



ECONOMIC GROWTH AND THE CHILEAN LABOR MARKET*

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I. INTRODUCTION

The number of employed individuals and the quality of their jobs are crucial determinants of the income of a household. Some studies empirically support that changes in the unemployment rate are related to significant reductions in the fraction of the population that are officially poor (Blank and Blinder, 1987; Cutler and Katz, 1991; Blank and Card, 1993; Haveman and Schwabish, 2000; Romer, 2000; Blank, 1996 and 2000). Thus, the quantity and quality of jobs that are available in an economy constitute a powerful weapon in the fight against poverty. This evidence makes the quest for preserving a dynamic labor market a policy-relevant issue. But, how can the economic authority reactivate a sluggish labor market? This article presents descriptive evidence for the Chilean economy that highlights economic growth as a powerful instrument to nourish the economy with more and better jobs.

We start by studying Chile's economic performance during the past four decades. The evidence shows a fluctuating economy that exhibits seven relatively well-delimited periods of economic growth: a Golden era (1986-1997), the Asian crisis years (1998-1999), the weak cyclical recovery after the Asian crisis (2000-2003), the strong cyclical recovery that followed the latter (2004-2008), the Global Financial crisis year (2009), the strong path of economic growth of the period 2010-2013, and the recent economic slowdown (2014-2017). These seven periods frame the comparison that we will perform between the labor market dynamics and economic growth in the next sections.

Then, we analyze how the aggregate unemployment rate and job creation¹ behaves across the seven periods of economic growth that we have delimited for our analysis. We show that the aggregate unemployment rate and job creation exhibit a marked synchrony with economic growth. Specifically, the unemployment rate sharply falls in periods of strong economic growth, but exhibits an opposite behavior during recessions or economic slowdowns. Similarly, economic growth accelerates job creation, whereas recessions destroy jobs. We observe that the synchrony between economic growth and the unemployment rate is also observed for men, women, and young workers.

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1 More precisely, we analyze net job creation. Hereafter, for simplicity, we just refer to it as job creation.

However, we document that the response of youth unemployment seems to be more sensitive to the fluctuations of economic growth than those of the other groups.

Once we have analyzed the dynamics of the unemployment rate and job creation, we turn the analysis to job quality. First, we document differences in the earnings and level of precariousness exhibited in two occupational categories: dependent employment and self-employment. Concretely, self-employment exhibits lower earnings and higher levels of precariousness than dependent employment. Then, we show how, on the one hand, the participation of dependent employment created in the private sector and, on the other hand, self-employment, exhibit dissimilar behaviors across the different periods of economic growth that we have defined. We document that strong economic growth increases the participation of private dependent employment in total employment but reduces the participation of self-employment. In recessions or periods of economic slowdown, the opposite pattern is observed. We also show how public sector employment rises during recessions, possibly being part of counter-cyclical policies.

We also study female labor force participation, which is a topic that has received a lot of attention in the literature and policy debate in recent years. We show that, beyond the cyclical fluctuations of GDP, long-term economic growth has steadily increased female labor force participation. We provide a tentative explanation to understand this latter phenomenon.

The contribution of this paper is not to present exhaustive causal evidence on the effects of growth on labor market dynamics, but to document descriptive evidence that could illuminate more formal studies and an informed policy debate regarding the role of economic growth as an active labor market policy.

The rest of the paper is organized as follows. Section II describes the performance of the Chilean economy over the past four decades. Section III analyzes aggregate trends of the unemployment rate and job creation. Section IV turns the analysis to job quality. Section V studies female labor force participation. Finally, Section VI concludes.

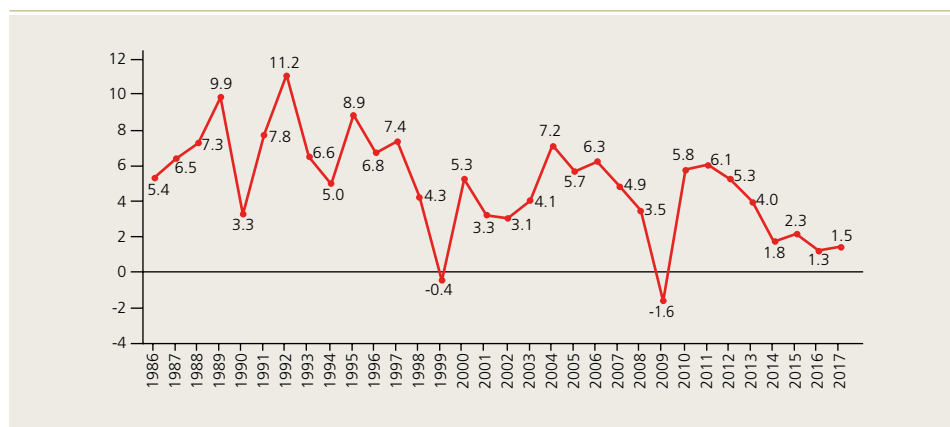
I. THE PERFORMANCE OF THE CHILEAN ECONOMY DURING THE PAST FOUR DECADES

This section describes the performance of the Chilean economy during the past four decades. Specifically, we analyze the dynamics followed by the real GDP growth during the period spanning from 1986 to 2017. Our goal is to delimit different sub-periods in which the performance of the economy was markedly different. After defining the windows for our analysis, we compare in the next sections the labor market dynamics within each of the sub-periods of economic growth that we have identified.

Figure 1

Real GDP growth

(percent)



Source: Central Bank of Chile.

We start by presenting evidence on the noticeable differences in the economic growth rate observed across relatively well-defined sub-periods. This variation of growth across periods provides us with the heterogeneity required to assess the relationship between economic growth and labor market performance. In order to define the specific year in which each of these sub-periods starts/ends, we rely on the timing of specific economic events that impacted the Chilean economy. The latter criterion also facilitates the discussion carried out in this article by providing us with a concrete reference with which to allude to each of the sub-periods that we analyze.

Figure 1 exhibits annual real GDP growth over the 1986-2017 period. Observe first the period 1986-1997, where Chile's economic performance was outstanding. These years mark the so-called Golden period, in which the average annual real GDP growth was 7.2%. Only in one year of that decade did the rate of economic growth fall below 5%. The outstanding macroeconomic performance of Chile during the Golden period has been mainly related to the market-oriented structural reforms implemented in the early 1980s, as discussed by Bosworth et al. (1994), Corbo et al. (1997), Perry and Leipziger (1999), Solimano (1999), and Gallego and Loayza (2002), among others.

The Golden period was, however, halted by the upheavals of the Asian crisis in the middle of 1997. The Asian crisis triggered a sharp cyclical contraction of economic growth in Chile during 1998-1999, with an average rate of 2%. The literature highlights two main channels through which the effects of the Asian crisis spread throughout the economy. First, a trade channel through a fall in Chilean exports (Ffrench-Davis, 2002) as a consequence of the reduced demand for Latin American exports by the Asian countries (Stallings, 1998). Second, a credit channel, which explains why the crisis particularly affected the industries that were more dependent on external funds (Braun and Larraín, 2005). The Asian crisis period delimits our second period of analysis.

The recession of the Chilean economy in 1999 in the aftermath of the Asian crisis was followed by a slow cyclical recovery in 2000-2003, with average growth at 4%, and a strong recovery toward full employment in 2004-2008, with average growth at 5.5%. However, in 2009, the Chilean economy fell into a recession hit by the Global Financial crisis, which was triggered by the collapse of the investment bank Lehman Brothers in September of 2008. Real GDP fell 1.6% during 2009, mainly driven by the fall in the prices of Chilean exports (De Gregorio, 2009). The post-Asian crisis slow and strong recovery periods and the Global Financial crisis years constitute our third, fourth, and fifth periods of analysis.

The recovery of the Chilean economy from the aftermath of the Global Financial crisis was, however, relatively fast. During the four years following the financial crisis the Chilean economy experienced a performance comparable to the period 2004-2008, with an average economic growth of 5.3%. The causes behind the economic performance of Chile during the period 2010-2013 are subject to debate. Some studies argue that the exceptional performance of the commodity markets during that period and the new investment flows into the mining sector were the main drivers of the high rates of economic growth (Fornero and Kirchner, 2014), whereas other studies point to the favorable internal conditions for investment generated by the incumbent government as the decisive factor (OECD, 2016). The strong recovery of the Chilean economy in the aftermath of the financial crisis is our sixth period of analysis.

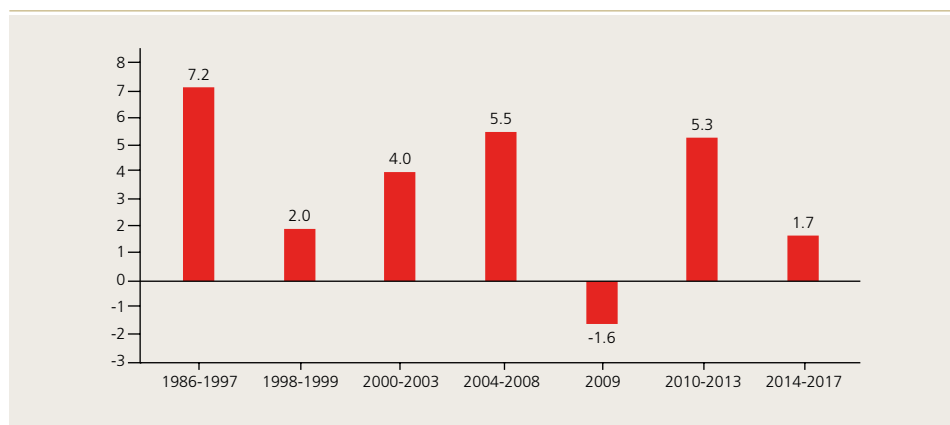
Finally, our last period of analysis spans the years 2014 to 2017, characterized by a sharp deceleration of economic growth. Annual real GDP grew at an average rate of 1.7% during this period. As in the preceding period, there is no conclusive answer regarding the driving factors behind the slowdown of Chile's economic growth during the 2014-2017 period. Two concurring factors are pointed to as the main drivers. On the one hand, a worsening in the external conditions facing the Chilean economy. The price of copper, its main export commodity, fell from 3.59 (USD/lb), the average of the period 2010-2013, to 2.65 (USD/lb), the average of the period 2014-2017. Moreover, the world economy also experienced a slowdown during the 2014-2017 period, with an average growth of 3.45%, lower than the 4.17% at which the world economy expanded during the 2010-2013 period. However, together with the worsening of external conditions, the incumbent government implemented structural reforms concerning the labor market and taxation areas, which could have also been responsible for the slowdown of the economy; for instance, the International Monetary Fund (2015) attributes 33% of the deceleration of the economy in 2014 to internal factors, although no conclusive answer is reached by the literature in this regard.

The previous discussion takes us to separate the performance of the Chilean economy during the past four decades into seven more or less well-delimited periods of economic growth. Figure 2 summarizes those periods, which frame our analysis for the next sections.

Figure 2

Real GDP growth in seven periods

(percent)



Source: Central Bank of Chile.

III. AGGREGATE LABOR MARKET DYNAMICS

This section describes the dynamic followed by the main labor market aggregates across the different periods of economic growth that we have defined in section II. We first study the dynamics of the unemployment rate, at both the aggregate level and within groups of the population, and job creation. Then, in section IV, we turn the analysis to job quality.

1. Unemployment rate

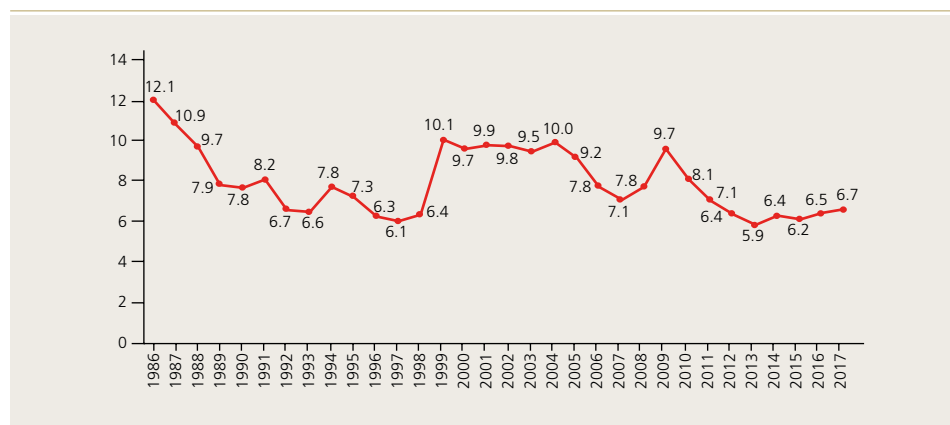
Figure 3 presents the evolution of the unemployment rate during the 1986-2017 period.² As stated in section II, our first period of analysis considers the Golden years of the Chilean economy, in which economic growth reached an average rate of 7.2%. We observe in figure 3 that the Golden period coincided with an outstanding performance of the labor market. The aggregate unemployment rate during that period experienced a pronounced fall, from 12.1% in 1986 to 6.1% in 1997. Thus, the 1986-1997 years were not only a Golden period for economic growth but also a Golden era in terms of labor market performance, in which the unemployment rate was cut by half.

² The National Employment Survey elaborated by the National Institute of Statistics defines unemployed workers as all individuals aged 15 years or more, who did not have a job during the reference week but looked for one during the last four weeks and are available to work in the next two weeks after the reference date.

Figure 3

Unemployment rate*

(percent)



Source: National Statistics Institute (INE).

(*) The INE's National Employment Survey (ENE) data is used for 1986 to 2009; and its New National Employment Survey (NENE) data is used for 2010 to 2017.

In the middle of 1997, the Asian crisis not only interrupted the bonanza of the Chilean economy in terms of output growth but also took its toll on the labor market. We observe in figure 3 that, together with the deceleration of economic growth, the unemployment rate rose from 6.4% in 1998 to 10.1% in 1999.

The synchrony between economic growth and the employment rate can also be observed during the post-Asian-crisis years. We observe in figure 3 that, during the slow cyclical recovery in the aftermath of the Asian crisis (2000-2003), where average economic growth reached 4%, the unemployment rate remained stable at a level slightly below its 1999 peak. However, in the period of strong recovery toward full employment (2004-2008), the unemployment rate fell to near pre-crisis levels, from 10% in 2004 to 7.8% in 2008.

This decreasing trend of the unemployment rate was again interrupted by an international crisis: the Global Financial crisis this time. Hand in hand with the recession experienced by the Chilean economy in 2009, where output fell 1.6%, the unemployment rate went up from 7.8% in 2008 to 9.7% in 2009, reaching levels close to those observed during the Asian crisis and its aftermath.

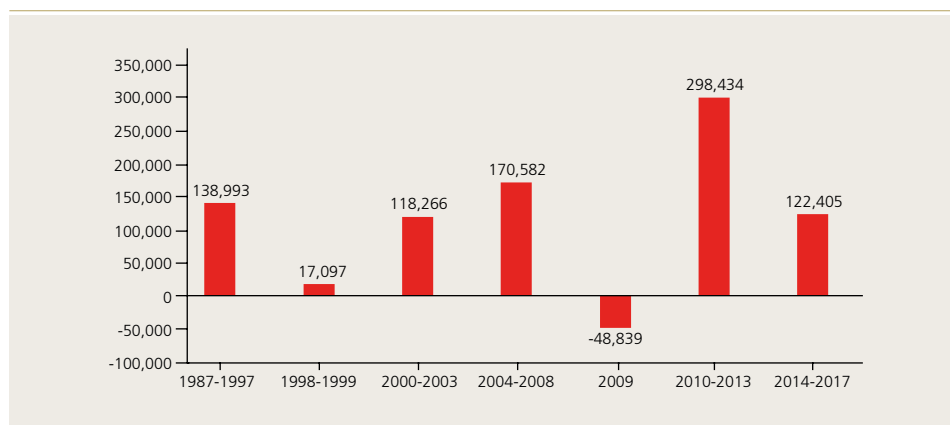
After the financial crisis, Chile returned to a path of strong economic growth, with an average rate of 5.3% during the 2010-2013 period. The dynamism of the labor market observed in the Golden period comes to the scene again. Figure 3 shows that the unemployment rate fell from 9.7%, the peak during the financial crisis, to 5.9% in 2013. However, in the last of the periods that we have defined for our analysis, the slowdown of the Chilean economy halted the gains experienced in employment in the preceding years. During the 2014-2017 period, when economic growth was rather modest at an average rate of 1.7%, the unemployment rate rose to 6.7% in 2017.

2. Job creation

Next, we turn the analysis to job creation. Figure 4 presents the annual average number of jobs created during each of the periods on which we have focused our analysis.³ We observe that the average annual job creation was particularly strong during the Golden period, the strong post-Asian-crisis recovery (2004-2008), and the strong recovery of the economy following the Global Financial crisis (2010-2013). In contrast, during the Asian crisis and the Global Financial crisis, job creation was practically null or even negative in the case of the latter crisis. In addition, the slowdown of economic growth during the last period of analysis, that is, the 2014-2017 period, was accompanied by a much more moderate job creation than during the periods of stronger economic growth.

Figure 4

Job creation*



Source: National Statistics Institute (INE).

(*) The INE's National Employment Survey (ENE) data is used for 1986 to 2009; and its New National Employment Survey (NENE) data is used for 2010 to 2017.

³ We build the average annual job creation for each of the sub-periods by computing the yearly net job creation and then averaging across the years included within each of the sub-periods.

3. Alternative source of data

The previous analysis relied on data from the National Statistics Institute (INE).⁴ For robustness, we will also analyze the unemployment rate and job creation trends using an alternative source of data. The Employment and Unemployment Survey conducted by *Universidad de Chile* has not undergone any methodological changes since 2007. This survey provides quarterly information on occupation and unemployment in Greater Santiago. Figures 5 and 6 replicate the analysis of figures 3 and 4 using this alternative source of data.

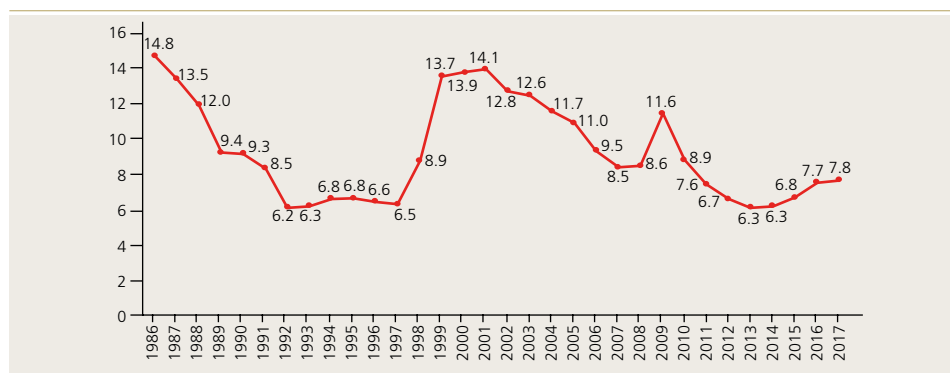
We observe in figures 5 and 6 that the main conclusions regarding the synchrony between the main labor market aggregates and economic growth still hold when we look at this alternative data source. We observe that the unemployment rate fell sharply from 14.8% to 6.5% during the Golden period, whereas the job creation of that period was stronger than in the crises years, the weak cyclical recovery of the 2000-2003 period, and the slowdown of the Chilean economy in the last period of analysis. In addition, in line with INE data, figure 5 confirms the sharp rise of unemployment during both the Asian crisis and the Global Financial crisis. Consistent with this fact, figure 6 shows that job creation during those years was not only scarce but negative. Finally, we also observe a slight increase in unemployment and modest job creation during the slowdown of economic growth of the period 2014-2017.

Overall, this first body of evidence suggests a synchrony between the unemployment rate and job creation with economic growth in the Chilean labor market. That is, we observe that the unemployment rate decreases and net job creation accelerates in the periods of stronger economic growth.

4 In April 2010, the INE replaced the National Employment Survey (ENE), which had been in force since 1986, with the New National Employment Survey (NENE). Following the recommendations proposed by the OECD, the International Labor Organization (ILO), and the U.S. Bureau of Labor Statistics, the main goal of the new survey was to introduce a new methodology, similar to that used in developed nations, for measuring employment and unemployment rates and the inactivity of Chile's workforce, allowing international institutions to develop comparable studies. As a result of introducing international measurement standards, NENE's conceptual and methodological design includes updated concepts of employed and unemployed individuals, as well as a distinction between traditional and nontraditional employees. Concretely, the old survey (ENE) considered the following question: "In which of the following situations were you for most of the last week?" After answering that question, the respondent self-classified as working, looking for work, studying, etc. In contrast, the current survey (NENE) includes the following question: "Last week, that is, between Monday and Sunday, did you work for at least one hour?" In the NENE, it is enough to have worked one hour a week to be considered employed. Thus, this methodological change brought consequences to measuring unemployment since in the old survey it was more likely that people did not self-classify as employed, especially when they were involved in the most precarious jobs. The sample size in the NENE is the total number of dwellings in the level of estimation. At the national level, the sample size at the national level is 35,719, with a relative sample error of 3.3% and an absolute sample error of 0.3%.

Figure 5

Unemployment rate measured by *Universidad de Chile* survey* (percent)

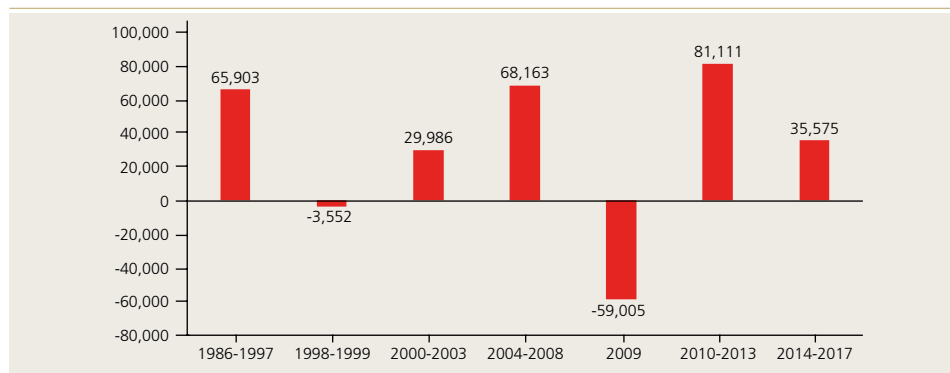


Source: *Universidad de Chile*, Employment and Unemployment Survey.

(*) Data from 1990 to 1996 use the average annual unemployment rates of June and December. Data from 1997 to 2010 use the average annual unemployment rates of March, June, September and December.

Figure 6

Job creation according to *Universidad de Chile* survey*



Source: *Universidad de Chile*, Employment and Unemployment Survey.

(*) Data from 1990 to 1996 use the average annual employment level of June and December. Data from 1997 to 2010 use the average annual employment level of March, June, September and December.

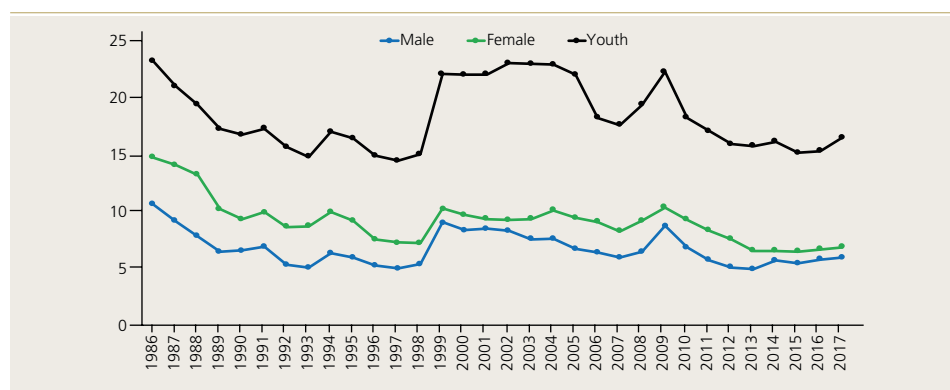
4. Female, male, and youth unemployment

We analyze now if the synchrony between the unemployment rate and economic growth is also observed within specific groups of the population: women, men, and young workers. We also analyze if the response of the unemployment rate to the cyclical movements of output is more pronounced among individuals in some of these specific groups. Figure 7 exhibits the evolution of female, male, and youth unemployment⁵ over the period 1986-2017.

5 The youth unemployment rate is measured considering individuals aged between 15 and 24 years old.

Figure 7

Male, female, and youth unemployment rate* (percent)



Source: National Statistics Institute (INE).

(*) The INE's National Employment Survey (ENE) data is used for 1986 to 2009; and its New National Employment Survey (NENE) data is used for 2010 to 2017.

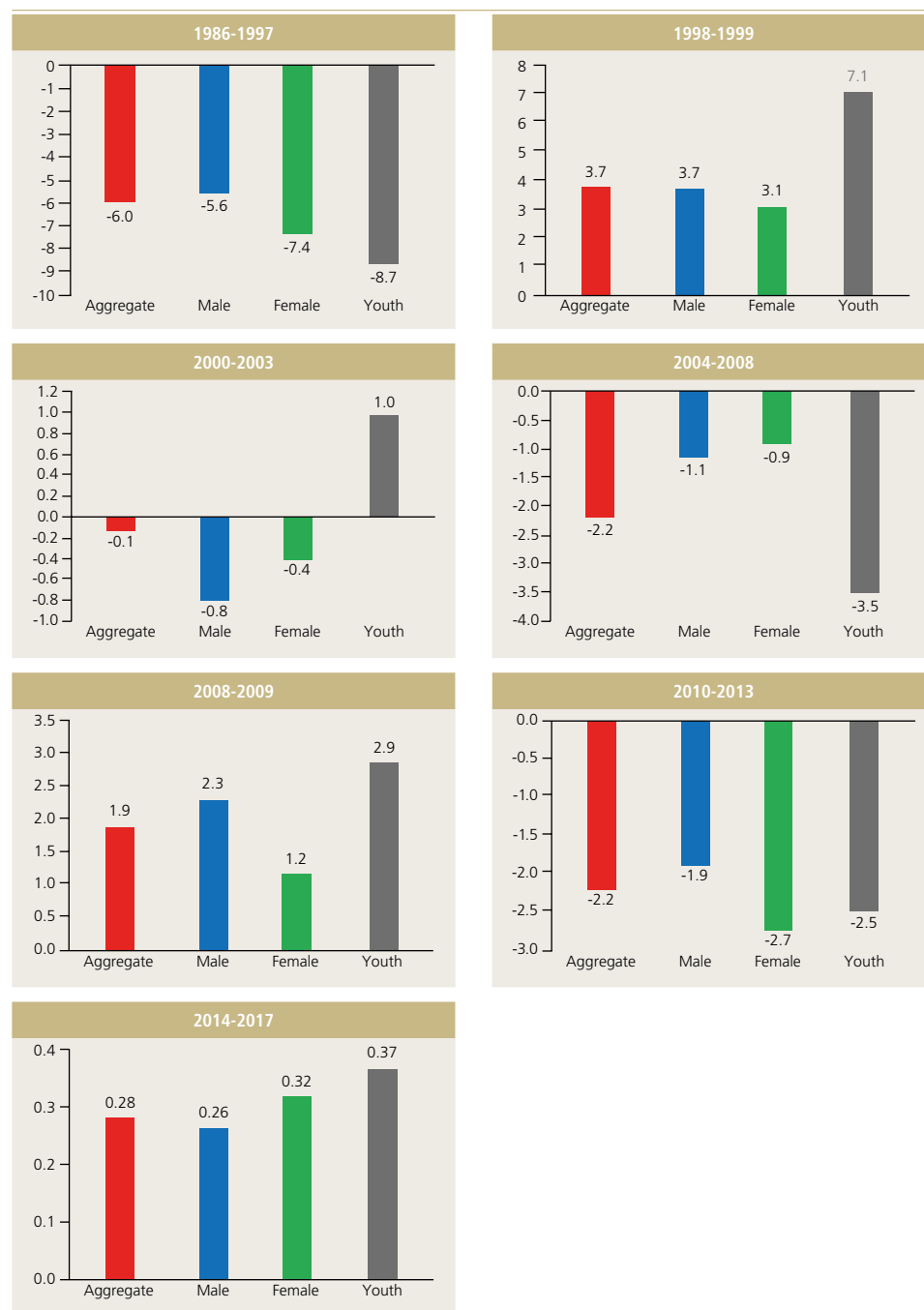
We observe that the trend of the unemployment rate within each of the analyzed groups of the population resembles that followed by the aggregate rate. Concretely, for women, men, and young workers, we observe (i) the fall in unemployment during the Golden period (1986-1997), (ii) the sharp rise in the unemployment rate during the Asian crisis years (1998-1999), (iii) the steady evolution of unemployment during the weak cyclical recovery of the period 2000-2003, (iv) the slightly decreasing trend during the strong cyclical recovery of the 2004-2008 period, (v) the rise in unemployment during the Global Financial crisis, (vi) the pronounced fall in unemployment during the years following the financial crisis, and (vii) the increasing trend during the slowdown of the Chilean economy during the period 2014-2017.

However, in addition, figure 7 suggests that, despite the synchronic response of male, female, and youth unemployment to economic growth, the magnitude of the changes do not seem to be identical across these groups. In order to assess the sensitivity of the unemployment rate of women, men, and young workers to economic growth, figure 8 presents the changes in the unemployment rate within each of the periods of economic growth.

We observe in figure 8 that the youth unemployment rate seems to be more sensitive to economic growth compared with the other groups of the population. For instance, during the Golden period, it was the youth unemployment rate that fell the most. Youth unemployment decreased 8.7% whereas the aggregate rate fell only 6.0%. However, during the crises years, it was also youth unemployment that experienced the most pronounced rise. This fact is particularly evident when looking at the Asian crisis years. During the 1998-1999 period, the youth unemployment rate jumped from 15.3% to 22.4%, whereas male and female unemployment only rose 3.7% and 3.1%, respectively, in said period.

Figure 8

Changes in male, female, and youth unemployment rate* (percent)



Source: National Statistics Institute (INE).

(*) The INE's National Employment Survey (ENE) data is used for 1986 to 2009; and its New National Employment Survey (NENE) data is used for 2010 to 2017.

In recent years, the response of unemployment to economic growth has been more balanced across female, male, and young workers. In the post-financial crisis period of strong economic growth both female and youth unemployment rates were the most sensitive to economic growth, although their response was less different to the response of male unemployment than in other periods. In the last years of our analysis, when economic growth slowed down, the rise in unemployment was evenly balanced across the three groups analyzed in this section.

IV. JOB QUALITY

The analysis performed in the previous section focused the lens on the unemployment rate both at the aggregate level and for specific groups of the population. This indicator could be considered the first dimension to be studied regarding the aggregate dynamics of the labor market. However, the overall unemployment rate is far from being informative with respect to the quality of the jobs that the economy creates (or destroys) during different periods of economic growth. As we state in the introductory section, both the number of employed individuals and the quality of their jobs is what in the end determines a household's income and, thus, the impact on the poverty rate of an economy. Consequently, in this section, we dig deeper by examining how the composition of employment evolves across the periods of economic growth that we have defined in section II.

Chile's National Statistics Institute (INE) classifies employment according to five occupational categories: (i) employers, (ii) self-employed workers, (iii) dependent workers, (iv) service workers, and (v) unpaid family. We focus the analysis on two of these five occupational categories: dependent employment and self-employment. As we show next, these occupational categories represent jobs of a quite different quality regarding earnings and precariousness.

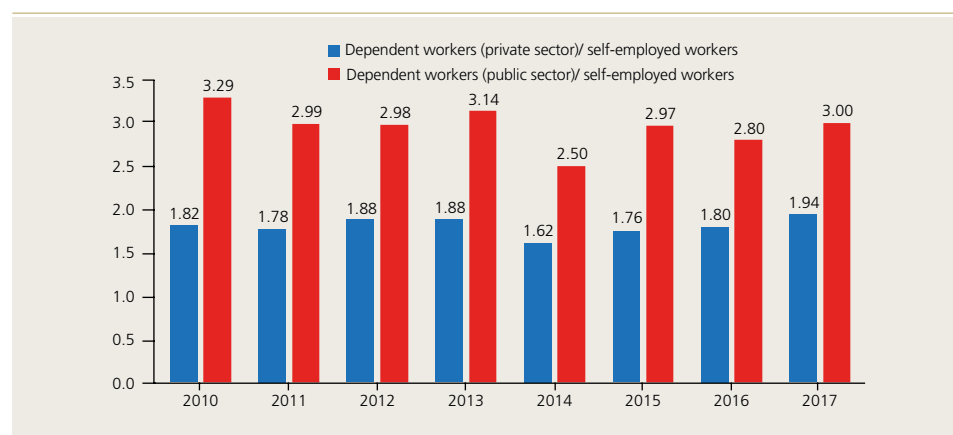
The INE classifies a worker as dependent if the individual works for a public or private employer and receives a remuneration in the form of a salary, commission, tips, or payments in kind. In contrast, according to the INE, a worker is self-employed if she operates her own business or exercises an independent profession without any relationship of dependence with an employer. These two occupational categories markedly differ regarding several characteristics, not only with respect to the formal definition given by the INE. Figure 9 shows that the median monthly earnings of a dependent worker in the private sector are consistently higher than those earned by a self-employed worker. In the case of dependent workers in the public sector, this ratio is even greater. In addition, data from the Supplementary Income Survey (ESI) for the year 2017 shows that only 23% of self-employed workers exhibit monthly earnings higher than those earned by median dependent workers. Moreover, data from the micro-entrepreneurship survey (EME) 2017 reveals that 62% of the micro-entrepreneurs—those who run a business with 10 or less employees—were pushed to launch their entrepreneurship through necessity, whereas only

28% did it to capitalize on a good business opportunity.⁶ In addition, Bravo and Larraín (2017) document that dependent workers and self-employed differ in terms of the frequency of their contributions to social security and healthcare systems. Concretely, Bravo and Larraín show that 83.3% of self-employed workers do not make contributions to the social security and healthcare systems; this figure is only 16.8% in the case of private dependent workers and 11.9% in the case of public sector dependent workers. The main lesson that can be extracted from this evidence is that dependent jobs and self-employment are indeed different regarding the level of precariousness; specifically, dependent employment can be considered of better-quality compared with self-employment.

However, the evolution of dependent employment in the private sector and the public sector could follow a different synchrony with economic growth. Neoclassical labor market models predict an unambiguous positive correlation between economic growth and job creation in the private sector. However, in the public sector, other factors could break a positive relation between economic growth and dependent employment. For instance, the use of counter-cyclical policies during economic recessions could generate an inverse relationship between growth and public sector dependent employment. We next analyze the evolution of dependent employment participation in both the private and public sector, and self-employment across the seven periods of economic growth that we have identified.

Figure 9

Earnings ratios by workers' occupational category (as of last quarter of each year)



Source: Chile's National Statistics Institute (INE).

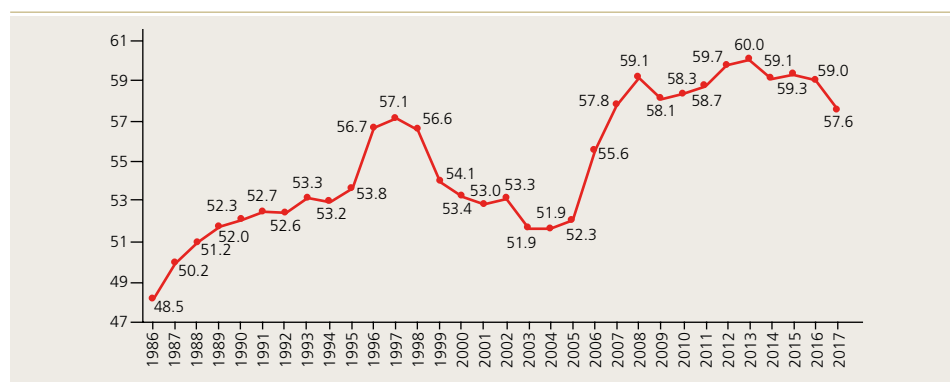
⁶ The remaining 11% of the individuals started an entrepreneurship due to family tradition.

Figure 10 presents the number of dependent workers in the private sector as a fraction of total employment, for the period 1986-2017.⁷ Based on the evidence exhibited in figure 9 and that reported by Bravo and Larraín (2017), this measure can be considered a proxy for the quality of jobs existing in the labor market; the higher the participation of private dependent employment, the less precarious the jobs in the labor market.

Analogous to what we did for the unemployment rate, we compare the evolution of the participation of private dependent employment in total employment in the periods of economic growth in which we are focusing our analysis. We observe in figure 10 that the participation of dependent employment rose strongly during the Golden period, from 48.5% in 1986 to 57.1% in 1997. Then, we observe that the Asian crisis not only impacted the aggregate unemployment rate but also the quality of the jobs; the participation of private dependent employment fell from the 57.1% peak in 1997 to 54.1% in 1999. Then, during the period of weak cyclical recovery, the participation of dependent employment remained more or less stable, but it rose sharply again during the period of strong cyclical recovery (2004-2007), reaching a level of 59.1% in 2008. The growing trend in the participation of private dependent employment ended with the Global Financial crisis, although the impact of this crisis on it was smaller in magnitude compared with the effects of the Asian crisis on this variable. Finally, job quality increased again during the period 2010-2013 when the Chilean economy resumed a path of strong economic growth but returned to a falling trend during the slowdown in economic growth of the period 2014-2017. Overall, figure 10 shows that job quality, proxied by the ratio of private dependent employment to total employment, rises in periods of strong economic growth but falls during recessions or slowdowns of the economy.

Figure 10

Private sector dependent employment participation*
(percent)



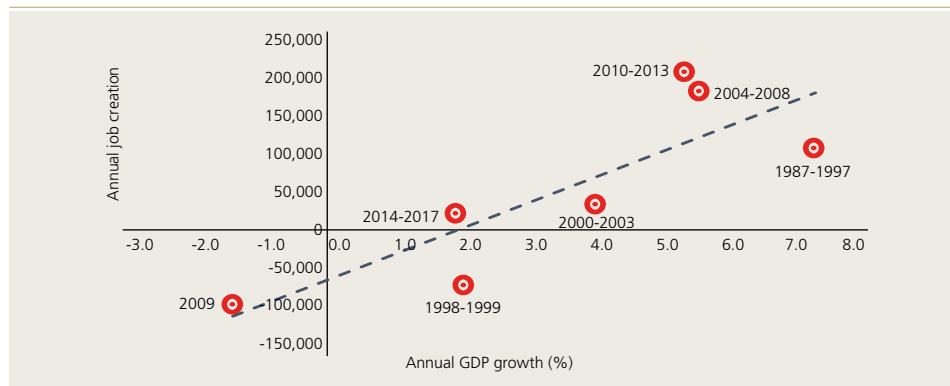
Source: National Statistics Institute (INE).

(*) The INE's National Employment Survey (ENE) data is used for 1986 to 2009; and its New National Employment Survey (NENE) data is used for 2010 to 2017.

7 Figures 10 to 15 are based on microdata and use the factor of expansions reported by the ENE and NENE to build the final aggregation.

Figure 11

Dependent employment creation in the private sector and economic growth* (percent)

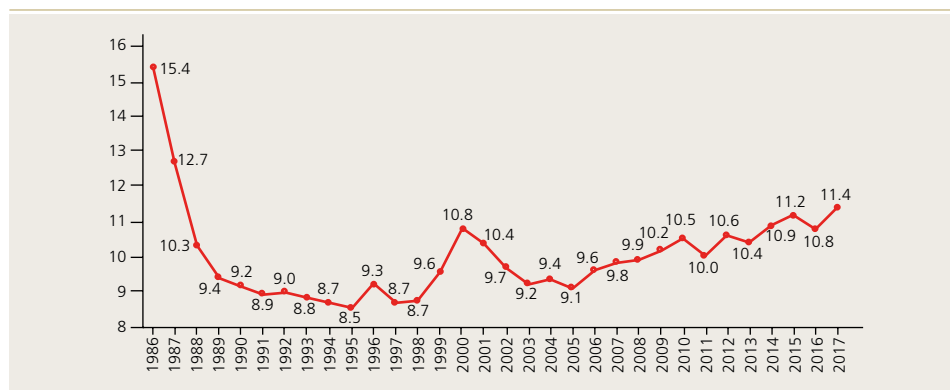


Source: National Statistics Institute (INE).

(*) The INE's National Employment Survey (ENE) data is used for 1986 to 2009; and its New National Employment Survey (NENE) data is used for 2010 to 2017.

Figure 12

Public sector dependent employment participation* (percent)



Source: National Statistics Institute (INE).

(*) The INE's National Employment Survey (ENE) data is used for 1986 to 2009; and its New National Employment Survey (NENE) data is used for 2010 to 2017.

Figure 11 plots the average annual creation of dependent employment in the private sector and the annual economic growth rate across the seven periods we have been analyzing. We observe a clear positive correlation between these variables. This alternative look at the data confirms our previous conclusion regarding the fact that strong economic growth seems to go hand in hand with more active dependent employment creation in the private sector.

We now turn the analysis to the public sector-dependent employment participation.⁸ Figure 12 plots the number of dependent workers in the public sector as a fraction of total employment.

Figure 12 confirms our previous conjecture regarding the dissimilar pattern that the participation of private-sector- and public-sector-dependent employment would exhibit across the different phases of economic growth. We observe that, in contrast to what happened with the participation of private sector-dependent employment, the participation of public sector-employment fell strongly during the Golden period, from 15.4% in 1986 to 8.7% in 1997. Moreover, we also observe that it rose during the crisis years, that is during the periods 1997-1999 and 2008-2009, the opposite trend to the one observed for the participation of dependent employment in the private sector. This dissimilar behavior of public and private dependent employment during the crises could possibly be due to the implementation of counter-cyclical policies during economic recessions.

As we did for private employment, in figure 13 we plot the correlation between job creation in the public sector and economic growth across the sub-periods of analysis. Consistent with the main conclusion extracted from figure 12, we observe a slightly negative correlation between these two variables. Overall, public sector jobs exhibit a slightly negative synchrony with economic growth, in contrast to the strong positive correlation that we observe in the case of private-sector-dependent employment.

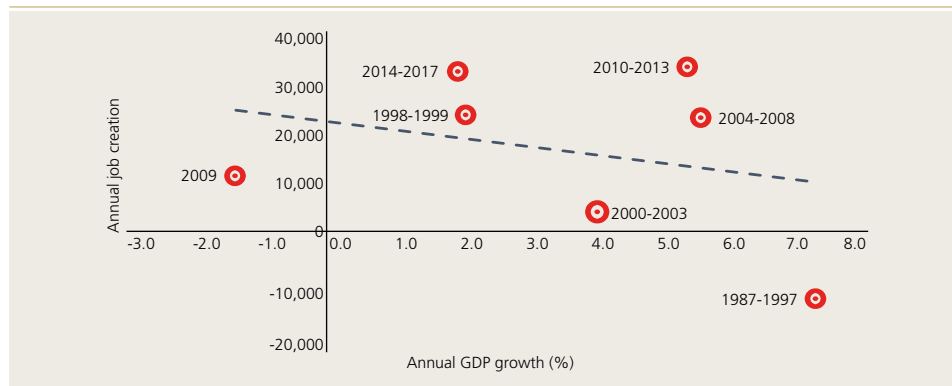
We analyze now the behavior of self-employment. As we discussed above, this type of job is considered more precarious than dependent employment, since it exhibits lower earnings and less attachment to the social security and healthcare systems. Theoretically, it is not clear how this type of employment should evolve across the different phases of economic growth. On the one hand, in periods of deceleration of economic growth, workers could start their own businesses in face of the lack of opportunities as dependent workers. On the other hand, in periods of strong economic growth the demand for the services produced by self-employed workers could rise, making this type of activity more attractive. In the end, the answer is an empirical one. Figure 14 shows the evolution of the number of self-employed workers over total employment during the period 1986-2017.

⁸ Data include the PEM and POJH programs.

Figure 13

Dependent employment creation in the public sector and economic growth*

(percent)



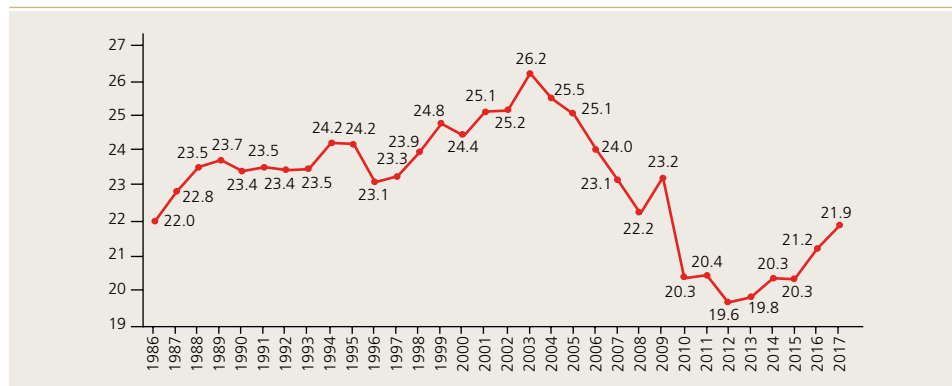
Source: National Statistics Institute (INE).

(*) The INE's National Employment Survey (ENE) data is used for 1986 to 2009; and its New National Employment Survey (NENE) data is used for 2010 to 2017.

Figure 14

Self-employment participation*

(percent)



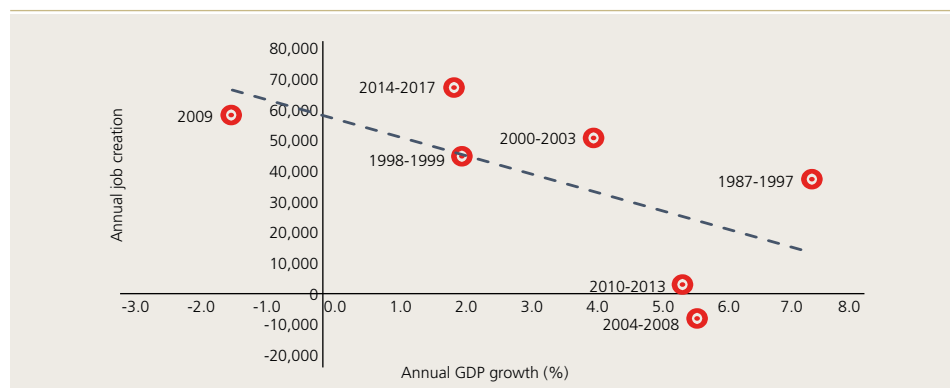
Source: National Statistics Institute (INE).

(*) The INE's National Employment Survey (ENE) data is used for 1986 to 2009; and its New National Employment Survey (NENE) data is used for 2010 to 2017.

Figure 15

Self-employment creation and economic growth*

(percent)



Source: National Statistics Institute (INE).

(*) The INE's National Employment Survey (ENE) data is used for 1986 to 2009; and its New National Employment Survey (NENE) data is used for 2010 to 2017.

We observe in figure 14 that the participation of self-employment was relatively stable during the Golden period. However, it rose markedly as a consequence of the Asian crisis and, after a small decline in the aftermath of the crisis, it reached a peak of 26.2% during the weak cyclical recovery of the period 2000-2003. Then, the participation of self-employment experienced a sharp reduction during the period 2004-2013, only interrupted by the hit of the Global Financial crisis. Finally, we observe that the participation of self-employment rose again during the recent slowdown of the Chilean economy (2014-2017 period). Thus, figure 14 shows that weak economic growth is associated with greater self-employment.⁹ The negative synchrony between self-employment and economic growth can be confirmed when we look directly at the correlation between self-employment creation and growth across the sub-periods of analysis, as figure 15 shows.

V. FEMALE LABOR FORCE PARTICIPATION AND ECONOMIC GROWTH

There are also some policy-relevant labor market variables whose dynamics more closely relate to the structural or long-run factors of economic growth than to the more cyclical ones. We end the discussion of this article by analyzing one of them, which is frequently present in the economic policy debate: female labor force participation.¹⁰

9 Szederkenyi and Vergara (2017) use the Universidad de Chile employment survey and conclude that during the last two decades self-employment indeed exhibits a counter-cyclical pattern.

10 Despite this fact, some studies show that there also exists a pro-cyclical component of the female labor force participation (Blagrove and Santoro, 2017).

Figure 16 presents the evolution of the female labor force participation rate for Chile and OECD countries from 1996 to 2016 across different age groups. As we can observe in figure 16, female labor force participation has steadily increased over the period in all the age groups. However, most remarkably, we observe a marked convergence to OECD rates, in particular in the group of women aged 25 years or more. What forces could explain this phenomenon?

There are inherent forces behind economic development that encourage women to participate more actively in the labor market. We conjecture that these forces have also been present in the development process of the Chilean economy. First, as countries move toward higher levels of economic development, production moves from the manufacturing sector to the services sector (Buera and Kaboski, 2012). Women present comparative advantages in jobs that are less intensive in physical strength and more intensive in knowledge (Goldin, 1990; Galor and Weil, 1996; Ngai and Petrongolo, 2017). Because the manufacturing sector is intensive in physical strength, the rise of the service economy is a primary reason through which economic development promotes opportunities for women in the labor market. Data from the World Development Indicators of the World Bank are consistent with the latter conclusion. We observe that employment in services as a percentage of female employment rose from 79% in 1991 to 84% in 2017. This evidence also shows that most of female employment has been allocated to the services sector during the past decades.

In addition, technological change increases workers' productivity and, therefore, their salaries. Higher wages increase the opportunity cost of time for women and thus make motherhood more expensive. On the other hand, technological change is biased in favor of more qualified workers. This encourages mothers to have fewer, but more educated, children. This is the so-called trade-off between quantity and quality of children, first documented by Becker and Lewis (1973): a lower birth rate releases women from the home, allowing them to participate actively in the labor market, which also encourages them to achieve higher levels of education and to delay the age at which they get married. And all these forces feed off one another.

Figure 16

Female labor force participation by age group

(percent)

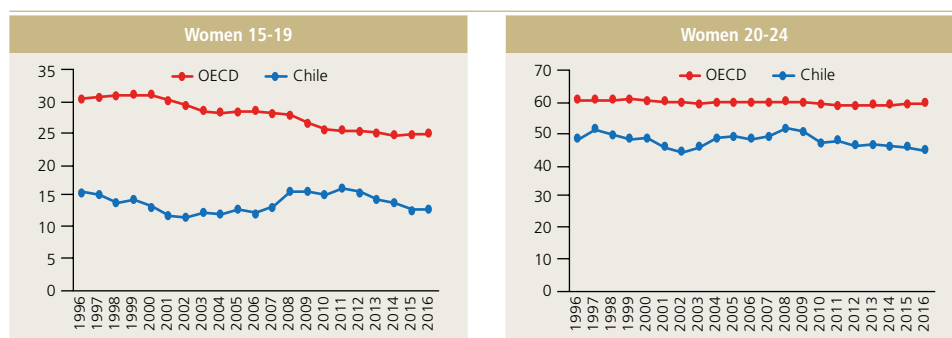
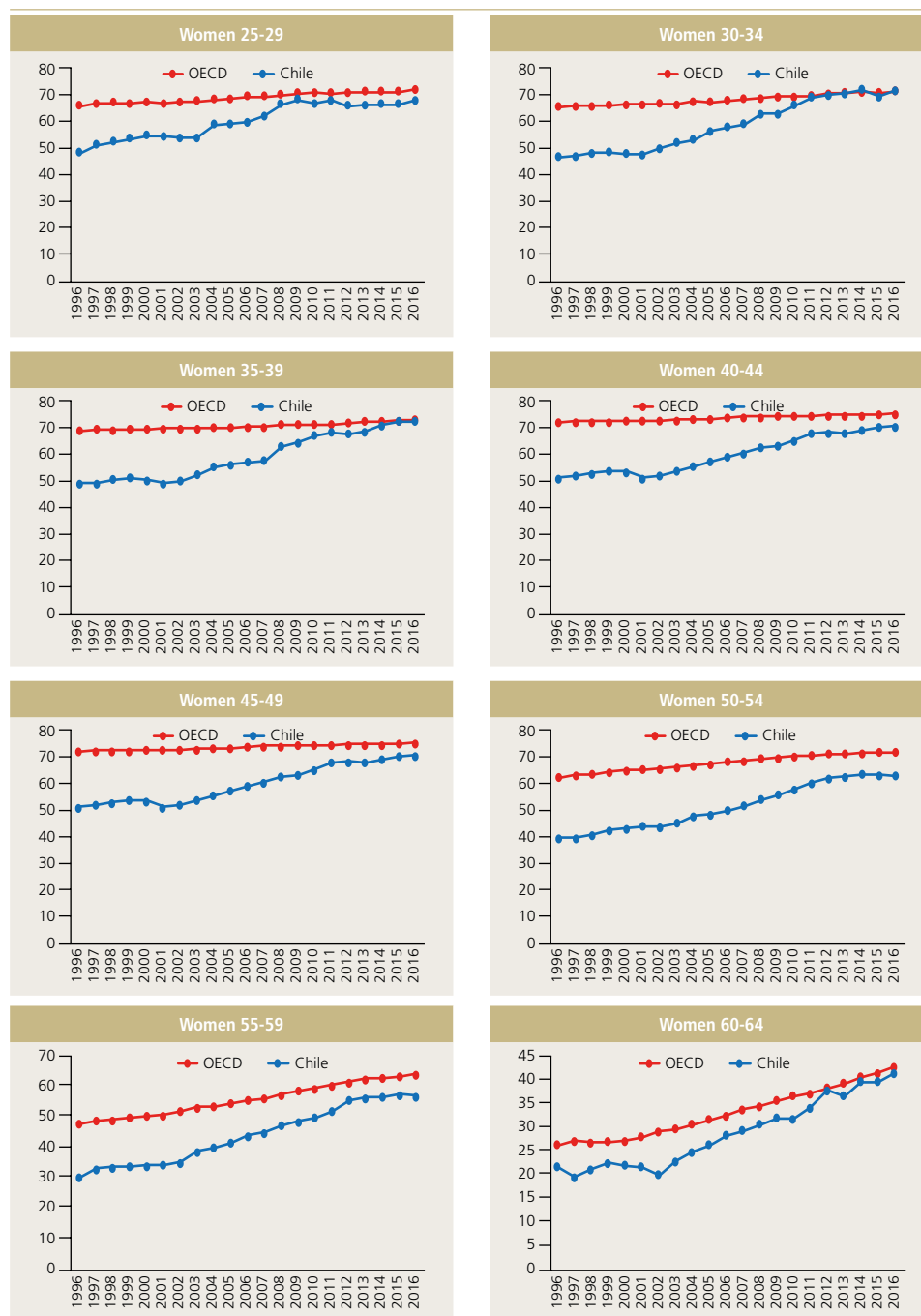


Figure 16 (continued)

Female labor force participation by age group

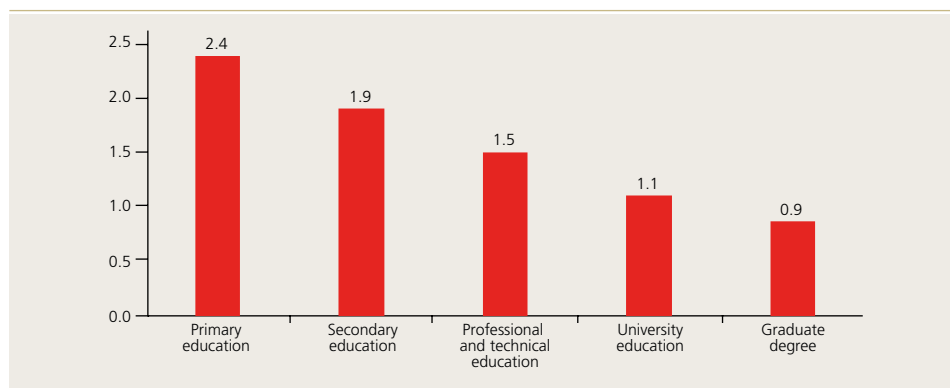
(percent)



Source: OECD Stats-Extracts.

Figure 17

Average number of children by educational attainment*
(percent)



Source: Chilean Census.

(*) Data correspond to the highest-level course completed for a cohort of women aged 30-39 in 2017.

Figure 17 presents evidence on the education-number of children gradient for a cohort of women in Chile. Data were taken from the Chilean Census of 2017 and consider women aged 30-39 in the year of the census. We observe a negative gradient education-number of children. Specifically, figure 17 shows that women with a primary education have on average 2.4 children, whereas the same figures for women with a secondary education, university education, and graduate degree are 1.9, 1.1, and 0.9, respectively.

Another element to consider is that technological changes increase the efficiency of services usually produced at home. This is another force that frees women from housework. The technological revolution occurred not only in the market but also within the household. As Greenwood et al. (2005b) document, the appearance of goods such as refrigerators, frozen food, and microwaves allowed women to produce the same home goods and services with less domestic time.

The long-run forces previously described explain why we observe that as countries become more developed, women have fewer children (Greenwood et al., 2005a), are more educated (Becker et al., 2010), delay marriage (Stevenson and Wolfers, 2007), participate more actively in the labor market (Jones et al., 2015), and achieve a higher level of empowerment in society.

In addition to the structural factors previously discussed, public policies and programs implemented in recent years could also have facilitated women's entry into the labor market. Among the programs that have been implemented over the past years, we can consider the following: (i) the extension of maternity leave to six months, (ii) the subsidy to women's work, (iii) the increase in childcare coverage, and (iv) the Skills Development Program for women as part of the *Chile Solidario* Program. Evidence for Chile supports the positive effects of these programs on female labor supply. For instance, using data from Chile, some articles show that

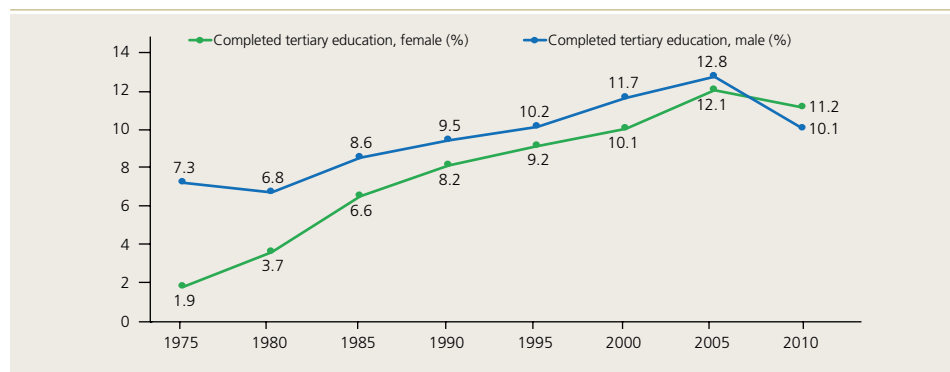
better-located childcare facilities with longer hours of operation have a positive impact on labor force participation (Contreras et al., 2008; Berthelon et al., 2015). Contreras and Sepúlveda (2016) study how the extension of the school day from half- to full-day school implemented in Chile in 1996 impacted female labor force participation. The authors estimate that, on average, labor force participation of single mothers with eligible children (between 8 and 13 years old) and no younger children increased by 5%. However, the authors do not find significant labor supply responses among other mothers with eligible children. Contreras et al. (2005) also conclude that policies oriented to increasing the educational level of females and access to children's day-care centers may induce future increases in female labor market participation. In addition, the authors present evidence that suggests that the provision of more day-care centers for children less than six years old could be a more effective policy in this regard than expanding school hours by one hour per day for children above six. Contreras et al. (2012) study the effects of adequate provision of childcare services, in terms of closeness and hours of operation on female labor force participation. The authors simulate a scenario in which 50% of women would benefit from adequate provision of childcare and find that labor participation would increase between 1% and 8%.

Contreras et al. (2005), using a synthetic cohort methodology to study the evolution of female labor force participation in Chile, find that an increase in average women's education from 7.7 years in 1945 to 11.3 years in 1975 was correlated with an increase close to 8 percentage points of the participation rate of that age group. Thus, Contreras et al. (2005) implicitly put education as an important force behind the rise in female labor force participation. Chile has indeed been participating in the worldwide boom in the higher education of women (Becker et al., 2010; Parro, 2012). Figure 18 shows how the gender gap has been closing during recent years and has even reversed lately. This evidence brings us to conjecture on the active role that women will play in the next decades.

Figure 18

Thirty to thirty-five year olds wait complete college education in Chile, by gender

(percent)



Source: Barro and Lee (2016).

VI. CONCLUSIONS

This article studied the dynamics followed by the labor market across different periods of economic growth observed for the Chilean economy. We defined different sub-periods of economic performance and analyzed the behavior of labor market aggregates related to the quantity and quality of jobs created in each of these sub-periods. We also presented evidence on female labor market attachment over the last decades.

We first documented that the unemployment rate decreases and net job creation accelerates in the periods of stronger economic growth. We showed that the synchrony between economic growth and the unemployment rate is observed for men, women, and young workers. However, the response of youth unemployment seems to be more sensitive to the fluctuations of economic growth than that of the other groups. Regarding job quality, we showed that strong economic growth increases the participation of private-sector-dependent employment in total employment but reduces the participation of self-employment, which exhibits lower earnings and higher levels of precariousness than dependent employment. We have also shown that public sector employment rises during recessions, possibly being part of counter-cyclical policies. Lastly, we documented that female labor force participation has experienced a secular increase during the past decades, and a converging trend towards OECD levels. We pointed to the rise of the service economy, technological change, and pro-female public policies as potential candidate forces behind the latter phenomenon.

The long-term growth–labor analysis performed in this article reveals that the labor market created more and better-quality jobs in periods of stronger economic growth. The evidence also showed that long-term economic growth pushed women to attain higher levels of education and to participate more actively in the labor market. Therefore, economic growth seems to be an attractive tool to nourish the labor market dynamics and, thus, can be transformed into an active “labor market policy.” We hope that the evidence presented in this article stimulates more formal studies and illuminates the policy debate on how to keep a dynamic labor market in the long-run.

REFERENCES

- Barro, R. and J.W. Lee (2016). "Educational Attainment Dataset." Available at <http://www.barrolee.com>.
- Becker, G., W.H.J. Hubbard, and K.M. Murphy (2010). "Explaining the Worldwide Boom in Higher Education of Women." *Journal of Human Capital* 4(3): 203–41.
- Becker, G. and H.G. Lewis (1973). "On the Interaction between the Quantity and Quality of Children." *Journal of Political Economy* 81(2): S279–S288.
- Berthelon, M., D. Krueger, and M. Oyarzún (2015). "The Effects of Longer School Days on Mothers Labor Force Participation." IZA Working Paper No. 9212.
- Blagrove, P. and M. Santoro (2017). "Labor Force Participation in Chile: Recent Trends, Drivers, and Prospects." IMF Working Paper 17/54.
- Blank, R. (1996). "Why Has Economic Growth Been such an Effective Tool against Poverty in Recent Years?" In *Poverty and Inequality, the Political Economy of Redistribution*, edited by J. Neill. Kalamazoo: W.E. Upjohn Institute.
- Blank, R. (2000). "Fighting Poverty: Lessons from Recent U.S. History." *Journal of Economic Perspectives* 14(2): 3–19.
- Blank, R. and A. Blinder (1987). "Poverty and the Macroeconomy." In *Challenging Poverty: What Works and What Doesn't*, edited by S. Danziger and D. Weinberg. Cambridge, MA: Harvard University Press.
- Blank, R. and D. Card (1993). "Poverty, Income Distribution, and Growth: Are they Still Connected?" *Brookings Papers on Economic Activity* 2: 285–339.
- Bosworth, B., R. Dornbush, and R. Labán (1994). *The Chilean Economy: Policy Lessons and Challenges*. Brookings Institution.
- Braun, M. and B. Larraín (2005). "Finance and the Business Cycle: International, Inter-Industry Evidence." *Journal of Finance* 60(3): 1097–128.
- Bravo, J. and F. Larraín (2017). "Efectos del Crecimiento Económico sobre el Empleo y su Composición en Chile." Working Paper No. 32. CLAPES-UC.
- Buera, F. and P. Kaboski (2012). "The Rise of the Service Economy." *American Economic Review* 102(6): 2540–69.



Contreras, D., L. de Mello, and E. Puentes (2008). “Encouraging Labor Force Participation in Chile.” OECD Working Paper No. 608.

Contreras, D., E. Puentes, and D. Bravo (2005). “Female Labour Force Participation in Greater Santiago, Chile: 1957-1997. A Synthetic Cohort Analysis.” *Journal of International Development* 17(2): 169–86.

Contreras, D., E. Puentes, and D. Bravo (2012). “Female Labor Supply and Child Care Supply in Chile.” Working Paper No. 370, Universidad de Chile.

Contreras D. and P. Sepúlveda (2016). “Effect of Lengthening the School Day on Mother’s Labor Supply.” Policy Research Working Paper Series 7599, The World Bank.

Corbo, V., R. Lüders, and P. Spiller (1997). “The Foundations of Successful Economic Reforms: The Case of Chile.” Mimeo, Pontificia Universidad Católica de Chile.

Cutler, D. and W. Katz (1991). “Macroeconomic Performance and the Disadvantaged.” *Brookings Papers on Economic Activity* 2: 1–74.

De Gregorio, J. (2009). “Chile and the Global Recession of 2009.” Economic Policy Papers No. 30, Central Bank of Chile.

Ffrench-Davis, R. (2002). “El Impacto de las Exportaciones sobre el Crecimiento en Chile.” *Revista CEPAL* 76: 143–60.

Fornero, J. and M. Kirchner (2014). “Learning about Commodity Cycles and Saving-Investment Dynamics in a Commodity-Exporting Economy.” Working Paper No. 727, Central Bank of Chile.

Gallego, F. and N. Loayza (2002). “The Golden Period for Growth in Chile: Explanations and Forecasts.” In *Economic Growth: Sources, Trends, and Cycles*, edited by N. Loayza and R. Soto. Central Bank of Chile.

Galor, O. and D.N. Weil (1996). “The Gender Gap, Fertility, and Growth.” *American Economic Review* 86(3): 374–87.

Goldin, C. (1990). *Understanding the Gender Gap: An Economic History of American Women*. NBER Series on Long-term Factors in Economic Development.

Greenwood, J., A. Seshadri, and G. Vandenbroucke (2005a). “The Baby Boom and Baby Boost.” *American Economic Review* 95(1): 183–207.

Greenwood, J., A. Seshadri, and M. Yorukoglu (2005b). “Engines of Liberation.” *Review of Economic Studies* 72(1): 109–33.

Haveman, R. and J. Schwabish (2000). “Has Macroeconomic Performance Regained its Anti-Poverty Bite?” *Contemporary Economic Policy* 18(4): 415–27.

International Monetary Fund (2015). IMF Country Report No. 15/227. *Chile: 2015 Article IV Consultation - Press Release; and Staff Report*. Washington, D.C.: IMF.

Jones, L.E., R.E. Manuelli, and E.R. McGrattan (2015). “Why Are Married Women Working so Much?” *Journal of Demographic Economics* 81(1): 75–114.

Ngai, L. R. and B. Petrongolo (2017). “Gender Gaps and the Rise of the Service Economy.” *American Economic Journal: Macroeconomics* 9(4): 1–44.

OECD (2016). *Regulatory Policy in Chile: Government Capacity to Ensure High-Quality Regulation*. Paris: OECD Publishing.

Parro, Fco. (2012). “International Evidence on the Gender Gap in Education over the Past Six Decades: A Puzzle and an Answer to It.” *Journal of Human Capital* 6(2): 150–185.

Perry, G. and D. Leipziger (1999). *Chile: Recent Policy Lessons and Emerging Challenges*, The World Bank.

Romer, P. (2000). “Poverty and Macroeconomic Activity.” *Federal Reserve Bank of Kansas City Economic Review* (first quarter): 1–13.

Solimano, A. (1999). “The Chilean Economy in the 1990s: On a ‘Golden Age’ and Beyond.” *After Neoliberalism: What Next for Latin America?* edited by L. Taylor. Chicago, IL: University of Michigan Press.

Stallings, B. (1998). *Impact of the Asian Crisis on Latin America*. ECLAC.

Stevenson, B. and J. Wolfers (2007). “Marriage and Divorce: Changes and their Driving Forces.” *Journal of Economic Perspectives* 21(2): 27–52.

Szederkényi, F. and R. Vergara (2017). “Evolución del Empleo en Chile: Asalariados y Cuenta Propia.” *Puntos de Referencia* No. 457, Centro de Estudios Públicos.