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ABSTRACT

Earnings Mobility in Argentina, Mexico, and Venezuela: Testing the Divergence of Earnings and the Symmetry of Mobility Hypotheses

This paper examines changes in individual earnings during positive and negative growth periods in three Latin American economies: Argentina, Mexico, and Venezuela. We ask whether those individuals who start in the best economic position are those who experience the largest earnings gains or the smallest earnings losses; this is the "divergent mobility" hypothesis. We also compare periods of positive economic growth with those of negative economic growth, asking whether those groups of individuals that experience large positive earnings gains when the economy is growing are the same as those that experience large earnings losses when the economy is contracting; this is the "symmetry of mobility" hypothesis. We find very occasional support for the divergent mobility hypothesis in scattered years in the cases of Mexico and Venezuela, and no support at all in the case of Argentina. Rather, earnings mobility is most frequently convergent or neutral in all three countries. As for the symmetry of mobility hypothesis, we find that it is rejected in most cases; rather, those groups that gain the most when the economy is growing are also the ones that gain the most when the economy is contracting. Furthermore, we explain how the absence of divergence is compatible with rising inequality in the countries under study.

JEL Classification: D31, J3, J6, O54

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1. Questions and contributions to the literature

Who gains the most income when economies grow? Who loses the most income when economies contract? Are those groups that gain the most income in good times the ones that lose the most income in bad times? Are these patterns of mobility related to changes in inequality over time? In this paper, we answer these questions for the changes in labor market earnings measured in local currency for three Latin American countries: Argentina, Mexico, and Venezuela.

Earnings mobility studies look at the same individuals or households, following them over time and gauging changes in their economic circumstances using panel data. To learn about earnings changes for identified individuals, we study the variations in patterns of individual earnings changes over a large number of one-year panels in each of the three countries. Throughout this paper, earnings mobility is measured as changes in labor market earnings in real local currency (Argentinean pesos, Mexican pesos, or Venezuelan bolivares).

We begin by asking who has larger earnings gains and smaller earnings losses: those individuals whose earnings were relatively high or those whose earnings were relatively low? We then ask whether the types of individuals that experience large positive earnings gains when the economy is growing are the same that experience large earnings losses when the economy is contracting. We answer this latter question both unconditionally and conditionally on a set of individual characteristics.

We formulate two hypotheses about the empirical patterns. The “Divergent Mobility Hypothesis” holds that the highest-earning individuals are the ones that experience the largest earnings gains and the smallest earnings losses, whether in good or bad times. The other hypothesis, the “Symmetry of Mobility Hypothesis,” holds that those groups that gain the most when the economy grows are the ones that lose the most when the economy contracts.

The study of mobility patterns in labor markets in developing economies is still a fresh area of research where much remains to be learned; for reviews of the developing country literature, see Baulch and Hoddinott (2000) and Fields (2001). There is a literature on income mobility in the three countries of this study (Freije, 2001; Wodon, 2001; Yitzhaki and Wodon, 2002; Albornoz and Menéndez, 2004a, 2004b, Maloney, Cunningham and Bosch, 2004; Antman and McKenzie, 2005; Sánchez-Puerta 2005; Duval-Hernández, 2006). However, to the extent that earnings gains and losses of different income groups in positive growth and negative growth periods have been studied in Argentina, Mexico, and Venezuela, the answers are based on comparable cross sections (e.g., IDB, 1999; Lustig and Székely, 1999; World Bank, 2004; Bourguignon, Ferreira, and Lustig, 2004). In this way, researchers have looked at anonymous individuals and households: those in the poorest 20% of the income distribution versus others, formal versus informal, and so on.

Argentina, Mexico, and Venezuela are chosen for our mobility study both for reasons of data availability and for inherent interest. The available data sets permit the same questions to be answered in each of the three countries. We are able to measure the changes in real earnings from a given month in one year to the corresponding month a year later. These one-year-long panels begin in 1996 for all urban Argentina, in 1987 for all urban Mexico, and in 1994 for all Venezuela. Moreover, each country has a large number of comparable panels - seven in the case of Argentina, fifty-six in the case of Mexico, and six in the case of Venezuela – ranging over widely different macroeconomic conditions.

Unfortunately, these economies experienced not only positive economic growth but severe economic downturns. The Argentinean economy experienced extraordinary macroeconomic variability. Having pegged its exchange rate to the dollar under a currency board type arrangement in 1991, Argentina had succeeded in ending hyperinflation, reducing inflation rates to single-digit levels, which led the country to be seen as a model of successful economic policymaking. Greater economic stability

attracted foreign investment inflows, contributing to an acceleration of economic growth; indeed, even as lenders withdrew their financing from East Asia in 1997, capital inflows continued into Argentina. Then, Argentina entered into a prolonged recession. The combination of the hard peg of the Argentinean peso to the U.S. dollar and excessive borrowing led to an unsustainable fiscal situation and, ultimately, to the collapse of the economy at the end of 2001. Gross Domestic Product fell by 13.5 percent in one year, and the share of the population in poverty reached 58 percent in October 2002 as compared with 38 percent a year earlier.

In the case of Mexico, the economy experienced an upward trend in real GDP from 1987 to 1994 thanks to the dynamism brought by the liberalization reforms implemented in those years. In particular, the private sector was allowed to play a more active role in the economy, trade liberalization was pursued, and inflation was controlled for the first time in many years. In December 1994, the Peso crisis hit the economy. After this crisis, output suffered a sharp downturn, from which it started rapidly recovering. Nevertheless, the pre-1994 aggregate output levels were not again reached until 1999. From 1999 onwards, the Mexican economy continued its growth, but by 2001-2002 a new recession had started due to the recession affecting the U.S. economy.

The Venezuelan economy was almost stagnant for the period under consideration. Instability of the oil market and political factors made the country unable to sustain economic growth for consecutive periods. Years of moderate economic growth were followed by moderate or severe contractions of economic activity. The positive growth years 1995 to 1997 were followed by the contractions from 1998 to 2000 that accompanied the incoming of a new administration after the 1998 elections. The economy recovered towards the end of 2000 thanks to favorable oil prices, but fell into deep recession in 2002 because of a serious political crisis due to a coup d’êtat and a general strike in the oil industry.

During this macroeconomic turmoil, relative income inequality was changing in the three countries. As shown in Figure 1, the Gini coefficient followed a rising trend followed by a leveling off in Argentina and Mexico and an inverted-V type of pattern in Venezuela.

The rest of the paper is structured as follows. Section 2 explains the mobility hypotheses in detail and their theoretical basis. Section 3 describes the data and the methodology used for testing the hypotheses. Section 4 presents the results and Section 5 the relationship between the tested hypotheses and inequality changes. Section 6 concludes.

2. Underlying Theories and Specific Hypotheses

Several theories underlie the divergence of earnings and the symmetry of mobility hypotheses. One theory is cumulative advantage, which posits that individuals with higher incomes and earnings in the base year experience the largest earnings gains (Merton, 1968; Boudon, 1973; Huber, 1998). Wealthier individuals' ownership of physical and human capital, access to social and political connections, and greater ability to borrow and save, could all contribute to cumulative advantage.

Complementing cumulative advantage in contributing to the divergent mobility hypothesis is the notion of poverty traps (Carter and Barrett, 2004; Chronic Poverty Research Centre, 2004; Sachs, 2005). According to this theory, those individuals who lack a minimum level of human, physical, and social assets are consigned to a life in poverty from which they cannot escape.

A third factor that may contribute to larger gains for the initially well-to-do compared with others is labor market twist. This idea holds that in an increasingly globalized and technology-dependent world, the demand for skills is outpacing the available supply, bidding up the earnings of skilled workers while lowering the relative earnings of the unskilled (Johnson, 1997; Gottschalk, 1997; Topel, 1997). Skill-biased technical change

would act to propel individuals with the highest human and physical capital endowments ahead the most.

Together, the first three factors reinforce one another. These three factors exemplify positive feedback, defined by Nobel laureate James Meade (1976, p. 155) as "self-reinforcing influences which help to sustain the good fortune of the fortunate and the bad fortune of the unfortunate."

A fourth factor operates in the opposite direction. According to the model proposed by Galton (1889), those who start above the grand mean tend to converge downward relatively, while those who start below the grand mean tend to converge upward relatively. Thus, those who have the highest incomes or earnings to start with are the ones who gain the least when growth is positive and lose the most when growth is negative.[1]

In this paper, we test four specific hypotheses concerning the patterns of earnings gains and losses in local currency (that is, pesos in Argentina and Mexico, or bolivares in Venezuela):[2]

> (H1) Divergence of Earnings, Unconditional Version: In any given year, the highest-earning individuals are those who experience the largest subsequent earnings gains or the smallest earnings losses.
>
> (H2) Divergence of Earnings for Different Population Groups, Unconditional Version: In any given year, the highest-earning groups of the population are those who experience the largest subsequent earnings gains or the smallest earnings losses.

[1] Galton's idea of reversion to the mean is equivalent to the concept of beta-convergence used in macroeconomics. In this paper, whenever we refer to convergence, we mean beta-convergence.

[2] Real earnings are used throughout.

(H3) Symmetry of Gains and Losses, Unconditional Version: Comparing positive growth and negative growth years, those groups for whom earnings changes are the most positive when the economy is growing are those for whom earnings changes are most negative when the economy is contracting.

(H4) Symmetry of Gains and Losses, Conditional Version: Other things equal, comparing the year with the most positive growth with the year of the most negative growth, those groups for whom earnings changes are the most positive when the economy is growing are those for whom earnings changes are most negative when the economy is contracting.

3. Data and Methodology

The data sources for the three countries are similar in a number of respects. In each case, the sample under investigation consists of men and women who were in the labor force both in a given survey and in a follow-up survey one year later. The dependent variable in each case is change in labor earnings from one year to the next. In each case, earnings are measured in real local currency (i.e., 1999 pesos for Argentina, 2002 pesos for Mexico, and 1996 bolivares for Venezuela). The explanatory variables (base-year reported earnings, longer-term earnings, gender, age, education, sector, and geographic region) are also similarly measured for the three countries. To capture earnings changes among workers and to exclude new labor force entrants and retirees, we limit the analysis to individuals aged 25 to 60 in the base year.

For Argentina, the data used come from the Encuesta Permanente de Hogares (Permanent Household Survey), a rotating panel following urban households throughout Argentina for a maximum of a year and a half. The survey is conducted in May and October each year in provincial capitals and areas with more than 100,000 inhabitants for a total of 28 urban areas. Argentina is predominantly urban (86%). The urban areas surveyed cover 61 percent of the country and 71 percent of urban areas. The survey contains detailed

questions on employment and incomes, together with information on household demographics, basic housing questions, and questions on education. The years available are 1996-97 to 2002-03 for all urban Argentina.

For Mexico, the data used come from the Encuesta Nacional de Empleo Urbano (National Urban Employment Survey), a survey conducted on Mexican urban households to trace urban labor market characteristics. This survey is a rotating panel with quarterly data for five periods. It is performed in the 48 main urban centers of the country; however, in order to maintain consistent geographical coverage over time, the present analysis is based only on the 16 cities that originally appeared in the 1987 panel. Mexico is predominantly urban (around 70% of the population lives in areas with 2,500 or more inhabitants). The urban areas surveyed cover around 60 percent of the overall urban areas in the country, but limiting the geographic coverage to the cities originally appearing in 1987 makes the actual coverage of the survey smaller. The ENEU contains information on employment, earnings and socio-demographic variables. The years available for these surveys are 1987 to 2002.

For Venezuela, the data source is the Encuesta de Hogares por Muestreo (Household Sample Survey). This survey has been conducted twice a year since 1969. For this study, the data run from 1994-95 to 1999-2000. It is a nationwide survey, initially intended for measuring unemployment and other characteristics of the Venezuelan labor market.[3] Currently, the EHM is a multipurpose survey that includes questions not only about labor market variables such as labor force participation, earnings and unionization but also about family composition and physical characteristics of dwellings. Every six months, one sixth of the sample is replaced by a new set of households from the same sampling cluster. This feature enables researchers to produce panel data for those dwellings that remain in the sample up to a maximum of six observation data points.

[3] Since 1997, the Venezuelan sample does not separate urban from rural households. However, according to the Venezuelan National Statistics Institute, the sample is nationally representative.

In this paper, we study one-year mobility for each country, i.e., change in earnings for the same individuals from a given month in one year to that same month a year later. The data for one-year mobility are analyzed in a number of ways, depending on the hypothesis being tested. The tests of divergence are based on a) a pooled sample, which uses all of the one-year-long panels, as well as b) each individual panel. The tests of unconditional symmetry involve a comparison of all of the positive-growth years with all of the negative-growth years. Finally, the tests of conditional symmetry compare regressions for the largest positive growth period and the most negative growth period in each country

Three methods are used to answer our questions and test the various hypotheses. For the unconditional analysis, we start with mobility profiles. Mobility profiles are tables showing the unconditional relationship between earnings change and the categories of individual explanatory variables such as base-year reported earnings quintile, gender, and so on. Because the data are unconditional, mobility profiles are the mobility equivalent of poverty profiles.[4]

For the unconditional analysis, we also perform simple regressions of real earnings changes measured in local currency on two measures of initial earnings, initial reported earnings $Y_{i,t-1}$ and an estimate of longer-term earnings $\hat{Y}_{i,t-1}$:

$$\Delta Y_{i,t} = \alpha + \beta Y_{i,t-1} + u_{i,t} \qquad (1)$$

and

$$\Delta Y_{i,t} = \alpha + \beta \hat{Y}_{i,t-1} + u_{i,t}\,. \qquad (2)$$

Regression (1) gives an estimate of the convergence between initially rich and poor individuals classified according to initial reported earnings. If $\beta<0$ there is such convergence, if $\beta>0$ there is divergence between rich and poor, and if $\beta=0$ earnings

[4] If earnings are measured with error, part of this measurement error should be eliminated by averaging across individuals in a given group. The only part of measurement error that would prevail then would be a group-specific measurement error component.

change is unaffected by initial earnings (i.e., rich and poor individuals gain or lose the same average amount in local currency units over time).

Regression (2) relates earnings mobility to a measure of longer-term earnings of the individual, $\hat{Y}_{i,t-1}$.[5] The reasons for performing this exercise are twofold. First, even if in the first regression we find a negative relationship between earnings change and initial earnings, such a finding could be the result of earnings in any given year adjusting back to their longer-term levels. By approximating longer-term earnings, we eliminate this possibility of capturing mobility related to such transitory adjustments, and instead we estimate the relationship between yearly earnings mobility and a more permanent measure of individual earnings. Second, by predicting initial earnings with a set of socioeconomic characteristics and using this prediction in our mobility equation (2), we eliminate the potential biases that might arise due to the presence of measurement error in the earnings variable. It has been shown elsewhere (e.g., Fields et al., 2003a; Duval Hernandez, 2006; Gottschalk and Huynh, 2006) that if earnings are measured with error, OLS estimation of equation (1) could indicate convergence in incomes (i.e $\hat{\beta}_{OLS} < 0$) even if the true β were equal to zero.

Longer-term earnings $\hat{Y}_{i,t-1}$ are predicted using a linear regression based on time-invariant characteristics and correlates of longer-term income. In the case of Argentina, these variables are the individual's age and its square, years of education and its square, gender, and dwelling characteristics including dwelling ownership, number of rooms, and a measure of comforts including access to sewers, running water, and electricity. For Mexico, they are the individual's age and its square, years of education and its square, gender, cluster average earnings, and after the third quarter of 1994, dwelling characteristics including dwelling type (i.e., house, apartment, room, etc.), construction material for roofs, floors and walls, presence of a kitchen, and several measures of services including access to sewers, running water, electricity, telephone line, among

[5] The methodology used to construct this estimate of longer-term earnings is detailed in the next paragraph.

others). And for Venezuela, the determinants of longer-term earnings are age and its square, education and its square, gender, and an informal sector dummy. [6]

By using these variables in the first-stage prediction, we capture the component of earnings that is associated with characteristics that are *permanently attached* to the individual. Notice that by proceeding this way, we allow $\hat{Y}_{i,t-1}$ to vary over time. For instance, if the returns to education increase, then so it will $\hat{Y}_{i,t-1}$ for highly-educated individuals. However, by using this predicted measure in the mobility equation (2) we manage to filter out the effects of transitory income shocks and measurement error.

In summary, initial reported earnings differ from longer-term earnings for two reasons: short-term income changes and measurement error. Regardless of whether this measurement error is of the classical variety (that is i.i.d. with mean zero, independent of any other household or personal characteristics, and independent of the error terms in the regression models) or is correlated with the true value of earnings, serious biases can arise if the measurement error is ignored.[7] In general, without further imposition of specific autocorrelation structures, it is not possible to disentangle a) true short-term differences in earnings from their longer-term values from b) differences between reported earnings and true earnings in any given year. Nonetheless, the first-stage prediction will lead to unbiased measures of mobility (with respect to longer-term earnings), even when measurement error follows a more complicated structure such as the ones described in the previous footnote.[8]

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[6] In addition to this particular instrumental variables method, five other prediction methods were also used based on different groups of predicting variables and also accounting for the self-selection of workers into the sample. However, all these methods gave answers similar in nature to the ones described in the text, and for this reason the results are not reported in this paper.

[7] The literature notes that a negative correlation between measurement error and true earnings might arise if richer households are reluctant to report their full incomes and if poorer households tend to overstate their incomes. Also, serial correlation in the measurement error would occur if particular households systematically under- or over-report their income. For thorough analyses of the measurement error issue, see Bound, Brown, and Mathiowetz (2001) and Gottschalk and Huynh. (2006).

[8] See Duval-Hernández (2006) for a proof of this result.

An alternative method that could be used is to approximate the individual longer-term earnings by averaging individual earnings over all the periods observed in the panel. The advantage of this method is that it would capture the advantage brought about both by observable factors (like age, education, gender, etc.) and by unobservable time-invariant characteristics (e.g. ability, social capital, etc.). This method will work best if the panel has many observations per individual (i.e. if T is large) and if these observations are spaced widely over time. Under these conditions the effects of transitory income fluctuations and measurement error would be averaged out and their impact would be minimal. We chose not to follow this route because in our case T is not very large and the time observations are close to one another.[9]

It bears mention that other methods for dealing with measurement error may be found in the literature. These include so-called validation studies, which use administrative data in place of survey data (Bound, Brown, and Mathiowetz, 2001; Dragoset and Fields, 2006), instrumenting using either second measurements of earnings or variables that are caused by earnings (Glewwe, 2005), and constructing pseudo-panels and tracking the mobility of average cohort earnings (Antman and Mckenzie, 2005). We could not do the first two options.[10] We chose not to do the third because we were interested in the mobility that takes place within cohorts, something that is lost by this type of analysis.[11]

Finally, for the conditional analysis, we estimate multiple regressions. The change in earnings from one year to the next (ΔY) is regressed on initial reported earnings (in pesos

[9] For Mexico there are 5 quarterly observations per individual (leaving aside attritors in the intermediate quarters) and for Argentina there are 4 semi-annual observations. In both countries, the aforementioned exercise gives virtually the same results as the ones observed with the regression based approach. For details see Duval-Hernandez (2006) and Sánchez Puerta (2005) respectively. For Venezuela, an experiment using the average income over the two-semester panel ended with qualitatively the same results as when using predicted income.

[10] For the Latin American economies under study, administrative data that can be matched to panel surveys are not yet available, and therefore no such analyses could be performed.

[11] The pseudo-panel method might still lead to biases if there is time-varying cohort-level measurement error. Also the pseudo-panel analysis can entail certain biases in that it might fail to track a consistent group of individuals over time due to reasons like migration, deaths, and household dissolution and creation. For a critique of these methods in mobility studies, see Deaton (1997, p. 120).

or bolivares), gender, age, education, sector transition, and region using Ordinary Least Squares. Earnings variables are used in continuous form. The regression equation is

$$\Delta Y_{i,t} = \Delta X_{i,t}\phi + Z_i\gamma + \delta Y_{i,t-1} + \varepsilon_{i,t}, \qquad (3)$$

where ΔX denotes sector transitions, Z denotes time-invariant characteristics like gender, age, education, and region, and $Y_{i,t-1}$ is base-year earnings measured in local currency units.[12] The variables used on the right-hand-side of (3) are the following. Gender is a binary variable taking on the value one for men and zero for women. Age is grouped into three categories in the mobility profiles; it is entered linearly and quadratically in the regressions. Education is grouped into three or four categories in the mobility profiles depending on the country; years of education are included linearly and quadratically in the regressions. Sector of employment is grouped into three categories (formal, informal, and unemployed) in both base year and final year. The precise definitions of sector of employment vary from country to country. In Argentina, the formal sector consists of 1) workers who have all legislated benefits (pension, paid vacation, etc.), 2) employers in firms with more than five employees, and 3) self-employed workers with more than a secondary education. In Mexico, an individual is classified as a worker in the informal sector if the firm for which s/he worked was not registered in any way with the government (e.g., did not pay taxes, did not a have license to operate, etc.) or if the individual worked in a firm with fewer than five employees and received no fringe benefits or social security coverage. In Venezuela, an individual is informal if s/he is a self-employed non-professional worker, or if s/he is a worker in an enterprise employing fewer than five workers. Sector transition is a nine-category variable: remaining formal, moving from formal to informal work, etc. In the regressions, the omitted category is

[12] We do not run the analog to equation (3) using predicted earnings $\hat{Y}_{i,t-1}$ in place of initial reported earnings $Y_{i,t-1}$ for two reasons. First, we believe that predicted earnings are approximating longer-term earnings and not initial earnings, and so the conditional equation would have no clear interpretation. Second, given that many of the variables used to predict $\hat{Y}_{i,t-1}$ are included in *X* or *Z*, multicollinearity would likely arise if $\hat{Y}_{i,t-1}$, *X*, and *Z* were all included.

remaining unemployed. Region is a grouping of five to eight geographic areas depending on the country.

4. Results

In what follows, we present the results of our study for each of the hypotheses posited in Section 2. After that, in Section 5, we reconcile these results on mobility with the evolution of inequality for the countries under study.

4.1. Divergence of Earnings, Unconditional Version

The unconditional divergence hypothesis holds that in any given year, the highest-earning individuals are those who experience the largest earnings gains or the smallest earnings losses in local currency. The hypothesis tests for initial reported earnings are presented in the top panel of Table 1 utilizing pooled data (i.e., data for all years taken together). In this table, the dependent variable is earnings change, and the explanatory variables are dichotomous variables for different groups of the population. We see that in all three countries, the higher is initial reported earnings quintile, the lower is the change in earnings. The null hypothesis of equality of means across the five quintiles (H_{02}) is rejected at the 1% level of significance.

As a second test of the unconditional divergence hypothesis, a linear specification is used and earnings change is regressed on initial reported earnings for each country for each year. These point estimates, along with their 95% confidence intervals, are reported in the left-hand graphs of Figure 2. In all years for all countries, the regression coefficient is significantly negative with one exception.[13] Thus, when initial reported earnings are

[13] The one exception is the 1996 panel for Venezuela, in which the coefficient is statistically insignificant. Venezuelan household surveys have two different rotation patterns. Out of eight regions, six of them are rotated every six semesters and the other two every four semesters. In the panel for the period 1996-1997, observations from only two regions could be matched. Consequently, the panel for such period does not

used, in all three countries, it is those with the lowest initial reported earnings who exhibit the largest average earnings gains in local currency. The unconditional version of the divergence hypothesis for initial reported earnings is decisively rejected.

As noted above, this negative relationship between earnings change and initial earnings could be the result of earnings in any given year adjusting back to their longer-term levels and also could be reflecting a biased estimation due to measurement error. Accordingly, longer-term earnings are approximated using the prediction method described earlier. Earnings changes are then regressed on predicted earnings for each panel. The regression coefficients for this exercise are plotted in the right-hand graphs of Figure 2.[14]

The results using predicted earnings differ qualitatively from the results for initial reported earnings and also differ across the three countries. In the case of Argentina, earnings change is usually related significantly to predicted earnings, and all of the significant coefficients are negative. Thus, in Argentina, the results using predicted earnings confirm the results using initial reported earnings: divergence is rejected in favor of convergence. However, in the case of Mexico, earnings change is related significantly to predicted earnings only occasionally, and the coefficients change sign. Thus, in Mexico, convergence always appears for initial reported earnings; but for predicted earnings, the earnings changes are significantly convergent in a small number of cases, especially after the 1994 Peso crisis, significantly divergent in a small number of cases, and insignificant in the great majority of cases. Finally, in the case of Venezuela, the results for predicted earnings are mixed: earnings change is significantly negatively related to predicted earnings in two years, significantly positively related to predicted earnings in two years, and insignificant in two years. These results for predicted earnings contrast with the results for initial reported earnings in Venezuela: initial reported earnings are significantly negatively related to earnings change in all years but one.

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have observations from every region of the country, as the other panels do. Therefore, the panel for this period is systematically different from others.

[14] As previously mentioned, the results for the five other methods are qualitatively similar. The graphs are omitted to save space.

In sum, in our three countries, the divergence hypothesis for earnings receives no support at all when using initial reported earnings and only infrequent support when using predicted earnings. In the great majority of cases, the relationship is significantly convergent. Convergence means that the lower-income people gain more or lose less than others in currency units. Note well the meaning of statistical insignificance in this context: it signifies that workers at different points in the income distribution experience average earnings gains or losses in pesos or bolivares that are not significantly different from one another.

4.2. Divergence of Earnings for Different Population Groups, Unconditional Version

Our second hypothesis is also an unconditional one. It holds that in any given year, those groups in the population that appear to be initially advantaged (in terms of earnings) are those who experience the largest earnings gains or the smallest earnings losses in local currency. In any given year, in all three countries, the highest-earners are men, the middle-aged, the better-educated and formal sector workers. In addition, each country displays significant regional differences.

Returning to Table 1, we find very limited evidence in favor of divergence for the higher-earning groups. Specifically: In all three countries, men exhibit significantly more negative earnings changes. The young exhibit changes that are significantly more positive or less negative in Argentina and Mexico (but not significantly so in Venezuela). Those with the most schooling have changes that are significantly more negative for Argentina and Mexico but significantly more positive for Venezuela. Those who started informal lose significantly more in Venezuela and lose significantly less in Argentina. In Mexico, initial sector does not appear to be as important a determinant of earnings change as is the destination sector. In this case, transitions into the informal sector are usually associated with earnings losses. Finally, to test for a regional pattern, for each country, we correlate mean earnings change in a region with mean earnings level in that region. The results show a correlation coefficient of +0.39 (significance level = 0.44) in Argentina, a

correlation coefficient of +0.11 (significance level = 0.86) in Mexico, and a correlation coefficient of +0.12 (significance level = 0.78) in Venezuela. Thus, there is no significant tendency for workers in the initially richer regions to experience more positive earnings changes than do workers in the initially poorer regions.

In sum, the three countries exhibit somewhat different patterns. In Argentina and Mexico, when we identify the initially advantaged groups in terms of their mean earnings levels, the divergence hypothesis is rejected in favor of convergence or neutrality. Similar patterns appear for the most part in Venezuela; but in contrast to Argentina and Mexico, Venezuela exhibits significant divergence by education and by labor market sector.

4.3. Symmetry of Gains and Losses, Unconditional Version

As already discussed, our three countries all experienced periods of economic growth as well as periods of economic decline. The third and fourth hypotheses are that when positive growth and negative growth years are compared, those groups for whom earnings changes are the most positive when the economy is growing are those for whom earnings changes are the most negative when the economy is contracting. Unconditional and conditional tests of this hypothesis are presented in turn.

We adopt the following terminology. The pattern of gains and losses described above - when those who gain significantly more when the economy is growing are those who lose significantly more when the economy is contracting – is termed “symmetric.” Alternatively, if the same groups gain significantly more regardless of whether the economy is growing or contracting, the pattern of gains and losses is said to be “structural.” A third possibility is that the gains for different groups are not significantly different from one another in positive growth and/or in negative growth periods; such a pattern is said to be “insignificant.” Finally, if the results for different countries are mixed, we will say that there is “no pattern.”

Beginning with the unconditional tests, the results appear in Tables 2A-C. Empirically, we find that the results vary depending on the country and the variables analyzed. Specifically:

- By initial reported earnings quintile, the pattern is structural in all three countries. In Argentina and Mexico, earnings changes fall significantly as earnings quintile rises, both in positive growth and in negative growth periods. In Venezuela, however, changes in the first quintile are not as positive as in the second, but otherwise the pattern is monotonically decreasing, as in the other two countries.
- By gender, there is no pattern across countries. In Argentina and Mexico, men's changes are significantly less positive or more negative than women's in both positive growth and negative growth periods. In Venezuela, though, men's changes are significantly better than women's in positive growth periods and significantly worse than women's in negative growth periods.
- By age, there is no significant pattern in most of the cases. In Argentina, the young lose less than others in negative growth periods, but there is no statistically significant difference by age in positive growth periods (insignificant pattern). In Mexico, the young gain more or lose less than others both in positive and negative growth periods (structural pattern). In Venezuela, the differences in earnings changes by age are not significant in either positive growth or negative growth periods (insignificant). In no country does significant symmetry hold.
- By education, there is no pattern across countries either. In none of the three countries is the pattern symmetric or structural. In positive growth periods, earnings change rises with education in Venezuela, no significant relationship is found between education and earnings change in Argentina, and in Mexico these variables appear to be related by an inverted u-shaped pattern. In negative growth periods, those with higher education have the most negative changes in Argentina and Mexico, while in Venezuela, it is those with secondary education who have the most negative changes.
- By sector transition, the pattern is structural. In Argentina, those who started informal have significantly better earnings changes than those who started formal

in both positive growth and negative growth periods. In Mexico, the pattern is structural in the sense that those moving into the formal sector experience more positive (or less negative) changes than those moving into the informal sector. In Venezuela too, the pattern is structural, though in a different way: those who transited from informal to formal jobs had poorer changes in both positive growth and negative growth periods; those who remained within sectors exhibited intermediate changes in both positive growth and negative growth periods; and those who transited from formal to informal employment had the best changes in positive and negative growth periods.

- By region: The pattern is insignificant. To test whether the earnings changes across regions in positive growth periods are associated with those in negative growth periods, we correlated the two sets of regional mean changes. The correlation coefficients were -0.69 in Mexico (significance level =.20), -0.17 in Argentina (significance level = 0.91), and -0.56 in Venezuela (significance level = 0.15). Thus, the pattern of earnings changes is not significantly associated with region in any of the three countries.

In summary, comparing positive growth and negative growth years, symmetry receives the scantest of support: for only one variable in one country (gender in Venezuela) is the pattern symmetric. Otherwise, when statistically significant patterns are found, they are largely structural. Therefore, of the six variable groups in the three countries, the unconditional version of the symmetry of mobility hypothesis is overwhelmingly rejected.

4.4. Symmetry of Gains and Losses, Conditional Version

The fourth hypothesis is that *holding other things equal*, when positive growth and negative growth years are compared, those groups for whom earnings changes are the most positive in local currency when the economy is growing are those for whom earnings changes are the most negative when the economy is contracting. In each

country, we test this hypothesis by comparing the year with the most positive economic growth with the year with the most negative economic growth. These growth rates were +8.1% and -13.5% for years 1997 and 2002, respectively, in Argentina; +8.4% and -8.0 for years 1999 and 1994 in Mexico; and +4.6% and –4.2% for years 2000 and 1999 in Venezuela.[15] Conditional tests of the symmetry of gains and losses hypothesis are performed using initial reported earnings in continuous form, gender (1 if male), years of education and its square, age and its square (not reported), sector transition (with those who remain unemployed as the omitted category), and regional dummies. The results are presented in Table 3.

The general result is that the conditional patterns are overwhelmingly structural – that is, holding everything else constant, those who experience the most positive or least negative gains when the economy is growing are also those who experience the most positive or least negative gains when the economy is contracting. Specifically, the conditional patterns are:

- By initial reported earnings: The relationship between initial reported earnings and earnings change is significantly negative in all three countries, i.e., those with the highest initial reported earnings experience the worse changes conditionally (structural).
- By gender: Men have significantly higher conditional earnings changes than women in all three countries (structural).
- By education: When the partial derivative of ΔY with respect to education is evaluated at the mean years of education, those with more education have significantly larger earnings gains conditionally in all three countries (structural).
- By sector transition:
    - Among the stayers, formal-formal and informal-informal are significantly positive conditionally in all three countries (structural).

[15] For Venezuela, these are the highest growth and deepest recession years which have the same panel structure.

  - Among the movers, informal-formal and formal-informal are significantly positive conditionally in all three countries (structural).

- By region: In Argentina, no region coefficient is significant in both positive growth and negative growth periods. In the case of Mexico, the U.S. Border region exhibits conditional gains in the growth period and no statistically significant losses in the recession period, while the other regions exhibit losses during the recession year and no significant gains during growth. This pattern can be interpreted as a structural one. Similarly for Venezuela, the Andean and Western regions perform consistently below the Capital region both in growth and recession years. Region is therefore insignificant in Argentina and structural in Mexico and Venezuela in the conditional analysis.

In summary, contrary to the conditional symmetry of gains and losses hypothesis, the conditional results demonstrate an overwhelmingly structural pattern. The one exception is region in the case of Argentina, which is insignificant.

4.5. Additional Results for Venezuela

For the Venezuelan case, using panel data that spans five consecutive semesters (i.e., from the second semester of 1998 to the second semester of 2000), it is possible to test the divergence and symmetry hypotheses making use of observations on the same individuals in both a negative growth period (1998-1999) and a positive growth period (1999-2000). We find that when the exact same people are compared in a negative growth and a positive growth year, the divergence and symmetry hypotheses are decisively rejected. Details are available in an unpublished appendix available from the authors upon request.

5. Reconciling Mobility and Inequality

The reader may have noticed a seeming contradiction. In the introduction, we reported that cross-sectional inequality (as measured by the Gini coefficient) has had its ups and

downs in each of our three countries, trending up in Argentina and Mexico and following an inverted-v curve pattern in Venezuela. However, we have also found that the mobility patterns are rarely divergent in the panel data analysis. The cross-sectional inequality finding means that those anonymous individuals at the upper end of the earnings distribution gained at least as much in percentage terms, and therefore much more in pesos or bolivares, than those at the lower end of the earnings distribution. On the other hand, the mobility evidence compiled from analysis of panel data means that among those particular individuals who are followed over time, those who started at the lower end of the earning distribution gained at least as much in pesos or bolivares as those who started higher in the earnings distribution. How can these two findings be reconciled?

It is important to note, contrary to what many observers may believe, that mobility and inequality change imply nothing about each other. The following example illustrates this point. Take an economy with two individuals, whose initial incomes are $1 and $3. Suppose the economy grows and the new incomes are $1 and $5. Clearly, inequality has increased in the course of economic growth, but what happened to mobility? With anonymous data, we cannot know. With panel data, and adopting the notational convention that individuals (denoted by Greek letters) are ordered from lowest initial income to highest initial income in both the initial income vector and final income vector, there are two underlying possibilities:

Case I: $(1, 3) \rightarrow (1, 5)$

$\alpha, \gamma \qquad \alpha, \gamma$

Case II: $(1, 3) \rightarrow (5, 1)$

$\alpha, \gamma \qquad \alpha, \gamma$

In our terminology, mobility is “divergent” in Case I and “convergent” in Case II. In the terminology of macroeconomics, Case I is β-divergent, Case II is β-convergent, and both are σ-divergent (Lichtemberg, 1994).

How much of the change in inequality is due to convergent mobility? If we measure inequality by the variance of income, an exact decomposition can be performed to address this question.[16] Start with the identity:

$$y_1 = y_0 + \Delta y.$$

Take the variance of both sides:

$$v(y_1) = v(y_0) + v(\Delta y) + 2\mathrm{cov}(y_o , \Delta y).$$

Subtract $v(y_0)$ from both sides and divide by $v(y_0)$:

$$\%\Delta v(y) = \frac{v(\Delta y)}{v(y_0)} + \frac{2\,\mathrm{cov}(y_0, \Delta y)}{v(y_0)} = \frac{v(\Delta y)}{v(y_0)} + 2\beta ,$$

where β is the parameter obtained from an OLS regression of earnings mobility on initial earnings. Then, divide by $\%\Delta v(y)$ to get:

$$100\,\% = \frac{v(\Delta y)}{\Delta v(y)} + \frac{2\beta}{\%\Delta v(y)}. \qquad (4)$$

The first term on the right hand side of (4), $\frac{v(\Delta y)}{\Delta v(y)}$, tells us what share of the change in inequality is due to the inequality of income changes; the second term $\frac{2\beta}{\%\Delta v(y)} \equiv s_m$ tells us what share of the percentage change in inequality is due to divergence from or convergence to the grand mean (as measured by the parameter β).[17]

[16] We thank Peter Gottschalk of Boston University for suggesting this decomposition to us.

[17] As an additional remark, as an alternative decomposition, it can be shown that the proportional change in inequality can be decomposed into 1) a convergence effect and 2) a term that reflects the change in

To illustrate what such a decomposition can yield, consider first the hypothetical cases presented earlier:

Case I: (1, 3) → (1, 5)

α, γ α, γ

Case II: (1, 3) → (5, 1)

α, γ α, γ

In Case I, $\beta_I = 1$, $\%\Delta v(y)_I = 3$, and so $s_m = \frac{2\beta_I}{\%\Delta v(y)_I} = +67\%$. That s_m is positive means that mobility, which in this case is divergent, contributes positively to the increase in inequality in Case I. That s_m is less than one means that the divergent mobility accounts for part but not all of the increase in inequality. On the other hand, in case II, $\beta_{II} = -3$, $\%\Delta v(y)_{II} = 3$, and so $s_m = \frac{2\beta_{II}}{\%\Delta v(y)_{II}} = -200\%$. That s_m is negative means that convergence alone would have reduced inequality. However, the dispersion of income changes more than compensated for convergent mobility and hence inequality increased.

Turning now to the actual empirical results for our three countries, the calculated values of s_m are displayed in Figure 3. The three country graphs are substantially similar in two important respects. The first is that the values of s_m are sometimes positive and sometimes negative. The second is that the magnitudes of s_m are in the same range.

To understand the first similarity, recall that $s_m = \frac{2\beta}{\%\Delta v(y)}$. The convergence parameter β is always negative. On the other hand, numerous instances of rising variance are found,

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inequality that would have been observed had each income group experienced the same earnings change on average (though with iid shocks within each):

$$\frac{\Delta v(y)}{v(y_0)} = \beta(\beta + 2) + \frac{v(u_1)}{v(y_0)}.$$

as are numerous instances of falling variance. The object of interest s_m is the ratio of a term that is always negative to a term that is sometimes positive and sometimes negative, which is why s_m changes sign.

The second similarity is that the magnitudes of s_m are for the most part in the range of +15% to -15%. These relatively small values of s_m indicate that most of the change in inequality is accounted for by the first term $\frac{v(\Delta y)}{\Delta v(y_0)}$, which captures the variance of income changes. In other words, while the central tendency is for higher-income individuals to lose relative to lower-income individuals ($\beta < 0$), the variance in individual changes is very large relative to this central tendency. It is this large variance in individual changes from one year to the next – some low-income individuals moving way up in an earnings distribution that is often becoming more unequal and some high-income individuals moving way down in the distribution – that reconciles the mobility and inequality results.

6. Conclusions

In this paper, we have asked who gains the most in local currency when economies grow, who loses the most when economies contract, and whether those who gain the most in good times are the ones that lose the most in bad times. The "Divergent Mobility Hypothesis" holds that the highest-earning individuals or groups are the ones that gain the most and lose the least, whether in good times or in bad. The "Symmetry of Mobility Hypothesis" holds that those groups that gain the most when the economy grows are the ones that lose the most when the economy contracts.

Our results for Argentina, Mexico, and Venezuela offer virtually no support for either hypothesis. Specifically, our major findings were:

1. The divergence of earnings hypothesis states that in any given year, the highest-earning individuals are those who experience the largest earnings gains and the smallest earnings losses in local currency. This hypothesis receives very limited support for predicted earnings (which approximate longer-term earnings) and no support at all for initial reported earnings. The evidence in favor of divergence in Mexico is that in two panels out of fifty-six earnings changes are found to be related statistically significantly positively to predicted earnings. In the case of Venezuela, earnings change is positively and significantly related to predicted earnings in two panels out of six. In the case of Argentina, a significant positive relation is never found. When initial reported earnings are used, we find in all three countries that it is those with the smallest initial reported earnings who exhibit the largest earnings gains and the smallest earnings losses in local currency, which is exactly contrary to the divergent mobility hypothesis. In sum, the divergence of earnings hypothesis receives very scant support for certain years in the cases of Mexico and Venezuela and no support at all in the case of Argentina.

2. The divergence of earnings hypothesis for different population groups states that in any given year, the highest-earning groups in the population are those who experience the largest earnings gains or the smallest earnings losses. The three countries exhibit somewhat different patterns from one another. In Argentina and Mexico, the divergence hypothesis is rejected, as it was for initial reported earnings and for the most part for predicted earnings, which does not mean that convergence holds either. In Venezuela, there is significant divergence by education and by labor market sector.

3. Unconditional symmetry of mobility is the hypothesis that when positive growth and negative growth years are compared, those groups for whom earnings changes are the most positive in pesos or bolivares when

the economy is growing are those for whom earnings changes are the most negative when the economy is contracting. Unconditional symmetry is found for only one variable in one country (gender in Venezuela). Rather than symmetry, we find that a) the evidence is structural for some variables in some countries ("structural" means that certain groups gain more than others regardless of whether the economy is growing or contracting), b) insignificant for some variables in some countries, and c) the patterns differ for some variables across the three countries. Therefore, the unconditional version of the symmetry of mobility hypothesis is overwhelmingly rejected.

4. Conditional symmetry of mobility is the hypothesis that, other things equal, those groups for whom earnings changes are the most positive in pesos or bolivares when the economy is growing are those for whom earnings changes are the most negative when the economy is contracting. The results demonstrate an overwhelmingly structural pattern, so the conditional symmetry of mobility hypothesis is also rejected.

Overall, the panel data analysis performed in this paper presents a picture of economic growth and decline that favor the low earners to a much greater extent than what one would have gotten from cross-sectional inequality comparisons. We have found that much can be learned by analyzing panel data, knowledge that would not have been obtained by analyzing comparable cross sections. In the future, researchers would do well to perform both panel data analysis and cross-section analysis. Both types of analysis are meaningful. They are, however, different from one another.

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Table 1
Mobility Profiles, All Years Pooled

Pooled Data: Unweighted Average of Reported Earnings Changes by Initial Position
Dependent Variable: Change in Reported Earnings

Pooled	**Argentina**				**Mexico**				**Venezuela**			
	Mean	Std.Dev.	Obs	H01	Mean	Std.Dev.	Obs.	H01	Mean	Std.Dev.	Obs.	H01
Total Population	-28.1	541.4	55483	***	-45	5,177.7	236931	***	-2,566	98,769	48824	***
By Base Year												
Reported Quintile	H_{02}: ***				H_{02}: ***				H_{02}: ***			
Lowest Quintile	238.8	508.9	11429	***	1,006	2,269.7	47397	***	16,346	47,113	17856	***
Quintile 2	6.6	215.5	11837	***	558	2,207.2	47380	***	32,131	66,761	3146	***
Quintile 3	-27.3	246.7	11615	***	399	2,614.6	47382	***	5,944	57,085	10418	***
Quintile 4	-67.5	335.7	10178	***	125	3,482.1	47402	***	-6,849	70,877	9126	***
Highest Quintile	-322.7	937.1	10424	***	-2,312	9,912.5	47370	***	-62,468	190,934	8288	***
By Gender	H_{02}: ***				H_{02}: ***				H_{02}: ***			
Men	-35.6	612.5	34862	***	-68	5,780.4	167472	***	-4,209	13,132	21396	***
Women	-15.5	392.9	20621	***	11	3,298.4	69459		-1,287	62,574	27438	**
By Age	H_{02}: ***				H_{02}: ***				H_{02}:			
25-36 yrs	-16.7	425.0	21637	***	30	4,399.9	116250	**	-1,576	82,412	21336	***
37-48 yrs	-33.1	582.8	21883	***	-107	5,667.2	83697	***	-3,221	108,885	18166	***
49-60 yrs	-39.7	641.3	11963	***	-138	6,178.7	36984	***	-3,559	111,537	9332	***
By Education Level	H_{02}: ***				H_{02}: ***				H_{02}: ***			
No Schooling[1]									-1,533	43,854	3456	
Primary or less	-17.8	325.2	19587	***	4	3,352.9	93450		-3,002	83,627	30308	***
Secondary	-25.8	447.8	21465	***	-16	4,349.0	91936		-4,072	101,662	8957	***
Higher	-45.6	827.5	14431	***	-183	8,311.9	51545	***	1,211	164,360	6113	
By Sector												
Transition	H_{02}: ***				H_{02}: ***				H_{02}: ***			
Informal to Formal	-8.5	609.2	4618		-36	6,232.9	14335		-8,825	112,198	2718	***
Informal to Informal	-17.9	451.6	18507	***	-96	4,996.0	63459	***	-4,485	114,798	10834	***
Formal to Formal	-35.1	614.7	18968	***	5	4,918.1	136850		-4,336	115,744	14598	***
Formal to Informal	-47.9	635.3	4678	***	-199	6,688.7	15663	***	3,527	130,934	3169	**
By Region[2]	H_{02}:				H_{02}: **				H_{02}: ***			
Region 1	-19.5	579.7	8058	***	-64	5,368.3	30304	*	-3,790	136,360	8584	***
Region 2	-28.0	551.8	17801	***	-118	5,692.8	39456	***	-5,378	72,285	3721	***
Region 3	-31.2	512.0	6692	***	0	5,513.5	81636		-3,043	112,890	11719	***
Region 4	-33.5	532.0	6640	***	-40	4,403.4	72638	**	-4,428	72,700	3883	***
Region 5	-31.2	518.8	9999		-84	4,897.8	12897	*	-2,849	62,327	7974	**
Region 6	-25.7	536.6	6293	***					3,246	90,592	6973	***
Region 7									-2,705	81,891	4117	*
Region 8									-4,693	78,052	1863	**

***, **, * H_{0j} rejected at 1, 5, 10% of significance

H_{01}: mean equal to zero

H_{02} : equality of means by groups

[1] No Schooling is a relevant enough category to be on its own only in Venezuela

[2] For Argentina Region 1: Greater Buenos Aires, Region 2: Pampeana, Region 3: Patagonia, Region 4: Noreste, Region 5: Noroeste, Region 6: Cuyo
For Mexico Region 1: Mexico City, Region 2: Border, Region 3: North, Region 4: Center, Region 5: South
For Venezuela Region 1: Capital, Region 2: Central, Region 3: Northwestern, Region 4: Andean, Region 5: Western, Region 6: South, Region 7: Northeastern, Region 8: Plains

Sources: Encuesta Permanente de Hogares (1996-2003) for Argentina, Encuesta Nacional de Empleo Urbano (1987-2002) for Mexico, and Encuesta de Hogares por Muestreo (1994-2000) for Venezuela.

Table 2

Mobility Profiles, Positive Growth and Negative Growth Years Distinguished

TABLE 2 A
Argentina: Unweighted Average of Reported Earnings Changes by Initial Position
Dependent Variable: Change in Reported Earnings

	Positive Growth				Negative Growth				
	Mean	Std.Dev.	Obs.	H_{01}	Mean	Std.Dev.	Obs.	H_{01}	H_{03}
Total Population	4.71	575.7	26931		-59.12	505.1	28552	***	***
By Initial Reported Quintile	H_{02}: ***				H_{02}: ***				
Lowest Quintile	263.14	533.3	5416	***	216.79	484.8	6013	***	***
Quintile 2	27.10	244.6	5975	***	-14.21	178.8	5862	***	***
Quintile 3	1.99	279.4	5494		-53.62	209.7	6121	***	***
Quintile 4	-35.23	368.2	4820	***	-96.60	300.7	5358	***	***
Highest Quintile	-249.03	1001.0	5226	***	-396.77	861.8	5198	***	***
By Gender	H_{02}: *				H_{02}: ***				
Men	0.29	660.2	17121		-70.28	560.3	17741	***	***
Women	12.41	385.9	9810	***	-40.79	397.4	10811	***	***
By Age	H_{02}:				H_{02}: ***				
25-36 yrs	11.82	430.4	10651	***	-44.36	417.8	10986	***	***
37-48 yrs	3.11	649.0	10726		-67.99	508.7	11157	***	***
49-60 yrs	-5.85	661.9	5554		-68.97	621.4	6409	***	***
By Education Level	H_{02}:				H_{02}: ***				
Primary or less	-1.04	340.6	9973		-35.28	307.6	9614	***	***
Secondary	2.93	491.5	10312		-52.27	401.3	11153	***	***
Higher	16.10	891.0	6646		-98.36	765.3	7785	***	***
By Sector Transition	H_{02}: ***				H_{02}: ***				
Informal to Formal	32.82	652.3	2333	**	-50.61	558.9	2285	***	***
Informal to Informal	6.71	492.2	9056		-41.42	407.5	9451	***	***
Formal to Formal	-2.73	639.3	9319		-66.40	588.2	9649	***	***
Formal to Informal	-2.47	646.1	2475		-98.89	619.2	2203	***	***
By Region	H_{02}: *				H_{02}:				
GBA	31.58	655.7	3324		-55.39	516.8	4734	***	***
Pampeana	2.04	584.0	8977		-58.64	515.3	8824	***	***
Patagonica	12.72	514.7	3279		-73.42	505.8	3413	***	***
Noreste	-5.74	518.5	3295		-60.93	543.6	3345	***	***
Noroeste	-0.99	584.2	4719		-58.15	450.7	5280		
Cuyo	-4.39	565.4	3337		-49.68	501.1	2956		

***, **, * H_{0j} rejected at 1, 5, 10% of significance

H_{01}: mean equal to zero

H_{02} : equality of means by groups

H_{03} : equality of means during growth vs. recession

Source: Encuesta Permanente de Hogares (1996-2003)

TABLE 2 B
Mexico: Unweighted Average of Reported Earnings Changes by Initial Position
Dependent Variable: Change in Reported Earnings

	Positive Growth				Negative Growth				
	Mean	Std.Dev.	Obs.	H_{01}	Mean	Std.Dev.	Obs.	H_{01}	H_{03}
Total Population	13	5,130.5	213442		-567	5,561.2	23489	***	***
By Initial Reported Quintile	H_{02}: ***				H_{02}: ***				
Lowest Quintile	1,012	2,220.6	42736	***	920	2,594.9	4700	***	**
Quintile 2	582	2,257.9	42661	***	308	1,916.3	4717	***	***
Quintile 3	424	2,627.5	42687	***	102	2,394.1	4683	***	***
Quintile 4	182	3,457.6	42672	***	-403	4,333.6	4701	***	***
Highest Quintile	-2,136	9,828.3	42686	***	-3,770	10,308.1	4688	***	***
By Gender	H_{02}: **				H_{02}: ***				
Men	-2	5,732.9	151275		-683	6,173.1	16197	***	***
Women	49	3,224.4	62167	***	-310	3,858.2	7292	***	***
By Age	H_{02}: ***				H_{02}: ***				
25-36 yrs	80	4,330.1	105103	***	-439	4,986.1	11147	***	***
37-48 yrs	-43	5,642.2	75149	**	-671	5,852.7	8548	***	***
49-60 yrs	-73	6,147.6	33190	**	-706	6,417.3	3794	***	***
By Education Level	H_{02}: **				H_{02}: ***				
Primary or less	36	3,331.4	85128	***	-320	3,548.8	8322	***	***
Secondary	38	4,384.6	82281	**	-483	4,002.9	9655	***	***
Higher	-75	8,194.7	46033	*	-1,088	9,184.3	5512	***	***
By Sector Transition	H_{02}: ***				H_{02}: *				
Informal to Formal	6	6,197.9	13055		-460	6,566.8	1280	***	**
Informal to Informal	-41	4,997.1	57032	*	-586	4,959.5	6427	***	***
Formal to Formal	57	4,862.6	123436	***	-477	5,378.2	13414	***	***
Formal to Informal	-110	6,514.3	14090	**	-1,000	8,043.5	1573	***	***
By Region	H_{02}:**				H_{02}:				
Mexico City	-2	5,308.7	27613		-699	5,910.0	2691	***	***
U.S. Border	-64	5,607.6	35147	**	-562	6,328.0	4309	***	***
North	57	5,475.0	73383	**	-510	5,820.2	8253	***	***
Center	17	4,390.3	65777		-586	4,491.1	6861	***	***
South	-25	4,814.1	11522		-571	5,527.5	1375	***	***

***, **, * H_{0j} rejected at 1, 5, 10% of significance

H_{01}: mean equal to zero

H_{02} : equality of means by groups

H_{03} : equality of means during growth vs. recession

Source: Encuesta Nacional de Empleo Urbano (1987-2002)

TABLE 2 C
Venezuela: Unweighted Average of Reported Earnings Changes by Initial Position
Dependent Variable: Change in Reported Monthly Earnings

	Positive Growth				Negative Growth				
	Mean	Std.Dev.	Obs.	H_{01}	Mean	Std.Dev.	Obs.	H_{01}	H_{03}
Total Population	5,789	83,789	13,984	***	-5,920	103,988	34,850	***	***
By Initial Reported Quintile	H_{02}: ***				H_{02}: ***				
Lowest Quintile	16,794	51,218	5,474	***	16,147	45,180	12,382	***	
Quintile 2	33,197	65,479	813	***	31,760	67,212	2,333	***	
Quintile 3	12,155	60,505	3,204	***	3,185	55,280	7,214	***	***
Quintile 4	3,830	74,648	2,414	**	-10,689	69,073	6,712	***	***
Highest Quintile	-41,440	153,731	2,079	***	-69,509	201,386	6,209	***	***
By Gender	H_{02}: ***				H_{02}: ***				
Men	9,406	108,824	5,933	***	-9,433	138,613	15,463	***	***
Women	3,124	58,751	8,051	***	-3,118	64,007	19,387	***	***
By Age	H_{02}:				H_{02}:				
25-36 yrs	6,776	77,657	6,135	***	-4,947	84,020	15,201	***	***
37-48 yrs	6,020	89,558	5,186	***	-6,912	115,504	12,980	***	***
49-60 yrs	3,069	85,716	2,663	*	-6,206	120,212	6,669	***	***
By Education Level	H_{02}: ***				H_{02}: *				
No Formal Education	2,496	38,623	1,007		-3,189	45,737	2,449		
Primary	4,217	67,032	8,781	***	-5,947	89,351	21,527	***	***
Secondary	6,866	104,410	2,543	***	-8,408	100,230	6,414	***	***
Higher	14,494	133,285	1,653	***	-3,712	174,233	4,460	**	***
By Sector Transition	H_{02}: ***				H_{02}: ***				
Informal to Formal	3,213	92,674	783		-13,696	118,868	1,935	***	***
Informal to Informal	7,643	95,959	3,130	***	-9,414	121,281	7,704	***	***
Formal to Formal	9,622	102,797	4016	***	-9,634	119,873	10,582	***	***
Formal to Informal	14,190	106,193	786	***	10	137,965	2,383		***
By Region	H_{02}: ***				H_{02}: *				
Capital	-6,049	118,751	1,522	***	-3,303	139,867	7,062	***	
Central	5,481	75,020	895	**	-8,817	71,065	2,826	***	***
Northwestern	5,371	79,135	4,267	***	-7,861	128,035	7,452	***	***
Andean	1,272	70,703	1,296		-7,284	73,527	2,587	***	**
Western	2,339	60,121	2,282		-4,929	63,076	5,692	***	***
South	25,516	95,408	2,266	***	-7,474	86,162	4,707	***	***
Northeastern	-1,994	74,799	1,063		-2,952	84,347	3,054		
Plains	-868	79,309	393		-5,716	77,708	1,470	**	

***, **, * H_{0j} rejected at 1, 5, 10% of significance

H_{01}: mean equal to zero

H_{02} : equality of means by groups

H_{03} : equality of means during growth vs. recession

Source: Encuesta de Hogares por Muestreo (1994-2000)

Table 3
Full Regression Results by Country

Tests of Conditional Symmetry

Dependent Variable: Change in Reported Earnings

	Argentina				Mexico				Venezuela			
	Biggest Growth Period	H_{01}	**Biggest Recessionary Period**	H_{01}	**Biggest Growth Period**	H_{01}	**Biggest Recessionary Period**	H_{01}	**Biggest Growth Period**	H_{01}	**Biggest Recessionary Period**	H_{01}
Initial Reported Earnings	-0.35	***	-0.53	***	-0.58	***	-0.60	***	-0.63	***	-0.60	***
	(0.05)		(0.04)		(0.08)		(0.04)		(0.01)		(0.01)	
Gender	87.24	***	66.01	***	615.46	***	587.97	***	16687.8	***	16136.5	
(Female Omitted)	(12.89)		(10.06)		(153.71)		(108.45)		(1998.23)		(1899.05)	***
Years of Education	H_{02}:	***	H_{02}:	***	H_{02}:	***	H_{02}:	***	H_{02}:	***	H_{02}:	***
Linear	-19.34	***	-10.65	**	-37.58		-101.28	***	-895.3	***	-2940.7	***
	(6.24)		(5.26)		(55.93)		(37.74)		(604.63)		(601.85)	
Squared	1.99	***	1.24	***	13.58	***	16.16	***	194.7	***	372.8	***
	(0.36)		(0.33)		(4.01)		(2.53)		(34.83)		(33.05)	
Sector Transition	H_{02}:	***	H_{02}:	***	H_{02}:	***	H_{02}:	***	H_{02}:	***	H_{02}:	***
Unemployed- Informal	323.34	***	184.62	***	2870.76	***	2938.86	***	44282.1	***	42899.6	***
	(15.52)		(8.15)		(481.20)		(334.55)		(4469.38)		(4093.62)	
Unemployed- Formal	525.22	***	265.28	***	3911.14	***	4426.38	***	26357.0	***	18697.7	***
	(64.37)		(31.70)		(509.72)		(465.49)		(6127.28)		(5450.26)	
Informal- Unemployed	-193.14	***	-75.84	***	-345.41		-413.99		-19798.1	***	-22959.8	***
	(23.19)		(15.15)		(677.33)		(356.90)		(4550.40)		(4441.26)	
Informal- Informal	201.41	***	168.79	***	2925.58	***	2264.36	***	45062.1	***	37324.2	***
	(27.64)		(15.49)		(619.56)		(346.42)		(2918.14)		(2739.46)	
Informal- Formal	218.80	***	189.53	***	2986.73	***	3223.03	***	33535.3	***	23580.2	***
	(34.82)		(22.27)		(658.63)		(483.79)		(4164.41)		(4081.32)	
Formal- Unemployed	-431.59	***	-258.35	***	-1601.76	*	-1183.17	***	-24157.6	***	-35964.5	***
	(43.91)		(36.50)		(857.93)		(397.97)		(5946.94)		(5433.85)	
Formal- Informal	176.08	***	174.61	***	3024.83	***	2504.72	***	34650.1	***	32018.4	***
	(37.00)		(26.70)		(693.38)		(483.30)		(3975.52)		(3763.40)	
Formal- Formal	213.20	***	202.89	***	3373.91	***	3120.87	***	38290.0	***	37630.6	***
	(31.17)		(20.81)		(621.97)		(331.27)		(2829.37)		(2701.17)	
Region	H_{02}:		H_{02}:		H_{02}:	*	H_{02}:	***	H_{02}:	***	H_{02}:	***
Region 1	-45.17	**	-22.72						.		.	
	(22.42)		(17.47)									
Region 2	-24.43		-15.30		725.71	**	-76.54		9939.14	**	-13144.5	***
	(23.91)		(18.38)		(304.23)		(435.23)		5222.596		(3510.83)	
Region 3	-35.69		-18.67		192.25		-682.10	*	-2456.3		-18307.5	***
	(25.23)		(19.93)		(212.83)		(387.96)		(2933.83)		(2529.10)	
Region 4	-55.09	*	-18.27		-34.60		-870.06	**	-4375.448	***	-14338.7	***
	(28.97)		(19.33)		(192.51)		(342.00)		3414.221		(3363.04)	
Region 5	-38.79		-3.78		-146.06		-1024.94	***	-6019.521	***	-14454.4	***
	(24.43)		(19.59)		(250.64)		(342.49)		2931.607		(2669.92)	
Region 6									7747.978	***	-11449.2	***
									3591.925		(2755.10)	
Region 7									-3988.075		-9420.0	***
									3478.568		(3108.71)	
Region 8									-4214.823		-17103.9	***
									5190.443		(4214.56)	
Constant	-424.98	***	-261.63	***	-4684.43	***	-3560.02	**	14418.9	***	26232.9	***
	(113.21)		(82.48)		(1508.05)		(1629.31)		(4066.70)		(3799.50)	
Number of Observations	8888		5402		4431		4183		4973		11221	
R2	0.171		0.3506		0.3244		0.5611		0.3566		0.2983	
Period	1996-1997		2001-2002		Q2:1996-Q2:1997		Q3:1994-Q3:1995		1999-2000		1998-1999	

Age controls included

Standard Error in parenthesis.

***, **, * H_{0j} rejected at 1, 5, 10% of significance

H_{01}: parameter equals zero

H_{02} : joint significance of parameters by groups

For Argentina Region 1: Pampeana, Region 2: Patagonica, Region 3: Noreste, Region 4: Noroeste, Region 5: Cuyo (GBA omitted)

For Mexico Region 1: Mexico City (omitted), Region 2: Border, Region 3: North, Region 4: Center, Region 5: South

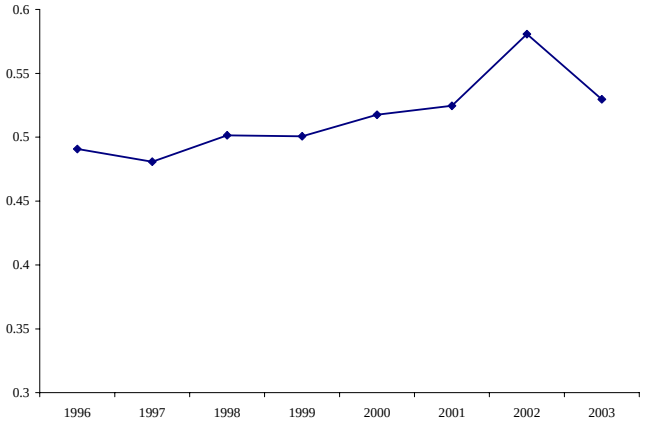
For Venezuela Region 1: Capital (omitted), Region 2: Central, Region 3: Northwestern, Region 4: Andean, Region 5: Western, Region 6: South, Region 7: Northeastern, Region 8: Plains

Sources: Encuesta Permanente de Hogares for Argentina, Encuesta Nacional de Empleo Urbano for Mexico, and Encuesta de Hogares por Muestreo for Venezuela.

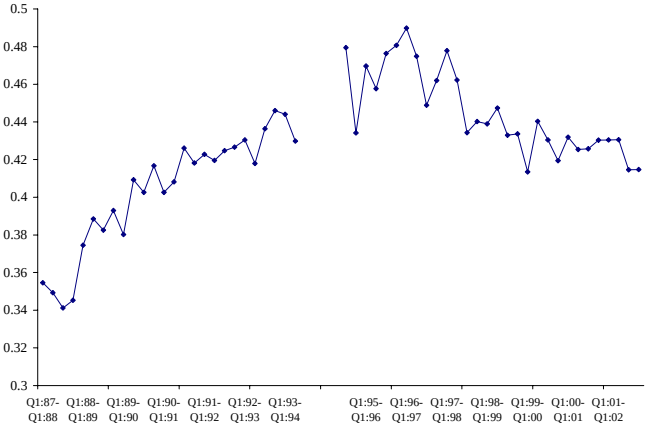
Figure 1

Evolution of the Gini Coefficient in the Three Countries

Argentina



Mexico



Venezuela

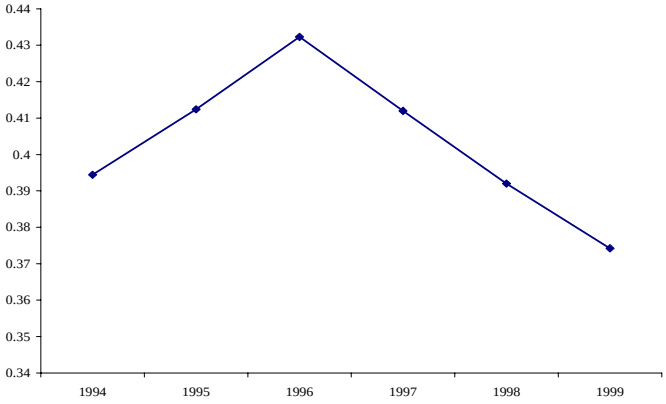
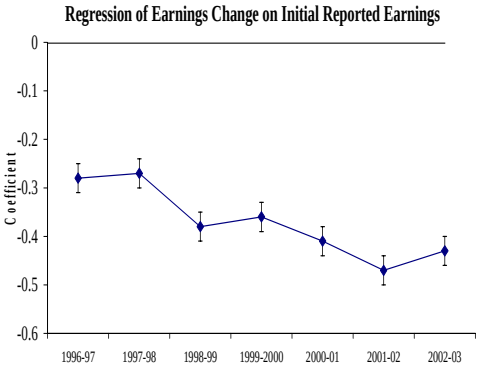
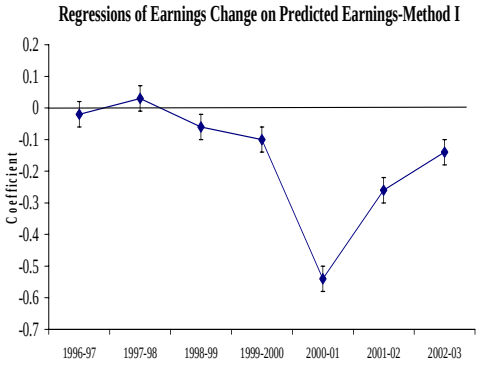


Figure 2
Regression Coefficients of Income Change on Initial Reported Earnings and Predicted Earnings

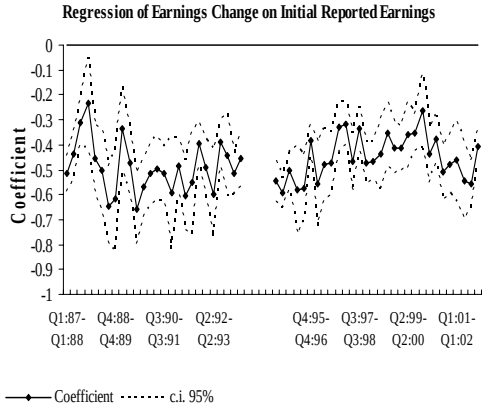
Argentina: Initial Reported Earnings



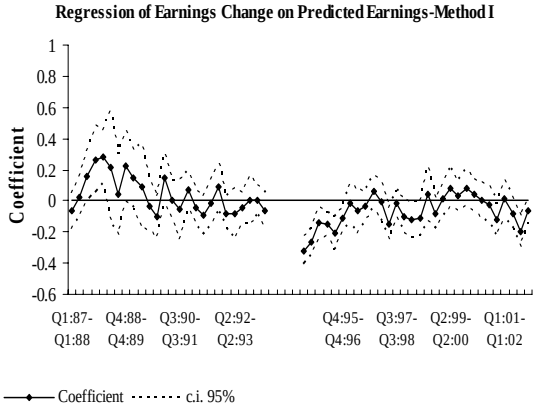
Argentina: Predicted Earnings



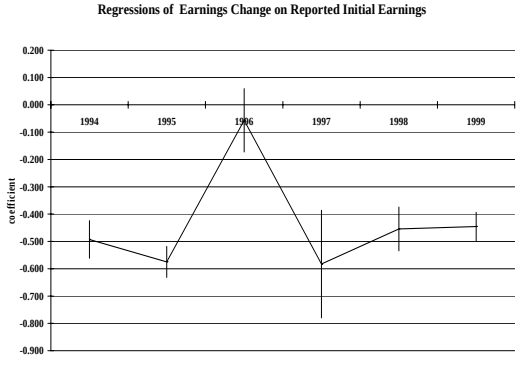
Mexico: Initial Reported Earnings



Mexico: Predicted Earnings



Venezuela: Initial Reported Earnings



Venezuela: Predicted Earnings

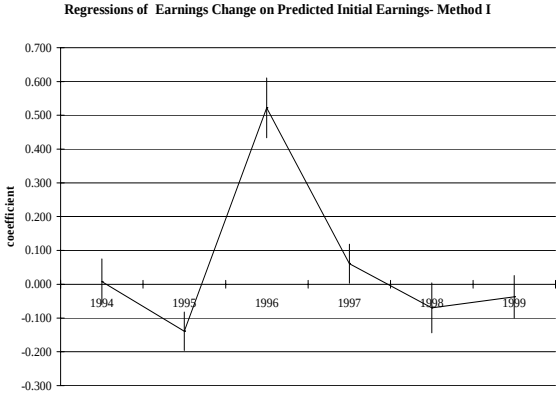
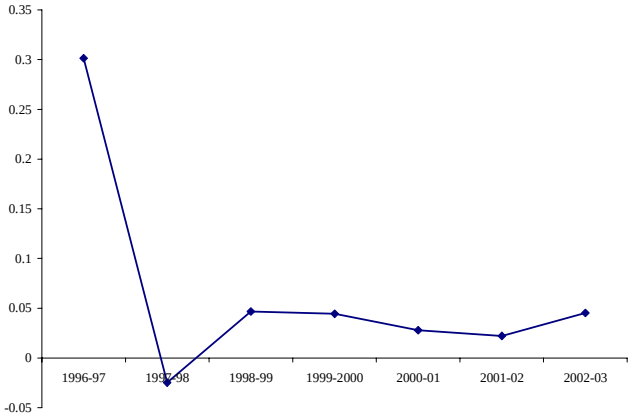
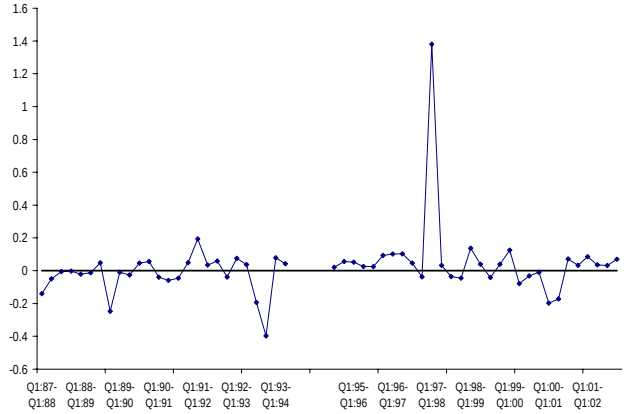


Figure 3
Share of Inequality Change Due to Convergence

3A- Argentina



3B- Mexico



3C- Venezuela