



Munich Personal RePEc Archive

**Recent changes in wage inequality in
Argentina. The role of labor
formalization and other factors**

Luis, Beccaria and Roxana, Maurizio and Vazquez, Gustavo

Universidad Nacional de General Sarmiento

17 June 2014

Online at <https://mpra.ub.uni-muenchen.de/56701/>

MPRA Paper No. 56701, posted 18 Jun 2014 00:02 UTC

Recent changes in wage inequality in Argentina. The role of labor formalization and other factors

Luis Beccaria*, Roxana Maurizio** and Gustavo Vázquez*

2014

Abstract

In the last decade Argentina experienced a process of wage inequality reduction that is in stark contrast with the trends of the previous decade. The purpose of this study is to analyze the contribution of different factors to this process. The method employed is a decomposition proposed by Firpo, Fortin and Lemieux (2007, 2011), which allows extending the Oaxaca-Blinder approach to decompose some distributive statistics of income between a ‘composition effect’ and a ‘returns effect’. Similar to other studies, the results reveal that declining returns to education have been a major factor explaining the improvement in the distribution of income observed in the 2003-2012 period. However, the process of labor formalization has also had an equalizing effect over the period.

* Universidad Nacional de General Sarmiento, Argentina.

** Universidad Nacional de General Sarmiento and CONICET, Argentina.

INTRODUCTION

In 2003 a process of wage inequality reduction began in Argentina, which more than offset the growing tendency of the 1990s. The reduction of labor income gaps took place together with an overall improvement of labor market variables, which also meant a reversion of the trends that had prevailed in the previous decade (Beccaria and Maurizio, 2012). In fact, during the 1990s the distribution of income continued to deteriorate in a context of poor labor market performance. The slow growth of employment was a result of the convertibility regime's (established in 1991) inability to attain macroeconomic stability.

To a greater or lesser extent, these positive trends in terms of income distribution and labor market performance exhibited by Argentina since the early 2000s have been present in several other Latin American countries as well. In all the cases, the reduction in wage inequality seems to have been the main source of improvement in household income concentration.

All previous studies on distributional changes of Argentina and other countries of the region stress the decline in returns to education as a main factor explaining the improvement observed in labor income inequality. However, they do not address the potential effects of other events occurred in the labor markets of those economies. In particular, there are no identified studies accounting for the effects of the decline in informality observed in the 2000s in many Latin American countries. The intensity of this process has been significant in some cases, particularly in Argentina, and it is therefore worth of consideration in the analysis of distributional dynamics as a possible cause of inequality reduction.

This document analyses the factors associated with the reduction of inequality among wage earners in Argentina, a group that represented 75% of the employed population in the 2003-2012 period. It evaluates the set of variables usually considered in this type of exercise but it pays particular attention to the effects of changes in the participation of informal wage earners (non-registered in the social security)¹ and in the returns associated with labor registration.

In order to assess the impacts of different variables on inequality we employ a decomposition method recently developed by Firpo, Fortin y Lemieux (FFL, 2007, 2011) that extends the Oaxaca-Blinder approach to decompose changes in other distributional functionals besides the mean into a 'composition effect' and a 'returns effect'. The composition effect measures the contribution of changes in the structure of characteristics to the reduction of inequality (measured, for example, by the Gini index or by the ratio between percentiles of the distribution), while maintaining returns constant. The returns effect measures the distributional effects of changes in returns while holding the structure of characteristics unchanged. The method also allows quantifying the contribution of each characteristic to the reduction of inequality through each of these effects.

The rest of the document is structured as follows. The first section presents a brief summary of the results of several previous studies analyzing distributional changes in

¹ The definition of informal employment is the one used by ILO (Husmanns, 2004).

Argentina and other countries of the region during the last decade. Section 2 details the source of information, while section 3 describes the methodology employed in the econometric estimates. Section 4 provides a descriptive analysis of the evolution of inequality and the main changes observed in the occupational structure; it is divided into three subsections: the first one presents a brief description of the economic context; the second one analyzes the changes in the composition of employment, particularly focusing on the educational level and informality; the third one presents the ‘anatomy’ of the distributional change observed in the period under analysis. Section 5 presents and discusses the results obtained in the decomposition exercise. Lastly, section 6 presents the conclusions of the study.

1. BACKGROUND

As it was mentioned above, the studies available on the evolution of Argentina’s income distribution over the past twenty years show a clear contrast between the 1990s and the period that started after the convertibility regime crisis in 2001-2002. Most of these studies focus the analysis on the changes observed in household income concentration and look into the possible causes of such dynamics (Cruces and Gasparini, 2010; Trujullo and Villafañe, 2011; Salvia and Vera, 2011). One of the studies’ main results is that labor incomes explain most of the deterioration of household income concentration in the 1990s and its subsequent improvement in the following decade. Other studies with similar purposes, which analyze the changes in income distribution in several countries of the region in recent years –including Argentina- arrive to the same conclusion (Cornia, 2012; Keifman and Maurizio, 2012).

These results are also in line with the evidence found for other Latin American countries. Amarante et al. (2011) show that Uruguay initiated a late process of inequality reduction in 2008, after a long period of growing income concentration. The authors find that this evolution was caused by a decline in wage dispersion and also by the introduction of non-contributive cash transfer programs and changes in the tax scheme.

For Brazil, Soares (2006) estimates that around 75% of the reduction in family income inequality between 1995 and 2004 is explained by a lower concentration of labor incomes, whereas the other 25% responds to the positive impact of the main cash transfer program (*Bolsa Familia*). On the other hand, Barros et al. (2010) points out that public transfers, both contributive and non-contributive, explain a higher proportion (almost 50%) of the change observed in inequality in the 2001-2007 period.

Esquivel et al. (2010) find that the reduction of inequality in Mexico in the 1996-2006 period was caused by a faster growth of incomes in the lower tail of the distribution compared to those of the richer deciles. The factors explaining these dynamics are again related to the labor market (a relative increase in the wages of low-skilled workers) but also to remittances inflows and to a growing progressiveness of public spending after the implementation of the cash transfer *Progres*a program (currently called *Oportunidades*).

Most of the studies that analyze the changes in labor incomes find that returns to education have been the main factor explaining the reduction in earnings inequality

during the 2000s, the very same factor that had caused the opposite behavior in the previous decade. Cruces and Gasparini (2010) and Cornia (2012) are examples for Argentina, while Lustig et al. (2012) and Gasparini et al. (2011) obtain similar results in comparative studies for Latin American countries.

Regarding the hypotheses on why returns to education might have changed, the studies available for Argentina and other Latin American countries put emphasis on the interaction between the relative supply and demand for qualifications. Cruces and Gasparini (2010) highlight the slowdown in the rate of technology incorporation during the 2000s in a context of an increasing relative supply of skilled workers. On the other hand, the evolution of the relative demand of skills responded to lower investment growth rates and to changes in the composition of labor demand by branch of activity as a result of a shift occurred in relative prices. They also mention that after the ‘inequality overshooting’ occurred in the previous decade as a result of the strong and rapid incorporation of technology, a subsequent adjustment phase might have arisen, thus contributing to the equalizing trends of the 2000s. This is also pointed out in another document (Gasparini and Lustig, 2011): *“the fading out of the effect of the skill-biased technical change that occurred in the 1990s”*.

In addition, the studies point out that the implementation of income policies immediately after the crisis and the process of labor union strengthening might have also played a part in the reduction of income gaps between workers with different skills and educational levels. More precisely, Maurizio (2014) highlights the strengthening of the minimum wage as a factor that has contributed to improve wage inequality, both in Argentina and other countries of the region. Amarante et al. (2009) arrived to the same conclusion in the case of Uruguay, and Bosch and González Velosa (2013) also found an equalizing effect of the minimum wage in Brazil. On the other hand, Marshall (2009) also stresses the minimum wage evolution and the recovery of collective bargaining as main factors to explain the reduction of wage inequality between sectors in the manufacturing industry.

All in all, available studies do not take into consideration the influence that the reduction in labor informality observed in many Latin American countries during the 2000s had on earnings inequality. The contribution of this paper is precisely to fill such gap by including this dimension among those usually considered in this type of analyses.

2. SOURCES OF INFORMATION

This study employs microdata coming from the Permanent Household Survey (PHS), a sample survey conducted by the National Institute of Statistics and Censuses of Argentina (INDEC). The survey is carried out on a quarterly basis and covers 31 urban centers across the country.

The econometric estimations presented in the following section have been performed for the group of wage earners between 16 and 64 years old in the case of men, and between 16 and 59 years old in the case of women. The lower age limit has been chosen considering the minimum legal age to work, whereas the upper limit indicates the retirement age for men and women, respectively. Individuals enrolled in employment

plans,² as well as those with no incomes declared have been excluded from the analysis. Also, to preserve the comparability of the results, we have included in the estimations only the 28 urban centers that remain in the PHS sample throughout the whole period under analysis.

Finally, to distinguish between formal and informal wage earners we have employed the criterion that is usually adopted when working with data from the PHS, i.e. the worker's registration condition in the social security system. More precisely, wage earners are considered as informal if they answer negatively to the question of whether his/her employer makes payroll deductions to pay the contribution for the social security system.

3. METHODOLOGY

In order to evaluate the contribution of personal and job attributes to the reduction of inequality we employ the Firpo, Fortin and Lemieux (2007, 2011) approach. This method is an extension of the decomposition approach developed by Oaxaca (1973) and Blinder (1973)³, allowing a broader application. On the one hand, it allows more flexible specifications of the underlying wage model; on the other hand, it allows quantifying the partial effects of changes in the distribution of covariables and in their returns on other functionals (v) besides the mean value, like quantiles, variance or the Gini coefficient.

The decomposition method consists of two different stages: 1) the estimation of the aggregate composition and return effects, employing a reweighting methodology; and 2) the disaggregation of those effects into the individual contribution of each attribute using recentered influence function regressions of each functional of interest.

In order to conduct the first stage, the total variation of v between $T = 0$ y $T = 1$ can be formalized as:

$$\Delta^v = v(F_{(Y_1|T=1)}) - v(F_{(Y_0|T=0)})$$

where $F_{(Y_1|T=1)}$ is the wage distribution function in time 1, and $F_{(Y_0|T=0)}$ in time 0.

² An extensive employment plan was launched in 2002. According to the PHS, the number of beneficiaries represented 6.5% of total occupation in 2003. The benefit initially consisted of a cash transfer which value was lower than the minimum wage and it has not been adjusted afterwards. As employment started growing, the quantity of beneficiaries gradually decreased to represent around 0.5% of total occupation in 2007. The incorporation of these individuals into the analysis that seeks to identify the factors that account for the changes observed in wage inequality would bias the results given the mentioned variability of the program's contribution to total employment and the decreasing value of the benefit compared to average wages.

³ Other studies employing this same methodology for Latin American countries are Serrano and Yupanqui (2012), and Campos et al. (2012).

To control for inequality in the distribution of attributes between groups, it is necessary to consider the counterfactual distribution $F_{(Y_0|T=1)}$, i.e. what would have the wage distribution observed in $T = 0$ been, had the distribution of characteristics observed in $T = 1$ been present in $T = 0$. Then, observed total change can be rewritten as:

$$\Delta^v = [v(F_{(Y_0|T=1)}) - v(F_{(Y_0|T=0)})] + [v(F_{(Y_1|T=1)}) - v(F_{(Y_0|T=1)})]$$

In this way, the total variation of v can be decomposed into two effects⁴: the ‘composition effect’ (Δ_C^v) and the ‘returns effect’ (Δ_S^v). The first effect measures the total change derived from modifications of the attributes while holding constant the wage structure between two moments in time. The second effect measures the impacts of changes in returns, holding constant the structure of characteristics.

For the second stage, in order to obtain the individual contribution of each attribute to the change of v , either through the composition effect or the returns effect, a recentered influence function (RIF) is employed. This function is defined as:

$$RIF(y; v) = v(F) + IF(y; v)$$

Where F is the distribution function of the variable of interest (in this case, incomes) and IF is the influence function.⁵

Given that the mathematical expectation of the recentered influence function is the parameter of interest, it is possible to rewrite each of the effects as:

$$\begin{aligned} \Delta_C^v &= E_X[E[(RIF(Y_0; v)|X, T = 1)]] - E_X[E[(RIF(Y_0; v)|X, T = 0)]] \\ \Delta_S^v &= E_X[E[(RIF(Y_1; v)|X, T = 1)]] - E_X[E[(RIF(Y_0; v)|X, T = 1)]] \end{aligned}$$

Then, letting $E[(RIF(Y; v)|X)] = X'\gamma^v$, and substituting the previous expressions by their respective linear projections⁶, we obtain:

⁴ It is worth noticing that for the mentioned effects to be identified it is necessary to consider two restrictions on the joint distribution of (T, X, ε) , namely: 1) ignorability assumption, i.e. the distribution of non-observable attributes determining wages $-\varepsilon-$ is the same for the two groups considered; 2) common support assumption, i.e. observed attributes cannot be considered for one of the groups under analysis and not the other, but rather observable characteristics should overlap. These are the two assumptions usually considered in the program evaluation literature.

⁵ The concept of influence function was introduced by Hampel (1974) with the aim of assessing the robustness of v in the presence of outlier data when replacing F by the empirical distribution:

$$IF(y; v, F) = \lim_{\epsilon \rightarrow 0} \frac{(v(F_\epsilon) - v(F))}{\epsilon}$$

being $F_\epsilon(y) = (1 - \epsilon)F + \epsilon\delta_y$; $0 \leq \epsilon \leq 1$ and where δ_y is a distribution that only puts mass at the point value y .

⁶ Here, we follow the suggestion made by FFL (2007), who highlight the practical advantages of such linear specification. They argue that: i) the methodology carries an approximation error anyway, given that it is a first order approximation of the impact of significant changes in the distribution of X ; ii) a linear specification does not affect the estimations obtained when employing a reweighting procedure; and iii) the substitution simplifies the interpretation of results.

$$\begin{aligned}\Delta_C^v &= E(X|T = 1)' \gamma_{0|1}^v - E(X|T = 0)' \gamma_0^v \equiv \\ &\equiv \sum_{k=1}^K (E(X^k|T = 1)' - E(X^k|T = 0)') \gamma_{0,k}^v + SPE^v \quad \text{I}\end{aligned}$$

$$\begin{aligned}\Delta_S^v &= E(X|T = 1)' \gamma_1^v - E(X|T = 1)' \gamma_{0|1}^v \equiv \\ &\equiv (\gamma_{1,0}^v - \gamma_{0|1,0}^v) + \sum_{k=1}^K E(X^k|T = 1)' \cdot (\gamma_{1,k}^v - \gamma_{0|1,k}^v) + RWE^v \quad \text{II}\end{aligned}$$

Where the superscript k refers to the k -th attribute to be considered in the disaggregated decomposition of the overall effects.

The expression I, which as mentioned above describes the ‘composition effect’, can in turn be rewritten by taking into consideration the SPE^v term -the specification error. This term accounts for the approximation error that originates in the fact that the procedure can only provide a first order (linear) approximation of such effect. It can be estimated as the difference between the overall composition effect, obtained using the counterfactual distribution of wages –i.e. the one that would have resulted if the cases observed in $T = 0$ would have shown similar characteristics than those observed in $T = 1$, and the estimation of the effect obtained using the RIF-regression approach. On the other hand, in order to observe the contribution of each covariate, each term in the expression can be interpreted as the impact of the temporary modification in the distribution of the k -th covariate on the total change of the functional, holding constant the wage structure prevailing in $T = 0$.

Expression II refers to the ‘returns effect’. One difference with the traditional Oaxaca-Blinder approach is that here $\gamma_{0|1}^v$ is considered rather than γ_0^v , i.e. the coefficients of the counterfactual RIF regression, which consider the wages in $T = 0$ with the structure of characteristics of $T = 1$ are considered instead of the coefficients of the RIF regression considering the wages and the attributes actually observed in $T = 0$. The objective here is to estimate the ‘pure’ returns effect, i.e. the effect that is not modified by changes in the distribution of attributes.

Like with the first expression, this effect can also be rewritten considering the term RWE^v , which in this case reflects the error of reweighting that results from the fact that the attributes of $T = 1$ might not be exactly replicated when obtaining the counterfactual values.

Moreover, given the interest in assessing the contribution of each variable to the explanation of the ‘returns effect’, we consider the detailed decomposition of the latter, where $(\gamma_{1,0}^v - \gamma_{0|1,0}^v)$ represents the ‘returns effect’ attributable to the omitted group, while each term of the following sum refers to the contribution of the k -th covariate. Hence, the overall returns effect is the sum of each of these terms considering the distribution of X prevailing in $T = 1$.

Lastly, regarding the estimation procedure, the first step consists in obtaining the overall estimations of both effects by directly estimating the parameters of interest based on the actual distributions and the counterfactual distribution obtained through the reweighting procedure, without specifying any function for the wage structure. The reweighting

function will be given by the quotient between the distribution of X en $T = 1$ and the distribution of de X in $T = 0$, both multivariate. However, following DiNardo, Fortin and Lemieux (1996), by applying Bayes' rule, such quotient can be summarized as:

$$\psi(X) = \frac{Pr(T = 1/X) Pr(T = 0)}{Pr(T = 0/X) Pr(T = 1)}$$

Then, the weight can be estimated by considering a probability model for conditional probabilities. In this case, we make use of a probit model based on a pool of observations of two different periods. Predicted values for each case are obtained from the estimations of the model, and the marginal probabilities are then replaced by their sample equivalents, thus obtaining the estimated weights for each case.

Once $\hat{\psi}(X)$ has been generated, we then apply it to the observations registered in $T = 0$ with the aim of estimating the functional of interest linked to the counterfactual distribution. On the other hand, in order to estimate the function associated with the other two distributions, we directly consider its application over the empirical distributions. This is,

$$\hat{\Delta}^v = [v(\hat{F}_{(Y_0|T=1)}) - v(\hat{F}_{(Y_0|T=0)})] + [v(\hat{F}_{(Y_1|T=1)}) - v(\hat{F}_{(Y_0|T=1)})]$$

The second stage consists in performing a detailed decomposition by estimating regression functions associated with the estimations of the influence functions of the parameters of interest. In order to do so, we employ the ordinary least squares method.

This is, being $v(\hat{F}_{(Y_1|T=1)}) = \hat{E}(X, T = 1)\hat{\gamma}_1^v$, $v(\hat{F}_{(Y_0|T=0)}) = \hat{E}(X, T = 0)\hat{\gamma}_0^v$, and $v(\hat{F}_{(Y_0|T=1)}) = \hat{E}(X, T = 1)\hat{\gamma}_{01}^v$, we obtain the estimation of the detailed decomposition, given by:

$$\hat{\Delta}^v = \sum_{k=1}^K [\hat{E}(X^k|T = 1) - \hat{E}(X^k|T = 0)]\hat{\gamma}_{0,k}^v + \widehat{SPE}^v + (\hat{\gamma}_{1,0}^v - \hat{\gamma}_{01,0}^v) + \sum_{k=1}^K \hat{E}(X^k|T = 1)' \cdot (\hat{\gamma}_{1,k}^v - \hat{\gamma}_{01,k}^v) + \widehat{RWE}^v$$

This methodology was applied to decompose changes in hourly wage inequality in Argentina between 2003 ($T = 0$) and 2012 ($T = 1$). The indicators of inequality employed are the Gini index and the log of the ratios between the median and the 10th and 90th percentiles.

4. MAIN CHANGES IN WAGE DISTRIBUTION AND IN THE OCCUPATIONAL STRUCTURE

i) *The economic context*

The changes in inequality briefly described in the first section were accompanied –and in some ways also influenced- by changes in employment levels and in the occupational structure.

The evolution of employment after 2003 is in stark contrast with the trends that had prevailed in the previous decade. During the nineties decade, employment grew slowly leading to a significant increase in the open unemployment rate, which reached 13.3% in 1998 and 21% in 2001. The scarce net job creation—particularly of jobs covered by the social security system—was mainly a result of a poor macroeconomic performance characterized by large fluctuations of GDP. The latter was in turn a result of the currency board regime, under which the fluctuations in the international trade and financial markets were fully transmitted into the domestic economy. Also, the growing exchange rate appreciation together with the trade liberalization policies implemented at the beginning of the decade negatively affected the competitiveness of tradable sectors. The accumulation of external and fiscal imbalances in a context of high external indebtedness and economic stagnation led to the collapse of the regime and to the devaluation of the peso in 2001.⁷

Prices grew significantly as a result of the exchange rate adjustment, giving rise to an inflationary process that was nevertheless less intense than the magnitude of the currency devaluation. It was also quite short-lived compared to previous episodes experienced by the country. The economic depression prevailing in the years prior to the change of regime contributed to weaken the propagation mechanisms of inflationary shocks. The real exchange rate increase was a determinant factor in the rapid and intense economic recovery that began in late 2002, by raising the competitiveness of the economy, and particularly of the manufacturing sector. This period was also characterized by a steady growth of public spending and by the implementation of several income policy measures that favored private consumption. The accelerated growth of exports—mainly as a result of the sharp increase in international commodity prices—further boosted aggregate demand and led to a significant improvement of external accounts.⁸

In this context, aggregate employment grew at a fast pace (3.1% per year between 2002 and 2013), particularly in the first years, when the economy was still benefiting from high idle capacity. Moreover, this process was accompanied by an increase in the proportion of jobs registered in the social security system, contrary to the trend that had prevailed in the 1990s. At the same time, real wages grew 46% between 2003 and 2012, more than compensating the 30%-fall that took place in 2002 after the devaluation.

ii) The occupational structure

The period of aggregate employment growth that started in 2003 was accompanied by significant changes in the occupational structure, in particular those related with education and labor formalization.

As a matter of fact, most of the net job creation observed since 2003 correspond to wage-earning positions, and particularly formal occupations (registered in the social security system). As a result, the proportion of informal salaried workers both in total employment and in total wage earning employment, fell (10 pp), reversing the trend of the previous decade, when the proportion rose by 6 pp. This same result is observed

⁷ Simultaneously, a political crisis unfolded with the resignation of the President. The transition period lasted more than 17 months: elections were conducted in March 2003 and the new constitutional president took office in May that year.

⁸ See, for example, Beccaria and Maurizio (2012), Damill et al. (2011).

within the subgroup of wage earners considered in the econometric estimates (Table 1). Such improvement in the quality of employment seems to have been favored by rapid employment growth together with some measures specifically aimed at fighting informality.⁹

The composition of employment by educational level also changed, with a significant increase in the proportion of workers with complete secondary education and a relatively lower increase of workers with complete tertiary education (Table 1). This is in stark contrast with the dynamics observed in the 1990s, when the relative participation of the more educated workers rose sharply while the weight of complete secondary education to a much lesser extent. The differences between the two decades seem to be explained by changes occurred in the supply of labor, although the demand might have played a role as well. Throughout the 1990s, the quantity of persons above 15 years old with complete tertiary education grew more rapidly than those with complete secondary school. Nonetheless, the increase in the number of workers with such educational levels was more pronounced than the expansion of the supply. On the contrary, in the 2000s, the relative participation of individuals with complete secondary education within the population of 15 years of age or older rose more than the proportion of workers with complete tertiary education. Also, the participation of complete secondary education grew even more intensely among the employed, as it can be observed across the different productive sectors in the occupational structure.

[insert Table 1 here]

The composition of employment by sectors of activity also changed in the 2000s, although the variation was relatively smaller compared to the other variables. As it can be seen in Table 1, there was an increase in the participation of construction and a reduction in the participation of commerce, which again was in contrasting trends of the 1990s, when employment growth was led by financial services. It is also noteworthy that employment in the manufacturing industry grew at a similar pace than the economy as a whole in the 2000s, after a decade of sharp decline.

iii) Income distribution

Table 2 summarizes the main changes occurred in the degree of concentration of different distributions of incomes as from the beginning of the 1990s. It can be noticed the contrast between the last two decades: whereas in the 1990s and the beginning of the 2000s income concentration rose for both labor and household incomes, as of 2002/03, the Gini for labor incomes fell by 9pp and that of per capita household incomes decreased by 12 pp. By 2010, these indicators reached the values registered twenty years before.

[insert Table 2 here]

Table 2 shows that the concentration of the distribution of wage and non-wage earnings exhibited a similar evolution. The figures also indicate that inequality in the distribution of monthly and hourly remunerations of both wage earners and the total employed population fell sharply as of 2003. A similar behavior was exhibited by the group of

⁹ See, for example, Bertranou et al. (2013) and Maurizio (2014).

wage earners in prime ages¹⁰, which is the subgroup considered for the decomposition exercise.

The analysis of ratios between the p10, p50 and p90 percentiles of the distribution shows that both the growing concentration of wage earners' incomes of the 1990s and the subsequent fall in the following decade are derived from the changes registered both in the upper and lower tails of the distribution (Table 2).

5. DECOMPOSITION OF CHANGES IN THE DISTRIBUTION OF REMUNERATIONS

Before carrying out the decomposition exercise, a balance test was performed to check for the absence of statistically significant differences between the actual 2012, and the reweighted 2003 (counterfactual), distributions of characteristics. It is shown in Table 1 (fifth column) that there is no difference in any of the considered attributes.

Aggregate decomposition

The first step in the decomposition –the aggregate decomposition- shows that two thirds of the decline observed in the log p90/p10 ratio between 2003 and 2012 was due to a fall in the returns to the factors considered (Table 3). The other third is explained by changes in the composition of wage earning employment according to those factors.

[insert Table 3 here]

This indicator also allows identifying to what extent these changes affected the whole distribution or only a part of it. As it was mentioned above, inequality fell with quite the same intensity in both the lower and the upper tails of the distribution, as shown by the behavior of the p50/p10 and the p90/p50 ratios, respectively. The decomposition exercise indicates that whereas the reduction in the upper segment seems to have been the result of changes in returns exclusively, the decrease observed in the lower segment seems to have responded to changes in the composition of employment.

On the other hand, in the case of the Gini coefficient, the reduction is entirely explained by the returns effect.¹¹

Aggregate decomposition: composition effect

As it was discussed in section 3, the second stage in the decomposition exercise allows assessing the contribution of different characteristics to each of the two effects considered, i.e. the one derived from the changes observed in the occupational structure –composition effect- and the one derived from changes in returns –returns effect.

¹⁰ As already mentioned, it consists of men between 16 and 64 years of age and women between 16 and 59 years old.

¹¹ The values of the Gini coefficients considered in the decomposition exercise are somewhat different than those included in Table 2 since the former were computed for the set of observations that have valid values in all the characteristics considered in the analysis.

With regards to the composition effect, Table 3 shows that except from gender, all the other variables included in the exercise had a significant effect on the variation of the p90/p10 ratio. The changes in structure in terms of educational levels and branches of activity raised inequality whereas the changes occurred in the age composition as well as the growing proportion of formal workers had a positive effect in reducing inequality. Similar results are obtained for the Gini index.

Of all the different variables considered, the rise in the proportion of formal jobs in total employment had the most significant impact on inequality. This variable explained more than one quarter of total log p90/p10 ratio variation and 80% of the composition effect measured by this same indicator. It also explained approximately 15% of the reduction in the overall Gini. The importance of a growing formalization in the reduction of inequality has not been stressed in the literature that studies the evolution of inequality in Argentina during the 2000s. Nor has this been mentioned in the studies conducted for other countries of the region, where formalization has also been taking place. The improvement in the quality of jobs seems to have a positive effect not only in terms of average incomes but also in terms of equality.

The analysis of the effects of formalization along the distribution of income shows that its equalizing effect has been a result of a decreasing impact from the lowest to the highest percentiles of income (Graph 1). In particular, it had a greater impact on the 10th percentile than on the 50th, whereas it had no significant effects on percentile 90. This is because both the proportion of informal wage earners (and hence of the population susceptible of becoming formal) and the premium to formality decrease along the distribution (Table Appendix A.1).

[insert Graph 1 here]

After formalization, the educational level is the second most important factor in terms of its distributional impact, although it had an opposite effect of increasing inequality. This unequalizing effect of education is in line with the results of other studies of the region.¹² The absolute magnitude of this effect is around 10% of the size of the reduction in both the log p90/p10 ratio and the Gini index (Table 3). This effect is concentrated in the upper part of the distribution, as it can be also appreciated in Graph 1. It is worth remembering that throughout the 2003-2012 period wage earners' average educational level continued to grow, with a relatively higher increase registered in the proportion of employees with complete secondary school than in the proportion of those with complete tertiary education (Table 1). Even though the latter would commonly lead to a growth of incomes in the middle or lower-middle part of the distribution (where most of the employees with complete secondary school are located), the relatively lower increase in the number of workers with complete tertiary education made a greater impact on incomes in the upper part of the distribution due to the larger premiums associated with the higher educational levels (Table Appendix A.1).

The modifications in the structure of wage earning employment by age led to a decline in inequality, although the effect is smaller than in the cases of formalization and education. The age factor explains 3% of total p90/p10 ratio reduction (10% of the composition effect). As it can be seen in Table 1, the effect is more intense in the lower

¹² Véase, por ejemplo, Cruces y Gasparini (2010).

part of the distribution, probably because the young, whose participation in total employment fell, have relatively lower remunerations and are mostly concentrated in that part of the distribution.

The changes in the occupational structure by branch of activity had an unequalizing effect on labor income distribution, although the effect was rather small. The impact of this variable was similar in both tails of the distribution (Table 3). The increase of income concentration in the lower end could have been caused by a reduction of wages at the bottom of the distribution, led by a higher concentration of employment in construction activities, which have relatively lower remunerations.

Lastly, the absence of gender-related effects is not surprising since the composition of wage earning employment has remained unchanged according to this variable (Table 1).

Disaggregated decomposition: returns effect

When the returns effect is considered, all of the five variables included in the analysis had significant effects on the reduction of the log p90/p10 ratio in the 2003-2012 period; on the other hand, only education and gender are significant when using the Gini indicator.

Graph 2 shows that the changes in formality premiums seem to raise incomes in the lower tail of the distribution and reduce incomes in the upper tail. However, Table 3 shows that only the reduction of the p90/p10 ratio is statistically significant, while the changes registered in the p50/p10 and p90/p50 ratios are not.

The changes in returns to education had the most significant contribution to the reduction of inequality indicators. It explains two thirds of the p90/p10 ratio reduction and more than one half of the reduction in the Gini. The analysis of the relations between percentiles indicates that this equalizing effect is concentrated in the upper part of the distribution (Table 3). Graph 2 shows this same result but also that the effect is particularly intense in the highest third of the distribution.

[insert Graph 2 here]

It is worth taking into account that the results related to the returns effect of a variable (in this case, education) on the value of the percentiles are obtained by weighting the changes observed in the premiums along the non-conditional distribution by the relative weight of each category in the occupational structure. Table Appendix A.1. shows that returns fell for all educational levels (in relation to complete primary education) except for incomplete primary school. However, this reduction has been more intense in the upper part of the distribution, a process that affects all educational levels but particularly the higher ones (complete and incomplete tertiary education). Given that this part of the distribution has a relatively higher concentration of workers with higher education, it is more intensely affected by the changes in returns.

As it was mentioned above, the results regarding the equalizing effect of declining returns to education are in line with previous studies. However, unlike the 1990s, when there was certain agreement about the behavior of the relative demand of skills as a main factor leading to increasing returns, nowadays there is less consensus regarding

the possible causes of the decline observed in this variable. Besides the existence of some studies suggesting that these could be consistent with a reversion in the trends of the demand of relative skills, there are really no in-depth analysis addressing this issue. The impacts of the labor institutions were also mentioned in some studies as another factor contributing to the reduction in skill premia in Latin America. In the case of Argentina the strengthening of collective bargaining that started in 2003 might have had an impact on the upper tail of the distribution, since most of the workers with higher wages are not included in the collective agreement process and hence their remunerations have lagged behind since then.

The equalizing effect of gender is more significant in the case of the Gini than with the percentiles ratios (Table 3). This is associated with an increase in returns to men in the first percentile and with a reduction in the last one. No significant changes are observed in the rest of the distribution (Graph 2).

The changes in wage gaps between workers in different branches of activity also contributed to the reduction of inequality as measured by the p90/p10 ratio, although this result is statistically significant only at a 10% level. The effect is almost in its entirety concentrated in the upper part of the distribution (Table 3). The analysis of returns to different productive sectors suggests that the equalizing effect of changes in the productive structure would be at least in part derived from a sharp reduction in the premium to financial services, which is one of the highest ones (Table Appendix A.1).

Lastly, the convergence of returns to the three groups of age considered shows an equalizing effect of this dimension, with a similar intensity in the upper and lower ends of the income distribution. However, the effects are not statistically significant in the case of the Gini index (Table 3).

6. CONCLUSIONS

In the last decade Argentina experienced a process wage inequality reduction that is in stark contrast with the trends of the previous decade. The purpose of this study is to analyze the contribution of different factors to that process.

The method employed is a decomposition proposed by Firpo, Fortin and Lemieux (2007, 2011), which allows extending the Oaxaca-Blinder approach to decompose some distributional statistics of income between a 'composition effect' and a 'returns effect'.

Like in other studies, the results reveal that declining returns to education have been a major factor explaining the improvement in the distribution of income, while the changes observed in the composition of employment according to this variable -biased towards the most educated levels- have been unequalizing. On the other hand, the process of labor formalization has been a significant factor for the reduction of inequality. This result has been barely included in previous studies. The growing formalization of wage-earners has not only meant that more workers are now covered by labor market institutions and have access to social security benefits but it has also produced an overall equalizing effect on wages.

However, despite these improvements in the labor market, Argentina continues to exhibit high levels of inequality and labor precariousness. This calls for the need to implement new measures and reinforce existing ones on both the supply and demand sides of the labor market in order to reduce the incidence of such phenomena. Promoting formal job creation (through greater enforcement of labor regulation, better incentives and more productive policies), increasing the educational level of the population and fighting against wage discrimination should all be part of an integral policy agenda to improve labor conditions in a context of sustained economic growth.

References

- Amarante, V., G. Salas and A. Vigorito, “El Incremento del Salario Mínimo en Uruguay y sus Impactos sobre el Mercado de Trabajo,” presented at Network of Inequality and Poverty (NIP) Meeting, Uruguay, 2009.
- Amarante, V., M. Colafranceschi and A. Vigorito, “Uruguay’s Income Inequality and Political Regimes during 1981–2010,” WIDER Working Paper, 94, 2011.
- Barros, R., M. de Carvalho and R. Mendonça, “Markets, the State, and the Dynamics of Inequality in Brazil,” in López-Calva, L. and N. Lustig, eds., *Declining Inequality in Latin America: A Decade of Progress?*, 134–174, Brookings Institution Press and The United Nations Development Programme, Washington, DC, 2010.
- Beccaria, L. and R. Maurizio, “Reversión y Continuidades bajo dos Regímenes Macroeconómicos Diferentes. Mercado de Trabajo e Ingresos en Argentina. 1990–2010,” *Desarrollo Económico*, vol. 52, 206, 205–228, 2012.
- Bertranou, F., L. Casanova, M. Jiménez and M. Jiménez, “Informalidad, Calidad del Empleo y Segmentación Laboral en Argentina, 1990–2011,” ILO-Buenos Aires Working Paper, 2, 2013.
- Blinder, A., “Wage Discrimination: Reduced Form and Structural Estimates,” *The Journal of Human Resources*, Vol. 8, No. 4, 436–455, 1973.
- Bosch, M. and C. González Velosa, “The Role of Minimum Wages on the Decline of Earnings Inequality in Brazil,” presented at XX Meetings of the LACEA/ IADB/ WB/ UNDP Research Network on Inequality and Poverty (NIP), Washington DC, 2013.
- Campos, R., G. Esquivel and N. Lustig, “The Rise and Fall of Income Inequality in Mexico, 1989–2010,” Tulane University Working Paper, 1201, 2012.
- Cornia, A., “Inequality Trends and their Determinants: Latin America over 1990–2011,” WIDER Working Paper, 9, 2012.
- Cruces, G. and L. Gasparini, “A Distribution in Motion: The Case of Argentina,” in López-Calva, L. and N. Lustig, eds., *Declining Inequality in Latin America: A Decade of Progress?*, 100–133, Brookings Institution Press and The United Nations Development Programme, Washington, DC, 2010.
- Damill, M., R. Frenkel and R. Maurizio, “Macroeconomic Policy for Full and Productive Employment and Decent Work for All. An Analysis of the Argentine Experience,” Employment Working Paper Series, 109, ILO, Ginebra, 2011.
- DiNardo, J., N. Fortin, T. Lemieux, “Labor Market Institutions and the Distribution of Wages, 1973–1992: A Semiparametric Approach,” *Econometrica*, Vol. 64, 5, 1001–1044, 1996.
- Esquivel, G., N. Lustig and J. Scott, “Mexico: A Decade of Falling Inequality: Market Forces or State Action?” in López-Calva, L. and N. Lustig, eds., *Declining Inequality in Latin America: A Decade of Progress?*, 175–219, Brookings

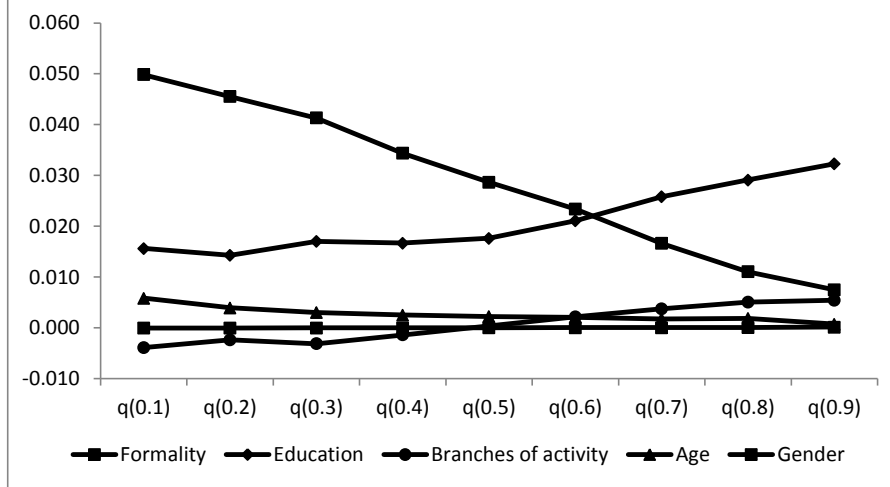
- Institution Press and The United Nations Development Programme, Washington, DC, 2010.
- Firpo, S., N. Fortin and T. Lemieux, “Decomposing Wage Distributions using Influence Function Projections and Reweighting,” mimeo, University of British Columbia, 2007.
- Firpo, S., N. Fortin and T. Lemieux, “Decomposition Methods in Economics,” in Ashenfelter, O. and D. Card, eds., *Handbook of Labor Economics*, Vol. 4A, pg. 1–97, North-Holland, Oxford, 2011.
- Gasparini, L. and N. Lustig, “The Rise and Fall of Income Inequality in Latin America,” ECINEQ Working Paper, 213, 2011.
- Gasparini, L., S. Galiani, G. Cruces and P. Acosta, “Educational Upgrading and Returns to Skills in Latin America: Evidence from a Supply-Demand Framework, 1990–2010,” IZA Discussion Papers, 6244, 2011.
- Hampel, F., “The Influence Curve and Its Role in Robust Estimation,” *Journal of the American Statistical Association*, 42, 1887–1896, 1974.
- Hussmanns, R., “Measuring the Informal Economy: From Employment in the Informal Sector to Informal Employment,” Policy Integration Department Working Paper, 53, ILO, Geneva, 2004.
- Keifman, S. and R. Maurizio, “Changes in Labour Market Conditions and Policies. Their Impact on Wage Inequality during the Last Decade,” WIDER Working Paper, 14, 2012.
- Lustig, N., L. Lopez-Calva, and E. Ortiz-Juarez, “Declining Inequality in Latin America in the 2000s: The Cases of Argentina, Brazil, and Mexico,” *World Development*, 44, april, 129–141, 2013.
- Marshall, A., “Desigualdad Interindustrial de Salarios, 2003-2008: ¿Reversión a los Patrones Históricos?,” *Estudios del Trabajo*, 37/38, 2009.
- Maurizio, R., “El Impacto Distributivo del Salario Mínimo en Argentina, Brasil, Chile y Uruguay,” Serie Políticas Sociales, CEPAL, Santiago, 2014.
- Maurizio, R., “Labour Formalization and Declining Inequality in Argentina and Brazil in 2000s: A dynamic Approach,” ILO Research Paper, 9, 2014.
- Oaxaca, R., “Male-Female Wage Differentials in Urban Labor Markets,” *International Economic Review*, Vol. 14, 3, 693–709, 1973.
- Salvia, A. and J. Vera, “Heterogeneidad Estructural y Desigualdad Económica: El Patrón de Distribución de los Ingresos y los Factores Subyacentes durante dos Fases de Distintas Reglas Macroeconómicas,” presented at Congreso de la Asociación Argentina de Estudios del Trabajo, Buenos Aires, 2011.
- Serrano, A. and G. Yupanqui, “Explicando las diferencias interregionales en la relación crecimiento – desigualdad,” *Anales de la Asociación Argentina de Economía Política*, 2012.
- Soares, S., “Distribuição de Renda no Brasil de 1976 a 2004 com Ênfase no Período entre 2001 e 2004,” Discussion Paper, 1166, Brasília, 2006.
- Trujillo, L. and S. Villafañe, “Dinámica Distributiva y Políticas Públicas: dos Décadas de Contrastes en la Argentina Contemporánea,” in Novick, M. and S. Villafañe, eds., *Distribución del Ingreso. Enfoques y Políticas Públicas desde el Sur*, MTESS-UNDP, Buenos Aires, 2011.

Appendix

[insert Table A1 here]

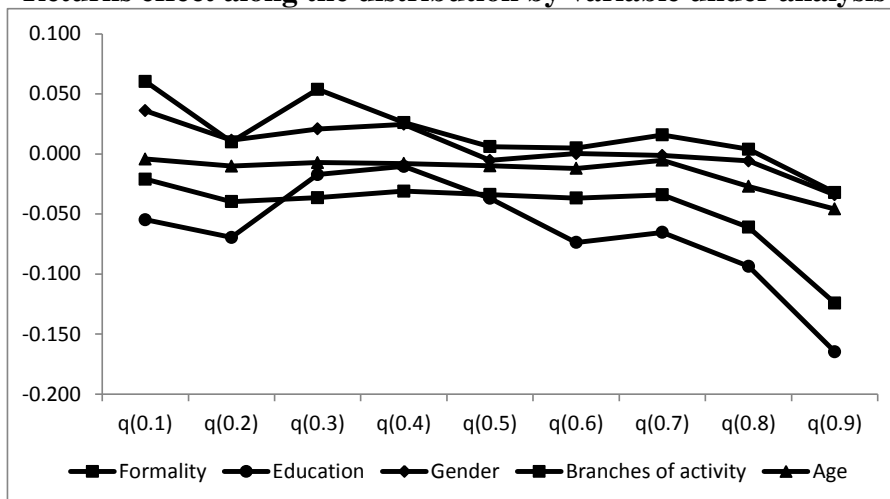
[insert Table A1 (cont.) here]

Graph 1
Composition effect along the distribution by variable under analysis



Source: Own elaboration based on PHS-INDEC.

Graph 2
Returns effect along the distribution by variable under analysis



Source: Own elaboration based on PHS-INDEC.

Table 1
Composition of wage earners' attributes. 2003 and 2012

Attribute	Q4-2003 (1)	Q4-2012 (2)	Q4-2003-2012 (3)	(2)-(1)		(2)-(3)
Registered wage earner	0.59	0.67	0.67	0.08	***	0.00
Male	0.56	0.57	0.57	0.00		0.00
Age						
<= 25 years old	0.16	0.15	0.15	-0.02	***	0.00
25 - 44 years old	0.55	0.57	0.56	0.02	**	0.00
> 44 years old	0.29	0.29	0.29	0.00		0.00
Married	0.60	0.58	0.59	-0.02	**	-0.01
Head of household	0.50	0.49	0.49	-0.01		0.00
Education						
Incomplete primary	0.06	0.04	0.04	-0.02	***	0.00
Complete primary	0.21	0.17	0.17	-0.04	***	0.00
Incomplete secondary	0.19	0.17	0.17	-0.02	***	0.00
Complete secondary	0.24	0.31	0.31	0.07	***	0.00
Incomplete tertiary	0.13	0.12	0.12	-0.01	***	0.00
Complete tertiary	0.18	0.20	0.20	0.02	***	0.00
Branches of activity						
Manufacturing	0.11	0.11	0.11	0.00		0.00
Construction	0.06	0.09	0.09	0.03	***	-0.01
Commerce	0.18	0.17	0.17	-0.02	***	0.00
Financial services	0.07	0.07	0.07	0.00		0.00
Transport services	0.06	0.06	0.06	0.00		0.00
Personal services	0.06	0.05	0.05	-0.01	***	0.00
Domestic service	0.11	0.10	0.10	0.00		0.00
Public administration	0.26	0.26	0.26	-0.01		0.00
Other branches	0.07	0.08	0.09	0.01	***	0.00
Job duration						
<= 3 months	0.20	0.16	0.16	-0.04	***	0.00
3-6 months	0.05	0.04	0.04	-0.01	**	0.00
6-12 months	0.07	0.05	0.05	-0.01	***	0.00
1-5 years	0.27	0.32	0.32	0.05	***	0.00
> 5 years	0.41	0.43	0.43	0.01	*	0.00
Region						
<i>Gran Buenos Aires</i>	0.19	0.14	0.14	-0.05	***	0.00
<i>Noroeste</i>	0.20	0.23	0.23	0.03	***	0.00
<i>Noreste</i>	0.10	0.12	0.12	0.02	***	0.00
<i>Cuyo</i>	0.11	0.11	0.10	0.00		0.00
<i>Pampeana</i>	0.31	0.29	0.29	-0.03	***	0.00
<i>Patagónica</i>	0.09	0.12	0.12	0.04	***	0.00
Full-time worker	0.67	0.67	0.66	0.00		0.01

Source: Author's elaboration based on PHS-INDEC (28 urban areas).

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 2
Inequality Indicators

	1991 (1)	1995	1998	2001	2003	2012
PER CÁPITA FAMILY INCOME						
Gini coefficient	0.504	0.516	0.535	0.546	0.553	0.425
WORKERS						
Monthly remuneration -main occupation- Gini coefficient	0.426	0.439	0.462	0.473	0.459	0.370
Hourly remuneration -main occupation- Gini Coefficient	0.437	0.447	0.471	0.479	0.449	0.358
Ratios of percentiles						
90/10	6.27	6.81	7.55	8.56	7.48	5.40
90/50	2.57	2.74	2.97	3.02	2.72	2.25
50/10	2.44	2.49	2.54	2.87	2.79	2.40
NON WAGE EARNERS						
Monthly remuneration -main occupation- Gini coefficient	0.490	0.528	0.559	0.580	0.570	0.420
Hourly remuneration -main occupation- Gini coefficient	0.505	0.545	0.572	0.586	0.552	0.428
ALL WAGE EARNERS						
Monthly remuneration -main occupation- Gini coefficient	0.401	0.402	0.427	0.444	0.423	0.356
Hourly remuneration -main occupation- Gini coefficient	0.411	0.407	0.434	0.446	0.414	0.339
Ratios of percentiles						
90/10	5.31	5.68	6.49	7.24	5.88	4.69
90/50	2.37	2.53	2.76	2.89	2.33	2.14
50/10	2.24	2.25	2.35	2.51	2.50	2.19
WAGE EARNERS IN PRIME AGE (2)						
Hourly remuneration -main occupation- Gini coefficient	0.375	0.373	0.394	0.410	0.413	0.336
Ratios of percentiles						
90/10	4.70	4.92	5.60	6.30	6.41	4.69
90/50	2.17	2.30	2.52	2.67	2.62	2.14
50/10	2.16	2.14	2.22	2.36	2.45	2.19

Source: Author's elaboration based on PHS-INDEC (28 urban areas).

Note: The estimates for the period 1991-2001 are based on data from the october waves while those for the period 2003-2012 are based on data from the fourth quarters.

(1) Based on extrapolated data from a smaller group of urban areas, according to the observed variation of the variable between 1991-1995.

(2) Women between 16 - 59 years old and men between 16 - 64 years old.

Table 3
Decomposition of changes in wage inequality between the IVQ-2003 and IVQ-2012

	log(90/10)	log(50/10)	log(90/50)	Gini
Q4 2012	1.713 ***	0.871 ***	0.843 ***	0.349 ***
	0.023	0.018	0.017	0.003
Q4 2003	1.870 ***	0.955 ***	0.915 ***	0.409 ***
	0.026	0.020	0.019	0.006
Total Change	-0.157 ***	-0.085 ***	-0.072 ***	-0.059 ***
	0.035	0.027	0.025	0.006
First Stage				
Composition effect	-0.055 **	-0.063 ***	0.008	-0.002
	0.028	0.023	0.021	0.006
Return effect	-0.102 ***	-0.022	-0.080 ***	-0.057 ***
	0.028	0.023	0.021	0.006
Second Stage				
Composition effects:				
Formality	-0.042 ***	-0.021 ***	-0.021 ***	-0.009 ***
	0.003	0.001	0.001	0.001
Education	0.017 ***	0.002	0.015 ***	0.005 ***
	0.004	0.002	0.002	0.001
Branches of activity	0.009 ***	0.004 ***	0.005 ***	0.002 ***
	0.002	0.001	0.001	0.000
Gender	0.000	0.000	0.000	0.000
	0.001	0.000	0.001	0.000
Age	-0.005 ***	-0.004 ***	-0.001 *	-0.001 **
	0.002	0.001	0.001	0.000
Other characteristics	0.022 ***	0.010 ***	0.012 ***	0.001 ***
	0.003	0.002	0.002	0.000
Total composition effects	0.001	-0.008 ***	0.009 ***	-0.001
	0.005	0.003	0.003	0.001
Specification Error	-0.056 **	-0.055 **	-0.001	0.000
	0.027	0.023	0.021	0.006
Return effects:				
Formality	-0.093 **	-0.054	-0.038	-0.014
	0.042	0.038	0.025	0.012
Education	-0.110 **	0.018	-0.128 ***	-0.023 ***
	0.047	0.034	0.037	0.008
Branches of activity	-0.103 *	-0.013	-0.090 *	-0.011
	0.058	0.039	0.047	0.011
Gender	-0.070 **	-0.041 **	-0.029	-0.020 **
	0.031	0.021	0.027	0.008
Age	-0.042 **	-0.006	-0.036 **	-0.007
	0.020	0.012	0.018	0.005
Other characteristics	-0.118	-0.009	-0.110	-0.024
	0.114	0.085	0.083	0.024
Constant	0.435 ***	0.084	0.351 ***	0.042 *
	0.142	0.102	0.109	0.025
Total return effects	-0.101 ***	-0.021	-0.079 ***	-0.057 ***
	0.027	0.023	0.021	0.006
Reweighting error	-0.002	-0.001	-0.001	0.000
	0.005	0.003	0.003	0.001

Source: Author's elaboration based on PHS-INDEC (28 urban areas).

Note 1: Bootstrapped standard errors with 1000 replicates.

Note 2: Other characteristics includes head of household, job duration and region.

Note 3: Estimates were obtained based on a probit model with registered wage earner, sex, age, married, head of household, branches of activity, and region dummies, and a full set of education and job duration dummies and its interactions.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A1
Unconditional quantile regressions
IVQ-2003 reweighted and IVQ-2012

Covariates	Q4-2003 reweighted								
	q(0.1)	q(0.2)	q(0.3)	q(0.4)	q(0.5)	q(0.6)	q(0.7)	q(0.8)	q(0.9)
Registered wage earner	0.643***	0.666***	0.578***	0.450***	0.352***	0.277***	0.178***	0.119***	0.0820**
Education									
Incomplete primary	-0.124	-0.0904	-0.0786	-0.0911**	-0.0818**	-0.0480	-0.0447	-0.0485	-0.0410
Incomplete secondary	0.0842	0.129***	0.0832**	0.0792***	0.0786***	0.103***	0.109***	0.172***	0.163***
Complete secondary	0.187***	0.200***	0.214***	0.186***	0.186***	0.232***	0.242***	0.301***	0.314***
Incomplete tertiary	0.315***	0.323***	0.366***	0.350***	0.395***	0.411***	0.458***	0.508***	0.535***
Complete tertiary	0.209***	0.315***	0.397***	0.417***	0.550***	0.661***	0.800***	0.944***	1.100***
Branches of activity									
Construction	-0.0397	-0.0733	-0.0831*	-0.0749	-0.0268	-0.00881	0.00168	0.0138	0.0333
Commerce	-0.0805*	-0.0991**	-0.105***	-0.124***	-0.139***	-0.165***	-0.148***	-0.149***	-0.163***
Financial services	-0.0408	0.00935	-0.00752	0.0120	0.0538	0.0880**	0.145***	0.174***	0.179**
Transport services	-0.116*	-0.0803	-0.0144	-0.0176	0.0415	0.0261	0.00544	-0.0298	-0.0849
Personal services	0.0577	0.113**	0.0657	0.0713*	0.0274	0.0164	-0.00423	-0.0758	-0.102
Domestic service	0.0631	0.0409	0.0670	0.0408	0.0550	0.0578	0.0757*	0.0853*	0.140**
Public administration	0.0742*	0.154***	0.119***	0.139***	0.157***	0.156***	0.164***	0.111**	0.0173
Other branches	0.0326	0.0817*	0.0660	0.0678*	0.0969**	0.179***	0.216***	0.242***	0.269***
Male	-0.0153	-0.0162	-0.0258	-0.0335	0.0247	0.00722	0.0167	0.0625**	0.122***
Age									
<= 25 years old	-0.228***	-0.167***	-0.144***	-0.120***	-0.0966***	-0.0864***	-0.0881***	-0.0468*	0.00656
> 44 years old	0.0359	0.0581**	0.0717***	0.0911***	0.118***	0.134***	0.172***	0.246***	0.297***
Region									
Noroeste	-0.520***	-0.549***	-0.457***	-0.407***	-0.382***	-0.338***	-0.371***	-0.363***	-0.398***
Noreste	-0.553***	-0.584***	-0.500***	-0.420***	-0.406***	-0.376***	-0.421***	-0.421***	-0.457***
Cuyo	-0.295***	-0.384***	-0.339***	-0.314***	-0.325***	-0.323***	-0.314***	-0.345***	-0.377***
Pampeana	-0.0847***	-0.184***	-0.192***	-0.185***	-0.190***	-0.190***	-0.227***	-0.256***	-0.286***
Patagónica	-0.0635**	-0.0771**	0.0107	0.0773**	0.163***	0.219***	0.235***	0.331***	0.490***
Head of household	0.0347	0.0595**	0.0709***	0.0764***	0.0639***	0.0804***	0.0801***	0.0700***	0.143***
Job duration									
<= 3 months	-0.319***	-0.205***	-0.129**	-0.0482	-0.0658	-0.0368	-0.0128	0.0104	0.00546
6-12 months	-0.0921	-0.0560	-0.0630	-0.0747	-0.0690	-0.116**	-0.0706	-0.00249	0.0306
1-5 years	-0.0276	0.00629	0.00537	0.0179	-0.0279	-0.00649	0.00121	0.0209	0.0425
> 5 years	0.0313	0.133**	0.182***	0.210***	0.176***	0.192***	0.222***	0.267***	0.203***
Constant	-0.117	0.0663	0.272***	0.494***	0.633***	0.747***	0.937***	1.082***	1.362***
Number of observations	8,661	8,661	8,661	8,661	8,661	8,661	8,661	8,661	8,661
R ²	0.187	0.274	0.316	0.308	0.313	0.299	0.280	0.227	0.151

Source: Author's elaboration based on PHS-INDEC (28 urban areas).

Note: Base categories are Complete Primary (Education), Manufacturing (Branches of Activity), 25 - 44 years old (Age), Gran Buenos Aires (Region), and 3 - 6 months (Job duration).

*** p<0.01, ** p<0.05, * p<0.1

Table A1 (cont.)

Covariates	Q4-2012								
	q(0.1)	q(0.2)	q(0.3)	q(0.4)	q(0.5)	q(0.6)	q(0.7)	q(0.8)	q(0.9)
Registered wage earner	0.734***	0.681***	0.659***	0.489***	0.361***	0.285***	0.202***	0.124***	0.0338*
Education									
Incomplete primary	-0.311***	-0.210***	-0.115***	-0.122***	-0.0962***	-0.0707***	-0.0765***	-0.0723***	-0.0690***
Incomplete secondary	0.0193	0.000719	0.0698***	0.0326	0.0400**	0.0354*	0.0520***	0.0554***	0.0547***
Complete secondary	0.122***	0.139***	0.206***	0.178***	0.154***	0.145***	0.172***	0.192***	0.160***
Incomplete tertiary	0.202***	0.229***	0.307***	0.347***	0.321***	0.311***	0.307***	0.332***	0.294***
Complete tertiary	0.191***	0.247***	0.376***	0.426***	0.493***	0.546***	0.725***	0.853***	0.755***
Branches of activity									
Construction	0.0787	-0.00877	-0.0713**	-0.0731**	-0.0664***	-0.0432*	-0.0185	-0.0532*	-0.126***
Commerce	-0.0597	-0.0661**	-0.0981***	-0.143***	-0.134***	-0.147***	-0.154***	-0.211***	-0.282***
Financial services	0.0803*	0.0650*	0.0364	0.0366	0.0496*	0.0223	0.0339	-0.00493	-0.155***
Transport services	-0.199***	-0.125***	-0.101***	-0.0786**	-0.0178	-0.0116	0.0272	-0.0549	-0.189***
Personal services	0.0170	0.0433	0.0150	0.000933	0.00989	-0.0295	-0.0122	-0.0915**	-0.114**
Domestic service	-0.173*	-0.0955	-0.0760	-0.0462	-0.0900***	-0.0711**	-0.0783**	-0.0732**	-0.114***
Public administration	0.0721**	0.0646**	0.0784***	0.118***	0.146***	0.153***	0.189***	0.125***	-0.0255
Other branches	-0.101**	-0.0518	-0.0386	-0.0268	-0.00827	0.0222	0.0404	0.0383	0.00550
Male	0.0484*	0.00384	0.0109	0.0100	0.0151	0.00766	0.0143	0.0522***	0.0623***
Age									
<= 25 years old	-0.178***	-0.151***	-0.126***	-0.0968***	-0.0610***	-0.0525***	-0.00759	-0.000640	0.00865
> 44 years old	-0.00535	0.0138	0.0370**	0.0515***	0.0650***	0.0738***	0.111***	0.128***	0.136***
Region									
Noroeste	-0.400***	-0.372***	-0.349***	-0.298***	-0.233***	-0.213***	-0.235***	-0.234***	-0.198***
Noreste	-0.455***	-0.433***	-0.405***	-0.355***	-0.284***	-0.258***	-0.300***	-0.311***	-0.239***
Cuyo	-0.161***	-0.196***	-0.194***	-0.215***	-0.174***	-0.161***	-0.184***	-0.221***	-0.166***
Pampeana	0.00127	-0.0399	-0.0651***	-0.0725***	-0.0576***	-0.0480**	-0.0775***	-0.111***	-0.0894***
Patagónica	-0.00450	0.0381	0.105***	0.211***	0.328***	0.387***	0.569***	0.714***	0.819***
Head of household	0.100***	0.0750***	0.0573***	0.0575***	0.0399***	0.0465***	0.0570***	0.0559***	0.0351*
Job duration									
<= 3 months	-0.209**	-0.0972	-0.110**	-0.0528	0.0225	0.0132	0.0110	-0.0254	-0.0427
6-12 months	0.00970	0.0810	-0.0251	-0.0345	-0.0440	-0.0584*	-0.0642*	-0.0832**	-0.0772*
1-5 years	0.0392	0.103**	0.0566	0.0472	0.0717***	0.0348	0.0124	-0.0308	-0.0458
> 5 years	0.0818	0.154***	0.147***	0.154***	0.214***	0.198***	0.221***	0.159***	0.129***
Constant	0.184**	0.499***	0.669***	0.912***	1.019***	1.245***	1.347***	1.620***	2.099***
Number of observations	11,559	11,559	11,559	11,559	11,559	11,559	11,559	11,559	11,559
R ²	0.187	0.290	0.362	0.359	0.371	0.364	0.351	0.302	0.202

Source: Author's elaboration based on PHS-INDEC (28 urban areas).

Note: Base categories are Complete Primary (Education), Manufacturing (Branches of Activity), 25 - 44 years old (Age), Gran Buenos Aires (Region), and 3 - 6 months (Job duration).

***p<0.01, **p<0.05, *p<0.1