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Size and profile of the working poor in Chile

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SIZE AND PROFILE OF THE WORKING POOR IN CHILE

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Abstract

Poverty is generally associated with a lack or insufficiency of income, and hence with economically inactive persons. But in developing countries it is not rare to observe people who work but live in poverty. The study estimates the extent of in-work poverty in Chile and identifies the determinants of being working poor. In-work poverty is estimated using 2013 data from the Chilean Socio-Economic Characterization Survey and through consideration of various measures of poverty, mainly focusing on the concept of “in-work at-risk-of-poverty”. Determinants of the working poor are estimated in order to present a broad profile of the category in the context of a developing country. There are relevant findings on the sensitivity of computations of the rate of in-work poverty across definitions. Finally, results from the econometric estimations suggest that the main risk factors in relation to in-work poverty are the following: being male; low education levels; female-headed households; high labour dependency; and part-time or low-paid jobs.

Resumen

La pobreza está generalmente relacionada a la falta o insuficiencia de ingresos y, por ende, a personas económicamente inactivas. Pero en los países en desarrollo no es extraño ver personas que trabajan y son pobres. El propósito de este estudio es estimar el tamaño de la población trabajadora pobre e identificar los determinantes de pertenecer a ella. Se estima a la población de trabajadores pobres utilizando datos para 2013 de la Encuesta de Caracterización Socioeconómica Nacional, considerando distintas medidas de pobreza centradas principalmente en el concepto *in-work at-risk-of-poverty*. Los determinantes de ser trabajador pobre son estimados con el fin de presentar un amplio perfil de los trabajadores pobres en el contexto de un país en desarrollo. Se encuentran hallazgos importantes respecto a la sensibilidad en los cálculos del tamaño del *working poor* a través de las diferentes definiciones. Los resultados de las estimaciones econométricas sugieren que ser hombre, tener bajos niveles educacionales, jefaturas de hogar femeninas, altas tasas de dependencia laboral, empleos de media jornada y empleos mal remunerados son los principales factores de riesgo de ser trabajador pobre.

Keywords: *working poor, at-risk-of-poverty rate, relative poverty, inequality, Chile.*

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Introduction

Even though having a job is one of the main tools for overcoming poverty, in most countries – mainly developing countries – it is still possible to observe a considerable number of people who, in spite of working, experience poverty. Chile is no exception to this problem. Despite many studies focusing on major accomplishments of the country in terms of poverty reduction, economic research has not studied in-work poverty in depth.

The “working poor” concept has become more widely known throughout the world during recent years, a primary reason being the inclusion of the *in-work at-risk-of-poverty rate* among the European Commission’s development indicators in 2003. This indicator defines the share of persons of working age living in private households who declared themselves as having a job and account for below 60 per cent of the median of national income. The in-work at-risk-of-poverty rate estimates the size of the working poor using a relative measure of poverty (the *at-risk-of-poverty threshold*), that is in comparison with the situation of the rest of the population. This last characteristic is a major factor in the definition of the working poor because the majority of the definitions of in-work poverty use absolute poverty lines for their statistical calculations, mostly in relation to developing countries. However, this is not the only issue concerning the definition and computation of the working poor and extensive literature can be found on the role concepts and definitions play when estimating the size and composition of the poor working population.

The present study uses different definitions of working poor for measuring the size of the population that both work and are poor in Chile, particularly as regards different measures of poverty (absolute and relative poverty thresholds), different components of income (labour, market and monetary incomes), different units of analysis (household and individual levels) and different reference populations. Subsequently a multivariate probabilistic model is constructed with the intention of identifying the determinants that most influence the likelihood of being working poor in a developing country context. In this model, individual, household and occupational characteristics are included. Interaction odds ratios complement the econometric analysis in order to explore more in detail some explanatory variables related to the Chilean labour market.

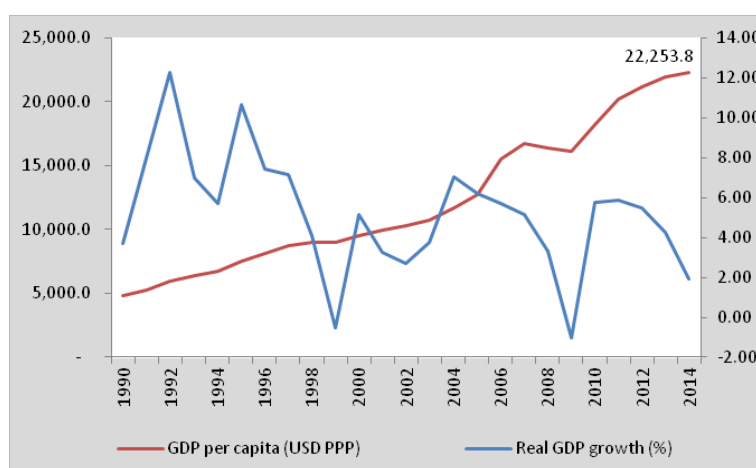
The document is organized as follows: Chapter 1 contains stylized facts (with a review of literature) on economic growth, poverty reduction and inequality in Chile during the last twenty five years. Chapter 2 presents a discussion of the difficulty of defining the concept of in-work poverty and the variations used in this study for estimating the extent of the working poor in Chile. In Chapter 3 the database is described, emphasizing the construction of worker categories and the different components of total

household income. Chapter 4 includes different estimates of the magnitude of the working poor in Chile following the definitions adopted in earlier chapters. Chapter 5 contains the findings relating to the determinants of the working poor in Chile. This chapter is divided into three sections: (i) descriptive statistics, (ii) a methodology and econometric model, and (iii) estimates. The methodology corresponds to a probabilistic model – logit type – for the likelihood of a worker being poor, conditional on a set of characteristics. The analysis of interaction odds ratios is included in this last section. Finally, Chapter 6 presents concluding observations.

Chapter 1. Stylized Facts on Growth, Poverty and Inequality in Chile

For three decades Chile has shown a solid macroeconomic performance characterized mainly by fast economic growth (Figure 1). In fact during this time Chile has been the country with the fastest growth in Latin America, achieving annual growth rates of over 7 per cent between 1989 and 1997, the period of greatest prosperity in the country (Ffrench-Davis, 2014; Palma, 2011). This growth was achieved primarily as a result of the pro-market reforms introduced by the military government in the 1980s, such as price flexibility, trade liberalization and capital account openness - all in addition to the “commodity boom” during post-Asiatic-crisis years.

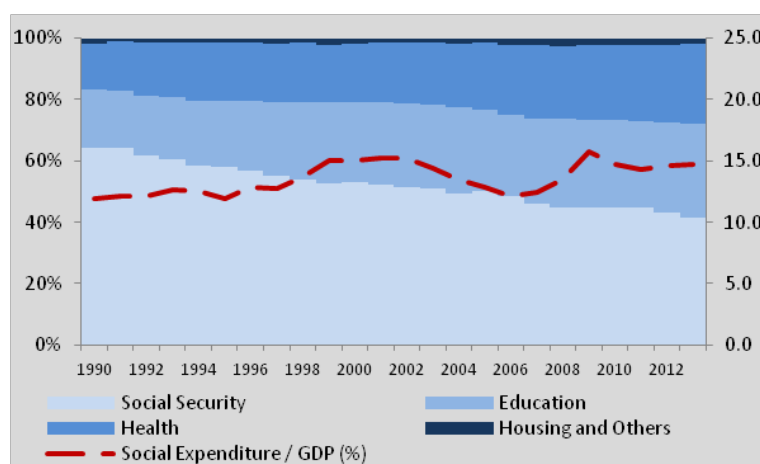
Figure 1. Real GDP growth rate and GDP per capita in Chile (1990 – 2014)



Source: Author's elaboration based on OECD Stats (OECD).

Owing to this sustained and fast growth, the absolute poverty and extreme poverty rates declined dramatically. An important factor was permanent concern for incrementing social expenditure targeted on the poorest households. Governments have led a series of social programs in order to help the poor – for example, assistance pensions; various types of subsidy; new programs in education, housing and health; and the effective anti-poverty program *Chile Solidario* (Contreras et al., 2007; Hoces de la Guardia et al., 2011). Even when Chilean economic growth dipped sharply as a result of two international crises – the Asiatic crisis (1998) and the international financial crisis (2007) – public expenditure levels in the country revealed strong growth (Figure 2), and therefore the economic cycle effects did not impair the trend in poverty reduction (Figure 3).

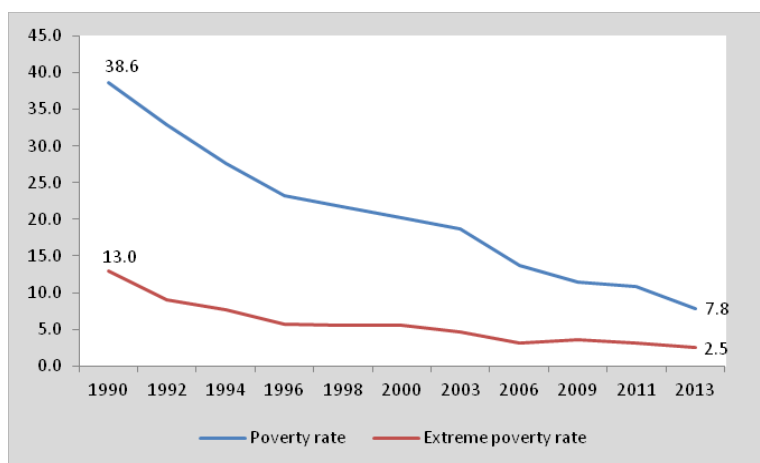
Figure 2: Social expenditure as proportion of GDP and participation by sector (1990 – 2013)



Source: Author's elaboration based on CEPALSTAT (ECLAC).

Even with real falls in GDP growth ranging from 5.2 per cent down to -1.0 per cent between 2007 and 2009, poverty rates continued to fall similarly as between 1997 and 1999. Doubtless a key component of this result was the counter-cyclical fiscal policy and the implementation of a structural balance policy (Rodríguez et al., 2007). In this sense fiscal responsibility has in general been a major determinant of the sustained poverty reduction (Ffrench-Davis, 2010).

Figure 3. Poverty and extreme poverty rates in Chile (1990 – 2013)



Source: Author's elaboration based on Observatorio Social CASEN (MDS).

In spite of the above-mentioned strong economic growth and poverty reduction, two important considerations must be highlighted: (i) the high levels of social vulnerability in the country, and (ii) the sensitivity of employment to the economic cycle. The first issue alludes to the share of that category of people who are not poor but nonetheless at severe risk of poverty. Contreras et al. (2005) find that

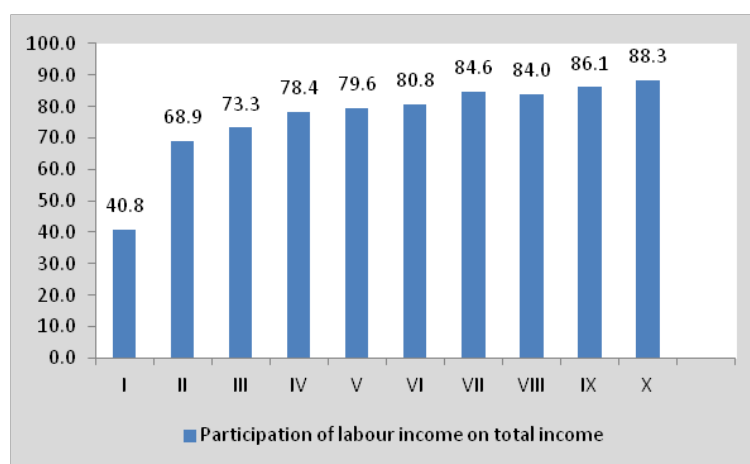
between 1996 and 2001 more than the 34 per cent of the Chilean population experienced poverty at least once, while 46 per cent of those who were poor in 2001 were non-poor in 1996. The second consideration relates to the inability of the Chilean economy to create decent jobs, particularly among the first deciles. These two points reflect the social-transfer dependency of a large proportion of the Chilean population. Although the country has had the most progressive social expenditure distribution in Latin America (ECLAC, 2006), government interventions have not led to gains in human capital for its beneficiaries, thus maintaining low labour participation, high unemployment, high dependency rates and a low share of labour market income among the poorest households (Table 1 and Figure 4).

Table 1. Participation, unemployment and labour-dependency rates by deciles in Chile (2013)

Deciles	Labour participation rate	Unemployment rate	Labour dependency rate
I	34.9	25.2	5.4
II	44.0	13.2	3.7
III	48.3	11.0	3.1
IV	52.7	7.3	2.6
V	57.0	7.6	2.4
VI	60.6	4.7	2.2
VII	64.6	3.9	1.9
VIII	66.9	3.6	1.8
IX	70.5	3.3	1.7
X	76.3	2.7	1.6
T	57.2	7.1	2.4

Source: Author's elaboration based on CASEN 2013 (MDS).

Figure 4. Proportion of labour income on total income by deciles in Chile (2013)

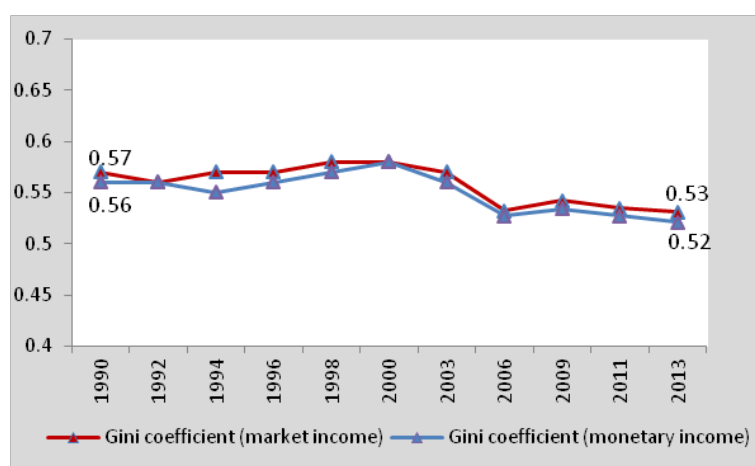


Source: Author's elaboration based on CASEN 2013 (MDS).

In this sense, López and Miller (2008) suggest that during the last decade governments have increased investment in public schools significantly, but even so spending per student in the public sector is only a fraction of the cost per student in the private sector, and this lower level of spending has been a key factor in the constraints on significant human capital expansion of the population, especially the poorest who are the most dependent on government action.

Despite the success in reducing absolute poverty during the observed period and owing to the same issues identified above – high vulnerability and dependence on social transfers, mainly –, concerns remain regarding the distribution of income in Chile. By measuring inequality through different indices, it is observed that it has not decreased significantly over more than two decades.

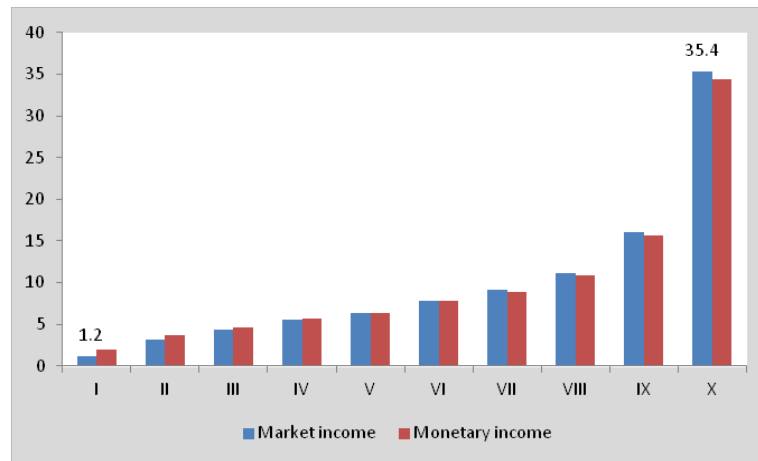
Figure 5. Gini coefficient in Chile (1990 - 2013)



Source: Author's elaboration based on Observatorio Social CASEN (MDS).

Considering the period between 1990 and 2013 there is only one clear decline in the Gini coefficient (between 2003 and 2006), which partially disappears in 2009 and then continues almost flat until the end of the period (Figure 5). Chile has one of the most unequal income distributions in the world with a Gini coefficient of 0.52, according to statistics on total income reported in the Socio-Economic Characterization Survey (Encuesta de Caracterización Socioeconómica Nacional - CASEN) for 2013. Likewise, the income held by the richest 10 per cent is slightly less than the income of the poorest 70 per cent (Figure 6). Moreover the distribution of income, as well as the inequality indicators, does not change significantly following social transfers. Social transfers and tax exemptions affect the first five deciles, which have a monetary income greater than the market income.

Figure 6. Income distribution in Chile (1990 - 2013)

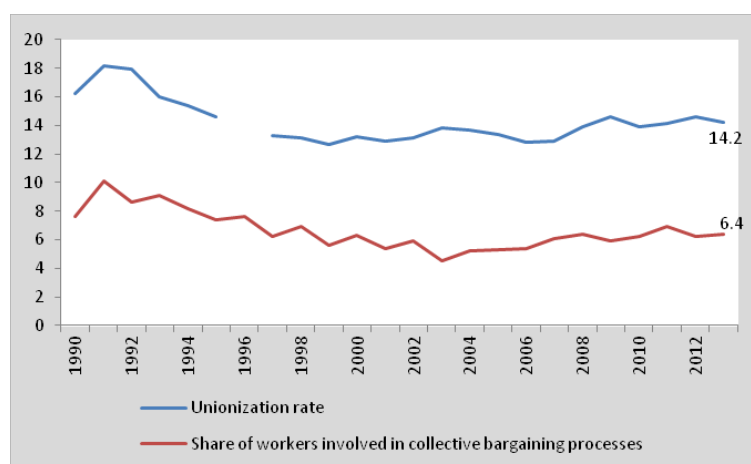


Source: Author's elaboration based on CASEN 2013 (MDS).

In addition to the macroeconomic performance, the presence of labour market institutions is also a factor affecting redistribution. In Chile the lowest historical value of the Gini coefficient – measured based on earnings – was observed in the first part of the 1970s as a result of the policies implemented during the government of Salvador Allende. In contrast, the highest point was seen in the late 1980s as result of the anti-labour reforms imposed by the dictatorship, particularly the weakening of unions and the minimum wage reforms (Ruiz-Tagle, 1998; Contreras and Ffrench-Davis, 2012). In this regard the post-dictatorship period has shown no improvements in terms of unionization and collective bargaining. According to data from the Chilean Department of Labour (*Dirección del Trabajo* – DT), the unionization rate – which includes formal private wage-earning workers and self-employed – was 16.2 per cent in 1990 and fell to 14.2 per cent in 2013, while the proportion of workers involved in collective bargaining fell from 7.6 per cent to 6.4 per cent over the same period (Figure 7).

The Labour Survey (*Encuesta Laboral* – ENCLA) 2011 shows that workers involved in collective instruments represent 13.9 per cent of employees covered by the Labour Code in 2010 (Department of Labour, 2012). ENCLA is also able to observe the situation at enterprise level, and in this regard it noted that the majority of companies (85.5 per cent) did not negotiate collectively between 2005 and 2010. Furthermore, the data shows that collective bargaining is deeply associated with the existence of a union. Thus while 88.7 per cent of firms with a union have negotiated collectively in the last five years, the proportion of firms without a union which have negotiated collectively is only one-tenth as great.

Figure 7. Unionization and collective bargaining in Chile (1990 - 2013)



Source: Author's elaboration based on *Compendio de Series Estadísticas 2013* (Department of Labour).

On the other hand the statutory minimum wage has been a permanent institution in Chilean legislation and has also shown anti-poverty impact. As outlined in Contreras and French-Davis (2012) and shown in Table 1, the minimum wage in 2009 was equivalent to 2.3 times the minimum wage in 1990 in real terms. In a workforce of 7,279,000 people, the minimum wage has the ability to cover approximately 5,114,000 workers by law (70 per cent of the total). Unlike other Latin American countries, Chile does not have high rates of informality and the coverage of formal labour contracts is higher than 85 per cent, so a high level of enforcement should be expected in terms of minimum wage law compliance.

However, the scope of the more recent labour reforms in terms of greater influence on vulnerability and inequality has been insufficient to counteract the pro-employer imbalance left by the Labour Plan of 1979 (*Plan Laboral de 1979*). The minimum wage, for example, has evolved faster than the overall average wage, concentrating much of the workforce on the minimum wage; that is to say a significant part of the workforce has not seen substantial increases in their earnings, which over the years have therefore been held at the minimum wage level. More than 60 per cent of the workers earn a salary equivalent to less than double the minimum wage and more than 13 per cent less than the minimum wage (Table 2). In addition, there is a high degree of variability between different occupations.

Using data from the CASEN 2013, a weighted average minimum wage¹ was calculated as USD 343², equivalent to 34.9 per cent of the national mean and 56.7 per cent of the national median. These values

¹ The calculation was made on the values of the differentiated minimum wage for young and old-age workers, and the relative importance of these sections of the population in employment.

² The exchange rate used is equivalent to the average exchange rate of 2013 (USD 1: CLP 495.31).

have not changed much over time, showing little improvement during the period 2000-2013 with a slight deterioration from 2010 onwards. In the words of Palma (2011):

“In sum, the combination of a ‘flexible’ labour market operating in a fast-growing economy with a progressive minimum wage generated a trend towards low unemployment and significant poverty reduction. However, it also led to a rapidly narrowing gap between the average and the minimum wage, and a scenario in which by 2003 no less than 60% of all workers were earning two minimum wages or less (i.e., less than the amount necessary at the time to cover a ‘basket of basic needs’ for an average-sized family) (...) In this way, during the 1990s the Chilean (more civilized but unwavering) neoliberal-style capitalism was able to cut poverty rates by half while ending the decade with a Gini at the same level as that left by Pinochet in 1990 (...) From the point of view of the latter, the end of the ‘Chilean miracle’ was the direct outcome of the deadly triad of undervalued labour, overvalued exchange rates and ‘sterilized’ governments”.

Table 2. Share of employment by hourly earnings as reference of the minimum wage (2013)

	<= 1 MW	<= 1.5 MW	<= 2 MW	>= 2 MW
Employer	7.9%	16.5%	25.2%	74.8%
Self- employed	30.9%	50.3%	64.6%	35.4%
Public worker	5.9%	25.8%	40.9%	59.1%
Public salary worker	4.7%	27.1%	39.4%	60.6%
Private salary worker	8.5%	45.1%	62.4%	37.6%
Domestic worker	30.4%	72.2%	87.1%	12.9%
Army and Defense	1.3%	7.6%	18.1%	81.9%
Total	13.2%	44.3%	60.4%	39.6%

Source: Author's elaboration based on CASEN 2013 (MDS).

Chapter 2. The working poor and the in-work poverty rate

While the working poor concept is very intuitive and reflects those individuals in employment yet living in poverty, other definitions such as ‘poverty’, ‘worker’ or ‘income’ are not as straightforward and depend on the context and on the final aims of their use. Hence defining the working poor is not an easy task. Indeed there is no generally accepted definition in the literature, and has never been. The consequence is that computation of the working poor rate varies according to the definitions used and is very sensitive to the assumptions made (Meulders and O’Dorchai, 2013).

The International Labour Organization (ILO) defines the working poor as the number of employed persons living in households with incomes below the nationally-defined poverty line, involving a set of assumptions as to the definition of the poverty threshold, the type of income considered, the reference population and the unit of analysis (individual or household. In the ILO definition, for example, the nationally-defined poverty line is the absolute threshold below which individuals in the population are considered poor and above which they are considered non-poor.

As regards the definition of poverty, there is a range of poverty measures, absolute poverty being lines the most used. The majority of developing countries define the poverty threshold as the *per capita* monetary requirements an individual needs to afford the purchase of a basic basket of goods and services. Chile is not an exception, and poverty is traditionally measured comparing *per capita* disposable income in the household with the cost of a basic basket at market prices. Meanwhile, an abundant and increasing number of researchers and organizations – mainly from developed countries – define poverty on the basis of relative measures, where the corresponding income threshold changes as a proportion of a statistical measure concerning income distribution, typically the mean or the median. Basically, poverty is measured by comparing the situation of the household or the individual with the situation of the rest of the population. This is the case with the new European Union indicator *in-work at-risk-of-poverty rate*, which indicates the share of persons who are at work and have an “equivalised” disposable income below the *at-risk-of-poverty threshold*, which is set at 60 per cent of the national median income (Ponthieux, 2010). The formulation of this indicator originated in debates within the European Social Protection Committee on the basis of recommendations of the *Atkinson Report* (Atkinson et al., 2002) and was adopted to assess and compare performance in the areas of employment and the fight against poverty and exclusion.

Just as with the previous definitions, the in-work at-risk-of-poverty indicator is not exempt from criticism or evaluation of its assumptions, particularly regarding the income considered and the unit of analysis. As for the type of income considered, this is another issue in the definition of the working

poor. Although it is true that most of the research and the statistical publications – including the ILO definition – use the equivalised disposable income, which is the result of adding together all the income sources in the household (labour income, capital income, social transfers, etc.), the choice of the most appropriate type of income to consider is not a closed discussion. Using total disposable income would contaminate the observed link between poverty and labour market because of the inclusion of non-labour incomes. It is known that in a developing-country context social transfers or tax exemptions are important contributory factors to escaping from poverty when they are well targeted towards lower income families (Allègre, 2008). In this regard it is recommended that only labour income sources be used for working poor computations. Indeed, when in-work poverty is computed only on the basis of incomes from work (salaries and wages, incomes from self-employment, pensions, unemployment benefits and incomes from secondary occupations excluding social transfers, and capital and property income), a better idea of the role of employment in poverty is obtained.

On the other hand, income is an individual attribute while poverty is a household characteristic. Ponthieux (2010) explores an in-work poverty approach based on individually-earned income taking into account the relationship between the chosen income and the unit of analysis. Since the working poor concept combines both individual and household dimensions (a working individual in a poor household), this two-level analysis generates some problems in terms of the conclusions obtained. For example, two people with the same income might be in different poverty situations depending on the household composition or household structure. In a poor household all members are poor, while in a non-poor household none is counted as poor (Gardiner and Millar, 2006). In other words, the working poor condition is not always the result of the individual's performance in the (labour) market and sometimes depends on the family configuration. Because of this it is necessary to take into account measures of the working poor considering the worker both as a family member sharing income (at household level) and also as a worker in his or her own right (i.e. at the individual level).

This paper will consider the discussion of the different measures of the working poor. In this regard, Chapter 4 presents comparative calculations taking into account: (i) absolute *versus* relative poverty thresholds, (ii) different income sources and (iii) household *versus* individual levels of analysis.

Chapter 3. Data Description

The data used in this research draws on the Socio-Economic Characterization Survey (*Encuesta de Caracterización Socioeconómica Nacional* – CASEN) of 2013, which is a cross-sectional household survey designed and conducted by the Ministry of Social Development of Chile (*Ministerio de Desarrollo Social* – MDS) since 1985 at intervals of 2-3 years. The CASEN survey has national coverage in both urban and rural areas. Its focus is on households in private dwellings and the individuals who comprise those households. This survey has been the main instrument for assessing the living conditions of the Chilean population, especially of those households in poverty and those groups considered as priority targets for social policy.

The CASEN survey of 2013, as well as its predecessors, has been designed as a tool for diagnosis, evaluation and targeting of social policy. The survey records the total set of incomes and revenues used for constructing indicators for population welfare such as poverty lines, distributional percentiles, inequality indices, and so forth. In addition, since it is a multi-purpose survey, CASEN also includes modules with questions regarding participation in social programmes, education, health, housing and employment.

The recorded incomes in the survey relate to: (i) labour income, which includes all earnings from work such as salaries and wages, monetary and in-kind, earnings from self-employment, self-provision of goods produced by the household, pensions and unemployment benefits; (ii) market income, that is to say the aggregate of labour income, capital income, profits from ownership of assets and remittances; and (iii) monetary income, which is the sum of market income and the monetary subsidies received by all household members, excluding domestic service. All these measures of income are available at individual and household levels.

As regards identification of individuals on the labour market, the survey defines employment status through three questions relating to tenure of employment, availability for work and active job searching. CASEN defines as employed people those individuals over 14 years old who worked at least one hour during the reference week in a productive activity – excluding household activities – in exchange for in-cash or in-kind remuneration, or who worked on a casual or occasional activity, or who were temporarily absent from work during the same reference period. In addressing a solid definition of worker, this study imposes one additional restriction on the in-work concept: labour activities must be the main activities of the individual. In this regard, for example, students who work are included only if they have worked at least 30 hours during the week of reference and do not report for a full school day.

In the 2013 version of CASEN, the survey sample consisted of 66.725 households, equivalent to 218.491 individuals, with good national and regional representativeness. For the purposes of this particular research domestic service is considered as a separate household category.

Chapter 4. Size of the Working Poor in Chile: Different Definitions, Different Estimates

From an absolute to a relative poverty threshold

As mentioned in previous sections, although absolute poverty lines are the most frequent instruments for measuring poverty, nowadays relative measures such as the more recently introduced at-risk-of-poverty threshold are being increasingly used. Hence the first exercise is to observe the impact on the size of the working poor by changing the poverty threshold from an absolute to a relative line.

Using data from CASEN 2013, the size of the working poor is calculated based on monetary (total) per capita income in the household, that is by considering all sources of income and a household-level analysis. Workers are defined as people aged 15 and above who were holding a job as their main occupation during the week of reference. Accordingly, four different reference populations are considered: (i) total population; (ii) working age population; (iii) poor population, which also depends on the chosen poverty threshold; and (iv) in-work population.

Table 3. Size of the working poor using total income and a household-level analysis

	Working poor (WP)	In-work poverty rate	Share of WP among working age population	Share of WP among poor population	Share of WP among in-work population
National Poverty Line	460,984	2.67%	3.37%	20.78%	6.48%
At-risk-of-poverty threshold	962,603	5.57%	7.04%	23.68%	13.54%

Source: Author's elaboration based on data from CASEN 2013 (MDS).

Table 3 shows that by changing the type of poverty threshold, the number of working poor increases. Indeed, both the number and the percentage of individuals at work living in poor households are larger if a relative poverty measure is used. Working poor population increases by more than double and the in-work poverty rate rises from 2.67 to 5.57 per cent. Similarly, Table 3 shows that even when general poverty increases (poor population), the share of working poor among the poor grows, and that almost a quarter of the poor population has a job.

Tables 4 and 5 present the estimates of the working poor when considering three different sources of income: (i) monetary income – total disposable income; (ii) market income – monetary income less social transfers; and (iii) labour income – monetary income less non-labour income.³ For all the specifications a household-level analysis is used. Likewise, Table 4 considers the absolute poverty line and Table 5 considers the at-risk-at-poverty threshold.

Table 4. Size of the working poor using the national poverty line and a household-level analysis

	Working poor (WP)	In-work poverty rate	Share of WP among working age population	Share of WP among poor population	Share of WP among in-work population
Monetary income	460,984	2.67%	3.37%	20.78%	6.48%
Market income	634,145	3.67%	4.64%	28.58%	8.92%
Labour income	838,075	4.85%	6.13%	37.77%	11.79%

Source: Author's elaboration based on data from CASEN 2013 (MDS).

Given that market income is lower than monetary income, Table 4 shows that there is a substantial growth in the size of the working poor whenever market income is used, proving that social transfers are an important weapon against absolute poverty. In this case the in-work poverty rate decreases by one percentage point with the inclusion of social transfers. On the other hand, labour-income-related figures show the real potential of participation in the labour market in overcoming poverty. In this regard, it is possible to obtain a more appropriate idea of the role of employment on poverty while only considering labour market earnings. Table 4 reveals that 4.85 per cent of the population would be working poor if they only depended on their jobs. The difference between this result and the situation after social transfers is more than two percentage points in the in-work poverty rate. Similarly, and according to this calculation, 11.79 per cent of workers live below the national poverty line.

³ See Chapter 3 for more details.

Table 5. Size of the working poor using the at-risk-of-poverty threshold and a household-level analysis

	Working poor (WP)	In-work poverty rate	Share of WP among working age population	Share of WP among poor population	Share of WP among in-work population
Monetary income	962,603	5.57%	7.04%	23.68%	13.54%
Market income	1,158,678	6.71%	8.48%	28.50%	16.29%
Labour income	1,419,807	8.22%	10.39%	34.92%	19.97%

Source: Author's elaboration based on data from CASEN 2013 (MDS).

Furthermore, Table 5 presents the same exercise, though using the at-risk-of-poverty threshold. In this way the working poor vary between 5.6 and 8.2 per cent of the whole population depending on the income considered. A noteworthy result is that the share of people with earnings from labour below 60 per cent of the national median corresponds to almost one-fifth of the in-work population and more than one-third of the poor population.

Therefore, what emerges from the analysis of Tables 4 and 5 is that employment does not always protect from poverty.

An individual-level analysis

As discussed previously, given that the condition of the working poor does not always depend on individual performance in the labour market and that it is also determined by family composition, Table 6 shows the effects of moving from a household-level analysis (household disposable income per capita) to an individual-level analysis (individually earned income) using absolute and relative poverty thresholds as well as the different income sources. As usual, figures are presented using four different reference populations.

The in-work poverty rate is estimated as between 1.74 and 3.13 per cent depending on the different definitions, showing the sensitivity of the working poor category to definitions of income and poverty thresholds. This table (Table 6) presents the lowest values of in-work poverty in the chapter, which is to be expected given that a fully-individualized approach is used. In other words, in this model workers do not share their income with the rest of household members. In this regard, the total population loses economic intuition and the other models provide better conclusions. Looking at the share of poor workers in total employment, it is observed that people with individual earnings below the poverty threshold represent between 4.23 and 7.59 per cent of the in-work population.

Table 6. Size of the working poor using an individual-level analysis

	Working poor (WP)	In-work poverty rate	Share of WP among working age population	Share of WP among poor population	Share of WP among in-work population
National poverty line					
Monetary income	300,501	1.74%	2.20%	7.39%	4.23%
Market income	353,087	2.04%	2.58%	8.68%	4.97%
Labour income	421,336	2.44%	3.08%	10.36%	5.92%
At-risk-of-poverty threshold					
Monetary income	401,698	2.33%	2.94%	9.88%	5.65%
Market income	465,327	2.69%	3.40%	11.45%	6.54%
Labour income	540,075	3.13%	3.95%	13.28%	7.59%

Source: Author's elaboration based on data from CASEN 2013.

Chapter 5. Microeconomic Determinants Of The Working Poor In Chile

5.1 Descriptive Statistics

Table 7 summarizes the descriptive statistics of the sample used for this research from the CASEN 2013 dataset.

Table 7. Descriptive statistics of the sample

	In-work population		Working poor population	
	Mean	Std. Deviation	Mean	Std. Deviation
Female	0.40	0.49	0.39	0.49
Age	42.22	13.56	38.49	12.45
Years of education	11.13	3.88	9.23	3.40
Metropolitan	0.19	0.39	0.12	0.33
North	0.21	0.41	0.16	0.37
Center	0.17	0.38	0.17	0.37
South	0.44	0.50	0.55	0.50
Household members	3.89	1.74	4.54	1.83
Head of household	0.51	0.50	0.62	0.48
Partner	0.19	0.39	0.15	0.36
Monoparental household	0.30	0.46	0.31	0.46
Pensioners	0.18	0.38	0.09	0.29
Labour dependency rate	2.22	1.15	3.31	1.43
Income per capita	256,595	349,012	62,242	18,657
(Median)	134,114	-	-	-
Market income per capita	251,775	355,225	55,303	20,717
(Median)	126,000	-	-	-
Labour income per capita	236,019	337,362	50,860	21,585
(Median)	106,767	-	-	-
Low-paid	0.19	0.39	0.46	0.50
Seniority	7.62	10.17	6.77	9.88
Registered worker	0.74	0.44	0.53	0.50
Part-time worker	0.12	0.33	0.21	0.41
Small-scale firm	0.49	0.50	0.64	0.48
Medium-scale firm	0.22	0.42	0.18	0.39
Large-scale firm	0.29	0.45	0.18	0.38
Agriculture	0.14	0.35	0.25	0.43
Production, mining and construction	0.25	0.43	0.25	0.43
Wholesale. Retail and commerce	0.35	0.48	0.38	0.49
Business services and finance	0.06	0.24	0.03	0.17
Social services, health and education	0.15	0.36	0.08	0.27
Public administration	0.04	0.20	0.02	0.15

Source: Author's elaboration based on CASEN 2013 (MDS).

The table compares the average and standard deviation of relevant variables for the in-work population and the working poor population. Besides the variables that reflect *per capita* incomes, the main

differences are found in terms of years of education, household composition, job quality and economic sectors. In this regard, the incidence of the working poor is concentrated among workers with low levels of education; members of large families with a low employment rate; the low-paid; non-registered workers; and workers with part-time jobs, in small-scale firms, or in less technical sectors such as agriculture and commerce.⁴

5.2 Methodology and Econometric Model

A probabilistic model, logit type, has been compiled in order to identify the factors which affect the likelihood of a worker being poor, conditional on a set of characteristics. The econometric model is calculated using data from CASEN 2013 and the analysis is undertaken using a binary dependent variable which takes a value of 1 if the individual (in-work) belongs to a poor household and a value of 0 otherwise, with controlling for various explanatory variables. The situation of the poor is distinguished from the situation of the non-poor using the at-risk-of-poverty threshold.

$Y=1$ if the individual is working poor

$Y=0$ if the individual is not working poor

The probability of being working poor depends on a set of explanatory variables X . Given that:

$$Pr[Y=1] = F(X, \beta)$$

$$Pr[Y=0] = 1 - F(X, \beta)$$

then the probability model is the following regression:

$$E[Y | X] = F(X, \beta)$$

X represents the set of explanatory variables included in the regressions. Four main groups of variables have been chosen based on a theoretical model based upon: (i) personal characteristics of the individual, (ii) household characteristics, (iii) characteristics of the individual's occupation, and (iv) characteristics of the firm.

The theoretical model starts from the assumption that workers apply for employment vacancies (at market-determined wages⁵) depending on the match between their own characteristics and the job profiles of the vacancies. The characteristics can vary from skills and competences to discriminatory signals. In general job seekers do not apply for jobs for which they are over-qualified or under-

⁴ Owing to gaps in the data, inclusion of other interesting variables such as labour experience, training, under-employment, subcontracting, discriminatory signals, etc., could not be achieved.

⁵ This point is important as employers do not negotiate salaries depending on household characteristics or the family needs of the individual.

qualified, and they try to look for the best job opportunities in the market matching their attributes. These characteristics thus represent the constraints the individual faces in the labour market (age, education, labour experience, number of hours available for work, etc.). Similarly, employers look for people with different skills and competences in order to fill the required positions with the best candidates available, and set wages according to the position profile.

Note that the empirical model is based on a household-level model in which the condition of poverty affects the whole family group while the working poor condition affects only those household members who participate in the labour market (in-work). The poverty condition is given by total *per capita* income in the household compared to the at-risk-of-poverty threshold set at 60 per cent of the median *per capita* income of the total population.

The above-mentioned model is based on the premise that the probability of being a working paper or not is affected not only by labour market conditions but also by household conditions or family composition. In these respects the following explanatory variables are included: (i) age, (ii) gender, (iii) years of education, (iv) headship of household, (v) labour dependency rate in the household, (vi) presence of pensioners in the household, (vii) low pay⁶, (viii) seniority, (ix) formal/informal employment, (x) labour supply, (xi) skill level of the occupation, (xii) scale of the firm, and (xiii) economic sector. Theoretical expectations are summarized in Table 8.

Table 8. Expected signs in the econometric model for the determinants of the working poor

Variable	Expected sign
Female	-
Age	-
Years of education	-
Female head of household	+
Labour dependency rate	+
Presence of pensioners	-
Low-paid worker	+
Seniority	-
Registered worker	-
Part-time worker	+
Low-skilled occupation	+
Medium-skilled occupation	+
Small-scale firm	+
Medium-scale firm	+
Production, mining and construction	-
Wholesale. Retail and commerce	-
Business services and finance	-
Social services, health and education	-
Public administration	-

Source: Author's elaboration.

⁶ Defined as hourly labour incomes below two-thirds of the national median.

5.3 Estimates

Table 8 shows the results of the econometric estimates for the determinants of the working poor in Chile. These estimates are conducted using a dichotomous dependent variable model (logit type), which explains the factors that affect the likelihood of belonging to the working poor category. The general model (n° 5) presents a broad profile of Chilean in-work poverty, which includes all the above-mentioned explanatory variables. The reason why the results are presented in this “accumulative” way is in order to check if there are changes in the statistical significance of the different variables across the models. In general, all the variables included are statistically significant and impact directions (signs) coincide with the expectations mentioned in the previous section (Table 7), showing great microeconomic intuition.

Table 9. Determinants of the working poor in Chile (logit estimation)

	(1)	(2)	(3)	(4)	(5)
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
Individual Characteristics					
Age	-0.026*** (0.006)	-0.026*** (0.006)	-0.026*** (0.006)	-0.026*** (0.006)	0.001 (0.006)
Age squared	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.000*** (0.000)
Female	-0.283*** (0.032)	-0.288*** (0.035)	-0.293*** (0.035)	-0.260*** (0.037)	-0.156*** (0.037)
Years of education	-0.163*** (0.004)	-0.161*** (0.004)	-0.128*** (0.004)	-0.119*** (0.004)	-0.115*** (0.004)
Household Characteristics					
Female head of household	0.633*** (0.039)	0.605*** (0.041)	0.593*** (0.042)	0.609*** (0.042)	0.442*** (0.042)
Labour dependency rate	1.089*** (0.011)	1.097*** (0.012)	1.104*** (0.012)	1.110*** (0.013)	1.175*** (0.013)
Presence of pensioners					-1.434*** (0.046)
Occupation Characteristics					
Low-paid worker	1.924*** (0.028)	1.928*** (0.030)	1.905*** (0.030)	1.889*** (0.030)	1.965*** (0.031)
Seniority	-0.005*** (0.001)	-0.005*** (0.002)	-0.002 (0.002)	-0.004*** (0.002)	-0.006*** (0.002)
Registered worker	-0.504*** (0.028)	-0.430*** (0.032)	-0.393*** (0.032)	-0.358*** (0.033)	-0.387*** (0.033)
Part-time	0.876*** (0.034)	0.905*** (0.037)	0.895*** (0.037)	0.916*** (0.037)	0.957*** (0.038)
Low-skilled occupation			1.206*** (0.059)	1.166*** (0.060)	1.202*** (0.061)
Medium-skilled occupation			0.894*** (0.054)	0.883*** (0.055)	0.900*** (0.056)
Firm Characteristics					
Small-scale firm		0.289*** (0.037)	0.328*** (0.038)	0.358*** (0.038)	0.351*** (0.039)
Medium-scale firm		0.272*** (0.041)	0.287*** (0.041)	0.275*** (0.042)	0.280*** (0.042)
Production, mining and construction				-0.361*** (0.040)	-0.377*** (0.041)
Wholesale, retail and commerce				-0.358*** (0.038)	-0.344*** (0.039)
Business services and finance				-0.624*** (0.081)	-0.605*** (0.081)
Social services				-0.277*** (0.058)	-0.244*** (0.058)
Public administration				-0.428*** (0.088)	-0.428*** (0.090)
Constant	-3.030*** (0.123)	-3.301*** (0.135)	-4.635*** (0.152)	-4.492*** (0.153)	-4.210*** (0.153)
Observations	81,810	71,077	71,077	70,853	70,853
Adjusted R-squared	0.346	0.351	0.359	0.361	0.381

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Source: Author's elaboration based on CASEN 2013 (MDS).

Individual characteristics

According to the estimates, the likelihood of being working poor does not merely decrease with age, but workers are also less and less likely to be working poor as they age. In this respect the results are coincident with the descriptive statistics for Chile, which show a lower average for the age of the working poor. In addition, the estimates are in line with recent findings, which suggest that young workers are more vulnerable to working poverty, even though this group traditionally does not make the main contribution to the household income (Hellier and Kalugina, 2015).

In the case of women, the estimates show that they are significantly less likely to be poor than men if they are not heads of household. The explanation for this interesting result arises from the design of the model. Measuring in-work poverty at household level is based on the supposition that income earners share with the remaining household members, thus hiding poverty within the household, especially among women who are more likely to be low-paid (Montenegro and Paredes, 1999; Bravo et al., 2008). Furthermore, if women are less likely to have adequate income than men, it is probably also less likely that women will work. Conversely, when women are heads of household (i.e. the main contributor to the household income), whether to work or not is not a decision, and traditional factors such as low education levels, higher prevalence of part-time work or gender discrimination, become evident in working poverty. This result confirms the so-called *gender paradox* (Hellier and Kalugina, 2015), which states that the outcome according to which “women are less likely to be working poor than men” only applies to household-level analysis.⁷

As one would expect, more educated workers are significantly less likely to be working poor. The likelihood of being working poor declines with as the number of years of formal education increases, in the same way as age does. Human capital theory (Becker, 1975; Mincer, 1981) states that human capital consists of any characteristics of workers which contribute to their productivity. Given that (i) age – seen as labour experience – and (ii) years of formal education – seen as certifiable knowledge – are associated with higher skills and productivity, they are considered as falling within those characteristics. The costs of acquiring those skills are usually compensated for in the labour market because they increase firms’ profits; therefore individuals make investments in human capital in order to obtain these rewards. Education is the most easily observable component of human capital investment, and it is for that reason that governments take measures to provide basic (even mandatory) public education in order to increase human capital – or set a minimum desirable stock of knowledge – thereby making it possible for the poor population to take advantage of it and to escape from poverty. The model

⁷ See for instance Meulders and O’Dorchai (2013), who calculates in-work poverty rates separately for women and men using analysis at household and individual level.

obviously cannot capture the effects of education differences on inequality, but there is nonetheless conclusive recent literature on how education drives inequality.

Household characteristics

The labour dependency rate and the presence of pensioners in the household are two sides of the same coin in the model. This research has stressed the point that in-work poverty is not always the result of individual performance on the labour market, but family composition is also an important determinant of the working poor. It is well known that the poverty rate is the number of poor individuals as a ratio of the total population and, if the poverty condition is calculated at household level, an individual is poor if he or she lives in a poor household. At the same time, all the members of a poor household are poor. The assumption used here is that there is complete income pooling within the household.⁸ With the aim of addressing this point, the labour dependency rate variable is included. It measures the ratio within the household of members who do not work to those who do work, that is the number of non-workers *vis-à-vis* the number of workers. The estimates of dependency rate effects on in-work poverty show, intuitively, that individuals who belong to households with larger proportions of workers are significantly less likely to be working poor.

On the other hand there is a special category of household members who, not being workers, are income recipients, namely the pensioners. The presence of pensioners in the household shows a negative and significant impact on the likelihood of being working poor, thus providing evidence of the importance of pensions – replacement wages– in the living standard of the population. The inclusion of this variable is a clear innovation in the working poor literature.

Occupation characteristics

In the occupation area, all models contain four variables which represent four traditional characteristics of job quality: (i) level of salaries, (ii) seniority in the same job (years), (iii) participation in the formal or informal sector, and (iv) working hours per week (as proxy of labour supply). The first variable was included as a dummy variable taking the value of 1 if the individual is low-paid and 0 otherwise. All models confirm the expectation that being low-paid increases the likelihood of in-work poverty. Even when the relationship between low-paid and in-work poverty looks tautological or redundant, there is evidence of a predictable relationship between low pay and working poor, and – even more so – less

⁸ Usually, individuals living in the same household share their resources, but this is a simplification of reality and illustrates a limit in the concept of intra-household inequality (Ward-Batts 2008; Amuedo-Dorantes et al., 2010).

incidence of working poor among low-paid workers in industrial countries (Nolan and Marx, 2000; Gardiner and Millar, 2006; Marx and Nolan, 2012). In the case of Chile the descriptive statistics provided suggest the existence of a great overlap between low-paid workers and in-work poverty, and the estimates support conclusions according to which low pay is a risk factor in being classified as a poor worker.

Given that the database of CASEN 2013 does not contain variables to capture the labour experience of individuals, the seniority variable was created, representing the number of years during which the individual is working in the same job. The variable is a proxy for job quality in terms of long-term stability. Using the same interpretation of working experience, longer seniority implies lower likelihood of being working poor in every model. Similarly labour formality also implies a reduction in the likelihood of being working poor in comparison with situations where informal labour relations apply. Outcomes reveal that part-time workers are significantly more likely to be working poor than full-time workers, supporting research related to the effect of the recent economic crisis and proliferation of part-time jobs on the numbers of working poor in Europe (Horemans and Marx, 2013). Controlling by quality of jobs and level of hourly income, the labour supply of individuals is a significant determinant of in-work poverty.⁹

With the double aim of testing the effect of job qualification and education credentials (human capital signals), the binary variables low-skilled, medium-skilled and high-skilled were created. Models 3, 4 and 5 contain these variables that represent levels of the skills required for specific jobs. These levels are constructed based on the International Standard Classification of Occupations (ISCO) and are proxy variables for the level of complexity of the work performed. Three main results arise from the econometric estimation: (i) the statistical significance of the variables is high and the sign of the coefficients show that inclusion of both the low-skilled and medium-skilled variables increases the likelihood of being working poor in comparison with workers in high-skilled occupations, in line with human capital theory; (ii) workers in low-skilled occupations are more likely to be working poor than workers in medium-skilled occupations, showing transitivity through the marginal effects; and (iii) across the different models there is no loss of significance in the variables relating to education when these variables are included. The latter finding is interesting because it might suggest that the significant effects of educational variables are not related to the effects of productivity variables on the likelihood of being working poor. From this one might infer that education in the Chilean labour market has significant signalling effects.

⁹ Owing to problems in the level of response of some questions in the survey, information on underemployment and involuntary part-time work could not be used.

Firm characteristics

The models show that the likelihood of being working poor decreases significantly among individuals working in large-scale firms. Basically, workers of small- and medium-sized companies are more likely to be working poor in comparison with workers in large companies. As in the case of occupations by skill level, the estimates are transitive for the three categories. These results are associated with traditional features of large firms, which are more productive, have higher levels of profits, and have relatively low labour costs. A similar situation occurs with economic sectors. First, according to the model workers in every sector are less likely to be working poor if the primary sector (agriculture, fishing and forestry) is the reference category. And second, workers from business services and finance, manufacturing, mining, construction and public administration present the largest (negative) marginal effects. The explanation may be that business services and finance are more technical service sectors while manufacturing, mining and construction are high-fixed-cost and capital-intensive sectors, while commerce and social services are less technical service sectors (Gleicher and Stevans, 2005). The case of public administration may be explained by the fact that, in general, variance in wages is lower than in other sectors and job quality standards are better.

The relationship between firm characteristics and the working poor can be seen as “aversion” to working poverty. Companies, depending on their characteristics (mainly related to productivity), are more or less “averse” to in-work poverty, not in the form of discrimination, but in line with human capital and efficiency wage theory (Shapiro and Stiglitz, 1984). The argument is that companies paying workers “non-poverty wages” may be led to setting minimum productivity levels for workers. If workers receive relatively higher wages, they feel more committed to the firm’s performance and are also more afraid of being unemployed.

Interaction odds ratios: Quality of jobs and economic sector

In order to investigate whether the risk factors of the working poor present consistency across the different economic sectors, separate logistic models for subsamples of low-paid *versus* non low-paid workers, registered *versus* non-registered workers and part-time *versus* full-time workers are calculated, controlling for individual, household and occupational characteristics. In general the analysis of interaction odds ratios shows “transparency” in the economic sectors in respect of the determinants of the working poor in relation to job quality. With few exceptions, the above conclusions on the positive and significant effects of low-paid workers, non-registered workers and part-time workers on the likelihood of being working poor apply to every economic sector.

Table 9. Estimates of risk factors to become working poor by economic sectors (odds ratios)

	Low-paid worker		Registered worker		Part-time worker	
	No	Yes	No	Yes	No	Yes
Agriculture, fishing and forestry	REF	REF	REF	REF	REF	REF
Production, mining and construction	0.66	0.63	0.54	0.66	0.74	0.49
Wholesale, retail and commerce	0.57	0.64	0.53	0.67	0.76	0.49
Business services and finance	0.48	0.26	0.28	0.24	0.28	0.20
Social services	0.45	0.30	0.29	0.42	0.26	0.23
Public administration	0.79	0.29	0.37	0.51	0.59	0.25
Constant	0.91	0.21	0.26	0.55	0.55	0.35

Source: Author's elaboration based on CASEN 2013 (MDS).

Interaction odds ratios: Skill-levels of occupations and economic sector

Accordingly the same analysis holds for levels of skill in the occupation. In general, workers in occupations which require high skills (mainly managerial and professional) are less likely to be poor compared with workers in low- and medium-skilled occupations. Some interesting findings are related to the level of likelihood of being working poor in high-skilled occupations in the wholesale, retail and commerce sectors, and the fact that for low- and medium-level occupations the largest “aversion” to the working poor is concentrated in business services and finance, while for high-skilled occupations it is concentrated in public administration.

Table 10. Interaction of skill-levels by economic sectors (odds ratios)

	Skill-level occupation		
	Low	Medium	High
Agriculture, fishing and forestry	REF	REF	REF
Production, mining and construction	0.70	0.54	0.39
Wholesale, retail and commerce	0.76	0.53	1.23
Business services and finance	0.50	0.23	0.30
Social services	0.61	0.38	0.33
Public administration	0.71	0.32	0.20
Constant	0.43	0.37	0.08

Source: Author's elaboration based on CASEN 2013 (MDS).

Conclusions

Defining in-work poverty is not an easy task. Even when the concept is straightforward in terms of describing those workers living in poverty, definition of workers and poverty are diverse in the economic literature, and computations of in-work poverty rates thus became difficult to compare. Unlike existing research on working poor in developing countries, this paper estimates the size of the working poor and studies its determinants in Chile using a relative poverty line derived from the currently widely-used development indicators of the European Commission, namely the at-risk-of-poverty threshold.

Using data from the Chilean household survey (CASEN) for 2013, the in-work poverty rate in the country rises from 2.67 to 5.57 per cent when the measure of poverty is changed from the national poverty line to the at-risk-of-poverty threshold. Other aspects of definitions in the calculation of the poverty rate were also challenged, such as the sources of income and reference populations considered. In this regard a noteworthy outcome of the calculations is that the share of people with earnings from labour below 60 per cent of the national median is almost one-fifth of the in-work population and more than one-third of the poor population.

On the other hand, results from the econometric calculations (logit and logistic models) suggest that, in general, the risk factors found in the descriptive statistics are important determinants of in-work poverty. Using controls from different dimensions (individual, family, occupation and firm), the estimates show high significance and intuitive effects on the likelihood of being working poor of the following variables: gender differences (men and female head of household); education differences; labour participation in the household; presence of non-working income recipients (pensioners); measures of job quality; skill requirements by occupations; firm scale; and economic sectors. The most attractive findings are the following: (i) females have less likelihood of being working poor only if they are not heads of household; (ii) the likelihood of being poor decreases with age - and that in the case of Chile young people have a higher risk of being working poor; (iii) pensioners in the household bring down the likelihood of being working poor, showing the relevance of pension systems and, hence, of labour participation with pension coverage; and (iv) low-paid workers, non-registered workers and part-time workers are more likely to be working poor across all the productive sectors in the Chilean economy, implying that, even when household characteristics are important, creation of decent jobs is a strong weapon against in-work poverty.

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