consider possible externalities in the recipient region in the form of the congestion of public services, temporary increases in the unemployment rate, pressure on housing markets, increased pollution and traffic, and potentially more crime and violence.[14]

5.3   The role of regional subsidies

A second area in which policies play a role in preserving inequity is via regional subsidies given to specific economic activities and their impact on different producers. Protection has been identified as a major deterrence to growth at the country level by several authors (see Parente and Prescott, 2000), mostly because of its negative impact on innovation

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[14] Some of these issues have been raised by Shioji (1995), who found they had occurred as regional migration in Japan responded to per-capita GDP differentials.

and productivity gains. In fact, at the root of the Chilean reforms was the notion that protection from international competition played against faster growth in the pre-reform period. There are no reasons why the same argument could not operate at regional levels within a country. Hence, it is important to study whether regional protection policies have had an undetected effect in perpetuating poverty and inequality.

Although most macroeconomic policies in Chile are designed to be neutral in order to not interfere with resource allocation, there are important exceptions to that rule. These are largely determined by political and lobbying reasons. One area in which policies distort resource allocation is the agricultural sector.[15] The military government enacted price stabilization mechanisms for several goods, including wheat and sugar beets. These stabilization mechanisms operate as price bands that, in principle, should be neutral in the long run. They would support farmers income when international prices are low, while protecting consumers via imports when prices are high. The official justification for implementing such policies was that price bands would reduce uncertainty and help poor farmers. Nevertheless, lobbying came from wealthy landowners rather than low-income communities.

Price bands have never operated in a neutral way. Between 1984 and 2000 they have produced substantial transfers from consumers to producers. In the case of wheat, annual transfers amount to US$ 40 millions (Roeschman, 2002). In the case of sugar beets, annual transfers amount to US$ 15 millions.

Price stabilization subsidies, by nature, are given to all producers without any targeting towards poor farmers. However, most of the beneficiaries in Chile concentrate in only three regions (VIII, IX, and X), despite the fact that farmers in other regions could opt to plant these protected crops (e.g., V, VI, VII, and RM) since weather and soil qualities are similar. The former regions derive an important fraction of their income from the subsidized agricultural sector (see table 2) and low income farmers depend largely on these crops for their subsistence. The latter regions, on the contrary, derive their income from international markets (such as fruit and wine) or compete directly with imports.

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[15] The only other important regional policies are free-trade areas in the extreme north region (I region) and extreme south region (XII region). We do not discuss their effect for lack of detailed data.

The analysis of the effects of these policies do not support the policy assumption that poor families would benefit (Roeschman, 2002). Subsidies do affect farmers' decisions with regards to the composition of what they produce. In those three regions that benefit most from subsidies, farmers allocate twice as much area of their farms to subsidized crops. In the other regions where subsidized crops could be harvested, these annual crops have to compete with products that are market profitable and are usually planted in marginal quality lands. Second, small size farmers allocate relatively more of their land to –and thus, depend more on– subsidized crops, despite the fact that scale economies are important in both wheat and sugar beets. Third, most of the subsidies go to high-income landowners and intermediaries. In Table 11 we present the size, production levels and yield of different type of wheat producers in Chile. It can be seen that small size, poverty-stricken farmers obtained less than 10% of all transfers while rich, large size producers obtained 70% of subsidies.[16]

Table 11
Size and Efficiency of Wheat Producers, 1997

	Subsistence less than 10 ha.	Small 10 to 50 ha.	Medium and Large more than 50 ha.
Number farms	38,147	37,778	13,374
Total area (ha)	44,317	102,350	223,229
Wheat produced (ton)	101,055	295,731	1,001,368
Average area on wheat	1.16	2.71	16.70
Yield (ton/ha)	2.30	2.90	4.50

Source: own elaboration based on 1997 Agricultural Census.

A second, and more important, outcome of these subsidies is the negative impact on productivity levels. It can be seen in Table 11 that the yields of subsistence and small size farmers are much lower than that of medium and large size producers. For this group, productivity has not increased in a decade. In fact, the three regions that benefitted from the price bands are those with the lowest increase in productivity in the entire agricultural sector in the 1990s. As shown in table 12, these regions show (1) the lowest productivity levels of the

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[16] In sugar beets transfers to subsistence producers amounted to only 2% of subsidies.

country (around 60% of the country average)[17], and (2) an annual average increase in labor productivity of less than 2.5% in the 1990s, while the average for all regions is around 4.5%. In wheat, the correlation between productivity gains and annual subsidies is negative (-0.67 for wheat in the 1990-97 period), a symptom of the wrong incentives induced by price bands.

Table 12
Labor Productivity in the Agricultural Sector
Selected regions, 1990-1997

	Average Productivity ($ mill / worker)	*Productivity Growth (annual avg.)*
IV Region	*553.1*	*5.58%*
V Region	*665.5*	*3.54%*
RM	*745.8*	*5.49%*
VI Region	*776.3*	*6.84%*
VII Region	*591.3*	*8.74%*
VIII Region	*369.7*	*2.04%*
IX Region	*289.6*	*2.25%*
X Region	*298.6*	*1.17%*

Source: Own calculations using data from Central Bank of Chile and INE.

Finally, out of the 75 thousand subsistence and small size farms in Chile, 64% correspond to an ethnic minority –the *mapuches*. This group has benefitted from active government policies that has transferred land to mapuche communities. In a similar fashion to urban poor, the mapuches are quite limited in terms of the disposal of their lands. As of 1997, only 37% of the property was legally owned by farmers (Apey et al., 2001). This severely limits the ability of this community to operate in competitive markets, have access to credit, or invest in more profitable goods (such as orchards or berries). In particular, a substantial fraction of the land is communal property, thus inhibiting selling, renting, and labor mobility. In a sense, these policies act in much of the same way as urban housing, tying people to low productivity areas and adding to persistence in poverty.

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[17] Region II is mostly the Atacama Dessert, where agriculture is nil (0.7% of total agricultural GDP).

6. *Concluding Remarks*

Two decades after of reforms, there is a consensus that the extraordinary period of high and sustained growth in Chile was the direct outcome of those policies. Unfortunately, growth did not benefit regions equally. While poverty and indigence diminished substantially, evidence shows that economic growth has not been balanced among regions and that spatial differences in per-capita income remain significant.

This paper contributes to previous research on regional economic convergence in Chile by exploring the implications of such convergence in terms of welfare, poverty reduction, and income inequality. The econometric analysis suggests that regions converge at a very slow pace to different steady state levels of income per capita. Likewise, we document the important yet asymmetric impact of regional GDP growth on poverty levels. For those regions that have grown very fast in the last decades, higher average income would have reduced poverty by as much as 50%, while for lagging regions the reduction in poverty would have not exceeded 25%. We also obtain that income inequality measured by the Gini coefficient is not a significant determinant of poverty levels in the long run. This contradicts the often heard presumption that inequality leads to slower growth and that distributive policies would also lead to faster convergence. Human capital, on the other hand, is associated with declining poverty levels even when we control for labor productivity, suggesting that much of the benefits of growth are channeled through the labor market. Nevertheless, when we study the labor market we observe that labor migration does not play the equalizing role one would have expected and, consequently, labor immobility has contributed to the slow speed of convergence observed in regressions.

Previous research did not address the question of what are the determinants of the speed of convergence, nor whether economic policies can affect it. We offer one explanation to slow convergence based on the spatial immobility of the Chilean labor force. Evidence suggest that migration has not been an equalizing force capable of reducing the heterogeneity among regions. We test the hypothesis that lack of mobility can be due (or, at least, is reinforced by) government policies. Using data for the last 35 years, we could not reject the hypothesis that the combination of successful targeting of housing policies and the prohibition to sell or rent subsidized houses effectively tied families to their original location and, thus, inhibited

migration. Since housing is primarily allocated to poor areas where unemployment is high and labor productivity low, workers could not arbitrage out spatial income differentials in an effective manner.

A second explanation to low mobility is based on agricultural subsidies given to low productivity crops. The government enacted price stabilization mechanisms for annual crops under the presumption that it would reduce uncertainty and help poor farmers. Beneficiaries concentrate in only three regions and are largely rich landowners and intermediaries. Low income producers benefit less because they are mostly limited by size and access to financial markets and they depend on credit given by intermediaries. In addition, few of these producers are legal owners to their land, so that they become

References

Andrienko**,** Y. and S. Guriev (2002): "Determinants of interregional mobility in Russia: evidence from panel data", Working Paper # 10, Center for Economic and Financial Research, Moscow.

Anríquez, G.; K. Cowan and J. de Gregorio (1998): "Poverty and Macroeconomic Policies: Chile 1987-1994", Working Paper # 27, CEA-U Chile, Enero.

Apey, A., B. Tapia, G. Guevara, J. Ramírez, and V. Solevilles (2001): "Agricultura Mapuche", Working Paper #6, ODEPA-CONADI, Santiago, Chile.

Aroca, P. and M. Bosch (2000): "Crecimiento, convergencia y espacio en las regiones chilenas" *Estudios de Economía*, 27(2):199-224.

Barro, R. and X. Sala-i-Martin (1991): "Convergence across States and Regions", *Brookings Papers on Economic Activity*, no. 1, pp. 107-182.

Barro, R. and X. Sala-I-Martin (1995): *Economic Growth*, McGraw Hill, Inc. New York.

Beyer, H. (1997): Distribución del Ingreso: Antecedentes para la Discusión", Estudios Públicos #65. Centro de Estudios Públicos, Santiago.

Bosworth, B.; R. Dornbusch and R. Labán (1994): *The Chilean Economy: Policy Lessons and Challenges*, The Brookings Institution, Washington, DC.

Cameron, G. and J. Muellbauer (1998): "The Housing Market and Regional Commuting and Migration Choices", mimeo, Nuffield College, Oxford.

Canova, F. and A. Marcet (1995): "The Poor Stay Poor: Non-Convergence Across Countries and Regions", *Centre for Economic Policy Research*, Discussion Paper No. 1265.

CIEPLAN-SUBDERE (1994): *Empalme de Cuentas Nacionales, por Regiones y Sectores Económicos*, Ministerio del Interior, Santiago, Chile.

Contreras, D.; O. Larrañaga, J. Litchfield, A. Valdés (2001): "Poverty and Income Distribution in Chile: 1987-1998. New Evidence", *Cuadernos de Economía*, 38(114):191-208.

Edwards, S. and A. Cox-Edwards (1987): *Monetarism and Liberalization: the Chilean Experiment*, Ballinger, Cambridge, MA.

Fuentes, R. (1997): "¿Convergen las regiones en Chile?", in *Estudios Empíricos sobre el Crecimiento en Chile*, F. Morandé and R. Vergara (eds). CEP-Ilades Georgetown University.

Fujita, M., Krugman, P. and Venables, A. (1999) *The Spatial Economy*, Cambridge: The MIT Press.

Gallego, F. and N. Loayza (2002): "The Golden Period for Growth in Chile: Explanations and Forecasts", Working Paper N° 146, Central Bank of Chile.

Goetz, S.J. (1999): "Migration and Local Labor Markets", in Scott Loveridge, ed., *The Web-Book of Regional Science*, published by the Regional Research Institute, Morgantown, WV, 1999

Greenwood, M. (1997): "Internal Migration in Developed Countries", *Handbook of Population and Family Economics*, Edited by: Mark K. Rosenzweig and Oded Stark, Elsevier-North Holland.

Industry Commission (1993): "Impediments to Regional Industry Adjustment", Report No. 35, Australian Government Publishing Service, Canberra.

Lindley, J.; R. Upward and P. Wright(2002): "Regional mobility and unemployment transitions in the UK and Spain", mimeo, Leverhulme Centre for Research on Globalisation and Economic Policy, University of Nottingham.

Loayza, N. and R. Soto (2002): *The Challenges of Economic Growth*, Central Bank of Chile, Santiago: Chile.

Lucas, R. E. (1988). "On the Mechanics of Economic Development." *Journal of Monetary Economics*, 22:3-42.

Lucas, R.E.. (2001): "Externalities and Cities", *Review of Economic Dynamics*, 4(2):245-274.

Lucas, R.E.B. (1997): "Internal Migration in Developing Countries", *Handbook of Population and Family Economics*, Edited by: Mark K. Rosenzweig and Oded Stark, Elsevier-North Holland.

Martínez, J. (1997): "Redistribución espacial de la población en Chile", *Notas de Población*, 25(65): 203-245.

Morandé, F. and R. Vergara (1997): *Estudios Empíricos sobre el Crecimiento en Chile*, CEP-Ilades Georgetown University.

Morandé, F.; R. Soto and P. Pincheira (1997): "Achilles, the Tortoise and Regional Growth in Chile", in *Estudios Empíricos sobre el Crecimiento en Chile*, F. Morandé and R. Vergara (eds). CEP-Ilades Georgetown University.

Parente, S. and E. Prescott (2000). *Barriers to Riches*, MIT Press, Cambridge, MA.

Riffo, L. (1999): "Crecimiento y Disparidades Regionales en Chile: Una Visión De Largo Plazo" *Estadística y Economía,* Segundo Semestre, pp. 129-152

Roeschman, J.A. (2002): "Banda de precios del trigo en Chile: Transferencia y efectos distributivos ", tesis de grado, Instituto de Economía, Pontificia Universidad Católica de Chile, unpublished.

Oyarzún, C. and I. Araya (2001): "Long Run Dynamics of Regional Growth in Chile", *Estudios de Economía*, 28(1):69-78.

Romer, Paul (1986). "Increasing Returns and Long-Run Growth," *Journal of Political Economy*, 94: 1002-37.

Sala-i-Martin, X. (1995): *Working Papers Series* 139, Universitat Pompeu Fabra.

Shioji, E. (1995): "Regional Growth in Japan 1995", *Working Papers Series* 138, Universitat Pompeu Fabra.

Silva, S. (1997): "Análisis de la evolución de la política habitacional", Informe BIP:20113980-0, Ministerio de la Vivienda, Santiago, Chile.

Solow, R. (1956). "A Contribution to the Theory of Economic Growth," *Quarterly Journal of Economics*, 70: 65-94.

Swan, T. (1956): "Economic Growth and Capital Accumulation" *Economic Record*, 32:334-361.

World Bank (2002): "Pobreza y Distribución del Ingreso en una Economía de Alto Crecimiento: 1987-1998, Dirección Sectorial de Reducción de la Pobreza y Gestión Económica para América Latina y el Caribe.