Temporary employment and its impact on wages in Latin America

Empleo temporal y sus impactos en los salarios en América Latina

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Citar como/Cite as:
Maurizio, R. (2019). Temporary employment and its impact on wages in Latin America. Iberoamerican Journal of Development Studies, vol. 8(1):186-215.
DOI: 10.26754/ojs_ried/ijds.306

Abstract

Latin America has experienced a process of significant improvement in the labour market during the new millennium. In spite of these advances, these countries continue to suffer from remarkable deficits in their labour markets. The high incidence of informality becomes a source of low wages and lack of social security benefits. Even within formal employment, the significant prevalence of non-permanent contracts frequently leads to consequences similar to those of informal occupations. This paper analyses fixed-term contracts in eight Latin American countries: Argentina, Brazil, Chile, Costa Rica, Ecuador, Mexico, Paraguay and Peru. We aim at estimating the incidence, evolution and characteristics of this phenomenon and assessing to what extent temporary employment generates wage gaps. Econometric techniques are used in order to estimate not only the average wage gap between these two groups of workers but also the penalty suffered by temporary workers located at different points of the wage distribution.

Keywords: Latin America, fixed-term contracts, temporary employment, wages.

Resumen

América Latina ha experimentado un proceso de mejora significativa en el mercado laboral durante el nuevo milenio. A pesar de tales avances, dichos países continúan sufriendo importantes déficits en sus mercados laborales. La alta incidencia de la informalidad se convierte en una fuente de bajos salarios y falta de beneficios de Seguridad Social. Incluso dentro del empleo formal, la prevalencia significativa de los contratos no permanentes a menudo conduce a consecuencias similares a las de las ocupaciones informales. En este documento se analizan los contratos de duración determinada en ocho países de América Latina: Argentina, Brasil, Chile, Costa Rica, Ecuador, México, Paraguay y Perú. Nuestro objetivo estriba en estimar la incidencia, evolución y características de dicho fenómeno y evaluar en qué medida el empleo temporal genera brechas salariales. Las técnicas econométricas se utilizan para estimar no solo la brecha salarial promedio entre estos dos grupos de trabajadores sino también la penalidad experimentada por los trabajadores temporales ubicados en diferentes puntos de la distribución salarial.

Palabras clave: América Latina, contratos de duración determinada, empleo temporal, salarios.

1 Introduction

Non-standard forms of employment (NSFE) have grown globally in the last decades, associated to technological change, the search for greater labour flexibility, the implementation of new forms of industrial organisation and a higher female participation rate in the labour market (ILO 2013).

In this context, nevertheless, Latin America has experienced a process of significant improvement in the labour market during the last fifteen years. This translates into a reduction of unemployment, creation of new jobs, a rise in the mean real wage and job formalization (ILO 2012, Bertranou *et al.* 2014, Maurizio 2015). Despite these advances, however, these countries continue to suffer from remarkable deficits in their labour markets (ILO 2017, Jaramillo 2013, Leite 2011, Infante & Chacaltana 2014). The high incidence of informality becomes a source of low wages, inequality, lack of social security benefits as well as labour instability (Bosch & Maloney 2010, CEPAL-OIT 2015, Beccaria *et al.* 2017, Pianto *et al.* 2004). Even within formal employment, the significant prevalence of non-permanent contracts frequently leads to consequences very similar to those of informal occupations.

There is widespread debate over the causes, role and consequences of this non-standard type of employment. On the one hand, it has been stated that temporary employment might be a palliative for high unemployment rates, especially in some European countries. It has also been suggested that these jobs might be a «stepping stone» to access others of higher quality in the future, as employers might use these kinds of contracts as a probationary period or a screening mechanism to assess the worker's productivity and the quality of the matching between her individual characteristics and those required by the position before turning the latter in open-ended. On the other hand, however, this NSFE might induce segmentation in the labour market as workers with permanent employment benefit from higher hourly wages and better employment conditions than those with similar characteristics who have fixed-term contracts. Furthermore, this type of occupation might lead to a substitution from open-ended labour to not open-ended labour that might in turn lead to higher rates of exit from occupation and, therefore, higher rates of entry to unemployment (ILO 2016).

Unlike developed countries, there is scarce literature on incidence, evolution and characteristics of temporary employment in Latin America. This region appears as particularly relevant in the study of this phenomenon. On the one hand, some countries exhibit a very high prevalence of fixed-term contracts, much higher than

in developed countries. On the other hand, the trends observed during the 2000s in some Latin American countries are in sharp contrast with other regions of the world, in particular, with Europe.[1]

This is the first paper that study non-permanent salaried employment from a comparative perspective in eight Latin American countries: Argentina, Brazil, Chile, Costa Rica, Ecuador, Mexico, Paraguay and Peru. We aim at estimating the incidence of this phenomenon in total salaried employment and in different subgroups of workers, analysing their evolution along the 2000s and assessing the extent to which this NSFE is a source of wage gaps. One dimension particularly studied in this paper is labour informality since it continues to be one of the most distinctive labour characteristics in Latin America and its connection with temporary employment is very high.

The selection of countries provides an exhaustive evaluation of the region as they exhibit labour structures and dynamics that greatly differ from one another. At the same time, since the biggest economies are included here, population under study represents about 70 % of total population living in the region.

The paper is structured as follows. In next section it is introduced the theoretical approach for the analysis of NSFE and provides a literature review for Latin America. In Section 3 the sources of the information used are described. In Section 4 it is detailed the methodology of estimation of wage gaps associated to temporary employment. In Section 5 the evolution of labour formality in the eight countries under study to contextualise the following sections is analysed. In Section 6 it is estimated the incidence of temporary employment, its characteristics and evolution during the new millennium. In Section 7 it is discussed about the wage gaps estimated for those countries. Finally, in Section 8 it is concluded.

2
Theoretical approach and empirical evidence for Latin America

As mentioned before, non-standard forms of employment and, in particular, temporary employment have grown globally in the last decades. Nowadays, there is an intense debate over causes and effects of this type of employment.

The existence of not open-ended contracts might owe to the employers' need to count on a «trial period», where the quality of the matching between the characteristics of position and employee can be assessed in a less costly manner than it would be the case under an open-ended contract («screening device» hypothesis). If the matching turned out not to be optimal, the employer might

1 Cazes and De Laiglesia (2015) provide an outlook of the prevalence of temporary contracts in developed and developing countries, including some Latin American countries.

choose not to renew the contract without facing firing costs. Alternatively, this type of positions might be a transit towards a permanent one («stepping stone» hypothesis) (Booth *et al.* 2002; Zijl *et al.* 2009).

In addition to this, the lower cost to finish this labour relationship or the need for external flexibility could be other employer incentives for using this kind of contract (Aleksynska & Berg 2015).

Regarding the consequences of this NSFE, one of the most evident is the less stability of the position, not only because these contracts stipulate an explicit end date but also since during contractive phases of the business cycle staff downsizing usually affects them the most, due to the possibility of non-renewal.

At the same time, short job duration makes it more difficult to access on-the-job training (Carpio *et al.* 2011, Bassanini *et al.* 2005; Arulampalam *et al.* 2004). On the one hand, it has been pointed out that in this context workers might be less inclined to receiving training if they consider that their probability of becoming permanent is low and therefore duration in the company is short. On the other hand, employers will be less encouraged to train a worker that will remain in the company for a short period of time which means they will not be able to fully exploit the productivity gains arising from the higher specific human capital (Cabrales *et al.* 2014). The combination of lower probability of receiving training and higher rotation threatens, in turn, the worker's possibility of experiencing upward labour trajectories.

In connection to this, temporary employment might also imply lower labour productivity and, in turn, lower wages. This might be associated to the fact that workers will exert a bigger effort the larger their expectations of acceding to a permanent position in the company (Dolado & Strucchi 2008). Perception of labour instability might also entail health hazard which affects productivity as well (Lora 2008).

Nevertheless, it is also stressed that temporary workers might receive a wage premium (instead of a penalty) to compensate for the lack of other benefits and less favourable labour conditions. This leads to what Smith (1776) referred to as «compensating differences», by which the wage of a certain position would reflect the advantages and disadvantages it offers. In this sense, hourly wages would be higher due to the «disadvantage» associated to, for instance, the lower stability of these positions which implies greater uncertainty on future wage.

Lastly, labour laws can contribute to amplify or reduce the gap in labour conditions between temporary and open-ended contracts. This depends on the extent to which the former are included or excluded from protective regulations and labour rights that benefit open-ended contracts. Likewise, macroeconomic stability, labour demand

and cost gaps (firing costs, among others) between permanent and temporary workers are factors that affect the possibility of a temporary position effectively becoming a permanent one.

Unlike developed countries, there is very scarce literature on temporary employment in Latin America. Empirical studies have been concentrated in three topics: (1) its incidence and motivations, (2) its impacts on wages and inequality, and (3) its role as screening device.

Regarding the incidence and motivations to use temporary contract, evidence suggests a heterogeneous situation across countries in Latin America. On the one hand, Gamero (2013) warns about the massive use of fixed-term contracts and also about the lack of contracts in Peru, considering it to be one of the countries with a highest incidence of such labour modalities in the region. In a more recent study, Jaramillo *et al.* (2017) also show the extended use of temporary contract in this country. They find that about 80 % of formal employment is made up of fixed-term contracts.

On the other hand, Bertranou *et al.* (2014) find a low incidence of temporary employment among formal wage-earners in Argentina, below 10 %. Additionally, they report transitions from these positions to other open-ended ones during the last decade.

Weller and Roethlisberger (2013) also find a strong contrast between Argentina and Costa Rica, on one side (with about 70 % of wage-earners in a permanent relationship), and Ecuador (where half of positions are temporary) on the other. Marull (2013) analyses the labour situation of this country and Bolivia. She finds, in both cases, high labour instability associated to the lack of labour contract and the prevalence of temporary contracts.

Leite (2011) identifies, on the one hand, a process of labour improvements in Brazil, especially after 2005; on the other hand, the persistence of precarious labour conditions, particularly those linked to temporary agency employment, widespread across several productive sectors. It translates into outsourcing, home working and cooperative society employment, among others.

Regarding the second topic, Cazes and De Laiglesia (2015) evaluate to what extent this kind of employment is a source of segmentation and wage inequality. They confirm this hypothesis and find a positive correlation between a higher prevalence of fixed-term contracts and wage inequality, even controlling for its other determinants, both in OECD and some Latin American countries.

In the same line, Jaramillo (2013) highlights that in Peru, in addition to informality, there exists another form of labour segmentation within formal contracts between open-ended ones and fixed-term ones. This type of arrangements presents more precarious labour

conditions (related to wages, social security access and stability) than permanent jobs.

Finally, regarding the third topic, Carpio *et al.* (2011) find that in Chile temporary workers receive less on-the-job training than permanent workers. Likewise, only a third of the former turned into the latter between 2002 and 2004. This casts doubts on the argument discussed above according to which not open-ended contracts are a stepping stone to a permanent position.

As already mentioned, together with temporary employment, this paper will pay special attention to informality and the connections between these two labour dimensions. There are, at least, three reasons to do that.

First, informality continues to be one of the most outstanding aspects of labor markets in Latin America, despite the improvements in labour conditions verified during the 2000s in this region (Weller 2014; Herrera-Idárraga *et al.* 2015; ILO 2011).

Second, its prevalence varies across countries; particularly, two sets of countries with different employment structures can be identified: on the one hand, Argentina, Brazil, Chile, Costa Rica and Uruguay, where informality represents between 20 to 30 % of total salaried employment; on the other hand, Bolivia, Ecuador, El Salvador, Mexico, Paraguay and Peru, where informality is very high, ranging from a minimum of 40 % to a maximum of 70 % (Tornarolli *et al.* 2014; Maurizio 2016a).

Third, significant wage gaps associated with informality are found in several Latin American countries. Maurizio (2016a), using different parametric and non-parametric econometric methods, point to the existence of significant income gaps in favor of formality that are not explained by differences in the observed attributes of workers in six countries in the region. Moreover, the wage gaps associated with informality are not constant across the income distribution but larger at the lower extreme. Tornarolli *et al.* (2014) confirm the existence of these gaps in almost all Latin American countries, both among women and men. Arias and Khamis (2008) also find significant wage penalties due informality in Argentina. Pianto *et al.* (2004) use quantile wage regressions and selection models to analyze wages in formal, informal and self-employed in Bolivia. Their results seem to confirm the existence of segmentation at the lower quantiles of the earnings distribution. However, findings at higher quantiles are more consistent with voluntary choice by high productivity workers. Finally, Herrera-Idárraga *et al.* (2015) evaluate the wage gap in Colombia considering the effect of mismatch between education and occupation. They find that the return to education is higher for formal than informal workers, controlling for the rest of covariates. However, wage penalty associated with informality is not only driven by the lower return

to correct years of education but also by the higher penalty that informal workers suffer due to overeducation, in comparison with formal workers.

Summing up, there are few studies on temporary employment in the region. Most of them analyse specific countries or only a small group of them. Likewise, those papers that study the impacts of this kind of contract on wages do so by studying their average effect, without assessing whether the wage gap associated with a fixed-term contract varies along the wage distribution. Finally, previous studies have not made a direct link between temporary employment and labour informality.

Taking into consideration all these previous studies, in this paper it is taken some steps forward by: (1) assessing the prevalence and characteristics of fixed-term contracts in eight Latin American countries, from a comparative perspective; (2) analysing the links between temporary and informal employment and the impacts of the former on wages in formal and informal salaried workers; (3) evaluating the behaviour of wage gaps along the distribution in order to assess if there is a combination of low and unstable wages in countries with scarce development of social and labour policies.

3
Source of information and definitions

3.1. Data

Data used in this paper come from regular household surveys carried out by the national statistical institutes of each country. While they are mainly focused on labour market variables they also gather information on other social and demographic characteristics of the households. Even when household surveys are not exactly the same their design and implementation follows the conceptual framework adopted by the International Labour Organization (ILO) and the Economic Commission for Latin America and the Caribbean (ECLAC). Additionally, same methods to process the data and definitions were implemented in order to make variables and indicators as comparable as possible across countries. In any case, when the comparison between countries is not completely possible, this is duly clarified in the paper.[2]

For Argentina, the data source is the *Encuesta Permanente de Hogares* (EPH). Micro-data are available for 31 urban areas. For Brazil, the *Pesquisa Mensal de Emprego* (PME) was used. It covers six major urban areas. The *Encuesta de Caracterización Nacional* (Casen) covers both urban and rural areas of Chile. For Costa Rica, the *Encuesta Nacional de Hogares* is used. The *Encuesta Nacional*

2 It is important to point out that these household surveys are the same regularly used by ILO, ECLAC and in academic papers to carry out comparable studies for Latin America.

de Empleo, Desempleo y Subempleo (Enemdu) in Ecuador is carried out in urban and rural areas. The *Encuesta Nacional de Ocupación y Empleo* (ENOE) is the source of data for Mexico. The Paraguayan *Encuesta Permanente de Empleo* has national coverage. Finally, the *Encuesta Nacional de Hogares* (Enaho) in Peru also covers urban and rural areas.

The period under analyses corresponds to the first fifteen years of the new millennium. However, specific years considered vary in each country according to data availability. In Argentina and Brazil all years between 2003 and 2015 are analysed; years 2000, 2003, 2006, 2009, 2011 and 2013 for Chile, 2006-2013 for Costa Rica, 2004-2015 for Ecuador and Peru, 2005-2015 for Mexico and 2002-2014 for Paraguay.

3.2. Approach and empirical identification of temporary employment

Temporary employment is measured according to data availability in each survey. There are two types of approach to this subject: a broader one that focuses on whether the job has an end date (Argentina, Brazil, Costa Rica and Ecuador) and a more specific one in which it is inquired into the type of contract, whether the workers have a signed contract or not and, in this case, whether it is open-ended or temporary (Mexico, Paraguay and Peru). For these countries, those wage-earners without contract are considered temporary workers. In Chile, both alternatives are available; nevertheless, while the first approach is available for all years, the second one changes along the series. Therefore, only the first option will be considered. Similarly, in Ecuador, possible answers regarding temporary jobs change in 2007 which produces a discontinuity in the series.

3.3. Approach and empirical identification of labour informality

As abovementioned, labour informality is one of the categories of analysis that most contributes to the characterization of labour conditions in Latin America. There are, at least, two approaches to informality.

On the one hand, the concept of *informal sector* (IS) emerged in the early seventies, in the ILO's documents for African countries (ILO 1972). It was then developed in Latin America by the Regional Employment Program for Latin America and the Caribbean. Under this «productive approach», informality reflects the inability of these economies to generate sufficient employment in the formal sector in comparison to the growth of the labour force. The IS is usually associated with small productive units with low levels of productivity

and where the aim is survival more than accumulation. Jobs generated in this sector constitute *employment in the informal sector.*

On the other hand, *informal employment* (IE) is another concept that has developed in more recent years. Based on a «legal approach», IE refers to a different dimension of informality because it focuses directly on job conditions. Particularly, this approach associates informality with the evasion of labour regulations, defining IE as that of workers not covered by labour legislation (ILO 2002, Hussmanns 2004). This paper adopts this second approach distinguishing formal (registered wage-earners) and informal workers.

The empirical identification of the wage-earners' registration condition in each of these countries is based on the availability of information derived from these databases. In Argentina, formal wage earners are those who answer that they employers make payroll deductions to pay social security contribution. In Chile and Brazil, a wage-earner is considered as registered if she has signed a labour contract. In Costa Rica, Mexico, Paraguay and Peru, the question on whether or not the employee is affiliated to a pension system is employed. In Ecuador, those indicating that they receive social insurance from the employed are considered registered wage-earners. In all cases, therefore, we identify those wage-earners that are covered by labour legislation and regulations and those who are not.

3.4. Other explanatory variables

In addition to formal/informal employment, in this paper it is used a wide set of demographic and labour market variables to characterize temporary salaried employment. These variables are: gender, age, position in the household, education, part/full time, sector of activity, size of enterprise, training, urban/rural and region. Their definition and empirical identification are comparable across countries because, as already mentioned, national household surveys adopted approaches and methodologies proposed by the ILO and ECLAC.

The selection of variables was based on four factors: first, the aim of having an exhaustive overview of the determinants of temporary employment and its implications in terms of wages; second, the theoretical arguments and previous empirical literature about the prevalence, characteristics and impacts of fixed-term contracts; third, those variables are usually used to characterize occupations and labour incomes in Latin America; finally, the availability of demographic, firm and job information from the household surveys. A description of all covariates used in this paper is presented in Annex 1.

4
Methodology of estimation of wage gaps

Wage equations are estimated to assess the wage gaps associated with temporary employment. To do this, two complementary methods are used.

First, wage gaps are estimated by using Mincer Equations. Particularly, we perform two-step Heckman selection models to avoid selectivity bias arising, in general, from female labour participation. This is the traditional approach when analysing the effect of one independent variable on wages, while controlling for the rest of the covariates.[3] This method has two steps. In the first step, we evaluate the probability of participation in the labour market using probit model from which the Mills inverse ratio is obtained. In the second step, we estimate Mincerian log hourly earnings functions including, in addition to a wide set of explanatory variables, this ratio as another regressor. In this way, it is possible to avoid the sample selection bias that occurs when unobservable characteristics that affect the work decision are correlated with explanatory variables.

Despite its frequent use, this method allows estimating the effects of the covariates only on the mean wage. However, it is relevant to compute the impact of the covariates along the entire distribution of wages. To do that, Unconditional Quantile Regression Model (UQR), proposed by Firpo *et al.* (2011a), is applied to evaluate whether wage gaps remain constant, grow or decrease along the different quantiles of the wage distribution.[4]

As usual, estimated coefficients indicate the effect of a marginal change in these covariates on the unconditioned quantile of the wage distribution. This method has two important advantages: on the one hand, the interpretation of the coefficients is the same as in the standard Mincerian equations; on the other hand, by estimating the impact of covariates at different percentiles, it is possible to evaluate whether the wage gap associated with temporary employment is stronger among low or high wages.[5] In this way it is possible, in turn, to identify if the penalty associated to fixed-term contracts suggests the present of a «sticky floor effect» or a «glass ceiling effect».[6]

5
An overview of labour formalization in Latin America

Although labour informality continues to be one of the region's distinctive characteristics, its incidence has fallen in a significant number of countries, especially over the past decade. Particularly, in all cases analysed here, except in Mexico, the proportion of

3 In several studies this method is used to estimate the determinants of wage in Latin America and other countries. Some examples are: Patrinos (2016), Contreras & Gallegos (2011), Bourguignon *et al.* (2005), Messina & Silva (2017), López-Calva & Lustig (2010), Jaramillo *et al.* (2017), and Arias & Khamis (2008).

4 Equations of the UQR model are presented in Annex 2.

5 Additionally, as explained in Firpo *et al.* (2009), unlike conditional quantile regression where determination of the quantiles depends on the explanatory variables, in UQR the definition of the quantiles is independent of covariates. It allows us to compare estimates from models with different number of independent variables.

6 There is a scarce but increasing literature that uses this approach. Firpo *et al.* (2011b) use RIF regression approach to evaluate the effect of changes in occupational tasks on wage distribution in the US. Töpfer (2017) estimates gender wage gaps in Italy. Ferreira *et al.* (2017) apply this methodology to analyse the decline of earning inequality in Brazil. Beccaria *et al.* (2015) assess the role played by formalization on the reduction of inequality in Argentina. Santangelo (2011) studies wage penalty associated with temporary contracts using UQR in six European countries. Lass and Wooden (2017) do the same for Australia.

formal wage-earners in total salaried employment rose, despite with different intensities. As detailed in Table 1, and considering only urban areas, in Argentina, Brazil and Paraguay the increase was about 11 percentage points (p.p.).[7] Even more intense was the formalization process that took place in Peru and Ecuador, where the proportion of formal workers increased 20 p.p. and 25 p.p., respectively. In Chile and Costa Rica, where formality was initially higher than in the rest of the countries, its increase was lower. On the contrary, in Mexico, where the percentage of formal workers at the beginning of the period was very low, informality continued relatively constant along the decade.

Year	Argentina		Brazil		Chile		Costa Rica		Ecuador		Mexico		Paraguay		Peru	
	Formal	Temporary	Formal	Temporary	Formal	Temporary	Formal	Temporary	Formal	Temporary	Formal	Temporary	Formal	Temporary	Formal	Temporary
2000					78.9	18.6										
2001																
2002													26.9			
2003	56.1	16.8	69.7	4.2	87.7	21.5							27.3			
2004	55.4	15.9	69.1	4.1					39.9				23.8		37.6	
2005	57.3	14.4	70.2	3.8					39.5		50.9	55.0	27.7	75.6	40.7	81.4
2006	58.7	14.2	71.3	4.6	80.6	20.4	73.1	11.5	39.8		52.1	53.9	25.4	77.3	44.4	81.6
2007	61.3	12.8	73.1	4.1			73.9	12.4	41.1		50.6	53.3	28.4	75.9	47.8	79.1
2008	62.5	11.5	74.4	3.8			75.4	20.3	43.5	53.3	50.2	53.5	30.7	74.3	48.4	80.4
2009	64.1	11.6	74.8	3.5	78.4	21.6	76.2	11.9	47.9	52.4	49.6	53.0	37.5	71.4	52.5	79.2
2010	66.8	9.9	77.0	3.4			75.1	7.4	54.1	51.2	48.5	53.9	34.7	71.3	53.4	80.9
2011	66.3	10.6	79.0	3.3	82.8	22.5	74.2	8.0	62.1	47.2	48.5	53.3	37.8	67.3	54.5	78.8
2012	65.6	9.9	79.3	3.5			76.4	8.1	64.6	45.7	49.3	52.7	38.5	74.0	57.6	78.7
2013	66.8	9.8	81.8	3.0	85.7	17.1	76.1	7.0	62.8	47.5	50.2	52.5	40.9	71.5	57.5	79.9
2014	66.2	10.8	82.7	3.0					64.3	48.0	51.0	51.4	39.2	72.8	60.6	79.5
2015	67.2	9.5	82.8	3.1					65.4	43.6	51.0	52.6			58.5	81.7

Table 1
Evolution of formal and temporary salaried workers. Urban areas (%)
Source: own elaboration based on Household Surveys.

This labour formalization process observed in almost all countries under study must be evaluated even more positive considering that it took place during a period of aggregate employment growth, which led to the creation of a significant amount of jobs registered in the social security system. In Argentina and Brazil, for instance, the number of formal occupations rose about 60 % whereas total employment rose 25 % along the last decade (Maurizio 2015).

Labour formalization achievements have been associated, on the one hand, to a greater dynamism in the generation of new jobs in a macroeconomic context generally characterised by relatively high and stable growth rates; on the other hand, to the implementation of specific public policies aiming at reducing the costs of informality, through varied incentive mechanisms, or at raising informality costs, strengthening labour inspection (Berg 2011, Bertranou *et al.* 2014, Maurizio 2015, Pires 2009).

In this context, in the following section it is analysed in detail the extent to which this labour formalization process has been parallel to improvements in other dimensions of labour quality.

7 The number of weighted observations involved in the calculation of indicators included in Table 1 and Table 2 is presented in Annex 3. They show the number of total employees in each year and country.

6
Prevalence, trends and characteristics of temporary employment

The incidence of temporary urban employment is different in each country under analysis (Table 1). Particularly, we can identify two groups of countries: on the one hand, Argentina, Brazil and Costa Rica, where the incidence of this phenomenon in urban areas is lower than 10 %; on the other hand, Ecuador, Mexico, Paraguay and Peru, where the share of these contracts is, at least, 40 %. This situation is even more problematic when rural areas are incorporated to the analysis.[8] Chile is an intermediate case between these two groups of countries.

According to EUROSTAT, in 2016 14 % of all employees aged 15 to 64 in the European Union had a temporary contract. Romania, Lithuania, Estonia and Latvia showed the lowest levels (around 2-4 %), whereas Poland and Spain exhibited the highest (around 27 %). Therefore, even though these numbers could be not strictly comparable with those for Latin America, it is observed that the maximum reached in this region (70/80 %) more than doubles that observed in Europe.

It is worth mentioning again that in Mexico, Paraguay and Peru wage-earners without contract are considered temporary workers. If these employees were excluded from the estimation temporary employment would be reduced by about 20 p.p. in each country, suggesting that the incidence of this phenomenon is high even among those workers with a signed contract.

In Table 2 it is presented the proportion of temporary employment among formal and informal wage-earners. As expected, it affects informal jobs more strongly than formal jobs. In Argentina, Brazil and Costa Rica, about 10/30 % of informal workers are temporary, reaching 40 % in Chile. In Ecuador, Mexico, Paraguay and Peru, about 90/100 % of informal wage-earners are temporary. This means that the poor labour conditions (mainly the lack of social security coverage) that characterise informal positions are worsened by the instability that arises from fixed-term contracts. Nevertheless, except for Argentina, Brazil and Costa Rica, temporary employment extends to formal workers, affecting 20 % of such workers in Chile and Mexico, nearly 30 % in Ecuador, 40 % in Paraguay and about 70 % in Peru.

When we move to the evolution of temporary employment, we find that, except Peru, where it shows a relatively constant behaviour, the rest of the countries experienced a reduction between the beginning and the end of the period, although with different intensity. This fall was particularly strong in urban areas in Argentina and Costa Rica (−40 %).

8 Data corresponding to rural areas are available upon request.

These trends observed in Latin America countries are in sharp contrast with other regions of the world, particularly, with Europe. According to Cazes and De Laiglesia (2015), the proportion of fixed-term contracts in the European Union increased from 9 % in 1987 to 14 % in 2012, after reaching 15 % in 2006.

The evolution of temporary employment has been different within each subgroup of workers (Table 2). Only in Argentina, Costa Rica and Mexico, both formal and informal workers experienced a reduction in the proportion of fixed-term employment. On the contrary, in Ecuador and Peru, both groups showed an increase in the proportion of temporary occupations, but more intensely among formal salaried workers. This suggests that these two countries experienced a «composition effect» such that the formalization process led to a global reduction (in Ecuador) or stability (in Peru) of temporary employment exclusively because formal workers show lower incidence of this phenomenon. In Chile and Paraguay a rise in the proportion of fixed-term jobs among registered positions together with a fall among informal workers was verified. Finally, in Brazil temporary employment among formal workers remained stable while there was a slight increase among informal jobs. These results show, therefore, that labour formalization in Chile, Ecuador, Paraguay and Peru has been characterised by a growing incidence of not open-ended contracts.

	ARGENTINA		BRAZIL		CHILE		COSTA RICA		ECUADOR		MEXICO		PARAGUAY		PERU	
YEAR	INFORMAL	FORMAL	INFORMAL	FORMAL	INFORMAL	FORMAL	INFORMAL	FORMAL	INFORMAL	FORMAL	INFORMAL	FORMAL	INFORMAL	FORMAL	INFORMAL	FORMAL
2000					49.7	12.4										
2003	38.0	5.3	11.8	0.9	53.4	19.4										
2004	36.3	4.9	11.4	0.9												
2005	35.2	4.4	11.1	0.8							91.2	21.9	97.3	19.8	98.1	55.6
2006	35.4	4.3	13.8	0.9	50.4	15.4	29.4	6.9			92.3	20.1	96.2	23.8	98.6	58.6
2007	31.8	4.8	13.0	0.8			31.5	8.4			90.4	19.1	96.5	26.2	98.7	58.1
2008	30.4	3.9	12.2	0.9			38.7	16.8	83.5	22.0	90.5	18.8	95.3	30.4	98.7	60.2
2009	31.1	4.0	11.6	0.8	49.0	15.7	31.0	7.3	83.8	23.8	89.9	17.8	96.9	30.8	98.6	62.1
2010	28.8	3.3	11.7	1.0			23.5	5.3	85.8	25.6	90.0	17.8	96.0	27.5	99.3	64.9
2011	30.8	3.5	12.8	0.7	51.0	18.9	24.9	4.0	87.0	27.5	88.7	18.1	93.4	28.0	98.6	62.9
2012	27.7	3.4	13.7	0.8			25.7	4.5	86.8	27.4	89.1	17.4	97.7	38.0	98.5	64.0
2013	28.2	3.3	13.2	0.8	43.5	14.4	24.2	4.4	87.0	28.9	89.3	18.4	97.4	35.9	98.7	66.2
2014	30.5	3.5	13.7	0.7					86.8	30.8	89.2	17.6	96.3	37.2	98.9	67.3
2015	28.8	3.1	12.8	1.0					85.0	26.0	89.8	19.0			98.9	69.0

Table 2
Prevalence of fixed-term employment in formal and informal salaried workers (%)
Source: own elaboration based on Household Surveys.

Therefore, at least two important differences arise when comparing the incidence of fixed-term contracts in Latin America and in European countries: the higher global prevalence among the former and the contrasting trends verified during the last decade between these two groups of countries.

This descriptive analysis was carried out without controlling for other attributes. In order to consider the independent impact of each personal and job characteristic we performed logit regressions, where the dependent variable takes value 1 if the wage-earning position is temporary and 0 if it is permanent. Covariates are those detailed in section 3.4. Marginal effects are presented in Table 3.

Covariates	ARGENTINA	BRAZIL	CHILE	COSTA RICA	ECUADOR	MEXICO	PARAGUAY	PERU
Men	-0.0131***	-0.00246***	-0.0750***	0.0203***	-0.0132	0.00874*	0.00723	0.0134
	[0.00421]	[0.000462]	[0.00564]	[0.00631]	[0.00958]	[0.00489]	[0.0112]	[0.0100]
Age	-0.00245***	-0.00142***	-0.00725***	-0.00288***	-0.0217***	-0.0214***	-0.00668***	-0.0267***
	[0.000890]	[9.89e-05]	[0.000930]	[0.000997]	[0.00193]	[0.00103]	[0.00238]	[0.00248]
Age2	7.47e-06	1.31e-05***	3.19e-05***	2.38e-05*	0.000159***	0.000201***	3.97e-05	0.000152***
	[1.10e-05]	[1.20e-06]	[1.11e-05]	[1.22e-05]	[2.28e-05]	[1.26e-05]	[2.87e-05]	[2.82e-05]
Informal	0.137***	0.0315***	0.323***	0.108***	0.485***	0.570***	0.292***	0.306***
	[0.00522]	[0.000889]	[0.00477]	[0.00648]	[0.0110]	[0.00503]	[0.0176]	[0.0186]
Head of Hous.	-0.00755*	-0.00155***	-0.0528***	-0.0202***	-0.00290	-0.0299***	-0.0188	-0.0330***
	[0.00395]	[0.000524]	[0.00499]	[0.00532]	[0.00933]	[0.00508]	[0.0116]	[0.0102]
Less than Comp. Primary	0.0303***	0.00125	0.0373***	0.0142**	0.0490***	0.0712***	0.0293	0.0853**
	[0.00954]	[0.00114]	[0.00590]	[0.00633]	[0.0165]	[0.0121]	[0.0251]	[0.0405]
Incom. Secondary	-0.00123	0.00801***	-0.0365***	-0.0126**	-0.0399***	-0.0802***	-0.0240	-0.0402
	[0.00588]	[0.00113]	[0.00671]	[0.00638]	[0.0146]	[0.0101]	[0.0203]	[0.0329]
Compl. Secondary	-0.0111*	0.00275***	-0.133***	-0.0392***	-0.0807***	-0.110***	-0.0464**	-0.141***
	[0.00570]	[0.00102]	[0.00653]	[0.00875]	[0.0124]	[0.00752]	[0.0191]	[0.0274]
Incom. Terciary	0.00531	0.0137***	-0.148***	-0.0130	-0.0915***	-0.113***	-0.0859***	-0.168***
	[0.00677]	[0.00110]	[0.0126]	[0.0126]	[0.0154]	[0.0113]	[0.0194]	[0.0293]
Compl. Terciary	-0.0122*	0.00226**	-0.252***	-0.0221**	-0.110***	-0.169***	-0.149***	-0.206***
	[0.00680]	[0.00111]	[0.0102]	[0.0101]	[0.0149]	[0.00824]	[0.0292]	[0.0271]
Part-time	0.0657***	0.00580***	0.113***	0.0978***	0.262***	0.279***	0.00633	0.00177
	[0.00596]	[0.00110]	[0.00716]	[0.00609]	[0.0209]	[0.0360]	[0.0211]	[0.0242]
Manufacture	-0.0804***	-0.00433***	-0.313***	-0.142***	-0.423***	-0.244***	-0.0816***	-0.222***
	[0.00759]	[0.00116]	[0.00902]	[0.0114]	[0.0197]	[0.0102]	[0.0292]	[0.0282]
Trade	-0.0756***	-0.00494***	-0.365***	-0.151***	-0.421***	-0.266***	-0.0584**	-0.176***
	[0.00639]	[0.00102]	[0.00936]	[0.00975]	[0.0185]	[0.00983]	[0.0286]	[0.0284]
Transport	-0.0590***	-0.00402***	-0.347***	-0.155***	-0.345***	-0.246***	-0.0539*	-0.174***
	[0.00817]	[0.00134]	[0.0112]	[0.0151]	[0.0228]	[0.0123]	[0.0320]	[0.0324]
Financial sector	-0.0714***	0.00219**	-0.366***	-0.124***	-0.273***	-0.260***	-0.0704**	-0.105***
	[0.00903]	[0.00103]	[0.0143]	[0.0117]	[0.0212]	[0.0112]	[0.0308]	[0.0289]
Personal services	-0.0839***	-0.00120	-0.361***	-0.0826***	-0.335***	-0.193***	-0.0292	-0.0521
	[0.0103]	[0.00116]	[0.0112]	[0.0149]	[0.0271]	[0.0139]	[0.0360]	[0.0328]
Domestic services		-0.00186	-0.486***	-0.160***	-0.435***	0.227***	0.00767	
		[0.00142]	[0.0115]	[0.0118]	[0.0259]	[0.0290]	[0.0421]	
Public sector	-0.0229***	0.00939***	-0.249***	-0.0808***	-0.229***	-0.345***	-0.241***	-0.306***
	[0.00697]	[0.00107]	[0.0108]	[0.0124]	[0.0189]	[0.0105]	[0.0317]	[0.0259]
Others	-0.0536***	-0.00431***	-0.209***	-0.0830***	-0.176***	-0.124***	-0.0509*	-0.186***
	[0.00680]	[0.00118]	[0.00724]	[0.00787]	[0.0175]	[0.0111]	[0.0309]	[0.0276]
6-40 employees	0.000144	0.00800***	0.0883***	-0.0105	-0.0431***	-0.308***	-0.0349**	0.110***
	[0.00452]	[0.00121]	[0.00570]	[0.00679]	[0.0126]	[0.00647]	[0.0139]	[0.0265]
More than 40 employees	0.00564	0.0154***	0.0991***	0.00426	-0.0896***	-0.403***	-0.0645***	0.0699***
	[0.00560]	[0.000937]	[0.00616]	[0.00706]	[0.0135]	[0.00692]	[0.0159]	[0.0251]
Urban			-0.00593	-0.0131**	-0.0746***	-0.0579***	1.49e-05	-0.0162
			[0.00470]	[0.00519]	[0.00949]	[0.00790]	[0.0146]	[0.0109]
Training					-0.0867***			
					[0.0100]			
Region	YES	YES	YES	YES	YES	YES	YES	YES
Constant	-0.0763***	-0.0290***	0.251***	-0.0354	0.832***	0.881***	0.345***	1.245***
	[0.0190]	[0.00246]	[0.0241]	[0.0229]	[0.0444]	[0.0269]	[0.0600]	[0.0671]
Observations	13,302	91,006	55,540	10,776	25,198	107,016	4,783	11,932

Standard errors in brackets

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

Table 3

Logit marginal effects. Probability of being a temporary worker. Most recent observation for each country

Source: own elaboration based on Household Surveys.

We confirm that, other things being equal, informal workers face statistically significant higher probabilities of having a temporary job than formal workers in all countries. One of the most important factors explaining this finding is international and national labour legislation that regulates the use and characteristics of fixed-term

contracts. Since this regulation only applies in the case of formal employees, it could explain the lower incidence of this type of jobs in this group of workers. At the same time, the gaps in the prevalence of temporary jobs among the countries under analysis may reflect the extent to which labour national legislation makes it easy for employers to hire workers through fixed-term contracts (ILO 2016, Maurizio 2016b). Besides the legal framework in place in each case, difference in its enforcement may also account for differences in the use of these contracts between countries.

There is a negative correlation between the probability of being a temporary worker and the educational level in all countries[9] except for Argentina and Brazil.[10] This inverse relationship may be explained by the accumulation of specific human capital, which usually complements general human capital. Better educated workers therefore receive more specific training, and thus employers tend try to keep them on through open-ended contracts.

In all countries, except in Argentina,[11] a U shape is found for the relationship between this kind of contract and age: prime-age people face the lowest probability of being temporary workers. Therefore, the young (and people over 45) and the least skilled workers have a greater probability of having such type of jobs and therefore they suffer the most from the occupational instability that characterise them.[12] There are different explanations for this result. On the supply side, it could be associated with certain characteristics of young people and, in particular, with their decision to go into jobs that end up being more unstable but that have other qualities that they value. On the demand side, it could be associated with occupational segregation because employers consider young people to be less reliable and then decide to offer them this kind of contract more intensely than in the case of adults.

There is not a clear correlation between fixed-term contracts and gender. In Argentina, Brazil and Chile women have a higher probability of being temporary workers than men, while the contrary holds in Costa Rica. In Ecuador, Mexico, Paraguay and Peru we do not find significant differences between men and women.[13] Occupational segregation against women could explain, at least partially, their labour situation in Argentina, Brazil and Chile. However, domestic responsibilities and care work might also be explicative factors of this phenomenon. According to ILO (2016), women in European countries are usually overrepresented among temporary workers but the differences with men are not large. Similarly, OECD (2002) shows that although the prevalence of temporary employment is higher among women, gender gaps are only significant in a few countries.

Regarding the branch of activity, construction activities, as expected, prove the highest use of temporary contracts in almost all countries.[14] In Mexico and Paraguay domestic services exhibit

9 Jaramillo and Sparrow (2014) find the same result in Peru.

10 This is particularly evident for the highest level of education where the coefficient of this covariate is negative and statistically significant in all countries, except in Argentina and Brazil.

11 A negative correlation between age and fixed-term contract is found in this country.

12 Young people also exhibit the highest incidence of temporary contracts in the European Union. According to EUROSTAT, the incidence of this kind of employment in 2016 was 44 % among salaried workers aged 15 to 24 while this figure was 13 % among employees aged 25 to 49. The same stylized fact is reported by OECD (2002).

13 A similar finding is reported by Jaramillo and Sparrow (2014) in the Peruvian case. Particularly, even when the prevalence of fixed-term contracts is higher in men, the difference between them and women is very low.

the highest. It could be associated, especially in the first case, to the irregular nature of the activity.

Except for Peru and Paraguay, all countries show higher incidence of this kind of employment among part-time jobs than among full-time ones. This finding is also common in Europe (ILO 2016). The correlation between the two types of NSFE might indicate that employers resort to them to hire workers they do not judge essential to the firm's activities.

Finally, as found by Bassanini *et al.* (2005), Arulampalam *et al.* (2004) and Carpio *et al.* (2011), a negative correlation between temporary employment and on-the-job training is found in Ecuador, the only country for which we count on data on this. This is consistent with the statement that employers will be less prone to provide this kind of training to employees who will remain shorter time in the company, as under such circumstances it is less likely that they might benefit from the potential productivity rise associated to the increase in specific human capital. Likewise it might indicate that temporary positions require *per se* fewer qualifications.

Summing up, consistent with previous evidence for European and some Latin American countries, these econometric results confirm that wage-earners with a «less favourable» vector of characteristics have a greater chance of having a temporary job. Therefore, this will be probably associated with lower labour income. In what follows we evaluate if, in addition to this «composition effect», there are wage gaps between temporary and open-ended contract, controlling for the rest of personal and job attributes.

7
Wage gaps associated with fixed-term employment

There are different arguments on the existence of wage gaps between temporary and permanent workers. Blanchard and Landier (2002) develop a model where it is assumed that firms initially hire temporary workers. Due to firing costs for permanent workers, companies do not promote their employees to permanent positions unless general economic conditions or the company's specific needs so require. However, once the worker fills an open-ended position, she finds herself in a better position to bargain for labour conditions precisely due to the existence of firing costs (insiders-outsiders theory). Hence part of the premium associated to permanent positions is a consequence of the existence of such costs.

At the same time, as explained before, permanent workers have greater chances than temporary workers of being unionized, which can be an additional source of wage gaps. Nevertheless, in Latin American, these arguments might only apply to formal

14 Cazes and De Laiglesia (2015) also find a high prevalence of temporary employment in construction in European countries.

workers. On the contrary, temporary positions might entail a premium in order to compensate for certain disadvantages these jobs involve, particularly greater instability.

In Table 4 it is presented the estimates of average wage gaps associated to temporary contracts, controlling for the other observable attributes. We use the set of covariates included in logit regressions.[15, 16]

A wage penalty associated to temporary employment was found in all countries analysed. Particularly, having a temporary job, by the end of the period, reduces hourly wages by about 4 % in Argentina,

15 Jahn and Pozzoli (2013) use similar covariates to estimate wage gap associated with temporary employment in Germany. Dias da Silva and Turrini (2015) evaluate the wage premium for permanent employment in EU using similar wage equation specification. Mertens *et al.* (2007) do the same for Germany and Spain.

16 In this table it is also included the coefficient of covariates used in the selection equation. The coefficient of lambda variable was statistically significant in all cases.

	ARGENTINA			BRAZIL			CHILE			COSTA RICA		
Covariates	Total	Formal	Informal	Total	Formal	Informal	Total	Formal	Informal	Total	Formal	Informal
Men	0.0390***	0.0411***	0.0551	0.258***	0.275***	0.190***	0.182***	0.191***	0.112***	0.0402*	0.0470**	-0.0270
	[0.0129]	[0.0124]	[0.0425]	[0.00862]	[0.0104]	[0.0106]	[0.00684]	[0.00720]	[0.0203]	[0.0211]	[0.0198]	[0.0531]
Age	0.0120***	0.00986***	0.0219***	0.0176***	0.0142***	0.0286***	0.0222***	0.0217***	0.0216***	0.0227***	0.0183***	0.0216***
	[0.00237]	[0.00274]	[0.00486]	[0.000893]	[0.00100]	[0.00191]	[0.00109]	[0.00122]	[0.00262]	[0.00282]	[0.00345]	[0.00496]
Age2	-8.08e-05***	-4.08e-05	-0.000235***	-0.000163***	-0.000123***	-0.000287***	-0.000215***	-0.000205***	-0.000221***	-0.000203***	-0.000125***	-0.000215***
	[2.76e-05]	[3.15e-05]	[5.97e-05]	[9.67e-06]	[1.11e-05]	[2.01e-05]	[1.26e-05]	[1.43e-05]	[2.92e-05]	[3.45e-05]	[4.31e-05]	[5.90e-05]
Informal	-0.432***			-0.139***			-0.253***			-0.272***		
	[0.0125]			[0.00489]			[0.00694]			[0.0150]		
Head of household	-0.000999	-0.00285	-0.00963	0.157***	0.164***	0.107***	0.0678***	0.0731***	-0.0389	0.0158	0.0349	-0.105*
	[0.0123]	[0.0128]	[0.0348]	[0.0113]	[0.0115]	[0.0235]	[0.00877]	[0.00911]	[0.0300]	[0.0234]	[0.0231]	[0.0560]
Less than Comp. Primary	-0.0202	-0.0106	-0.0588	-0.124***	-0.137***	-0.0765***	-0.0559***	-0.0496***	-0.0652***	-0.0658***	-0.108***	-0.0232
	[0.0285]	[0.0347]	[0.0525]	[0.0101]	[0.0116]	[0.0151]	[0.0104]	[0.0116]	[0.0229]	[0.0201]	[0.0237]	[0.0337]
Incom. Secondary	0.0315*	0.0575***	-0.00609	0.0858***	0.104***	0.0176	0.0630***	0.0671***	0.0361	0.0624***	0.111***	-0.0198
	[0.0163]	[0.0185]	[0.0333]	[0.0107]	[0.0123]	[0.0180]	[0.00997]	[0.0109]	[0.0241]	[0.0176]	[0.0187]	[0.0334]
Compl. Secondary	0.101***	0.141***	0.00954	0.288***	0.315***	0.158***	0.192***	0.208***	0.104***	0.253***	0.334***	0.0628
	[0.0167]	[0.0180]	[0.0364]	[0.0150]	[0.0172]	[0.0185]	[0.00993]	[0.0107]	[0.0243]	[0.0232]	[0.0234]	[0.0466]
Incom. Terciary	0.214***	0.233***	0.230***	0.561***	0.614***	0.305***	0.363***	0.394***	0.177***	0.420***	0.493***	0.215***
	[0.0213]	[0.0227]	[0.0491]	[0.0214]	[0.0244]	[0.0279]	[0.0139]	[0.0148]	[0.0356]	[0.0336]	[0.0327]	[0.0810]
Compl. Terciary	0.334***	0.356***	0.401***	1.140***	1.176***	0.974***	0.816***	0.843***	0.576***	0.876***	0.938***	0.664***
	[0.0233]	[0.0245]	[0.0600]	[0.0264]	[0.0302]	[0.0321]	[0.0138]	[0.0147]	[0.0387]	[0.0320]	[0.0323]	[0.0784]
Part-time	0.270***	0.261***	0.316***	0.345***	0.354***	0.331***	0.484***	0.502***	0.449***	0.366***	0.380***	0.403***
	[0.0102]	[0.0109]	[0.0249]	[0.00446]	[0.00525]	[0.00888]	[0.00757]	[0.00903]	[0.0151]	[0.0162]	[0.0222]	[0.0258]
Temporary	-0.0406***	-0.0275	-0.0553**	-0.130***	-0.122***	-0.0607***	-0.131***	-0.133***	-0.122***	-0.429***	-0.153***	-0.576***
	[0.0156]	[0.0234]	[0.0248]	[0.00955]	[0.0173]	[0.0137]	[0.00614]	[0.00685]	[0.0142]	[0.0185]	[0.0262]	[0.0287]
Manufacture	0.00298	-0.121***	0.145***	0.0314***	0.0526***	0.000804	0.0936***	0.0849***	0.146***	0.0752**	-0.0737**	0.153**
	[0.0194]	[0.0248]	[0.0385]	[0.00839]	[0.00935]	[0.0209]	[0.0106]	[0.0110]	[0.0345]	[0.0296]	[0.0337]	[0.0597]
Trade	-0.0915***	-0.124***	0.0216	-0.108***	-0.118***	-0.0443**	-0.0830***	-0.0784***	-0.0913***	-0.0682***	-0.0767***	-0.0639
	[0.0159]	[0.0170]	[0.0378]	[0.00572]	[0.00600]	[0.0177]	[0.00915]	[0.00944]	[0.0300]	[0.0215]	[0.0207]	[0.0529]
Transport	-0.0403**	0.000907	-0.109**	0.00214	-0.00224	0.0357	0.00809	0.0181	-0.0311	-0.0267	-0.0362	-0.0394
	[0.0201]	[0.0214]	[0.0483]	[0.00735]	[0.00762]	[0.0246]	[0.0113]	[0.0118]	[0.0350]	[0.0320]	[0.0322]	[0.0716]
Financial sector	-0.00303	-0.0586***	0.231***	-0.0427***	-0.0629***	0.145***	0.138***	0.129***	0.254***	0.0429*	0.0219	0.112*
	[0.0195]	[0.0198]	[0.0556]	[0.00596]	[0.00615]	[0.0204]	[0.0118]	[0.0120]	[0.0446]	[0.0249]	[0.0232]	[0.0679]
Personal services	0.00989	-0.0475**	0.254***	-0.0430***	-0.0566***	0.0703***	0.0373***	0.0201*	0.257***	0.151***	0.138***	0.0860
	[0.0213]	[0.0217]	[0.0603]	[0.00740]	[0.00772]	[0.0234]	[0.0115]	[0.0117]	[0.0444]	[0.0306]	[0.0273]	[0.121]
Domestic services				-0.124***	-0.147***	-0.0911***	-0.177***	-0.218***	-0.133***	-0.342***	-0.406***	-0.390***
				[0.00810]	[0.0101]	[0.0187]	[0.0123]	[0.0146]	[0.0315]	[0.0284]	[0.0456]	[0.0560]
Public sector	0.0643***	0.0311**	0.131**	0.157***	0.160***	0.116***	0.136***	0.118***	0.346***	0.190***	0.171***	-0.337**
	[0.0156]	[0.0157]	[0.0554]	[0.00672]	[0.00703]	[0.0218]	[0.00998]	[0.0101]	[0.0378]	[0.0255]	[0.0229]	[0.165]
Others	0.0174	0.0193	0.0435	0.00831	0.0129	0.0391*	0.00115	0.0157*	-0.0511*	-0.128***	-0.0660***	-0.252***
	[0.0183]	[0.0200]	[0.0416]	[0.00825]	[0.00924]	[0.0204]	[0.00892]	[0.00926]	[0.0288]	[0.0217]	[0.0216]	[0.0508]
Region	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Selection equation (dep. variable = 1 if individual is occupied, 0 otherwise)												
Men	0.662***	0.556***	0.764***	0.327***	0.403***	0.0329***	0.447***	0.479***	0.248***	0.708***	0.764***	0.562***
	[0.0164]	[0.0182]	[0.0244]	[0.00596]	[0.00636]	[0.00950]	[0.00733]	[0.00785]	[0.0117]	[0.0174]	[0.0207]	[0.0221]
Age	-0.00945***	-0.00988***	-0.0106***	-0.0134***	-0.0136***	-0.0118***	-0.00401***	-0.00559***	-0.00290***	-0.00547***	-0.0110***	-0.00231***
	[0.000553]	[0.000608]	[0.000829]	[0.000192]	[0.000206]	[0.000294]	[0.000245]	[0.000266]	[0.000375]	[0.000615]	[0.000752]	[0.000755]
Head of household	0.750***	0.833***	0.522***	0.436***	0.445***	0.344***	0.884***	0.911***	0.701***	0.872***	1.003***	0.687***
	[0.0196]	[0.0213]	[0.0314]	[0.00689]	[0.00737]	[0.0113]	[0.00913]	[0.00981]	[0.0151]	[0.0224]	[0.0268]	[0.0293]
Presence of children	0.219***	0.210***	0.243***	0.0358***	0.0639***	-0.0919***	0.105***	0.112***	0.0805***	0.0733***	0.0685**	0.114***
	[0.0242]	[0.0264]	[0.0365]	[0.00856]	[0.00912]	[0.0138]	[0.0105]	[0.0112]	[0.0170]	[0.0258]	[0.0302]	[0.0337]
Married	0.734***	0.801***	0.540***				0.561***	0.594***	0.368***	0.485***	0.579***	0.373***
	[0.0180]	[0.0196]	[0.0286]				[0.00804]	[0.00862]	[0.0130]	[0.0194]	[0.0231]	[0.0251]
Education	0.407***	0.433***	0.244***	0.261***	0.298***	0.0972***	0.337***	0.365***	0.148***	0.332***	0.409***	0.137***
	[0.00542]	[0.00600]	[0.00808]	[0.00179]	[0.00192]	[0.00282]	[0.00216]	[0.00233]	[0.00345]	[0.00560]	[0.00642]	[0.00773]
Presence of children*Male	-0.213***	-0.194***	-0.249***	-0.131***	-0.147***	-0.0625***	-0.116***	-0.107***	-0.120***	-0.201***	-0.226***	-0.175***
	[0.0224]	[0.0249]	[0.0324]	[0.00890]	[0.00951]	[0.0139]	[0.00965]	[0.0103]	[0.0154]	[0.0229]	[0.0271]	[0.0292]
Lambda	-0.135***	-0.116***	-0.154***	0.257***	0.256***	0.156**	-0.0870***	-0.0720***	-0.258***	-0.102***	-0.0641**	-0.320***
	[0.0180]	[0.0169]	[0.0507]	[0.0400]	[0.0390]	[0.0785]	[0.0132]	[0.0129]	[0.0468]	[0.0365]	[0.0297]	[0.0905]
Constant	3.296***	3.303***	2.793***	0.614***	0.646***	0.265**	6.578***	6.547***	6.877***	6.588***	6.547***	6.933***
	[0.0664]	[0.0763]	[0.170]	[0.0434]	[0.0490]	[0.124]	[0.0356]	[0.0379]	[0.133]	[0.0864]	[0.0903]	[0.225]
Censored Observations	32,878	32,878	32,878	119,831	119,831	119,831	129,346	129,346	129,346	20,525	20,525	20,525
Uncensored Observations	11,241	8,706	2,535	90,865	74,785	16,080	56,966	47,822	9,144	10,567	6,977	3,590
Total Observations	44,119	41,584	35,413	210,696	194,616	135,911	186,312	177,168	138,490	31,092	27,502	24,115

Robust standard errors in bracl
*** p < 0.01, ** p < 0.05, * p < 0

	ECUADOR			MEXICO			PARAGUAY			PERU		
Covariates	Total	Formal	Informal	Total	Formal	Informal	Total	Formal	Informal	Total	Formal	Informal
Men	0.154***	0.148***	0.199***	0.0455***	0.0609***	0.0139	0.102***	0.0131	0.163***	0.0999***	0.0828***	0.160***
	[0.0115]	[0.0126]	[0.0281]	[0.00684]	[0.00793]	[0.0115]	[0.0283]	[0.0333]	[0.0448]	[0.0130]	[0.0160]	[0.0208]
Age	0.0166***	0.00961***	0.0202***	0.0236***	0.0168***	0.0263***	0.0413***	0.0237***	0.0440***	0.0287***	0.0153***	0.0370***
	[0.00153]	[0.00228]	[0.00208]	[0.000792]	[0.00135]	[0.000995]	[0.00378]	[0.00660]	[0.00466]	[0.00163]	[0.00260]	[0.00223]
Age2	-0.000168***	-5.23e-05*	-0.000246***	-0.000236***	-0.000136***	-0.000270***	-0.000409***	-0.000153*	-0.000470***	-0.000310***	-0.000164***	-0.000400***
	[1.80e-05]	[2.71e-05]	[2.44e-05]	[9.80e-06]	[1.68e-05]	[1.24e-05]	[4.67e-05]	[7.97e-05]	[5.81e-05]	[1.96e-05]	[2.95e-05]	[2.86e-05]
Informal	-0.291***			-0.186***			-0.188***			-0.237***		
	[0.00921]			[0.00506]			[0.0237]			[0.00980]		
Head of household	0.110***	0.170***	0.0951**	-0.0126	0.00787	-0.0668***	-0.0632**	-0.0266	-0.0373	-0.0474***	-0.0124	-0.0367
	[0.0171]	[0.0218]	[0.0403]	[0.00941]	[0.0116]	[0.0153]	[0.0263]	[0.0305]	[0.0411]	[0.0174]	[0.0202]	[0.0312]
Less than Comp. Primary	-0.119***	-0.146***	-0.0800***	-0.0745***	-0.0774***	-0.0776***				-0.0608***	0.0266	-0.0994***
	[0.0138]	[0.0255]	[0.0161]	[0.00789]	[0.0168]	[0.00903]	[0.0363]	[0.0732]	[0.0431]	[0.0198]	[0.0411]	[0.0230]
Incom. Secondary	0.0662***	0.111***	0.0421**	0.0807***	0.131***	0.0623***	0.0231	0.101*	0.0115	0.0284	0.0217	0.0709***
	[0.0129]	[0.0200]	[0.0171]	[0.00783]	[0.0128]	[0.00995]	[0.0321]	[0.0564]	[0.0395]	[0.0178]	[0.0340]	[0.0213]
Compl. Secondary	0.179***	0.314***	0.107***	0.0679***	0.120***	0.0541***	0.0937**	0.201***	0.109**	0.0896***	0.0815**	0.156***
	[0.0151]	[0.0239]	[0.0203]	[0.00664]	[0.0117]	[0.00740]	[0.0400]	[0.0623]	[0.0515]	[0.0185]	[0.0339]	[0.0208]
Incom. Terciary	0.405***	0.583***	0.256***	0.253***	0.341***	0.196***	0.345***	0.466***	0.306***	0.195***	0.205***	0.268***
	[0.0208]	[0.0319]	[0.0343]	[0.0109]	[0.0169]	[0.0143]	[0.0487]	[0.0730]	[0.0645]	[0.0230]	[0.0403]	[0.0263]
Compl. Terciary	0.697***	0.916***	0.440***	0.534***	0.603***	0.462***	0.716***	0.800***	0.799***	0.414***	0.454***	0.398***
	[0.0235]	[0.0377]	[0.0436]	[0.00950]	[0.0163]	[0.0112]	[0.0658]	[0.0879]	[0.110]	[0.0247]	[0.0444]	[0.0284]
Part-time	0.185***	0.292***	0.195***	0.400***	0.441***	0.386***	0.529***	0.493***	0.530***	0.257***	0.309***	0.241***
	[0.0100]	[0.0235]	[0.0116]	[0.00470]	[0.00831]	[0.00586]	[0.0209]	[0.0299]	[0.0273]	[0.00901]	[0.0132]	[0.0126]
Temporary	-0.0868***	-0.0493***	-0.155***	-0.143***	-0.0978***	-0.215***	-0.229***	-0.126***	-0.269***	-0.148***	-0.159***	-0.145**
	[0.00809]	[0.00912]	[0.0159]	[0.00508]	[0.00603]	[0.00886]	[0.0262]	[0.0258]	[0.0574]	[0.0125]	[0.0125]	[0.0609]
Manufacture	0.207***	0.172***	0.151***	0.229***	0.199***	0.222***	0.442***	0.518***	0.357**	0.238***	0.259***	0.202***
	[0.0146]	[0.0232]	[0.0209]	[0.00755]	[0.0129]	[0.0103]	[0.0879]	[0.0883]	[0.159]	[0.0179]	[0.0246]	[0.0260]
Trade	-0.0494***	-0.0369**	-0.0760***	-0.0756***	-0.102***	-0.0554***	0.0242	-0.119***	0.0477	-0.145***	-0.145***	-0.136***
	[0.0131]	[0.0162]	[0.0210]	[0.00564]	[0.00704]	[0.00917]	[0.0258]	[0.0372]	[0.0339]	[0.0160]	[0.0218]	[0.0236]
Transport	0.104***	0.119***	0.0398	0.0419***	0.0823***	0.00120	0.0918**	0.122**	0.0842	-0.0442**	-0.0452	-0.0387
	[0.0175]	[0.0232]	[0.0264]	[0.00860]	[0.0115]	[0.0129]	[0.0414]	[0.0507]	[0.0594]	[0.0219]	[0.0289]	[0.0326]
Financial sector	0.0514***	0.0402**	0.186***	0.0343***	-0.0174*	0.110***	0.0123	-0.00962	0.0506	0.0309	0.0259	0.0942**
	[0.0168]	[0.0184]	[0.0393]	[0.00796]	[0.00952]	[0.0136]	[0.0384]	[0.0460]	[0.0567]	[0.0199]	[0.0231]	[0.0376]
Personal services	-0.0165	-0.0445*	0.132***	0.0746***	-0.00292	0.166***	-0.108***	0.00849	-0.140***	0.0141	-0.0167	0.0901**
	[0.0214]	[0.0232]	[0.0479]	[0.0116]	[0.0148]	[0.0183]	[0.0281]	[0.0387]	[0.0382]	[0.0243]	[0.0291]	[0.0411]
Domestic services	-0.0706***	-0.0988***	-0.0719**	0.0611***	0.149***	0.0583***				-0.328***	-0.431***	-0.310***
	[0.0202]	[0.0307]	[0.0282]	[0.00851]	[0.0563]	[0.0108]				[0.0234]	[0.0539]	[0.0300]
Public sector	0.249***	0.247***	0.509***	0.291***	0.275***	0.265***				0.101***	0.0779***	0.186***
	[0.0137]	[0.0152]	[0.0621]	[0.00664]	[0.00787]	[0.0124]				[0.0167]	[0.0200]	[0.0304]
Others	-0.0482***	0.0591***	-0.147***	0.0120*	0.140***	-0.0371***	-0.0545	-0.0456	-0.0585	-0.0555***	0.0307	-0.107***
	[0.0123]	[0.0161]	[0.0191]	[0.00668]	[0.0107]	[0.00941]	[0.0393]	[0.0678]	[0.0487]	[0.0156]	[0.0213]	[0.0230]
Region	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Selection equation (dep. variable = 1 if individual is occupied, 0 otherwise)												
Men	0.646***	0.503***	0.724***	0.509***	0.466***	0.518***	0.703***	0.695***	0.693***	0.490***	0.543***	0.447***
	[0.0120]	[0.0155]	[0.0142]	[0.00649]	[0.00846]	[0.00746]	[0.0260]	[0.0400]	[0.0280]	[0.0124]	[0.0167]	[0.0142]
Age	0.00933***	0.00596***	0.00735***	-0.0142***	-0.0161***	-0.0152***	0.00227***	-0.000395	0.00125	-0.00911***	-0.00521***	-0.0143***
	[0.000362]	[0.000475]	[0.000425]	[0.000247]	[0.000323]	[0.000285]	[0.000864]	[0.00137]	[0.000915]	[0.000446]	[0.000597]	[0.000524]
Head of household	1.078***	1.097***	1.104***	0.901***	1.012***	0.834***	0.564***	0.552***	0.554***	0.841***	0.926***	0.790***
	[0.0155]	[0.0196]	[0.0189]	[0.00811]	[0.0104]	[0.00964]	[0.0351]	[0.0501]	[0.0387]	[0.0170]	[0.0219]	[0.0207]
Presence of children	0.373***	0.373***	0.431***	0.0438***	0.0882***	0.0313***	0.0292	0.0283	0.0476	0.0216	0.0530**	0.00976
	[0.0183]	[0.0223]	[0.0229]	[0.00925]	[0.0117]	[0.0110]	[0.0399]	[0.0569]	[0.0440]	[0.0185]	[0.0237]	[0.0220]
Married				0.426***	0.522***	0.375***	0.566***	0.760***	0.484***	0.492***	0.561***	0.432***
				[0.00687]	[0.00893]	[0.00806]	[0.0295]	[0.0442]	[0.0326]	[0.0140]	[0.0184]	[0.0166]
Education	0.407***	0.528***	0.217***	0.192***	0.334***	0.0598***	0.447***	0.607***	0.353***	0.270***	0.478***	0.0900***
	[0.00358]	[0.00455]	[0.00461]	[0.00198]	[0.00268]	[0.00236]	[0.00869]	[0.0142]	[0.00959]	[0.00383]	[0.00555]	[0.00468]
Presence of children*Male	-0.114***	-0.0638***	-0.174***	-0.0833***	-0.113***	-0.0703***	-0.0958***	-0.0670	-0.113***	-0.0929***	-0.142***	-0.0798***
	[0.0152]	[0.0192]	[0.0183]	[0.00804]	[0.0103]	[0.00939]	[0.0334]	[0.0501]	[0.0362]	[0.0158]	[0.0212]	[0.0181]
Lambda	0.114***	0.234***	0.0185	-0.146***	-0.0926***	-0.220***	-0.302***	-0.0564	-0.325***	-0.244***	-0.124***	-0.231***
	[0.0248]	[0.0298]	[0.0473]	[0.0152]	[0.0149]	[0.0233]	[0.0509]	[0.0492]	[0.0756]	[0.0307]	[0.0302]	[0.0490]
Constant	0.0520	-0.163**	-0.0782	2.717***	2.730***	2.729***	8.535***	8.557***	8.428***	1.353***	1.538***	0.966***
	[0.0569]	[0.0810]	[0.115]	[0.0285]	[0.0428]	[0.0438]	[0.130]	[0.197]	[0.193]	[0.0635]	[0.0968]	[0.110]
Censored Observations	62,990	62,990	62,990	126,765	126,765	126,765	10,599	10,599	10,599	30,982	30,982	30,982
Uncensored Observations	24,673	13,798	10,875	84,619	40,364	44,255	4,958	1,789	3,169	24,035	12,088	11,947
Total Observations	87,663	76,788	73,865	211,384	167,129	171,020	15557	12388	13768	55,017	43,070	42,929

Robust standard errors in brackets
*** p < 0.01, ** p < 0.05, * p < 0.1

Table 4
Wage gaps associated to temporary employment. Heckman estimates. Most recent observation for each country
Source: own elaboration based on Household Surveys.

9 % in Brazil and Ecuador, between 13 and 15 % in Chile, Mexico, Paraguay and Peru, and 35 % in Costa Rica.[17]

This global overview is consistent with the findings obtained for developed countries. Boeri (2011), for instance, performs a comparative study of European countries and finds that males with open-ended contracts receive higher monthly wages than those with not open-ended ones, controlling for education and job duration. The range

17 Using cross-sectional data does not allow us to identify the extent to which these gaps might be overestimated due to the presence of unobserved heterogeneity.

goes from 6 % in the United Kingdom to 45 % in Sweden. Jahn and Pozzoli (2013) estimate that the penalty suffered by workers hired through temporary employment agencies in Germany is 20 % for men and 14 % for women. A similar figure, 20 %, is obtained by Blanchard and Landier (2002) for temporary workers in France.

As pointed out by Kahn (2013), these cross-section estimations might be upwardly biased insofar as permanent workers might have unobserved productivity levels that exceed those of temporary workers. In order to control for unobserved heterogeneity, this author applies fixed effects estimation using the European Community Household Panel for 13 European countries in 1995-2001. In spite of this correction, the author still finds premiums associated to permanent positions, although these vary according to certain characteristics of workers.

Unlike the results presented by Cazes and De Laiglesia (2015)[18] for OECD countries, however, we do not find a positive (or negative) correlation between the prevalence of this kind of contracts and the size of the wage penalty.

In general, wage gaps are found both for formal and informal workers, with no clear pattern regarding its relative intensity in each group. While in Argentina, Costa Rica, Ecuador, Mexico and Paraguay the gap is greater among informal workers, the opposite holds for Brazil, Chile and Peru.

The point made by Blanchard and Landier (2002) might account for temporary employment penalty in formal positions. It might also be the case that in these positions a permanent worker receives more on-the-job training (as already shown for Ecuador) and specific human capital, which might in turn translate into wage premiums. In fact, based on the Efficiency Wage theory it is possible to say that the growth of vacancies can increase the voluntary turnover of employees in the search of better employment opportunities, causing a higher number of exits that can result in greater costs for the employers. Then, the higher the level of investment made by the employer in specific training of the employee, the greater the costs incurred when they exit the firm. Therefore, employers want to retain them, and even more as they become more experienced in their jobs. One way to do so is by offering them better working conditions, for example, through higher wages. However, even in Ecuador where we can control for the presence of on-the-job training in these regressions the wage penalty associated with temporary employment remains statistically significant, although the absolute value of the coefficient after the inclusion of this covariate is slightly lower than before.

Additionally, a higher level of unionization among permanent workers might also contribute to the observed result.

However, these arguments seem more appropriate for formal wage-earners. In this sense, these results are all the more impor-

18 Based on Boeri (2010) estimates.

tant considering that labour legislation stipulates in all cases that temporary workers should have equal treatment in wage determination. Nevertheless in the countries under analyses, where labour inspections usually have limited scope, the use of temporary contracts might weaken workers leading to lower wages and lower coverage of other labour rights. Additionally, even though temporary workers may be compensated according to legal standards, it might be the case that they do not receive bonuses, annual complementary salary or premiums that companies do pay to permanent workers.

So far, we have analysed average gaps without assessing the extent to which they reflect the penalties suffered by temporary workers located at different points of the distribution. Figure 1 shows the behaviour of gaps in hourly wages along the distribution.

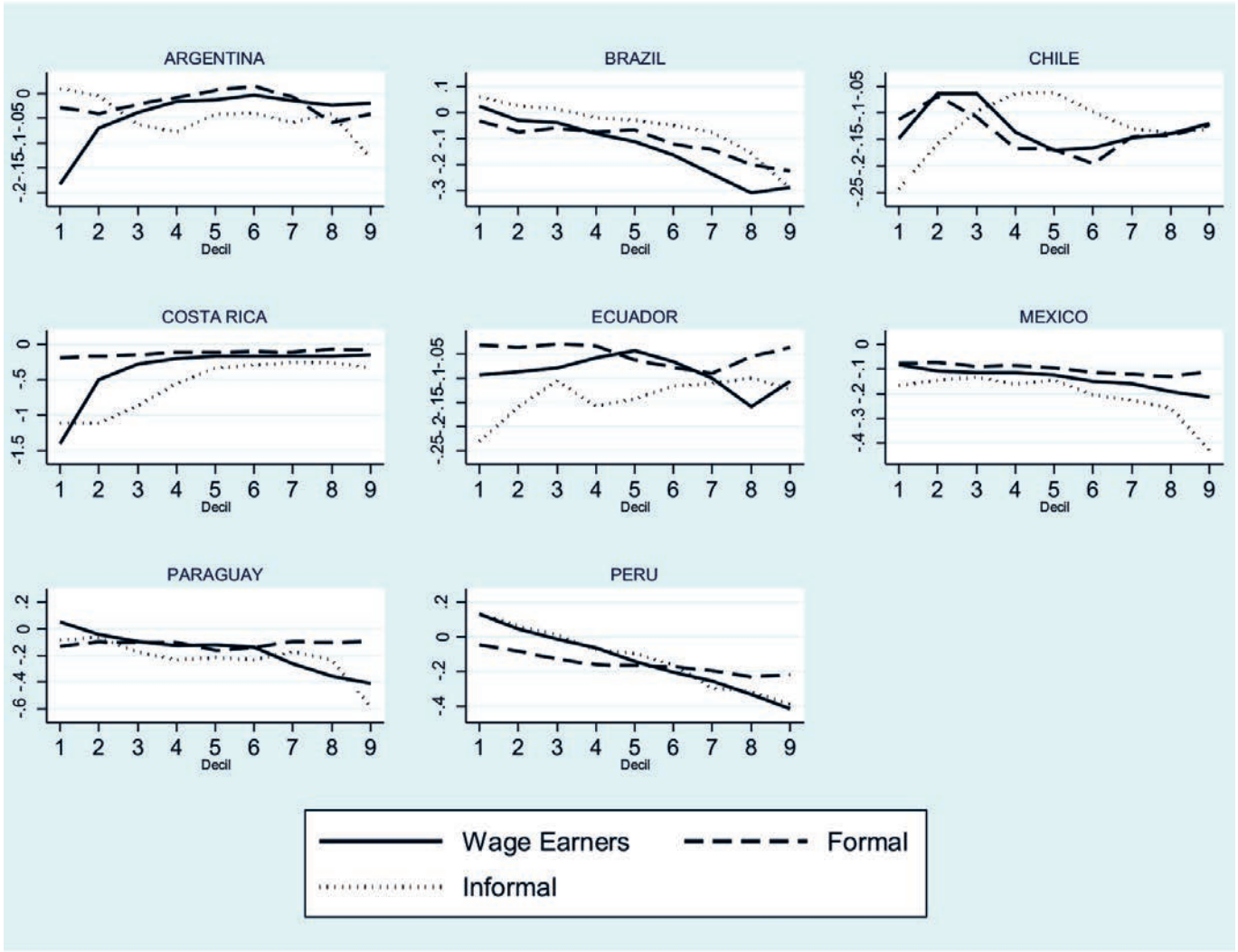

Figure 1
Wage gaps associated to temporary employment along the wage distribution. Most recent observation for each country
Source: own elaboration based on Household Surveys.

It is obtained from UQR estimates. There are three different scenarios.

In Argentina and Costa Rica, the wage gap is greater at the bottom tail of distribution. In the first case, this roughly holds for formal workers, while for informal employees the penalty stays relatively stable along the distribution. In Costa Rica this pattern only verifies among informal workers. This is particularly worrisome since low-paid temporary workers are those who face the higher wage penalty; on the contrary, in Brazil, Mexico, Paraguay and Peru, an increasing profile (even when not always monotonically) in the penalty along wage deciles if found. Hence the wage gap is larger at the higher part of the distribution. This might suggest the existence of a «glass ceiling» as temporary workers do not achieve high wage positions as do permanent ones, even when controlling for the rest of attributes. In Chile and Ecuador we do not find a monotone pattern. This implies that for total wage-earners and for formal ones, the penalty is similar in the lower deciles and in the higher deciles. For informal workers, however, the penalty is higher in the left tail of the distribution. Future studies should analyse in more detail the determinants of the behaviour of the wage penalty along the distribution and its differences among these countries.

Heterogeneous effects of temporary employment on wages are also found in developed countries. Mertens *et al.* (2007) compare the behavior of wage gaps associated with fixed-term along the earning distribution in Germany and Spain. They find that, while in the first country the penalty is decreasing with labour incomes, in Spain the wage gap remains slightly constant. Lass and Wooden (2017) distinguish between fixed-term contract workers, casual workers and temporary agency workers in Australia. Casual workers (the most important group of temporary workers in this country) suffer a penalty at the bottom of distribution but a wage premium at the top. Finally, Bossio (2009) also finds a similar behavior of wage gaps between permanent and temporary workers in Italy, being the penalty higher at the bottom of earning distribution. The author concludes that it suggests a «sticky floor effect» instead of a «glass ceiling effect».

Therefore, all these results confirm the relevance of quantile regression in this type of analysis to have a broader picture about the wage gaps associated with temporary employment.

Finally, Figure 2 shows that the proportion of temporary workers in total wage-earners is decreasing along the distribution, although the profile is not always monotone. The higher concentration of wage-earners with fixed-term positions in the lower part of the distribution owes, on one side, to the fact that this phenomenon is more common, as discussed above, for workers with a less favourable

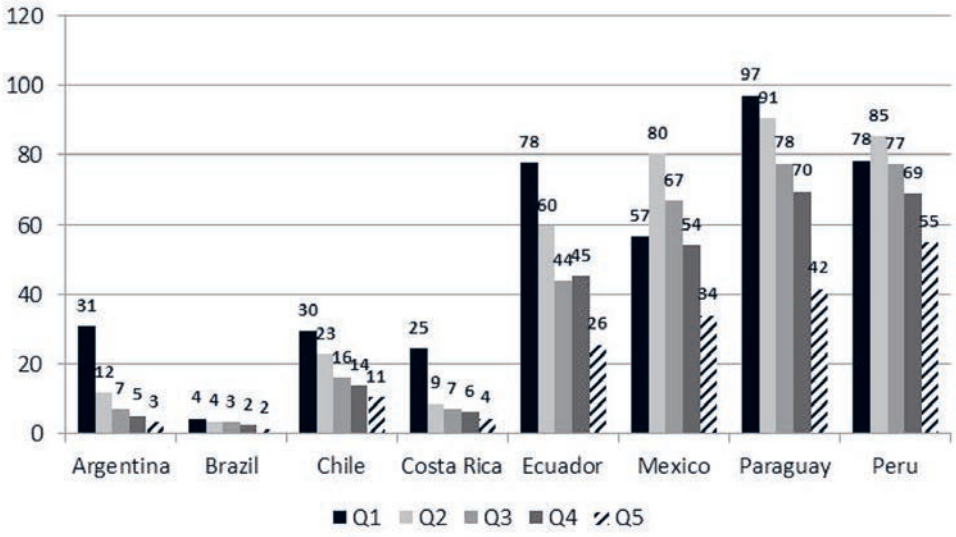

Figure 2
Proportion of temporary wage-earners by hourly wage quintile. Most recent observation for each country
Source: own elaboration based on Household Surveys.

vector of characteristics but also to the specific penalty associated to this sort of positions. Hence, we find a combination of low and unstable wages in countries with scarce development of social or labour policies that enable mitigation of the impacts of occupational turnover on labour and family incomes.

8
Final remarks

During the last decade, Latin America has experienced a process of significant improvement of the labour market, mainly reflected in a reduction of unemployment, creation of jobs, increase in the mean real wage and labour formalization.

Despite these advances, notwithstanding, countries of the region still show remarkable deficits in labour matter and in the generation and distribution of income. High informality coincides with non-standard forms of employment.

This is the first paper that analysed, from a comparative point of view, temporary employment in eight countries of the region: Argentina, Brazil, Chile, Costa Rica, Ecuador, Mexico, Paraguay and Peru. We estimated the incidence of this phenomenon in total salaried employment and in different subgroups of workers; we analysed its evolution along the new millennium and assessed the extent to which this NSFE leads to wage penalties. In this sense, this study also contributes to the scarce but increasing international literature that analyses the behaviour of the wage gaps along the unconditional wage distribution. The selection of countries provided an exhaustive

evaluation of the region as they have labour structures and dynamics that greatly differ from one another.

Temporary occupations exhibit less favourable conditions than open-ended jobs. In particular, fixed-term employment more strongly affects informal workers, young and lower-educated workers. At the same time, in addition to an evidently lower stability, it entails a significant wage penalty in all countries under analysis. This suggests correlation between low wages, precarious labour conditions and absence of labour income, all the more serious considering low or none protection from unemployment in these countries. In so far as this phenomenon more strongly affects workers who on average exhibit a vector of less favourable observable characteristics, these wage gaps appear as additional sources of inequality.

These results seem to be consistent with the «labour market segmentation» hypothesis. According to this, there are two different segments in the labour market. In the «primary» segment, those workers with an open-ended contract have better working conditions associated with a more stable occupation, more specific training and wage premium. On the contrary, in the «secondary» segment, temporary workers face higher occupation turnover and lower wages. Nevertheless, more analysis is required to confirm this hypothesis in Latin American labour markets.

Finally, it is worth mentioning that wage penalties, in turn, reflect violations of labour legislation that in all these countries guarantees equal conditions to those of permanent workers in wage determination. However, the weakness in labour inspection and likely lower unionization on behalf of fixed-term workers contributes to these results in Latin America.

Despite the contributions of this document, there are still important aspects related to temporary employment in Latin America that should be addressed. For those Latin American countries where administrative employer-employee data is available it would be interesting to study in detail the magnitude of wage gaps in each firm to test the labour market segmentation hypothesis with greater robustness.

On the other hand, further research should study dynamic aspects of temporary employment. In particular, for those Latin American countries with household panel survey it would be relevant to evaluate to what extent fixed-term contracts serve as a screening period, where employers verify the characteristics of worker before hiring them on a permanent contract.

Finally, in connection to this, another line of research could assess under which specific conditions temporary jobs can be stepping stones to open-ended contract in the region.

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ANNEX 1. Variable description

Variables	Explanation
Individual characteristics	
Men	Gender dummy variable (1 = male, 0 = female)
Age	Age (continuous variable)
Age2	Age squared
Head of household	Husehold head dummy variable (1 = head, 0 = otherwise)
Presence of children	Children in the household dummy variable (1 = yes, 0 = no)
Married	Marital status dummy variable (1 = married, 0 = single)
Less than Comp. Primary	Education dummy variable (1 = less than complete primary, 0 = otherwise), base complete primary
Complete Primary	Education dummy variable (1 = complete primary, 0 = otherwise), base complete primary
Incomplete Secondary	Education dummy variable (1 = incomplete secondary, 0 = otherwise), base complete primary
Complete Secondary	Education dummy variable (1 = complete secondary, 0 = otherwise), base complete primary
Incomplete Terciary	Education dummy variable (1 = incomplete terciary/univ, 0 = otherwise), base complete primary
Complete Terciary	Education dummy variable (1 = complete terciary/univ, 0 = otherwise), base complete primary
Job characteristics	
Informal	Informality dummy variable (1 = informal, 0 = formal)
Temporary	Type of contract dummy variable (1 = temporary, 0 = permanent)
Part-time	Labour intensity dummy variable (1 = part time, 0 = full-time)
Training	On-the-job training dummy variable (1 = yes, 0 = no)
Manufacture	Economic sector dummy variable (1 = manufacturing, 0 = otherwise), base construction
Construction	Economic sector dummy variable (1 = construction, 0 = otherwise), base construction
Trade	Economic sector dummy variable (1 = trade, 0 = otherwise), base construction
Transport	Economic sector dummy variable (1 = transport, 0 = otherwise), base construction
Financial sector	Economic sector dummy variable (1 = financial services, 0 = otherwise), base construction
Personal services	Economic sector dummy variable (1 = pers. services, 0 = otherwise), base construction
Domestic services	Economic sector dummy variable (1 = dom. services, 0 = otherwise), base construction
Public sector	Economic sector dummy variable (1 = public sector, 0 = otherwise), base construction
Others	Economic sector dummy variable (1 = other services, 0 = otherwise), base construction
Less than 6 employees	Size of enterprise dummy variable (1 = less than 6, 0 = otherwise), base less than 6 employees
6-40 employees	Size of enterprise dummy variable (1 = 6-40, 0 = otherwise), base less than 6 employees
More than 40 employees	Size of enterprise dummy variable (1 = more than 40, 0 = otherwise), base less than 6 employees
Regional characteristics	
Urban	Urban dummy variable (1 = urban, 0 = rural)
Region	Regional dummy variables. Specific for each country

ANNEX 2. Unconditional quantile regression

The concept behind the UQR is the so-called Recentered Influence Function (RIF). This function is defined as:

$$RIF(y; q_r) = q_\tau + IF(y; q_r)$$

where q_r is the unconditional r-th quantile of wages and is the influence function. This function measures the effect of slight changes in the distribution on the different functionals of the dependent variable. *IF* is defined as:

$$IF(y; q_r;\ F) = \lim_{\epsilon \to 0} \frac{\left(q_r(F_\epsilon) - q_r(F)\right)}{\epsilon}$$

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

One important aspect is that the expected value of the RIF is equal to the statistic of interest since the expected value of the *IF* is zero. From RIF regressions, we obtain the marginal effect of one explanatory variable *(X)* on unconditioned quantiles of the wage distribution, which are then integrated over the values of *X* like in standard regressions. Formally, we have:

$$\alpha(q_r) = \int \frac{dE(RIF(y; q_r)|X = x)}{dx} dF(x)$$

Finally, since our interest is to analyse the effect of *X* on each quantile of the wage distribution, the *IF* associated to this functional is:

$$\phi(Y;\ q_r) = q_r + \frac{(r - \mathbb{I}\{Y \leq q_r\})}{f_Y(q_r)}$$

where f_Y is the marginal density function of *Y* and $\mathbb{I}$ (·) is the indicator function.

Once the RIF is calculated, it is possible to perform OLS estimation using it as the dependent variable and the same covariates as in standard Mincer equations.

ANNEX 3. Number of weighted observations

	Argentina	Brazil	Chile	Costa Rica	Ecuador	Mexico	Paraguay	Peru
2000			4,099,406					
2001								
2002							5,109,110	
2003	6,083,025	41,832,258	4,397,544				5,378,618	
2004	6,534,873	38,033,832			3,041,391		5,599,733	5,349,655
2005	6,959,759	45,163,370			3,169,845	27,057,385	6,103,294	5,292,583
2006	7,336,352	46,493,524	4,885,133	1,293,419	3,286,739	28,209,577	5,943,566	5,910,343
2007	7,589,288	48,283,101		1,406,597	3,303,204	29,138,901	6,633,922	6,354,788
2008	7,797,134	49,094,052		1,425,523	3,373,800	30,076,997	6,969,303	6,633,776
2009	7,717,108	49,192,375	4,712,510	1,420,196	3,338,549	30,100,805	6,969,303	6,839,718
2010	7,929,465	52,780,029		1,447,645	3,399,879	30,344,930	7,040,061	6,992,846
2011	8,106,587	51,525,239	5,235,648	1,511,831	3,347,717	30,898,800	7,685,761	7,083,625
2012	8,236,780	54,344,751		1,531,061	3,482,356	31,925,036	7,859,252	7,541,862
2013	8,262,886	53,977,893	5,555,143	1,527,176	3,813,019	32,734,102	8,114,830	7,746,422
2014	8,305,771	53,504,682			3,945,036	33,572,087	8,440,436	7,732,323
2015	8,274,264	51,610,989			4,012,180	34,071,506		7,774,158