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In-work poverty dynamics: trigger events and short-term trajectories in Argentina

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Abstract

In-work poverty (IWP) is gaining interest in the public agenda. This article is a first contribution to the analysis of IWP dynamics in Latin America, based on the study of the Argentine case. Using one-year interval panel data, the paper analyzes the trigger events that produce entries and exits from IWP, short-term poverty trajectories and the determinants associated to transient and persistent poverty. Drawing on a decomposition analysis of mutually exclusive events, the article shows that labor market events are the most relevant triggers for both exits and entries into IWP. Based on a multinomial logistic regression, the paper concludes that low education, the presence of children in the household, and having a low-quality job are the three main factors explaining persistent-poverty.

Keywords In-work poverty, Poverty dynamics, Labor market, Quality of employment

JEL Classification I32, E24, J62, C23

1 Introduction

In-work poverty (IWP) has attracted increasing attention in recent years (Brady et al. 2010; Filandri and Struffolino 2019; Halleröd et al. 2015; Horemans et al. 2016). Globally, changes in labor markets are posing challenges to social inclusion through employment. The expansion of unprotected, precarious, and low-quality forms of employment (Sehnbruch et al. 2020) is reshaping labor inequalities. Precisely, the working poor, employed individuals living in households with incomes below the poverty line, reflect one of the limits that employment is facing to guarantee decent living conditions. The ILO stresses that given the unstable global economic scenario, decent work deficits have been accentuated. One of its expressions is the increase in the number of working poor, especially in low-income countries (ILO 2023).

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Previous research has shown a series of factors that are commonly related to IWP (Crettaz 2015; Fraser et al. 2011a, b; Lohmann and Crettaz 2018; Tejero 2017). Crettaz (2015: 313) developed an analytical framework including macro-level drivers of IWP (macroeconomic, demographic, and public policy factors) that affect households through micro-level channels (e.g., a low wage rate, low work intensity and above average household needs). Most research on IWP has focused on cross-section data (see Struffolino and Van Winkle 2021, for a review), yet available longitudinal studies suggest that entries and exits are fluid (Gutiérrez et al. 2011; Hick and Lanau 2018; Tejero 2018). As Hick and Lanau (2018) emphasize, studying IWP dynamics is important to better understand IWP –since not all the trajectories or the events that provoke them are similar– and to identify different policy solutions in order to reduce it.

In Latin America, little attention has been paid to IWP. The available research is restricted to cross-section data (Maurizio 2018; Poy 2020). Even if this information is relevant to give an order of magnitude of the phenomenon, evidence from developed countries points to the importance of incorporating the longitudinal perspective. This article contributes to fill the lack of research on IWP

dynamics in Latin America by addressing two objectives. The first objective is to characterize the transitions in and out poverty among employed individuals, defining the events that produce such entries and exits, and considering whether they are labor, non-labor or demographic episodes. The second objective is to explain the factors related to different types of poverty according to its duration: transient or persistent poverty. Data derive from a household survey, the Permanent Household Survey (*Encuesta Permanente de Hogares, EPH*), carried out quarterly by the National Institute of Statistics and Censuses (*Instituto Nacional de Estadistica y Censos, INDEC*) of Argentina. We use one-year interval pooled panel data corresponding to three years of the EPH (2017, 2018 and 2019) to examine the trigger events that provoke entries and exits from IWP, and the factors associated to different types of IWP.

The paper relies on Argentina as a relevant case study of Latin American trends regarding IWP. In Latin America, the 'commodities boom' led to a period of declining economic inequality and poverty after structural reforms (Birdsall et al. 2011; Economic Commission for Latin America and the Caribbean [ECLAC], 2014). However, the end of this cycle resulted in a partial reversion of these positive trends (ECLAC, 2022). Argentina is the third largest economy in Latin America after Brazil and Mexico and has performed in a similar manner to the whole region in the last two decades. After the economic and social improvements of the early 2000s, the country is facing a superposition of economic stagnation, external sector crisis, high inflation, and external indebtedness to multilateral organizations. Between 2010 and 2019, its Gross Domestic Product (GDP) only grew 3.3% with an average annual inflation rate of 32.3%. This scenario worsened in 2020 due to the pandemic and the measures taken to restrict human circulation, which severely affected productive and commercial activities. The case of Argentina is thus relevant to study IWP dynamics in a context characterized by low growth and economic instability.

The concept of IWP combines labor market and poverty analysis and thus requires considering both labor market models and welfare regimes. As in other Latin American countries, the literature highlights the segmented nature of the Argentine labor market (Paz 2013). There is a fraction of the labor market –which includes around 40% of the workforce– operating under informal conditions, also including low-skilled self-employed activities (Poy 2020). On the other hand, Argentina has been characterized by the existence of a 'stratified universalistic welfare-regime' (Martinez-Franzoni and Sanchez-Ancochea 2016). While traditionally formal workers enjoy social protections, informal workers are unprotected, not only during their active years but also during their retirement. In this regard, Argentina has been a case of significant expansion of the social protection system during the first decade of the 2000s in Latin America. This included typically new conditional cash transfer programs (CCTs) aimed at households of informal workers and an extension of the pensions system. Almost a quarter of the national population was included in these CCTs programs –namely, the Universal Child Allowance (*Asignacion Universal por Hijo, AUH*)– in 2015 (Cecchini and Atuesta 2017), while older adults covered by pensions increased from 62.7% to 92.5% between 2000 and 2017 (Arenas de Mesa 2019).[1]

The paper is comprised of five sections. The following section includes a review of the relevant literature about IWP and, specifically, IWP dynamics. The third section details the data used in this paper as well as the methodological strategy for analyzing IWP dynamics. The fourth section presents the main findings of this paper: (i) labor episodes are the most relevant to explain both exits and entries in and out of IWP; (ii) labor and individual characteristics (specifically, low education and low-quality jobs) and households' characteristics (composition and the presence of children) are strongly related to IWP persistence. The fifth section concludes.

2 Literature review

Although the international literature has different definitions for IWP, according to Filandri and Struffolino (2019) two major approaches can be found. On the one hand, the working poor are defined as those employed individuals whose labor income is below a certain threshold. On the other hand, the working poor are defined as those employed persons living in poor households (Fraser et al. 2011a, b; Lohmann 2018). The latter is also the current definition of ILO, and it is the criterion followed in this paper.[2]

The literature points to three immediate drivers of IWP beyond some macro level factors (such as GDP growth or the welfare regime). The first refers to the characteristics of the workers' occupations: workers in low-productivity occupations, in temporary or part-time positions, are more prone to IWP (Maître et al. 2012; Salverda 2018). In Latin America IWP is closely linked to 'informal employment', employment in microenterprises and to domestic work (Maurizio 2018; Poy 2020). It is also well-known

[1] Pensions are relevant for understanding IWP, as more than 20% of the working population live in households with an elderly person.

[2] Despite using the second definition, some problems still arise when defining different concepts of 'employment' and 'poverty'. As shown by Ponthieux (2010), the reference period of employment has consequences on the universe of the working poor, as do the type of poverty threshold chosen (i.e., 'absolute' or 'relative'). We discuss these methodological issues in the next section.

that there is not a simple overlap between IWP and low pay employments. Thus, the second set of drivers refers to some characteristics of the workers themselves –such as gender, ethnicity, education, and migratory status–, (Filandri and Strufolino 2019; Lohmann 2018; Tejero 2018). Finally, as a third level, some household characteristics are also determinants of IWP, such as the household size, the presence of children, and the labor intensity of the adults' members (García-Espejo and Gutiérrez 2011; Lohmann and Crettaz 2018; Maurizio 2018; Tejero 2017; Thiede et al. 2018).

While there is vast literature on the determinants of IWP, commonly relied on cross-section data, its dynamics have not been much studied. Studying poverty dynamics requires longitudinal data, which is often not available, especially in developing countries (Beccaria et al. 2015). In developed countries, efforts have been made to differentiate between situations of 'chronic' poverty (i.e., population or households that remain in poverty for long periods of time), 'recurrent' poverty (i.e., population or households that alternate periods in and out of poverty) and 'transient' poverty (i.e., population or households only experiencing some period in poverty).[3] An OECD study (2008) highlights that households in which there are no employed persons and with a high number of dependents are the most likely to face chronic poverty. Following Cantó et al. (2012), households more likely to experience recurrent poverty are those whose members face difficulty staying in the labor market or whose members are generally in low-skilled, no-contract (or fixed-term contract) or self-employed jobs. According to Tejero (2018), transient poverty is experienced for a short period of time and can be regarded as temporary episodes associated with a low-income period, without negatively affecting households' future welfare levels.[4]

There are some precedents of research on IWP dynamics in developed countries. Hick and Lanau (2018) state that analyzing IWP transitions is difficult since workers can exit (or enter) IWP both leaving (or entering) poverty and/or employment. Studying IWP in four European countries (Spain, France, Poland, and the UK), Gutiérrez et al. (2011) found that IWP is fluid and that poverty exits and entries are commonly restricted to movements close to the poverty threshold. A recent piece of evidence for the European Union (Guio, Marguerit and Salagean 2021) focuses on short-term IWP trajectories, showing that half of the working poor remain poor a year later. The likelihood of moving out of IWP is hindered by factors such as having low education, part-time jobs, fixed-term contracts and living in households with self-employed workers (2021: 271). In a study focused on the UK, Hick and Lanau (2018) found that people in one-worker households are the most likely to enter and to remain in poverty after a two-year observation window. Tejero (2018) offers thorough insights of IWP dynamics for Spain with important differences for employees and self-employed workers. Among employed workers, those living in households with children and with low work intensity face the highest chances of persistent and recurrent poverty. Low paid and part-time jobs are also strongly related to these types of poverty (Tejero 2018: 11). To our knowledge, there is no previous research on IWP dynamics for Latin America, so this paper aims to fill in this gap by studying the Argentine case.

Poverty dynamics literature has also been particularly interested in identifying the 'trigger events' that occur with transitions in and out of poverty. Typically, the existing literature considers three types of trigger events: labor market events (e.g., changes in the number of workers in the household, in working hours or in labor incomes), non-labor events (e.g., changes in social transfers), or demographic events (e.g., changes in the household size). The available research on 'total' poverty shows that labor market events are the most relevant to explain transitions (Beccaria et al. 2013, 2015; Layte and Whelan 2002; Polin and Raitano 2014). Beccaria et al. (2013) analyze trigger events associated with poverty transitions in five Latin American countries (Argentina, Brazil, Costa Rica, Ecuador, and Peru) during a phase of economic growth (the early 2000s). They found that the events exclusively related to the labor market (wage growth and a rise in the number of employed members in the household) were the most relevant among those associated with poverty exits (2013: 12).

The trigger events approach is relevant to better understanding IWP, though it should be noted that there is no previous research for Latin America. Gutierrez et al. (2011) use this approach to understand IWP transitions in four European countries (Spain, France, Poland, and the UK). They found that changes in the labor market participation of the household (adult members' work intensity and the number of labor income earners) are the most important events explaining IWP transitions, whilst demographical changes are less influential. Hick and Lanau (2018) apply this methodology to the UK, and they find that labor and social security income events are the most relevant in explaining IWP transitions, followed by changes in labor participation (changes in hours worked and in the number of workers in the household).

[3] As we discuss below, different types of poverty trajectories can be defined following two main approaches, the 'spells' method and the 'components' approach.

[4] Relevant literature on 'total' poverty dynamics in Latin America includes Beccaria et al. (2013, 2015), Cruces and Wodon (2003), Machado and Ribas (2010), Neilson et al. (2008), Paz (2002) and Slon and Zúñiga (2006).

Recent research on IWP transitions for Europe finds that the likelihood of workers exiting poverty is favored by an increase in labor incomes, social benefits, and the number of workers, whereas an increase in the number of children in the household reduces the probability of exiting poverty (Guio, Marguerit and Salagean 2021).

3 Data and methods

This paper relies on microdata of the EPH for the period 2017–2019. More recent data was discarded due to the effect that the COVID-19 pandemic had on labor market dynamics.[5] The EPH is a survey of households and living conditions, carried out quarterly by the INDEC. It is the main official survey to assess income distribution and poverty. The sample size is 26,000 households and 58,000 people per quarter. The EPH is based on a multistage sample conducted in 31 urban areas, representing about 62% of the total national population.

The dynamic data for this study come from the EPH, as the survey includes a rotation scheme: A fraction of the households are interviewed in two consecutive quarters, are removed from the sample for two quarters, and are re-interviewed in two consecutive quarters during the following year. Between one quarter and the same period of the following year, there is a 50% shared sample, so the usual use of this rotation scheme is the construction of one-year interval panels (Beccaria et al. 2013; Paz 2013). Following a common strategy with the EPH, we first build a one-year panel using every quarter microdata and then we pool them both to have a larger sample size and to avoid problems due to income seasonality.[6] One problem with panel data is that they are usually affected by attrition, which could introduce sample bias if it is not random.[7] The EPH does not provide information to apply eventual corrections. However, following Paz (2013) we implemented a procedure to evaluate the existence of attrition bias. A logit model for the probability of remaining in the panel was estimated. The original sample weights were adjusted by the inverse of the probability of remaining in the panel. For a series of relevant indicators, we compared the adjusted results with those observed without adjustments (Additional file 1: Table S1). We concluded that attrition bias is irrelevant and, therefore, we decided to use the uncorrected microdata. In addition, a comparison of descriptive variables and IWP incidence on cross-section and panel samples shows very small differences between the two datasets (see Table 1).

When analyzing IWP, it is necessary to define how poverty is measured and who is considered employed. Poverty is measured here using an 'absolute' approach that compares the households' equivalized income with a certain threshold –the 'poverty line'– that represents the monetary value of a basket of goods and services. This methodology is the official procedure in Argentina used by the INDEC and it is the usual methodology in developing countries (ECLAC, 2018). In Argentina, the INDEC calculates equivalized poverty lines monthly, and that threshold is used here to define whether a worker lives in a poor household or not.

On the other hand, a worker is every individual who has worked at least one hour during the week before the survey was carried out (the 'reference period' in the EPH). But when analyzing IWP from a dynamic perspective, it may happen that individuals change their employment status in a one-year period. Since the individuals can leave IWP by leaving poverty and/or work, we decided to consider two subpopulations. Following a 'restricted' definition, we consider respondents aged 18 to 64 who were employed in both periods ($t$and$t+1$). A 'broader' definition considers respondents of the same age that were employed at least in one of the two periods ($t$or$t+1$). The sample size of the pooled panel was of 34.872 and 44.331 individuals, respectively.

Regarding the 'trigger events' that occur together with the transitions in and out of poverty, we follow the approach proposed by Bane & Ellwood (1986), to identify a set of mutually 'exclusive' trigger events that co-occur with transitions.[8] These events are the following: (1) *Exclusively labor income events*: an increase (or decrease) in the number of hours worked per earner, an increase (or decrease) in the number of labor income earners, an increase (or decrease) in hourly labor earnings per earner, and combinations of these events; (2) *Exclusively non-labor income events*: an increase (or decrease) in pensions and/or social benefits income, other non-labor income events, and combinations of the former; (3) *Both labor and non-labor income events*, considering if they include social benefits income events or not; (4) *Exclusively demographic events*: a decrease (or increase) in the household size; (5) *Combinations of labor, non-labor*

[5] Information from 2016 was not used because there is no microdata available for the first quarter of that year. In addition, in 2016 the INDEC made changes in the identification codes of the households surveyed, so it is not possible to construct annual panels with respect to the previous period.

[6] Since it is a quarterly survey, the EPH captures the effect of an extraordinary source of income, the *Aguinaldo* (a thirteenth salary paid in two parts) in the first and third quarters, which reduces poverty rate in about 7%.

[7] Attrition refers to the dropout of households from the panel. According to the sample design of the EPH, 50% of the household must be interviewed in the following year; however, we found that only 39.4% effectively remain. Attrition bias arises when systematic differences are found between the theoretical and the observed sample.

[8] Since this application is based on a descriptive approach, no efforts are made to control for covariates that could affect entries and exits, so the results should not be interpreted as causal effects.

Table 1 Summary statistics of the variables included in the analysis for cross-section and panel data. 2017–2019

		Panel data			Cross section		
		Obs	%	Standard error	Obs	%	Standard error
In-work poverty	Working but not poor	34.507	78,88	0,20	233.070	79,50	0,07
	Working poor	9.242	21,12	0,20	47.198	20,50	0,07
Gender	Male	23.897	54,62	0,24	158.141	56,42	0,09
	Female	19.851	45,38	0,24	122.127	43,58	0,09
Age	18–29	11.429	26,12	0,21	68.411	24,41	0,08
	30–44	16.192	37,01	0,23	108.574	38,74	0,09
	45 +	16.127	36,86	0,23	103.283	36,85	0,09
Education	Up to incomplete secondary school	15.150	34,63	0,23	93.576	33,39	0,09
	Secondary School	12.231	27,96	0,21	79.502	28,37	0,09
	University/Tertiary (incomplete)	6.854	15,67	0,17	41.556	14,83	0,07
	University/Tertiary (complete)	9.514	21,75	0,20	65.634	23,42	0,08
Nationality	Argentine	41.336	94,49	0,11	263.182	93,90	0,05
	Other	2.412	5,51	0,11	17.086	6,10	0,05
Household composition	Single person	2.453	5,61	0,11	19.572	6,98	0,05
	Single parent	5.384	12,31	0,16	34.529	12,32	0,06
	Couple, no children	9.980	22,82	0,20	64.373	22,97	0,08
	Couple, children	15.574	35,61	0,23	93.841	33,48	0,09
	Other family, no children	2.969	6,79	0,12	20.834	7,43	0,05
	Other family, children	7.378	16,87	0,18	47.100	16,81	0,07
Number of workers in the household	1	13.655	31,21	0,22	83.952	29,95	0,09
	2 +	30.094	68,79	0,22	196.316	70,05	0,09
Household w/ pensions	No	33.374	76,29	0,20	216.174	77,13	0,08
	Yes	10.374	23,71	0,20	64.094	22,87	0,08
Household w/ social transfers	No	36.164	82,66	0,00	222.800	83,16	0,08
	Yes	7.585	17,34	0,00	57.468	16,84	0,08
Working hours	Full time (+ 30 hs)	27.241	62,27	0,23	182.524	65,12	0,09
	Part time (30 hs or less)	16.507	37,73	0,23	97.744	34,88	0,09
Occupational status	Employee	32.980	75,39	0,21	213.602	76,21	0,08
	Self-employed	10.769	24,61	0,21	66.666	23,79	0,08
Social protection status	With contributions to the pension system	27.768	63,47	0,23	184.923	65,98	0,09
	W/out contributions to the pension system	15.980	36,53	0,23	95.345	34,02	0,09

Source: Authors' own elaboration based on EPH

and demographic events: with or without labor events involved.

Drawing on Beccaria et al. (2013) notation, the probability of moving from state 'i' to state 'j' between t and $t+1$, is equal to the sum of probabilities of transition associated with each event:

$$Pr(S_{ij}) = \sum_{r=1}^{R} Pr(S_{ij}, E_r) \quad (1)$$

where S_{ij} is the transition (e.g., from in-work poverty in t to non-poverty in $t+1$), E_r indicates the occurrence of the event r and R is the space of mutually exclusive events. As demonstrated by Jenkins and Schluter (2003), the probability of transition from 'i' to 'j' can thus be expressed as follows:

$$Pr(S_{ij}) = \sum_{r=1}^{R} Pr(S_{ij}|E_r)P(E_r) \quad (2)$$

Equation (2) decomposes the probability of transition in two factors: the transition probability (i.e., entry or exit rate) conditional to the occurrence of the event, and the probability of the event among the at-risk population (i.e., the working poor when exiting IWP). It is worth noting that this decomposition allows to identify the importance of each event in the transitions and to indicate if each event favors entries or exits because it is *frequent* among the at-risk population or because it is associated with a *high entry or exit rate* (Hick and Lanau 2018).

A second common concern in poverty dynamics research is to pinpoint different types of poverty according to its duration We follow the strategy known as the 'spells approach' (Bane and Elwood 1986; Beccaria et al. 2013; Calvo and Dercon 2007; *inter alia*), that focuses on the experiences of poverty period by period. In this approach, different types of poverty are defined according to time spent in poverty. Chronic poor are generally those who spent a high number of episodes in poverty, whereas transient poor are those that experienced a lower number of episodes (Foster 2009).

Following the usual terminology (Cantó et al. 2012; Tejero 2018), with two observations for each worker, three types of situations are recognized: (i) *transient working poverty,* involves every individual that experienced only one poverty episode; (ii) *persistent working poverty,* includes every individual in poverty during two periods; (iii) *never working poor*, refers to individuals who were never poor in the two periods considered.[9] We use a multinomial logit regression (MNL) to assess the factors associated to these different types of IWP (Baulch and Dat 2010; Garza et al. 2015). The MNL is appropriate for a polytomous dependent variable. Considering the three possible outcomes of y and the explanatory variables X, a set of coefficients$\beta^{(1)}$, $\beta^{(2)}$ and $\beta^{(3)}$ are estimated for each outcome:

$$\begin{cases} Pr(y=1) = \frac{e^{X\beta^{(1)}}}{e^{X\beta^{(1)}}+e^{X\beta^{(2)}}+e^{X\beta^{(3)}}} \\ \Pr(y=2) = \frac{e^{X\beta^{(2)}}}{e^{X\beta^{(1)}}+e^{X\beta^{(2)}}+e^{X\beta^{(3)}}} \\ Pr(y=3) = \frac{e^{X\beta^{(3)}}}{e^{X\beta^{(1)}}+e^{X\beta^{(2)}}+e^{X\beta^{(3)}}} \end{cases} \quad (3)$$

Identifying the model requires to set one of the coefficients to 0, whereas the remaining will measure the change relative to the 'base' outcome. Setting $\beta^{(1)} = 0$ – for our purposes, the 'never poor' outcome–, the equations in (3) become:

$$\begin{cases} Pr(y=1) = \frac{1}{1+e^{X\beta^{(2)}}+e^{X\beta^{(3)}}} \\ \Pr(y=2) = \frac{e^{X\beta^{(2)}}}{1+e^{X\beta^{(2)}}+e^{X\beta^{(3)}}} \\ Pr(y=3) = \frac{e^{X\beta^{(3)}}}{1+e^{X\beta^{(2)}}+e^{X\beta^{(3)}}} \end{cases} \quad (4)$$

If X and ${\beta_k}^{(2)}$ are vectors equal to $(x_1,x_2,\ldots,x_k)$ and $({\beta_1}^{(2)},{\beta_2}^{(2)}\ldots,{\beta_k}^{(2)})$, we may write the ratio of the relative risk for a one-unit change in x_i as:

$$\frac{e^{\beta_1^{(2)}x_1+\cdots+\beta_i^{(2)}(x_i+1)+\ldots\beta_k^{(2)}x_k}}{e^{\beta_1^{(2)}x_1+\cdots+\beta_i^{(2)}x_i+\ldots\beta_k^{(2)}x_k}} = e^{\beta_i^{(2)}} \quad (5)$$

The exponentiated value of each coefficient is thus the *relative-risk ratio* (RRR) for a one-unit change in the corresponding explanatory variable, where the risk is relative to the base outcome (in the present case, not being working poor at either of the two moments).

4 Results and discussion

4.1 Trigger events and in-work poverty

Chart Fig. 1 presents the evolution of IWP in Argentina between 2017 and 2019. In this period, GDP fell by 7% and the annual inflation rate grew from 24.8% to 54%. Not surprisingly, IWP grew from 18.5% to 25.1%. As the trigger events analysis does not account for the factors that prevent transitions –since it is only applied to those workers that moved in and out of IWP–, Fig. 1 also includes an analysis of IWP poverty rates before social benefits and pensions.[10] It is worth noting that social benefits have a scarce effect on preventing IWP, as less than 2% of workers avoid poverty through these instruments.[11] On the contrary, pensions are more relevant, as they account for almost 6% of workers that avoid entering poverty due to these incomes.

Table 2 presents the complete transition matrix of IWP using pooled one-year interval panel data. These results confirm previous international research (e.g., Gutiérrez et al. 2011; Hick and Lanau 2018), showing that IWP in Argentina is fluid in a short-term interval: almost a half (44.9%) of the working poor in t are no longer poor in $t+1$. Nevertheless, the complete transition matrix shows other relevant additional pieces of evidence: 14.1% of the working poor in t 'leave' working poverty by leaving employment, as they remain poor in $t+1$. Two thirds of the working poor in t thus remain poor one year later

[9] An important limitation of this approach is the presence of interval-censored data using a one-year interval, and the short-term period considered, which prevents the correct identification of the incidence of transitory and chronic poverty.

[10] Chart 1 includes a microsimulation analysis of the effects of social benefits and pensions on IWP. This microsimulation requires to use the worker's household income net of social benefits and pensions income, and to recalculate the IWP headcount ratio.

[11] Indeed, in December 2019 the Universal Child Allowance was ARS 2.746 (USD 25), about 21% of the official poverty line.

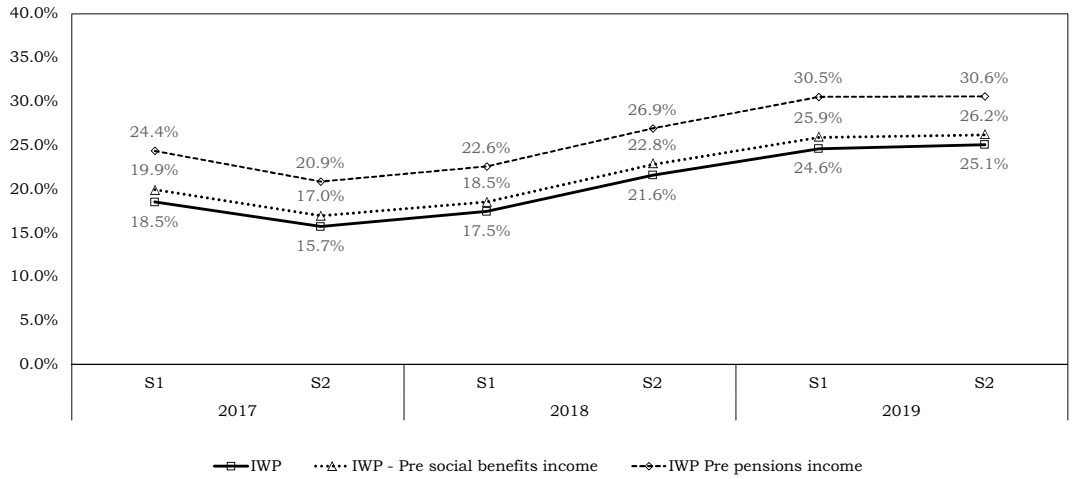


Fig. 1 In-work poverty rate before and after pensions and social benefits income. 2017–2019. Source: Authors' own elaboration based on EPH

Table 2 In-work poverty transition matrix. Pooled data, 2017–2019

			t+1				Total
			Not working		Working		
			Neither poor nor working	Poor but not working	Working but not poor	Working poor	
t	Not working	Neither poor nor working	61.0	17.3	18.6	3.2	100.0
		Poor but not working	17.3	51.1	13.3	18.4	100.0
	Working	Working but not poor	6.2	4.3	78.7	10.9	100.0
		Working poor	2.6	14.1	28.2	55.2	100.0

Source: Authors' own elaboration based on EPH

(69.3%), whether they are working or not. It is worth noting that individuals leaving IWP through leaving employment are probably the most vulnerable workers as they alternate periods of occupation with unemployment.

Since IWP is fluid, it is worth analyzing the factors underpinning the transitions. Table 3 examines the processes that co-occur with the exits from poverty –the trigger events–, considering both workers that remained employed in *t* and *t+1* and those who were employed at least in one of the two periods (the 'restrictive' and the 'broader' definitions aforementioned). The first column of Table 3 presents the probability of occurrence of the event among workers who exited IWP; the second column is the exit rate conditional on the occurrence of the event among the at-risk population (i.e., the working poor in *t*); the third column is the product of the previous columns as shown in Eqs. (1) and (2). As the events are mutually exclusive, the sum of the third column is the exit rate, and thus the relative importance of each event in the exit rate is included in the fourth column.

Labor events are the most relevant of the 'trigger' events in IWP exits, both exclusively and in combination with other events. Considering the 'always working' population, 51.2% of the exits from IWP occur due to exclusively labor events. Among these events, the most relevant is the increase in the labor income of a household earner (11.5%) especially if combined with an increase in the average of hours worked per earner (11.3%). The mere increase in the number of labor income earners has a minor effect on exit IWP (7.9%), but it becomes more relevant when it is combined with the average of working hours (6.4%). These findings are consistent with those of Maurizio et al. (2008) for 'total' poverty in Argentina and with Beccaria et al. (2013, 2015) for Latin America. Similar results can be found if we consider the population of those working in *t* and/or in *t+1*. However, among this group the relevance is placed on the increase in the number of labor income earners and in the number of hours worked by earner. This is consistent with a definition that includes workers

Table 3 Decomposition of in-work poverty exit rate. Pooled data, 2017–2019

	Always working				Working in *t* and/or in *t* + *1*			
	P(E)	P(S|E)	P(E)*P(S|E)	%	P(E)	P(S|E)	P(E)*P(S|E)	%
Exclusively labor income events	**39.0**	**44.2**	**17.3**	**51.2%**	**39.0**	**43.3**	**16.9**	**50.3%**
Increase: hours worked by earner	5.7	32.0	1.8	5.4%	4.7	30.9	1.4	4.3%
Increase: hourly income per earner	9.7	39.9	3.9	11.5%	7.1	36.1	2.6	7.7%
Increase: hours worked and hourly income	8.1	47.3	3.8	11.3%	6.5	42.3	2.7	8.2%
Increase: number of labor income earners	6.0	44.5	2.6	7.9%	6.5	44.8	2.9	8.6%
Increase: number of labor income earners and hours	4.1	52.4	2.2	6.4%	9.2	50.5	4.6	13.8%
Increase: number of labor income earners and income	4.2	54.7	2.3	6.9%	3.8	52.9	2.0	6.1%
All the above events	1.3	49.0	0.6	1.9%	1.2	45.4	0.5	1.6%
Exclusively non-labor income events	**10.3**	**7.4**	**0.8**	**2.3%**	**11.2**	**9.5**	**1.1**	**3.2%**
Increase: pensions income	1.7	23.3	0.4	1.2%	2.1	25.6	0.5	1.6%
Increase: social benefits income	5.8	0.9	0.1	0.2%	5.9	0.9	0.1	0.2%
Increase: pensions and social benefits income	0.4	10.8	0.0	0.1%	0.7	8.2	0.1	0.2%
Only other non-labor income events	1.5	12.7	0.2	0.6%	1.5	15.5	0.2	0.7%
Combinations of non-labor income events	0.8	9.0	0.1	0.2%	0.9	18.9	0.2	0.5%
Both labor and non-labor events	**25.3**	**42.7**	**10.8**	**32.0%**	**26.3**	**41.7**	**11.0**	**32.7%**
With social benefits income events	7.9	35.3	2.8	8.3%	9.4	34.0	3.2	9.5%
Without social benefits income events	17.4	46.1	8.0	23.8%	16.9	46.0	7.8	23.2%
Exclusively demographic events	**1.8**	**16.4**	**0.3**	**0.9%**	**1.9**	**11.2**	**0.2**	**0.6%**
Combinations of events	**9.6**	**46.9**	**4.5**	**13.3%**	**9.9**	**43.8**	**4.3**	**12.9%**
With labor events	7.6	53.8	4.1	12.2%	7.8	51.9	4.0	12.0%
Without labor events	1.9	19.6	0.4	1.1%	2.1	14.3	0.3	0.9%
Non classified	**14.0**	**0.8**	**0.1**	**0.3%**	**11.7**	**0.8**	**0.1**	**0.3%**
	100.0	**0.0**	**33.7**	**100.0%**	**100.0**	**0.0**	**33.6**	**100.0%**

Source: Authors' own elaboration based on EPH

Bold values represent categories that are then dissaggregated into sub-categories

who enter the labor market after having been unemployed or inactive.

The first and the second columns of Table 3 show that, generally, labor income events have a relatively low probability of occurrence –P(E)–, but they are associated with a high exit rate –P(S|E)–. An exception is the increase in the number of hours worked, which has both a relatively low probability of occurrence and it is associated with a low exit rate. The growth in the number of earners has a scarce incidence on exiting poverty, especially due to its low frequency (even if it is associated with a high exit rate).

Non-labor income events include the growth in pensions and social benefits income, other non-labor income events and their combinations. These events play a very small role in IWP exits, because of their low frequency and, especially, due to a low exit rate associated with them (2.3% for the 'always working' population). Interestingly, social transfers have a scarce impact on poverty amelioration (which may be due to the low amount of these benefits); in contrast, pension income events had a greater impact (1.2%), due to their high exit rate. When combined with labor events –such as those previously examined–, however, non-labor episodes account for 32% of the exits (32.7% among those working in *t* and/or in *t* + *1*), which is mostly explained by events not related to social benefits. As it is documented by previous research on total poverty, changes in the household composition are less important to understand IWP exits (0.9% of the outflows). When these demographic events are combined with labor and non-labor income events, they play a significant role in exiting IWP (12.2%).

Table 4 presents IWP entry rate decomposition. Exclusively labor events account for almost half of the entry rate (47.9% among the 'always working' population and 46.4% among the 'broader' population), and when combined with other types of events, they explain most of the transitions. Not only is the relative importance of exclusively labor events in the entries into IWP quite similar to that of exits,

Table 4 Decomposition of in-work poverty entry rate. Pooled data, 2019–2021

	Always working				Working in *t* and/or in *t* + *1*			
	P(E)	P(S|E)	P(E)*P(S|E)	%	P(E)	P(S|E)	P(E)*P(S|E)	%
Exclusively labor income events	**44.3**	**13.1**	**5.8**	**47.9%**	**44.2**	**15.8**	**7.0**	**46.4%**
Decrease: hours worked by earner	7.1	6.6	0.5	3.9%	6.5	8.0	0.5	3.4%
Decrease: hourly income per earner	17.3	10.3	1.8	14.6%	15.5	11.0	1.7	11.3%
Decrease: hours worked and hourly income	11.3	13.2	1.5	12.3%	10.9	13.0	1.4	9.4%
Decrease: number of labor income earners	3.6	17.8	0.6	5.3%	4.7	22.0	1.0	6.8%
Decrease: number of labor income earners and hours	2.3	32.2	0.7	6.0%	4.0	40.0	1.6	10.6%
Decrease: number of labor income earners and income	2.5	23.1	0.6	4.7%	2.5	27.0	0.7	4.4%
All the above events	0.2	55.9	0.1	1.1%	0.3	59.0	0.2	1.1%
Exclusively non-labor income events	**7.8**	**3.1**	**0.2**	**2.0%**	**8.1**	**4.0**	**0.3**	**2.2%**
Decrease: pensions income	3.4	2.2	0.1	0.6%	3.6	2.7	0.1	0.6%
Decrease: social benefits income	1.2	3.9	0.0	0.4%	1.2	3.8	0.0	0.3%
Decrease: pensions and social benefits income	0.2	5.2	0.0	0.1%	0.3	7.9	0.0	0.1%
Only other non-labor income events	2.4	2.1	0.1	0.4%	2.5	3.7	0.1	0.6%
Combinations of non-labor income events	0.5	10.4	0.1	0.4%	0.6	11.8	0.1	0.5%
Both labor and non-labor events	**19.6**	**21.4**	**4.2**	**34.4%**	**21.2**	**25.5**	**5.4**	**35.9%**
With social benefits income events	2.4	44.6	1.1	8.7%	2.9	47.9	1.4	9.3%
Without social benefits income events	17.2	18.1	3.1	25.7%	18.3	22.0	4.0	26.6%
Exclusively demographic events	**1.8**	**1.6**	**0.0**	**0.2%**	**1.6**	**1.5**	**0.0**	**0.2%**
Combinations of events	**7.0**	**26.2**	**1.8**	**15.1%**	**7.6**	**29.8**	**2.3**	**14.9%**
With labor events	6.3	28.3	1.8	14.7%	6.9	32.0	2.2	14.5%
Without labor events	0.7	7.1	0.0	0.4%	0.7	9.0	0.1	0.4%
Non classified	**19.5**	**0.2**	**0.0**	**0.3%**	**17.3**	**0.4**	**0.1**	**0.4%**
	100.0	**0.0**	**12.1**	**100.0%**	**100.0**	**0.0**	**15.1**	**100.0%**

Source: Authors' own elaboration based on EPH

Bold values represent categories that are then dissaggregated into sub-categories

but also the specific events that explain the transitions are quite similar: a decrease in the hourly labor income per earner is the most important trigger event (14.6%), not only individually but also combined with a reduction in the average of hours worked per earner (12.3%). More specifically, the first type of event is the most frequent among the non-poor workers in *t* –P(E)–, whereas the second is associated with a high conditional probability –P(S|E)– of entry into IWP. A decrease both in the number of labor income earners and in the number of hours worked has a minor effect due to its low frequency, but it is strongly associated to entering IWP.

Like in exits from IWP, exclusively non-labor income events play a minor role in transitions into poverty (2%), due to both a scarce probability of occurrence and a low conditional entry rate. However, when combined with labor income events, they do play a more significant role in explaining entries into poverty (34.4% among the 'restricted' population and 35.9% considering a 'broader' definition). Finally, entries into IWP are rarely influenced by exclusively demographic events. Nevertheless, when combined with labor and non-labor income events, they gain relevance in explaining entries into IWP.

4.2 Analyzing different types of IWP

In the previous section we described the events that 'trigger' the inflows and outflows of IWP. Although the relative importance of these different types of events has been already acknowledged, little is known about the workers who experience such entries and exits. Therefore, our attention must now turn to understanding the social differences in transitions into and out of IWP. In this regard, it might be useful to describe the entry and exit rates for different subgroups of workers first (Table 5).

There are no differences between men and women in their respective entry and exit rates into and out IWP when a 'broad' definition of working is used. Conversely, when using a 'restrictive' definition, men are more likely to face a higher entry rate (and a lower exit rate) than women. This effect has been called the 'gender paradox': while women are

Table 5 In-work poverty transition probabilities by subgroup. Pooled data, 2017–2019

		Entry rate		Exit rate	
		Always working	Working in t and/or in t + 1	Always working	Working in t and/or in t + 1
Total		12.2	15.1	33.8	33.6
Gender	Male	13.5	15.9	33.1	33.5
	Female	10.5	14.2	35.0	33.7
Age	18–29	14.5	18.6	31.2	33.6
	30–44	12.2	14.8	32.1	31.8
	45 +	10.9	13.2	37.8	36.1
Education	Up to incomplete secondary school	22.6	26.3	27.9	27.2
	Secondary school or higher	8.4	10.8	43.2	43.3
Nationality	Argentine	11.7	14.6	33.9	33.8
	Other	21.3	24.4	32.9	31.3
Household composition	Single person	5.0	8.4	54.7	59.5
	Single parent	12.2	16.3	30.8	29.9
	Couple. no children	5.8	7.8	58.3	55.4
	Couple. children	15.5	18.2	28.5	27.9
	Other family. no children	8.6	12.2	53.3	54.3
	Other family. children	21.6	25.3	33.0	31.9
Household's workers	1	13.9	15.6	31.8	33.2
	2 +	11.5	14.9	35.6	34.0
Occupational Status	Self-employed	17.0	18.6	31.0	32.5
	Employees	10.8	12.1	35.1	36.3
Social protection status	With contributions to the pension system	8.3	9.9	42.2	44.1
	W/out contributions to the pension system	24.8	28.4	28.6	28.4

Note: all occupational covariates refer to time *t* (or *t* + *1* in case of the not-working population at *t*, and vice versa)

Source: Authors' own elaboration based on EPH

more likely to have lower individual incomes than men, they face a lower IWP risk (Broström and Jansson 2023), which could be explained by a greater propensity among men to be the sole income earner in their household. Young and middle-aged workers (under 44 years old) have higher entry rates and lower exit rates than other groups: the moment of their life cycle and the presence of dependents may account for these differences. As it has been shown by previous literature (Lohmann and Crettaz 2018: 60), formal education plays a central role in protecting from IWP: lower educated workers show higher rates of entry and lower rates of exit than those higher educated, probably due to the type of jobs these workers have. As it is widely documented in the literature (Hick and Lanau 2018), the household composition has a strong impact on transition probabilities: single parent households and couples with children face the highest entry rates and the lower exit rates, whereas workers living in single person households or with a partner, but without kids, face the higher IWP entry rates.

Workers that were self-employed (in *t*) have higher entry rates and lower exit rates than employees. In addition, as it has been shown by previous literature, quality of the employment becomes a relevant factor: workers with contributions to the social protection system (the indicator of job-quality adopted here) (in *t*) face lower entry rates (and higher exit rates) into IWP than the rest of the individuals, whatever the definition adopted. These results help to understand previous evidence of the 'trigger' event analysis: Indeed, non-salaried and unprotected workers have higher employment and income instability (Maurizio 2018), which actually results in their losing hours worked.In a context of high inflation (such as in Argentina), self-employed workers are also more exposed to losing income as they are not protected by unions who would make regular adjustments of their income through salary negotiations.

Table 6 shows the relative risk-ratio (RRR) of different types of IWP for all the covariates. A Relative Risk Ratio higher than 1 means that a covariate is positively related to a certain type of IWP, whereas an RRR lower than 1 has the opposite interpretation. In the Table we include two models, using both the 'restrictive' and the 'broader' definition

of the population that we already mentioned, but it must be stressed that very little differences arise from the analysis.[12]

After controlling for other covariates, it is worth noting that the demographic characteristics of the individual –such as gender and age– are slightly related to the type of IWP. Women are somewhat more protected against IWP, especially persistent poverty. Workers' age 'protects' only from transient poverty among workers aged 45 or higher when using a broader definition of the subpopulation. On the contrary, low education is associated with a higher probability of both transient and persistent in-work poverty (as shown in the descriptive analysis).

Two variables relative to the worker's household play a crucial role in the type of IWP. Higher labor intensity in the household (measured here by the number of workers) protects against transient poverty, but especially against persistent IWP. This result is consistent with the 'trigger' event analysis, which shows that changes in the number of labor income earners are related with both IWP entries and exits. As the descriptive analysis has shown, another relevant variable is the worker's household composition: living in larger households is strongly correlated with IWP. Single parent households, couples with children and multigenerational families with children are much more exposed to IWP than other types of households. Interestingly, household composition is associated with both types of IWP, but more intensely with persistent poverty. This result suggests that larger households face a higher consumption demand which is not compensated by a higher work intensity (which is controlled in the regression), and thus experiment a higher risk of IWP. When comparing households of similar composition, the presence of children is always associated with a higher risk of IWP: this could be due not only to the fact that the presence of children implies greater consumption demands, but also that the presence of children reduces the labor capacity of working households. In addition, it shows that social protection systems are insufficient to mitigate the impacts of the household structure on IWP. In fact, regarding social protection, conditional cash transfers are not related to poverty amelioration (only pensions are negatively related with IWP) which is consistent with its minor effect as 'trigger' of entries and exits of IWP.

We consider the explanatory relevance of the variables that refer to the worker's occupation on the different types of IWP. Working hours are positively linked to IWP: part-timers are more likely to face both transient and persistent poverty than full-timers. As previous analysis has shown, increasing the number of hours worked is relevant as it 'triggers' both exits and entries of IWP when combined with an increase (decrease) in hourly wages. The occupational status has also a statistically significant effect on IWP once controlling for other covariates, slightly higher on persistent poverty. This weak effect of the occupational status is expected, mostly because the MNL also controls for the job quality. In this sense, workers with jobs without a contract or social security contributions are the most exposed to poverty, particularly persistent IWP (indeed, this is the most relevant variable in the model, together with household characteristics). Thus, workers with low-quality jobs would not only be exposed to more frequent entries and exits from IWP –as shown by the 'trigger' event analysis– due to the instability of their occupations and earnings, but also to permanence in the IWP.

5 Conclusions

This article is a first attempt to contribute to the analysis of the dynamics of IWP in Latin America, based on the study of the Argentine case. Recognizing that IWP is a dynamic phenomenon is relevant for at least two reasons. First, because the dynamic analysis can account for different degrees of severity of IWP: while some workers experience transient poverty, others face persistent poverty, which may have adverse long-term consequences on their living conditions. The dynamic analysis presented in this paper informs public policy by identifying profiles of workers with different levels of economic vulnerability. Second, dynamic analysis makes it possible to identify the events that co-occur with entries and exits into and out of IWP. This represents a powerful policy tool, as it allows strengthening those interventions associated with the events that have the greatest capacity to generate positive transitions.

A first strategy for analyzing IWP dynamics –frequently used in 'total' poverty studies– was to identify the different events that 'trigger' transitions into and out of working poverty. It became clear that labor events are the main responsible both for negative and positive transitions. The most important factor to explain exits from IWP is that the worker's household increases its labor income, both by increasing the income per earner and the number of worked hours. Interestingly, this is also the central type of events that explain entries into IWP. Wage policies (such as raising minimum wages) thus take a leading role in attacking working poverty. The increase in the number of labor income earners plays a minor role in IWP exit and entries, except when using a 'broad' definition of working-poor (i.e., those who were employed in t and in $t+1$). Active labor market policies –not only policies aimed at improving employability, but also at activating the economically inactive population– are

[12] In Appendix, we include the predicted cumulative probabilities of transient and persistent poverty for selected subgroups of workers.

Table 6 Multinomial logistic regressions on IWP types of poverty. Pooled data, 2017–2019. Relative-risk ratios (RRR) and clustered standard errors in parenthesis

	Always working		**Working in t and/or in t + 1**	
	Transient poverty	**Persistent poverty**	**Transient poverty**	**Persistent poverty**
Gender (Ref = Male)	0.968	0.912	0.983	0.926
	(0.0475)	(0.0609)	(0.0374)	(0.0491)
Age (Ref = 18–29)				
30–44	0.937	0.998	0.863**	0.931
	(0.0660)	(0.0906)	(0.0523)	(0.0691)
45 +	0.954	0.922	0.809***	0.803***
	(0.0667)	(0.0844)	(0.0449)	(0.0600)
Education (Ref = Up to incomplete secondary school)				
Secondary School	0.611***	0.390***	0.629***	0.395***
	(0.0403)	(0.0317)	(0.0370)	(0.0251)
University/Tertiary (incomplete)	0.475***	0.212***	0.454***	0.197***
	(0.0408)	(0.0264)	(0.0324)	(0.0195)
University/Tertiary (complete)	0.192***	0.0683***	0.223***	0.0777***
	(0.0178)	(0.0115)	(0.0178)	(0.0103)
Nationality (Ref = Argentine)	1.476***	1.343*	1.425***	1.375**
	(0.195)	(0.222)	(0.171)	(0.219)
HH composition (Ref = Single parent)				
Single person	0.308***	0.102***	0.473***	0.132***
	(0.0460)	(0.0247)	(0.0598)	(0.0295)
Couple, no children	0.768**	0.412***	0.688***	0.386***
	(0.0871)	(0.0706)	(0.0757)	(0.0644)
Couple, children	1.933***	2.405***	1.507***	1.750***
	(0.183)	(0.310)	(0.133)	(0.230)
Other family, no children	0.871	0.452***	0.836	0.389***
	(0.131)	(0.129)	(0.112)	(0.0873)
Other family, children	2.113***	2.515***	1.613***	1.762***
	(0.241)	(0.370)	(0.170)	(0.259)
Number of workers in the household (Ref = 2 or more)	2.568***	5.382***	1.940***	3.677***
	(0.0251)	(0.0152)	(0.0336)	(0.0213)
Working hours (Ref = Full time)	1.367***	1.954***	1.294***	1.832***
	(0.0784)	(0.144)	(0.0626)	(0.113)
Occupational status (Ref = self-employed)	1.402***	1.457***	1.432***	1.556***
	(0.0893)	(0.111)	(0.0763)	(0.102)
Social protection status (Ref = With contract/self-contributing)	2.369***	3.860***	2.322***	3.831***
	(0.145)	(0.318)	(0.120)	(0.267)
Household w/ transfers (Ref = No)				
Only pensions	0.441***	0.218***	0.611***	0.328***
	(0.0770)	(0.0699)	(0.0942)	(0.0744)
Only conditional cash transfers	2.210***	3.886***	2.199***	3.984***
	(0.214)	(0.402)	(0.199)	(0.381)
Both	1.566**	1.612**	1.727**	2.029***
	(0.318)	(0.326)	(0.369)	(0.446)
Constant	0.330***	0.240***	0.422***	0.309***
	(0.0358)	(0.0380)	(0.0433)	(0.0490)
Observations	34,872	34,872	44,331	44,331
R2 McFadden	0.213		0.231	
Wald Chi Sq	2970		2973	
p-value Chi Sq	0,000		0,000	

*** p < 0.01, ** p < 0.05, * p < 0.1. Clustered standard errors in parenthesis

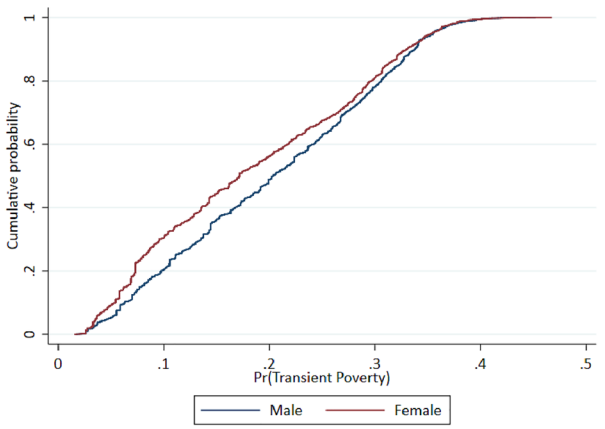
Source: Authors' own elaboration based on EPH

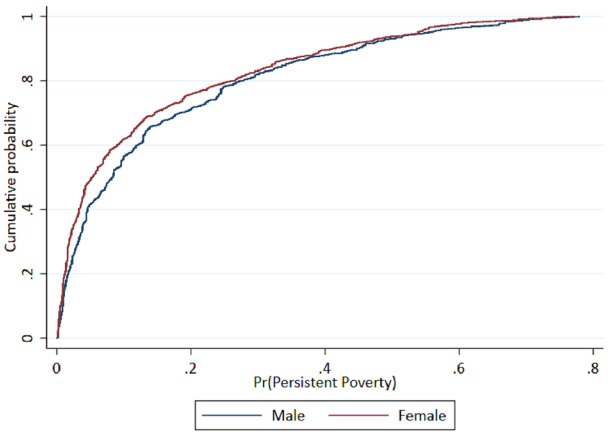
consequently relevant for reducing IWP, especially among intermittent workers. This result seems particularly relevant in Argentina, given the process of economic stagnation with high inflation that has been taking place in recent years. These results are consistent with available research on working poverty for advanced countries that used a similar methodology (Hick and Lanau 2018) and for studies on 'total' poverty in Latin American countries (Beccaria et al. 2015). On the contrary, as shown by the microsimulation analysis and the trigger events approach, the current scheme of conditional cash transfers and family allowances have proved to have a low capacity to lift workers out of poverty.

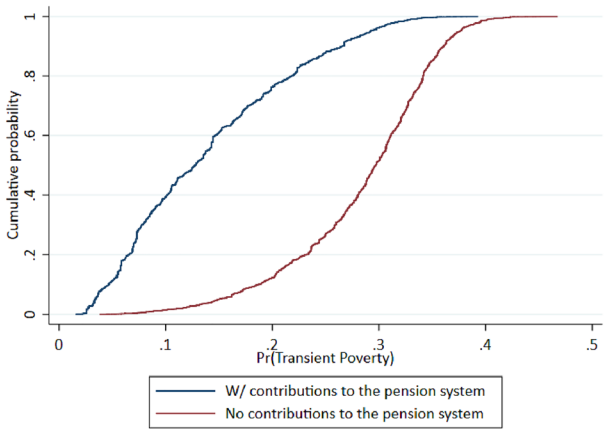
A second strategy, drawing on short-term panel data, was to identify different types of working-poverty ('transient' and 'persistent' IWP). The covariates included in the MNL play a similar role in both types of IWP, but they increase their explanatory capacity in the case of persistent IWP. Three factors have proved to be the most relevant: a low educational level of the worker (e.g.: high school dropout), the household composition (the household size and, especially, the presence of children), and having a low-quality job (i.e., without social security contributions). In this line, this article also provides evidence to studies on working poverty that found similar results (Tejero 2018). These results are consistent with those provided by the 'trigger' event analysis: workers living in larger households, who face greater demands for care, often must reduce their labor participation (in terms of hours or, directly, by exiting the labor market). Similarly, workers with lower quality jobs suffer greater income and job instability. In both cases, these are the factors most associated with entries into poverty. To address in-work poverty, public policies must simultaneously consider training programs, welfare allowances aimed at workers with children, and strengthening job quality.

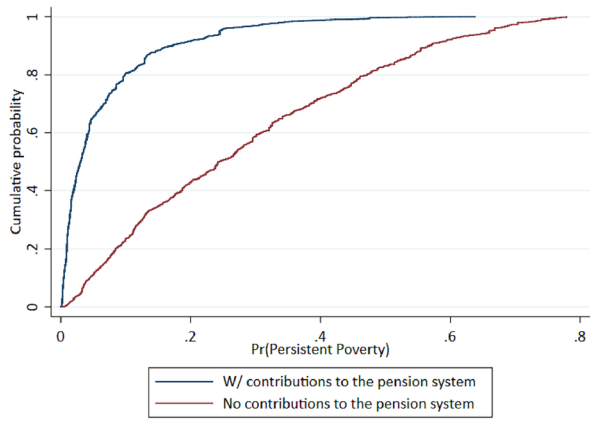
The absence of previous studies on the dynamics of IWP in developing countries is associated with the lack of long-term longitudinal data. In this sense, an important limitation of the present study is the short period that can be analyzed from the longitudinal data used. Longer-term information would mean a highly significant contribution to the study of IWP. Therefore, the results achieved here should be considered indicative of certain trends, an exploration that requires further approximations.

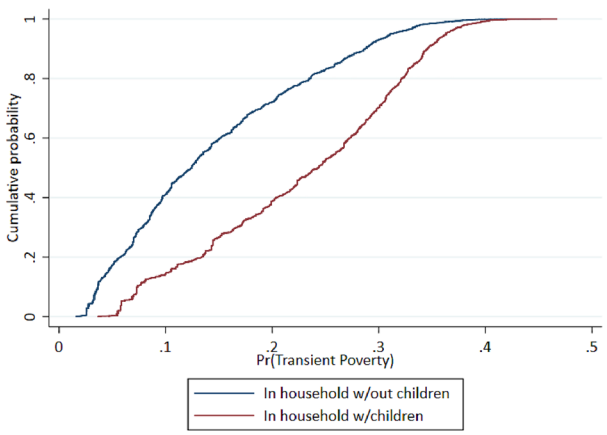
Appendix: Cumulative probabilities of transient and persistent in-work poverty by subgroups. 2017–2019. Source: Authors' own elaboration based on EPH.

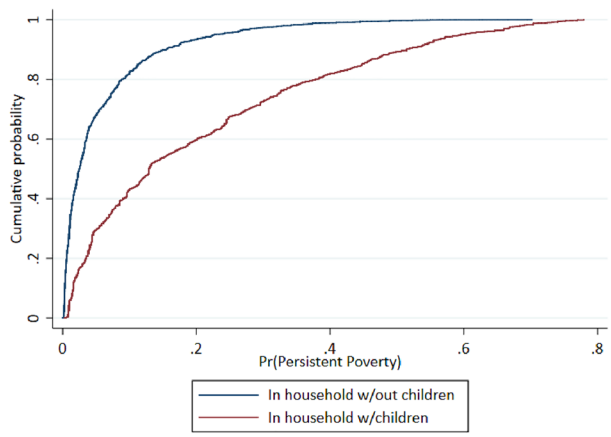












Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12651-023-00348-5.

Additional file 1: Table S1. In-work poverty transition probabilities by subgroup. Pooled data, 2017-2019, correcting for the inverse probability of remaining in the panel. all occupational covariates refer to time t (or t+1 in case of the not-working population at t, and vice versa). Authors' own elaboration based on EPH.

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Author contributions
All the authors contributed equally.

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Availability of data and materials
The datasets used during the current study are available from the corresponding author on reasonable request.

Declarations

Competing interests
The authors declare that they have no competing interests.

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