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**SYSTEMATIC COUNTRY DIAGNOSTIC (P157088)
TRANSITIONING TO A PROSPEROUS SOCIETY**

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ABBREVIATIONS AND ACRONYMS

CASEN	Encuesta de Caracterización Socioeconómica Nacional (national household income survey)
Corfo	Chilean Economic Development Agency
FDI	foreign direct investment
Fonasa	Fondo Nacional de Salud (national health fund)
GDP	gross domestic product
OECD	Organisation for Economic Co-Operation and Development
PISA	Program for International Student Assessment (OECD)
PM	particulate matter
PPP	purchasing power parity
R&D	research and development
SCD	Systematic Country Diagnostic
SEDLAC	Socio-Economic Database for Latin America and the Caribbean
TFP	total factor productivity

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Chile: Transitioning to a Prosperous Society

Executive Summary

Three key characteristics help shed light on Chile's development performance. First, *strong institutions and sound macroeconomic policies* have contributed to long-term economic growth. Second, *market-oriented policies* have boosted growth through productivity-enhancing reforms and helped improve the design of public services and social policy. Third, as the world's biggest copper producer and exporter, Chile is characterized by *commodity dependence*. These characteristics have helped the government achieve an average annual growth rate of almost 5 percent over the last 30 years, while reducing the poverty rate to less than 8 percent. Chile's middle class is one of the largest in Latin America; yet, inequality remains substantial. Economic development has led to a steep increase in life expectancy and a decline in fertility rates. Indeed, though relatively less than other countries in the Organisation for Economic Co-operation and Development (OECD), Chile is advanced in the demographic transition, which pose important challenges to economic growth and labor productivity.

This Systematic Country Diagnostic (SCD) takes stock of Chile's progress and reflects on the constraints and opportunities that the country is encountering as it continues along a path to eradicate extreme poverty and boost shared prosperity. The report provides elements to answer three main questions: (1) What are the critical factors driving output and productivity growth? (2) What are the critical factors that determine inclusion? and (3) How sustainable are the current trends in growth and inclusion? The SCD also identifies a select list of priority areas in which the country faces the greatest challenges in advancing toward the World Bank's twin goals of poverty reduction and sharing prosperity.

Growth

Over the past three decades, the country has achieved strong and sustained economic growth, largely through capital deepening backed by a solid macroeconomic framework. Market-oriented structural reforms have helped improve economy-wide efficiency, and together with steady demand for copper, has fueled the economy. However, since the end of the 1990s, productivity growth has slowed, and the recent fall in copper prices has exposed underlying challenges in productivity and diversification that predated the boom, but were less of a policy imperative during the boom. The government is thus met with the challenge of gradually shifting from a growth model relying on volatile commodity exports toward a more knowledge- and technology-intensive model. Productivity can be boosted through a range of measures, including by enhancing the quality of human capital, fostering innovation, and boosting female labor force participation. This last is also a key to stemming the decline in the labor supply caused by the demographic transition.

Productivity-enhancing reforms and economic diversification are needed to reinvigorate Chile's long-term growth prospects. Weak total factor productivity (TFP) growth and the lack of economic diversification have given impetus to concerns about future growth. While capital deepening and increases in labor supply have led the way in the process of convergence, this pattern is not sustainable because additional capital accumulation will not produce commensurate

future marginal returns owing to the diminishing returns and the downward pressure on labor supply exerted by demographic trends. The empirical evidence on whether demographic aging increases or decreases savings and, ultimately, investment is mixed (Bussolo et al. 2015). A further rise in living standards would thus have to be derived from sustained productivity growth.

Inclusion

Chile has also achieved important progress in eradicating extreme poverty and boosting shared prosperity over the last two decades. The country managed to reduce the extreme poverty rate—measured by the share of the population living on less than US\$1.90 a day—to less than 1 percent, one of the lowest rates in the Latin American and Caribbean region. Similarly, the effort to reach the goal in shared prosperity advanced significantly. Between 2006 and 2015, incomes among the bottom 40 percent of the welfare distribution (the bottom 40) rose at an annualized rate of 4.4 percent, more rapid than the growth rate of the top 60 percent of the welfare distribution (the top 60). Increases in labor income and the transition to more productive sectors largely explain the great strides in poverty reduction and shared prosperity.

The substantial income growth over the last decade expanded the size of the middle class, making the middle class the largest socioeconomic group, though it still needs to be further consolidated. The country's middle class is among the largest in Latin America, but heavily skewed: a significant share of the middle class is living closer to the US\$10-a-day vulnerability line.¹ Thus, policies that focus on the sustainability of poverty reduction in addition to the eradication of poverty are needed, given the shifts among socioeconomic groups. Moreover, a growing share of households want assurances that the government's labor and social protection policies and programs will accomplish more than prevent poverty; they are also demanding higher-quality services and better opportunities. The increasing demands of the middle class can also be seen as an opportunity to further strengthen institutions and services. Similarly, to achieve greater prosperity, the government needs to continue to pursue policies that foster productivity.

The government needs to continue improving the quality of key social services to sustain growth and meet the demands of an aging population. Past improvements in the provision of social services has helped increase private sector participation, improve efficiency, and promote individual choice. Though great progress has been made in the quality of public services, which often meet the highest quality standards in Latin America and the Caribbean, some indicators still lag behind the OECD averages along key dimensions. The segmentation of service provision in education, health care, and social security has, however, led to important disparities in access to high-quality services. Constraints in access to good-quality education translates into inequality in the labor market, which also influences health system participation and pension contributions. Given the segmented labor market, only a small share of the labor force enjoys the sustained levels of income, income growth, and consistent participation and contribution rates in the pension system which are necessary but not sufficient to make the system an effective instrument of income replacement in old age. By 2050, over two million Chileans are projected to be over 80 years of age. This is nearly four times the number today, putting additional pressure on improving the health

¹ Although 51.3 percent of the population belonged to the middle class in Chile in 2015 (living on between US\$10 and US\$50 a day), most were concentrated close to the US\$10-a-day line. Indeed, 33.3 percent were living on US\$10–US\$20 a day, whereas only 18.0 percent were living on US\$20–US\$50 a day.

care and pension systems, especially given the country's epidemiologic transition, which is likely to be accompanied by rising medical costs among individuals and the state because of the rise in life expectancy and chronic diseases.

Sustainability

Managing water resources, natural capital, climate change adaptation and social sustainability are the key challenges facing the government in the effort to sustain the gains in poverty reduction and shared prosperity. Rapid growth has been accompanied by increasing pressures on Chile's natural capital, leading to water scarcity, deforestation, fish stock depletion, risks to biodiversity, soil degradation and air and water pollution. The country is also particularly vulnerable to the effects of climate change. Evolving weather patterns are expected to affect Chile's water resources negatively and alter export-oriented agribusiness and silvopastoral systems. Fiscal sustainability is well anchored in a strong and transcending commitment of the government in a sound fiscal rule. Yet, the government will face significant pressures in managing the advanced demographic transition, which may lead to rising costs in age-related public services if it is not addressed in the medium term. On the upside, fiscal position from which to tackle these challenges is solid and sustainable.

Priority Areas

Chile is in the midst of a challenging rebalancing process, and, if the country is to continue to achieve progress in development, a new consensus on equity² and productivity must emerge. Constraints on access to critical high-quality services, the end of the commodity supercycle, and the decline in the size of the working-age population because of the demographic transition now weigh on the country's growth prospects and require that the government forge a new consensus on growth-enhancing reforms that meet the aspirations of all Chileans. These challenges are not unique to Chile. Several countries that are able to transit to income levels similar to Chile's, are struggling with the need to reinvigorate productivity growth and meet the needs and aspirations of a growing middle class. Nonetheless, addressing these challenges in the context of sluggish productivity growth, an aging population, and relatively high inequality will require strong and cohesive vision. Policy discussions should continue to be grounded on technical analysis. Meanwhile, misguided economic policy responses to the challenges to equity pose the risk of undermining private sector confidence and growth. How policy makers and society respond to these challenges will determine the country's future path toward prosperity.

To identify policy areas in which the country faces the greatest challenges in advancing toward the World Bank's twin goals of poverty reduction and sharing prosperity, this SCD first relies on an analytical benchmarking exercise and then validates the main findings using sound analytics paired with a filter for policy areas that would enhance productivity and equity at the same time. The benchmarking exercise compares the performance of Chile with the performance of all other countries in the world, the members of the OECD, and other countries in

² Throughout this SCD equity is defined using the Equality of Opportunities approach that seeks to level the playing field so that gender, ethnicity, birthplace, family background and other characteristics that are beyond an individual's control do not influence a person's outcomes. According to this definition of equity, success should depend on people's choices, effort, and talents, not on their circumstances at birth (Roemer and Trannoy 2016).

the Latin American and Caribbean region. The development indicators selected cover a wide range of topics, including growth and competitiveness, poverty, inclusion, and sustainability. Chile's performance in each indicator is compared with the performance of the best achievers within each comparison group (the world, the OECD, and Latin America and the Caribbean) (annex A). Moreover, this is complemented by also comparing Chile's performance with the performance of regional and structural peers.³

This SCD identifies priority areas that are both equity and productivity enhancing. Priority areas have been selected by identifying policies within a set of interventions aimed at tackling key constraints to both equity and productivity. In addition, recent reforms, as well as the size and time horizon of the expected impacts on productivity and equity, which determine the magnitude of the aggregate impact on welfare, are also evaluated to identify priority areas. These are grouped as follows: (i) Improve the quality of public services; (ii) Enhance the conditions to boost productivity growth: innovation, diversification and energy; (iii) Enhance labor productivity and reduce labor market segmentation; and (iv) Strengthen management of environmental resources and climate change adaptation. In particular, the first priority areas address some of the constraints to social sustainability in Chile.

Improve the quality of public services

- **Improve the quality of education.** Despite significant progress in educational attainment and achievement, Chile lags behind the OECD average in key education outcomes. Firms face increasingly difficulty in hiring workers with appropriate skills. Access to high quality education depends largely on family income. Ensuring that all Chileans have access to high-quality education and that the education system delivers the skills the private sector needs, is critical to the effort to establish a more inclusive, knowledge-based economy.
- **Improve health care regulation and financing to ensure quality of health care provision and equitable access to affordable health insurance.** The health care system would benefit from improvements and the stronger regulation of hospital care, particularly in primary health care and in human resources. The incidence of obesity, smoking, and noncommunicable diseases such as diabetes, combined with an aging population, will put more pressure on the system in the near future. Public health care spending has increased, but it's efficiency and targeting can be further improved. The insurance market needs better regulation to address for example differences in premiums, especially among women and the elderly, and to standardize benefits.
- **Evaluate the adequacy of the pension system.** While the pension system is based on sound principles and is characterized by strong governance, it leaves a significant share of retirees without retirement security. The average Chilean employed in the formal sector spends four years in any given job, limiting their potential to contribute. Approximately 79 percent of pensions are lower than the minimum wage. Different policies are needed to address these inequities, both for current pensioners with insufficient retirement funds and current workers that are not accumulating enough for their own retirement. If not addressed, Chile's pension

³ The regional peers are Colombia, Mexico, and Peru (fellow members of the Pacific Alliance), and the structural peers are Australia, Canada, and Norway.

system will likely lead to greater old-age poverty as old age is frequently accompanied by a loss of earnings and a reduction in income. Though the pension system itself does not have a direct impact on productivity the outcomes are not socially optimal and could have indirect impacts on productivity as some may choose to leave the labor market to care for their elderly.

Enhance the conditions to boost productivity growth: innovation, diversification and energy

- **Boost innovation.** To achieve sustainable productivity growth, Chile needs to close the technology and innovation gap, increase spending on research and development (R&D), and remove barriers to entry by continuing to improve competition policy regulation. Chile's spending on R&D is low compared with its peers and has not increased substantially in the last decade, with most of it concentrated in the publicly funded university sector. The marginal return to firm-level R&D may be substantial, positively affecting employment, wages, and productivity (Alvarez et al. 2012). Although Chile has developed a strong base of entrepreneurs, and new business formation is accelerating in response to regulatory improvements and government programs, including Start-up Chile, program scale and take-up have not been sufficiently large yet to have a substantial impact. To boost innovation, programs should be reviewed and designed such that they may be adequately evaluated to ensure they are cost-effective. Resources should be targeted on programs that have the largest impact on productivity. Supporting entrepreneurs beyond the start-up phase and encouraging firms to increase investments in R&D could mitigate the problems. Coordination among Chile's innovation policy-making agencies, potentially through a new ministry of science and technology, could provide greater policy coherence.
- **Promote export diversification.** Trade diversification both geographically and in the product space by upgrading value chains, removing barriers to competition, and encapsulating processes in services is needed to realize the shift toward an economic model that is more knowledge and technology intensive. The goal of Chile's Productivity, Innovation, and Growth Agenda is precisely to move from an economy based on natural resources to a knowledge-based one. This requires improvement in the quality of human capital and the incidence of innovation. Chile could draw upon its comparative advantage within copper mining, but make further progress in moving up the mining value chain as well as entering the markets for mining services. Service exports need to be boosted, and the transport sector can be liberalized to strengthen competitiveness. A product map analysis could also help define potential new sources of diversification and exports. So could a value chain analysis, by mapping the position of Chile in the different value chains and identifying the next akin tasks where Chile could capture more value domestically, or gain efficiency by outsourcing and substitute upstream with downstream activities. In doing so, policies that are needed to reach this new innovation frontier could be defined.
- **Continue strengthening, modernizing and improving the energy sector.** Recent changes in the country's energy sector could have important impacts on the economy, productivity, and inclusion. Chile's substantial renewable energy expansion, paired with competitive auctions, have led to substantial drops in the cost of electricity. Moreover, the link between the General Interconnected System and the Central Interconnected System over a single transmission line will lower costs additionally. This will help the private sector and households alike as they

benefit from the lower energy costs generated through less highly polluting methods. Poor households would particularly benefit. Even if virtually every household in Chile has access to electricity, some of the poorest still rely on more highly polluting, yet cheaper sources of energy (such as wood for heating and cooking and kerosene for lighting). This has important effects, for example, on health because of indoor air pollution, poorer educational attainment associated with lack of adequate lighting, and less labor force participation because of the time spent collecting wood.

Enhance labor productivity and reduce labor market segmentation

- **Increase female labor force participation.** Female labor force participation in Chile lags behind the OECD average. Removing barriers to female labor force participation, such as lack of access to affordable childcare, cultural norms, unutilized provisions for paternity leave, rigid working hour regulation, and limited active labor market policies, would improve inclusion and long-term growth, particularly because of the rapidly shrinking working-age population. A low female participation hurts economic growth through by holding back overall labor supply thereby directly affecting the level of real output and by reducing productivity owing to resulting mismatches between worker skills and occupations (Hsieh et al. 2013). The implied income loss of Chile's gender gap in the work force is estimated at 20 percent (Cuberes and Teignier 2015).⁴ Even though the government has introduced financial incentives to help participation at the margin, its effect on employment has been low.⁵ Thus, a more flexible approach to working hours, which are strict in Chile, may also help, for instance by promoting teleworking. Similarly, improving public transportation and locating child care centers closer to employment centers may provide the necessary incentives at the intensive margin for younger women to actively look for employment and for parents to send their children to higher quality yet more distant schools.
- **Enhance the links between education and the labor market.** The country lacks well-established education-labor market links, resulting in skill mismatches and losses in labor productivity. The extent of qualification mismatches is greater in Chile than in many OECD countries. A concerted effort among employers and education providers is required to promote active engagement in the design and implementation of educational programs that correspond to the country's labor market needs. Strengthening the link between industry and university research could also boost innovation through greater investments in R&D. This should also include technical and vocational education, which represents an alternative means to prepare students for the labor market.
- **Evaluate the adequacy of the labor market structure and regulation.** There are vital trade-offs between more flexibility and more rigidity in the labor market, and the case of Chile is a good example. On the one hand, labor market flexibility allows the private sector to adapt more rapidly to changing conditions (an important asset for a small open economy), whereas labor market rigidity would become a drag that could affect productivity growth. Chile's flexible

⁴ Comparative income loss estimates for the OECD and Latin America and the Caribbean are 15 and 17 percent, respectively.

⁵ This includes an in-work benefit (benefiting 180,000 women in 2012) of up to US\$67/month as part of the cash transfer program as well as a 50 percent subsidy to the employer.

labor market has contributed to past economic growth. On the other hand, however, labor market flexibility transfers some of the risk from the employer to the employee, leaving some workers more vulnerable to shocks, which could enhance inequality if adequate safety nets do not exist. Therefore, it is essential to balance the trade-offs imposed by these objectives. In addition, current Chilean legislation provides strong protection for employees with indefinite contracts, whereas workers in nonstandard contracts have little or no security, in fact segmenting the labor market.

Strengthen management of environmental resources and climate change adaptation

- **Strengthen water management.** The private ownership and free tradability of water rights have led to the overexploitation of water resources. There is a need to strengthen the capacity of government authorities in water resource management. . In the Chilean model, the rights to use water are not concessions on the public domain, but rather private property rights. Yet, water belongs in the public domain. The need to strike the proper balance between the roles of the state and the private sector in the administration of water resources is at the core of water resources management issues in Chile. The role, power, and means of the Water Authority need to be strengthened at national and basin level to ensure water sustainability and economic development. Taking preparatory action to address current and future water stress will be crucial to ensure water resources sustainability and reduce vulnerability.
- **Further strengthen and incorporate climate change adaptation and mitigation measures.** Despite Chile's resilience to natural hazards, the country will need to cope with the adverse effects of climate change on disaster risk. Chile's characteristics place it among the countries that are at risk of being affected by changes in prevailing global climate patterns. The 2017 forest fires were partly a result of poor preparation for climate change though such an event was unprecedented in Chile. Harsher and more recurrent events increase the vulnerability of the poor to disasters, making it harder for them to break out of the poverty cycle.
- **Improve conservation efforts in protected areas and biodiversity.** Economic growth has put pressure on Chile's natural capital resulting in deforestation and biodiversity loss. Although important advances have been made to strengthen the National System of Protected Areas, challenges remain. In particular, there is no biodiversity and protected areas service within the Ministry of Environment. Despite the government's awareness of this institutional fragmentation, relevant draft legislation has been discussed since 2014, but never passed. Furthermore, at present, the government does not have a public policy to promote private protected areas even though around 80 percent of its continental territory is privately owned.

Knowledge and Analytical Gaps

In the process of reviewing and analyzing existing data and research on Chile, a series of knowledge and analytical gaps needed to inform policy decisions were identified. Although there is vast research and analysis on Chile, the availability of more knowledge and data collection would provide more information to support the design of concrete policies to address the key constraints identified throughout the SCD. Knowledge gaps have been identified, as follows:

- **Census:** The country lacks an updated census. The 2012 census failed to survey over 9 percent of the population. A shorter census consisting of 21 questions was therefore conducted on April 19, 2017.
- **Reliable estimates of the indigenous population:** The target population and the survey methods in the measurement of the indigenous population and their characteristics in the national census have changed significantly over the years, and census estimates of the population share of the indigenous population vary widely. The indigenous section of the census questionnaire is generally based on self-identification with legally recognized, predefined communities.
- **Immigration:** The government has few formally established migration policies and limited data on immigrants to evaluate the potential impact of immigration on the economy and on social services.

Chapter 1. Introduction

1.1. Setting the Stage: What Makes Chile Unique?

- 1. Within the Latin America and Caribbean region, Chile stands out for having doubled per capita income between 1990 and 2015, one of the lowest poverty rates and maintained relatively high inequality.⁶** Chile joined the Organisation for Economic Co-operation and Development (OECD) in 2010, though gross domestic product (GDP) per capita is 2.5 times lower than that of the OECD average. It is one of the few countries in the region to have experienced sustained income convergence with the United States over several decades. It has one of the lowest poverty rates in the region, including a global extreme poverty rate, as measured by those living on less than US\$1.90 a day, below 1 percent.⁷ The country made good progress on shared prosperity and poverty reduction. Between 2006 and 2015, incomes among the bottom 40 percent of the welfare distribution (the bottom 40) rose by 4.4 percent a year, more rapidly than the growth rate among the top 60 percent; similarly, it has one of the lowest poverty rates in the Latin America and Caribbean region. National extreme poverty was below 4 percent in 2015. Though Chile's redistributive capacity has been better than that of similar countries in the region, inequality remains high compared to OECD countries. Moreover, given Chile's geographical and territorial characteristics, including a south Pacific coastline 4,270 kilometers long north to south, but, east to west, a maximum width of only around 350 kilometers, there are significant regional inequalities and sustainability challenges, particularly in the Atacama Desert in the north, the Andean peaks on the east, and Patagonia in the south. Frequent earthquakes and volcanic eruptions add to the potential risks and vulnerabilities encountered on the development path.
- 2. Chile's exceptional growth path could be explained by these characteristics: macropolicies and institutions, market-oriented policies, and commodity dependence.** The relevance of each characteristic for Chile is discussed further below. The first dimension includes economic (such as Central Bank independence) as well as noneconomic aspects (such as low corruption). Market-oriented policies can be divided into policies that aim to improve productivity growth (for example, trade liberalization) and policies that affect service delivery (for instance, health care). As the largest copper producer and exporter in the world, Chile's commodity dependence affects real, fiscal, and external sectors.
- 3. The country is well advanced in the demographic transition, which may affect economic growth, labor productivity, and the cost of providing public services.** In the past, growth was supported by a strong demographic dividend. However, the process of demographic transformation accelerated in the 1970s and 1980s, with sharp declines in fertility and mortality rates, and, by 2015, Chile had the highest life expectancy rate and the second highest median age in Latin America and the Caribbean. A shrinking share of working-age population may have important implications for economic growth, labor productivity, and the cost of providing public services.

⁶ In 1990, Chile's GDP per capita (constant 2010 US\$) was US\$6,105.50; by 2015, it had reached US\$14,660.50. In contrast, in Latin America and the Caribbean in 2015, GDP per capita was US\$9,342. See WDI (World Development Indicators) (database), World Bank, Washington, DC, <http://data.worldbank.org/products/wdi>.

⁷ As measured using the global extreme poverty line of US\$1.90 (2011 purchasing power parity [PPP]).

4. These characteristics contribute to an understanding of what makes Chile unique, its past performance, and its future challenges. An analysis of the country through the lens of strong macropolicies and institutions, market-oriented policies, substantial commodity dependency, and the demographic transition helps shed light on the successful growth performance and the challenge of reducing inequality.⁸ They also help identify future challenges. Challenges in increasing access to critical high-quality services, the end of the commodity supercycle, and a decline in the share of the working-age population weigh on long-term growth prospects and require that the government forges a new consensus on growth-enhancing reforms that meet the aspirations of all Chileans

1.1.1. Strong institutions and macroeconomic policies

5. Strong macroeconomic policies have been well anchored in sound fiscal and monetary institutions. Chilean policy makers have demonstrated strong commitment to fiscal responsibility since the mid-1980s, including through the introduction of the copper stabilization fund in the late 1980s and a fiscal rule in 2001. The adoption of a fiscal responsibility law in 2006 and the creation of sovereign wealth funds further institutionalized the fiscal framework. Chile's structural fiscal balance rule is often cited as a prime example of effective fiscal management in commodity dependent economies and of how to institutionalize countercyclical fiscal policies. Cornerstones of Chilean monetary policy include the introduction of Central Bank independence (1989), a fully flexible exchange rate (1992), and inflation targeting (1999). These policies helped institutionalize and safeguard macroeconomic stability, resilience, and credibility. In addition to conferring important benefits to Chile, this economic policy framework has served as a role model for other countries in the region and beyond.

6. Chile is a top performer on a range of broader indicators of governance and high-quality institutions. A strong national consensus about the country's growth path enabled the government to pursue ongoing, comprehensive institutional reform during recent decades and maintain one of the highest ranks on governance in Latin America and among OECD countries over the last two decades. The worldwide governance indicators suggest that governance is high quality in most dimensions. Areas of particular strength include regulatory quality (89th percentile), control of corruption (88th percentile), rule of law (87th percentile), government effectiveness (83rd percentile), and voice and accountability (76th percentile).⁹ Property rights are also relatively strong, according to the relevant Economic Freedom subindex, which places Chile in the 85th percentile. The global competitiveness index (pillar 1) ranks Chile's institutions at the 77th percentile.¹⁰

7. Sound fiscal and monetary policies and a strong institutional framework combined with structural reforms generated substantial and stable growth. Since the mid-1990s, inflation has largely fallen below that of Latin America and the Caribbean and approached OECD levels. Chile

⁸ These factors only provide partial insights. Many other explanatory factors are discussed in more detail throughout this report.

⁹ On political stability and the absence of violence and terrorism, Chile ranks at the 59th percentile. Data of the Worldwide Governance Indicators is for 2015.

¹⁰ See GCI (Global Competitiveness Index) (database), World Economic Forum, Geneva, <http://reports.weforum.org/global-competitiveness-index/>.

has also achieved better fiscal outcomes than regional and most structural peers¹¹ in recent decades, as reflected by low fiscal deficits and limited gross public debt levels (17.5 percent of GDP in 2015). When assets are included, Chile's net financial position has been positive during most of the 2000s and has only recently turned negative. These achievements supported the country's favorable credit rating (Standard & Poor's: AA-) and its low sovereign risk premium – among top 30 worldwide. Similarly, the relevant global competitiveness index subindicator for macroeconomic performance places Chile at the 79th percentile of countries in 2015.¹² As a result of sound policies and strong institutions, Chile's growth volatility has been significant lower than that of other nonfuel primary exporters. Lower volatility helped sustain growth and mitigate the impact of economic shocks on the population.

1.1.2. Market-oriented policies

- 8. Chile has become a benchmark for implementing comprehensive and sustained, growth-enhancing, market oriented, structural reforms.** The country was among the first to implement far-reaching trade and market liberalization in the mid-1970s. It has pioneered in the field of competition law and policy (since 1973) as well as Public Private Partnership in infrastructure provision (since 1991). Together with a liberal environment for the private sector, this framework has held up well over time, including in the face of external shocks. By the mid-2000s, Chile had fully caught up with the OECD average in areas such as trade, the current account, the capital account, agriculture, and domestic finance liberalization, while lagging on energy and telecoms (networks) liberalization. Chile ranks 7th globally on the Economic Freedom Index performing particularly well on the subindex for open markets in trade, investment and the financial sector.
- 9. More than its regional and OECD peers, Chile has pioneered changes to the social contract.** Seeking the right balance between promoting freedom of choice and protecting the vulnerable, structural reforms have been enacted in Chile's recent history that shift the burden of risks to well-being among the state, employers, and individuals. Some of the more well-known reforms, most of which were conceived and implemented during the 1970s and 1980s, include the introduction of privately managed mandatory retirement savings accounts, mandatory unemployment insurance based on individual savings accounts and vouchers to access private education. Chile also implemented a private market for water rights. Successive democratically elected governments have continued to redesign policies and programs to help reduce the burden of individual risk. For example, the pension system is to a large extent privately administered and includes a solidarity pillar for the poor. A private health system covers about 15 percent of the population and relies substantially on payroll contributions and copayments.

- 10. Chile has solid social institutions and policies to support the poor and vulnerable.** The guiding objective of reforms, the details of which varied from one administration to the next, has

¹¹ The regional peer countries in the Pacific Alliance selected included Colombia, Mexico, and Peru, given the interest of the government of Chile in this regional group of peers. For structural peers, countries were selected with similar economic characteristics relative to Chile based on the following criteria: (a) a high-income OECD country, (b) natural resource exports accounting for more than 30 percent of total exports, (c) a population greater than 5 million people, and (d) existence of a sovereign wealth fund. These criteria deliver three structural peers: Australia, Canada, and Norway.

¹² See GCI (Global Competitiveness Index) (database), World Economic Forum, Geneva, <http://reports.weforum.org/global-competitiveness-index/>.

been to prioritize the least well off households, consolidate a wide array of cash subsidies, ensure the inclusion of isolated and disconnected households, and articulate the government efforts to assist the poorest citizens into a coherent and cohesive system. These efforts put Chile at the forefront of public policy for the poorest households among its neighbors and even ahead of many OECD members which still administer relatively fragmented and incoherent social assistance systems. Since 2002, *Chile Solidario* has been the foundation on which the government consolidated its programs for the poorest families. Since 2012, it was replaced by the *Ingreso Ético Familiar* effort, which delivers a set of monetary transfers supported by the provision of social support, social and labor support, and preferential access to some social benefits from the state.

11. Market-oriented principles have contained the size of the government. At 25 percent in 2015, public expenditure as a share of GDP is the lowest in OECD (which averages 44 percent) and structural peers (42 percent), but similar to regional peers.¹³ Low social benefit expenses explain a large part of Chile's low spending level. Fiscal revenues, at 23 percent of GDP, are also lower than the OECD (44 percent) and Chile has the lowest tax revenue in the OECD despite an efficient tax administration.¹⁴ The origins of small government spending were a series of pioneering reforms implemented in the early 1980s, including an increased private provision of pensions, health care and education. These reforms had the goal to increase efficiency and promote individual choice. Public spending remained at around 20 percent of GDP until mid-2000, but increased in the second half of the decade. Around 40 percent of spending growth between 2010 and 2015 was absorbed by subsidies and grants as the government increasingly outsourced the provision of public services, especially in education and health. Recent equity¹⁵-enhancing reforms aim at raising tax revenues by 3 percent of GDP to finance greater public spending on education. Even after the full implementation of this reform, however, public spending on education in GDP terms will remain the lowest in the OECD.

1.1.3. Commodity dependence

12. The country's per capita natural capital is relatively extensive, particularly in minerals and forests. According to the latest available data (2005), Chile's natural capital per capita is above the 75th percentile in the world, OECD and Latin America. Chile has the largest global reserves of copper and is the world's largest copper producer and exporter.

13. Mining has played a key role in Chile's economy, especially since 2000. Mining exports rose from less than 10.0 percent of GDP during the 1990s to 24.5 percent in 2007. On average, they accounted for about half of exports of goods and services, 10.0 percent of GDP, and half of the inflows of foreign direct investment (FDI) in 2003–14 and thus contributed more to the economy in Chile than elsewhere in Latin America and the Caribbean or the OECD. Mining

¹³ International Monetary Fund, World Economic Outlook Database, April 2017.

¹⁴ Tax Revenue (database), Organisation for Economic Co-operation and Development, Paris (accessed on March 28, 2017), <https://data.oecd.org/tax/tax-revenue.htm>. In order to have comparable measures with other countries, data from IMF and OECD statistics are reported. The latest available comparable spending and revenue data is for 2015.

¹⁵ Throughout this SCD equity is defined using the Equality of Opportunities approach that seeks to level the playing field so that gender, ethnicity, birthplace, family background and other characteristics that are beyond an individual's control do not influence a person's outcomes. According to this definition of equity, success should depend on people's choices, effort, and talents, not on their circumstances at birth. (Roemer and Trannoy 2016)

contributeds around 20 percent of revenues between 2004 and 2014. It also contributed significantly to growth: up to a third of recorded per capita growth can be attributed to mining during the commodities supercycle, which is one of the strongest effects observed in the Latin America and Caribbean region (Araujo et al. 2014). The decline in copper prices by almost 40 percent between 2011 and 2015, has depressed exports, investment, fiscal revenues and growth.

1.1.4. Demographic transition

14. Chile also reaped the benefits of a significant demographic dividend. Its working-age population increased from 55 percent of its population during the mid-1960s to 68 percent by 2015 as generations of children born during periods when fertility rates were high entered the labor force.¹⁶ As fertility rates declined, female labor force participation rates increased from 37.4 percent to 56.0 percent between 1996 and 2015, thereby increasing the labor supply. Analysis suggests that the first demographic dividend may account for about half a percentage point of the annual growth rate in this period and contributed to an increase in consumption per adult of 35 percent. The population also experienced large gains in life expectancy, from 63 years in 1970 to more than 80 years in 2010, which supported savings and investment. However, the share of working-age population is expected to decline, putting brakes on growth. Between 1998 and 2025, the share of people older than 65 years of age is expected to double, from 7 percent to 14 percent.

1.2. Key Characteristics in Explaining Past Performance and Future Challenges

15. Chile is unique in terms of the relative ranking of these characteristics. The factors that make Chile special can be approximated or illustrated by three indicators: the sovereign credit rating (reflecting strong macropolicies and institutions), the size of government spending (reflecting pro-market policies), and the share of commodity exports in total exports (reflecting commodity dependence).¹⁷ Among 91 countries for which data are available, Chile is the only country that has a top 30 credit rating. It is also the only country in which government spending is below 30 percent of GDP, and it is among the countries in which commodity exports account for over 50 percent of total exports. These combined factors capture a unique set of circumstances. Indeed, Chile emerges as one of the few commodity-dependent countries with strong institutions and market-oriented policies. In addition, it is advanced in the demographic transition. While these characteristics have been critical to Chile's growth success, they also define the current and future challenges facing the country.

16. The end of the commodity supercycle and the demographic transition pose challenges for the economy's growth potential. Growth has been substantial and stable, averaging 5.1 percent between 1984 and 2014, largely driven by capital deepening, labor accumulation, and strong productivity growth within sectors. The decline in copper prices, if permanent, is likely to slow

¹⁶ Chile's total fertility rate peaked at 5.2 in the mid-1950s and has declined to 1.7 by 2015.

¹⁷ None of these indicators perfectly matches the concept they are intended to reflect. These are only approximations and have both advantages and limitations. In particular, there is always a trade-off between using an indicator that more closely resembles the concept it is intended to illustrate, with the downside that it is usually associated with few comparable observations, versus using an indicator that provides information and offers comparability, even if the relationship with the target concept is not a close one.

growth over the medium term. There are a broad range of options for boosting growth in the future (see chapter 2).

17. Market-oriented policies helped propel growth and poverty reduction, but some posed challenges for inclusion when applied to social policies. Voucher schools delivered on education access, but might have contributed to increase segmentation in education by giving schools more freedom to choose the best students as opposed the original intent of letting students choosing the best schools. Labor market regulations may appear tight de jure, but in practice firms are often relatively free to hire and fire and workers have relatively limited bargaining power vis-à-vis employers. Improved provision on health care, pensions and unemployment support could lead to better insurance for citizens against large-scale risks outside of their control. These points are examined in Chapter 3.

18. Additional pressures on environmental, social, and fiscal sustainability have emerged:

- Rapid economic growth has strained the country's natural resources and led to increasing environmental concerns. Environmental protection has gradually gained attention in the political decision-making process since the 1990s, allowing the government to lower the pressures on natural resources and implement an environmental agenda, particularly on issues linked to health, international trade, and water and energy security. Meanwhile, the power sector has faced the challenge of keeping pace with economic growth because of its substantial dependence on energy imports, thereby raising awareness of the challenge of energy security and the link with energy efficiency and environmental protection. Additionally, climate change is expected to negatively affect the country's water reservoirs and change temporal and spatial precipitation trends, thus exerting additional stress on the already limited availability of freshwater. Aware of this, the government has made notable progress in incorporating climate change adaptation and mitigation measures into strategic long-term decision making.
- Constrained access to opportunities and increased demand for higher quality public services has led to social tensions and a departure from the consensual politics of past decades. Fault lines in society will make it more difficult to redefine the growth strategy and social contract.
- The decline in the working-age population, comparable only with Costa Rica and Uruguay in the region and closer to the experience in East Asia and Europe, will exert pressure on the health and pension systems, but has important implications for long-term growth and social cohesion. For example, guaranteeing equitable access to high-quality education and enhancing access to well-paying jobs will quickly become a necessary condition for stemming the economic impact of the declining in the working-age population by tapping into talent across every income deciles and continuing to increase the labor productivity of a shrinking labor force. An ever-increasing share of the elderly will raise the demand for public services such as pensions, health care, and long-term care (see chapter 4 for more on these challenges).

1.3. The Chile SCD Framework

19. Chile is in the midst of a challenging rebalancing process. Constraint access to critical high-quality services, the end of the commodity super-cycle and a decline in Chile's working-age

population now weigh on Chile's growth prospects and require for Chile to forge a new consensus on growth-enhancing reforms that meet the aspirations of all Chileans. These challenges are not unique in Chile. Several countries that were able to transit from a middle-income to Chile's income level faced challenges to implement reforms in support of strong productivity growth and meet the needs and aspirations of a growing middle class. Addressing these challenges in the context of high inequality, sluggish productivity growth, and an aging population will require a strong and cohesive vision.

20. The protests that have emerged in Chile since 2011, student, mining and pension protests, reflect the challenge. By one interpretation, the student protests emerged out of the frustration of thousands of young people and families who have borrowed to invest in their future through higher education without being able to find the high-quality jobs to pay back student debt. As discussed in more detail in Chapters 3 and 4, barriers to access of opportunities in education and labor market that individuals encounter over the life cycle ultimately translate into insufficient retirement security. More fundamentally, the challenges facing the education sector and pensions system in Chile are at the core of a broader political discussion along classical left-right divides, which has characterized Chile's modern history, particularly since the early 1970s.

21. Chile experienced a deterioration in the external environment since 2011, which also shapes its current challenges. A favorable external environment through high copper prices was one of the main drivers of Chile's recent growth, but prices have fallen substantially since 2011. With lower copper prices, the economy's potential rate of growth has also declined. Indeed, both variables have resulted in lower fiscal revenues and the need to reduce the rise in public spending. Moreover, lower copper prices have exposed long-standing structural weaknesses of the economy, which the commodity boom had temporarily hidden. These include sluggish productivity growth and lagging economic diversification and complexity. These observations, in turn, lead to the following central corollary of the Chile SCD:

Corollary: Establishing a political and technical consensus around the equity-productivity agenda in Chile is critical to placing the country on a trajectory of more inclusive growth.

22. If the country is to make continued progress, a new consensus on equity and productivity needs to emerge. Providing better and more accessible services—as many citizens demand—will help boost productivity and income for society in the longer term. Yet, it may also require higher taxes and more regulation which could impose an economic burden. The country needs a common vision for the future. How policy makers and society respond to these challenges will determine the country's future path toward prosperity.

23. A political consensus on the equity-productivity agenda would involve a stronger balance between objectives. Table 1.1 classifies policies depending on their effects on equity and productivity. Win-win policies that promote both objectives are obviously the most desirable, but are relatively scarce and trade-offs can be significant. At the core, is the question about the government's role. Productivity-enhancing reforms could lead to an increase in inequality in the absence of well-designed education reforms. Excessive labor market regulation or progressive income taxation tends to promote equity while holding back productivity. Policy makers on the traditional left may be more willing to trade-off some productivity to make gains on equity.

Conversely, policy makers at the right of the political spectrum typically place a larger emphasis on meeting productivity objectives. Since inclusive growth requires progress on both dimensions, consensual policies that do not consistently favor one trade-off (type I or II) over the other and that reinforce each other would be needed to ensure sustainable progress and improved societal balance.

Table 1.1. The Productivity-Equity Nexus

<i>Policy</i>	<i>Equity enhancing</i>	<i>Equity reducing</i>
Productivity enhancing	Win-win	Trade-off I
Productivity reducing	Trade-off II	Bad policy

24. Policies that promote equality of opportunity and at the same time enhance productivity seem particularly warranted in Chile going forward. The Equality of Opportunities approach seeks to level the playing field so that gender, ethnicity, birthplace, family background and other characteristics that are beyond an individual's control do not influence a person's outcomes. According to this definition of equity, success should depend on people's choices, effort, and talents, not on their circumstances at birth. To the extent that talent is relatively evenly distributed across the income distribution and that there are barriers that prevent such talent from reaching its full productive potential, the elimination of such barriers would also promote productivity. The pursuit of equal opportunity may also lead to a more equitable distribution of outcomes, such as employment earnings, if marginal or excluded groups are able to convert better opportunities into better earnings. It follows that the policy pursuit of equality of opportunity would support both the equity and productivity objectives and fall into the win-win category.

25. The identification of policies aimed at equal opportunity and the quantification of benefits and trade-offs of other policies would foster more nonpartisan institutions. A polarized political debate has spilled over into an almost equally polarized technical debate. Many institutions at all levels appear to have an increasing bias, relying less on objective technical analysis. Chile lacks a tradition for independence in the civil service as known in OECD countries, such as the United Kingdom. It has a shortage of institutions that can offer technical and nonpartisan evaluations of alternative economic policies. While initially successful, it has not been able to establish independent think tanks that take pride in offering unbiased analysis. Even at the individual level, most social scientists are either labeled or referred to as center-right or center-left. The absence of nonpartisan institutions undermines the development of an objective set of facts and options that policy makers can debate and choose from. Hence, a technical consensus over the equity-productivity agenda is equally warranted in Chile.

Auxiliary corollary: Chile's public services must more effectively meet the needs and expectations of the country's large and growing middle class.

26. Chile's large and growing middle class plays an important role in shaping the productivity-equity agenda. More than half of Chile's population can be classified as middle class. Not only is the median voter from the middle class, but the middle class also constitutes the majority of the electorate. The well-being and political views of the middle class are therefore critical in Chile's democratic system of decision making.

27. However, the middle class is somewhat disgruntled with health, education and pension services on offer. Public services such as health care, education, and the pension system are dualistic in Chile and tend to serve the tail ends of the income distribution relatively more. The rich can thus afford higher-quality private health care and education services and earn enough to secure decent replacement rates in the private pension system. The government also takes relatively good care of the poor, through public education, health care, and a solidarity pillar supporting a minimum pension, in addition to social safety nets. So, while the plight of the poor may not be enviable, the state devotes substantial resources to the support of the poor. The middle class is caught in between. Few in the middle class can afford private health care. Some may have access to private education, but they cannot go to the best schools and universities, thereby obtaining the best jobs. Their earnings and the stability of employment history are not sufficient for a reasonable pension and they do not have access to social subsidies. The recent student protests also reflect the discontent of the middle class.

28. This SCD explores the constraints to confronting the country's development challenges. It argues that renewed consensus around the equity-productivity agenda is critical for inclusive growth. This agenda is being gradually shaped through an ongoing negotiation among the political and business establishment and the emerging middle class. It needs to be well informed by independent and objective analysis of facts and of the implications of the various options. Most of all, it needs to demonstrate how to make the Chilean society more equitable while enhancing productivity growth on which the country's prosperity depends.

29. To identify policy areas where the country faces the largest challenges to advance on the twin goals the SCD uses an analytical benchmarking exercise comparing Chile's performance with that of other countries in the world, the members of the OECD, and other countries in Latin America and the Caribbean. The development indicators selected cover a wide range of topics, including growth and competitiveness, poverty, inclusion and sustainability. Chile's performance in each indicator was compared with that of the best achievers within each comparison group (the world, the OECD, and Latin America and the Caribbean) (see annex A). Moreover, this is complemented by comparing the performance of Chile and its regional and structural peers.

30. The remainder of this document is structured as follows. Chapter 2 presents the drivers of and constraints to economic growth, and is structured in three parts, (i) growth performance, (ii) productivity constraints, and (iii) external sources of growth. Chapter 3 examines the drivers of poverty, shared prosperity, and inclusion and is structured in three parts, as follows: (i) performance in poverty, inequality, shared prosperity, and nonmonetary measures of well-being, (ii) drivers behind the performance on these measures, and (iii) inequality of opportunities as a binding constraint on inclusion. Chapter 4 discusses environmental, social, and fiscal sustainability and identifies key sustainability-related constraints on achieving the twin goals over the longer term. Chapter 5 presents the proposed prioritization process and concludes.

Chapter 2. What are the critical factors driving output and productivity growth?

“Mayor productividad es la única forma de mantener las mejoras en bienestar en el largo plazo.”¹⁸
— SCD consultation mission, Productivity Commission

Over the past three decades, Chile achieved strong economic growth characterized by substantial capital deepening and backed by a strong macroframework. The key driver of sustained long-term growth was market-oriented structural reforms, which helped improve economy-wide efficiency, and the recent commodity boom associated with strong demand from China. However, the recent trade slowdown has exposed the underlying challenges to productivity and diversification that predated the boom, but were less of a policy imperative then. The government thus faces the challenge of gradually shifting from a growth model relying on volatile commodity exports toward a more knowledge- and technology-intensive model. Productivity can be boosted, including by enhancing human capital, fostering innovation, and raising female labor force participation. Creating an environment that enables product upgrading within areas of specialization and export diversification, including in services, are also needed to sustain growth.

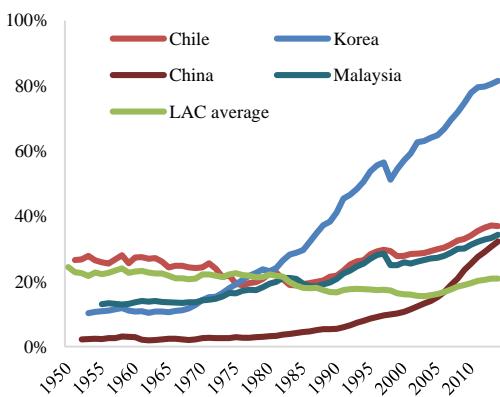
2.1.Drivers of Growth

2.1.1 Trends and Economic Characteristics

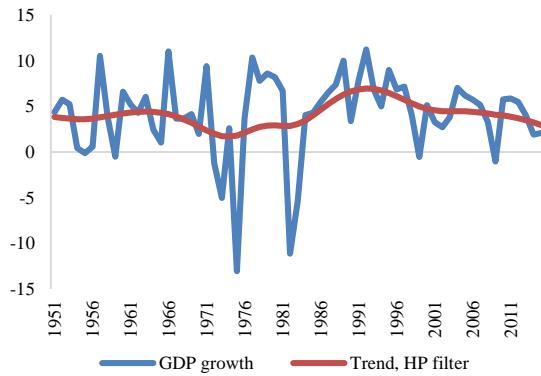
31. Chile is one of the few successful Latin American countries to have achieved sustained income convergence over several decades. Income per capita relative to the United States declined between the 1950s and the 1970s, but then started rising in the early 1980s (Figure 2.1). By 1994, it surpassed the level attained in 1950 (27 percent) before reaching 37 percent by 2014. By comparison, the Latin America and Caribbean region only started converging during the 2000s. Chile converged more rapidly than Malaysia, though not as rapidly as China and the Republic of Korea. It joined the OECD in 2010 and was classified as a World Bank high-income country in 2013.

Figure 2.1. Growth Trends and Characteristics

a. Real GDP per capita, % of U.S. value, 2005 prices

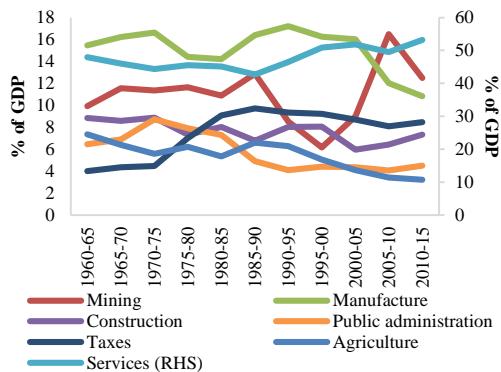


b. Real GDP growth and Trend, %, 1960–2015

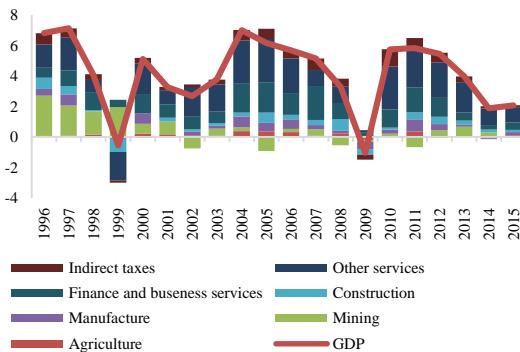


¹⁸ Greater productivity is the only way to maintain welfare improvements over the long term.

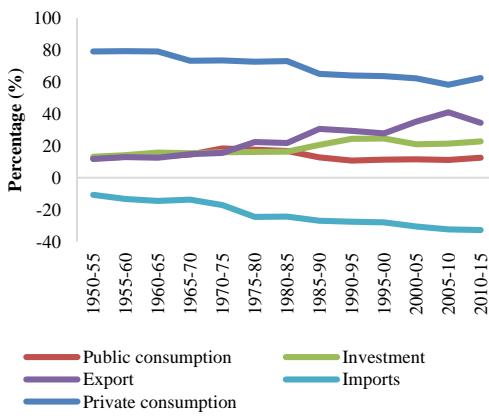
c. Nominal GDP supply-side shares, %



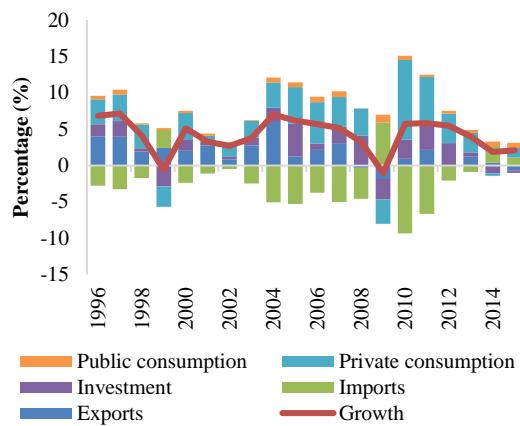
d. GDP growth, supply-side decomposition, %



e. Nominal GDP, demand-side shares, %



f. GDP growth, demand-side decomposition, %



Sources: a: WDI (World Development Indicators) (database), World Bank, Washington, DC, <http://data.worldbank.org/products/wdi>; b-f: Data of the Central Bank of Chile.

Note: c. Right-hand side axis is linked to services.

32. **Growth has been relatively strong and stable since the mid-1980s.** Between 1984 and 2014, annual real GDP growth averaged 5.1 percent (4.1 percent per capita) compared with 2.9 percent (1.4 percent per capita) in the Latin America and Caribbean region. The growth acceleration was particularly strong between 1986 and 1997, known as the golden period, averaging 7.2 percent per year (6.0 percent per capita). Despite its commodity dependence, growth was relatively stable over the past decades with the exception of short-lived interruptions during the 1998–99 Asian crisis and the 2008–09 global financial crisis (Figure 2.1). As Chile reached high-income status, the sustained high growth rates of the past are less likely to return.

33. **Chile's economy is dominated by services and mining.** These sectors accounted for 61 percent and 12 percent of GDP, respectively, in 2014. Chile's mining sector consists mainly of copper (91 percent) and gold (4.7 percent). The country has followed the trodden path of development, whereby services have gained importance, while manufacturing and agricultural output shares declined as per capita income increased (Figure 2.1, panel c). Among services, business and enterprise services has risen substantially since the 1960s, from 5 percent to 20 percent of output. Nonetheless, services account for a smaller share in Chile than in the OECD (75

percent) and Latin America and the Caribbean (65 percent), which is partly caused by the prevalence of mining.

34. Private consumption and investment were the main factors in terms of aggregate demand growth. Between 1950 and 2014, Chile experienced a gradual increase in the GDP shares of total investment (from 13 to 23 percent) and exports (from 12 to 35 percent) while private consumption declined (from 80 to 62 percent). Export growth, in turn, facilitated an equivalent rise of imports (Figure 2.1.5). Total investment was driven by mining-related private investment, as public investment was relatively low at about 3 percent of GDP. Given its still substantial GDP share, private consumption explains most variations in annual growth rates. The contribution of investment to growth is more substantial than the share of investment in GDP would suggest owing to high underlying growth rates (Figure 2.1.6). The rise in FDI, particularly in the mining, financial and utilities sectors, has been impressive from about 1 percent of GDP in 1980 to around 8 percent of GDP in 2014.

35. Exports are concentrated in mining, manufacturing, services, and agriculture. Total exports of goods and services averaged 36.6 percent in 2003–14. Mining accounted for about half. Mining exports followed a cyclical trend (according to global commodity prices), peaking at 25 percent of GDP in 2007, but declining to 16 percent by 2014. Other key exports are in manufacturing (10 percent of GDP), services (5 percent of GDP), including transport and travel, and agriculture and fishing (2 percent of GDP). Nonmining exports have remained stable in recent decades. Manufacturing exports include food products, beverages, tobacco, wood products, pulp, chemicals, basic metals, and machinery and equipment.

2.1.2. The Engine of the Economy: the Private Sector and Key Industries¹⁹

Dominance of Mining

36. Copper mining has had a significant impact on the performance of the Chilean economy. Chile produces about a third of the world's copper and has a third of the estimated world reserves. It accounts for approximately 10 percent of GDP, over 50 percent of exports, and about a fifth of fiscal revenues over the last decade. In addition, copper accounts for about a third of employment in mining regions. The last 25 years have been exceptional for the copper industry in Chile, particularly because of the upswing in commodity prices during the recent commodity supercycle. Investment in mining increased from an estimated 2 percent of GDP in 2002 to 7 percent of GDP a decade later, ultimately generating large spillover effects on other sectors. Nonetheless, copper prices have weakened and will likely remain low in the future, affecting mining profitability and investment (see below).

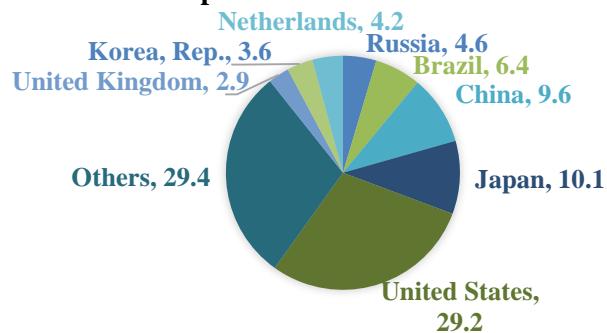
Chilean Agriculture and Fisheries

37. Agriculture and fisheries have played an important role in Chile's economic growth and employment, accounting for 3 percent of the country's GDP and employing over one million

¹⁹ This subsection draws on a background note prepared by the Trade and Competitiveness Global Practice and a set of industry notes prepared by the International Finance Corporation.

Chileans (Figure 2.2). Beginning in the 1980s and 1990s, Chile emerged on the global stage and quickly established itself as one of the world's most progressive and dynamic agricultural exporters, riding a wave of technology-driven productivity gains in a range of products including farmed salmon, fruit, grapes, and wine. As of 2015, these sectors employed 10.9 percent of the total workforce in Chile. Over 2010–15, the employment in the sector rose at 1.8 percent a year, well below the overall employment growth in the economy (4.6 percent).²⁰ The sector's value added has grown at 2.1 percent over 2010–15, however below the growth rate of the overall economy (3.8 percent). In addition, the sector is important for Chilean trade, with an 18.1 percent share in total exports and a trade surplus of US\$8.7 billion in 2015. Salmon has shown the most rapid increase in exports, with a nearly threefold jump in 2010–15 (EMIS 2016).

Figure 2.2. Main Export Destinations in Value Terms, %, 2015



Source: EMIS 2016.

38. More recently, growth in Chile's agriculture sector has slowed, to some extent due to loss of competitiveness. Rising income levels in Chile and associated increases in wage rates have undermined the country's former comparative advantage in cheap labor, and the expansion of urban areas into the countryside has put increasing upward pressure on the price of land. Squeezed by rising production costs, many Chilean agricultural products have become more expensive in international markets.

Sophisticated Banking Sector and Financing Services

39. The financial markets are performing well. Financial markets are another integral part of an economy's ability to put productive resources to most efficient use. The financial sector is well developed in Chile. Though Chile is only the sixth-largest economy in Latin America and the Caribbean, its financial sector is the deepest and most sophisticated in the region. The credit-to-GDP ratio of 106 percent is much higher than expected relative to the level of income, and stock market capitalization is 90 percent of GDP, though it employs only 2.2 percent of the workforce. It ranks 21st on the global competitiveness index of financial market development, placing it in the upper half of OECD countries (13th).²¹ The country also performs better than expected on

²⁰ According to an EMIS (2016) estimate based on data of the Internal Tax Service, 111,000 companies were in operation in the sector at the end of 2015, accounting for 10.5 percent of the enterprises in Chile.

²¹ See GCI (Global Competitiveness Index) (database), World Economic Forum, Geneva, <http://reports.weforum.org/global-competitiveness-index/>.

access to credit; only 18 percent of firms citing access to credit as a major constraint. The country also has a solid track record of liberal financial sector and capital account policies.²²

40. The banking sector is also marked by stability, with strong capitalization and steady profits, despite vigorous competition. Foreign participation in the market is extensive, led by several European and North American banks. However, private domestic banks are well established and compete on equal terms. Dependence on global wholesale financing is also low, thereby mitigating the contagion effects of foreign financial shocks. Credit card usage has risen as consumers began to switch to card payments, and because many banks have commercial partnerships and loyalty schemes. Card usage has also risen as a result of the efforts of retailers to extend consumer credit over the past decade; as a result, most credit cards are issued through department stores. The amount of purchases made using debit cards has been growing steadily, driven mostly by the supermarket segment and by payments to municipal and state entities (EIU 2016).

41. While it has some of the most well developed financial markets in Latin America, frictions may remain, particularly among certain types of producers. Indeed, Diaz et al. (2014) find evidence that financial access among small firms is still low. Banks charge larger spreads to these companies to compensate for the higher risk and the high cost of these operations. Furthermore, a high maximum legal rate, the lack of payments history and standardized financial statements, and an insufficient amount of collateral complicate the access of smaller firms to external funds.

Infrastructure

42. Similarly, Chile's infrastructure lags Latin America and the Caribbean and is about half of the OECD average with an associated GDP loss of 7 percent. Infrastructure, physical and otherwise, can in many ways be thought of as facilitating the workings of input markets. How does Chile compare? Transportation infrastructure (kilometers of road per worker) actually falls below the Latin America and Caribbean average and is among the lowest in OECD. The size of the road network (78,000 kilometers in 2010) has basically remained unchanged since 1990, although the paved shared has increased from 13.8 percent to 23.3 percent.²³ Electricity generation capacity (kilowatt-hours per worker) and telecommunications (number of lines per worker) both fall into the as expected category.²⁴ The International Monetary Fund (IMF 2015) uses a composite index of the above three indicators and finds that Chile's 10-year average infrastructure capital is about 50 percent below the OECD average, although it is above the Latin America and Caribbean average. Similarly, lagging with respect to financial infrastructure, it ranks 79th in Doing Business on Getting Credit, reflecting weaknesses in credit information and use of movable collateral. The GDP loss from this infrastructure gap relative to the OECD average is about 7 percent. Finally, in terms of trade logistics, Chile performs as expected on the Doing Business Trading across Borders indicators with a distance to the frontier of 81 percent, compared with 93 percent in the OECD and 66 percent in Latin America and the Caribbean. Similarly, it ranks 42nd on the logistics

²² Foreign participation in the market is high, led by several North American and European banks.

²³ In terms of road density Chile is also lagging Latin America and the Caribbean and the OECD, partly explained by the country's low population density and large concentration in metropolitan areas. See Chapter 5 for details.

²⁴ Using alternative measures such as technical losses in electricity generations and distribution, quality of roads and kilometers of railroads, Chile still ranks well behind OECD peers.

performance index, making it the top performer in Latin America and the Caribbean, though it trails most OECD countries.²⁵

2.1.3. Growth Determinants: Reforms and External Factors

43. Chile has a long track record of implementing market-oriented reforms. Deep reforms were adopted during the Pinochet era in the 1970s and 1980s and laid the foundations for Chile's high-growth path attained since the mid-1980s. The market-oriented approach was continued and refined by subsequent democratic governments since 1990 (Schmitt-Hebbel 2009).

44. Initial reforms since the 1970s aimed primarily at establishing macroeconomic stability and high growth and contemplated nine main areas:²⁶ (1) a stabilization program to reduce inflation, (2) the liberalization of markets in an effort to get the price system back in operation, (3) public sector reforms to reach macroeconomic stability and to improve the efficiency of the public sector and of the economy as a whole, (4) trade reforms to provide appropriate incentives to export-oriented and import-competing activities, (5) a social security reform to change from a pay-as-you go pension system into one based on individual capitalization, (6) a financial sector reform to improve the efficiency of financial intermediation, (7) a labor market reform to facilitate the industrial restructuring and the drastic reallocation of labor that had to take place from the highly protected import competing sectors toward the export oriented activities, (8) a comprehensive privatization program, and (9) social sector reforms to improve incentives in the production and provision of social services. There is ample macro- and microlevel evidence that many of these reforms had positive impacts on growth and productivity (see below).

45. Chile's increased market orientation can be summarized in real and financial reform indicators and may be attributed to its growth performance. Structural policy reforms to increase the degree of liberalization in real and financial sectors are positively associated with growth across countries (Prati et al. 2013).²⁷ Chile's progress on structural reforms can be illustrated using a global dataset on structural reforms in 1960–2006 (Figure 2.3). By the mid-2000s, Chile had fully caught up with the OECD in areas such as trade, the current account, agriculture, and domestic finance liberalization, while it was yet to catch up in terms of energy and telecommunication liberalization. Moreover, Chile has a more liberalized capital account than the average OECD country. Using a comparable structural reform index, Fuentes, Larrain, and Schmidt-Hebbel (2006) explain more than 100 percent of the improvements in Chile's total factor productivity (TFP) growth in 1963–2005. In another study, Gallego and Loayza (2002) estimate that about 1 percent of Chile's growth acceleration can be explained by threshold effects and interactions of progress in different institutional and policy reform areas.

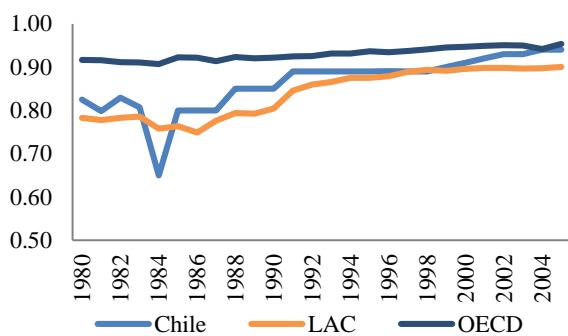
²⁵ See LPI (Logistics Performance Index) (database), World Bank, Washington, DC, <http://lpi.worldbank.org/>.

²⁶ As summarized by Bergoeing (2005). See Corbo (1993) for a detailed description of these reforms.

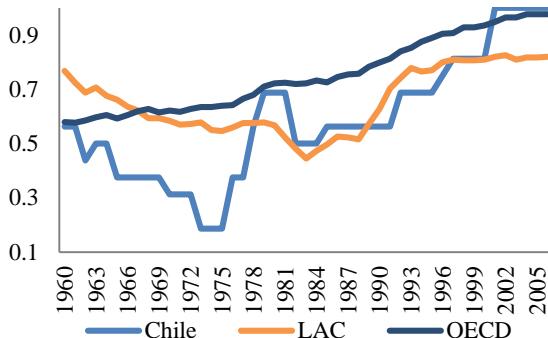
²⁷ There is a distinction between the structural measures captured in the regression results of Loyaza et al. (1995) and Araujo et al. (2014) and the structural economic reforms analyzed by Prati et al. (2013) and Fuentes, Larrain, and Schmidt-Hebbel (2006). The former tend to refer to structural characteristics, whereas the latter focus on liberalization. There is some degree of overlap (in trade, for instance), but the types of policies in the two areas are distinct.

Figure 2.3. Structural Reform Indicators, Real and Financial Sectors, Chile and OECD

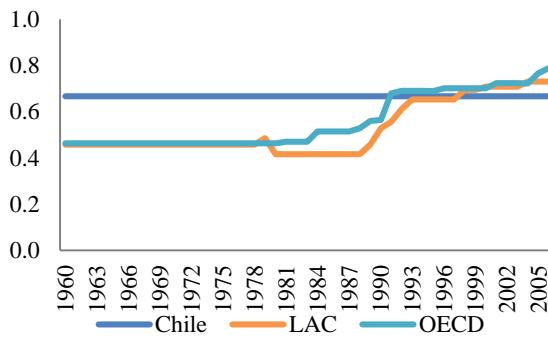
a. Trade



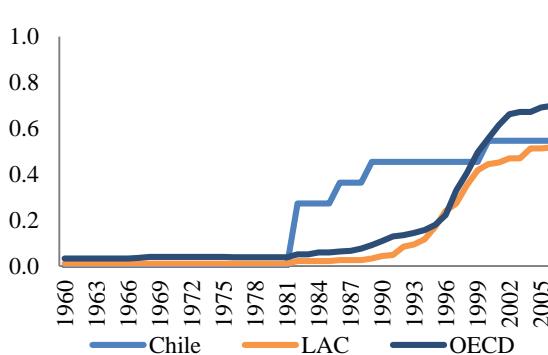
b. Current account



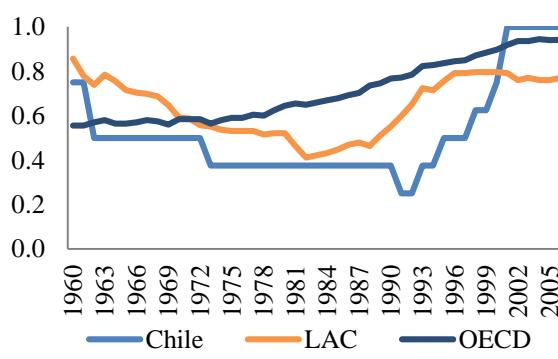
c. Agriculture



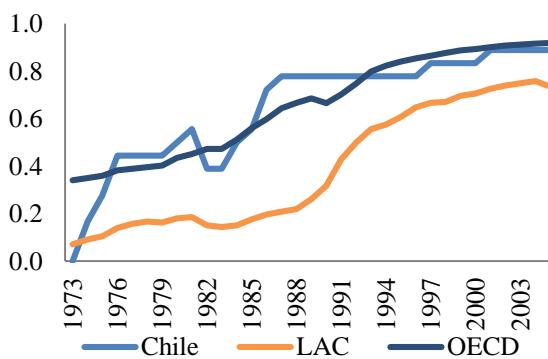
d. Networks



e. Capital account



f. Domestic finance

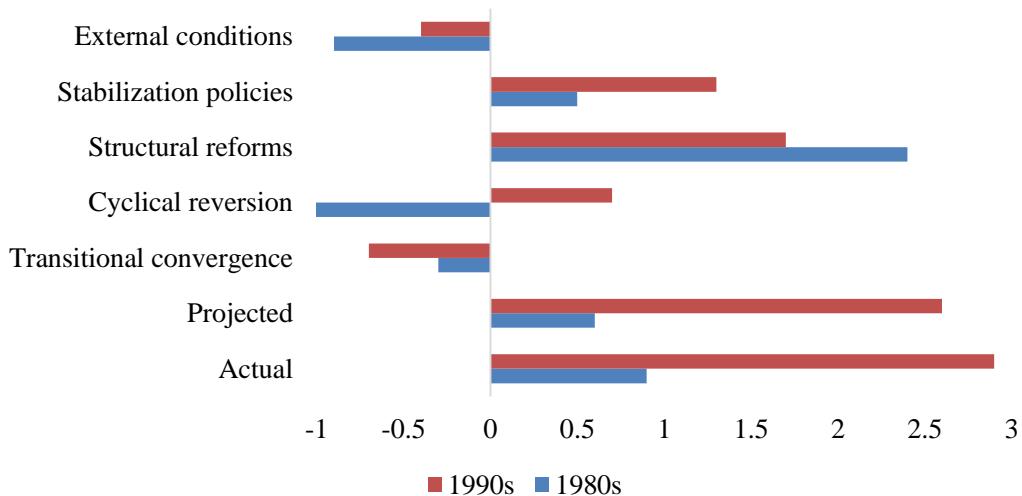


Source: Calculations based on data of Prati et al. 2013.

Note: Higher index values among the indicators denote a larger degree of structural reform. Each index is rescaled to range between 0 and 1. Their plotted values correspond to the mean of each index across countries in a given year. “Agriculture” captures public intervention in the market for each country’s main agricultural export commodity. “Domestic finance” takes into account restrictions on the interest rate determination and the banking sector’s competition, credit controls, and quality of supervision in the banking sector, as well as the degree of liberalization of securities markets. “Trade” denotes average tariff rates. “Capital account” is an indicator of restrictions on financial credits and personal capital transactions for residents and financial credits for nonresidents. “Networks” captures the degree of competition and liberalization and the quality of regulation in the electricity and telecommunications markets. “Current account” denotes current account restrictions on the proceeds from international trade in goods and services. See Prati et al. (2013) for more details.

46. Structural improvements and macroeconomic stabilization policies contributed substantially to growth, particularly in the 1980s and 1990s.²⁸ Loyaza et al. (2005) estimate the relative importance of macrostabilization, structural improvements, and external factors in Chile's per capita growth.²⁹ Their results for the 1980s indicate strong contributions from structural improvements (2.4 percentage points) and macrostabilization policies (0.5 percentage points). For the 1990s, they attribute 1.7 percentage points to structural improvements and 1.3 percentage points to stabilization policies (Figure 2.4). Using a comparable econometric approach, Araujo et al (2014) find small direct growth impacts from structural improvements (0.5 percentage points) and no growth effect from macropolicies during the 2000s on Chile's growth rate, though they estimate strong persistence in the effects of improvements from previous decades, which continue to pay off today.

Figure 2.4. Growth Determinants, Chile, 1980s and 1990s



Source: Loyaza et al. 2015.

Note: External conditions refers to the log difference of the terms of trade. Terms of trade are defined as customary. Stabilization policies includes measures of price stability, cyclical volatility, real exchange rate overvaluation, and systematic banking crises. Structural reforms include policies in education, financial depth, international trade openness, government burden, public services and infrastructure and governance. Transitional conversion is the initial value of ratio of total GDP to total population. GDP is in 1985 purchasing power parity (PPP) U.S. dollars. Cyclical reversion is the difference between the log of actual GDP and (the log of) potential (trend) GDP around the start of the period. To decompose the log of GDP, the Baxter-King filter is used. For further details, see Loyaza et al. (2015).

47. The external environment became the most important driver of growth in the 2000s. Sustained commodity demand from China and the commodity supercycle created a favorable environment for Chile. Araujo et al. (2014) attribute more than one-third of Chile's per capita growth in the 2000s to the favorable external environment associated with the commodities supercycle. In fact, Chile stands out among the Latin America and Caribbean countries for having

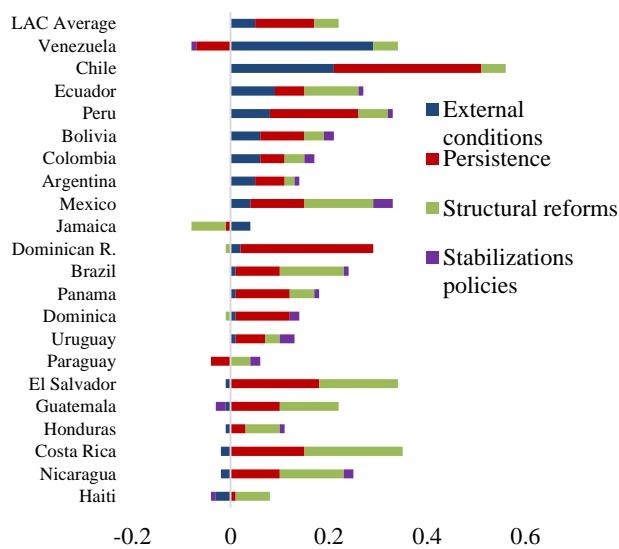
²⁸ This section does not include an evaluation of the social reforms related to pension, education and health.

²⁹ Structural factors include infrastructure, private credit, education, government consumption, governance, and trade openness. Macro-factors include: inflation, real exchange rate and banking crisis. External factors include terms of trade and commodity prices.

one of the strongest growth impetus from the commodity price boom in this period (Figure 2.5). Structural reforms contributed about half a percentage point per year to growth during this period.

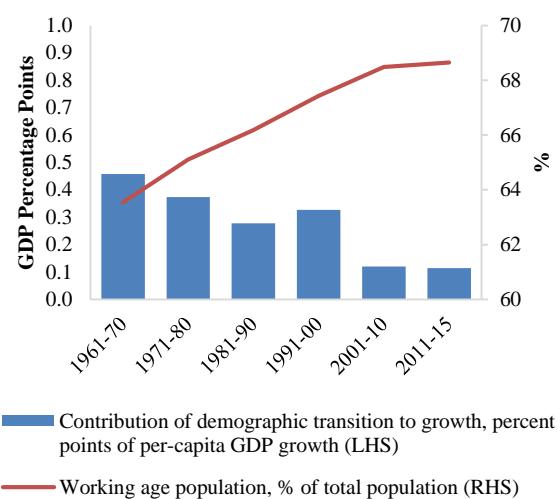
48. Growth benefited from a demographic dividend though this effect is gradually dissipating. Growth potentially gets a boost when the working-age population rises relative to total population. This happens as reductions in child mortality are followed by declines in fertility. Using a Shapley decomposition, Figure 2.6 estimates the maximum potential contribution to growth from this effect. The growth effect peaked in the 1970s (up to 1.5 percentage points) and contributed up to 0.5 percentage points around the early 2000s. It is now dissipating as the share of the working-age population declines.

Figure 2.5. Chile: Growth Determinants, 2000s
Decomposition of predicted output change, 2006–10 vs. 1996–2000, Log points



Source: Araujo et al. 2014.

Figure 2.6. Demographic Dividend: Contribution to Growth



Source: World Bank estimates.

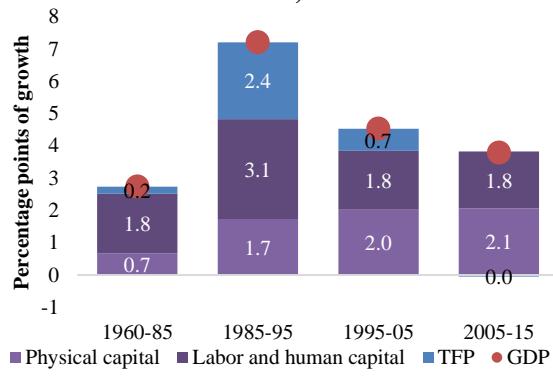
49. As the external environment deteriorated, growth has slowed down significantly in recent years. Growth has hovered around 2 percent since 2014, which is well below Chile's historical averages. In the absence of an increase in copper prices, Chile is unlikely to return to the high growth rates of the past. As the country grows richer, high growth will become more difficult to achieve. Many market distortions have been removed, making it difficult to register quick wins. Demographics will weigh on the growth outlook. The country will need to tap into new drivers of growth. These would need to include improvements in female labor force participation and broad-based improvements in education (see below).

2.1.4 Aggregate Productivity Growth

50. Growth was characterized by substantial capital deepening while TFP growth was remarkably modest. A Solow decomposition of the economy's real GDP growth since 1960 highlights the importance of capital deepening as a key growth driver (averaging close to 2 percentage points of recent growth). The country's demographic transition has supported growth

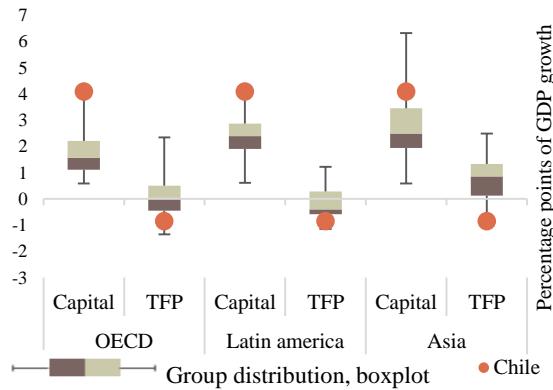
because the contributions of labor accumulation averaged about 1.5 percentage points in the past two decades. Improved human capital has also added to growth (less than 0.5 percentage points) as the average years of education of the population rose from 5 to 10 years in 1960–2015 (Figure 2.7).³⁰ TFP growth, on the other hand, was remarkably low, with the exception of the 1987–97 golden period, when it averaged about 2.4 percent. Indeed, Chile stands out among peers in the OECD, Latin America, and Asia for the strong role of investment and the meager TFP growth between 1995 and 2014 (Figure 2.8).

Figure 2.7. Solow Decomposition of GDP Growth, %



Source: World Bank calculations.

Figure 2.8. Solow Decomposition, %, 1995–2014



Source: Total Economy Database, Conference Board, New York, <https://www.conference-board.org/data/economydatabase/>.

51. During the past decade, TFP growth has declined. Regulatory rigidities that reduced the capacity of the economy to absorb the external shocks of 1998 and 2001 may have prompted the initial slowdown in productivity growth. (Di Bella and Cerisola 2009). After peaking between 1992 and 1997, TFP growth decreased between 3.9 and 2.0 percentage points between 1997 and 2003 and never recovered the range of 1.2–4.3 percentage points achieved between 2003 and 2012.

52. Given the drag exerted by the mining sector, nonmining TFP performance was stronger than headline TFP figures suggest, but nonetheless modest and occasionally declining. Period choice heavily affects interpretations of the trend even if the same dataset is used. To illustrate, if the 1993–2013 period is divided into three subperiods, nonmining productivity growth exhibits a slightly rising trend.³¹ Annual data reveal a fluctuating pattern and some periods of decline. Within sectors, average annual TFP growth was stronger in commerce, financial and business services, and agriculture and fishing, ranging from 2.6 percent and 2.9 percent in 1993–2013, but much weaker in manufacturing and construction, by 1.4 percent and 0.0 percent, respectively (de Gregorio and Magendzo 2015).

53. Factors related to the mining sector, particularly lower copper grades and the commodity price cycle, explain the muted TFP growth. Following healthy growth of 8 percent a year in 1993–98 when a series of highly productive mines came on stream, mining TFP declined 6 percent a

³⁰ See Pritchett (2001) for a discussion of the measurement challenges of education as a growth factor.

³¹ Specifically, 1.5 percent in 1993–98, 2.3 percent in 2000–08, and 2.2 percent 2010–13 (UAI and Corfo 2015, cited in OECD 2015).

year in 2000–08 and an additional 10 percent a year in 2010–13 (UAI and Corfo 2014). This decline is partly related to a natural decline in copper ore grades. However, even accounting for this effect, mining TFP is estimated to have declined by 20 percent in 2000–13 (Cochilco 2014). Falling mining TFP is part of a broader international trend, which saw mining labor productivity decline 30 percent worldwide in 2004–12, including in peer countries, and by a similar rate in Chile (CNP 2016). There are two potential explanations for this phenomenon, both related to the commodity price boom. The first reflects a healthy optimization process whereby mining companies have an incentive to extract copper in hard-to-reach areas because this is affordable if prices are high, and this reduces input-output efficiency. The other, less healthy reason relates to the efficiency slack that builds up in good times because incentives to maintain high efficiency are damped.

54. Strong TFP growth will be critical to sustain high growth in Chile. While capital deepening and increases in labor supply have led the way in Chile’s process of convergence, this pattern is not sustainable as further capital accumulation will not produce commensurate marginal returns in the future owing to diminishing returns and demographics trends will put downward pressure on the labor supply. Empirical evidence whether demographic aging increases or decreases savings and ultimately investment is mixed (Bussolo et al. 2015). A further rise in living standards would thus have to come in the form of sustained productivity growth.

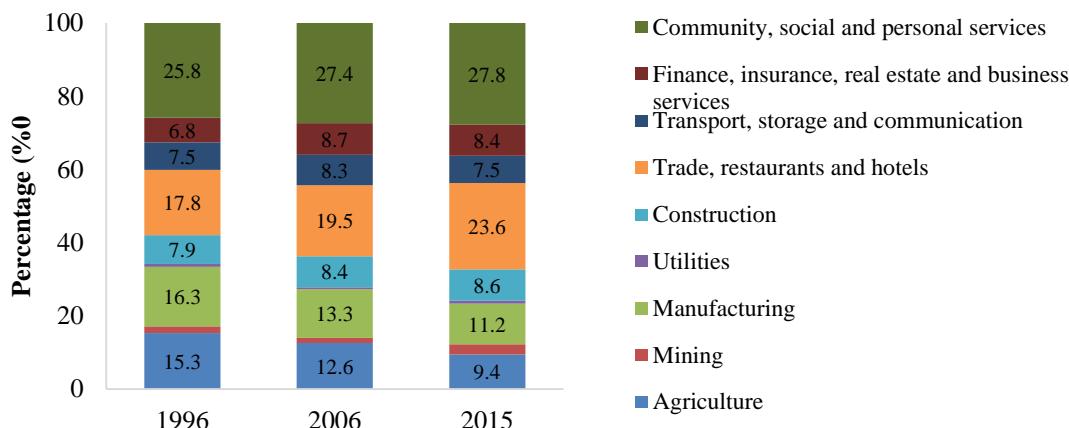
55. In light hereof, Chile’s recent TFP growth performance has received substantial analytical interest, though comprehensive explanations are yet to be identified. Syverson (2014), for instance, rules out the long-term structural shift toward the less productive services sector and points instead to a series of microeconomic factors. Some of these factors are also identified by other authors, including higher energy costs (Fuentes 2011; Corbo and Gonzalez 2014), lagging innovation (Maloney and Rodriguez-Claire 2007) and increased labor market rigidity (Fuentes 2011; Petrin and Sivadasan 2013). Recently, Blagrave and Santoro (2016) find that Chile’s recent growth slowdown has been structural, driven primarily by weaker capital accumulation followed by labor-input growth as participation rates have slowed and working-age population growth rates have started to decline. However, further work is needed to quantify the relative importance of each of these potential sources.

2.1.5. Labor Productivity and Structural Change

56. Similar to other countries, services employment increased as Chile grew richer. Between 1996 and 2014, total employment increased from 5.2 to 7.9 million workers as a result of the demographic transition and rising labor market participation, especially of women. Mirroring trends on the output side, the employment share of services increased from 58 percent to 67 percent while the shares of agriculture and manufacturing declined with each sector contributing roughly 10 percent of employment in 2014 (Figure 2.9).³² The services employment share is close to the OECD average (69 percent) and above the average in Latin America (63 percent).

³² The employment share in manufacturing peaked in 1954 at about 25 percent (Rodrik 2015).

Figure 2.9. Employment, by Sector, Chile, 1996–2015



Source: National Statistics Institute.

57. Yet, the share of services in GDP remained in the range of middle-income countries. The service sector tends to become an important driver for growth in high-income countries. Yet, in contrast to the OECD, where growth in the service sector outpaced economy-wide growth, growth of services in Chile broadly matched GDP growth. Its share of services in GDP remained broadly constant at 56.1 percent in 1996, 57.9 percent in 2008 and 63.3 percent in 2015. As service employment increased, productivity of the sector declined.

58. A relatively large share of workers is employed in sectors with below-average productivity. The dispersion of labor productivity across sectors is broadly in line with income, but the share of employment in sectors with above-average productivity is low. Sectors with labor productivity above economy-wide levels employ only 31 percent of workers in Chile (Figure 2.10). This is significantly more than the Latin America and the Caribbean average of 65 percent and the high-income-country average of 60 percent.³³ The majority of jobs are concentrated in sectors, such as community, social, and personal services (28 percent) and trade, restaurants and hotels (24 percent), which have the lowest labor productivity. Finance, manufacturing, and construction have a higher labor productivity and some concentration of jobs.

59. Within-sector productivity growth in Chile was comparable with Asia, but the labor shares of higher-productivity sectors declined, reducing aggregate productivity growth. Between 1995 and 2009, labor productivity rose mainly as a result of within sector productivity gains (Figure 2.11).³⁴ Chile experienced more productivity growth than regional peers because of higher within-sector productivity growth. At the same time, similar to several other countries in Latin America and the Caribbean, a decline in the labor share of higher-productivity sectors led to growth-depressing structural change.³⁵

³³ Community, social, and personal services is a heterogeneous group ranging from domestic workers to teachers.

³⁴ The results presented here are consistent with those of Schiffbauer et al. (2016).

³⁵ Structural change is divided into contributions from the reallocation of workers to above average productivity level sectors (static reallocation effect) and the contribution from the reallocation to above average productivity growth sectors (dynamic reallocation effect).

Figure 2.10. Labor Productivity and Job Shares, 2015

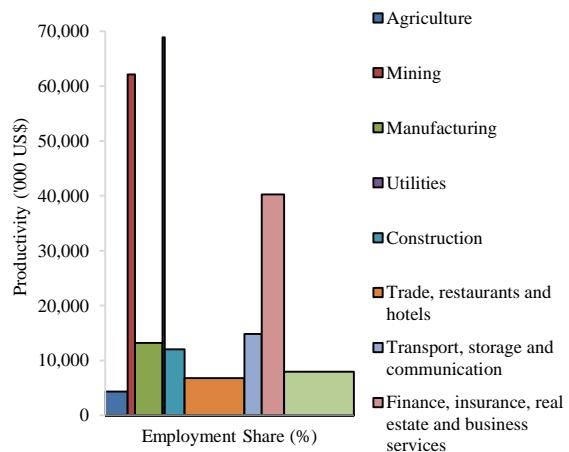
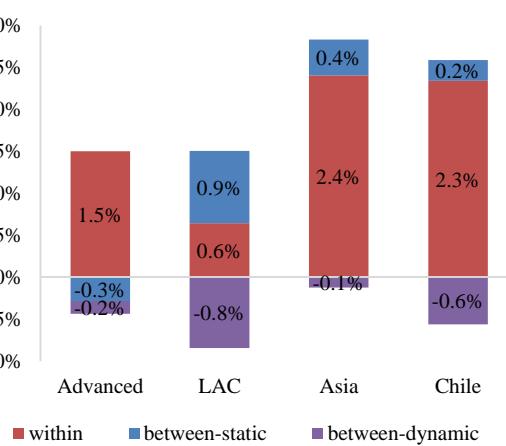


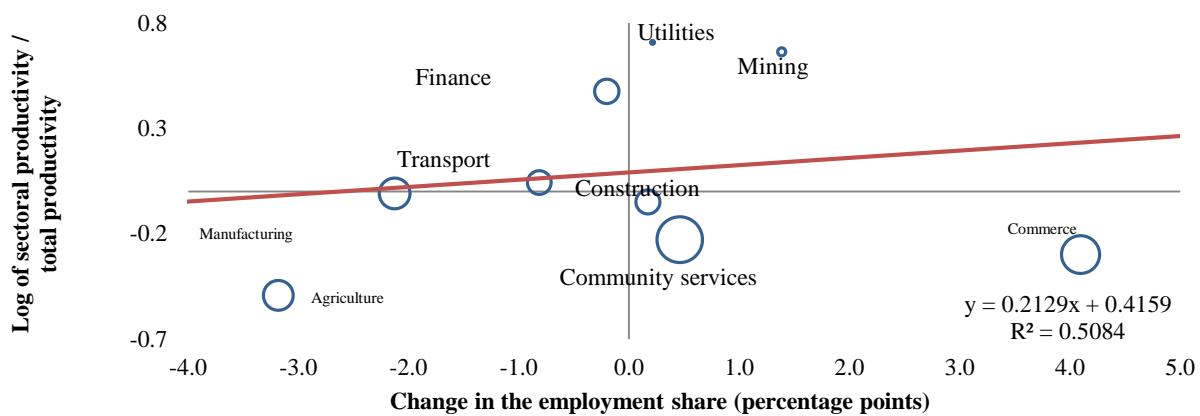
Figure 2.11. Labor Productivity Decomposition, 1995–2009



Sources: Central Bank of Chile; National Statistics Institute.

60. Employment trends in agriculture and mining supported structural change, while services sectors held it back. Several factors determined Chile's negative structural change. Similar to other Latin American countries, productivity of the commerce sector, which absorbed a large share of workers, was low (**Figure 2.12**). This suggests that redundant labor from other sectors end up working in relatively unproductive small-scale activities in the retail trade sector. In addition, the manufacturing sector, which often absorbs well-paid workers, shrank, unlike what happened in other higher-income commodity exporters.

Figure 2.12. Productivity and Employment Changes, 2006–15



Sources: Central Bank of Chile; National Statistics Institute.

2.2. Boosting Productivity Growth

61. To identify Chile's productivity constraints, the country's productivity determinants are benchmarked against the country's level of income per capita using the framework of Syverson (2011) (see Annex B). The framework distinguishes between factors that operate directly at the level of an individual producer, that is, the levers that management and others actors

may have and elements of the external environment, such as competition, regulations and productivity spillovers that can affect firm-level productivity. The next question is, given the level of income per person, how would one expect the country to fare on the productivity determinant? The per capita gross national income of US\$14,910 in 2014 is used on which the country ranked 48th worldwide. The country is positioned between the OECD, in which it is the third-poorest member, and Latin America and the Caribbean, in which it is the third-richest country in income per capita. The natural prior would be that the country is a top regional performer and a bottom OECD performer. Where this is the case, Chile's performance is labeled "as expected." If Chile is not among the top in Latin America and the Caribbean, it is classified as "lagging," and, if its performance brings it close to or above the OECD average, it is classified as "strong." Similarly, in scatterplots of gross national income per capita, performance is denoted "as expected" if Chile is close to the regression line, "lagging" if it is below, and "strong" if it is above.

2.2.1. Productivity Heterogeneity and Dynamics among Firms

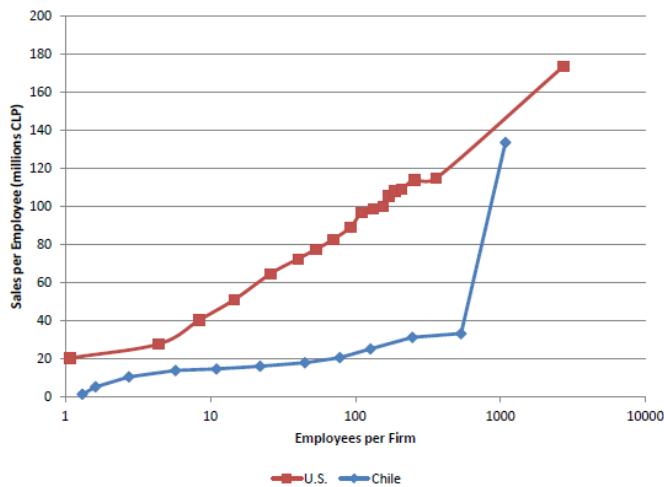
62. The productivity dispersion of manufacturing among firms in Chile is higher than in the United States, but lower than in Latin America. Productivity dispersions across firms can be tied in part to the existence of frictions in markets that slow or prevent the reallocation of economic activity from less- to more-efficient producers. The tradition in the literature focusing on the manufacturing sector is fruitful because this is where the best comparable data are available. In Chile, manufacturing firms in the 90th percentile of the productivity distribution are more than two and a half times (260 percent) more productive than those in the 10th percentile. This is greater more than the dispersion in the United States (2.2 times), but among the lowest in Latin America (Busso et al. 2012).

63. A more efficient allocation of resources could boost Chilean manufacturing TFP by about 50 percent. Following the method of Hsieh and Klenow (2009), this result is obtained by reallocating labor and capital to equalize marginal products (Busso et al. 2012). These efficiency gains are among the largest among Latin America and Caribbean countries, but not as large as in the United States.³⁶

64. Chilean manufacturing plants are substantially less productive than their equal-sized U.S. counterparts, except for the largest ones. Labor productivity among the largest Chilean firms (with sales exceeding Ch\$2.3 billion in 2012 prices and about 1,100 employees) is comparable, at 93 percent, with similar U.S. firms (Figure 2.13). However, for the second-largest category of Chilean firms (sales of Ch\$33 million in 2012 prices and 535 employees) productivity is only 25 percent of U.S. levels. While striking, this is a familiar pattern in Latin America and the Caribbean and the observed drop in productivity by firm size is actually relatively less pronounced in Chile (Pages 2010).

³⁶ In aggregate, convergence of the country's TFP and the TFP of the United States would increase the country's GDP per worker relative to the United States from 35 percent to 60 percent (Caselli 2014)

Figure 2.13. Labor Productivity versus Firm Employment, Chile and the United States



Sources: Chile, 2012 data: Internal Tax Service; United States, 2007 data: Statistics of U.S. Business.

65. Chile has fairly strong rates of firm turnover compared with peers. The available evidence for the manufacturing sector show annual gross firm entry and exit rates of around 5 percent and Chile compares favorably with OECD countries (Bergoeing and Repetto 2006; Haltiwanger et al. 2004). This churning can support a relocation process that increases aggregate productivity, although this may not be sufficient. The churn must also systematically move activity away from less efficient uses and toward more efficient ends. Encouragingly, the above cited evidence suggests this to happen to some extent, primarily through more efficient entrants replacing less productive exiting firms (Syverson 2014).

2.2.2. *Productivity Determinants: The Levers under Firm Control*

Management Practices

66. Management practices in Chilean manufacturing are as expected, and closing the gap with the rich-country average may boost TFP by 3 percent. Speculation has long placed management practices and talent as the sources of differences among producers. The World Management Survey collects data on the management practices of businesses, and research has established a causal link between practices and manufacturing productivity (Bloom et al. 2012).³⁷ On average, Chilean manufacturing firms rank 15th of the 20th countries surveyed with similar patterns across the specific management dimensions for monitoring, targets and people practices. As expected, the country ranks best among regional peers but trails all but one OECD countries covered. Compared with best practice (observed in the United States), the practice gap appears broadbased. In fact, the Chilean distribution is similar to the United States except that it is shifted leftward implying that there are more poorly managed companies in Chile and a dearth of

³⁷ For the survey, see WMS (World Management Survey) (database), London School of Economics, London, <http://worldmanagementsurvey.org/>.

exceptionally managed ones. If its managers adopted management practices in line with the sample average, manufacturing TFP would increase by almost three percent (Syverson 2014).³⁸

Quality of human and physical capital

67. The quality of education is lagging in Chile given the country's level of development; achieving universal secondary education skills may increase growth by 0.6 percentage points per year. Chile's scores in reading, mathematics, and science in the Program for International Student Assessment (PISA) position it globally as lagging despite substantial improvements over the past decade. Almost half of the children are unable to demonstrate the basic skills (PISA level 1) necessary for participating productively in a modern economy.³⁹ The potential gains of attaining universal skills—with all students attaining Level 1—can be large (Box 2.1). While attaining universal access in Chile by 2030 would boost the growth rate by 0.1 percentage points per year, improving the quality of schools so that all students would achieve Level 1 would increase the growth rate by 0.5 percentage points per year. If both scenarios are combined, the growth boost is 0.6 percentage points, implying that real GDP would be 8.5 percent greater by 2030 (OECD 2015).

Box 2.1. Education Policy in Perspective: The Case of Finland and the Republic of Korea

Finland and the Republic of Kora are among the OECD's top performers in education, particularly mathematics, and the socioeconomic background of students has historically had less impact on student performance than in other OECD countries. In PISA 2012, Korea had the largest share of top performers and the lowest share of low performers in the OECD in mathematics, with nearly a third of students at or above level 5 (31 percent) relative to the OECD average of 13 percent and only 9 percent below proficiency level 2. Moreover, Finnish and Korean student's socioeconomic background had less impact on the performance of 15-year-olds in mathematics (8.0 percent and 10.1 percent, respectively) than in other OECD countries (14.8 percent).

Korea has several policies to promote equity in education, particularly in early childhood education. Enrolment rates in early childhood and preprimary education are among the highest in the OECD, with nearly 90 percent of 3-year-olds enrolled in 2014, significantly higher than Chile (54 percent) and the OECD average (36 percent). Korea's integrated curriculum in early childhood education—the Nuri Curriculum—supports the cost of preschool education for all 3- to 5-year-olds, regardless of their parents income, reducing the effect of socioeconomic background on educational attainment at early ages. Similarly, school choice is also common and more frequent than in other OECD countries.^a

Similarly, equal opportunity in education is at the core of Finland's welfare system. The government of Finland subsidizes higher education and also actively supports families in need. Approximately 14 percent of public spending on higher education is dedicated to student financial aid. Similarly, the government aims to ensure that all children participate in preprimary education, including children

³⁸ An analysis of Chile's Enterprise Survey data for 2006 and 2010 shows no signs of a positive relationship between managerial experience and firm productivity (Syverson 2014).

³⁹ In on-the-job training, Chile's performance is as expected in the global competitiveness index, where it ranks 38th in terms of on-the-job training. It does well on the local availability of specialized training services (36th), but less well on the extent of staff training (52nd). Nonetheless, publicly funded training programs, mainly through the National Training and Employment Service, are ineffective and poorly targeted at those who need it most (Larrañaga et al. 2011; OECD 2013a). See GCI (Global Competitiveness Index) (database), World Economic Forum, Geneva, <http://reports.weforum.org/global-competitiveness-index/>.

among immigrants and children in remote areas. Since 2001, preprimary education has been free and voluntary, with 96 percent of 6-year-olds attending. In addition, teaching is a highly appreciated profession and, relative to workers with a tertiary education, teachers earn salaries that are higher than the OECD average. Overall, social and political agreement on the value of education has delivered stability in the structure and key features of Finland's education system.

Strong education in science, engineering and mathematics has contributed to Korea's strong economic development. Korea has some of the highest attainment rates among OECD countries in secondary and tertiary education, with more tertiary education graduates in the field of engineering and natural science (32 percent) than the OECD average (OECD 2016). Nonetheless, Korea still faces challenges regarding attractiveness of vocational education to provide an appealing alternative for students and meet labor market needs. In addition, investment in education as a share of GDP is among the highest in OECD countries, with one of the highest shares of private funding.

Finland's education system has effectively developed skill linkages with its labor market. The average skill level of adults ages 16–64 is one of the highest of all countries participating in the Program for the International Assessment of Adult Competencies (OECD 2013b). Finland has one of the lowest levels of skill mismatches across the countries surveyed, and unemployment rates across all education levels were below OECD average in 2011. Similarly, it has below OECD-average share of youths (15–29 year olds) not in education or employment (14.3 percent vs 14.5 percent for the OECD and 18.8 percent for Chile).

a. In Korea, 90 percent of principals report that their school competes with at least one other school in the area for students, this is above the OECD average of 76 percent.

68. The strong productivity impact of improving human capital is confirmed in other studies. Fuentes and Mies (2014) develop a model explaining Chile's gap of income per worker compared with the United States. They find that increasing the average years of schooling up to the level of the United States (12.2 years) would close the productivity gap by 7 percent. More importantly, if the gap in educational quality is closed, the gap could be closed by 60 percent. Combining both policies would close the gap by 78 percent.⁴⁰

69. Increasing female labor market participation may not only increase the labor force but also boost productivity. First, in aggregate, the increase in female labor supply, especially of more highly educated women, can help boost structural change. Second, the employment of women enables companies to draw from a larger talent pool increasing productivity by reducing mismatches between worker skills and occupations (Hsieh et al. 2013). An increased presence of women in entrepreneurial activities can raise the average talent of entrepreneurs. The implied income loss because of Chile's gender gap in the work force is 20 percent according to simulations carried out by Cuberes and Teignier (2015). Comparative income loss estimates for the OECD and Latin America and the Caribbean are 15 percent and 17 percent, respectively.

70. Chile performs as expected on the quality of capital and information technology, but the impact of improvements is not easily quantifiable. Capital vintages differ in the amount of technological progress they embody and the productivity gains they generate. Measureable

⁴⁰ In a related exercise, the International Monetary Fund (IMF 2015) uses a production function approach to estimate an implied GDP loss of 6–7 percent from the fact that Chile's human capital level is 12 percent below the OECD average.

indicators of information technology infrastructure confirm the “expected” pattern. For instance, 61 percent of Chileans reported using the Internet in 2012, less than in the euro Area (81 percent) and the United States (81 percent), but more than in Latin America and the Caribbean (39 percent). Capital imports, which speaks more directly to the intensity of productive capital in information technology, accounted for 7 percent in Chile compared with 13 percent in the European Union and the United States and 7 percent in Latin America and the Caribbean. Similarly, the global competitiveness index places Chile 39th on the dimension of technological readiness, which covers technological adaption (29th) and use of information and communication technology (47th).⁴¹ Given the gap between Chile and the frontier economies in information technology intensity, it is possible and perhaps even likely that the government could raise productivity growth by more effectively adopting information technology capital. While estimates about how much this would matter are scarce, the literature does offer some guidance on the how to do it: for companies to take the fullest advantage, they need to be able to put information technology and other high-technology capital into production with an efficacy equivalent to world-leading companies (Syverson 2014).

Research and Development, Innovation, and Learning by Doing

71. Overall, Chile’s innovation outcomes are somewhat lagging even if the quality of the government’s innovation policy framework is as good as expected. Both process and product innovations are tied to measured productivity growth. Process innovations reduce unit production costs because they improve the efficiency with which an existing product is made. Product innovations, which improve the quality of products or introduce new varieties altogether, may not necessarily reduce unit costs, but increase the amount of economic surplus created per unit of input. Alvarez et al. (2010) show that, in Chile, process innovations are more apt to raise productivity contemporaneously, while product innovations typically act with a lag. Fuentes and Mies (2014) benchmark Chile’s research and development (R&D) efforts in various dimensions (R&D spending, R&D personnel and license expenditures) and find that these fall short of the country’s level of development.

72. Chile spends below what would be expected on R&D and lags even regional peers. The economic literature finds clear connections between R&D and productivity, though the measure is somewhat narrow and its effects may depend on complementary factors. Chile spends only 0.4 percent of GDP on R&D compared with 2.4 percent in the OECD and even below the Latin America and Caribbean average of 0.8 percent. Moreover, most R&D activity in Chile is done outside firms (about two-thirds of spending), mainly in state-financed universities. For this reason, Chile ranks 92nd on the global competitiveness index on company R&D spending.⁴² The number of firms reporting R&D spending has doubled in the past few years (OECD 2015b). Similarly, the country has only 350 full-time equivalent R&D researchers per million people, well below the 4,700 in the United States, the 3,200 in the euro area, and the 500 in the region. Overall, its investment in R&D falls below what would have been expected, controlling for economic specialization (Maloney and Rodriguez-Clare 2007).

⁴¹ See GCI (Global Competitiveness Index) (database), World Economic Forum, Geneva, <http://reports.weforum.org/global-competitiveness-index/>.

⁴² See GCI (Global Competitiveness Index) (database), World Economic Forum, Geneva, <http://reports.weforum.org/global-competitiveness-index/>.

73. Chilean firms seem to innovate less than its peers. In 2012, 24 percent of Chilean firms reported they had undertaken innovation activities. This is below the corresponding share reported among structural peers (56 percent), that is, Australia, Canada, and Norway, but higher than other Pacific Alliance members. Innovation incidence in Chile seem to have declined steadily from the 38 percent of firms registered in 2004, though this may be partly related to issues of measurement. The vast majority of Chilean firms belong to the technology-adapting firm category (OECD 2013a). A large share of firms is also small and medium, active in the service industry, and exhibit a lack of skills, limited information on technological and market opportunities, and limited funding.

74. Innovation in agriculture, which generates Chile's most important non-copper export earnings, has been low. Chile lags with respect to OECD comparator countries in the number of agriculture-related patents granted by the United States Patent and Trademark Office in the field of biotechnology, a proxy for agriculture-related patents. For instance, in 2013 Australia and the Netherlands were granted 163 and 186 biotechnology patents respectively whereas Chile only had 8.⁴³ Nonetheless, Chile has been able to compensate for the low level of investment in agricultural R&D by relying heavily on imported technology (Table 2.2). While imported technology has fueled innovation in Chile, there are signs that the easy gains realized during the “catching up” phase are now being exhausted, suggesting that future innovation increasingly will have to be generated domestically.

75. Marginal returns to innovation appear to be positive, but part of the innovation shortfall is potentially related to market failures. International and local evidence suggests that the private returns to innovation are high. The OECD (2010), for instance, reports that firms that have spending on R&D are 4.5 times as likely to introduce new products as those with no spending. Nguyen and Jaramillo (2016) find that the returns to innovation among firms are higher in countries with strong institutional quality, such as Chile. Indeed, in an evaluation of innovation subsidy programs, Alvarez et al. (2012) find evidence that the marginal return to firm-level R&D may be substantial, positively affecting employment, wages and productivity. The positive relationship between innovation and productivity has also been documented in Chile’s services sector, especially the modern segment (information technology, telecommunication, and engineering) (Alvarez et al. 2016). Chile’s National Productivity Commission identifies three broad areas that could help improve innovation outcomes: i) improve public sector efficiency, ii) promote competition, and iii) strengthen employment and human capital. Based on a recommendation from the commission, the government has started to include a productivity assessment in all projects from economic ministries.

2.2.3 An Emerging Ecosystem of Business Start-Ups

76. Chile has a strong base of entrepreneurs and new business formation is accelerating in response to comprehensive policy support. Chile outperforms most other countries on new business registration rates. This is an important metric of how well an economy allows reallocation of inputs to potentially higher valued uses, because while new businesses fail at a much higher rate than established ones, those that survive the first tumultuous years tend to account for a

⁴³ OECD Patent Statistics (database), “Patents by Main Technology and by International Patent Classification (IPC),” OECD, Paris (accessed December 17, 2015), <http://dx.doi.org/10.1787/data-00508-en>.

considerable portion of economic growth. In 2014, the density of new businesses in Chile was 8.0 per 1,000 people ages 15–64 (top 13 worldwide), compared with 2.0 in Latin America and the Caribbean and 6.4 in high-income countries. This rate increased gradually from 2 to 3 in 2004–08 and has accelerated since 2009. The OECD (2015) relates Chile’s strong performance in recent years to regulatory improvements and government programs, including measures to start a new business (2011, 2013), a bankruptcy law (2014), and, the Start-Up Chile Program (2010) and related support, including credit access facilitation among small and medium enterprises. Moreover, Chile’s Productivity Growth and Innovation agenda is expected to further improve Chile’s performance along these measures through innovation (Box 2.2).

Box 2.2. Chile’s Effort to Boost Entrepreneurship and Innovation

In 2014 the government introduced is productivity, growth and innovation agenda to continue promoting economic growth.^a This is part of the government’s efforts to improve productivity and competitiveness through innovation. The agenda is structure around seven pillars: (a) strategic investments and sectoral development plans, (a) infrastructure for new development, (c) funding and management support for small and medium enterprises, (d) boosting entrepreneurship and innovation, (e) efficiency in regulation and in the provision of public services, (f) improved markets, and (g) new institutional framework. It also includes 11 bills and 36 administrative initiatives with an investment of US\$1,500 million between 2014 and 2018. As part of this agenda, President Bachelet also appointed a productivity commission in 2015. The commission is an independent, permanent consultative body that advises the government on matters relating to productivity and economic growth.

Similarly, the government is supporting innovation and entrepreneurship primarily through Corfo. Corfo started promoting venture capital funds and incubators in the late 1990s. Between 2012 and 2014, Corfo invested a total of US\$11.8 million in Chile’s entrepreneurship program Start-Up Chile, supporting 240 startup ventures per year. Start-Up Chile estimates that slightly more than half of these start-ups are still considered active and successful, with over a third remaining within the country. During the same period, it channeled US\$12.5 million through incubators, accelerators and pre-seed financing. Similarly, Corfo introduced the 2018 Entrepreneurship Policy to promote dynamic entrepreneurship and to allow new ventures shape productivity and sustainability in current economic sectors. The institutions expenditures for supporting entrepreneurship increased from about US\$10 million in 2005 to about US\$36 million in 2014 (World Bank 2016). At present, the country has about 30 venture capital funds, with a total size of approximately US\$500 million. This has generated some success with an estimated 1,200 start-ups incubated through Corfo-supported programs in high-technology industries such as financial technology, mining technology, bio- and agrotechnology and information technology services.

Chile’s innovation policy framework is one of the best in the region even though it lags behind best OECD practice. At the governance and strategic level, excessive fragmentation of the innovation system has been a longstanding challenge, according to OECD (2015a). Further strengthening of the Inter-ministerial Committee on Innovation with an explicit legal framework, and the *Consejo Nacional de Innovación para el Desarrollo* (National Council of Innovation), which helps set longer-term strategy, seems warranted. At the program level, the OECD (2013a) has recommended that Chile strengthens its innovation programs by thoroughly evaluating them. Although often well-implemented, programs present some design weaknesses (World Bank 2016).

a. “Agenda de Productividad, Innovación, y Crecimiento,” Ministry of Economy, Development, and Tourism, Santiago, Chile, <http://www.agendaproductividad.cl/>.

77. This success notwithstanding, the start-up ecosystem is still at an early stage in Chile and has shown only limited results in creating a sizable number of larger companies. The majority of potential high-growth start-ups tend to leave the country, frequently moving to the United States and other developed markets, mainly in search of greater market size and deeper capital markets. The start-up financing system in Chile is still highly dependent on the support of the Chilean Economic Development Agency (Corfo), funded, first, through a series of grants by Start-Up Chile, followed by Corfo-supported Series A venture capital funds for up to US\$3 million. Larger funding needs cannot be met as there are no Series B or C funds operational in Chile at this point. This is partly explained by the relatively limited number of successful exits from earlier stages of funding, combined with a relatively conservative and risk-averse investor community, not yet comfortable with higher-risk angel or venture capital investments.

2.2.4. The Need for Diversification

78. Chile has not been able to diversify its export sector over the past decade. Its export basket has barely shifted over the past decade. Chile even lost comparative advantage in a few manufactured products while few new products emerged, which is consistent with the decline in the manufacturing labor share as well as the stagnant productivity growth. This experience contrasts with the experience of Canada, New Zealand, and Norway, which are major exporters of mining products, but have nonetheless also developed a sound manufacturing base. While these developments did not preclude strong economic growth in Chile, suggesting an example of income convergence without a strong manufacturing base in the core of the product space, it made the country more vulnerable to changes in external conditions (World Bank 2016b). In 2014, the country scored 0.74 on an export diversification index, which implied that Chile's diversification was lower than OECD and regional averages (0.47 and 0.63, respectively).

79. Chile lags in economic complexity, and this may hold back potential growth. The country ranks 69th on the index of economic complexity, well behind OECD countries and in the lower half of countries in Latin America and the Caribbean. Chile has also specialized in products that are not typically in the core of the product space (food processing and mining), having revealed comparative advantage (RCA) in many agricultural and mining-based products. Moreover, the economic complexity of Chilean exports has deteriorated over the past 15 years. To some extent, this reflects the inability of Chilean firms to create novel products and develop sophisticated exports beyond mining and agriculture. Given Chile's low economic complexity, long-term economic growth is projected at only 1.9 percent a year in 2013–23 (CID 2014). This growth projection falls well below several peers, including Canada (2.7 percent), Peru (2.8 percent), Colombia (3.0 percent), and Mexico (4.4 percent).

80. Moreover, Chile's reliance on copper for export revenues has become increasingly a source of stress. Its commodity dependence has left it susceptible to price fluctuations and decreasing demand growth from China. Water and electricity supply shortages keep the overall operating costs elevated in Chile's mining sector. This constraint has led to several companies exploring both desalination as well as independent power plant options for future operations. Currently in mining regions with less water access, a quarter of the water used comes from the sea. Furthermore, mining companies are increasingly turning to renewable energy sources to secure a reliable power supply at an affordable price in the country's remote mining regions. It is expected

that electricity demand by the mining industry will increase by 50.3 percent in 2016–25. Both the government and industry share the objective of achieving greater efficiency in the use of energy. A possible decrease in energy prices in the medium term is expected because of the proliferation of lower cost renewable energy, which is expected to account for 20 percent of Chile's energy matrix by 2025 (see chapter 4).

81. Chile maintains an upstream position in regional and global value chains implying that its exports are inputs to other countries exports rather than final products. A large share of foreign and domestic value added in intermediate exports (respectively, 76.9 percent and 73.8 percent) relative to final exports suggests that Chile is specialized in the upstream stages of the value chain. This is partly explained by the preponderance of minerals and metals in Chile's exports. However, even compared with its peer countries, Chile appears as an outlier in terms of integration in global value chains (the foreign value added in final exports is half that of Chile's peers). Moreover, the significant drop of domestic and foreign value added in final exports over the past two decades suggests that, far from having moved up the value chains and diversified, Chile got even more specialized in upstream production phases.

82. Chile also experienced challenges in maintaining and capturing new segments in the market for copper and exports of refined copper have declined. Between 2004 and 2016, global refinery usage of copper increased by 60 percent (including 16 percent in the past five years). Over this period, Chile's copper export volumes increased by only 6 percent. Asia was both the driver and the benefactor of global market growth: refined copper usage and production increased by 3 million metric tons in Asia in 2011–15 while usage stagnated elsewhere and production in the Americas (including Chile) declined. The key driver of this trend has been further development of refinery activities in China, relegating Chile further upstream. In fact, China ranks first in smelting, refining and semiproduction (Table 2.1). Chile also remains the leader in extraction, second for refinery and third for smelter. Further analysis is needed to understand how Chile can preserve its current global position in smelting and refining while also gradually moving into semi-production of copper.

Table 2.1. Copper Value Chain, Global Ranking

Rank	Extraction	Smelting	Refining	Semiproduction
1	Chile	China	China	China
2	China	Japan	Chile	United States
3	Peru	Chile	Japan	Japan
4	United States	Russian Federation	USA	Germany
5	Australia	India	Russian Federation	Korea, Rep.
6	Russian Federation	Germany	Germany	Italy

Source: International Copper Study Group, 2016. "The World Copper Factbook." www.icsg.org

83. Heavy reliance on copper exports to China may have prevented an upgrading of value chains. While Chile's position is relatively further downstream in value chains that involve the Americas and Europe (that is, closer to the consumer and final product stage), it shifted its trade to Asia where it is further upstream (farther away from the consumer and the final product stage). Upgrading of an economy would require a move in the opposite direction. Quick wins have prevailed over upgrading in business development plans. This is a common feature among exporters of commodities, with sometimes dramatic consequences for nascent transformation industries. The high demand from China for unprocessed or little-processed materials and the

upward pressure on prices it exerted kicked off the ladder for upgrading within value chains, feeding the industrial growth in China and hampering the development of basic processing industries in commodity-providing countries.

84. A number of strategies would need to be designed to join, move up value chains and maximize the benefits of Chile's participation to global trade and value chains. These would both facilitate intra-chain transfers and increase the attractiveness of Chile as a pinch point of global trade and value chains, thereby positioning the country on higher-value added segments of those chains. These would rely, among others, on innovation and skills.

85. Chile would need to continue working on moving up and developing the development content of value chains in several key sectors. This includes mining, wood products, chemicals and metal products, agricultural/animal products, and food. A product map analysis could also help defining potential new sources of diversification and exports. So could a value chain analysis, by mapping the position of Chile in the different value chains and identifying the next akin tasks where Chile could capture more value domestically, or gain efficiency by outsourcing and substitute upstream with downstream activities. In doing so, policies that are needed to reach this new innovation frontier could be defined. For example, an analysis of the wood products value chain would be interesting as Chile has developed higher-value added activities, but at the same time has still a limited paper production (as opposed to wood pulp) and over the last decade saw its exports of planed wood decrease when its exports of chips increased. Through the Chilean Economic Development Agency (Corfo), the government is attempting to move beyond clusters and focus on smart specialization to boost the economy (Box 2.3)

Box 2.3. Corfo and Diversification in Chile

Corfo is the Chilean government agency aimed at supporting economic growth. Although Corfo's focus has varied over the years, one of its main goals has been always the advancement of the country's productive structure and sectoral diversification.^a

During the 2000s, the government created a sector cluster approach, as an attempt to sustain earlier diversification efforts. Of 70 initially identified potential sectors, the selected competitive clusters included fish farming, pork and chicken farming, processed food for human consumption, primary fruit industry, copper (mining and subproducts), tourism, financial services and outsourcing. These sectors were chosen based on a variety of factors, including their relevance, size, potential, necessary intervention by the state and efforts required to increase GDP. This growth and diversification strategy was effective in promoting the selected sectors, but mainly leveraged the potential of resource abundant regions and mature sectors that did not require a substantial upgrade of labor skills.

The most recent strategy put in place by the government—the Productivity, Innovation, and Growth Agenda—goes beyond the clusters and focuses on smart specialization. The idea behind the approach is to move from an economy based on natural resources to a economy based on knowledge. The clusters were successful in leveraging the commodity supercycle, stabilizing the macroenvironment and starting the diversification process, but the subsequent stagnation of competitiveness provided an opportunity to move toward a new strategy of inclusive and sustainable decentralization that further promotes the economy's diversification and sophistication.

The agenda focuses on the following sectors: mining, sustainable tourism, healthy food, creative economy, sustainable construction and fishery and aquaculture. It also adds a further focus on the

enabling platforms of logistics, solar industry, smart industries, technology and health services, and advanced manufacturing.

The areas were chosen considering the timing to initiate a productive transformation, existing market failures, market potential, sustainability, and ability and need to sophisticate the supply side. These initiatives allow to reach all regions in the countries and involve different actors, including the private sector, the state, Corfo and universities, among others. The participation of the private sector, in particular, is key to the desired productive transformation.

Some initiatives driven by Corfo under the new agenda include:

- Support program for competitiveness and innovation in logistics.
- Support program for productivity and diversification of artisanal fishery activities.
- A center for technological transfer to identify and capture external technology and transfer it to local enterprises.
- Financial support program for innovation efforts benefiting small and medium enterprises.

These are only a few of the 47 measures and initiatives identified under the agenda, which aims at improving competitiveness, productivity, diversification, and sophistication and, therefore, at moving Chile toward a knowledge-based economy.

a. The Corfo website is <http://www.english.corfo.cl/>.

2.2.5. Services development

86. Chile's services performance is “as expected” on a number of services indicators. Thus, Chile's trade in services represents 10.2 percent of GDP, more than the average in Latin America (6.2 percent), but less than the OECD average (13 percent). Service exports remain more oriented toward traditional exports in Chile than in the OECD. Past trends are encouraging. Chile's service exports have tripled in value over the past decade, and the share of modern sector services rose from 22 percent to 31 percent. Moreover, the sophistication of Chile's service export stands out. In particular, Chile has increased investment in other countries, mainly in Latin America and the Caribbean, on specific services such as retail and financial services. Chile also has a better score on the services trade restrictiveness index than the OECD average in 13 of 22 sectors and is more open in the services sector than one would expect based on the country's income level.⁴⁴

87. Structural peers, such as Australia and Canada, are potential role models for Chile in terms of achieving diversification through services development in the mining sector. Australia provides more than 60 percent of the software used in mining globally, and exports from the mining technology and services sector surpass US\$3 billion, with more than 500 rapidly growing companies involved, employing more than 17,000 people, most of them highly qualified (in 2001, before the commodity boom). In Canada, 3,100 companies provided mining services in 2009, among which 238 companies provided consulting services on environment issues, 152 on finance and management issues, and 140 on exploitation. Finland has gained a leading position in the mining technology sector with companies exporting their services globally: Metso employed up to 32,000 people in 50 countries, and positioned itself as the leading technology and service

⁴⁴ See STRI (Services Trade Restrictiveness Index) (database), Organisation for Economic Co-operation and Development, Paris, <http://www.oecd.org/tad/services-trade/services-trade-restrictiveness-index.htm>.

provider for end-to-end mineral processing and to become a leader in flow control within the oil and gas and mining industries (OECD 2013a).

88. The external environment had a significant impact on Chile's growth performance, raising the question how the country can derive sources of growth from international trade in goods and services, including participation in global value chains. The recent sharp drop in copper prices and the slowdown in China have become a factor of stress and highlights the urgency for a change in trade strategy. Chile lacks specialization in export products within the core of the product space, lags in the economic complexity of its exports, and its service exports are relatively limited. How should Chile respond to these challenges? By specializing further and utilizing more fully its comparative advantage in copper production? By diversifying exports to reduce commodity dependence? Which new economic activities can potentially take up the slack to drive future growth? Arguably, a combination of product upgrading within areas of specialization (for example, copper) as well as additional export diversification would be needed.

89. To sum up, Chile would need to gravitate toward an economic model that is more knowledge and technology intensive. Trade diversification both geographically and in the product space by upgrading value chains, removing barriers to competition, and encapsulating processes in services would be needed. This requires improving the quality of human capital and the incidence of innovation (see above). Chile could draw upon its comparative advantage in copper mining, but make further progress in moving up the mining value chain as well as entering the markets for mining services. Service exports need to be boosted, and the transport sector can be further liberalized to strengthen competitiveness. Finally, Chile would need to continue working on moving up and developing the development content of value chains in several key sectors.

2.3. Competition and Regulation

Productivity Spillovers

90. Chile lags on cooperation to achieve productivity spillovers. The presence of spillovers is one possible channel through which the external environment affects productivity levels. Spillovers may be particularly important in Chile given the primacy of catch-up productivity growth. On average, Chile performs poorly in terms of cooperation within the OECD. Overall, only 7 percent of Chilean firms that are innovation active cooperate on innovation activities compared with 32 percent in the OECD, according to the 2015 OECD Innovation Indicators. Regionally comparable data are only available on Colombia, which shows an overall cooperation level of 39 percent. Cooperation in Chile is more prevalent among large (16 percent) and R&D active firms (20 percent); it is particularly low among suppliers, clients, higher-level institutions, and government (about 3–4 percent) and generally lags markedly behind the rest of the OECD in all dimensions.

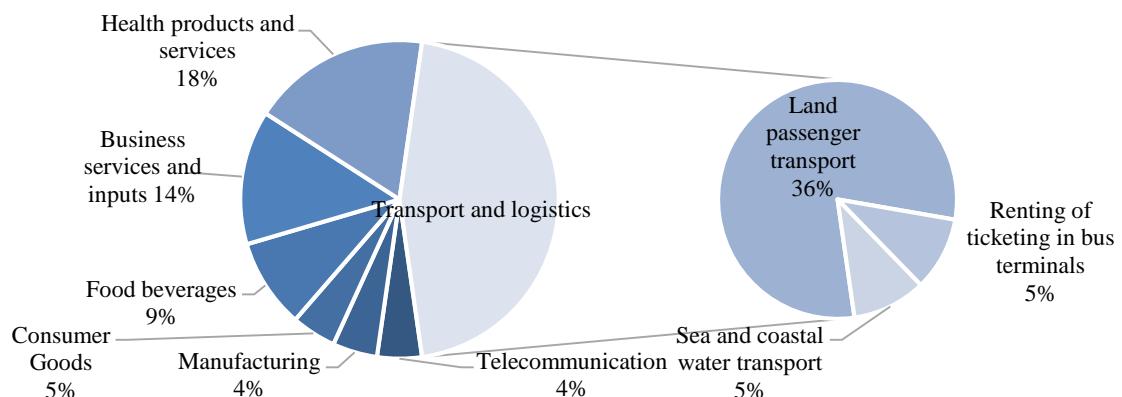
Competition and FDI

91. Despite market-based reforms, competitive pressure has been limited in some sectors. Trade liberalization in the 1990s had the expected effect on resource allocation among firms and on overall higher productivity in the manufacturing sector (see section 2.1; for example, Pavcnik

2002). More recently, between 2006 and 2010, an increase in market concentration in manufacturing industries seems to have been associated with larger price-cost margins.⁴⁵ The recently detected cartel agreements in retail sectors of supposedly homogeneous tradable goods, such as hygiene products or poultry, suggests that import competition alone does not guarantee competitive market outcomes. Fuentes and Mies (2014) find that easing the entry and exit restrictions will close the income gap between Chile and the United States by 5 percent. Competitive pressure from potential or actual competitors is critical for further productivity growth in Chile.⁴⁶

92. Chile developed a solid competition legal framework, placing the country ahead of regional peers. Besides overall improvements in business entry and exit regulation, following a wave of privatization in the 1990s, pro-competition network regulation has generally enabled entry of more efficient rivals in segments where competition is viable. A relatively strong track record on competition law enforcement positioned the government of Chile as a quiet pioneer in Latin America (OECD 2003, 2015) and will remain critical to tackle harmful anti-competitive behavior in key goods and services. The success in detecting harmful price-fixing agreements, including 11 cartels in the transport sector, since 2002 and even in tradable goods, such as essential hygiene products, has contributed to the international reputation of the government. The antitrust agency is rated “as expected,” comparable with Colombia and Mexico’s rating, but not as good as Australia, Canada, or Norway’s rating (*Global Competition Review* 2016) (Figure 2.14). A recent reform to Chilean competition law aligns certain instruments (such as merger review and cartel enforcement) with common practice across OECD.

Figure 2.14. Distribution of Detected Cartel Agreements, Chile, 2005–15



Source: Anti-Cartel Enforcement Database, World Bank (Forthcoming).

⁴⁵ Between 2006 and 2010, average price cost margins have increased in those manufacturing industries in which the share of concentrated markets has grown, as measured by the Enterprise Survey Database. However, without further case-by-case analysis, it is not possible to determine whether the increase in concentration and estimated market power is due to product differentiation (investment, innovation, product adaptation), increased regulatory protection, or even exclusionary conduct. Each of those scenarios may imply different conclusions about the degree of market competition.

⁴⁶ Facing entry or expansion of a new competitor, firms have an incentive to reduce managerial slack, improve efficiency of production processes or differentiate themselves with a new product variety. Also, the availability of efficient and competitively prices input goods and services is key to competitiveness of downstream firms (Goodwin and Pierola 2015).

93. Nonetheless, Chile lags behind other OECD countries in terms of restrictiveness of product market regulation in critical sectors. According to the latest estimates of the OECD Indicators of Product Market Regulation, which captures the degree to which government market regulations promote or restrict competition, “as expected,” Chile ranks 25th of 55 countries, putting it ahead of Brazil and Mexico, but behind most other OECD countries.⁴⁷ Despite reforms of network industry regulation in the 90s and generally liberal economic policy of the past decade, the scope of government interventions in markets along several dimensions is unusual among OECD top performers: In Chile, regulations allow for pricing guidelines in professional services and transport sectors; 32 SOEs operate in mining, telecommunications, water and sanitation, financial and even agricultural sectors; and some of these are vertically integrated along infrastructure and service provision segments. The state’s involvement in business operations could also be further aligned with best practice, including in road transport companies and water plants. Simulations based on countries with similar levels of restrictiveness (that is, France and Mexico) suggest that aligning product market regulation with OECD best practice could boost GDP by 0.25–0.50 percent a year on a five-year horizon (OECD 2015). A relatively strong competition policy framework positioned Chile as a quiet pioneer in Latin America, which is expected to strengthen with the amendment to the Competition Act enacted in July 2016 (OECD 2003, 2015).

94. Some government interventions are associated with barriers to entry and protection of incumbents, as well as distortions to the level playing field. Where the government maintained its SOEs, principles of competitive neutrality are not always guaranteed. For example, SOEs can receive financing which are not available to private companies. In key services sectors, particularly network industries such as gas, electricity, telecommunications and the various transport modes, Chile maintains barriers to entry and regulatory protection of incumbents. For example, Chile lacks consistent ownership or even accounting separation of the generation and other segments in the electricity sector, and there is no vertical separation of the railroad infrastructure and services sector.⁴⁸

95. Despite trade tariffs being relatively low and aligned to the OECD average, international competition may be discouraged by lack of implementation of Mutual Recognition Agreements and other means of trade facilitation. “As expected” trade tariffs are relatively low (simple average of 6 percent), and Chile displays goods trade liberalization similar to the OECD average. Nonetheless, Chile maintains several barriers to trade facilitation. As of 2013, the country had not engaged in mutual recognition agreements yet in several sectors, namely air transport, banking, construction, distribution, energy, insurance, transport and telecom; foreign suppliers were treated less favorably regarding taxes and eligibility to subsidies in certain business services (such as accountancy) and regulations limited the opportunities for cabotage services.⁴⁹ Nonetheless, given that trade barriers are low, more trade liberalization is unlikely to yield much gain in productivity (Syverson 2014).

⁴⁷ 2013 data of Indicators of Product Market Regulation (database), Organisation for Economic Co-operation and Development, Paris, <http://www.oecd.org/eco/growth/indicatorsofproductmarketregulationhomepage.htm>.

⁴⁸ Moreover, several accounting services have binding minimum prices, and engineers and architects charge some services according to nonbinding recommended prices (as defined by their respective association).

⁴⁹ See Indicators of Product Market Regulation (database), Organisation for Economic Co-operation and Development, Paris, <http://www.oecd.org/eco/growth/indicatorsofproductmarketregulationhomepage.htm>.

96. The connectivity and competitiveness of the economy are also being affected by rents in the transport sector. Despite the openness that the government promotes in trade agreements and has sought to implement, as illustrated by low average services trade restrictiveness index scores, some service providers have managed to capture rents associated with merchandise trade.⁵⁰ The country registers its worst services trade restrictiveness index scores in transport and logistics, in which it also is less open than average, that is, in sectors in which the country exports and imports the most. While the country's trade expansion has been driven by commodity exports, services have represented a tax or supplement rent on commodity trade. Far from being driven by competitiveness in an open economy, service exports were free riding on commodity exports and represented a tax on those exports, thereby affecting overall competitiveness. This is reflected in Chile's 42nd rank on the logistics performance index and below average in its income group in all the various performance indicators.⁵¹

97. The country is less liberalized in service exports, and additional reforms hold important productivity-enhancing potential. The country's restrictiveness in the trade in services is generally in line with the regional average and greater than in the OECD. Indeed, the country's services trade restrictiveness index score is lower than the OECD average in 13 of 22 sectors. Scatterplots regressing the index score with income per capita show Chile slightly below the line. Intermediate services such as maritime transport, telecommunications, and courier services are some distance from best practice.

98. The inflows of FDI into Chile are among the highest in the OECD, and there is evidence linking this to productivity-enhancing technology transfers. FDI is in ways trade by another means: rather than producing a product abroad and exporting it to Chile, a foreign producer instead invests productive capacity in Chile itself. FDI has been shown to raise Chilean productivity by introducing superior practices of successful foreign firms into the domestic market (Ramondo 2009) as well as through supply chains (Fernandes and Paunov 2012). FDI inflows are an important source of investment in Chile, in particular for the mining, financial and utilities sectors. They have increased from an annual average of 6 percent of GDP in the early 2000s to 8.5 percent by 2015. The United States, the Netherlands, and Spain represent the main source markets (IMF 2015). The FDI going into Chile is far greater than the OECD and Latin America and Caribbean averages.

Input Market Flexibility

99. Most of Chile's labor market regulations and institutions point to a great deal of flexibility although some features impose rigidity. Differences between de facto and de jure regulation has important implications for the analysis. Ruiz-Tagle and Sehnbruch (2015) point out that Chile has a legislative framework that looks relatively rigid on paper, but employment practices that are highly flexible. The labor contract type is an important distinguishing feature creating a segmented or dualistic labor market, where fixed term contracts are largely associated with flexibility and open-ended contracts with rigidity (chapter 3). About a third of employment

⁵⁰ See STRI (Services Trade Restrictiveness Index) (database), Organisation for Economic Co-operation and Development, Paris, <http://www.oecd.org/tad/services-trade/services-trade-restrictiveness-index.htm>.

⁵¹ See LPI (Logistics Performance Index) (database), World Bank, Washington, DC, <http://lpi.worldbank.org/>.

contracts are fixed term, and about a fifth are renewable once a year, giving employers considerable flexibility. There is evidence of deliberate abuse of short-term contracts by employers (Multiruts), though the prevalence is uncertain. Such practices restrict the *de facto* labor rights of employees by preventing access to severance pay, ability of forming effective unions, and provision of child care access. Other aspects of labor market flexibility includes low unionization rates, restrictive striking rights (worker substitution allowed), decentralized and fragmented bargaining, and highly flexible dismissal regulation of permanent workers. On the other hand, there are also rigid elements to labor regulation. The minimum wage is high relative to the median wage (the second highest in the OECD); severance payments are relatively high; and individual dismissal regulations among temporary workers and on individual dismissals are rigid.

100. **There is evidence that a gradual tightening of labor market regulations has been associated with reduced manufacturing productivity in Chile since the mid-1980s.** Petrin and Sivadasan (2013) find that tighter labor market regulations in 1984 and 1990 – which increased the costs of dismissing a worker – reduced allocative efficiency within manufacturing firms thereby lowering aggregate productivity. Similarly, Micco and Repetto (2014) find evidence that labor market regulations affecting the employment of high-skilled workers complicate the adjustment of manufacturing plants when they are hit by a shock, including a lower reallocation of workers toward high-productivity plants. Yet, the complex nature of the Chilean labor market, particularly the *de facto* vs. *de jure* considerations and the absence of internationally comparable data across all relevant dimensions, makes it difficult to assess whether current labor regulation is a constraint on productivity growth. Nonetheless, weighing the available evidence, labor regulations would appear to be less of a concern for productivity in Chile.

2.4. From Past to Future Sources of Growth

101. **Future growth drivers can be grouped into four different categories.** First, the growth fundamentals which will continue supporting potential growth going forward. Second, factors that will become increasingly important in the future, including quality of education, female labor force participation and innovation. Third, the factors that helped propel growth in the past, but which are likely to yield lower returns going forward: additional factor accumulation, and additional market reforms. Fourth, the headwind factors that are likely to work against Chile in the future even if they helped growth in the past: the end of the commodity price supercycle and demography.

Growth fundamentals

- **Economic and governance institutions** offer an excellent basis for future growth (see chapter 1). They include strong fiscal and monetary institutions to preserve macroeconomic stability; relatively open and well-regulated markets to foster an efficient allocation of resources, and government effectiveness and good governance (strong property rights, an independent judiciary and low corruption).
- **Sound macro policies:** Chile's impeccable macroeconomic record has helped it substantially in the past (for example, the 1980s and 1990s), though with diminishing returns for growth (2000s). Going forward, macroeconomic stability will remain a necessary condition for growth.

Growth drivers with positive and increasing returns

- **Quality of education.** Chile's education outcomes lag behind other OECD member states. Beyer and Gallego (2014) estimate that the marginal returns of educational quality doubled for Chile from 0.2 percent in 1960 to 0.4 percent in 2000. Moreover, improvement in education will be important to facilitate structural change.
- **Female labor force participation.** Only 55.7 percent of Chilean women participate in the labor force, which is below the average levels of Latin America (58.2 percent) and the OECD (62.8 percent), suggesting that increases in female labor force participation rates could yield significant gains as the marginal product of labor increases as the share of working-age population declines.
- **Innovation.** Innovations are often a key driver of growth, enabling businesses to produce more with less or to produce better or new goods. Chile significantly lags behind the OECD average on key measures of innovation.

Growth drivers with positive, but marginal returns

- **Additional factor accumulation:** Macroeconomically, in the face of diminishing returns to labor and capital, TFP is the only channel through which long-term economic growth can be sustained. As a part of its convergence to a high-income country, Chile has moved closer to the global technology frontier, albeit without reaching it yet. While additional factor accumulation will still yield positive growth returns, they will be smaller than in the past. Nonetheless, it is essential to provide an environment that is equally conducive to increase capital investment though the promotion of confidence through institutional stability and adequate regulation. Therefore, there is a need to balance policy responses to address legitimate challenges to equity without undermine private sector confidence.
- **Additional market reforms:** Chile's success in several, but far from all, reform areas imply that their future productivity punch is limited. This is particularly the case in terms of financial and capital account liberalization as well as merchandise trade and current account liberalization. There is still scope for growth-enhancing improvements on competition, regulatory and innovation policy frameworks as well as services trade openness (see below).

Growth headwinds

- **The end of the commodity price supercycle.** Consensus forecasts suggest that the recent decline in commodity prices which helped spur Chile's growth in the 2000s could well be permanent. Declining commodity prices and terms of trade will hold back Chile's growth over the next decade similar to what it experienced in the 1980s and 1990s.
- **Demography.** Chile has fully benefited from an expanding working-age population over the past 50 years, but this trend is shifting. Because the working-age population is projected to shrink by 5 percent over the next decade, demography will become a drag on growth.

102. **Chile still has a broad range of options at its disposal to boost growth in the future.** In fact, the list of potential future sources of growth is long so that the challenge is more one of identifying the most of important of these. Indeed, the rest of the chapter is devoted to this purpose.

2.5. Identifying Binding Constraints

103. **To identify binding constraints, Chile's performance gap is examined, along with information about the potential impacts of closing the gap.** The most obvious candidates are those areas where Chile lags, and there is evidence that the productivity impact of improvements would be substantial. The group could potentially be expanded to include determinants where Chile's performance is “as expected,” but with a substantial productivity impact.

104. **Additional selection criteria were also considered, including the potential equity and fiscal impacts, as well as the effectiveness of public policy** (see chapter 5). Some determinants, including female labor participation and quality of human capital have positive equity impacts. Others, including investments in education and infrastructure are relatively costly from a fiscal point of view. Finally, some determinants do not easily translate into government policy, including management practices, quality of physical capital and learning by doing. Table 2.2 summarizes the results.

Table 2.2. Productivity Determinants: Performance and Impact, Chile

Performance	<i>Evidence of substantial impact</i>	<i>Limited or unknown impact</i>
Lagging	Quality of human capital (+, US\$) Female labor force participation (+) Innovation Export diversification (+)	Productivity spillovers (~)
As expected	Domestic competition Labor market rigidity (-) Management practices (~) Services development	Quality of physical capital (~)
Strong	Merchandise trade competition FDI Capital markets	
Unknown		Learning by doing (~)

Source: World Bank analysis.

Note: Positive equity impact (+); equity trade-off (-); substantial fiscal cost (US\$); government policy ineffective (~).

105. **Chile faces a challenge of gradually shifting away from a growth model relying on volatile commodity exports toward a more knowledge and technology intensive model.** Improving the quality of human capital, increasing female labor force participation, and fostering innovation are among the most promising interventions that could boost productivity in Chile. Moreover, fostering process and product innovations and removing entry barriers (including rent-seeking behavior in key sectors) could also increase TFP and boost growth. Product specialization is another binding constraint to growth. A combination of product upgrading within areas of specialization as well as additional export diversification are also needed for Chile's economy to move closer to the global technology frontier.

Chapter 3. What are the critical factors that determine inclusion?

“La macro anda bien pero yo ando en micro”⁵²

— SCD consultation mission

Over the last two decades, Chile has made impressive progress on economic growth and poverty reduction. It is one of the countries in Latin America and the Caribbean with the lowest poverty rate and managed to reduce extreme poverty, as measured by those living on less than US\$1.90 a day, to less than 1 percent. Between 2006 and 2015, incomes among the bottom 40 rose at an annualized rate of 4.4 percent, more rapid than the average growth rate. Increases in labor income and transitions to more productive sectors have been the dominant factors explaining Chile’s strides in poverty reduction. Substantial income growth has also shifted Chile’s income distribution to the right, making the middle class the largest socioeconomic group though most of it is close to the vulnerable population limit. Nonetheless, inequality has remained persistently wide, and Chile’s Gini coefficient is among the highest in the world. Structural factors that may explain income inequality include low intergenerational mobility and limited opportunities for vulnerable groups to participate in productive activities. In addition, Chile’s market oriented institutions have not contributed enough to integrate public service provision in education, health and social security. In the context of a large and growing middle class that demands higher-quality services and better opportunities, coupled with Chile’s epidemiologic transition and fast aging population, there is additional pressure on improving public service provision.

3.1. Performance on the Twin Goals

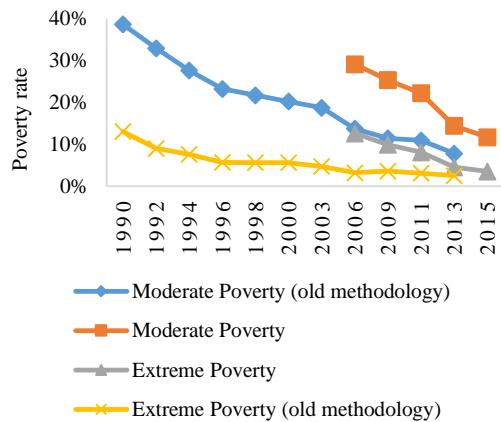
3.1.1. Poverty

106. Chile has made important strides in reducing monetary poverty during the last two decades. Between 1990 and 2013, both moderate and extreme poverty fell into the single digits; moderate poverty decreased from 39 to 8 percent, whereas extreme poverty fell from 13 to 2.5 percent. Calculations based on the recently updated official poverty methodology reveal that, in 2015, only 11.7 percent of Chileans were living below the poverty line, while only 3.5 percent were living in extreme poverty (Figure 3.1). Moreover, the share of the population living on less than US\$1.90 a day—the global extreme poverty line—was 1 percent in 2013, placing Chile well on track to meet the United Nations Sustainable Development Goal of eradicating extreme poverty by 2030. In Latin America and the Caribbean, Chile, at approximately 8 percent, has the second-lowest rate of moderate poverty measured using the regional US\$4.00-a-day poverty line, but has a poverty rate higher than the OECD average (Figure 3.2) (Box 3.1).⁵³

⁵² “The macro goes well, but I go in *micro*.” In Chile, *micro* is also used to refer to public buses.

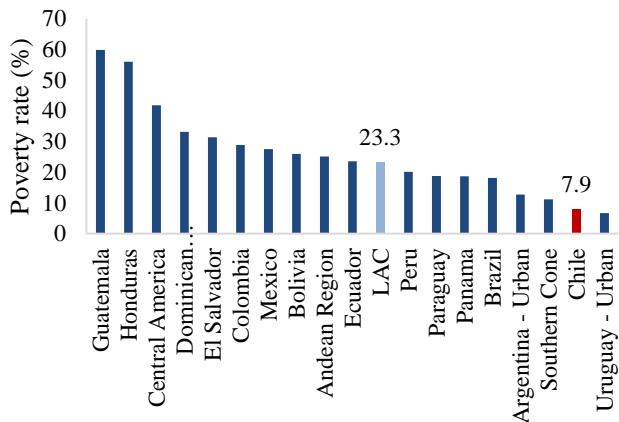
⁵³ Poverty among OECD countries is measured according to individuals whose household income is less than half the median (after taxes and transfers) prevailing in each country. In Chile, this fell decreased from 17.8 percent in 2009 to 16.8 percent in 2013, still above the OECD average of 11.2 percent for 2013. In the same year, Chile had a lower poverty rate than Israel and Turkey, though the rate was higher than among structural peers (Australia, Canada, and Norway).

Figure 3.1. Household Moderate and Extreme Poverty, Old and New Methodology, 1990–2015



Source: 1990–2015 data of the Encuesta de Caracterización Socioeconómica Nacional (national household income survey, CASEN).

Figure 3.2. Poverty US\$4 2005 PPP, circa 2014



Source: LAC Equity Lab Tabulations, Team for Statistical Development, World Bank, Washington, DC, based on data in SEDLAC (Socio-Economic Database for Latin America and the Caribbean) (CEDLAS and World Bank).

Note: Poverty rates for Chile refer to 2013.

Box 3.1. Poverty Measurement in Chile

Official national poverty data

Chile's official poverty figures are produced by the Ministry of Social Development using the information collected through the national household income survey (*Encuesta de Caracterización Socioeconómica Nacional*, CASEN) and have been released since 1987 every two or three years.^a Poverty is defined as the share of poor individuals in the country in a given year, where an individual is defined as poor if her income aggregate falls below the poverty line.

The income aggregate is defined as the sum of all incomes received in the household, including imputed rents for homeowners, adjusted to take into account the size of the household and, starting in 2013, also the household composition. In particular, until 2011, the adjustment involved dividing the total household income by the number of individuals living in the household (except domestic workers), leading to a measure of total per capita household income. Starting in 2013, the adjustment has taken into account also the composition of the household and the potential economy of scale generated within the household, leading to a measure of equivalized total household income.^b

The poverty line defines the standard of living considered the minimum possible to live a decent life. The official methodology distinguishes between the minimum income needed to satisfy the basic nutrition standard, which is the extreme poverty line (*línea de indigencia*), and the minimum income needed to satisfy the basic living standard (*línea de pobreza*). The extreme poverty line reflects the cost of a food basket which allows an average individual to consume 2,000 calories per day. The poverty line, in turn, inflates the extreme poverty line to take into account the need to consume also other basic goods (different from food) and services to meet a minimum standard of living. Before 2013, two different set of poverty lines were defined for households living in urban and rural areas, to take into account the differences in living standards for different type of settlements. Table B3.1.1 summarizes the evolution of extreme poverty and poverty lines from 1990 to 2015.

Table B3.1.1. Moderate and Extreme Poverty Lines, Monthly Values, Current Prices, 1990–2015

a. Extreme poverty lines				b. Moderate poverty lines			
Traditional methodology (per capita)			New methodology (per adult equivalent)	Traditional methodology (per capita)			New methodology (per adult equivalent)
	Urban current prices	Rural current prices	Overall 2005PPP		Urban current prices	Rural 2005PPP	Overall 2005PPP
1990	9,297	77.8	7,164	60.0	1990	18,594	155.6
1992	12,875	76.6	9,921	59.0	1992	25,750	153.2
1994	15,050	71.3	11,597	54.9	1994	30,100	142.5
1996	17,136	69.8	13,204	53.8	1996	34,272	139.7
1998	18,944	69.2	14,598	53.3	1998	37,889	138.4
2000	20,281	69.1	15,616	53.2	2000	40,562	138.1
2003	21,856	68.2	16,842	52.6	2003	43,712	136.4
2006	23,549	68.2	18,146	52.6	2006	47,099	136.5
2009	32,067	80.7	24,710	62.2	2009	64,134	161.3
2011	36,049	86.5	27,778	66.7	2011	72,098	173.1
2013	39,725	90.8	30,611	70.0	2013	66,084	151.1
2015				101,113	2015		
				212.2			

Sources: World Bank calculations. Values in current prices: CASEN data. Consumer price index series: IMF Data (database), International Monetary Fund, Washington, DC, <http://www.imf.org/en/Data#data>. PPP: WDI (World Development Indicators) (database), World Bank, Washington, DC, <http://data.worldbank.org/products/wdi>.

Note: To ensure comparability with the regional US\$4-a-day poverty line (2005 PPP), Chile's national poverty lines have been converted to 2005 PPP. In 2005, PPP was Ch\$333.7.

Notwithstanding the recent change in poverty methodology, the Ministry of Social Development released, for 2006, 2009, 2011, and 2013, poverty figures using both the traditional and the new definitions, guaranteeing continuity and comparability while transitioning to the new methodology.

International poverty data

To make meaningful international comparisons, poverty should be measured using the same methodology across countries, ideally using the same definition of the welfare aggregate, and the same level of poverty line.

For this purpose, the World Bank set an extreme poverty line at US\$1.25 a day, in 2005 PPP terms, per day per capita, which represents the mean of the poverty lines found in the poorest 15 countries ranked by per capita consumption among 88 surveyed countries over 1990–2005 (Ravallion, Chen, and Sangraula 2009). Following the release of the new PPP estimates, the international extreme poverty line has been updated in 2015 to US\$1.90 in 2011 PPP terms, per day per capita, using the same methodology. Another commonly used poverty line for international comparisons across countries in the Latin American and Caribbean region is US\$4.00 a day (or about US\$122 a month) in 2005 PPP terms, which corresponds to about Ch\$1,749 a day in 2013 prices (in monthly terms, Ch\$53,211).^c This regional poverty line is close to the average between the urban and rural poverty lines in Chile for 2013. Moreover, the income aggregates for countries in Latin America and the Caribbean are harmonized in the Socio-Economic Database for Latin America and the Caribbean (SEDLAC) to allow for maximum comparability across countries, and may differ from the official values.^d Whenever, in this report, Chile is compared with other countries in the region, SEDLAC and international poverty lines are therefore used, unless otherwise specified.

The OECD adopts a relative approach to the definition of the poverty line, which is set to 50 percent of the median income in a given country in each year (a similar approach is used, among others, by the European Statistical Agency for comparing standards of living across European Union countries). For the purpose of comparing Chile with the other OECD countries, this relative approach is adopted throughout the report.

- a. Resultados Encuesta CASEN (Encuesta de Caracterización Socioeconómica Nacional [national household income survey]), (database), Ministry of Social Development, Santiago, Chile, <http://www.ministeriodesarrollosocial.gob.cl/resultados-encuesta-casen-2013/>.
- b. Total household income, including imputed rents, is divided by ($n^{0.7}$), where n is household size.
- c. Considering the PPP 2005 was Ch\$333.7, and the consumer price indexes in 2005 and 2013 were, respectively, Ch\$76.297 and Ch\$99.995 (IMF 2016).
- d. SEDLAC (Socio-Economic Database for Latin America and the Caribbean), Center for Distributive, Labor, and Social Studies, Universidad de La Plata, La Plata, Argentina; World Bank, Washington, DC, <http://sedlac.econo.unlp.edu.ar/eng/index.php>.

107. Although still large, regional differences in poverty exhibit important declines. In 2015, extreme poverty rates for all regions were below 9 percent and the differences between these dropped with respect to 2006. In 2006, the region with the greatest incidence of extreme poverty, La Araucanía, exhibited 21.3 percentage points greater incidence than the lowest, Antofagasta; by 2015, this difference had dropped to 6.8 percentage points. Moderate poverty rates presented similar patterns, though differences across regions were larger. In 2015, the moderate poverty rate was four times higher in La Araucanía than in Antofagasta. In addition, at 22.1 percent, the rural poverty rate is significantly higher than the urban poverty rate (10.2 percent).

108. The incidence of poverty is especially high among indigenous people, women, and youth. One out of four indigenous individuals live in rural areas and rural indigenous show substantially higher poverty rates. Although indigenous poverty rates fell by over 20 points beginning in 2006 (44.0 percent to 18.3 percent), there is still a 7-point gap compared with the nonindigenous population. In addition, La Araucanía has the highest regional poverty rate (23 percent) as well as the largest share of indigenous peoples living in poverty (33.9 percent) (map 3.1). Likewise, extreme poverty rates are two times greater among indigenous peoples than among the general population (6.6 percent vs 3.2 percent).⁵⁴ Moderate and extreme poverty rates are higher among women than among men (12.1 percent vs. 11.2 percent and 3.4 vs. 3.7 percent, respectively). Youth are also poorer than adults. In 2015, 18.3 percent of Chileans younger than age 15 were living in poverty, compared with 9.7 percent of working-age adults (see annex C).

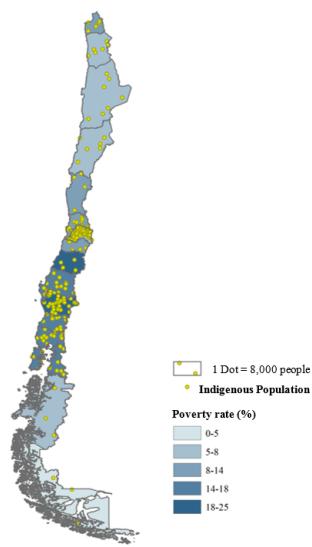
3.1.2. Shared Prosperity

109. Chile has also made considerable progress on shared prosperity. Between 2003 and 2013, incomes among the bottom 40 rose at an annualized rate of 5.5 percent, more rapid than the rate among the general population (3.8 percent). Growth among the bottom 40 was significantly greater in Chile than in Mexico (1.9 percent), but still lagged relative to Brazil and Peru (6.8 percent and 6.9 percent, respectively) (Figure 3.3). Chileans in the bottom 40 have a median daily income nearly twice that of the Latin America and Caribbean average. As of 2015, the average Chilean in the bottom 40 had a median daily per capita income of US\$6.14, whereas the average individual in Latin America and the Caribbean had a daily income of US\$3.70.⁵⁵

⁵⁴ As of 2013, only 13 percent of indigenous people were living on less than US\$4 a day in Chile compared with over a third in Brazil, Mexico, and Peru (Tabulations of Equity Lab, Team for Statistical Development, World Bank, Washington, DC, based on data in SEDLAC).

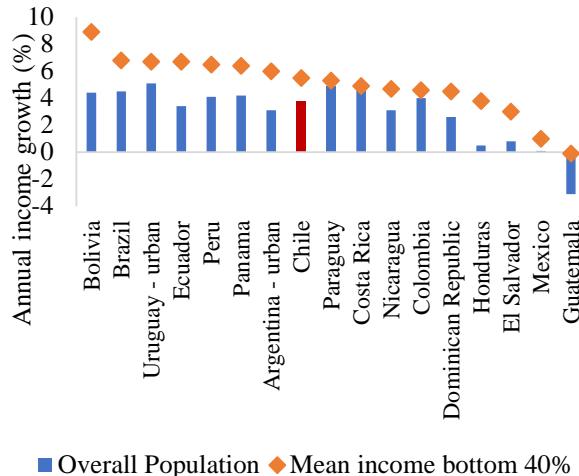
⁵⁵ Data of the SEDLAC database. The data on Latin America and the Caribbean are for 2014.

Map 3.1. Regional Poverty Rate and Indigenous Population, 2015



Source: Calculations based on CASEN data, 2015.
Note: Yellow dots = indigenous population (1 dot = 8,000 people). Blue = regional poverty rates.

Figure 3.3 Pro-poor Income Growth, Annualized Growth Rate of Income for the Bottom 40 and the Overall Population, circa 2004–14



Source: LAC Equity Lab tabulations based on data in SEDLAC (CEDLAS and World Bank)
Note: Annualized growth rates for Chile are for 2003–13.

110. **There has been an increase in the size of the middle class in Chile, making it the third largest in Latin America and the Caribbean.** The share of the population living above the poverty line, but below the middle-class threshold declined between 2003 and 2015. At the beginning of the period, over 42 percent of Chileans were considered vulnerable; there had been a 6.5 percentage point reduction by 2015, leaving the share of the vulnerable at 35.5 percent. This contrasts with the Latin America and Caribbean average; there, the vulnerable population actually rose, from 36 percent to 39 percent, during the period. Moreover, as poverty fell throughout the decade, the middle class expanded from 33 percent to 51.3 percent of the population, making it one of the largest in Latin America and the Caribbean.

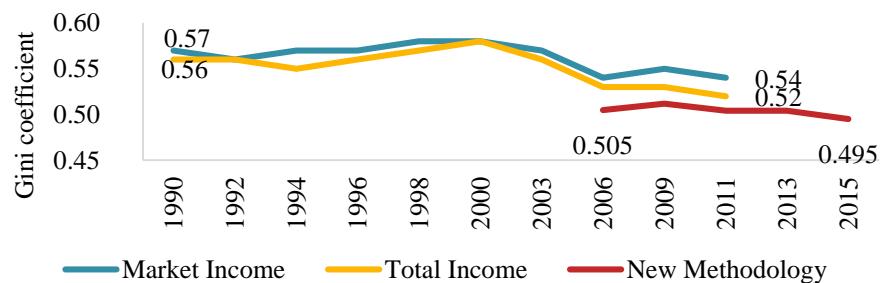
3.1.3. Inequality

111. **Although Chile has made impressive advances on inequality reduction, it is still among the most unequal countries in the world.** Chile's Gini coefficient dropped from 0.55 to 0.50 in over a decade (Figure 3.4). The income of the richest 10 percent of Chileans is 27 times greater than the income of the poorest 10 percent, which constitutes the greatest difference among OECD countries. Moreover, Chile not only exhibits the widest income inequality among OECD countries, but also has the 14th widest equality gap globally. The Gini coefficient is much higher in Chile than in developed economies with around the same GDP per capita as Chile.⁵⁶ Similarly, the Palma

⁵⁶ Data of the Treasury 2014, the World Bank, and the OECD. The level of development according to GDP per capita is similar. Years were selected to reflect the value closest to the reference year, that is, the year in which each country presented income per capita equal or similar to Chile in 2011.

ratio—the ratio of national income shares of the top 10 percent of households to the bottom 40 percent—is also higher in Chile than in most OECD countries.⁵⁷

Figure 3.4. Trends in the Gini Coefficient, 1990–2015



Source: Calculations based on CASEN data, 2006–15.

Note: The old income definition is used for the Gini series to allow for a longer time comparison.

3.1.4. Nonmonetary Poverty Measures

112. Chile has experienced significant declines in multidimensional and chronic poverty. Between 2009 and 2015, Chile's multidimensional poverty rate fell from 27.5 percent to 19.1 percent (Figure 3.5). However, this disguises important regional variations; the least multidimensionally poor region had a rate of 9.1 percent (Magallanes) and the most poor region had a rate of 26.2 percent (La Araucanía) (Figure 3.6). Measures of multidimensional poverty also show an unfavorable scenario among indigenous populations (28.4 percent relative to 18.2 percent among the nonindigenous) (CASEN data, 2015). Similarly, the chronic poor, defined as the proportion of individuals who are deprived in monetary and nonmonetary dimensions, declined by 6.8 percentage points during the same time period, from 11.1 percent to 4.3 percent.

Figure 3.5. The Multidimensional Poverty Index and the Chronic Poor, 2009–15

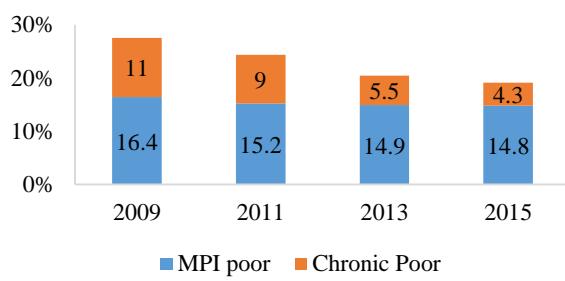
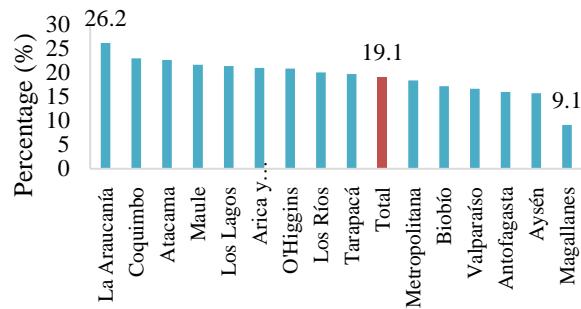


Figure 3.6. Multidimensional Poverty, by Region, 2015



Source: Calculations based on CASEN data, 2015.

Note: The multidimensional poverty index has four dimensions: educational attainment, health, labor and social security, and housing conditions. See MPI (Multidimensional Poverty Index) Interactive Data Bank, Oxford Poverty and Human Development Initiative, Oxford, <http://www.ophi.org.uk/multidimensional-poverty-index/mpi-data-bank/>.

⁵⁷ Chile's Palma ratio in 2013 was 2.6; thus, the top 10 percent had 2.6 times the income of the bottom 40. In contrast, the Palma ratios of Australia and Canada were half that of Chile, while Norway's was 0.86 percent of Chile's.

113. Chile has performed well on other dimensions such as health outcomes, educational attainment and the human development index, converging to levels of developed countries. In each of these dimensions Chile has improved its performance, placing it as a top performer in Latin America and the Caribbean and closer to the OECD average. Maternal mortality decreased from 57 per 100,000 live births to 22 between 1990 and 2015. Similarly, under-5 mortality rates (per 1,000 live births) dropped nearly 60 percent, from 19.1 to 8.1, during the same period. Mean years of schooling for Chilean adults increased from 8.1 in 1990 to 9.8 in 2013, placing it as the best Latin America and Caribbean performer along with Argentina and closer to the OECD average of 11.2 (UNDP 2015). Chile's human development index has also seen improvements, going from 0.699 in 1990 to 0.832 in 2014, making Chile, together with Uruguay, one of the two Latin America and Caribbean countries classified as exhibiting "very high" human development.

114. Over the past few decades, life expectancy has increased more quickly in Chile than in most OECD countries. Chile's life expectancy is approaching that of OECD countries; the gap in life expectancy between the two has decreased from eight years in 1970 to less than two years in 2013 (80.5 years on average for OECD countries and 78.8 years in Chile). Nonetheless, approximately 40 percent of adults in Chile report they smoke each day, well above the OECD average of 21 percent; indeed, this is the highest smoking rate on the South American continent.⁵⁸ Such a high rate suggests that respiratory illnesses and increasing health care costs could be an issue in the near future, especially given Chile's epidemiologic transition. Similarly, in 2009, one adult in four in Chile was considered obese (OECD health statistics, 2016). Even though this rate is lower than in the United States and Mexico where over a third of the population is obese, the growing prevalence of obesity suggests that health problems, such as diabetes and heart disease, and higher health care costs could be yet another concern in the near future. Chile has been a pioneer in implementing innovative policies to tackle these issues; in particular, its new food labels are aimed at encouraging consumers to prefer healthier foods.⁵⁹ In addition, Chile has low utilization levels, as indicated by a low rate of physicians and consultations per capita; low screening and survival rates for certain cancers; and long wait times for selected types of surgery. International benchmarking also reveal an overuse of Caesarian sections, for which Chile has the third highest rate in the OECD.

115. Chile performs below average on several measures of well-being relative to most other countries in the OECD better life index.⁶⁰ It ranks close to the average in subjective well-being and below average in civic engagement, health status, jobs and earnings, social connections, work-life balance, housing, income and wealth, personal security, education and skills, and environmental quality.

⁵⁸ The latest available data on Chile are for 2009 and on the OECD for 2012, using OECD Health Statistics. In 2014, the Chilean government increased specific taxes for tobacco and sugar-containing nonalcoholic beverages to inhibit the consumption of products that harm an individual's health. It introduced a flat tax on cigarettes that equalizes prices across all brands and aims to make the cost of smoking higher and thus reduce demand. Nonetheless, because tobacco represents a greater share of total consumption among lower-income households, the direct effects on real income loss are estimated to be higher among bottom decile consumers because of these corrective taxes (World Bank 2015c).

⁵⁹ In June 2016, the Ministry of Health introduced warning labels indicating components in quantities in excess of limits it had established relative to sodium, sugars, saturated fats, and calories, all which are associated with obesity and other chronic diseases such as hypertension, diabetes, heart attacks, and some cancers. See "Ley de Alimentos: Nuevo etiquetado de alimentos," Ministry of Health, Santiago, Chile, <http://web.minsal.cl/ley-de-alimentos-nuevo-etiquetado-de-alimentos/>.

⁶⁰ See OECD Better Life Index (database), Organisation for Economic Co-operation and Development, Paris, <http://www.oecdbetterlifeindex.org/>.

3.2. Drivers of Recent Trends

3.2.1. Drivers of Poverty reduction⁶¹

116. **Economic growth and well-targeted innovative social protection policies have contributed to poverty reduction and shared prosperity.** The declines in poverty rates and the higher growth rates in incomes among the bottom 40 can be explained mostly by an increase in labor incomes and public transfers. Labor income contributed to over a third (34.6 percent) of the poverty reduction observed between 2006 and 2015, while nonlabor income contributed 48.3 percent of the reduction (Figure 3.7 and Figure 3.8).

Figure 3.7. Drivers of Change, Official Moderate and Extreme Poverty, 2006–15

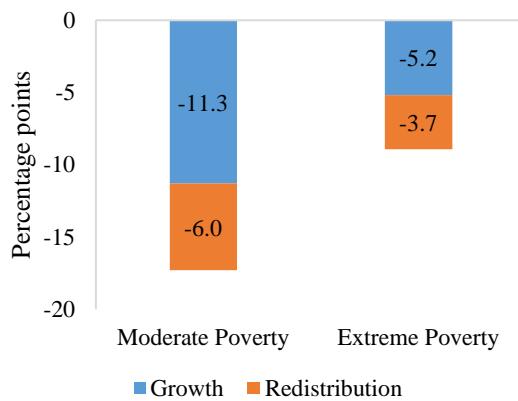
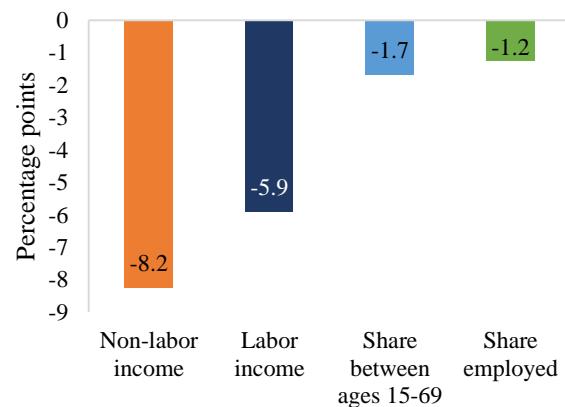


Figure 3.8. Contribution of Sources of Household Income to Changes in Moderate Poverty, 2006–15



Source: Calculations based on CASEN data, 2006–15.

Note: The Shapley decomposition relies on data on real per capita household income.

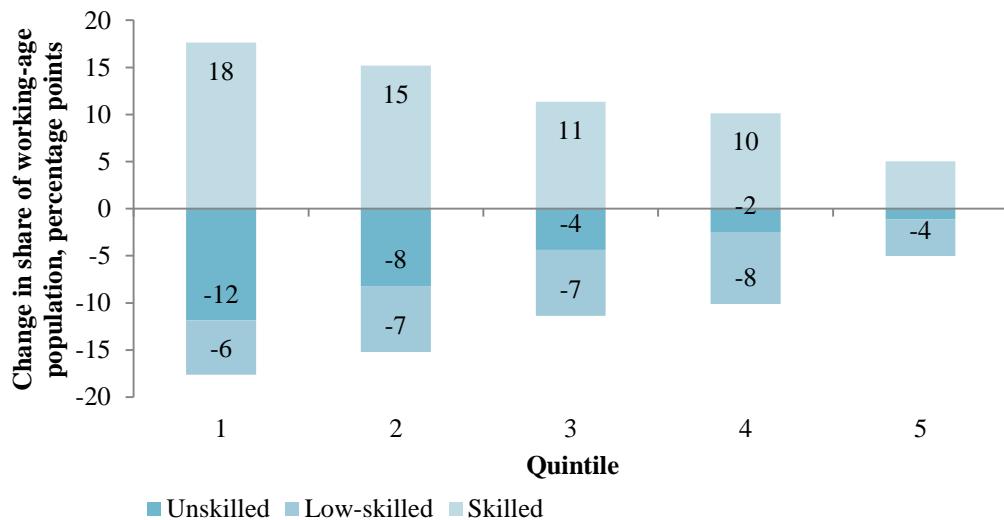
117. **Chile experienced significant reduction in poverty even when labor force participation increased modestly for the bottom 40.** Labor force participation among the bottom 40 increased slightly from 58.4 percent in 2006 to 58.7 in 2015. Similarly, labor force participation dropped for the youngest while increased for women between the ages of 25 and 65 by more than 7.5 percentage points. Even though unskilled women increased their participation it was lower than that of women with more schooling. In contrast, unskilled men between the ages of 25 and 55 decreased their participation in the labor markets by 6 percentage points.

118. **Changes in the composition of the labor force, specifically through human capital accumulation, contributed to poverty reduction.** The share of unskilled adults –those with incomplete primary education– in the bottom quintile percent fell by 12 percentage points between 2006 and 2015. At the top of the income distribution, in particular in the top two quintiles, there was a decrease in the share of low-skilled adults –those with incomplete secondary schooling (Figure 3.9). Nonetheless, only 6 percent of the reduction in labor income poverty was associated with

⁶¹ Analysis on the drivers of poverty reduction has been carried out for 2006–15 using Chile’s new poverty measurement methodology. Because of data limitations, cross-country analysis is limited to 2003–13 for Chile and to circa 2004–14 for the Latin American and Caribbean countries; the 2015 SEDLAC harmonized household datasets for Latin America and the Caribbean did not become available until April 2017.

increases in the educational endowments of the labor force relative to 17 percent in Latin America and the Caribbean, suggesting other factors played an even stronger role.⁶²

Figure 3.9. Change in Skill Level, by Quintile, 2006–15



Source: Calculations based on CASEN data, 2006–15.

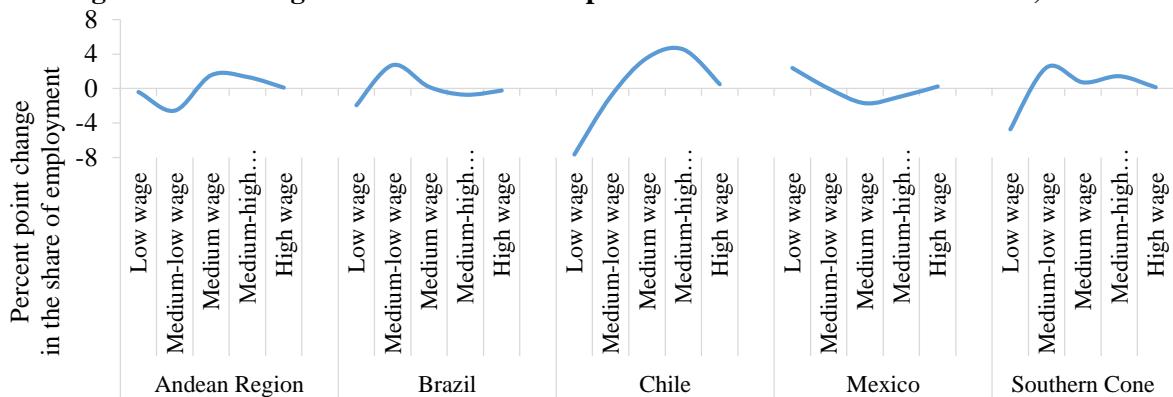
Note: The figure reports the percentage point change in the composition of the workforce (individuals ages 18–65) in Chile between 2006 and 2015, by quintile of per capita household income.

119. The increases in wages among the less highly skilled can be partly attributed to the workers transitioning toward more well paying sectors. Between 2006 and 2015, the share of unskilled workers fell in the lowest paying sectors in Chile, as unskilled workers transitioned toward higher-paying sectors. In 2006 approximately a third (32 percent) of the unskilled worked in agriculture (low-wage group), by 2015, this number dropped to 26.8 percent (Figure 3.10). Moreover, since 1990 there has been a 38 percent reduction in primary sector employment among the bottom 40. This has been accompanied by an increase in employment in more well paying sectors such as services and construction (Figure 3.11). Hourly wages also increased more in the last two decades among the bottom 40 than among the overall population across all sectors (Figure 3.12). On average, between 1990 and 2013 wages among the bottom 40 grew 16.6 percent more relative to the top 60 percent of the income distribution during the same period. Even after controlling for socioeconomic characteristics, this differential growth remains at 15 percent.⁶³

⁶² Data in the SEDLAC database, based on World Bank 2015b. A Blinder (1973) and Oaxaca (1973) decomposition of labor income poverty shows the change in poverty that is derived only from changes in labor income. The skills of households (the intrasectoral component) are measured based on the educational attainment of the main labor income earner in the household.

⁶³ Wage growth among the bottom 40 relative to the top 60 in 1990–2013 was positive and statistically significant, even after one controls for the socioeconomic characteristics of agriculture, fishing, mining and quarrying, manufacturing, construction, wholesale and retail trade, hotels and restaurants, and transportation and communication, sectors in which over 70 percent of the bottom 40 were employed in 2013. See annex D for regression results.

Figure 3.10. Changes in the Sectoral Composition of the Unskilled Workforce, 2003–13



Sources: SEDLAC (CEDLAS and World Bank); World Bank 2015b.

Note: Estimates are limited to workers ages 18–65 who received wages. For “Type of sector,” the sectors were grouped among countries to allow for differences in wage returns from each sector across countries within the same subregion. Sectors were ranked based on the median hourly wage of each sector in 2003 for a set of 15 sectors and then collapsed into groups of three to define the five-sector wage groups.

Figure 3.11. Sector of Employment, 1990–2015

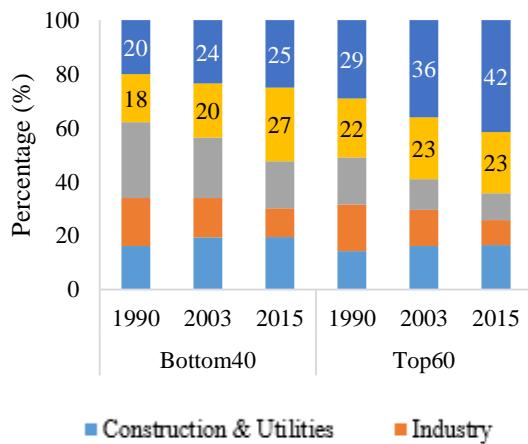
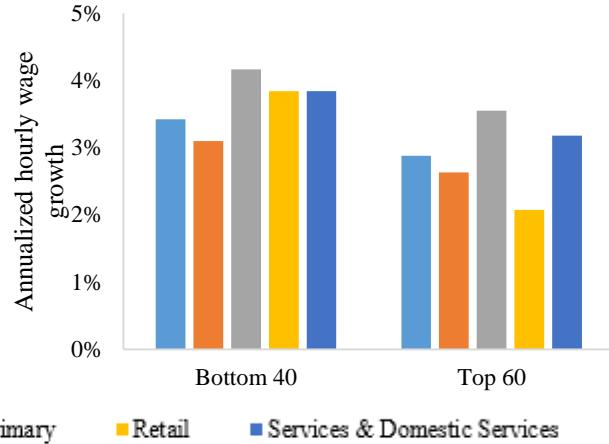


Figure 3.12. Annualized Hourly Wage Growth, by Sector, Bottom 40 and Top 60, 2006–15

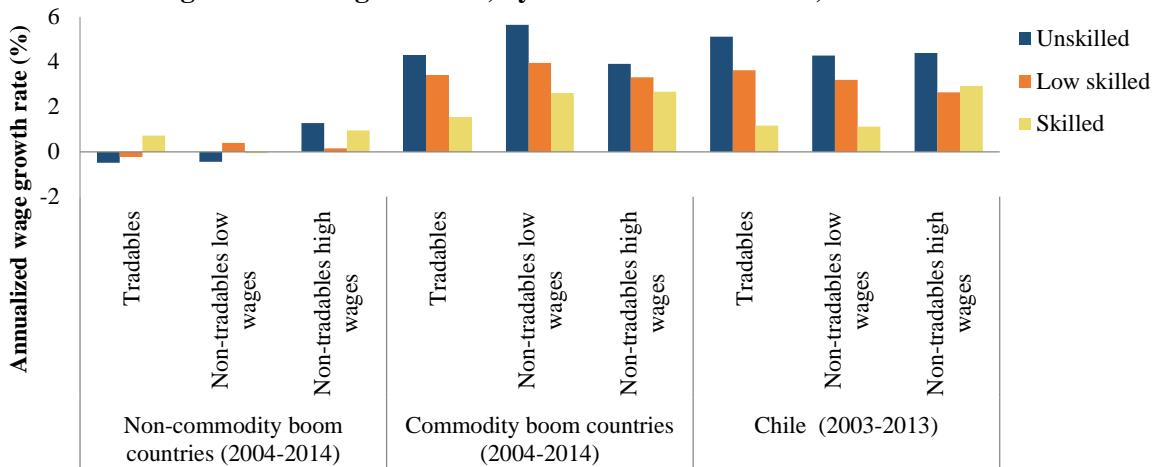


Source: Calculations based on CASEN data, 2006–15.

Note: Median hourly labor income from the main occupation is used. The bottom 40 and top 60 are identified using per capita household income.

120. Poverty reduction was primarily associated with increases in earnings within sectors. Wages for the unskilled and low skilled grew more than wages for the skilled in Chile between 2006 and 2015. Income of unskilled and low-skilled workers registered real annualized growth of 3.3 and 2.9 percent respectively whereas wages for skilled workers grew only at 2.8 percent. Overall, wages grew among all types of workers and sectors of employment, though the income growth was more rapid among the least skilled workers, a pattern evident across commodity-boom countries in the region (Figure 3.13). In Chile, the reduction of labor income poverty was largely associated with increases in earnings in the agriculture and services sectors, in contrast, population shift between sectors explains only 5 percent (0.41 percentage points) of the poverty reduction between the periods of study (Figure 3.14).

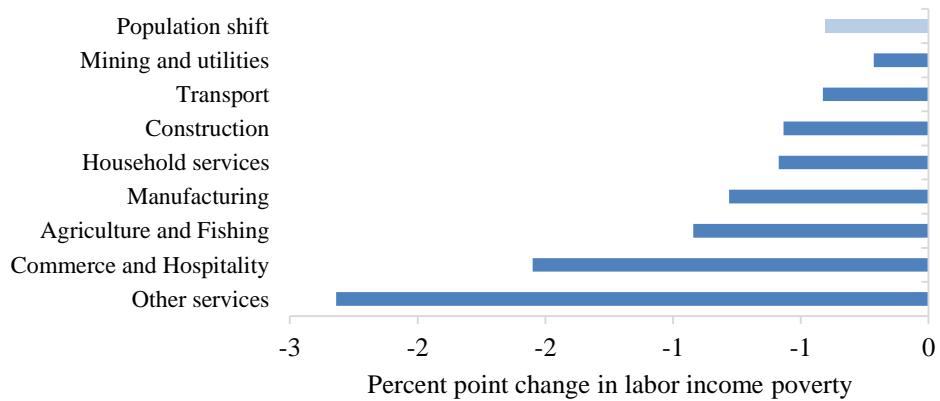
Figure 3.13. Wage Growth, by Sector and Skill Level, circa 2004–14



Sources: SEDLAC (CEDLAS and World Bank); World Bank 2015b.

Note: The figure reports the annualized growth of average wages among workers older than age 15 years. Commodity-boom countries are countries that registered annualized growth in trade above 2 percent in 2004–14 (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, and Peru). Data on Chile cover 2003–13. Countries without a commodity boom are the Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Paraguay, and Uruguay. Because of data limitations, Costa Rica, Nicaragua, and Panama are excluded. The tradable sector includes primary activities, mining, and manufacturing. The nontradable low-wage sector includes construction, wholesale and retail trade, hotels and restaurants, public administration, and domestic work. The high-wage nontradables are electricity and gas, transport and communications, financials, real estate, education and health care, and extraterritorial organizations.

Figure 3.14. Huppi-Ravallion Decomposition of Labor Income Poverty, 2006–15



Source: Calculations based on CASEN data, 2006–15.

Note: The figures are the results of the Huppi and Ravallion (1991) decomposition of labor income poverty. The decomposition calculates the change in poverty in this set of households that is due strictly to changes in labor income. This approach abstracts from the effects of changes in nonlabor income in Figure 3.9 and 3.10. The intra-sectoral component refers to the sector of employment of the main earner in the households.

121. Nonlabor income has also played an important role in poverty reduction. Of all the branches of social protection and labor policy in Chile, that in which governments have been the most active is assistance to the indigent, chronically poor and households at greatest risk of falling into poverty from shocks to income. The guiding objective of these efforts has been to prioritize the

least well off families; consolidate a wide array of cash subsidies; ensure inclusion of isolated and disconnected households; and articulate the government's efforts for the poorest citizens into a coherent and cohesive system. During the 1990s, Chile maintained a complex set of cash transfers and subsidies, each operating in isolation. And although the country was an early adopter of and developer of targeting assistance to the poorest households, a lack of coherence and coordination limited the impact of its programs, leaving the level of extreme poverty/indigence stubbornly unmoved despite years of growth and social gains for most households.

122. **To overcome fragmentation and consolidate its efforts for the poorest citizens, in 2002, *Chile Solidario* was created to enhance Chile's poverty reduction and social protection policies and institutions.** Families are at the focus of the intervention, making it the main gateway to the system that provides social services and state benefits for the extreme poor.⁶⁴ The guiding objective of reforms has been to ensure inclusion of isolated and disconnected households, and articulate the government's efforts for the poorest citizens into a coherent and cohesive system. These efforts put Chile at the forefront of public policy for the poorest households among its neighbors, and even ahead of many OECD members which still administer relatively fragmented and incoherent social assistance systems. Between 2002 and 2012, over 550,000 families, equivalent to 8.5 percent of the Chilean population, participated in the program (Cabezas et al. 2015). The earliest impact evaluations of *Chile Solidario* were positive and found that participation tended to improve education and health outcomes (Galasso 2006). In 2012, *Chile Solidario* was replaced by *Seguridades y Oportunidades* and *Ingreso Ético Familiar* (ethical family income), an effort that builds off the original program but that delivers a set of monetary transfers (unconditional, conditional and performance incentives), supported by the provision of social and labor support and preferential access to some social benefits from the state.

3.2.2. Drivers of Persistent Income Inequality

123. **Like poverty reduction, Chile's decline in income inequality was caused primarily by a reduction in labor income inequality and larger and more progressive government transfers.** The fall in labor income inequality can be partly attributed to a reduction in the returns to education driven to some extent by a greater supply of skilled workers. Moreover, the gap between the cost and the benefits of tertiary education are highly correlated with quality, suggesting the quality of certain tertiary institutions has decreased the skill premium in Chile, ultimately preventing inequality from narrowing further (Azevedo et al. 2013; Barros et al. 2010; Campos et al. 2012; de la Torre et al. 2012; López-Calva et al. 2013; World Bank 2011).

124. **The persistence of income inequality in Chile is partly explained by the persistence in labor income inequality, which in turn reflects an unequal distribution of skills.** Labor income is the primary source of income for all Chileans, ranging from 65 percent of total income for the bottom quintile to 82 percent for the richest.⁶⁵ In 2015, the poorest quintile earned only 4.2 percent of total labor income whereas the richest quintile reached 50.5 percent. Likewise, over 30 percent of

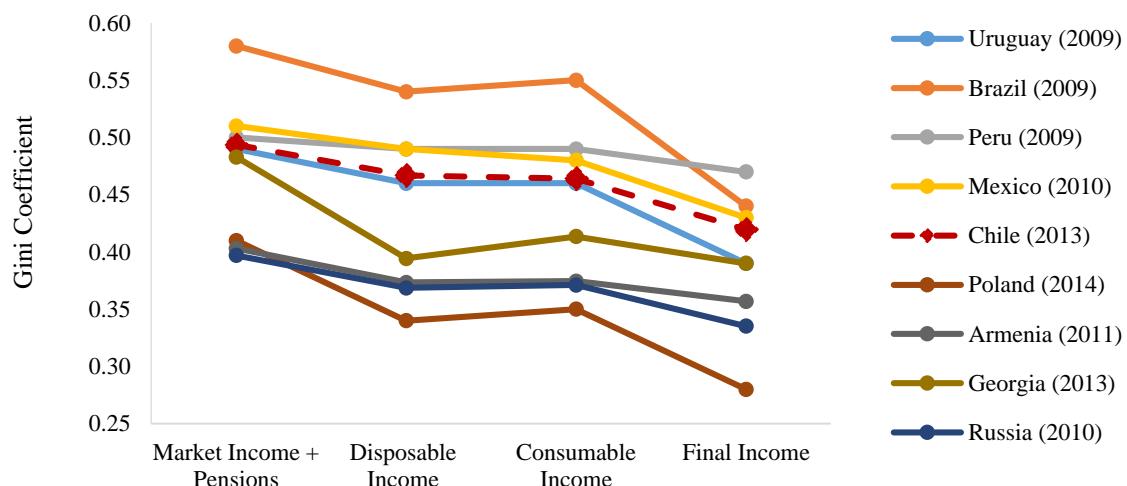
⁶⁴ Preferential access to Chile's social protection system was given to the neediest 225 thousand families rather than to the 850 thousand individuals that were classified as indigent in 2000.

⁶⁵ Tabulations of Equity Lab, Team for Statistical Development, World Bank, Washington, DC, based on data in SEDLAC.

individuals in the bottom quintile are unskilled (less than primary education), while this is true of only 6 percent of the top quintile.⁶⁶

125. Despite having a more progressive fiscal system than most countries in Latin America and the Caribbean, it still lags that of OECD countries ultimately contributing to wide income inequality in Chile. Chile's redistributive capacity has been better than that of similar countries in the region, though much lower than OECD countries. Chile and Peru show an almost identical level of inequality (0.49 and 0.50, respectively) measured by market income; however, if one takes into account the prevailing structure of taxes and transfers, one finds that Chile's Gini coefficient drops considerably more than Peru's (Figure 3.15) Nonetheless, the size of the transfers is too small, hence limiting the impact of social programs (OECD 2015). If direct and indirect taxes, transfers and subsidies are taken into account, the Gini coefficient of consumable income is 0.46 in Chile and 0.49 in Peru. Moreover, considering in-kind transfers in education and health, Chile exhibits an even lower level of inequality (0.42). Nonetheless, pensions still exhibit a limited role in inequality reduction relative to other high-income countries such as Georgia and Poland. In Chile, the Gini coefficient decreases from 0.49 to 0.47 if pensions are considered; in contrast, Poland shows a much larger drop, from 0.41 to 0.34. Similarly, spending on education and health does not impact inequality as strongly as in other European countries. Moreover, Chile's private spending on health care and education is relatively much greater than in most OECD countries. For instance, private health spending only represents 1.8 percent of GDP in Poland, in contrast to 3 percent in Chile. This pattern persists in education, where Chile's public education expenditure is less than 4 percent of GDP and private expenditure is 5.8 percent of GDP.

Figure 3.15. Fiscal Policy, by Gini Coefficient, Selected Countries, 2009–14



Sources: Armenia: Younger et al. 2016; Brazil: Higgins and Pereira 2014; Chile: Martinez Aguilar et al. 2017; Georgia: Cancho and Bondarenko 2016; Mexico: Scott 2013; Poland: Goraus and Inchauste 2016; Russian Federation: López-Calva et al. 2016; Uruguay: Bucheli et al. 2014.

Note: The year in which the analysis on each country was conducted is shown in parentheses.

126. Even if it could be more effective, Chile still uses its fiscal instruments to reduce market income inequality through a progressive tax system and well targeted social spending. The

⁶⁶ World Bank calculations based on CASEN data, 2015. The data cover only prime-aged workers, ages 18–65.

richest decile in Chile pays for over 90 percent of direct taxes and receives less than one percent of direct transfers (Figure 3.16). In contrast, noncontributory pensions and Chile's main social programs—*Chile Solidario* and *Ingreso Ético Familiar*—benefit mainly the lower end of the income distribution (Figure 3.17). Though generally progressive, several key components of social spending are regressive in Chile, including indirect taxes and subsidies as well as spending on tertiary education (Figure 3.18).

Figure 3.16. Distribution of Taxes, by Income Decile, Chile, 2013

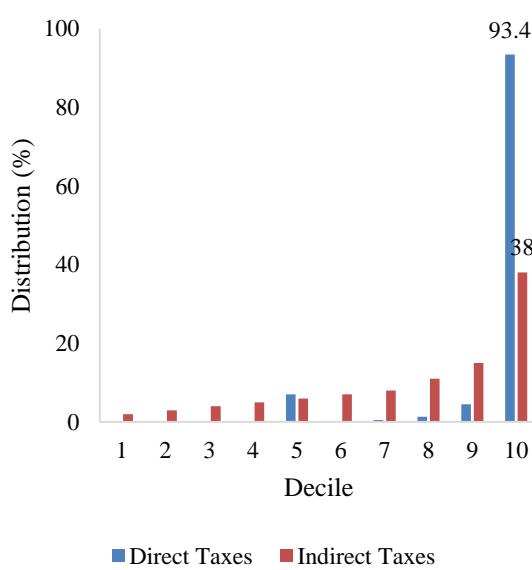
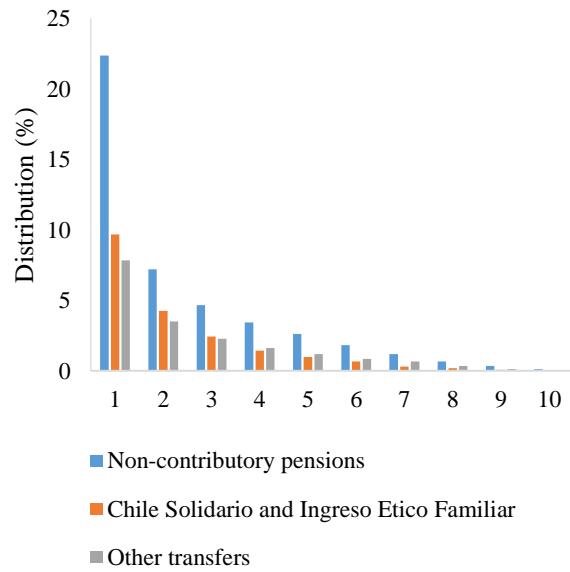
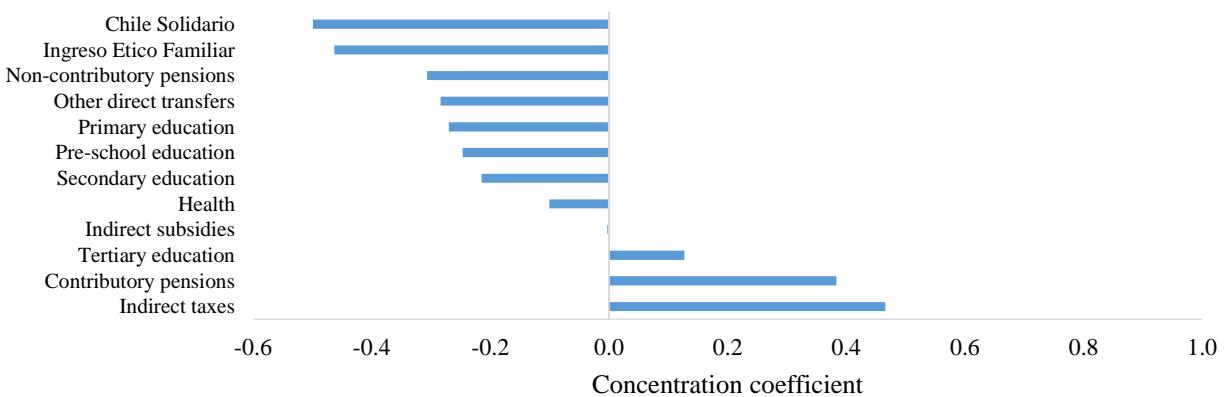


Figure 3.17. Distribution of Monetary Transfers, by Income Decile, Chile, 2013



Source: Martinez Aguilar et al 2017.

Figure 3.18. Concentration Index of Public Spending, Chile, 2013



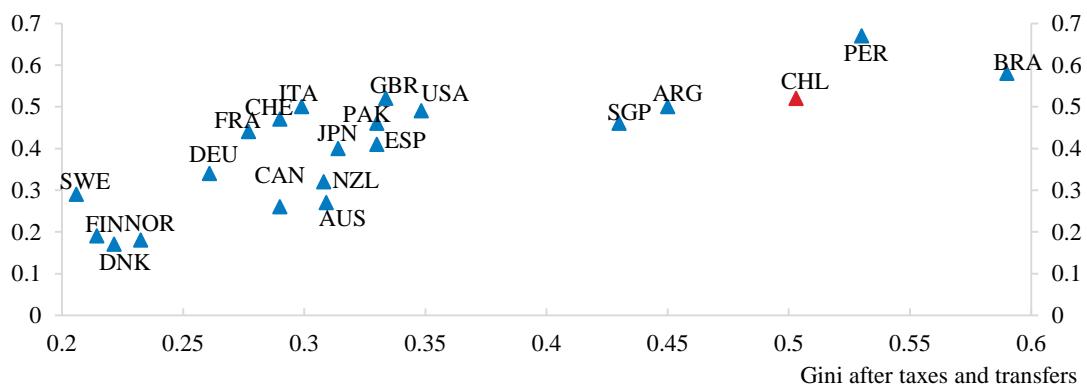
Source: Martinez Aguilar et al. 2017.

Note: The higher the concentration of social spending among the low-income population, the greater the reduction in inequality; thus, a negative concentration coefficient indicates that the policy or program is pro-poor.

3.3. Equality of Opportunities

127. Inequality of opportunities—manifested as low intergenerational mobility—is a potential constraint on the Chile’s development and a persistent source of inequality. Equality of opportunity implies that the initial circumstances and background characteristics of individuals should not limit opportunity. Thus, initial conditions or circumstances that are beyond the control of individuals should not determine future educational, labor, and welfare outcomes. To the extent that talent is relatively evenly distributed across the income distribution, the elimination of barriers that prevent such talent from reaching full productive potential would promote productivity. The pursuit of equal opportunity may also lead to a more equitable distribution of outcomes, such as employment earnings, if marginal or excluded groups are able to convert better opportunities into higher earnings. As in other OECD countries, wide income inequality is associated with low intergenerational social mobility. Intergenerational mobility in Chile is low relative to the OECD, meaning that birth into a low-income household can negatively affect wages by approximately 40 percent relative to the average; in contrast, people of higher socioeconomic status earn 50 percent more (Figure 3.19; OECD 2015). Residential segregation is also a barrier to equality of opportunity because Chilean households with lower incomes live considerably farther than richer households from private schools and workplaces (Box 3.2).

Figure 3.19. Intergenerational Elasticity between the Earnings of Father and Son, Selected Countries



Source: OECD analysis based on CASEN data, 2013, and Corak 2013.

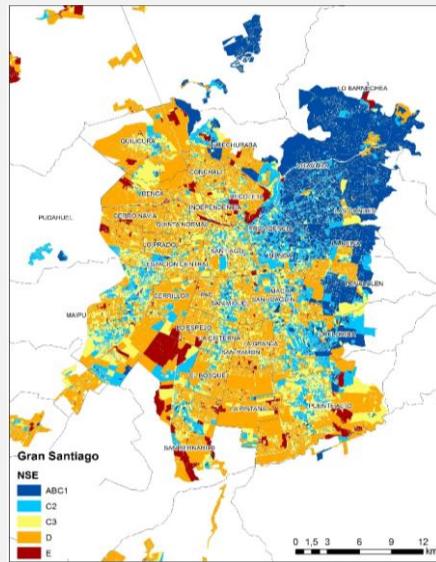
Box 3.2. Residential Segregation in Chile: Access Disparities in Public Services and Employment

Residential segregation has been found to be particularly noxious because it generates a vicious cycle where initial poverty conditions affect the ability of citizens to access high-quality services, which entrenches poverty.^a In Chile, property taxes are an important contributor to available municipality budgets. Thus, richer municipalities that can rely on a tax base of more high-value real estate can deliver better public services and facilities relative to poorer municipalities. The access to public facilities or the lack thereof affects the price of land, generating a residential-segregation-poverty trap (Lambiri and Vargas 2011). Furthermore, residential segregation simultaneously affects educational enrollment and achievement, health, labor market opportunities, and political efficacy (Valenzuela, Bellei, and de los Ríos 2013).

Chilean households with lower incomes live considerably farther from private schools and workplaces compared with richer households. There is also a negative correlation between income

and distance to schools, health facilities and workplace centers. Using data on city residential blocks in the 10 largest metropolitan areas in Chile, one finds that the mean distance between a household belonging to the richest income group and the closest workplace area is slightly over 3.2 kilometers, whereas it is 11.3 kilometers among the poorest income group. Private schools are located closer to richer households, whereas middle-income households are closer to public and private primary and middle schools relative to households on either end of the income distribution. Hospitals and inpatient facilities tend to be located farther from the poorest neighbors. In addition, one may observe a negative correlation between distance and income groups, implying that richer households tend to be closer to a school, health facility, or workplace center. Maps B3.2.1–B3.2.3 illustrate the spatial distribution of, respectively, socioeconomic status, health facilities, and basic education schools for the case of Greater Santiago.

Map B3.2.1. Spatial Socioeconomic Distribution of Households, Greater Santiago

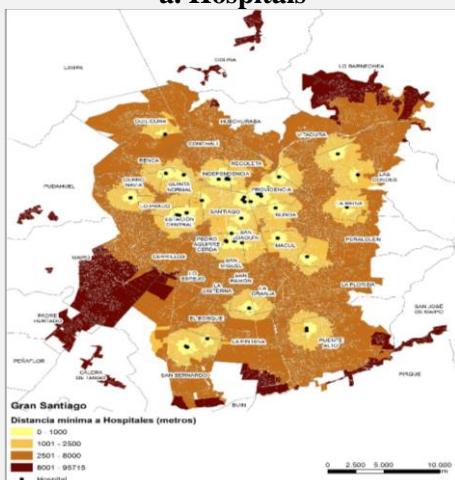


Sources: World Bank; Centro de Información Tecnológica (Information Technology Center), Universidad Adolfo Ibáñez; Centro de Investigación Avanzada en Educación (Center for Advanced Research in Education), Universidad de Chile.

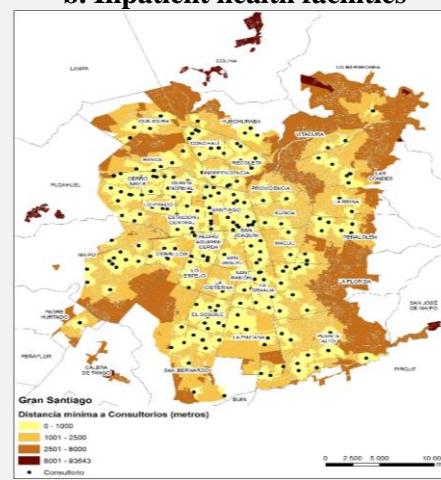
Note: Dark blue = richest socioeconomic group; orange and red = poorest socioeconomic groups.

Map B3.2.2. Spatial Distribution of Health Facilities, Greater Santiago

a. Hospitals

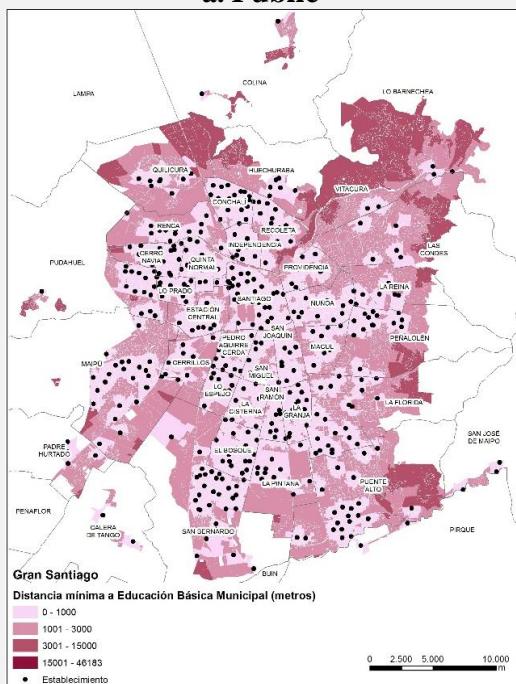


b. Inpatient health facilities

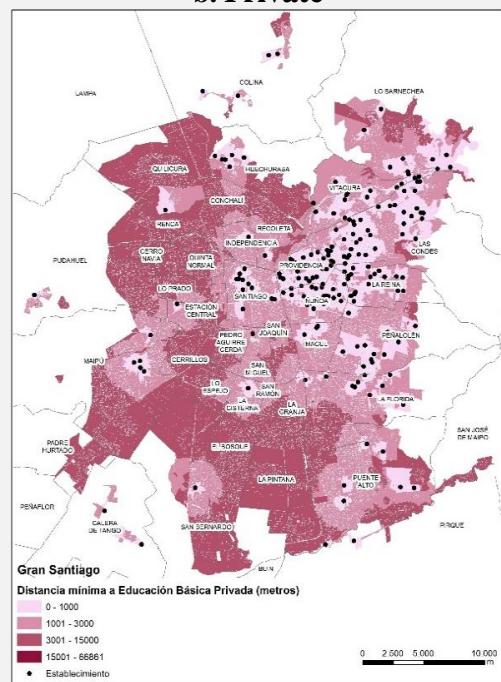


Map B3.2.3. Spatial Distribution of Basic Education Schools, Greater Santiago

a. Public



b. Private



Sources: World Bank; Centro de Información Tecnológica (Information Technology Center), Universidad Adolfo Ibáñez; Centro de Investigación Avanzada en Educación (Center for Advanced Research in Education), Universidad de Chile.

Note: Black dots = schools. Colors show the minimum distance from blocks to facilities (light purple = distance of 0–1 kilometers; purple = 1–3 kilometers; light violet = 3–15 kilometers; violet = 15–65 kilometers).

Similarly, lower-income households spend more time getting to schools, health facilities and workplaces compared with the wealthier. Combining distance data from residential blocks to the closest schools, health facilities, and workplaces in the 10 largest cities of Chile, one may then calculate average travel speed using public transportation, private cars, or walking.^b Based on this information, average travel times are obtained from a specific block to the closest school, health facility, or workplace using different means of transport. In addition, average school quality is included (measured by standardized tests of the *Sistema de Medición de la Calidad de la Educación* (education quality measurement system) to calculate the time it takes for children from the poorest households to reach high-quality schools.^c As expected, one finds that children from the poorest households not only spend more time reaching school, but, if they aim to attend higher-quality institutions, they must endure considerably longer commutes. Fortunately, although poorer households spend more time reaching schools, health facilities and workplaces, they do not seem to spend much more money (in relative terms) getting there. The average household in Greater Santiago spends 15.8 percent of their total budget on transportation (both public and private), whereas households in other urban areas spend about 17.1 percent. The poorest quintile spends more or less the same proportion of their budget on public transport compared with the middle quintiles (II-IV), but it represents twice the proportion of the richest one. Despite the latter, lower density of public transport in the poorest areas makes access to basic services more difficult, worsening the effects of residential segregation. Currently 16.5 percent of Greater Santiago inhabitants have access to a metro station (in a 600 meter radius or 5.5 blocks (Atisba 2016)). Metro service coverage is still in deficit compared with other cities of similar size or with similar volume of transport requirements.

Among the factors that contribute to residential segregation in Chile, housing policy seems to be one of the most salient. The government started a massive affordable housing construction project during the 1990s to decrease shortages. To maintain affordability, houses were primarily built on the urban periphery where the value of land was cheaper.⁶⁴ However, this policy engendered residential segregation as a by-product. In fact, the propensity of neighboring with households of the same socioeconomic level increases significantly for low-income households (Lambiri and Vargas 2011).

Residential segregation, combined with a lack of efficient public transportation, could potentially explain the incidence of school dropouts, lower female labor force participation, and even pockets of localized crime. It may seem natural that, if children spend two to three hours a day to travel to school that is perceived to be of higher quality school by using public transportation, their educational attainment, grades, and motivation are eventually affected. Similarly, if women with small children face the decision of leaving them at a daycare facility to work and face not only long commutes, but also the need to spend large proportions of their labor income to pay for public transportation, they might end up deciding not to work at all. Moreover, staying out of the labor market for long periods may make it more difficult to return to the labor market in the future because human capital and skills depreciate, reinforcing a vicious cycle. Although these are not exclusive phenomena for Chile, public policy interventions could help ameliorate these trade-offs and enhance equality of opportunities. For example, improving public transportation and locating child care centers closer to employment centers may provide the necessary incentives at the intensive margin for younger women to actively look for employment and for parents to send their children to higher quality, yet more distant schools. Between 2005 and 2007 public day care centers in Chile have increased in 240 percent. Bordon (2007) estimates that doubling the day care supply in Chile would increase female labor force participation by 5.7 percentage points, a significant effect given the country's low levels of female labor force participation.

- a. Segregation can be broadly defined as the uneven distribution of different social groups across various geographical areas within cities (James and Taeuber 1985).
- b. For each city, several departing points have been chosen from different *comunas* (communes) with a common destination: downtown. The average time and distance traveled to obtain the average travel speed by foot, car, and public transport is used. The departure time was chosen at 8:00 am on weekdays to ensure homogeneity.
- c. City-block data are used with score result information from the 2015 education quality measurement system test for private, private subsidized, and private schools in basic education and middle schools.
- d. The Ministry of Housing built around 70 percent of all housing units in Chile between 1950 and 2000 (Tokman 2006).

128. **Although Chile has performed well in terms of equitable access to services, important gaps remain in equitable coverage of quality education and in access to development opportunities for indigenous people (Box 3.3).** Chile exhibits the largest gap for the human opportunity index of quality of education, suggesting access in quality of education is more unequal than in most OECD comparison countries.⁶⁷ Moreover, parental education and occupation are the circumstances that explain most of the inequality in access to quality education in Chile, suggesting that important barriers remain for intergenerational mobility (Ferreira et al. 2013). There is evidence that in Chile a child's circumstances at birth have a strong influence on test scores. That is, approximately 16 percent of the passing 2012 PISA test scores in Mathematics would need to be reallocated across children to ensure no association between performance and their circumstances at birth (World Bank 2014). Moreover, as of 2015, only 4 percent of Chileans whose parents had not completed basic education were able to obtain a professional degree, in contrast to 25 and 15 percent

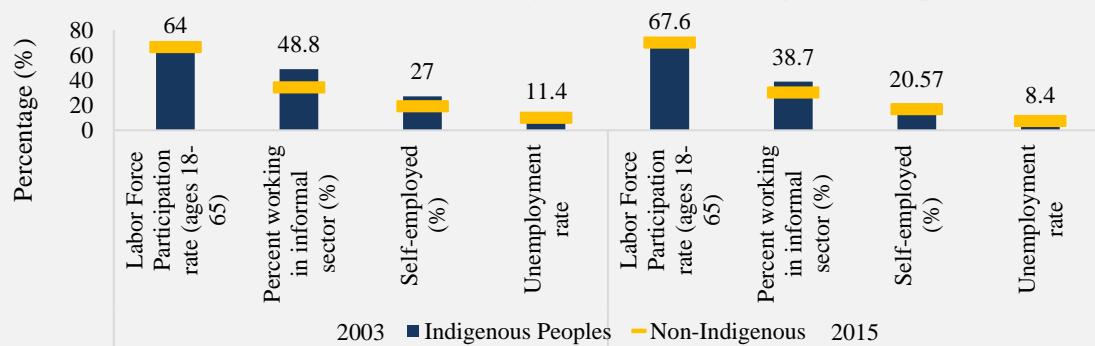
⁶⁷ Tabulations of Equity Lab, Team for Statistical Development, World Bank, Washington, DC, based on data in SEDLAC.

of professionals and post-graduates respectively that have at least one parent with the same educational attainment.⁶⁸ Chile also has the lowest share of students who beat the socioeconomic odds and exceed expectations: 2 percent compared with 13 percent of Korean students and 6.4 percent OECD average (OECD 2015). Moreover, there is evidence of unequal presence of the state across Chile's regions with regards to provision of basic services, another barrier for equality of opportunities (Box 3.4).

Box 3.3. Gaps in Access to Services among Indigenous Peoples

Frequently, the conditions facing indigenous peoples mean they are less privileged in several dimensions of development. Indigenous households have more underage members, more women heads, and larger proportions of single-parenthood. However, indigenous homes show lower levels of schooling, lower literacy rates, higher economic dependence, higher unemployment and lower participation in the labor market. A third of indigenous homes belong to the first income quintile, while only 7.61 percent belong to the fifth quintile (this figures reach 20.9 percent and 16.8 percent for nonindigenous). Indigenous people have a lower labor force participation (67.6 percent vs. 69.9 percent for nonindigenous ages 18–65), a figure that decreases to 58.8 percent in rural areas. Indigenous people show 8.4 percent unemployment, while the ones that are employed are more likely to be working with salary (68.6 percent vs. 73 percent among the nonindigenous), which evidences lower labor quality (Figure B3.3.1). Furthermore, there are more workers without a contract among indigenous populations (14.5 percent vs. 12.6 percent of nonindigenous). Furthermore, 25 percent does not participate in social security systems (in contrast to 21.9 percent in nonindigenous) and the literature reports difficulties in access to markets and low quality of jobs, frequently related with cultural stigmatization. The inclusion of indigenous women in the labor market is an emergent topic, as there is a proven effect in reducing poverty when larger proportion of women work and increase family income. However, this incorporation seem deficient among indigenous women, thus it is relevant to identify the barriers for their inclusion to this development opportunities

Figure B.3.3.1. Labor Market Indicators, Indigenous and Nonindigenous Peoples, Chile, 2003–15



Source: LAC Equity Lab tabulations, based on data in SEDLAC (CEDLAS and World Bank).

The gaps in health care, education, and other areas show clear disadvantages in access to development opportunities among indigenous people. Illiteracy is higher among indigenous individuals (3.6 percent vs. 2.2 percent among the nonindigenous), fewer years of education (9.7 years vs. 10.9 years), a greater share of household heads without completed secondary education (57.7 percent vs. 45.5 percent), and adults without completed secondary education (46.5 percent vs. 37.9 percent). Likewise, indigenous students more frequently attend public schools and, in a lower proportion, private nonsubsidized schools relative to nonindigenous students. A larger proportion of indigenous peoples use

⁶⁸ Calculations based on CASEN data, 2015.

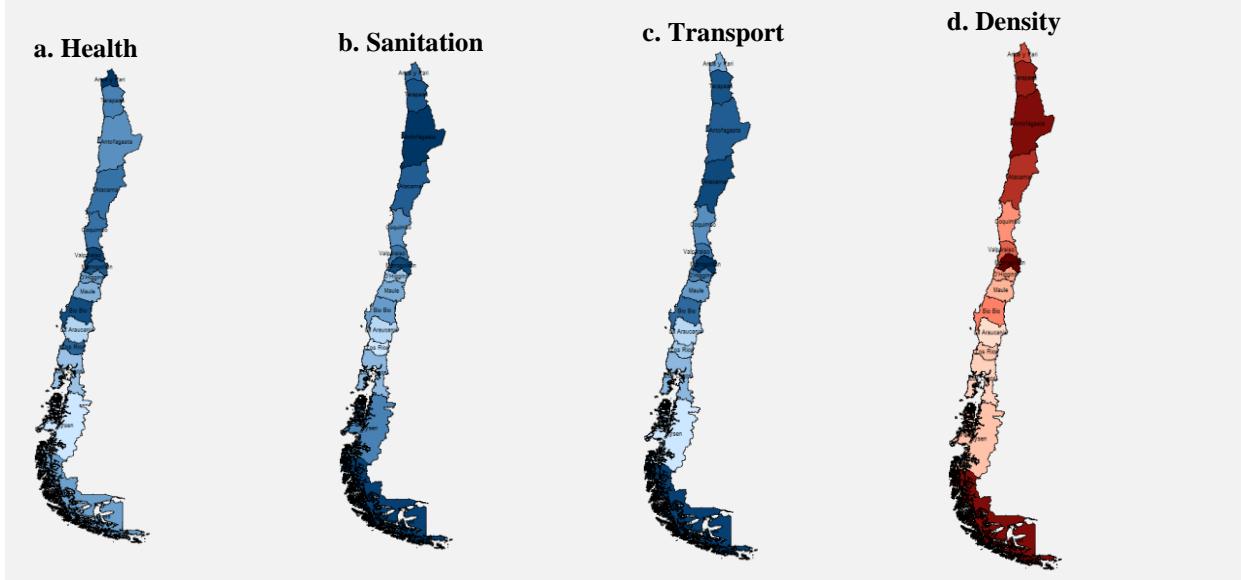
the *Fondo Nacional de Salud* (the national health fund, the public health care system, Fonasa) (87.1 percent vs. 76.3 percent among the nonindigenous), and only a few use the private system, the Instituciones de Salud Previsional (association of health insurance institutions) (7.2 percent vs. 16 percent). Impact evaluations to identify policies that are more efficient and effective should also be carried out. On the other hand, indigenous peoples tend to exhibit greater social participation relative to the general population (37.4 percent vs. 25.5 percent), particularly ethnic and cultural minority groups.

Box 3.4. Discontinuities of the State

World Development Report 2017 (World Bank 2017a) stresses the importance of location as a crucial circumstance associated with the capacity of groups to influence the distribution of resources and the design of policies to address their needs. Geography becomes a prominent dimension of inequity if some regions are systematically neglected in the provision of social services, particularly if the state's heterogeneous responsiveness is associated with other circumstances, such as political or ethnic divides. Therefore, the *World Development Report 2017* introduces the concept of state discontinuity as a measure of the unequal density of the presence of the state across the regions of a country.

Applying this methodology, the degree of state discontinuity in Chile can be assessed by analyzing the provision of a set of basic services across the country's 15 regions. Consider, for instance, three basic services such as (a) health, measured by the under-5 mortality rate; (b) sanitation, measured as the share of households connected to the sewerage system; and (c) transport, measured as the share of households in the vicinity of a stop of the public transport system. Map 3.4.1, panels a–c, shows the level of the state presence in health, sanitation, and public transport in each region, while panel d shows the composite density for these indicators (which measures the average presence across dimensions). La Araucanía, Los Lagos, Aysén, and Los Ríos share the lowest levels of state density, which means they fall behind the other regions in all three indicators of state presence. As of 2015, La Araucanía and Los Lagos are also home to nearly a third of Chile's indigenous peoples (20 percent and 13 percent, respectively). In addition, La Araucanía has the highest regional poverty rate (23 percent) and multidimensional poverty rate (26 percent), as well as the highest share of indigenous peoples living in poverty (33.9 percent). At the opposite end of the spectrum, Santiago Metropolitan Region, Antofagasta, Magallanes, and Tarapacá perform the best in all dimensions of policy intervention, and this is reflected in the higher state density.

Map 3.4.1. Government Action, Selected Areas of Intervention and Composite Density, circa 2015



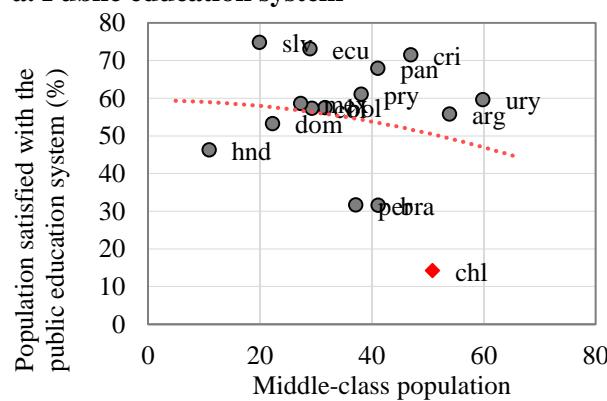
Source: World Bank calculations based on data of a: National Statistics Institute; b–c: CASEN, 2015; d: World Bank analysis.

Note: A darker color corresponds to greater government involvement. The different degrees of state density (government action) across regions is positively correlated with the amount of local resources (for instance, GDP per capita). *World Development Report 2017* (World Bank 2017a) suggests that differences in regional development can be thought of as a result of the uneven responsiveness of the state over a long of time to various socioeconomic groups. Thus, in La Araucanía, more than 27 percent of household heads declare they belong to an indigenous group. This compares with less than 6 percent in the Santiago Metropolitan Area.

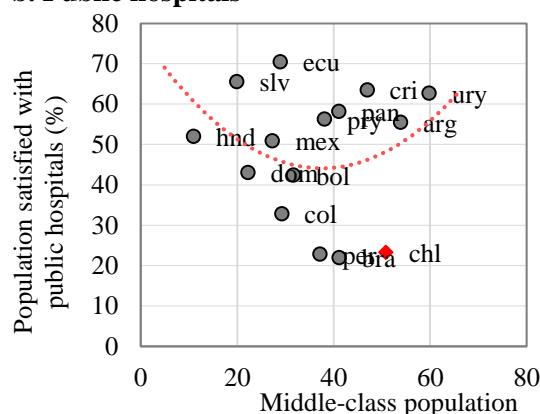
3.3.1. Social Policies That Affect Equality of Opportunities: A Life-Cycle Approach

129. More than its regional and OECD peers, Chile has pioneered bold changes to the social contract. Seeking the right balance between providing protection and promoting individual initiative, structural reforms have been enacted that have shifted the burden of risks to well-being among the state, employers, and individuals. Many of the internationally well-known reforms—particularly, the introduction of privately managed, mandatory retirement savings accounts—were conceived and implemented in the 1970s and 1980s. Yet, in the wake of innovation and reform to social protection and labor policies, the people of Chile are still debating whether the distribution of risks to human capital is socially fair and economically optimal. The growth of the middle class has been accompanied by demands for higher-quality services and better opportunities, and Chile is the country with the lowest satisfaction with the public education system and public hospitals (Figure 3.20). Moreover, the middle class may not have been served well due to the dualistic nature of public services, which tends to serve the rich and the poor relatively more effectively.

Figure 3.20. The Middle Class and Satisfaction with Public Services, Selected Countries, circa 2011
a. Public education system



b. Public hospitals



Sources: Subjective measures: 2011 data of Latinobarómetro Database, Latinobarómetro Corporation, Santiago, Chile, <http://www.latinobarometro.org/latContents.jsp>. Middle-class population: Tabulations of Equity Lab, Team for Statistical Development, World Bank, Washington, DC, based on data in SEDLAC.

130. Since assuming office in 2014, Chile's current administration has implemented a series of equity-enhancing reforms aimed at redesigning some of these services, notably in education. The advent of the student protests since 2011 and the second Bachelet administration in 2014 marked a departure from the consensual politics toward a more structural attempt to reformulate the social contract. Even though important reforms have already taken place, the implications and

sustainability of these to address Chile's persistent inequality is yet to materialize. Further details on these reforms are discussed throughout this chapter and section 4.2 of this report.

Education

131. The coverage of primary and secondary education is extensive in Chile, but enrollment rates are lower in preschool and tertiary education, particularly among children and young adults in lower-status socioeconomic groups. The country has close to universal coverage in primary education and rates above 90 percent in secondary education. Despite recent improvements in coverage for preschool and tertiary education, enrollment rates lag with respect to OECD averages. In 2013, enrollment in early childhood education among children ages 3–5 years was 74 percent, below the OECD average of 83 percent. Moreover, as of 2013, the share of 25- to 34-year-olds who had completed tertiary education was only 27 percent, below the OECD average of 42 percent. Similarly, nearly 16.0 percent of 20- to 24-year-olds did not complete schooling. This contrasts with the Latin American average of 48.0 percent and the 15.9 percent among OECD countries (OECD 2014).

132. Despite progress made in educational attainment and achievement, Chile lags in quality with respect to its OECD peers. As of 2012, the country is still among the lowest ranking OECD countries in PISA scores. More than 23 percent of the difference in student performance in the PISA exams can be attributed to their socioeconomic status, this is above the average of 15 percent for OECD countries (OECD 2014). Similarly, according to the exams of the education quality measurement system, almost 63 percent of children in 4th grade registered a reading level categorized as elementary or insufficient in 2014, this percentage increases to 78 when considering skills in mathematics.⁶⁹ Between 1990 and 2014, mathematic scores remained constant and showed only slight improvements in reading.⁷⁰ Chile's lagging quality of education limits the country's productivity because children are unable to demonstrate the basic skills (PISA level 1) necessary for participating productively in a modern economy (Chapter 2). Furthermore, Chile is still behind the most developed nations in quality of education, innovation potential, and as a result, availability of a skilled workforce (OECD 2012a).⁷¹

133. The Chilean education system exhibits a low degree of social integration that has hampered intergenerational mobility and could be a factor explaining the country's poor quality of education. Chile's copayment system has allowed private subsidized schools to charge families a tuition fee on top of a public voucher, introducing competition between this modality of schools. Studies indicate that the voucher program led to increased sorting in Chile, as children from more-advantaged backgrounds concentrate in the schools of higher quality, from which children from less highly privileged families are excluded because of the higher prices. Moreover, most students in private subsidized schools perform better academically than those in municipal public schools. This phenomenon translates into higher mean lifetime earnings among more well off people

⁶⁹ SIMCE (*Sistema de Medición de la Calidad de la Educación* [education quality measurement system]), 2014, Agency for Education Quality, Ministry of Education.

⁷⁰ The examination of the education quality measurement system defines three learning standards—(a) adequate, (b) elementary, and (c) insufficient—to measure student achievement over the previous year.

⁷¹ In Chile, more than 20 percent of the difference in student performance in the 2012 PISA scores can be attributed to the socioeconomic status of the students.

who graduate from private schools, which perpetuates intergenerational inequality (Contreras, Bustos, and Sepulveda 2010; Hsieh and Urquiola 2006; MacLeod and Urquiola 2009; Valenzuela and Allende 2012). Although there is considerable quality heterogeneity between schools, variables in the household, such as parents education, are equally or more relevant than the type of education being provided by the school (Peña 2002; Redondo et al. 2004).⁷²

134. To address these persistent inequalities, the government, in 2014, introduced a comprehensive education reform aimed to guarantee equal opportunity to access quality and well-financed education at all levels. For primary and secondary education (both mandatory levels of schooling) the recently approved Inclusion Law consists of four main components: (i) improving quality by increasing public spending per pupil; (ii) promoting social integration by means of regulating selection; (iii) eliminating co-payments for students attending educational institutions that receive public funds to further improve access to quality schooling for all, and (iv) prohibiting profit in schools that receive state contributions. Despite the controversy of these reforms the risks associated with it, particularly the potential for student migration to schools of unknown or even lesser quality and the closing of private-subsidized schools, have not materialized during the first year of implementation. Moreover, the government proposed a gradual implementation to ensure adequate monitoring and evaluation to feedback into policy design (World Bank 2017b). Similarly for tertiary education, the government has created a network of public technical training centers (*centros de formación técnica*) to focus tertiary education on growth-enhancing value added services. In addition, in April 2016 the country created a system for the professional development of teachers to improve the quality of teachers by making the teacher track more attractive, as well as implementing an improved and rigorous curriculum for teaching careers. These reforms place Chile on track to meet the United Nations Sustainable Development Goal of ensuring inclusive and equitable quality education for all.

135. The coverage of tertiary education has increased significantly in Chile, but low quality and inequity remain prominent. In the early 1990s, the coverage of tertiary education was less than a third in Chile, by 2015 this increased to over 70 percent, making coverage nearly twice as much as the global average. Similarly, prior to 1980, there were only eight universities in Chile; by 2015, there were over 250 institutions of higher education.⁷³ Moreover, Chile is among the Latin America and Caribbean countries with the greatest reduction in inequality in access to tertiary education. Between 2003 and 2013 enrollment increased for the poorest 50 percent of the population, with an increase of 24 percent in their likelihood of attending tertiary education, thus this group went from representing less than a quarter (23 percent) of tertiary education students to 41 percent (Avitabile et al. 2016). Yet, quality assurance and evaluation at this level are not robust, and the system lacks institutional mechanisms for coordination with stakeholders in the private sector. Links between technical programs, professional degrees and academic degrees are often an obstacle, as is the lack of certification systems in some fields.⁷⁴ In addition, there are no monitoring systems to assess whether institutions are teaching the technical and professional competences the country requires.

⁷² If academic results are broken down by socioeconomic level, there is no significant difference between the municipal sector and subsidized private establishments.

⁷³ According to data of the *Sistema de Información de Educación Superior* (higher education information system), there are 158 tertiary education institutions, 56 technical training centers, and 42 professional institutes.

⁷⁴ For example, legal requirement of *licenciatura* before obtaining certain professional degrees.

136. In addition, students from private secondary schools are more likely to enroll in selective universities. Twenty-five universities, represented by the Council of Rectors of Chilean Universities, and eight private universities use a centralized selective admission system based on the combined results of the university entry test (*prueba de selección universitaria*) and the secondary school report. This group is often recognized to be of better quality and prestige than their counterparts. In contrast, technical training centers, professional institutes, and nonselective private universities, often of lower quality, provide direct access to students.⁷⁵ This results in a larger share of students from private secondary schools enrolled in selective universities and greater enrollment of municipal and subsidized private school students in public technical training centers, professional institutes, and nonselective private universities. In 2010, 76 percent of private school students enrolled in selective universities, in contrast to only a third from municipal schools. Moreover, municipal school students accounted for 37 percent of total enrollment in the nonselective institutions and over half came from subsidized private schools (OECD 2012b).

137. Chile's student loan and scholarship system for tertiary education is complex. In 2015, over half of students enrolled in tertiary education received some sort of student aid from the government to pay their studies. Similarly, since 2009, the number of students receiving aid increased by 86 percent (Ministry of Education 2014). Nonetheless, tertiary education remains expensive, with resulting student debt burdens that are above international standards. Chile's debt-to-annual income ratio for graduates is 174 percent; in contrast, the equivalent rate for similar countries is below 100 (World Bank 2011). Though it could be argued that this still leaves them with a positive return on their investment, recent studies show that many borrowers are reaching payment levels that will outweigh the monetary benefits from obtaining a university degree Urzúa and González-Velosa (2015).

138. Similarly, Chile has one of the smallest share of public expenditure allocated to tertiary education of all OECD countries. It also has half the average OECD private expenditure on education (2.4 percent of GDP vs. 1.6 percent of GDP). Similarly, Chile's spending per student is nearly half that of OECD countries.⁷⁶ The country's dependence on household expenditure for funding tertiary education indicates that the largest share of tertiary education funding comes from tuition fees and ultimately results in a heavy financial burden for families. As part of a broad reform for tertiary education, the current administration wants to increase public investments at this level, particularly for institutional strengthening, research and innovation, teacher development, and links with the labor market. By doing so, it aims to improve the quality of public education and thus increase the availability of a skilled workforce, both potentially contributing to reduce inequities in Chile. As a first step to increase access to tertiary education, it has eliminated tuition fees for the poorest 60 percent at this level.

⁷⁵ Students who graduate from public technical training centers or professional institutes cannot use these studies as credit for a university degree.

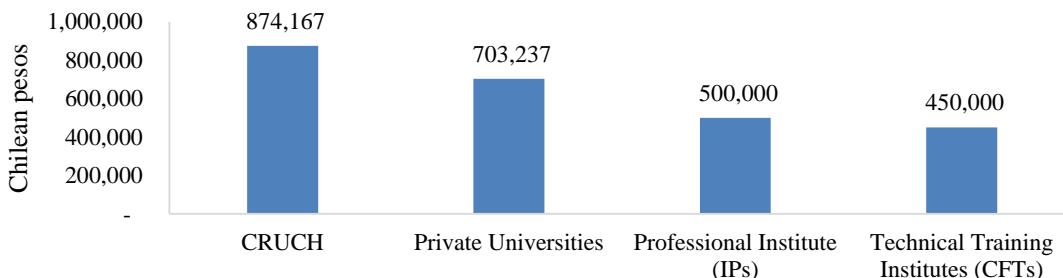
⁷⁶ "Private spending on education," OECD, Paris (accessed, March 28, 2017), http://www.oecd-ilibrary.org/education/private-spending-on-education/indicator/english_6e70bede-en. Spending per student for tertiary education is US\$9,052 in Chile, while the OECD average is US\$16,199.

Labor Markets

139. **Most people go to the labor market to seek a return on their endowment and investments in human capital, and, there, most households come into contact with government policies and programs.** Labor is among the most important assets of households, particularly poorer households, and employment earnings are typically the largest source of household income. Thus, the risks of job loss or extended periods of unemployment are serious for most households and can even be catastrophic, especially if work is keeping a household above the poverty line. The rate of informal employment in Chile has for years been relatively low relative to neighbors in Latin America. However, relative to other OECD member countries, labor informality in Chile is high, and, in addition to unregulated work, the focus of the current policy debate has narrowed on the segmentation and inequality created by the pervasive use of temporary and fixed term labor contracts (OECD 2015).

140. **Constraints in access to good-quality education translates into inequality in the labor market.** Labor market outcomes in Chile are highly correlated with the school and university attended and the type of tertiary training received. The median income of a working individual who has attended an elite university is almost two times greater than the median income of an individual who has attended a technical training or professional institute (Figure 3.21). Even relative to graduates of private universities, the median income is almost 25 percent higher. Elite university graduates are mainly employed in more well-paying sectors such as education (27.5 percent), real estate and business activities (15 percent), and public administration (9.4 percent). Moreover, an elite tertiary degree increases the number of management positions a student holds by 50 percent, though these gains are most likely seen by students who have attended elite private high schools (Zimmerman 2013).

Figure 3.21. Median Labor Income, by Type of Tertiary Education Institution, Chile



Source: Calculations based on CASEN data, 2015.

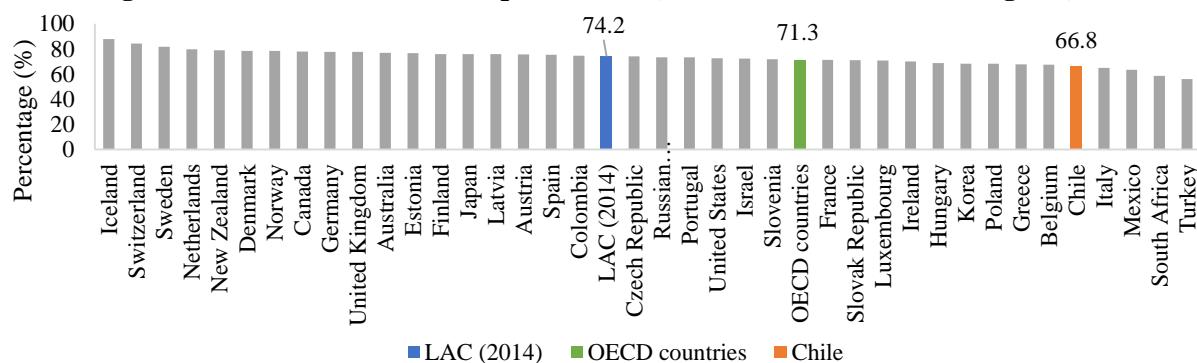
Note: Median labor income is reported for individuals ages 25–65 who are working.

141. **The share of youth who are not in education, employment, or training is sizable in Chile, contributing to the intergenerational persistence of inequality.** In 2000–15, the share of *ninis* (adults ages 15–24 *ni estudia, ni trabaja* [not in school, not in employment]) fell from 24 percent to 16 percent in Chile, below the Latin America and Caribbean average of 20 percent. The share of *ninis* has historically been higher among women than men (20.0 percent of women ages 15–24 years, compared with 12.6 percent of men in 2015). The prevalence of *ninis* has a strong equity and gender dimension. In Latin America and the Caribbean, approximately two-thirds are women, and 60

percent are from poor or vulnerable households in the bottom 40.⁷⁷ Similarly, at 19 percent, the share of youth (ages 15–29) not in employment, education, or training in Chile is among the highest in the OECD.⁷⁸ These factors, together with the long-term negative labor market outcomes among youth, translates into the intergenerational persistence of gender inequalities and low incomes, which hinders social mobility and poverty reduction (Ferreira et al. 2013).

142. The labor force participation rate has risen in Chile in the last decade, but is still among the lowest in the region and in the OECD, especially among women. The rate among adults ages 15–64 is only 67 percent, well below the Latin America and Caribbean and OECD averages of 74 percent and 71 percent, respectively (Figure 3.22). Moreover, though Chile has the most generous maternity policy in the region, only 55.7 percent of the women in the country participate in the labor force, which is below the averages of the region (58.2 percent) and the OECD (62.8 percent), ultimately limiting productivity.⁷⁹ The rates are below 40 percent among women in the poorest deciles. As in most countries in the region, unskilled workers—those with incomplete primary education or less—show lower participation rates than their skilled peers. However, in Chile, participation rates have been stagnant among the unskilled in the last decade, while the rates have increased among skilled workers with secondary or tertiary education.

Figure 3.22. Labor Force Participation Rates, Selected Countries and Regions, 2015



Sources: SEDLAC (CEDLAS and World Bank); OECD.Stat (database), Organisation for Economic Co-operation and Development, Paris, <https://stats.oecd.org/>.

Note: Labor force participation is restricted to individuals ages 15–64. The latest available data on Latin America and the Caribbean are for 2014.

143. Gender wage differences have worsened. As of 2013, women earned an average 17 percent less than men compared to 13 percentage points less in 2003. In addition, the gap is not justified by

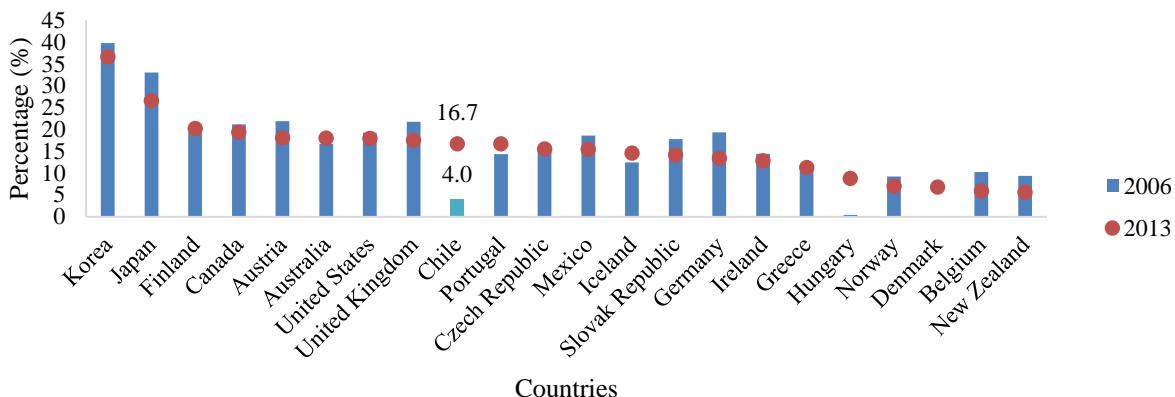
⁷⁷ Tabulations of Equity Lab, Team for Statistical Development, World Bank, Washington, DC, based on data in SEDLAC and the methodology of de Hoyos et al. (2016). Data for Latin America and the Caribbean refer to 2014.

⁷⁸ 2016 data in OECD.Stat (database), Organisation for Economic Co-operation and Development, Paris, <https://stats.oecd.org/>.

⁷⁹ In 2011, maternity leave was extended from three to six months. Most women feared this would lead to gender discrimination in hiring, but there is no evidence of less female labor force participation because of this progressive law. A 2013 study showed that, among women who had become pregnant in 2011, 70 percent subsequently returned to work (IDB 2013). Similarly, according to Chilean law, companies with 20 or more women workers of any age or marital status must provide nearby space separate from the workplace in which women may feed their children under age 2 and leave them in care while on the job.

the differences in women's educational attainment.⁸⁰ In contrast, in most OECD countries, gender pay differences either were unchanged or narrowed (Figure 3.23). Moreover, there are still significant differences with respect to the type and quality of work women perform. The situation is most acute for young women whose employment rates remain low at about 25 percent compared with 37 percent in the OECD and this is partly explained by a high incidence of teenage pregnancies. Full-time women salary workers earn 16 percent less on average, though a relatively large share is explained by job characteristics. The gender pay gap is widest among the poorest decile owing to firm size, informality, and standard contracts (OECD 2015). Women are also over-represented among informal workers without a contract (40 percent vs. 22 percent for men). As a result of these disadvantages, the replacement rate in retirement pension remuneration is 51 percent for women compared with 70 percent for men (Sanchez 2014). Lack of autonomy and voice to participate and decide on life plans are some of the factors that contribute to the existence of wage gaps and lower employment for women (Nopo 2007; Perticará and Bueno 2009).

Figure 3.23. Gender Wage Gap, OECD, 2006–13



Source: Data of OECD.Stat (database), Organisation for Economic Co-operation and Development, Paris, <https://stats.oecd.org/>.

144. Chile's unemployment rate has decreased in the last decade, but challenges remain. Chile's unemployment rate has decreased from 9.4 percent in 2005 to 6.2 percent in 2015 and is below the OECD average since 2010 (OECD 2016). The female unemployment rate is now 2 percentage points higher than the male rate, an improvement from the 4 percentage point gap in 2003. Yet, there is concern that unemployment may have been compounded by the end of the commodity price supercycle and the marked slowing of economic growth (de la Torre et al. 2015). Approximately a third of Chilean workers that have completed tertiary education have jobs that require less skills than their academic preparation, suggesting substantial skill mismatches between the skill supply and the needs of the labor market (Bravo 2016).

145. Although Chile has improved key labor market indicators in the last decade, employment conditions, specifically differences in contract types, have contributed to labor

⁸⁰ This outcome is observed for all occupational categories (employers, salaried workers, domestic workers) except the self-employed. Self-employed women have lower tenure rates, likely associated with intermissions caused by caregiving and domestic responsibilities, which have a negative impact on their accumulated experience. In contrast, self-employed men exhibit more consistent career paths, hence, are able to accumulate more experience (INE 2015).

market segmentation. Approximately a third of employment contracts have a term limit, of which nearly a fifth are renewable once a year, known as contingent contracts in Chile. Workers with fixed term contracts, typically short term, lose out on many aspects of work quality, as they often receive less training and also support a greater workload, have less job security than many open-ended contract workers, are not entitled to severance pay or unemployment insurance and often do not pay social security contributions. Moreover, in 2015, one fixed term worker in four does not have a signed contract. Income levels are also lower with respect to hourly salaries. In 2014, the average open-ended contract worker earned 20 percent more than fixed term workers (Figure 3.24) and primarily belonged to the poorest income deciles (Figure 3.25). While temporary and fixed term work is often taken up by people seeking greater flexibility, there is evidence of limited mobility into more permanent forms of employment. In tightly regulated labor markets, this lack of mobility leads to insider-outsider disparities that can perpetuate inequality (Chen 2015).

Figure 3.24. Median Hourly Wages, by Type of Employment Contract, 2010–14

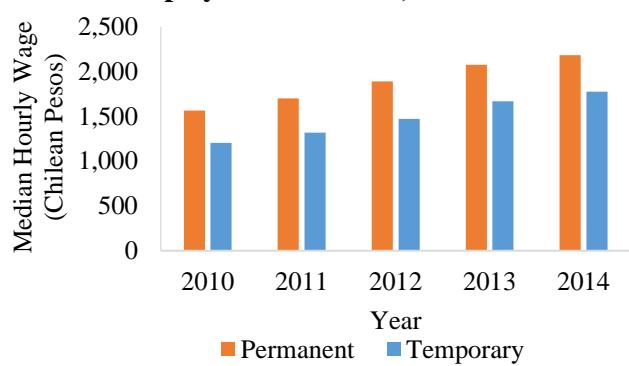
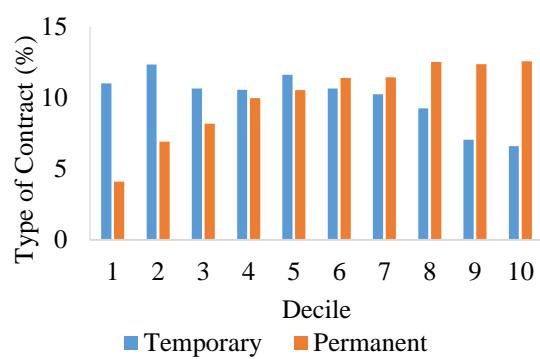


Figure 3.25. Type of Employment Contract, by Decile, 2014



Source: Calculations based on data of the *Nueva Encuesta Nacional de Empleo* (new national employment survey) 2010–14, fourth quarter.

146. **Moreover, fixed term contracts are more prominent among lower-income households typically employed in lower paying sectors such as agriculture and construction.** Fixed term contracts are also prominent in the service and education sectors, where nearly a third of fixed term workers that do not have a signed contract report being able to renew their jobs every year. In addition, after controlling for individual and job characteristics, having an open-ended contract is associated with greater job stability, a greater probability of finding a new job and higher income. This suggests contractual status plays an important role in employment outcomes and income capabilities for Chileans thus the excessive use of short-term contracts should be discouraged to reduce segmentations in the labor market (Ruiz-Tagle and Sehnbruck 2015).

147. **Since 2014, the debate over labor policy has focused fairly narrowly on labor market segmentation and the weak position of labor unions.** Segmentation in the Chilean labor market—between regulated and unregulated work, but also between indefinite and fixed term employment—is a significant driver of wage inequality. Current legislation provides strong protection for employees with indefinite contracts, while providing little security to workers in nonstandard contracts. Evidence shows that this strongly increases the level of inequality. Thus, as a response to what is viewed by many as misuse of temporary and fixed term contracts to sidestep worker protections, efforts are under way to strengthen the position of labor unions. However, whereas

union membership (trade union density) is lower in Chile than the OECD country average and clearly at the lower end of country rankings by this measure, it is comparable with union membership in Poland and Spain (OECD 2016). The low rate of union membership and its decline since the restoration of democracy, mirrors similar declines in countries across the world. Where Chile stands out from other countries, is the limited coverage of bargains struck between employers and labor groups –that is, the percentage of workers who are covered by collective bargaining agreements, regardless of whether or not they belong to a trade union. The contrast with Poland and Spain is again illustrative, and has motivated content of a package of reform legislation that has been hotly debated since December 2014 (OECD 2016).

148. After nearly 15 years, Chile's program of financial support for people who lose formal jobs is well established, responsive in times of crisis, and financially robust. Combining individual savings accounts and a solidarity component that pools risks, the *Seguro de Cesantía* is broadly seen to provide effective financial support while incentivizing job search and re-employment. There are four features of unemployment insurance system that are particularly attractive. First, the "hybrid" insurance model that combines individual savings with risk pooling, is better able to address the needs of workers who change employment frequently as well as the long-term unemployed. Second, the new system provides better levels of compensation and consumption smoothing than Chile's purely noncontributory unemployment benefit. Third, under the system, benefits are indexed to protect their value from inflation and stabilize replacement rates at their starting levels. Fourth, the system has a sound financial basis. However, the government is concerned that labor market intermediation and active job search assistance services are weak and fragmented. While many affiliates need little more than access to the funds in their unemployment savings accounts to sustain their job search and find work, a significant number exhaust their savings and require support from the solidarity fund. Moreover, at 0.1 percent of GDP, Chile has one of the lowest levels of public unemployment spending of the OECD.⁸¹ To shorten periods of unemployment and to raise the quality of matches, the government would like to increase labor market information and strengthen active job-search assistance. The system's *Bolsa Nacional de Empleo*, an electronic job registry platform, is being overhauled and augmented with updated information technology and new management structure.

Health Care

149. The Chilean health system consists of a two-tier system and is characterized by high out-of-pocket costs. The two-tier system has with two major types of health insurance, public and private. In the former every employed worker is required to contribute 7 percent of their salary toward health insurance, in contrast private-insurance holders may contribute less though most contribute about 10 percent of their salary. Moreover, approximately less than a fifth of private-insurance holders contribute less than 7 percent, reflecting the limited solidarity of the system. As of 2015, the public health financing system, the *Fondo Nacional de Salud* (national health fund, Fonasa), covered 78.6 percent of the population (approximately 13.5 million Chileans), while private health insurance institutions covered 15 percent). Nearly 9 in 10 public health insurance users are in the bottom four quintiles, in contrast to only 8 percent from the richest quintile (Table 3.1.).

⁸¹ OECD public employment spending in 2013 was 0.9 percent of GDP. "Public Employment Spending," OECD, Paris, <https://data.oecd.org/socialexp/public-unemployment-spending.htm>.

Moreover, average out-of-pocket health expenditure has increased in recent years and accounts for 6.3 percent of total household spending (Ch\$51,000) (Figure 3.26).⁸² This varies across income groups, ranging from Ch\$14,000 for the bottom quintile to Ch\$122,000 for the top quintile. Similarly, approximately a third of health spending is paid directly by households (the third-largest share among OECD countries), in contrast to less than 20 percent on average in OECD countries.

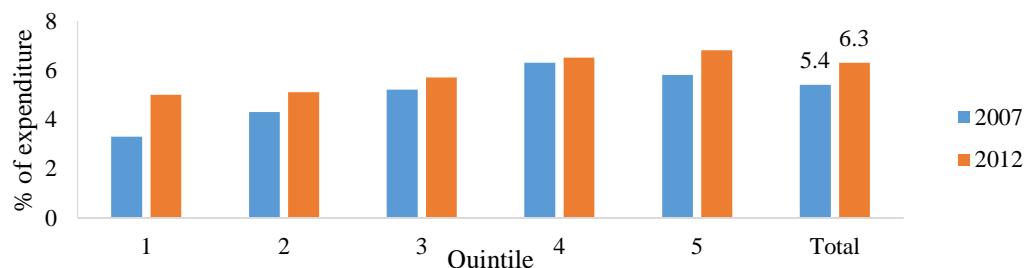
Table 3.1. Health Insurance Coverage, by Income Group, 2015

Insurance coverage	Income quintile					Total
	1 (poorest)	2	3	4	5 (richest)	
Fonasa	94.4	90.9	84.2	72.8	39.6	78.6
Fonasa A	52.3	31.0	18.4	9.8	3.8	24.7
Fonasa B	27.3	32.6	31.6	25.7	11.3	26.5
Fonasa C	8.3	15.2	17.2	15.9	7.3	13.0
Fonasa D	3.0	7.5	11.8	15.4	13.7	9.9
Fonasa unknown group	3.7	3.3	4.6	5.3	6.1	3.6
Isapre	2.1	4.4	9.3	19.1	52.0	15.3
Other insurers	0.6	0.6	0.3	0.5	0.8	0.8
Armed forces	0.5	1.0	2.6	4.2	4.6	0.6
Uninsured	2.6	3.1	3.6	3.4	3.0	3.1

Source: Calculations based on CASEN data, 2015.

Note: Isapre = private health insurance institutions. Fonasa A: free; Fonasa B: 7 percent contribution, 0 percent copay; Fonasa C: 7 percent contribution, 10 percent copay; Fonasa D: 7 percent contribution, 20 percent copay.

Figure 3.26. Health Care Expenditure in Total Household Expenditure, by Quintile, 2007–12



Source: Calculations based on data of the Family Budget Survey 2007–12.

150. Although health spending has increased in Chile, it remains lower than in most OECD countries. Public health spending in Chile increased significantly over the last two decades from 1.6 percent of GDP in 1990 to 4.7 percent in 2015.⁸³ Since 2005, public expenditure on health has increased by 8.6 percent per year, the most rapid rate compared with other OECD countries. Nonetheless, as of 2015, total health spending accounted for 7.7 percent of GDP in Chile, below the

⁸² See Ministry of Health (2015). Out-of-pocket health expenditure includes all direct payments of individuals for any health care provision. Expenses include therapeutic appliances and equipment, pharmaceuticals, hospital services, dental services, medical services, and paramedical services.

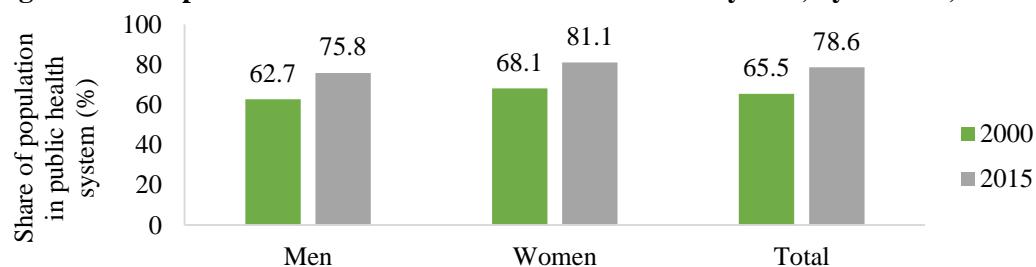
⁸³ To ensure comparability with OECD countries, public health spending in Chile does not include the 7 percent contribution to private health insurance institutions or the public Fonasa. If these contributions are included, public expenditure on health is 4.7 percent of GDP, still below the OECD average of 6.6 percent. See Health Spending (database), Organisation for Economic Co-operation and Development, Paris (accessed March 28, 2017), <https://data.oecd.org/healthres/health-spending.htm>.

OECD average of 9 percent. In addition, only 60 percent of health spending was funded by public sources in 2015, well below the average across OECD countries of 72 percent. Rising public spending on health care has been mainly driven by an increase in drug expenditures and payments for contracting of physicians engaged in dual practice. Drug expenditures have grown substantially in the last 10 years; the three highest shares of total public drug expenditure have been observed in urban areas. The proportion of total spending on labor has slightly decreased in the last decade, but the share of labor expenditures for contracts for private physician services has increased considerably, as well as the share of honoraria paid to physicians. The excessive dual practice of physicians, that is, physicians with private practices and practices in public facilities, has been a key driver of hospital debt since 2013.

151. Despite improvements in health outcomes in recent decades, Chile's health outcomes lag behind the OECD. Chile has low levels of utilization, as evidenced by low screening and survival rates for certain cancers; low rate of consultations and physicians per capita and long wait times for selected types of surgery. Moreover, it has the third-highest rate of Caesarian sections in the OECD, suggesting an overuse of this procedure. Significant efficiency gains can be achieved through improvements in the clinical effectiveness and efficiency in addition to the management of hospital care services (World Bank 2016).

152. Growing discontent with the private insurance system contributed to migration to the public system. Prior to the 2000 health care reform, known as *Plan Auge*, the association of private health insurance institutions set various restrictions on access and tended to deny treatment for certain types of preexisting diseases, to the elderly and low-income individuals. Through Plan Auge, the government introduced stronger regulations to mitigate these issues. Nonetheless, there was a permanent migration of patients from private health insurance institutions to the public Fonasa. Between 2000 and 2015, there was a 20 percent increase in the share of the population affiliated to the public insurance system. Moreover, a breakdown by gender shows greater relative participation of women than men in the public health system (Figure 3.27). This is explained by the fact that private health care plans for women of reproductive age cost almost twice as much as the equivalent plans for men in the same age-group.

Figure 3.27. Population Distribution in the Public Health System, by Gender, 2000–15



Source: Calculations based on CASEN data, 2000, 2015.

153. Despite improvements in the regulation of the private insurers, further health care reforms are needed. In 2010, the Constitutional Court struck down a core element of the private insurance system, disallowing its mechanism for risk-adjusting premiums by age and sex as discriminatory, but not providing any alternative mechanism. In addition, increasing numbers of

enrollees in private health insurance institutions go to court to contest premium increases. The court system generally grants these petitions, threatening the financial viability of the private health insurance institutions. As a result, in 2015, a presidential advisory commission was convened to reform the health insurance system; nonetheless, a consensus on the long-term vision of the health sector has not yet been reached.

Pensions

154. Chile's privately managed pension system was at the root of the country's shift toward free-market economic liberalism in the 1980s and became an example for many other countries in the region. Old age is frequently accompanied by a loss of earnings and a reduction in income. At the same time, the elderly become increasingly vulnerable to sickness and disability which may result in burdensome health care costs. The combined effect of those two factors may result in poverty. To help households manage the risks to welfare that arise from aging, the government has an array of instruments, provided both directly and through the regulation of private provision. Structural reforms in 1981 introduced a shift away from a single-pillar, defined-benefit public pension system to a multipillar system in which the private financial sector plays a leading role. Following the Chileans, a large set of enthusiastic adoptions of similar models followed across Latin America and many parts of Central and Eastern Europe, often with support from international financial institutions, thereby representing an endorsement of a policy stance that was broadly accepted as a foundational ingredient to Chile's economic performance. At the turn of the last century, after the new multipillar system had been in operation for about 20 years, unease and concern began to arise with the model, provoked in part by lower investment returns and how much affiliates were paying in administrative costs (Arenas de Mesa and Benavides 2003; Arenas de Mesa and Marcel 1999). Few people had yet retired with pensions financed mainly through the new system.

155. However, as the government expanded investment in longitudinal and administrative data, it became clearer that only a small share of the labor force had the sustained levels of income and income growth and consistent rates of participation (contribution) in the pension system for it to be an effective instrument of income replacement in old age. Pensions were based on the savings of individuals accumulated during the active work life and was compulsory for all salary and wage workers, though participation was not mandatory for the self-employed, the unemployed, and people in the informal sector. Moreover, salaried workers were required to pay 10 percent of their salary toward their pension and employer contributions to pension funds were voluntary. Analysis showed holes in the coverage of Chile's old-age safety net (the zero and first pillars) that had suffered neglect from repeated governments preoccupied with the fiscal transitions costs of the 1981 reform, lowering administrative costs, and raising the returns on investment of the *Administradoras de Fondos de Pensiones* (pension fund managers). Questions were raised about whether the promise of greater efficiency and lower costs were being kept by a fund management industry that looked increasingly less assailable and where opportunities for cost competition had been ignored (Valdes 2005).

156. In 2008, the Solidarity Pension was introduced to ensure the less well-off and the self-employed were guaranteed a minimum basic pension regardless of their contribution history. The reform extended the coverage of targeted noncontributory cash transfers as well as guaranteed

benefits through the basic solidarity pension and the pension solidarity complement for affiliates to the pension system who upon reaching retirement age have low account balances despite having completed a minimum required period of contributions.⁸⁴ The reform has had a dramatic positive impact on coverage of entitlements to a public pension, which in 2003 covered only 56 and 70 percent of urban workers in the first and second deciles, and 20 and 46 percent of rural households in the first and second deciles, respectively. In 2013, the coverage of these groups rose to 84 and 90 percent (urban) and to 78 percent and 88 percent, along with a rise in coverage to above 90 percent for workers from average income households in both urban and rural areas. On the other hand, even though contribution rates for the self-employed increased from 5 to 30 percent with this reform, it was half of the anticipated increase of 60-70 percent. There was insufficient effort to communicate benefits for the self-employed, thus the compulsory stage was postponed to 2018.

157. Despite it being an exemplary pension system in the region, it leaves many Chileans without retirement security and carries excessive costs. The Chilean pension system assumes a full contribution history, it copes poorly with short or frequently interrupted periods of contribution. Although the opportunities to work that allow people to avoid (self-employment) or evade (informal employment) the mandate to contribute, are relatively fewer in Chile than in other countries at a similar level of development, they are still sufficiently present for working people to indulge preferences for current consumption over savings. Moreover, Chile's dual labor market does not incentivize fixed term contract workers to contribute to the pension system, leaving them with little to no retirement funds. The average Chilean employed in the formal sector spends four years in any given job, limiting their potential to contribute.⁸⁵ Likewise, employer contributions are strictly voluntarily, making the decision to save for old-age entirely up to the individual.

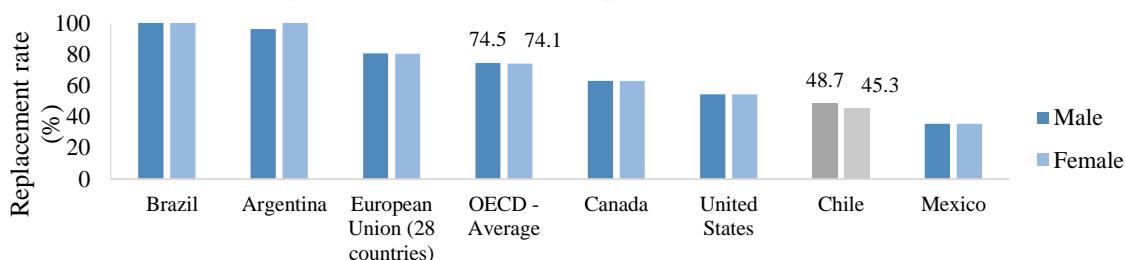
158. In addition, there is a concern that many workers could reach retirement with inadequate funds to provide adequate pension annuity. On average, men at their legal retirement age obtain a replacement rate of 48.7 percent and women only 45.3 percent (Figure 3.28).⁸⁶ This is far below the OECD average and the Chileans expected replacement rate of 70 percent (Social Protection Survey 2012). Nonetheless, these replacement rates include individuals who retired within the old pensions system that had higher replacement rates; thus, under the new system, rates are lower. Among men and women retiring at the legal retirement age, the replacement rates are estimated at 55 percent and 39 percent, respectively. Similarly, approximately 79 percent of pensions are lower than the minimum wage, and 44 percent are below the poverty line (Comisión Presidencial Pensiones 2015).

⁸⁴ To qualify for the basic solidarity pension, individuals must belong to the poorest 60 percent of the population (as determined by the *Puntuaje de Focalización Previsional*), provide proof of residence in Chile for a period of 20 years (continuous or discontinuous), which is counted beginning on the 20th birthday, and provide proof of residence in the country in at least four of the last five years preceding the application. See “Pensión Básica Solidaria de Vejez (PBSV),” Instituto de Previsión Social, Santiago, Chile, <https://www.chileatiende.gob.cl/fichas/ver/5270>.

⁸⁵ Calculations based on CASEN data, 2013. This is limited to individuals ages 18–65 with signed contracts.

⁸⁶ The replacement rate is defined as the relationship between a workers pension and their average salary in the last 10 years.

Figure 3.28. Net Pension Replacement Rates, 2014



Source: 2014 data of OECD.Stat (database), Organisation for Economic Co-operation and Development, Paris, <https://stats.oecd.org/>.

Note: The replacement rate in Chile includes individuals who retired under the old pension system that had higher replacement rates than the current system; thus, the replacement rate shown is higher than the current rate. OECD estimates assume 40 years of contributions; thus, if the same model were applied to Chile, replacement rates would be much higher.

159. Low replacement rates disproportionately affect middle-income workers, the self-employed, and women. Middle-income workers are at a disadvantage when it comes to pensions given that lower-income groups receive the pension solidarity complement, and higher-income workers complement their pension funds with the *ahorro previsional voluntario* (voluntary pension savings). Second, workers who spend some time as self-employed (approximately 20 percent of the 2013 labor force) or in the informal sector and, as a result, do not contribute to pension fund during this time. Third, since the legal retirement age for women is 60, whereas for men it is five years later, women end up with exceedingly low benefits due to their longer life expectancy and lower life-time earnings.⁸⁷ Fourth, workers with higher-income earnings at the time of retirement end up with lower replacement rates than if they contributed more than the mandatory 10 percent.

160. It is estimated that, by 2050, over 2 million Chileans will be over 80 years of age, nearly four times the share today, putting additional pressure on improving the pension system. Moreover, Chile's epidemiologic transition—increases in life expectancy, increased disease chronicity, and aging—is inevitably being accompanied by rising medical costs for individuals and the state, making retirement security even more relevant. Amid the persistent population discontent with the pension system, President Bachelet set up the Bravo Commission in 2014 to assess its deficiencies and develop proposals to improve it. The Bravo Commission became mired in a protracted debate between widely diverging constituencies, some proposing radical changes to the system and even a restoration of the pre-1981 purely publicly defined benefit model financed on a pay-as-you-go basis from earmarked employer and worker contributions. The widely differing stances of stakeholders and members of the commission made finding a consensus reform proposal difficult.⁸⁸ Though consensus on the reform has not been reached, there is growing awareness of the severity of this issue especially given the relatively fast aging of the population. A reform of Chile's pension system will likely require distinct policies for those retiring today without insufficient

⁸⁷ As of 2013, life expectancy was 81.3 years among women and 76.1 years among men; see OECD.Stat (database), Organisation for Economic Co-operation and Development, Paris, <https://stats.oecd.org/>.

⁸⁸ Some of the proposed reforms include: increasing coverage of the Solidarity Pillar from 60 percent to at least 80 percent of the population, increase the retirement age for women from 60 to 65 given increases in life expectancy and use the same life expectancy tables for men and women.

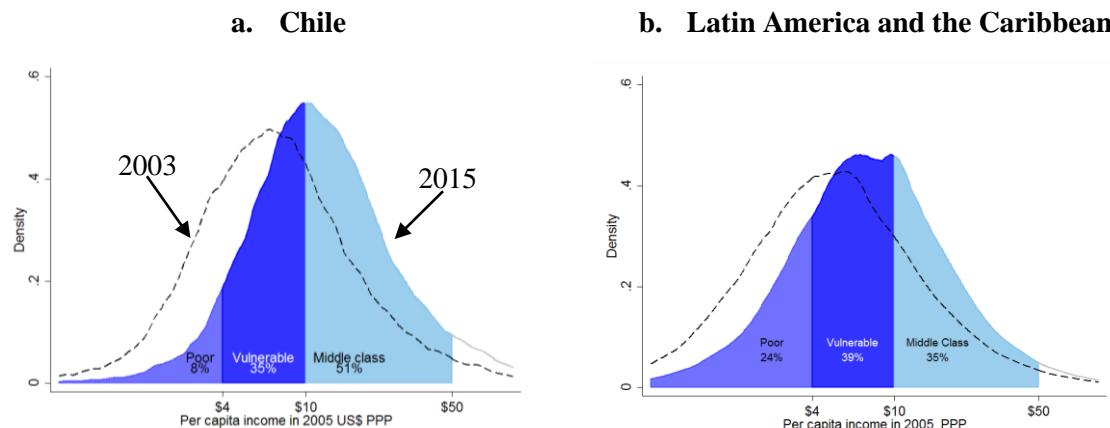
replacement rates and those retiring in the future that still have time to increase their contribution rates.

3.4. Identifying Binding Constraints

161. Despite an impressive reduction in poverty, important pockets of poverty remain, posing an even greater task for the eradication of extreme poverty. Targeting the remaining 4.5 percent of the population that lives in extreme poverty will be even more challenging given that more specific policies are needed to target such a specific group. For instance, nearly a fifth of the extreme poor are of indigenous descent, a group also subject to a number of disadvantages on other social dimensions. Moreover, regions with the greatest concentration of income poverty also have greater concentrations of multidimensional poverty.

162. Substantial income growth over the last decade has shifted the income distribution to the right; thus, policies and institutions are needed to ensure that the vulnerable and the middle class do not sink back into poverty. However, growth also concentrated a large proportion of the middle class close to the threshold of vulnerability. This contrasts with the changes experienced in the region, where the poor and vulnerable remain a sizable group in the population (Figure 3.29). At 35 percent, the vulnerable, those above the US\$4.00 poverty line but below the middle-class threshold (US\$10.00), are the second-largest group in Chile. Thus, policies that also focus on the sustainability of poverty reduction, in addition to its eradication, are needed. A growing segment of households want assurances that labor and social protection policies and programs will do more than prevent poverty; they are also demanding higher-quality public services and a credible channel for greater prosperity and advancement.

Figure 3.29 Distribution of Income, Chile and the Region, 2003–15



Source: LAC Equity Lab tabulations, Team for Statistical Development, World Bank, Washington, DC, based on data in SEDLAC (CEDLAS and World Bank).

Note: Dotted line = 2003.

163. The changing composition of Chile's economic classes, especially through a growing and more educated middle class, puts additional pressure toward attaining more inclusive, high quality public services. Seeking the right balance between providing protection and promoting individual initiative, structural reforms have been enacted in Chile's recent history that have shifted

the burden of the risk to well-being among the state, employers, and individuals. Successive democratically elected governments have also been active in redesigning the policies and programs intended to help households manage the risks to their human capital. Yet, in the wake of innovation and reform to social protection and labor policies, the people of Chile are still debating whether the distribution of risks to human capital is socially fair and economically optimal. Even though this worked in Chile's earlier stages of development, recent discontent and protests over public service provision suggests the country has reached an inflection point where the status quo is not meeting society's expectations. Society's polarization reflects frustration at the stubbornly unequal distribution of wealth in Chile, despite income growth and sharply falling poverty rates (see chapter 4).

164. The growing polarization of social policy debate presents a binding constraint, since it will make it more challenging to achieve greater equity and productivity in Chile. A lack of inclusion and socialization of risk has resulted in an unequal society with limited opportunities for its rising middle class. A growing middle class has not been enough to delink income from parental socioeconomic status, innate abilities and effort are not enough to change socioeconomic status in the country. Labor market outcomes are highly dependent on the type of education received, that in turn also determine—to a certain extent—health system affiliations and pension contributions. Overall, the current distribution of risks is not socially fair and economically optimal. Table 3.2 summarizes Chile's inclusion constraints to achieve greater equity and productivity.

Table 3.2. Equity and Productivity Determinants: Inclusion, Chile

<i>Performance</i>	<i>Evidence of substantial impact</i>	<i>Limited or unknown impact</i>
Lagging	Quality of human capital (+) Female labor participation (+) Public unemployment spending (+) Labor market segmentation and workers protections (+)	Out-of-pocket health expenditure (+) Inefficient health outcomes (+) Pension replacement rate (+)
As expected	Coverage of primary and secondary education (+)	
Strong	Poverty reduction (+) Pro-poor income growth (+)	

Source: World Bank analysis.

Note: Positive equity impact (+); equity trade-off (−); government policy ineffective (~).

Chapter 4. How sustainable are the current paths of growth and inclusion?

“No hay que convencer, hay que conversar”⁸⁹

— SCD consultation mission

Chile has been achieving the twin goals in a largely sustainable manner: it faces some challenges related to environmental and social sustainability while preserving a solid fiscal position. Rapid growth in some sectors has been accompanied by increasing pressures on Chile’s natural capital. This relates particularly to water resources management, deforestation, fish stock depletion, biodiversity conservation and air/water pollution. Chile is also particularly vulnerable to the effects of climate change as weather patterns are expected to negatively affect the country’s water resources and alter export-oriented agribusiness and silvopastoral systems. Chile is experiencing social tensions and polarization in the political discourse. Recent developments have marked a departure from the consensual politics of past decades. Reforms aimed at reformulating the social contract have faced challenges related to design, implementation and broadbased political support. Furthermore, Chile faces a significant challenge in managing its advanced demographic transition, one that may affect labor productivity and the cost of providing public services if not addressed in the medium term. Nonetheless, Chile has a solid and sustainable fiscal position from which to tackle these challenges.

165. The World Bank goals emphasize the importance of fiscal, environmental, and social sustainability aspects of a country’s development strategy. Achieving the twin goals of reduced poverty and shared prosperity in the short term, but only at a cost of sacrificing those same goals in the future, makes no economic, social, environmental, or moral sense. Therefore, sustainability analysis must ask about both the short and longer terms, that is, about both current and future generations, which this chapter does, and it also identifies key sustainability-related constraints on achieving the twin goals over the longer term.

4.1. Environmental Sustainability

4.1.1. Resources, Environment and Economic Growth

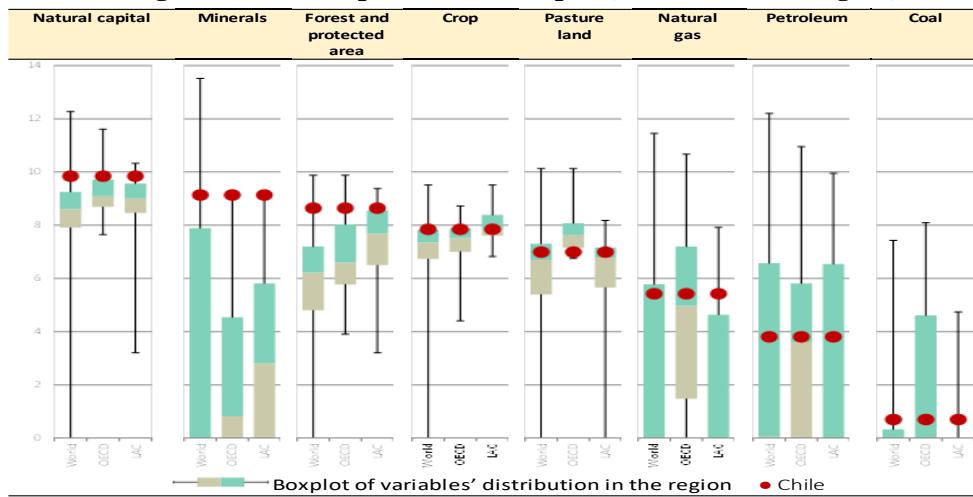
166. Chile’s per capita natural capital is relatively substantial, particularly in minerals and forests. Chile’s natural capital per capita was above the 75th percentile in the OECD, the region, and the world (Figure 4.1). Aside from copper, the country also ranks high on forests and protected areas and has above-median endowments of crops and pastureland.

167. Rapid economic growth has resulted in pressures on natural resources. In recent decades Chile has experienced high growth rates, particularly in resource-intensive industries such as mining, agriculture, forestry, and aquaculture. Rapid growth, combined with sound macroeconomic and social policies, has resulted in significant reductions in poverty rates. However, it has also caused increasing environmental pressures, particularly on water resources as water-intensive sectors, such as agriculture, mining, and hydropower generation, continue to

⁸⁹ “We don’t have to convince, we have to talk”

grow. Water resources management is in fact a major constraint to sustainability. Other environmental challenges include biodiversity conservation, air and water pollution, increased energy consumption, forest degradation, and climate change.

Figure 4.1. Per Capita Natural Capital, Chile and the Region, 2005



Source: Data of the Changing Wealth of Nations (database), World Bank, Washington, DC, <http://data.worldbank.org/data-catalog/wealth-of-nations>.

Note: The figure illustrates the logarithm of 2005 U.S. dollars. Zeros and negative logarithms were transformed into zeros.

168. Policies to protect the environment allowed Chile to reduce some of the pressures on its natural capital since the 1990s. Environmental concerns were initially driven by the visibly poor air quality in Santiago and rapid deforestation (World Bank 2000). Since then, the country's institutional strength and commitment to reforms have been manifested in its environmental agenda, particularly in issues linked to concerns over human health, international trade, and energy security. Over the last decades, Chile has modernized its institutional framework for environmental sustainability, including the creation of the Ministry of the Environment in 2010. It has also intensified its environmental actions on air, water, waste, and biodiversity management, with innovative instruments such as pioneering tradable emission permits, water rights, and fishing quotas, as well as environmental impact assessments, and the introduction of carbon taxes in 2014. Chile has made progress in integrating environmental concerns in sectorial policies, with wide-ranging studies and national action plans such as the national strategies on energy, water resources, forests and climate change, and the 2017–22 National Climate Change Action Plan. Additionally, the government has relied on voluntary environmental regulation, supported by the high environmental standards in the export markets of Chilean firms.

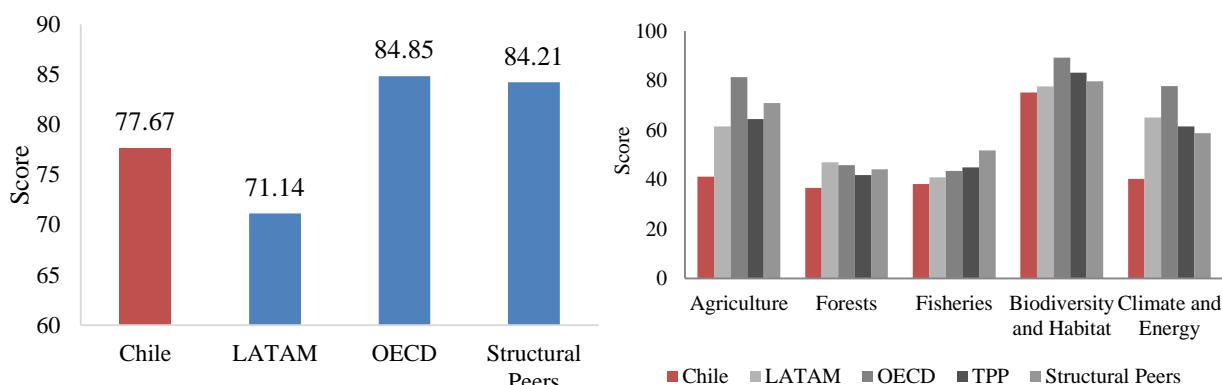
169. Chile's environmental management performance lags behind regional peers and OECD members. Chile ranked 52nd in 180 countries on the 2016 environmental performance index, above Colombia (57), and Mexico (67).⁹⁰ It had high marks on health impacts, water and sanitation, and wastewater treatment. However, Chile's score in ecosystem vitality ranks it only 100th, well below Colombia (63) and Mexico (64). There is scope for improvement in terms of

⁹⁰ EPI (Environmental Performance Index) (database), Yale Center for Environmental Law & Policy, New Haven, CT, <http://epi.yale.edu/>.

agriculture forests, fisheries, biodiversity and habitat and climate and energy (Figure 4.2). The country also falls into the bottom ranks when compared with OECD countries in the environmental policy indicator of the 2015 Sustainable Governance Indicators score.⁹¹ Although environmental institutions have been strengthened in recent years, “policy is oriented toward complying with international markets rather than toward sustainability” and “industrial interests have considerable influence over policy,” especially in the field of water and forestry policies and regulation, according to the Sustainable Governance Indicators report (SGI 2015).

Figure 4.2. Environmental Performance Index, 2016

a. EPI Score b. Ecosystem Vitality, selected indicators



Source: EPI (Environmental Performance Index) (database), Yale Center for Environmental Law & Policy, New Haven, CT, <http://epi.yale.edu/>.

170. Environmental degradation, inadequate environmental management and regulation disproportionately affect the poor and vulnerable. The poor tend to depend more on natural resources, not only as a source of income but also for food, fuel, and building materials. They are especially affected by pollution, soil erosion, and other negative externalities arising from extractive activities, such as mining and commercial logging (OECD 2009). In Chile, poor communities usually have the lower hand in negotiating conflicts over natural resources with large companies. Forestry expansion and large forest companies have been associated with higher rural poverty rates as small-scale agriculture faces increased challenges and economic hardship such as less water available for irrigation, and possible contamination of crops from plantation pesticide fumigation (Andersson et al. 2015).

4.1.2. Major Challenges to Environmental Sustainability

Sustainable Management of Water Resources

171. Despite abundant water availability, Chile faces water stress. Mean water availability in Chile is almost 50,000 square meters per capita per year, much higher than the world average

⁹¹ SGI (Sustainable Governance Indicators) (database), Bertelsmann Stiftung, Gütersloh, Germany, <http://www.sgi-network.org/2016/>.

of 6,000 m³ per capita per year and the 2,000 square meters per capita per year international threshold of sustainable development (2016 data, World Development Indicators). Yet, most of Chile's population is located in areas of arid and semiarid climates, where water availability is less than 1,000 square meters per capita per year, and water demands are larger than the available surface runoff. Demand is then covered by groundwater to meet municipal, industrial, agricultural, and mining needs, which severely depletes the resource (Valdés-Pineda et al. 2014).

172. Economic specialization in water-intensive sectors has generated ever-increasing demand on water resources. Surface water has been the main source to water intakes for booming activities such as mining, agriculture, and forestry but constant economic growth and social development during the last two decades has increased the demand for groundwater resources as well (Valdés-Pineda et al. 2014). Chile's annual freshwater withdrawals as percentage of internal resources went from 2.3 percent in 1992 to 4.0 percent in 2014. Even though Chile has more than two times more internal freshwater resources per capita than Latin America and the Caribbean, annual freshwater withdrawals are almost twice that of the regions'.⁹² In fact, this indicator, as well as water productivity, shows the highest level of priority in percentage terms relative to the world and to its peers according to the prioritization exercise presented (see chapter 5).

173. The country must face the challenge of reconciling conflicting water uses. The largest freshwater consumer is the agricultural sector, responsible for 73 percent of water consumption, followed by the industrial sector (12 percent), mining (9 percent), and sanitation (6 percent) (Government of Chile 2013). On top of the large competition for surface water among these sectors, nonconsumption uses of water must be reconciled with the growing demand of households and booming sectors. In particular, hydroelectric power generation is competing for the resource. Hydroelectric plants accounted for 32 percent of the country's electricity generation in 2014 and are expected to continue to be the main source of power generation despite the diversification in the energy mix (Government of Chile 2014).

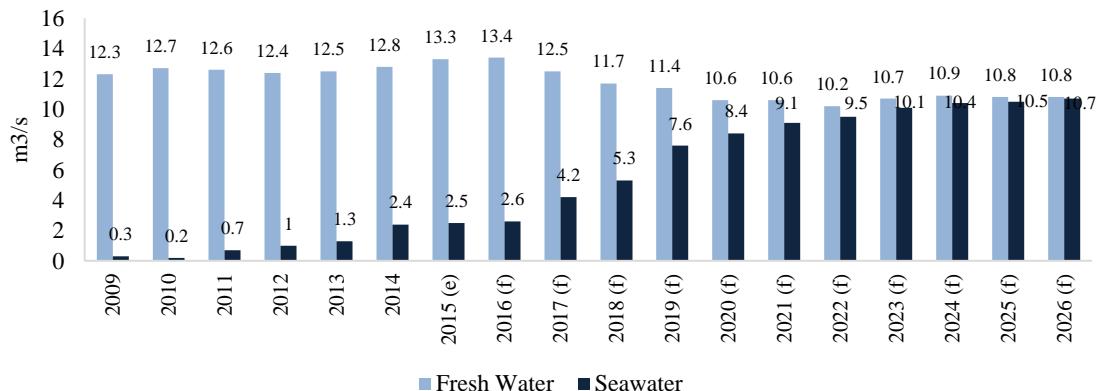
174. Scarcity and competition for water use has led to progress in terms of increasing water efficiency in some sectors. The mining industry, for instance, has taken actions to reduce its demand for water including recirculation of water in operations, desalination and direct use of salt water, improved technology and management practices, and the selection of sites with easy filtration control. Between 2013 and 2014, there was an 88.3 percent increase in the use of salt water, currently in mining regions with less water access, Antofagasta and Atacama, 25 percent of the water used comes from the sea. According to projections, seawater consumption is set to account for 50 percent of water consumption in mining by 2026 (Figure 4.3). Still, mining demand for water is expected to increase by 43 percent between 2012 and 2020, mostly in the northern river basins where water resources are already scarce (Brantes and Oliveres 2008).

175. Still, Chile is among the countries most likely to face a decline in the water supply because of climate change. Chile ranked 32 in 162 countries in the World Resources Institute score on water stress for 2020. The World Resources Institute also found that Chile is among the countries that "could face an especially significant increase in water stress by 2040" (Maddock,

⁹² In 2014, annual freshwater withdrawals as a percentage of internal resources was 2.4 for Latin America and the Caribbean. See WDI (World Development Indicators) (database), World Bank, Washington, DC, <http://data.worldbank.org/products/wdi>.

Young, and Reig 2015). The country is projected to move from medium water stress in 2010 to extremely high stress in 2040 because of the combined effects of rising temperatures in critical regions and shifting precipitation patterns (see below).

Figure 4.3. Forecast of Water Consumption in Mining, by Source, Chile, 2009–26



Source: Data of Cochilco, the Chilean Copper Commission.

176. Water availability is constrained by worsening water quality from industrial, mining and agricultural pollution. In only a decade, there has been a significant reduction in the pollutant load from urban and industrial wastewater despite strong economic growth and urbanization. Chile has also seen a drastic reduction in the prevalence of waterborne diseases. However, water quality has decreased in some regions of the country. In northern and central Chile, this has been mostly due to urban and industrial wastewater discharges as well as mining, agriculture and agroforestry activities, whereas fish farming and fish processing affects water resources in the south (OECD and ECLAC 2016). Challenges regarding water quality management also include the protection of coastal lakes, estuaries and groundwater, which are particularly vulnerable to pollution.

177. However, Chile's water allocation system has also generated environmental and social challenges which have only been partly addressed by recent reforms. According to the OECD 2014, Chile's market for water rights, which is subject to minimal regulation, has been effective in allocating water resources to major categories of water users, supporting the expansion of key sectors, such as mining, export-oriented agricultural activities, and forestry. Yet, the water market also resulted in problems of water accessibility by vulnerable groups, such as small farmers and indigenous peoples, due to market failures that led to concentration of water rights among few stakeholders as well as hoarding and private speculation (OECD 2014). These market imperfections include lack of transparency, prevalence of bilateral negotiations, transaction costs, and asymmetry of information regarding the operation of markets. Furthermore, the water code does not provide a strong framework to manage conflict over water rights (Bauer 2015) and created challenges related to the over-allocation of water resources, leaving insufficient water for the environment. The 2005 reform to the 1981 code sought to address these issues. It included the consideration of environmental sustainability issues in the granting of new water use rights, the possibility of excluding water resources from the market when necessary to protect the public interest, and the establishment of nonuse fees and limits to applications for water user's rights to the original needs. However, the reform did not change the basics of the model of allocation and

trade of water rights, which is still subject to critics, particularly in terms of equity and exclusion, and governance of water conflicts.

178. The role of the Water Authorities would need to be strengthened to contain the overexploitation of water resources. In the Chilean model, the rights to use water are private property rights though water itself belongs to the public domain. This apparent contradiction is meant to recognize the multifunctionality of water: it is a social good –necessary to satisfy basic human needs– whose access should be protected by the state; and it is also an economic good, with property rights being freely used by the private sector for economic development. The need to strike the right balance between the roles of the state and the private sector in the administration of water resources is at the core of water resources management issues in Chile. The Water Code assigned, however, a limited role to the state in the management of water resources. The role, power, and means of the Water Authority need to be strengthened at national and basin level to ensure water sustainability and economic development (World Bank 2013).

179. Taking preparatory action to address current and future water stress will be crucial to ensure water resources sustainability and reduce vulnerability. Poor and vulnerable people tend to be disproportionately affected by water scarcity (Rossing 2010). Poor people are typically concentrated in arid or semiarid rural regions, which tend to be affected by droughts and wide climatic variability, or in large urban centers with high population density, which are at risk of freshwater scarcity. Chile's sustainable progress toward eradication of poverty and inequality calls for further revision of the institutional framework in this area to ensure equitable access to water resources.

Making Energy Secure, Reliable and Affordable

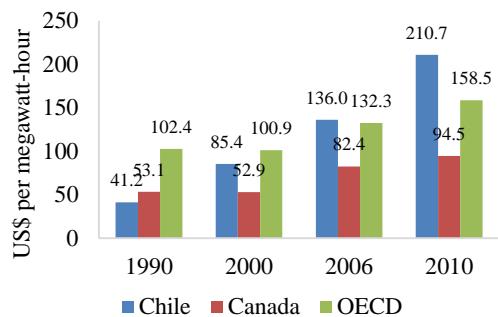
180. Chile's power sector has faced the challenge of keeping pace with economic growth and was considered a key bottleneck to growth in the past. Total energy consumption more than doubled in the 1990-2013 period. Low domestic energy production in Chile combined with increasing energy demands from a fast-developing economy has led to substantial energy imports (about 60 percent of total demand), particularly of fossil fuels, and high energy costs, imposing a burden on growth. Though the cost of energy declined, challenges remain in increasing affordability and achieving a secure and reliable service throughout the country (Figure 4.4). At the same time, Chile's dependency on carbon energy consumption has been accompanied by a 93 percent increase of carbon emissions per capita from 1992 to 2011 compared with a 24 percent increase in the region, but yet at significantly lower levels than the OECD average (World Development Indicators data). While Chile has a particularly high rate of access to electricity (99.6 percent), 67 percent of domestic energy consumption comes from oil, coal and gas, most of which is imported. Coal alone makes up 39.4 percent of the power mix. Hydropower is the second most important source of electricity, with 31.2 percent of the total.

181. The country has become increasingly conscious of the challenge of energy security and its link with energy efficiency and environmental protection. The severe droughts of 1998/99 and 2007/08 that greatly reduced hydroelectric power generation, and the Argentinian natural gas export restrictions in 2004 forced Chile to take immediate steps to secure its energy supply. These included a commitment to develop clean renewable energy sources, both

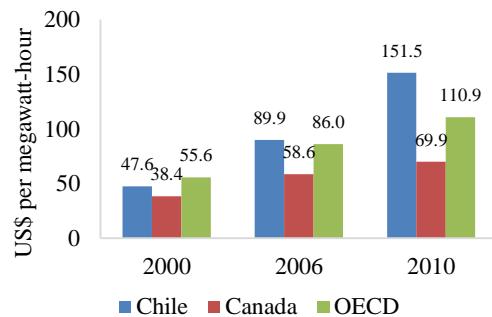
conventional (such as hydroelectric generation) and nonconventional (wind, geothermal, and solar, abundant in the country), as a fundamental part of Chile's energy policy. Traditional energy sources such as hydroelectric power, large coal fired plants, and liquid natural gas remain, however, essential for Chile's security of supply. This led to a rising awareness of the need to develop energy efficiency programs to reduce the high cost of energy in the country as well as its ecological footprint. The success of attempts to improve energy efficiency, by creating the Chilean Agency for Energy Efficiency in 2010, and by advancing an Energy Efficiency Law, has been limited.

Figure 4.4. Electricity Prices

a. Households, 1990–2010



b. Industry, 2000–10



Source: 2012 data, Prices and Taxes (database), <http://www.iea.org/statistics/topics/pricesandtaxes/>. International Energy Agency, Paris,

182. **The government launched Energy Policy 2050 in December 2015 to establish a reliable, inclusive, competitive, and sustainable energy sector and make Chile one of the first nations in Latin America to set long-range targets for clean generating capacity.** By law, 20 percent of electricity will come from renewable energy generation by 2025, and, by 2035, 60 percent of electricity is expected to come from renewable sources, thereby placing Chile on track to complete one of the United Nations Sustainable Development Goals. Several government initiatives and studies support this target.⁹³ Chile also encourages clean energy through total exemption from transmission taxes for small renewable projects and low-cost funding via its Economic Development Agency. The design of electricity supply tenders was modified in 2014 to attract bids for renewable energy projects. The most recent round of energy auctions was extremely competitive, with average costs of contracts decreasing 40 percent since the last auction, which could lead to a 20 percent drop in electricity costs.⁹⁴ Likewise, to increase coverage and reliability in remote areas, the government has promoted the connection between the General Interconnected System and the Central Interconnected System over a single transmission line. With the interconnection and the identification of a single independent operator as established in the

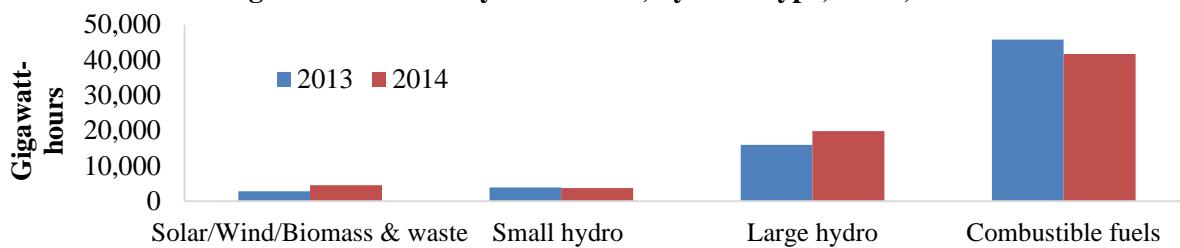
⁹³ National Climate Change Action Plan for 2016–21; the national sustainable construction strategy, the nationally appropriate mitigation actions for all sectors of the economy, a carbon dioxide emission tax approved in 2014 and set to be implemented in 2017, a sales tax on light duty vehicles that indirectly targets carbon dioxide emissions; and the National Energy Agenda (Herrera 2015).

⁹⁴ At a lowest bid price of US\$29.10 per megawatt-hour, solar contracts reached the lowest price ever, at half the price of coal. Main generators of conventional energy failed to win any contracts, and over half the contracts were awarded to nonconventional renewable capacity (all renewable forms of energy and small hydropower plants of up to 20 megawatts in capacity).

transmission law (Law 20.936), regional exchanges with neighboring countries, namely, Argentina and Peru, may help develop competition in the energy market.

183. Chile is currently undergoing one of the biggest expansions in renewable capacity in the world. The country's cumulative installed capacity rose from only 1.1 gigawatts in 2013 to 5.4 gigawatts by 2017, at a compound annual growth rate of 50 percent. In 2015, almost 300 renewable initiatives were submitted for environmental evaluation, and renewables accounted for over 75 percent of total investments.⁹⁵ Chile is also leading the region in solar energy capacity, with almost 0.5 gigawatts installed in 2014, followed by Peru with around 0.1 gigawatts. It is expected to exceed the 2025 renewable energy target. By 2014, the country was generating 12 percent of its electricity production from renewable sources (forest biomass, solar, wind, and small hydro), registering a 24 percent growth rate in clean energy generation and more than doubling the goal set for the period. Large hydro accounted for 28 percent and natural gas, coal, oil, and diesel accounted for the rest (Figure 4.5). This puts Chile well ahead of its upper-middle-income peers in the region except for Brazil. Moreover, Chile remains the most attractive market for nonhydro renewables development in Latin America because of the supportive regulatory environment, political support, competitive prices, favorable natural conditions, cost-competitive resources, and stable business environment.

Figure 4.5. Electricity Production, by Fuel Type, Chile, 2013–14



Source: Calculations based on data of Climatescope 2015 (database), Bloomberg New Energy Finance, New York, <http://2015.global-climatescope.org/en/>.

184. The energy matrix has transformed over time with biofuels waste replacing crude as the main source of primary energy supply in 2012. Forest biomass accounted for 28.1 percent of the country's primary energy matrix in January 2015, making it the second largest source of energy at the national level, equivalent to the generation of 102,982 gigawatt-hours of energy a year (CONAF 2015). Biofuels coming from this and other biomass wastes accounted for 31 percent of Chile's primary energy supply as of 2013, a slightly larger share than crude oil and also compared with 21 percent participation of coal. In contrast, crude oil was the main source of primary supply in Latin America and the Caribbean with a 43 percent participation, followed by natural gas (25 percent) and biofuels waste (17 percent). In terms of energy demand, industry (including mining) accounted for 37 percent of Chile's total consumption in 2013; transport and residential demands represented 31 percent and 23 percent of total consumption, respectively. This compares with a 36 percent share in transport, 32 percent in industry, and 16 percent in residential in the Latin America and the Caribbean region.

⁹⁵ As of June of 2016, Chile had 2,550 megawatts of installed nonconventional renewable capacity, while 2,336 megawatts were in construction and expected to become operational in 2018. Another 8,815 megawatts in new projects are currently being assessed by the environmental authorities.

185. Chile's increasing use of biomass as a primary source of energy has important implications for both indoor and outdoor air pollution. Most Chileans living in the center and southern parts of the country use biomass for heating and cooking, due mainly to cultural preferences and a relatively low price. Production and commercialization of biomass is not well regulated and greatly fragmented, resulting in a low quality and highly polluting indoor and outdoor air energy resource. Many of the main cities in the south have air pollution levels higher than Santiago and are thus experiencing a surge in pulmonary health complications among the elderly and children. In 2015, the government launched a policy for the use of fuelwood for heating that aims to increase the efficiency and sustainability of fuelwood, thereby reducing indoor and outdoor air pollution and reduce respiratory diseases.

186. Chile's strong policy commitment to clean energy development implies limited risks to environmental sustainability. The pioneering privatization and liberalization of Chile's electricity sector in the 1980s led to a competitive energy sector, which has been able to sustain the rapid growth and sharp reduction of poverty of the Chilean economy over the past two decades (OECD and IEA 2009). As challenges to energy security and social and environmental sustainability rose, Chile laid an energy agenda that is on the right path to address challenges associated with the country's substantial dependency on energy imports, while protecting the country's natural capital. Nonetheless, it is worthwhile to pay close attention to this sector because the barriers to the attainment of the national energy goals still exist, including implementation and governance constraints and infrastructure and financial constraints.

Pollution

187. Air pollution threatens urban efficiency, agricultural productivity, and public health in Chile. Rapid urbanization, industrialization, and motorization have intensified air pollution in the country.⁹⁶ High concentration of particulate matter (PM) less than 2.5 and 10 microns (PM2.5 and PM10), as well as O₃, and SO₂, among others, are diminishing the quality of life and increasing the incidence of premature deaths and cardio-respiratory diseases, particularly in urban areas and areas surrounding copper smelters. According to the Chilean government estimates, at least 10 million people are exposed to an annual average PM2.5 concentration higher than 20 micrograms per cubic meter, which is the maximum limit established in current regulations. More than 3,000 people die prematurely each year from cardiopulmonary diseases associated with chronic exposure to air pollution (Ministry of Environment 2017). Moreover, recent evidence suggests that higher annual PM10 and ozone levels negatively impact academic test scores in Chile (Miller and Vela 2013). Thermal power plants, copper smelters, transport, and wood heating are the main causes of poor air quality in Chile (OECD 2014a). Similarly, mining is a significant emitter of air and water pollutants. Despite Chile's significant progress toward cleaner mining in the last two decades, rapid growth in the sector has brought important emissions of sulfur oxides in copper smelters (OECD 2011).⁹⁷

⁹⁶ Most Chilean cities have particulate matter (PM) 2.5 levels exceeding 20 micrograms per cubic meter. Cities in the north of the country register lower of levels PM2.5 (Ministry of Environment 2011).

⁹⁷ Although these have been reduced by 61 percent over 1990-2010 with strong decoupling from GDP, which grew by 182 percent in the same period, the OECD reported in 2014 that mining activities still cause the bulk of SO_x emissions in Chile and arsenic emissions in several regions (OECD 2014a).

188. The country performs poorly on air pollution relative to peers. Mean annual exposure to PM2.5 in Chile was 18 micrograms per cubic meter in 2013, much higher than the annual guideline limit of 10 micrograms per cubic meter set by the World Health Organization and among the highest in the OECD and the Latin America and Caribbean region, which reported an average exposure of 14 micrograms per cubic meter in the same year (2016 data, World Development Indicators). Exposure to PM2.5 increased in the 1990s and early 2000s, and has decreased in the last decade from 19.5 micrograms per cubic meter in 2005. In the same period, air pollution in OECD countries steadily decreased from 20.9 micrograms per cubic meter in 1990 to 14.0 micrograms per cubic meter in 2013, while air pollution in Latin America and the Caribbean saw a continuous increase from 10.6 to 13.7 micrograms per cubic meter in 2013. Of the Chilean population, 15 percent are exposed to severe PM2.5 concentrations (above 35 micrograms per cubic meter), compared with the OECD average of 1 percent.⁹⁸

189. Despite progress on air quality management, more work is needed to strengthen implementation of environmental standards. Current policies and programs include air quality standards, which have been made more stringent. These regulate the maximum concentrations of PM, both PM10 and PM2.5, sulfur dioxide, nitrogen dioxide, tropospheric ozone, carbon monoxide, and lead, which have been identified as the most harmful pollutants for human health. Furthermore, the Atmospheric Decontamination Strategy of the Ministry of Environment includes a mandate to increase the availability of high-quality (low moisture) fuelwood, which emits less PM, in cities declared as saturated zones (Ministry of the Environment 2014). Additionally, new industrial projects must go through the Environmental Impact Assessment System. In Santiago, an air prevention and decontamination plan created in 1998 and updated in 2009 helped reduce high pollution levels during the last decades. PM2.5 levels in the city went from 69 micrograms per cubic meter in 1989 to 27 PM2.5 in Chile was 18 micrograms per cubic meter in 2010 (Ministry of Environment 2011). However, air pollution levels seem to have stabilized and neither the city nor the country, comply with the limits established in current standards.

Environmental Pressures from Forestry and Agriculture

190. Economic growth has put pressure on Chile's natural capital resulting in deforestation and biodiversity loss. Chile's forestry sector has grown in economic importance over the last decades, supported by forestry development policies that have promoted the expansion of fast growing exotic species. However, this has also brought a "devaluation" of the country's vast native forests (less profitable than exotic timber plantations), making them vulnerable to conversion to land uses that generate higher rents. Thus, although Chile has one of the highest annual rates of afforestation and reforestation in South America (FAO 2010), an important part of Chile's net forest gain has been driven by timber plantation expansion, which has cleared secondary native forests. The subsidy instruments that incentivized exotic tree plantations in the past expired in 2012 and a proposal to renew it is currently being debated. This has prompted discussions as to which forestry model the country should opt for –a productive-oriented, industry-led model based on exotic species or a more inclusive model aimed at ensuring

⁹⁸ Data of OECD.Stat (database), Organisation for Economic Co-operation and Development, Paris, <https://stats.oecd.org/>.

the sustainability of native forests— and poses an opportunity to address Chile’s native forest management issues.

191. Conservation of biodiversity and protected areas could be further strengthened. The country has high levels of biodiversity and a strong presence of endemic species that face pressures from land-use changes, fisheries, mining, and urban development. According to the OECD (2016), sixteen of the 127 terrestrial ecosystems in continental Chile lost more than half of their native vegetation between 1992 and 2012, while pressures on inland water ecosystems are increasing. In terms of protected areas, the same reports states that while almost 20 percent of Chile’s land is protected –exceeding the Aichi target of protecting at least 17 percent of its terrestrial and inland water areas by 2020— important land-based ecoregions are not adequately represented in the protected area system, while marine protected areas are far from shore and large population centers where protection is needed the most.

192. Important advances have been made to strengthen the National System of Protected Areas, but challenges remain in terms of management of protected areas. In particular Chile lacks a Biodiversity and Protected Areas Service under the Ministry of Environment. The Ministry of Agriculture currently manages national protected areas, but relevant draft legislation to change this is being discussed since 2014. Furthermore, at present, Chile does not have a public policy to promote private protected areas even though around 80 percent of its continental territory is privately owned (ELI 2003). A draft legislation is being discussed in the parliament to create an integrated national protected areas system, which would comprise official marine and terrestrial protected areas and private protected areas.

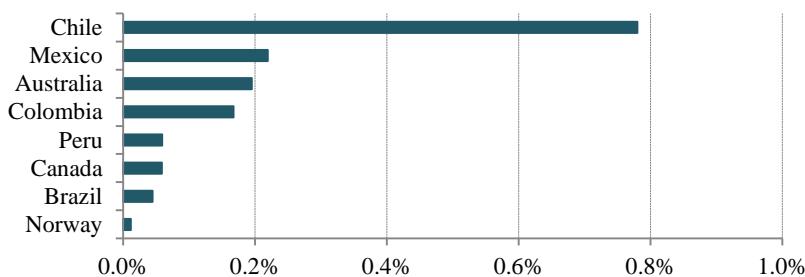
193. Chile has made important advances in terms of forest management. The current administration has encouraged the debate on the reformulation of the forestry development policy to promote sustainable commercial forest activities in native forests and published the National Forest Policy 2015-2030, which provides strategic and political orientation for the forest sector (Ministry of Agriculture and CONAF 2015). At the same time, the high sustainability standards in Chile’s export markets has led its forest companies to seek sustainable management practices and certifications requiring regeneration of harvested forest and compatibility of harvest rates with reforestation rates. This advances are particularly important given the role of forests in ensuring the provision of hydrological services in watershed contexts.

194. The erosion and desertification of national soils poses an important sustainability challenge related to growth in Chilean forestry and agriculture sectors. The country faces soil degradation affecting nearly half of its territory and 75 percent of its productive soil due to deforestation, overgrazed land, and the use of inadequate logging, crop and irrigation practices (World Bank 2009). Arable land (as percentage of land area) decreased by 42.5 percent over the last 2 decades, more than any other country in the region and coming only after New Zealand and Portugal in the OECD. The challenge in Chile’s limited supply of arable land is intensified by its increasing difficulties regarding water supply, which emphasizes the need to increase the productivity of arable land available. Similarly, aquaculture production doubled in 2003–14, carrying with it potential threats to coastal environments.

4.1.3. Disaster Risk Management and Climate Change Mitigation and Adaptation

195. Chile's geographic location and geological and hydro-meteorological characteristics make it substantially prone to costly natural hazards. Chile regularly experiences natural disasters of geological and hydro-meteorological origin. Since 1990, Chile reported a total of 67 natural disasters, affecting almost all parts of the country. Average annual GDP losses due to natural disasters accounted for 0.8 percent of Chile's GDP in the 1995–2014 period, a significantly higher share than its counterparts (Figure 4.6). This is explained by the 2010 Maule earthquake with estimated losses of US\$30 billion or around 14 percent of Chile's GDP. The earthquake affected 2.7 million people, almost 16 percent of Chile's population.⁹⁹

Figure 4.6. Disaster Losses, Selected Countries, % of GDP Average, 1995–2014



Sources: Calculations based on data of World Bank; EM-DAT (International Disaster Database), Centre for Research on the Epidemiology of Disasters, Université Catholique de Louvain, Brussels, <http://www.emdat.be/database>.

196. Significant exposure to natural hazards, combined with institutional strength, has allowed the government to develop world-class disaster risk management capacity. Chile ranks among the highest in Latin America and at a par with OECD members in the Overseas Development Institute's disaster risk management capacity score (Shephard et al. 2013). The country has strict building codes and rigorous evacuation plans, which helped save millions of lives and contain the structural damage during the earthquake in Chile in 2010. The earthquake in Haiti killed 11.0 percent of the people who were exposed to it, compared with 0.1 percent of lives lost in the Chile earthquake (del Bello 2013). The government is discussing reforms and improvements to the legal and institutional framework for disaster risk management, including the incorporation of disaster risk management into planning instruments.¹⁰⁰ Similarly, the government is designing a national policy on disaster risk management for 2019–30 with a special focus on the United Nations Sustainable Development Goals.

197. Chile is economically resilient to disasters. The disaster deficit index of the Inter-American Development Bank measures the economic loss that a particular country could suffer if a catastrophic event takes place and the implications in terms of the resources needed to address

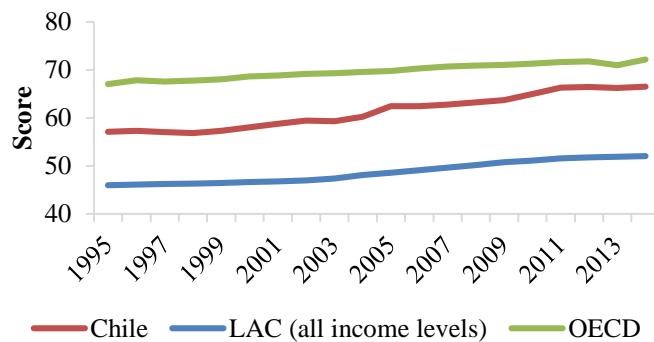
⁹⁹ See EM-DAT (International Disaster Database), Centre for Research on the Epidemiology of Disasters, Université Catholique de Louvain, Brussels, <http://www.emdat.be/database>.

¹⁰⁰ The National Emergency Office is currently developing a multisectoral indicator for each commune to identify gaps and opportunities to target resources and programs for disaster risk management tailored to each commune.

the effects of the disaster.¹⁰¹ The index captures the ratio between the demand for contingent resources to cover the losses caused by the maximum considered event and the public sector's economic resilience, that is, the availability of internal and external funds for restoring affected inventories. The 2012 index for Chile for a 500-year return period hazard was 0.83, showing that the country would have the economic resources needed to address losses from a strong natural hazard. Indeed, Chile did not request international financial support after the 2010 earthquake, but, instead, reallocated public resources to deal with the reconstruction process. Chile's economic resilience compares with the greater resilience in Mexico (with a 500-year return period hazard of 0.29) and the lesser resilience in Peru (with an index greater than 1 for every return period and, hence, insufficient economic resources to address losses from a strong natural hazard if needed).

198. Despite Chile's resilience to natural hazards, the government will need to cope with the adverse effects of climate change on the risk of disaster. Chile's characteristics place it among the countries that are at risk of being affected by changes in prevailing global climate patterns according to the United Nations Framework Convention on Climate Change criteria. In particular, this phenomenon might affect Chile by increasing the frequency and severity of natural disasters and extreme weather events. For instance, recent torrential rains and floods in the Atacama Desert and prolonged droughts in the usually lush southern parts of the country have been associated with anthropogenic climate change. Similarly, in late January 2017 the country faced its worst forest fires to date in the south-central regions of O'Higgins, Maule and Biobio, with over 100,000 acres of land destroyed and thousands of people evacuated from their homes.¹⁰² Harsher and more recurrent events increase the vulnerability of the poor to disasters, making it harder for them to break out of the poverty cycle. Nonetheless, the country is less vulnerable than its peers in the region as measured by the Notre Dame Global Adaptation Index (Figure 4.7). An important exception is its vulnerability of fresh water supplies to climate change in which Chile scored 0.359 compared with 0.386 and 0.389 in the OECD and Latin America and the Caribbean, respectively.

Figure 4.7. Readiness for and Vulnerability to Climate Change



Source: ND-GAIN Country Index (University of Notre Dame Global Adaptation Index) (database), University of Notre Dame, Notre Dame, IN, <http://index.gain.org/>, data release November 2015.

¹⁰¹ See Natural Disasters: Indicators (database), Inter-American Development Bank, Washington, DC, <http://www.iadb.org/en/topics/natural-disasters/disaster-risk-indicators,2696.html>.

¹⁰² According to the National Emergency Office, these fires were a result of lack of maintenance to the power supply, high temperatures and, approximately a third of these were intentional.

199. Climate change will affect water reservoirs, change temporal and spatial precipitations trends and accelerate the desertification process and lead to large economic losses. Chile has seen a rise in temperature in the Central Valley and particularly the Andes Mountains, where most of its water resources are stored. This could reduce summer water availability by switching precipitation from snow to rain in the mountain range. Additionally, glaciers are in retreat, which will have a significant impact on water supply, as glaciers act as strategic water reserves, supplying water to river basins in summer and replenishing rivers, lakes, and groundwater in arid regions during periods of drought. Global warming is also projected to raise the number of months with a hydrologic deficit in river basins as well as bring an increase in droughts (OECD 2013). In 2015, approximately 72 percent of the land area had been affected to some degree by different categories of drought (mild, moderate, severe) and affecting 90 percent of the population (CONAF 2015). According to the Meteorological Directorate, Chile has generated a precipitation deficit of close to 80 percent, especially in the summer months. In a report on the Chilean mega drought of 2010–15, the Center for Climate Research and Resiliency estimated that 25 percent of the rainfall deficit Chile experienced during this period was attributable to anthropogenic climate change (CR2 2015). Additionally, Chile's economic activity is more exposed to a strong El Niño phenomenon. A study by the United Nations Economic Commission for Latin America and the Caribbean found that, under a high-emissions scenario, climate change could have a cost ranging from US\$22 billion to US\$320 billion, whereas in a low-emission scenario, the values range from net benefits of US\$25 billion to a cost of US\$40 billion (OECD 2014). A study by Andersen and Verner (2010) found that climate change might decrease average income in Chile by almost 7 percent over the next 50 years (Box 4.1).

200. Chile has made notable progress in incorporating climate change adaptation and mitigation measures into its strategic long-term decision making. In 1994, Chile ratified the United Nations Framework Convention on Climate Change, subscribed to the Kyoto Protocol, and, in 2017, ratified the Paris Agreement. The climate action plan has been strengthened through the adoption of the 2017-2022 National Climate Change Action Plan. In 2010, climate change became one of the five thematic focuses of the Ministry of Environment. The Chilean government has carried out extensive sectorial studies on the impact of climate change and mitigation strategies, and has established institutional arrangements for intersectoral coordination in matters related to climate change –including the Council of Ministers for Sustainability and Climate Change and the Advisory Committee on Climate Change. In addition, under the intended nationally determined contribution, the government committed to reducing the country's emissions intensity by 30 percent between 2007 and 2030.

201. Chile's environmental sustainability challenges arise mainly from increasing pressures on Chile's natural capital, particularly to water resources management and air/water pollution, as well as the country's vulnerability to climate change. Moreover, each of these have important implications to enhance equity and productivity in the country. Table 4.1 summarizes Chile's environmental sustainability constraints.

Table 4.1. Chile's Equity and Productivity Determinants: Environmental Sustainability

<i>Performance</i>	<i>Evidence of substantial impact</i>	<i>Limited or unknown impact</i>
Lagging	Water stress Air pollution High electricity prices (+)	Environmental management (+) Biodiversity conservation
As expected	Access to electricity (+) Carbon emissions (+)	
Strong	Renewable energy expansion Disaster-risk management (+) Climate change adaptation and mitigation (+)	

Source: World Bank analysis.

Note: Positive equity impact (+); equity trade-off (−); government policy ineffective (~).

Box 4.1. The Distributive Impact of Climate Change in Chile

The effects of climate tend to have unequal distributional implications across regions and social strata. They are also situation-specific, making it hard to generalize its overall impact on poverty and inequality.

Nonetheless, the poor are likely to face more serious consequences of climate change and variability than the rich, implying that poverty and inequality might increase as a consequence of this phenomenon. Poor and vulnerable people often live in ecologically fragile land, which makes them vulnerable to natural hazards such as droughts, floods, and mudslides, as well as in farmland with limited water access. The rural poor are more likely to be employed on agriculture, an activity whose productivity is highly dependent on weather conditions. Additionally, they have the fewest resources to cope with climate-related productivity or health shocks, increasing their risk of falling into a poverty trap.

Andersen and Verner (2010) use municipal data to estimate the contemporary relationship between climate change and income in five Latin American countries (Bolivia, Brazil, Chile, Mexico, and Peru) and then to simulate the effects of future climate change on poverty and inequality. Their results on Chile show a negative association between temperature and income when controlling for education and urbanization rates, and for rainfall. In Chile, people in the cooler regions earn at least twice as much as people in the warmest regions. The use of this association in a simulation exercise for the next 50 years shows that, while the income distribution between municipalities will not be affected by climate change, poverty will increase because this phenomenon will cause average per capita incomes to fall by about 7 percent (all else being held constant). The negative effects are stronger in the north, which is expected to experience more warming, than in the south.

Municipality regressions indicate that the climate-income relationships differ by country, resulting in differential impacts of climate change on incomes, poverty, and inequality across countries. For instance, the coldest regions in Bolivia show 40 percent more consumption than the hottest regions, implying that the cold parts of Bolivia might gain from global warming, all else being equal.

The results of the simulations are summarized in table B4.1.1. As in Chile, the simulation results suggest that average income and poverty would be negatively affected by climate change in Brazil and Peru; the effect is larger than Chile's for the former (11.9 vs. 6.7) and lesser for the latter (2.3 vs. 6.7). Mexico and Peru would also see no effect on inequality. Contrary to Chile, the results for Bolivia show a positive effect in both poverty and inequality, while the effect on income in Mexico is neutral.

Table B4.1.1. Simulation of the Effects of Climate Change on Poverty and Inequality

Country	<i>Effect of future climate change on average incomes, % change</i>	<i>Effect on poverty</i>	<i>Effect on inequality</i>
Bolivia	2.9	Decrease	Decrease
Brazil	-11.9	Increase	Increase
Chile	-6.7	Increase	Neutral
Mexico	Neutral	Neutral	Neutral
Peru	-2.3	Increase	Neutral

Source: Andersen and Verner 2010.

The simulation results isolate the effect of climate change from all the other factors that also will affect people's incomes and hence should not be interpreted as forecasts; yet, they are indicative of the direction and magnitude of the effects that might be expected from climate change on poverty and inequality in Chile and the study countries.

Source: Andersen Verner 2010.

4.2. Social Sustainability

202. Seeking an adequate balance between promoting freedom of choice as well as protection of individuals, Chile has made different changes to its social contract. As mentioned in section 3.3, throughout its recent history, Chile has enacted structural reforms that have shifted the burden of risks to well-being between the state, employers and individuals. In the early 1970s, Chile oscillated sharply between different political visions of development from Allende's socialism to Pinochet's liberal market approach. With the return of Democracy in the 1990s, a more consensual approach was introduced with fewer extremes as subsequent center-right and center-left coalitions assumed office. Although many of the internationally better known reforms were conceived and implemented during the 1970s and 1980s, successive democratically elected governments have also been actively redesigning the policies and programs intended to help households manage risks to their human capital.

203. There is a new scope and tenor to these debates that contrasts sharply with the prior political consensus. The advent of the student protests since 2011 and the second Bachelet administration in 2014 marked a departure from the consensual process toward a more structural attempt to reformulate the social contract. The positions taken by stakeholders in the debates of pending and future policy reforms have drifted further apart, and appear more unrelenting. Policy discussion has become more polarized. This change on the policy debate may reflect a shift in societal aspirations as Chile's high-income status becomes more firmly established. For many Chileans it is no longer satisfactory to have escaped poverty and vulnerability and joined the middle class. Rather, a growing segment of society wants assurances that policies and programs will offer better quality social services, and that they will ensure remunerated work for greater prosperity and progress.

204. The middle class has expanded owing to rapid economic growth and, to some extent, well-targeted social protection policies. In the last 25 years, Chile saw its middle class become the largest group with around half of the population living on a per capita daily income of US\$10 to US\$50 in 2013, compared with one-third in 2000. This trend reflects not only the substantial decrease in poverty rates in recent decades, but also the drop in the size of the vulnerable population (those at risk of falling back into poverty, that is, those living on US\$4–US\$10 a day) from 42 percent of the population in 2000 to 38 percent in 2013. Measured by income, the expansion of the middle class began earlier in Chile than in the region; in Chile, it followed a similar trend in 2000–10 and has increased more quickly since 2011. The middle class in Latin America and the Caribbean expanded by 47 percent in 2005–14, although people who are vulnerable and risk falling back into poverty still represent the majority group in the region.¹⁰³

205. As the new majority group in an increasingly consolidated democracy, the middle class is now a key actor in defining the political agenda. Chile's middle class not only constitutes the majority of the electorate, but it also represents its median voter. The well-being and political views of the middle class are therefore critical in Chile's democratic system of decision-making. Furthermore, the middle class can support political programs and electoral platforms that promote inclusive growth because these are associated with more active

¹⁰³ Tabulations of Equity Lab, Team for Statistical Development, World Bank, Washington, DC, based on data in the SEDLAC database.

participation in the political process. The middle class tends to exhibit more moderate values relative to people at the extreme of the income and education distribution and, hence, can be a moderating political force and promote sociopolitical stability (López-Calva et al. 2012).

206. Chile's middle class has actively participated in the political debate even though this has not been channeled through formal political mechanisms. The lack of identification with political parties and the lack of interest in formal politics that have been expressed in opinion surveys, as well as low voter turnout, are evidence of an aversion for formal politics (UNDP 2015). Indeed, only 26 percent of Chileans identify themselves with a political party (UNDP 2015). Furthermore, the parliamentary and presidential elections in 2013 were marked by an abstention rate of 50 percent and 60 percent, respectively, with total votes decreasing after a switch from voluntary registration and compulsory voting to the automatic registration of all eligible Chileans and voluntary voting in 2012 (IDEA 2016). Nonetheless, there is evidence of civil involvement with public issues in informal ways; 92 percent of people sympathize with a public cause, 57 percent are interested in their country's current affairs, 51 percent participate in organizations, 48 percent support a cause public, and 28 percent have participated in protest actions. In this sense, civil society groups are playing an increasingly important role in Chile's public policy debate.

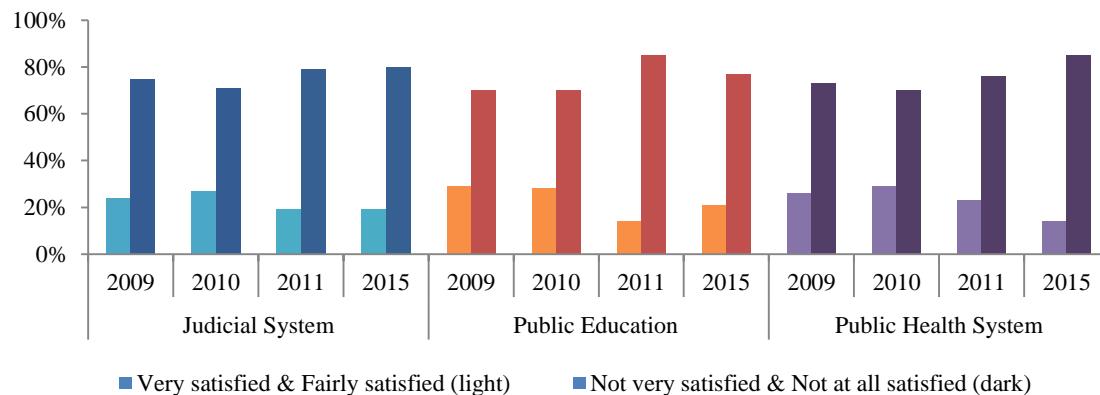
207. Social demands for better quality public services emerging from this sector of society are reshaping the debate on the public agenda for reforms, and have brought new social challenges. As their country's economic situation improves, Chileans are no longer satisfied with only having access to the same public services they had in the past. As demonstrated in the demands of student movements in 2011–13, students want higher quality at an affordable price. Moreover, although a rise in people's expectations about public services is a common phenomenon as countries develop, the expectations of the Latin American middle class also show idiosyncratic features, including a highly aspirational content. In Chile, around 85 percent of the population consider themselves part of the middle class, while only half correspond to this group by the US\$4-to-US\$10-a-day criterion.¹⁰⁴ Although Chile's aspirational gap is smaller than the Latin America and Caribbean average (the difference between the subjective and the objective middle class in the former is 39 percentage points compared with 33 percentage points in Chile), it represents a potential constraint because large differences between aspirations and realizations may lead to resentment and social unrest (Penfold and Trinkunas 2015).

208. Surveys suggest that dissatisfaction with public services is high and growing in Chile. Chileans are increasingly frustrated with public education and public health systems, as well as the judicial system (Figure 4.8). Satisfaction with public services is also low relative to other countries in the region. The Latin American Public Opinion Project ranked Chile's satisfaction with public services (including the quality of roads, public schools, and public health services) as one of the lowest in Latin America in 2012 (Figure 4.9).

¹⁰⁴ 2015 data of Latinobarómetro Database, Latinobarómetro Corporation, Santiago, Chile, <http://www.latinobarometro.org/latContents.jsp>.

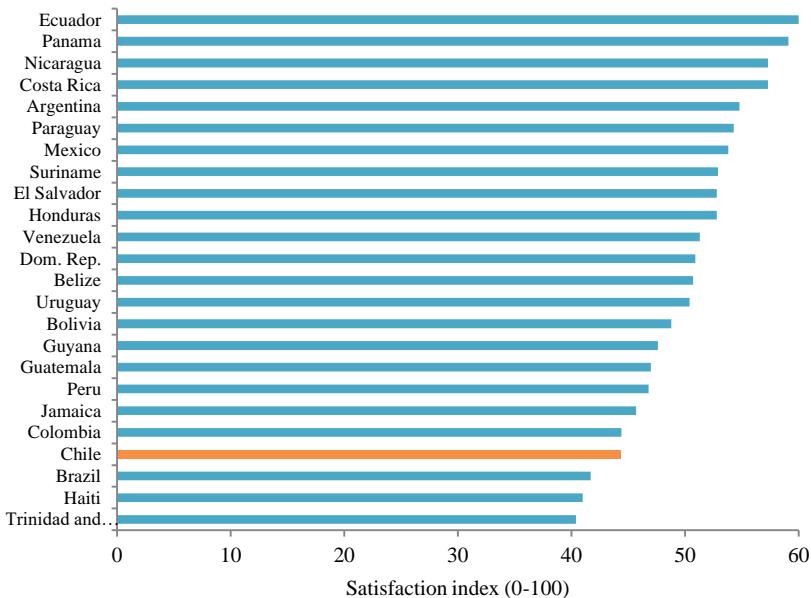
Figure 4.8. Satisfaction with Public Services, Chile, 2009–15

Would you say you are very satisfied, fairly satisfied, not very satisfied, or not at all satisfied with the way the following institution works...?



Source: Data of Latinobarómetro Database, Latinobarómetro Corporation, Santiago, Chile, <http://www.latinobarometro.org/latContents.jsp>.

Figure 4.9. Satisfaction with Public Services, Latin America and the Caribbean, 2012

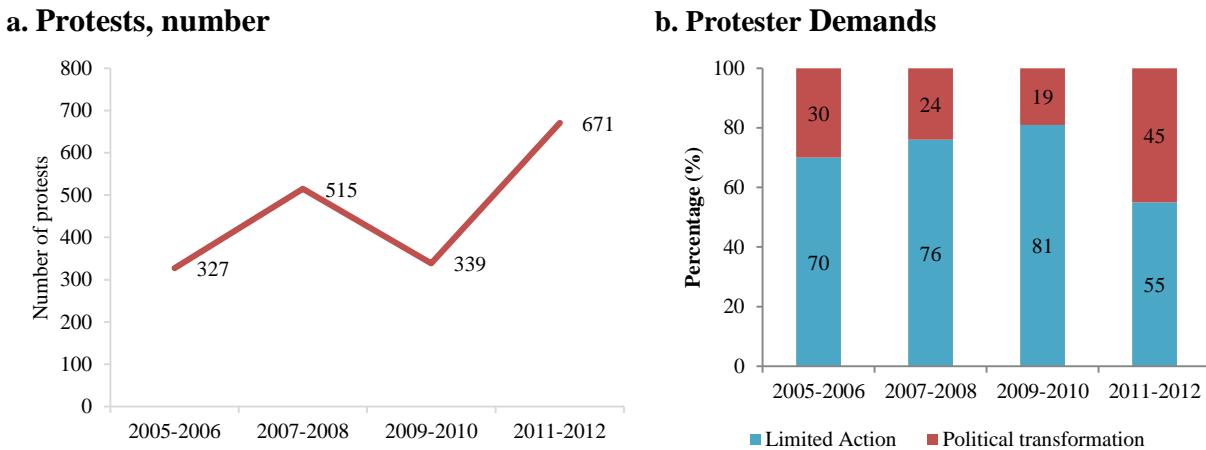


Source: Moseley and Layton 2013.

209. Protests and social movements have channeled the concerns and dissatisfaction of the middle class in Chile. The number of protests and social movements has increased since 2005 (Figure 4.10, panel a). There are also signs of a widespread plunge in the confidence in institutions that coincided with the start of the 2011 student protest movement (Figure 4.11). This occurred in the context of a generalized drop-off in the trust in institutions in Latin America, but the reaction was stronger in Chile. Between 2010 and 2015, confidence in the judiciary and in Congress declined in Chile by 38 percent and 44 percent, respectively. The focus of protests also changed from narrower issues to issues affecting broader swaths of the population. Thus, 45 percent of the protests in 2011–12 revolved around demands for political reform, while the corresponding share

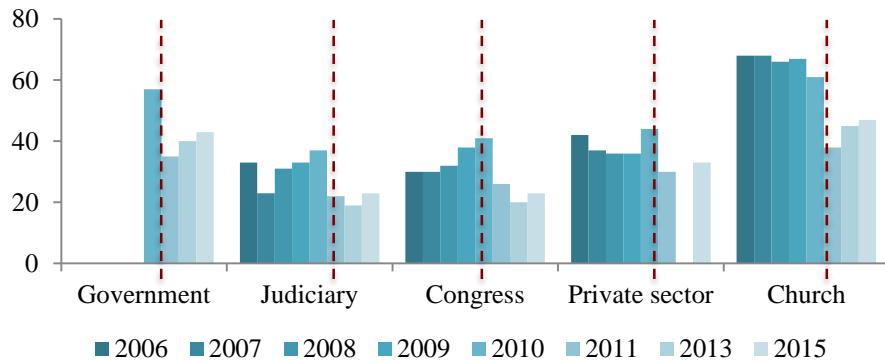
in 2009–10 was 19 percent (Figure 4.10, panel b). As a result of these protests the 2014 Bachelet administration marked a departure from the consensual politics toward a more structural attempt to reformulate the social contract (Box 4.2).

Figure 4.10. Protests and Associated Demands, Chile, 2005–12



Source: United Nations Development Programme, with data from the Observatory of Social Conflicts of Clacso for 2005–12.

Figure 4.11. Confidence in Institutions, Chile, 2006–15



Source: Data of Latinobarómetro Database, Latinobarómetro Corporation, Santiago, Chile, <http://www.latinobarometro.org/latContents.jsp>.

210. Education, health care, the precariousness of the labor market, and retirement have been increasingly identified by Chileans as the country's most pressing issues. In 2015, 14.0 percent of the population believed that education was the most pressing issue, while 11.0 percent thought it was health care (Figure 4.12). Similar shares were most concerned about insecurity (17.4 percent) and unemployment (11.2 percent). Chile's advanced demographic transition, combined with low social benefits, benefit coverage gaps, and significant inequalities in the pension system, is shifting more attention toward pensions (see chapter 3). Indeed, 81 percent of Chileans are demanding profound changes in the pension system (UNDP 2015). In August 2016, nationwide demonstrations were held in protest against the pension funds.

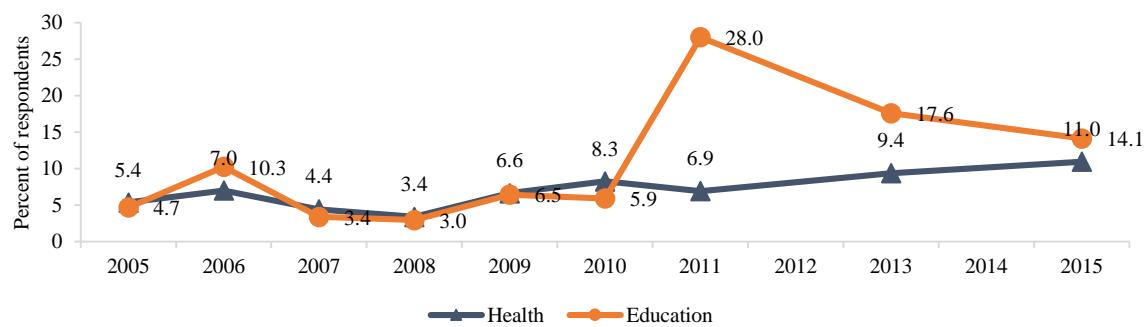
Box 4.2. Recent Reforms in Chile

Since assuming office in 2014, Chile's current administration has implemented a series of equity-enhancing reforms to meet social demands. As part of its efforts to address high levels of inequality, the government enacted a comprehensive fiscal reform expected to raise tax revenues by 3 percent of GDP to finance higher public spending on education. At the same time, the Bachelet administration enacted a comprehensive education reform aimed to guarantee equal opportunity to access quality and well-financed education at all levels. For primary and secondary education, the government has implemented the Inclusion Law that regulates the admission process of public schools, eliminates shared funding and prohibits profit in educational institutions that receive state contributions.

Similarly, current administration set up the Bravo Commission in 2014 to assess the Pension System deficiencies and develop proposals to improve it. The Bravo Commission ended up stuck in a protracted debate between widely diverging constituencies, some proposing radical changes to the system. The widely differing stances of stakeholders and members of the commission made finding a consensus reform proposal difficult. Though consensus on the reform has not been reached, there is increasing awareness of the severity of this issue especially given the relatively fast aging of the population.

Chile also underwent the first electoral reform since the Pinochet administration. The electoral reform changed the country's 25-year binomial system to a system with more proportional representation of the electorate. This reform established greater representation within the regions, set a maximum ratio between men and women candidates at between 60 and 40 percent, respectively, and reduced the barriers facing independent candidates.

Figure 4.12. Perceptions of the Most Pressing Issue in the Country, Chile, 2005–15

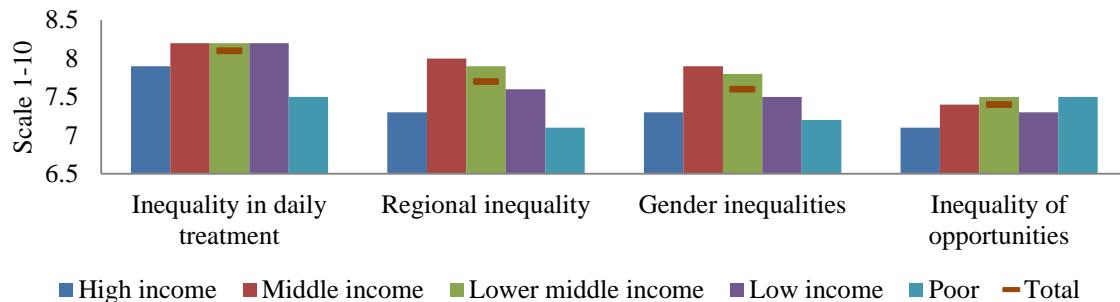


211. Source: Data of Latinobarómetro Database, Latinobarómetro Corporation, Santiago, Chile, <http://www.latinobarometro.org/latContents.jsp>.

212. **Closely linked to the boom in the expectations of the middle class as a source of social tensions is the wide and persistent inequality.** Rapid economic growth led to important gains in poverty reduction in Chile. Nonetheless, income inequality in Chile, measured by the Gini coefficient, remains the largest in the OECD and higher than comparable countries in the region such as Mexico and Peru. Chile's recent success might be undermined in the country by the public perception that citizenship rights are not guaranteed to everyone equally. Following Hirschman's tunnel effect (Hirschman and Rothschild 1973), the middle class in Chile would have had a relatively high initial tolerance of any inequality arising from the recent economic growth because the middle class expected to catch up in the near future. Yet, the middle class considered that this was not occurring quickly, discontent would start to emerge. Inequality is breeding unrest in Chile,

particularly among the middle class (Figure 4.13). Differences in treatment and the lack of recognition of the dignity of people are breeding the most resentment. Regional inequality, gender inequality, and inequality of opportunity are also causing discontent.

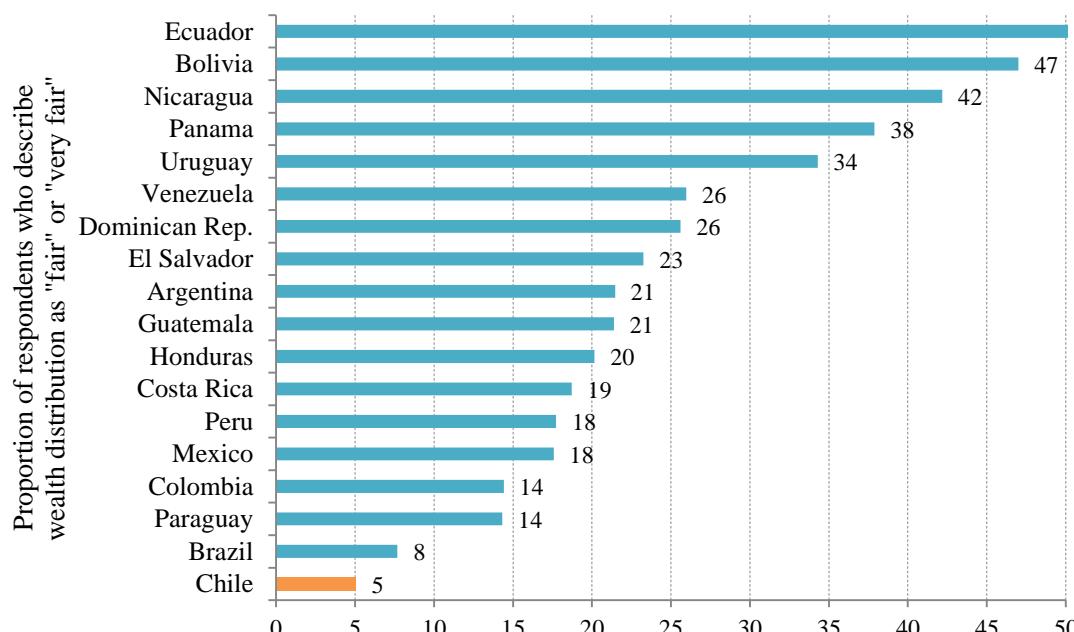
Figure 4.13. Discontent over Inequality, Chile, 2015
How much does each of these types of inequality trouble you? (scale from 1 to 10)



Source: 2015 data of Latinobarómetro Database, Latinobarómetro Corporation, Santiago, Chile, <http://www.latinobarometro.org/latContents.jsp>.

213. The incidence of poor perceptions of inequality is more frequent in Chile than in other countries in the region. In 2015, only 5 percent of Chileans considered income distribution to be “very fair” or “fair” (Figure 4.14). This is considerably lower than the shares in other countries in the region, such as Argentina (21 percent) and Uruguay (35 percent), while countries at comparable inequality (such as Colombia, Costa Rica, and Mexico) show corresponding shares that are three times higher.

Figure 4.14. Perceptions of Income Distribution as “Fair” or “Very Fair,” the Region, 2015

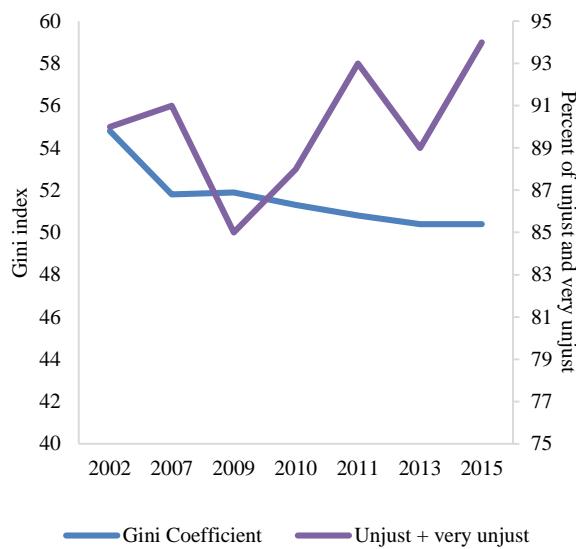


Source: 2015 data of Latinobarómetro Database, Latinobarómetro Corporation, Santiago, Chile, <http://www.latinobarometro.org/latContents.jsp>

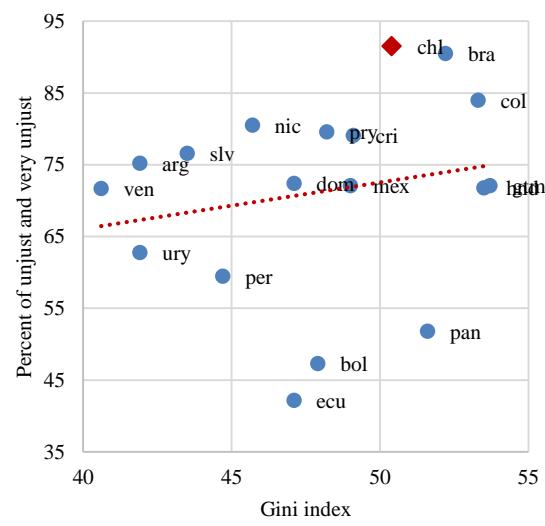
214. **Perceptions of inequality also show a strong correlation with trends in inequality measures in the beginning of the 2000s, though the trend diverges after 2009** (Figure 4.15, panel a). Chile is also an outlier in comparisons across several subjective and objective measures of inequality. In most Latin America and Caribbean countries, even those with higher Gini coefficients than Chile, smaller shares of the populations report that income distribution is the worst problem in their countries (Figure 4.15, panel b). These data may reflect evolving expectations and the growing demand for equality of opportunities in Chile as the country becomes wealthier and the population becomes more well educated and more aware of the differences in income and wealth within the Chilean society.

Figure 4.15. The Gini Index and Perceptions of Inequality, Chile and the Region

a. Chile, 2002–15



b. Latin America and the Caribbean, 2015

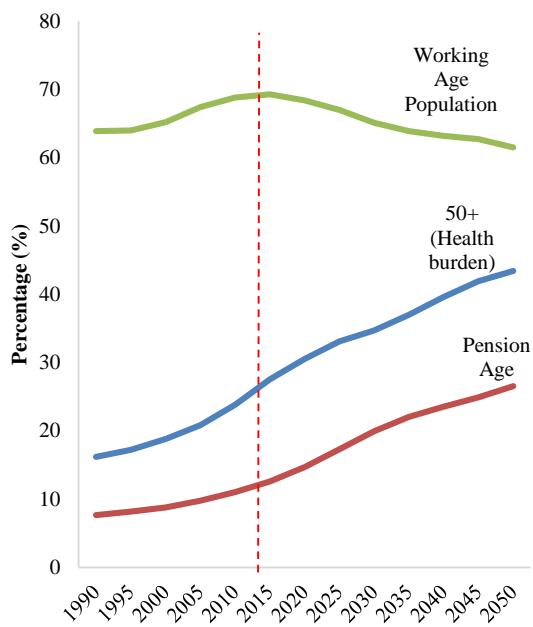


Sources: Data of World Bank; 2015 data of Latinobarómetro Database, Latinobarómetro Corporation, Santiago, Chile, <http://www.latinobarometro.org/latContents.jsp>.

Note: Perception of inequality refers to the share of the population that believes income distribution is “unjust” or “very unjust.”

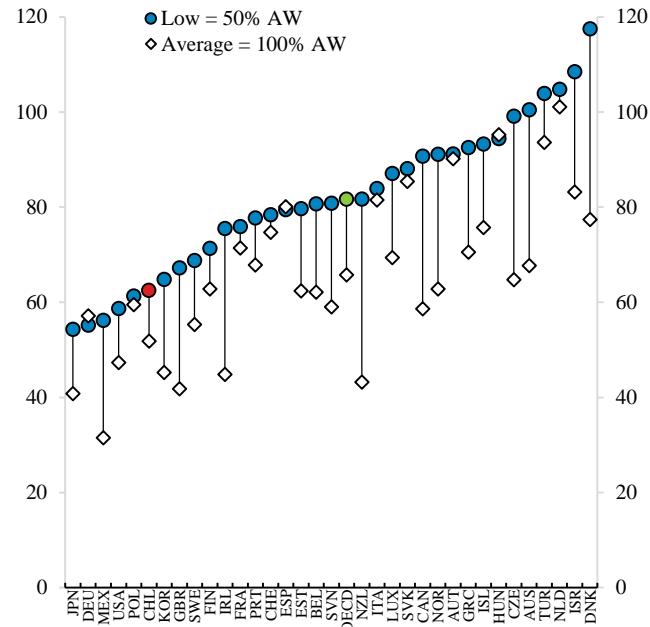
215. **The growing share of the population at pension age poses a unique social challenge in Chile in the context of relatively low replacement rates and the high expectations generated by increasing wealth.** The population of pension age will expand steadily over the next decade from 12.6 percent (2.2 million) in 2015 to 17.3 percent (3.2 million) in 2025 (Figure 4.16). At the same time, the pension benefit replacement rate among low earners is only between 50 percent and 60 percent of preretirement earnings, which is among the lowest rates in the OECD (Figure 4.17). This means individuals will face a significantly lower standard of living when they retire relative to the standard of living they enjoyed during their working lives. Moreover, survey results suggest that many low-income pensioners have unrealistically high expectations about the generosity of their future pensions because the average implied replacement rates range from 100 to 150 percent.

Figure 4.16. Demographic Projection, Selected Age-Groups, Chile



Source: World Population Prospects: The 2012 Revision (database), Population Division, Department of Economic and Social Affairs, United Nations, New York, <https://esa.un.org/unpd/wpp/Publications/>.

Figure 4.17. Projected Net Pension Replacement Rate, Selected Countries



Source: 2015 data of OECD.Stat (database), Organisation for Economic Co-operation and Development, Paris, <https://stats.oecd.org/>.

216. The government's challenges in social sustainability arise from the lack of consolidation among the middle class and the growing demands for social rights in the midst of an increasingly polarized policy dialogue. The middle-class perception that rights and opportunities are not guaranteed to everyone equally has created dissatisfaction and has been a cause of public upheaval and polarization political discourse. Nonetheless, the discontent of the middle class can also be seen as an opportunity for Chile to further strengthen institutions and public services. In this context, the active engagement of the middle class in policy decisions seems necessary for Chile to continue advancing in reducing poverty and inequality while further strengthening social rights and promoting environmental sustainability.

217. The growing polarization of policy debate presents a potential binding constraint and a challenge to achieving greater equity and productivity. The constraint is that as the ability of stakeholders and policy makers to find compromise solutions becomes scant, necessary policy changes, including labor regulation, pension system, health insurance, and safety net are stalled. The danger is that when one or other side in the debates sees an opportunity to reform, that changes are made in an ideologically driven rush and in the narrow interest of a particular constituency, rather than by following a more pragmatic and balanced approach. Table 4.2 summarizes Chile's social sustainability constraints to achieve greater equity and productivity.

Table 4.2. Equity and Productivity Determinants: Social Sustainability, Chile

Constraints	Outcomes
Increasing demands from a rising middle class	Dissatisfaction with public services; growing polarization
Advanced demographic transition	High cost of providing public services; shrinking productivity

Source: World Bank analysis.

4.3. Fiscal Sustainability¹⁰⁵

218. **Over the past two decades, the government's fiscal policy, which is anchored on a fiscal rule, has been successful in enhancing fiscal sustainability and reducing output volatility.** Given the large revenues the government derives from the copper sector, managing the volatility of copper prices remains a key fiscal challenge. In 2001, the government put a structural balance rule in place, based on the central government balance evaluated at potential output and the long-term copper price. Since 2002, both have been provided by a committee of experts. The adoption of a fiscal responsibility law in 2006 further institutionalized the fiscal rule and established the two main sovereign wealth funds: a pension reserve fund and an economic and social stabilization fund. Strong adherence to the fiscal rule strengthened fiscal sustainability in the context of large fluctuations of the actual fiscal balance and enabled the saving of a substantial part of revenue during the commodity price supercycle between 2005 and 2013. The rule contributed significantly to the reduction of macroeconomic volatility (Larrain and Parro 2008) and enabled Chile to implement one of the most counter-cyclical fiscal policies in Latin America and the Caribbean (OECD 2010). The rule also helped to reduce Chile's sovereign spreads (DIPRES 2005; Lefort 2006).

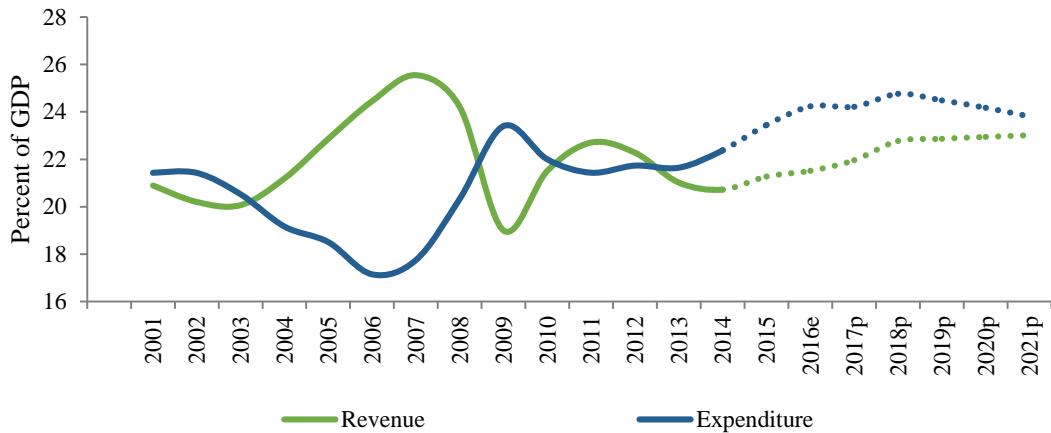
219. **The structural balance is expected to be reduced by 0.25 percent over the medium term to reach a target of 0.8 percent by 2020.** During the first years of the application of the structural fiscal balance rule in Chile, the target was a surplus of the cyclically adjusted balance of 1 percent of GDP. The current administration originally envisaged, in June 2014, a gradual convergence to a structural balance target of 0 percent of GDP by 2018. A sharper contraction of economic activity than initially foreseen raised the structural deficit in 2015 to 1.9 percent of GDP led the administration to adjust its target in September 2015, using comparable parameters, into a reduction of the structural deficit between 2016 and 2018 by about a quarter percentage point of GDP each year. The adjustment process could be supported through measures that improve the efficiency of public spending.

220. **Chile's net financial position has recently changed from being a net creditor to becoming a net debtor.** Chile used the resources from the fiscal surpluses attained between 2004 and 2012 to pay off public debt and accumulate resources in its sovereign wealth funds. The fiscal stimulus in 2009 was largely financed by drawing down wealth funds, whereas recent fiscal deficits have been financed by an increase in gross public debt, which gradually increased from 3.9 percent of GDP in 2007 to 17.5 percent in 2015. Meanwhile, the sum of sovereign wealth funds and other liquid financial assets of the treasury remained relatively stable at around 12 percent of

¹⁰⁵ This section draws on World Bank (2016).

GDP over the past few years (Figure 4.18). As a result, the net financial position of the central government changed from a position of net creditor achieved in 2006–11 to a position of net debtor since 2012.

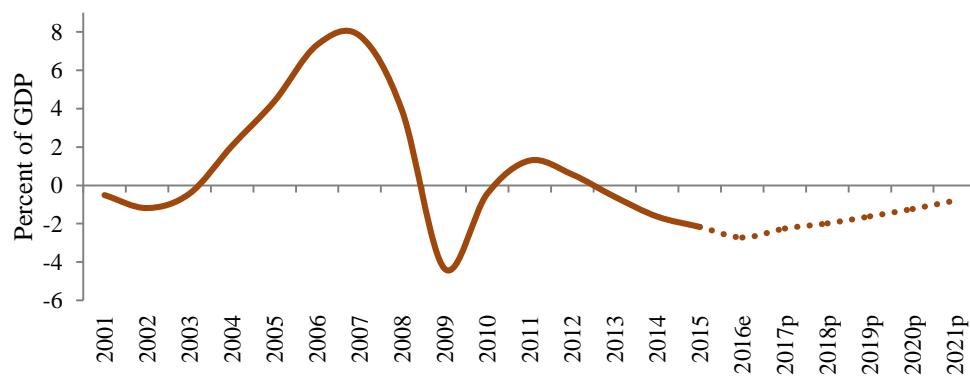
Figure 4.18. Central Government Revenue and Expenditure, 2001–21



Source: World Bank estimates; World Bank 2016.

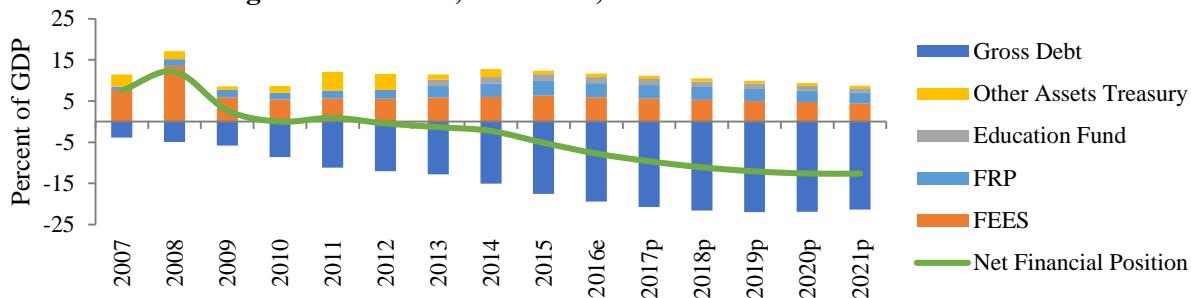
221. Medium-term fiscal projections show a steady increase of fiscal revenue, a gradual reduction of the fiscal deficit and sustainable public debt. According to World Bank staff projections, revenue is projected to grow to about 23 percent of GDP by 2021 allowing for an increase in public expenditure that would peak by 2018 at 24.8 percent of GDP. Afterward, additional spending consolidation would lead to a slight reduction in the spending-to-GDP ratio to 23.8 percent by 2021. The fiscal deficit is projected to peak in 2016 and gradually reduce to 0.8 percent of GDP by 2021 (Figure 4.19). The gradual reduction in the structural deficit target expected in the coming years would lead to a modest increase in the gross public debt-to-GDP ratio which climb to 28.3 percent of GDP by 2019 (Figure 4.20). A further reduction of the target in the cyclically adjusted balance to a zero deficit by 2021 would put the debt-to-GDP ratio again on a modest downward path. Debt sustainability is not a concern, particularly in the presence of significant resources in the sovereign wealth funds.

Figure 4.19 Fiscal Balance, 2001–21



Source: World Bank estimates; World Bank 2016.

Figure 4.20. Assets, Liabilities, and the Net Financial Position



Source: World Bank estimates; World Bank 2016.

Note: FEES = *Fondo de Estabilización Económica y Social* (economic and social stabilization fund). FRP = *Fondo de Reserva de Pensiones* (pension reserve fund).

222. The demographic transition in Chile will lead to fiscal pressures in the longer term because of rising demand. Chile is facing a rapid demographic transition. The country saw a sustained increase in the population over age 65, from 6 percent in 1990 to 11 percent in 2015, compared with 5 percent and 8 percent, respectively, in Latin America and the Caribbean during the same period. A rising share of the elderly increases demand for public services such as pensions, health, and long-term care. Per capita health care expenditures, for instance, are broadly U-shaped with respect to age-groups. Spending on the youngest and the elderly is significantly higher than spending on the rest. Indeed, elderly people tend to consume more health care because illnesses, chronic disease, and hospital visits become more frequent with old age. Similarly, demand for long-term care tends to rise steeply after people turn 65 years of age. Pension systems often come under strain as the share of the elderly expands. Indeed, the pension system is currently not delivering adequate benefits and is in need of reform. The budgetary implications of the country's demographic transition will ultimately depend on the degree of public and private financing and policy responses. The relatively high share of private financing reduces future fiscal pressures compared with systems with more entitlements and greater public financing of age-related public services.

223. A sustained reform commitment will be required to mitigate the economic and social impact of the demographic transition. Population aging will not only increase fiscal pressures, it will also affect consumption patterns, savings, investment, innovation and structural change. Policy reforms can induce behavioral changes that can mitigate possible negative growth effects of population aging. Well-designed investments in basic education, for example, could raise labor force participation, make it easier to retrain workers at a later stage of their life, foster innovation and contribute to a healthier population, mitigating the impact of the demographic transition.

224. Similarly, the growing demand for higher-quality services may lead to additional fiscal pressures. Chileans are increasingly disenchanted with the education, health care, and pensions systems. Some recent reforms are a direct response to these demands, particularly the provision of free services to large segments of the population, such as free public primary and secondary education, and the debate over free tertiary education. Although implementation has been gradual, these reforms have resulted in greater public spending on education. The expansion should be gradual to avoid damaging the country's fiscal position. The government thus needs to continue evaluating which demands can be met given the fiscal stance.

Chapter 5. Prioritization

225. This chapter builds on the previous chapters to address the constraints to achieving strong, equitable, and sustainable growth in Chile by identifying priority areas for the implementation of policies that are equity and productivity enhancing. To achieve this, the analysis and main conclusions drawn from previous chapters are complemented with a benchmarking exercise comparing Chile's performance with the performance of three groups of countries: all other countries in the world, the members of the OECD, and other countries in Latin America and the Caribbean. The exercise has helped identify policy priorities and related areas of intervention to tackle the constraints by enhancing equity and productivity, while avoiding equity-productivity trade-offs (Table 5.1). The projected size and time horizon of the expected impacts on productivity and equity, which determine the magnitude of the aggregate impact on welfare, are also taken into account. According to the corollary presented in chapter 1, establishing a political and technical consensus around the equity-productivity agenda is critical to placing the country on a trajectory of more inclusive growth. The requirements of carrying out such an effort are also analyzed in the chapter.

Table 5.1. The Equity-Productivity Nexus

Policy	Equity enhancing	Equity reducing
Productivity enhancing	Win-win	Trade-off I
Productivity reducing	Trade-off II	Bad policy

Corollary: Establishing a political and technical consensus around the equity-productivity agenda in Chile is critical to placing the country on a trajectory of more inclusive growth.

226. The benchmarking exercise that was carried out highlighted some of the shortfalls in the country's performance with respect to its peers. The indicators selected cover a wide range of topics, including growth and competitiveness, poverty, inclusion, and sustainability. Chile's performance on each indicator has been compared with that of the top performers within each comparison group. The magnitude of the difference between Chile and the best achievers is assessed using the normalized gap with the best performer on each indicator. A priority measure has been assigned to each indicator according to the criteria described in Table A.2. The higher the value of the priority measure, the more Chile underachieves with respect to the comparison group (see annex A).

227. Chile performs relatively well in comparison with other countries in Latin America and the Caribbean, but poorly in comparison with OECD members. Relative to Latin America and the Caribbean, Chile is among the best performers on around half the indicators, and, on three-quarters of them, the gap between Chile and the top performer is less than 50 percent. The situation is reversed in the comparisons with the OECD. Chile is among the worst performers on around 40 percent of the indicators, with a gap greater than 50 percent on two-thirds of the indicators. These results are consistent with Chile's level of development. Still, the benchmarking exercise reveals a number of indicators on which Chile ranks among the worst or best performers relative to both the OECD and Latin America and the Caribbean. Priority areas of particular importance are those in which Chile is not among the top performers in Latin America and the Caribbean. These have helped confirm the identification of the policy areas in which the government faces the largest

challenges to advancing toward the twin goals of the World Bank: to reduce poverty and to enhance shared prosperity.

228. Chile's low and declining productivity growth rate represents a formidable challenge to gains in sustainable growth and shared prosperity. Chile is one of few countries in the world to have achieved sustained growth over several decades. The end of the commodity supercycle has, however, led to a significant slowdown. The demographic transition is also likely to weigh on the growth outlook. Growth has been the key driver of sustained poverty reduction and of the rise of the middle class. Lagging quality in education and relatively low levels of innovation are constraining productivity growth and impeding the rebalancing of the economy toward a more-diversified technology- and knowledge-intensive economy. Barriers to entry and the regulatory protection of incumbents, particularly in key network sectors, are creating negative spillovers in other sectors; for instance, electricity supply shortages are affecting the mining sector.¹⁰⁶

229. Inequality of opportunity is among the key constraints to achieving a sustained enhancement in shared prosperity. Chile's Gini coefficient is the highest among OECD members. It also puts the country at a 59 percent gap with Latin America and the Caribbean's top performer. This result contrasts with Chile's achievements in poverty, where the country is among the top performers in Latin America and the Caribbean, and, although the country is still behind other OECD members in the headcount ratio, the gap with the priority level in the welfare growth of the bottom 40 is the second lowest in Chile. Chile performs poorly in the inequality of outcomes, and some inclusion indicators related to the equality of opportunity have also been assigned a high priority. These include out-of-pocket health expenditures (the higher level hints at less opportunity to live a healthy life) and labor force participation (lower levels mean more individuals are excluded from participating productively in society). Moreover, Chile's low PISA scores and enrollment rate in upper-secondary education, as well as labor market inequality and segmentation in the health system are also reflected in the analysis in chapter 3.

230. Moreover, making energy secure, reliable, and affordable has been discussed as another major challenge to environmental sustainability, and indicators of energy imports and access to electricity show Chile's weaknesses in these areas. Notwithstanding a rapid increase in renewable energy capacity,¹⁰⁷ Chile currently relies on energy imports for more than 60 percent of its demand, showing low levels of energy security. Moreover, energy imports are the third most important priority found by the benchmarking exercise. As a result, Chile faces some of the highest energy prices among the comparison countries both in Latin America and the Caribbean and in the OECD.¹⁰⁸ Nonetheless, the government is aware of these issues and has recently passed a series of reforms along with its Energy Policy 2050, with the vision of attaining a reliable, inclusive, competitive, and sustainable energy sector.

¹⁰⁶ Since TFP is the ratio of annual output on accumulated factors of production, it is also a measure of how efficient the use of inputs in production is.

¹⁰⁷ This indicator is assigned a priority level 2 in terms of distance to the best OECD performer (Norway), but priority level 4 if measured by the gap with the same country, suggesting that many opportunities for improvement remain.

¹⁰⁸ OECD and IEA (2012) Energy Prices and Taxes.

231. Poor water management has also been identified as a central issue and constraint for Chile to achieve the twin goals in a sustainable manner. Chile is lagging in water management and stands out as particularly troublesome among indicators of sustainability. The country is among the worst performers in the world in water productivity and annual freshwater withdrawals per capita. Although Chile has large internal water resources, the regional distribution of water is highly uneven, putting some regions in center and south Chile under significant water stress. In addition, water availability is being constrained by worsening water quality from industrial, mining, and agricultural pollution. Thus, taking preparatory action to address current and future water stress will be crucial to ensuring sustained growth of key economic sectors and ensuring access to the poor and vulnerable.

Auxiliary corollary: Chile's public services must more effectively meet the needs and expectations of the country's large and growing middle class.

232. Chile's main social sustainability challenge arises from consolidating an expanding middle with growing demands for public services in the midst of an aging society and an increasingly polarized policy dialogue. Although the middle class is currently the largest group in Chilean society, it is mainly concentrated on the lower end of the middle-class distribution. A key challenge will be how to continue increasing income levels and how to avoid a reversal of these gains (and a fall back into vulnerability and poverty). These, in a scenario of increasing expectations and demands of higher quality public services, on the one hand, and of limited public resources and an aging society that will increase pressure into public finance in the near future. The government faces the challenge of responding to the people's growing expectations from public services, particularly in terms of education, health care, and pensions. Nonetheless, increasing demands of Chile's middle class can also be seen as an opportunity in the form of demand for better governance, institutions and a re-balanced social contract.

5.1. Identifying priority areas that are both equity and productivity enhancing

233. Inclusive growth requires progress on both equity and productivity. Thus, the final step in the prioritization exercise takes the emerging issues from the previous section and identifies priority areas that are win-win. As discussed throughout this SCD, Chile's current administration has implemented a series of equity-enhancing reforms. Some of these, particularly reforms in education and energy, coincide with some of the issues identified in this chapter. The government is trying to boost productivity through its current productivity, growth and innovation agenda. Similarly, despite a lack of consensus, the government has tried to address problems arising in the pension and health systems. This last step therefore takes into account Chile's recent reforms and the impact each may have in the medium to long term. Priority areas are grouped as follows: (i) Improve the quality of public services; (ii) Enhance the conditions to boost productivity growth: innovation, diversification and energy; (iii) Enhance labor productivity and reduce labor market segmentation; and (iv) Strengthen management of environmental resources and climate change adaptation. In particular, the first priority areas address some of the constraints to social sustainability in Chile.

Improve the quality of public services

- **Improve the quality of education.** Despite Chile's progress in educational attainment and achievement, it still lags in quality. Chile usually performs last or second to last when compared with OECD countries in standardized tests such as PISA scores. High-quality education will be critical for Chile to move to a more knowledge based, technology intensive economy. Good basic education is also important in softening the impact of the demographic transition by making it easier to retrain workers during the course of longer working lives, increase labor force participation, and improve health outcomes. Evidence suggests improving human capital in Chile can have a strong productivity impact (Fuentes and Mies 2014; IMF 2015; OECD 2015). Similarly, several studies suggest that government spending on education does not necessarily come at the expense of productivity (Barro 1991; Benhabib and Spiegel 1994; Buysse 2002; Easterly and Rebelo 1993; Levine and Renelt 1992). Improving the quality of education is at the forefront of the government's agenda and has been widely recognized as a key priority for long-term economic growth and equity. Chile's 2014 education reform is aimed to guarantee equal opportunity to access quality and well-financed education at all levels. Moreover it has a focus on teacher professional and career development, as well as on technical and vocational education in particular on growth enhancing value added services. Through these reforms the government can provide those from the most disadvantaged backgrounds the tools necessary to be highly productive and thus earn higher wages. Thus, ensuring the correct implementation of these reforms will be crucial to ensure long-term gains for both equity and productivity. Chile should also focus more on improving the quality of vocational and technical education, as having a strong basis allows workers to better adapt to changing labor conditions and the use of new technologies. On-the-job training is another potential low-hanging fruit that could be explored: strengthen Chile's National Training and Employment Service and establish more secure links between tertiary education (both vocational and traditional) and labor markets.
- **Improve health care regulation and financing to ensure quality of health care provision and equitable access to affordable health insurance.** Chile's health financing remains inefficient and inequitable despite recent increases in public health spending. Private out-of-pocket health expenditure is the third highest among OECD countries, creating barriers in access to health care for low-income groups. Moreover, Chile's insurance market is poorly regulated with differentiating premiums, particularly for women and the elderly. Chile's health system would benefit from stronger regulation of its private insurance market, standardization of benefits and regulation of premiums. Similarly, Chile's health outcomes lag behind the OECD. It has low levels of utilization, as evidenced by low screening and survival rates for certain cancers; low rate of consultations and physicians per capita and long wait times for selected types of surgery. Overall significant efficiency gains can be achieved through improvements in the clinical effectiveness and efficiency in addition to the management of hospital care services.
- **Evaluate the adequacy of the pension system.** Chile's pension system leaves many without retirement security and carries excessive costs. The average Chilean employed in the formal sector spends four years in any given job, limiting their potential to contribute. Approximately 79 percent of pensions are lower than the minimum wage and 44 percent are below the poverty

line. Moreover, employer contributions are strictly voluntarily, making the decision to save for old-age entirely up to the individual. Different policies are needed to address these inequities, both for current pensioners with insufficient retirement funds and current workers that are not accumulating enough for their own retirement. If not addressed, Chile's pension system will likely lead to greater old-age poverty as old age is frequently accompanied by a loss of earnings and a reduction in income. Similarly, the elderly become increasingly vulnerable to sickness and disability which may result in burdensome health care costs. Though the pension system itself does not have a direct impact on productivity the outcomes are not socially optimal and could have indirect impacts on productivity as some may choose to leave the labor market to care for their elderly. In 2014, President Bachelet set up the Bravo Commission to assess its deficiencies and develop proposals to improve it. Though consensus on the reform has not been reached given widely differing stances of stakeholders and members of the commission, there is growing awareness of the severity of this issue especially given the relatively fast aging of the population.

Enhance the conditions to boost productivity growth: innovation, diversification and energy

- **Boost innovation.** If Chile is to achieve sustainable productivity growth, it must close the technology and innovation gap, increase spending on R&D, and boost entrepreneurship. Alvarez et al. (2012) find evidence that the marginal return to firm level R&D may be substantial, positively affecting employment, wages and productivity. The positive relationship between innovation and productivity has also been documented in Chile's services sector, especially the modern segment (information technology, telecommunication, and engineering) (Alvarez et al. 2016). Chile has developed a strong base of entrepreneurs and new business formation is accelerating in response to regulatory improvements and government programs, including measures to start a new business (2011, 2013), a bankruptcy law (2014), and, the Start-Up Chile program (2010) and related support, including SME credit access facilitation and increased expenditures in Corfo to support entrepreneurship. Nonetheless, program scale and take-up has not been large enough yet to have a substantial impact. Chile's spending in R&D has not increased substantially, with most of it concentrated in the publicly funded university sector. To further boost innovation, programs should be reviewed and designed such that they can be adequately evaluated to ensure they are cost-effective. In turn, resources should be targeted on programs that have the largest impact on productivity, while those that are found to be inefficient may be revised or closed. In addition, supporting entrepreneurs beyond their start-up phase and further encouraging firms to increase investments in R&D could mitigate these issues. Even though fiscal incentives for investments in R&D have been in place since 2008, with modifications in 2012, they are still not widely used.¹⁰⁹ To enhance incentives among larger firms, an incremental element could be added to reinforce incentives. Similarly, refundable credits for smaller firms could also complement this policy. Finally, coordination among Chile's innovation policy-making agencies, potentially through a new ministry of science and technology, could provide greater policy coherence.

¹⁰⁹ *Incentivo Tributario a la Inversión privada en Investigación y Desarrollo* (database), Chilean Economic Development Agency, Santiago, Chile, <http://www.corfo.cl/programas-y-concursos/programas/incentivo-tributario-a-la-inversion-privada-en-investigacion-y-desarrollo>.

- **Promote export diversification.** Trade diversification both geographically and in the product space by upgrading value chains, removing barriers to competition, and encapsulating processes in services is needed to move toward an economic model that is more knowledge and technology intensive. The goal of Chile's Productivity, Innovation, and Growth Agenda is precisely to move from an economy based on natural resources to a knowledge-based economy. This will require an improvement in the quality of human capital and the incidence of innovation (chapter 2). Chile could draw upon its comparative advantage in copper mining, but make further progress in moving up the mining value chain as well as entering the markets for mining services. Service exports need to be further boosted and transport sector can be further liberalized to strengthen competitiveness. A product map analysis could also help define potential new sources of diversification and exports. So could a value chain analysis, by mapping the position of Chile in the different value chains and identifying the next akin tasks where Chile could capture more value domestically, or gain efficiency by outsourcing and substitute upstream with downstream activities. In doing so, policies that are needed to reach this new innovation frontier could be defined. For example, an analysis of the wood products value chain would be interesting as Chile has developed higher value-added activities, but at the same time has still a limited paper production (as opposed to wood pulp) and over the last decade saw its exports of planed wood decrease when its exports of chips increased.
- **Continue strengthening, modernizing and improving the energy sector.** Recent changes on Chile's energy sector could further have important impacts in the economy, productivity and inclusion. Chile's important renewable energy expansion, paired with competitive auctions have led to substantial drops in electricity cost. Moreover, the connection between the General Interconnected System (SING) and the Central Interconnected System (SIC) via a single transmission line, will likely also bring down the costs of electricity. This will likely help the private sector and households alike as they would benefit from lower energy costs produced through less polluting sources. In particular, poor households would benefit from cheaper electricity. Even when virtually every household in Chile has access to electricity, some of the poorest still use more polluting yet cheaper sources of energy (such as wood to heat and cook, and kerosene to light up). The latter has important implications, associated with poorer health due to indoor air pollution, poorer educational attainments due to lack of adequate lighting, and labor force participation associated to the time spent collecting wood, just to mention a few.

Enhance labor productivity and reduce labor market segmentation

- **Increase female labor force participation.** Chile lags behind in terms of female labor market participation with adverse consequences for inclusive growth. In Chile, participation of women is held back by educational outcome, lack of access to affordable child care, cultural barriers, unutilized provisions for paternity leave, rigid working hour regulation, and limited active labor market policies. A low female participation hurts economic growth through several channels. First, by holding back overall labor supply thereby directly affecting the level of real output. Second, by reducing productivity owing to resulting mismatches between worker skills and occupations (Hsieh et al. 2013). Through the low participation of women in entrepreneurial activities because of the fall in the average talent of entrepreneurs, the implied income loss associated with the country's gender gap in the workforce is estimated at 20 percent (Cuberes

and Teignier 2015).¹¹⁰ Even though the government has introduced financial incentives to help participation at the margin, its effect on employment has been low.¹¹¹ Similarly, take-up has been low in a program providing free access to childcare for the poorest 60 percent due to incompatible opening hours with working hours and lack of knowledge about the program. Thus, a more flexible approach to working hours, which are strict in Chile, may also help, for instance by promoting teleworking. Similarly, improving public transportation and locating child care centers closer to employment centers may provide the necessary incentives at the intensive margin for younger women to actively look for employment and for parents to send their children to higher quality yet more distant schools. Bordon (2007) estimates that doubling the day care supply in Chile would increase female labor force participation by 5.7 percentage points, a significant effect given the country's low levels of female labor force participation.

- **Enhance education-labor market linkages.** Skill mismatch is associated with lower labor productivity. Thus, if skills are to translate into growth, these must be efficiently allocated and be used effectively across the economy (Adalet McGowan and Andres, 2015). The degree of qualification mismatch is higher in Chile than in many OECD countries (OECD 2015), in fact approximately a third of Chilean workers that have completed tertiary education have jobs that require less skills than their academic preparation (Bravo 2016). High level of skill mismatch may be a result of low quality tertiary education or Chileans leaving the education system without the skills employers want and need to boost productivity. A concerted effort by employers and education providers is required to become actively engaged in designing and providing educational programs that are in line with the country's labor-market needs. Strengthening the link between industry and university research could also boost innovation in Chile through greater investments in R&D. This should also include technical and vocational education, which provides an alternative way to prepare students for the labor market. As an initial step, the government has created a network of public technical training centers to focus tertiary education on growth enhancing value added services in each region.
- **Evaluate the adequacy of the labor market structure and regulation.** Economies often face trade-offs between promoting labor market flexibility and increasing labor market rigidity. On the one hand, labor market flexibility allows the private sector to adapt more rapidly to changing conditions (an important asset for a small open economy) and thus enhance productivity gains, whereas labor market rigidity could become a drag on productivity growth. On the other hand, however, labor market flexibility transfers some of the risk from the employer to the employee, leaving some workers more vulnerable to shocks. In addition, current Chilean legislation provides strong protection for employees with indefinite contracts, whereas workers in nonstandard contracts have little or no security, implying a *de facto* segmented market. While labor market flexibility is important for firms to adjust to shocks, a large use of temporary contracts can not only increase inequality but also affect productivity as employers are less likely to invest in temporary worker skill development and increase worker turnaround. Even though the win-win policy mix filter is not clear to address these

¹¹⁰ Comparative income loss estimates for the OECD and Latin America and the Caribbean are 15 and 17 percent, respectively.

¹¹¹ This includes an in-work benefit (benefiting 180,000 women in 2012) of up to US\$67/month as part of the cash transfer program as well as a 50 percent subsidy to the employer.

issues, labor market segmentation is one of the country's key binding constraints to achieve more inclusive growth.

Strengthen management of environmental resources and climate change adaptation

- **Strengthen water management.** Private ownership and free tradability of water rights has not been enough to prevent the overexploitation of water resources in Chile. Thus, there is a need to strengthen the capacity of government authorities in water resource management. In the Chilean model, the rights to use water are not concessions on the public domain, but rather private property rights. Yet, water itself belongs to the public domain. The need to strike the right balance between the roles of the state and the private sector in the administration of water resources is at the core of water resources management issues in Chile. The role, power, and means of the Water Authority need to be strengthened at national and basin level to ensure water sustainability and economic development. Taking preparatory action to address current and future water stress will be crucial to ensure water resources sustainability and reduce vulnerability. Chile's sustainable progress toward the eradication of poverty and inequality calls for revision of the institutional framework in this area to ensure equitable access to water resources.
- **Further strengthen and incorporate climate change adaptation and mitigation measures.** Despite Chile's resilience to natural hazards, the country will need to cope with the adverse effects of climate change on disaster risk. Chile's characteristics place it among the countries that are at risk of being affected by changes in prevailing global climate patterns. The 2017 forest fires were partly a result of poor preparation for climate change though such an event was unprecedented in Chile. Harsher and more recurrent events increase the vulnerability of the poor to disasters, making it harder for them to break out of the poverty cycle.
- **Improve conservation efforts in protected areas and biodiversity.** Economic growth has put pressure on Chile's natural capital resulting in deforestation and biodiversity loss. Although important advances have been made to strengthen the National System of Protected Areas, challenges remain. In particular, there is no biodiversity and protected areas service within the Ministry of Environment. Despite the government's awareness of this institutional fragmentation, relevant draft legislation has been discussed since 2014, but never passed. Furthermore, at present, the government does not have a public policy to promote private protected areas even though around 80 percent of its continental territory is privately owned.

234. Table 5.2 summarizes the strategy and policy priorities.

5.2. Knowledge and Analytical Gaps

235. This SCD also underlines knowledge gaps and areas for further research in Chile. The most salient topics for further research include the following:

- **Chile lacks an updated census.** The 2012 census failed to survey over 9 percent of the population. It surveyed nearly 15.8 million people, while the National Statistics Institute projected the population at 17.4 million in 2012. Moreover, methodological errors were found,

including deficiencies in the design and instructions of the questionnaire. The census was therefore declared not useful for population estimates or public policy by several auditing commissions, forcing policy analysts to work with 2002 data. To mitigate this knowledge gap a shorter census with 21 questions was conducted on April 19, 2017 throughout the country.

- **Similarly, on measurements of the indigenous population in the national census, the target population and the survey methods have changed significantly over the years, and census estimates of the percentage of the indigenous population vary widely.** The indigenous chapter of the census questionnaire is generally based on self-identification with legally recognized, predefined communities. Nonetheless, changes throughout the years have resulted in large differences in indigenous population estimates, from 10.3 percent in 1992, to 4.6 percent in 2002, and back up to 11.1 percent in 2012. In 1992, the questionnaire only asked about the ethnicity of people over 14 years of age, while, since 2002, ethnicity is addressed among the whole population. The way of posing questions has also changed from a multiple choice question on participation in three ethnic groups in 1992 to eight groups in 2002. For 2012, a two-stage question strategy was adopted, which asks for general identification to any ethnic groups before asking about one of the nine predefined groups to which the person may belong, adding the option “other” with an open response possibility to specify which ethnicity.
- **Chile’s economic growth and political stability have positioned it as an emerging country of destination for immigrants.** Over the past three decades, the country has seen an increase in its foreign-born population. The most recent census in 2002 estimates that immigrants represent 1.2 percent of the population. By 2014, the Department of Immigration and Migration estimated the foreign-born population at 2.3 percent. Despite the lack of updated data on Chile’s immigrant population, the 2017 census will provide more up-to-date information on this group. Nonetheless, Chile has few formally established migration policies and limited data on immigrants to evaluate the impact of immigrants on the economy, especially the potential effects on the cost of labor.¹¹²

¹¹² Analysis on the impacts of immigration on the economy represents a broader lack of analysis and information in the literature and public domain

Table 5.2. Prioritization

Priority	Expected impacts	Time-horizon	Equity-productivity trade-offs
<i>Improve the quality of public services</i>			
Improve the quality of human capital	Support long-term economic growth and equity; Provide those from the most disadvantaged backgrounds the tools necessary to be highly productive and thus earn higher wages; Improving human capital can have a strong productivity impact.	Long term	Government spending on education does not necessarily come at the expense of productivity. The 2014 education reform is based on a sound fiscal rule to ensure its adequate implementation.
Evaluate the adequacy of the pension system	Greater retirement security for all workers; indirect impact on productivity	Short and long term	
Improve health financing to ensure equitable access to affordable health insurance and improve efficiency in health outcomes	Equitable access to affordable health care; indirect impact on productivity	Short and medium term	
<i>Enhance the conditions to boost productivity growth: innovation, diversification and energy</i>			
Further boost innovation	Increase spending in R&D and further cultivate entrepreneurship. Improve links between research centers/universities and specific industries to improve financing of research and potential product innovation	Medium and long term	A transition to a knowledge based economy could potentially increase inequality unless the quality of education improves and becomes more accessible
Promote export diversification	Move from an economy based on natural resources to a knowledge-based one to boost productivity.	Medium and long term	
Continue strengthening, modernizing and improving the energy sector	Lower electricity costs; access to clean energy sources for vulnerable populations.	Medium and long term	
<i>Enhance labor productivity and reduce labor market segmentation</i>			
Increase female labor participation	Increase the labor supply thereby directly affecting the level of real output; Boost in productivity through better match between worker skills and occupations (Hsieh et al. 2013). Improve incomes, especially among poorer women	Medium and long term	
Enhance education-labor market linkages	Links between industry and university research could also boost innovation in Chile through greater investments in R&D; greater labor productivity	Short and medium term	
Evaluate the adequacy of the labor market structure and regulation	Reduce excessive use of temporary contracts to boost productivity and workers skill development; Greater incentives for fixed-term contract workers to contribute to the pension system;	Short and medium term	Strengthening labor unions might be productivity reducing
<i>Strengthen management of environmental resources and climate change adaptation</i>			
Strengthen water management	Chile's water stress could harm its comparative advantage in key sectors (such as mining) and reduce longer-term economic potential; ensure water sustainability to further boost economic development	Medium and long term	
Further strengthen and incorporate climate change adaptation and mitigation measures	Greater resilience to climate change, reduction in vulnerability to natural disasters.	Medium and long term	
Improve conservation efforts in protected areas and biodiversity	Greater conservation of protected areas and biodiversity.	Medium and long term	

Source: World Bank analysis.

Note: Expected impacts: assesses the potential impact on the twin goals of reducing poverty and promoting shared prosperity; Time-horizon assess the possible timeframe under which the impact can be expected to be realized.

Annexes

Annex A. Constraints and Benchmarking Priorities

Table A.1. Number of Comparison Countries, by Indicator for Prioritization

Indicator	Number of countries		
	OECD	LAC	World
Agricultural land (% land area)	28	35	195
Agricultural land per agricultural worker (hectares per agricultural worker)	26	32	166
Agriculture value added per worker (constant 2005 US\$)	26	32	167
Agricultural machinery, tractors per 100 square kilometer of arable land	25	24	137
Average PISA score, mathematics, 2012	28	8	61
Average PISA score, reading, 2012	28	8	61
Gross enrolment ratio, preprimary, both sexes (%)	28	30	165
Gross enrolment ratio, upper secondary, both sexes (%)	28	31	163
Gross enrolment ratio, tertiary, both sexes (%)	27	24	153
Energy imports, net (% of energy use)	28	22	135
Electricity production from renewable sources (kilowatt hours)	28	22	135
Environmental health cost	28	34	189
CO2 emissions (kilograms per 2011 PPP US\$ of GDP)	28	32	183
Droughts, floods, extreme temperatures (% of population, average 1990–2009)	27	27	168
Percent change in forest area 2005–10	28	35	189
Population exposed to ambient PM2.5 (% of total)	28	34	190
Commercial bank branches (per 100,000 adults)	28	32	179
Account at a formal financial institution, income, bottom 40 (% ages 15+)	25	21	146
Domestic credit to private sector (% of GDP)	25	21	144
Adults with an account at a formal fin. inst. to total adults (%)	25	21	147
Small firms with line of credit to total small firms (%)	7	16	95
Adults borrowing from a formal financial institutions in the past year to total adults (%)	25	21	147
Bank concentration of the largest 3 banks (%)	27	26	154
Stock market capitalization to GDP (%)	28	19	107
Firms with line of credit to total firms (all firms) (%)	7	16	95
Voice and Accountability (WGI)	28	34	190
Rule of law (WGI)	28	34	190
Regulatory Quality (WGI)	28	34	189
Political Stability and Absence of Violence/Terrorism (WGI)	28	34	190
Government effectiveness (WGI)	28	34	189
Control of corruption (WGI)	28	34	189
Life expectancy at birth, total (years)	28	32	188
Mortality rate, under-5 (per 1,000 live births)	28	33	190
Out-of-pocket health expenditure (% of total expenditure on health)	28	33	186
Adolescent fertility rate (births per 1,000 women ages 15–19)	28	32	186
Prevalence of anemia among children (% of children under 5)	28	32	184
Cause of death, by communicable disease (% of death by any kind of disease)	28	27	172
Tax revenue (% of GDP)	27	28	150
Gross domestic savings (% of GDP)	28	34	182
GDP per capita growth (annual %)	28	34	190
Inflation, consumer prices (annual %)	28	31	179
Time to prepare and pay taxes (hours)	28	33	187
Gross fixed capital formation (% of GDP)	28	33	180
Headcount ratio used	21	18	118
Poverty headcount ratio at US\$2.00 a day (PPP) (% of population)	21	20	118

Gini coefficient, PovcalNet, external sources	28	26	159
Growth, bottom 40 2007–12	7	17	72
Relative growth, bottom 40	7	17	71
Unemployment, total (% of total labor force) (modeled ILO estimate)	28	28	173
Labor share of national income	25	17	97

Table A.1 (continued)

<i>Indicator</i>	<i>Number of countries</i>		
	<i>OECD</i>	<i>LAC</i>	<i>World</i>
Average wage growth (2009–13)	28	17	110
Social security coverage (% of employment), averaged 2005–10	25	21	126
Beneficiary incidence in poorest quintile (%), all social protection and labor	3	15	45
Coverage (%), all social protection and labor	3	15	45
Access to electricity, urban (% of population)	28	35	194
Access to electricity, rural (% of population)	28	35	194
Access to nonsolid fuel, rural (% of households)	27	30	175
Access to nonsolid fuel, urban (% of households)	27	30	175
Improved sanitation facilities, rural (% of rural population with access)	27	35	188
Improved sanitation facilities, urban (% of urban population with access)	27	35	189
Improved water source, rural (% of rural population with access)	27	35	189
Improved water source, urban (% of urban population with access)	28	35	191
Amount of municipal solid waste collected (% of total MSW generated)	26	30	122
Total factor productivity	22	17	74
7.07 Reliance on professional management, 1–7 (2014–15)	28	24	143
Concentration of export markets (HH of export value by destiny of exports)	28	29	154
Innovation index (GCI)	28	24	141
Cost to export (per container)	28	31	166
	28	33	181
Mobile cellular subscriptions (per 100 people)	28	34	190
Road sector energy consumption per capita (kilograms of oil equivalent)	28	22	135
2.04 Quality of port infrastructure, 1-7 (2014–15)	28	24	143
Road density (kilometers of road per 100 square kilometers of land area)	26	16	109
Internet users (per 100 people)	28	34	191
Annual freshwater withdrawals, total (% of internal resources)	28	35	195
Annual billion cubic meters of freshwater withdrawals per capita	28	32	179
Water productivity, total (constant 2005 US\$ GDP per cubic meter of total fresh)	28	29	171
Share of population living in basins of high water stress, 2010	28	35	194
Waste water treatment	28	27	172
Electricity production from renewable sources, excluding hydroelectric (% of total)	28	22	135
Labor force participation rate, total (% of total population ages 15+) (modeled)	28	30	180
Average of math and reading PISA score (2009–13)	28	35	195
Agricultural raw materials exports (% of merchandise exports)	28	33	172
Urban poverty headcount ratio at national poverty lines (% of urban population)	3	17	78
Ratio share of top 10/ share of bottom 10, decile	27	20	127
Rural poverty gap at national poverty lines (%)	0	8	55
Share of youth not in education, employment, or training, total (% of youth population)	28	19	106
Energy intensity, level of primary energy (megajoule/US\$ 2011 PPP GDP)	28	33	181
Change in area of forest as percentage of land, 2000–13	28	33	187

Note: GCI = GCI (Global Competitiveness Index) (database), World Economic Forum, Geneva, <http://reports.weforum.org/global-competitiveness-index/>. LAC = Latin America and the Caribbean region. For PovcalNet, see PovcalNet (online analysis tool), World Bank, Washington, DC, <http://iresearch.worldbank.org/PovcalNet/>. WGI = WGI (Worldwide Governance Indicators) (database), World Bank, Washington, DC, <http://info.worldbank.org/governance/wgi/index.aspx#home>.

Box A.1. Defining a Metric for Benchmarking

Borrowing from Colombia's SCD (World Bank 2015), a metric is introduced to assess Chile's performance with respect to other countries in the reference groups. In particular, Chile is positioned with respect to other countries in the world, other OECD member states, and other countries in the Latin American and Caribbean region. Each indicator is measured by the average value in 2009–13 to reduce the outlier effect of atypical years, that is, years in which any given country may have had results that deviate from the norm, which could result in misleading rankings among countries.

As a preliminary step in the definition of the measures and because the 90 indicators are expressed in different metrics, all indicators have been rescaled so that a higher value corresponds to greater achievement. For instance, while, in the case of school enrollment rates, higher levels of the indicator correspond to better performance, it is the opposite in the case, for instance, of the under-5 mortality rate or the poverty rate, where higher values correspond to worse performance.

The normalized gap with respect to the best performer, $g_i^s_{(bp,ch)}$, is defined as the difference between the value of the indicators of the most well performing country and Chile's value as a share of the difference between the values of the best and worst performer on the same indicator:^a

$$g_i^s_{(bp,ch)} = 100 \frac{v_{i,bp}^s - v_{i,ch}^s}{v_{i,bp}^s - v_{i,wp}^s}, \quad (\text{BA.1.1})$$

where $v_{i,bp}^s$ is the value of the best performer in the comparison set s in indicator i , identified as the country around the 95th percentile in the world and the country with the lowest value in the 10th decile in Latin America and the Caribbean and the OECD; $v_{i,ch}^s$ is the value of Chile in indicator i ; and $v_{i,wp}^s$ is the value of the worst performer, which is defined around the 5th percentile for the world and the country with the highest value in the 1st decile for Latin America and the Caribbean and the OECD in the comparison set in indicator i .

The normalized gap is a relative measure in the sense that there is no assessment of the best possible value for each indicator (for example, the ideal lowest value on the inequality indicator or the ideal growth rate among the bottom 40). Instead, it is the best achiever in the comparison group that defines the threshold. Other possible distances may be defined using an absolute approach if a universal best for each indicator is defined.

a. Although results in the text refer to one metric, the normalized gap, another metric has been used as a robustness check, the quantile distance to the best performer, $q_i^s_{(bp,ch)}$, defined as the difference in any given indicator I between the top quantile (bp) and the quantile where Chile belongs (ch) in the set $s=\{p, w\}$:

$$q_i^s_{(bp,ch)} = q_{i,bp}^s - q_{i,ch}^s + 1, \quad (\text{BA.1.2})$$

where $q_{i,bp}^s$ is the quantile of the best performer—the 100th percentile for the world (w) and the 10th decile for Latin America and the Caribbean and the OECD (p)—in the comparison set s (that is, the world, the region, or the OECD) in indicator i , and $q_{i,ch}^s$ is the quantile where Chile belongs with respect to indicator i . Given the small number of countries that constitute p (OECD and Latin America and Caribbean peers), quantiles are defined at the decile level. Thus, possible values for Chile range from 1, where it is within the best performer group, to 10, where it would be among the worst performers in the group. On the other hand, in the case of w , quantiles were defined

as percentiles. Thus, 1 means Chile is among the best performers, and 95 indicates it is within the worst performers in the world. As in the Colombia SCD, to ensure consistency with the definition of the frontier and isolate the effect of the outliers in the value of the range, the distance is defined between the 5th and the 95th percentile.

Table A.2. Priority Criteria

<i>Priority</i>	<i>Normalized gap with the top performer, %</i>
1 (lowest)	Less than 20
2	20–50
3	50–80
4 (highest)	80 or more

Table A.3. Rankings and Prioritization: Gap to Best Performer



Prioritization Chile SCD: Gap to Best Performers

Rank	Indicator name, (unit of measure)	WORLD	OECD	LAC
1	Annual freshwater withdrawals per capita, (billion cubic meters per 1000 inhabitants)	■	■	■
2	Water productivity, (Constant 2005 US\$ by cubic meter of freshwater withdrawal)	■	■	■
3	Energy imports, net, (% of total energy use)	■	■	■
4	Road density , (Km of road per 100 sq. km of land area)	■	■	■
5	Gini coefficient , (Index from 0 to 100)	■	■	■
6	Agricultural raw materials exports (% of merchandise exports)	■	■	■
7	Alternative and nuclear energy , (% of total energy use)	■	■	■
8	Adults borrowing from a formal fin. inst. in the past year to total adults, (% of 15 years old or above)	■	■	■
9	Exports and imports of goods and services, (% of GDP)	■	■	■
10	Share of population living in basins of high water stress, 2010, (% of total population)	■	■	■
11	Energy intensity level of primary energy (MJ/\$2011 PPP GDP)	■	■	■
12	Agriculture value added per worker, (In constant 2005 U.S. dollars.)	■	■	■
13	Time to prepare and pay taxes , (Number of hours.)	■	■	■
14	Agricultural land, (% of total land area)	■	■	■
15	Beneficiary incidence in poorest quintile -all SP&L programs, (% of beneficiary population)	■	■	■
16	Access to non-solid fuel, rural , (% of rural population)	■	■	■
17	Commercial bank branches , (Number of bank branches per 100,000 adults)	■	■	■
18	Account at a formal financial institution, income, bottom 40%, (% of 15 years old or above)	■	■	■
19	Adults with an account at a formal financial institutions to total adults , (% of 15 years old or above)	■	■	■
20	Agricultural land per agricultural worker, (Hectares per agricultural worker)	■	■	■
21	Agricultural machinery, (Tractors per 100 sq. km of arable land)	■	■	■
22	Ratio wealth share of top 10/ wealth share of bottom 10, decile	■	■	■
23	Out-of-pocket health expenditure , (Percentage of total expenditure on health)	■	■	■
24	Adolescent fertility rate , (Births per 1,000 women ages 15-19)	■	■	■
25	Labor force participation rate, total (% of total population ages 15+) (modeled ILO estimate)	■	■	■
26	Average score math PISA 2012, (Score of PISA test)	■	■	■
27	Average score reading PISA 2012, (Score of PISA test)	■	■	■
28	Social security coverage (2010), (% of employed population)	■	■	■
29	Total factor productivity, (annual output / accumulated factors of production..)	■	■	■
30	Road sector energy consumption per capita, (Kg of oil equivalent per inhabitant)	■	■	■
31	Change in area of forest as percentage of land 2000-2013	■	■	■
32	Gross enrollment rate, upper secondary -UP-, (% of the total population of official UP education age)	■	■	■
33	Labor income share, (% of national income)	■	■	■
34	Acess to improved water source, rural , (% of rural population)	■	■	■
35	Domestic credit to private sector , (% of GDP)	■	■	■
36	Tax revenue, (% of GDP)	■	■	■
37	Electricity production from renewable sources, excluding hydroelectric (% of total)	■	■	■
38	Access to electricity, urban , (% of population)	■	■	■
39	Welfare growth of the bottom 40 of the population, (Annualized growth rate, circa 2007-12)	■	■	■
40	Innovation, (Index from 1 to 7, higher is better)	■	■	■

Table A.3. (continued)



Prioritization Chile SCD: Gap to Best Performers

Rank	Indicator name, (unit of measure)	WORLD	OECD	LAC
41	Electricity production from renewable sources , (Kwh per capita)	■	■	■
42	Access to improved sanitation facilities, rural, (% of rural population)	■	■	■
43	CO2 emissions per \$ of GDP, (kg per 2011 PPP \$ of GDP)	■	■	■
44	Population exposed to ambient PM2.5 , (% of total population)	■	■	■
45	Political Stability and Absence of Violence/Terrorism, (Index from -2.5 to 2.5, higher is better)	■	■	■
46	Unemployment, total , (% of total labor force)	■	■	■
47	Access to electricity, rural, (% of population)	■	■	■
48	Access to improved water source, urban , (% of urban population)	■	■	■
49	Internet users , (Per 100 inhabitants)	■	■	■
50	Gross fixed capital formation, (% of GDP)	■	■	■
51	Welfare growth bottom 40 respect to the mean income , (times of growth of mean income)	■	■	■
52	Population affected by droughts-floods-extreme temp., (average % of population affected 1990-2009)	■	■	■
53	Cause of death, by non injuries, (% of total deaths excluding deaths by injury)	■	■	■
54	Headcount ratio 4USD (PPP), (% of total population)	■	■	■
55	Poverty headcount ratio at \$2 a day (PPP) , (% of total population)	■	■	■
56	Reliance on professional management, (Index from 1 to 7, higher is better)	■	■	■
57	Quality of port infrastructure, (Index from 1 to 7, where higher is better)	■	■	■
58	"Average of math and reading PISA score (2009-13)"	■	■	■
59	Urban poverty headcount ratio at national poverty lines (% of urban population)	■	■	■
60	Inflation, consumer prices, (Annual % growth rate of price index)	■	■	■
61	Mobile cellular subscriptions, (Per 100 inhabitants)	■	■	■
62	Waste water treatment, (% of total water)	■	■	■
63	Change in forest area 2005-2010, (Annual % change of the remaining forest area each year)	■	■	■
64	Access to non-solid fuel, urban , (% of urban population)	■	■	■
65	Amount of Municipal Solid Waste (MSW) collected, (% of total MSW generated)	■	■	■
66	Market Concentration Index, (Hirschman-Herfindahl index of exports value destination)	■	■	■
67	Mortality rate, under-5 , (Probability per 1,000 live births)	■	■	■
68	Cost to export, (\$US per container)	■	■	■
69	Share of youth not in education, employment, or training, total (% of youth population)	■	■	■
70	Prevalence of anemia among children , (% of children under 5)	■	■	■
71	Gross domestic savings , (% of GDP)	■	■	■
72	Access to improved sanitation facilities, urban, (% of urban population)	■	■	■
73	Annual freshwater withdrawals, total, (% of total internal water resources)	■	■	■
74	Gross enrollment ratio-tertiary, (% of the total population of the five-year age after official secondary fi..)	■	■	■
75	Voice and Accountability, (Index from -2.5 to 2.5, higher is better)	■	■	■
76	Rule of law, (Index from -2.5 to 2.5, higher is better)	■	■	■
77	Goverment Effectiveness, (Index from -2.5 to 2.5, higher is better)	■	■	■
78	Control of corruption, (Index from -2.5 to 2.5, higher is better)	■	■	■
79	Life expectancy at birth, total , (Number of years a newborn infant would live)	■	■	■
80	Environmental health costs, (% of GNI)	■	■	■
81	Regulatory Quality, (Index from -2.5 to 2.5, higher is better)	■	■	■
82	GDP per capita growth, (Annual % growth rate of GDP per capita)	■	■	■
83	Employees monthly earnings growth, (Annual growth rate)	■	■	■
84	Coverage - all social protection and labor, (% of total population)	■	■	■
85	Gross enrollment ratio pre-primary -PP-, (% of the population of official PP education age)	■	■	■
86	Stock market capitalization ..	■	■	■
87	Small firms with line of credit to total small firms, (% of total small firms)	■	■	■
88	Firms with line of credit , (% of total firms)	■	■	■

Table A.4 lists the constraints facing Chile that have been identified in this report and the priority areas associated with each constraint that have been identified through the benchmarking exercise.

Table A.4. Constraints and Benchmarking Priorities

<i>Constraints identified through the analysis</i>	<i>Priority areas identified through benchmarking</i>
Poor quality of human capital	Average PISA score, mathematics, 2012 Average PISA score, reading, 2012 Average of PISA scores, mathematics and reading, 2009–13 Gross enrollment ratio, upper-secondary education
Low female labor force participation	Labor force participation rate, total
Low level of innovation	Agriculture value added per worker Agricultural land per agricultural worker Agricultural machinery Total factor productivity Innovation Domestic credit to the private sector
Low export diversification	Agricultural raw material exports
Inadequate Infrastructure	Road density
Rents in key sectors (particularly, transport)	Road sector energy consumption per capita
Complexity and rigidity of regulations	Domestic credit to the private sector
High levels of social exclusion of particular groups in the population (indigenous peoples, women, youth)	Gini coefficient Tax revenue (% GDP) Welfare growth among the bottom 40 Adolescent fertility rate Account at a formal financial institution, bottom 40 Ratio of the wealth share, top 10 to bottom 10
Gap between rich and poor in quality of education	Average PISA score, mathematics, 2012 Average PISA score, reading, 2012 Average of PISA scores, mathematics and reading, 2009–13
Gap between rich and poor with respect to school enrollment	Gross enrollment ratio, upper-secondary education
Labor market inequality and segmentation	Labor force participation rate, total Labor income share
Sizable gender wage differences	
Imbalance in the risk burden on individuals (as opposed to the state or employers)	Tax revenue (% GDP)
Segmented health system	Out-of-pocket health expenditure Adolescent fertility rate Access to improved sanitation facilities, rural Access to improved water source, rural
Pension system does not fulfill its function of supporting individuals to be independent	Beneficiary incidence in poorest quintile – all SP&L programs Social security coverage
Inefficient use of water resources	Annual freshwater withdrawals per capita Water productivity Share of population living in basins of high water stress Access to improved water source, rural
Low levels of energy security	Energy imports Access to nonsolid fuel Access to electricity
High levels of pollution	Electricity production from renewable sources Access to improved sanitation facilities, rural CO_2 emissions per US\$ of GDP
Deforestation, biodiversity loss, erosion, and desertification	Agricultural land
High exposure to natural hazards	Population affected by droughts, floods, extreme temperatures (% of population, 1990–2009 average)
Unmet needs of a growing middle class	Average PISA score, mathematics, 2012 Average PISA score, reading, 2012 Average of PISA scores, mathematics and reading, 2009–13 Out-of-pocket health expenditures

Annex B. Methodology: Identifying Productivity Constraints

The framework of Syverson (2011) classifies productivity determinants into two broad categories. The first involves factors that operate directly on individual producers, that is, the levers that management or others might be able to use to affect productivity, including: managerial practice or talent, general labor quality, capital quality, information technology capital, R&D, innovation, and learning-by-doing. The second category involves elements of the external environment that can shape productivity levels, including incentives encouraging producers to pull some of the levers. These external factors are productivity spillovers, domestic and international competition, regulatory structure, and input market flexibility.

Information about the size of the productivity determinant gap in Chile is combined with estimates on the effects of closing the gap to help identify the most pressing constraints.¹¹³ The most obvious candidates as binding constraints are areas in which Chile's performance is lagging and where the impact of closing the gap is substantial. Conversely, a strong performance in a less important dimension would lead to exclusion from the set of binding constraints. Intermediate cases, which are the most prevalent ones, are harder to classify, and additional judgment and discretion are needed in this instance. Impact estimates for Chile are available in less than half the cases. If these are unavailable, insights must be drawn from the literature on potential impacts.

The method has advantages and drawbacks. The Syverson framework helps focus the analysis on variables known to be productivity determinants across countries. Benchmarking offers a common, simple, intuitive, and consistent method for establishing *how* Chile is performing on each productivity determinant. However, it does not explain *why* Chile is performing poorly on each determinant. Benchmarking can also be misleading in some cases unless one controls for other factors. For instance, R&D intensity (a productivity determinant) can differ by country because of differences in economic structure (Maloney and Rodrigues-Clare 2007). The approach is also limited by the available data on impacts. Despite potential shortcomings, the analysis yields important insights into Chile's productivity challenges (Table B.1).

Table B.1. Benchmarking Selected Productivity Variables

Variable	Gap	Data source
Productivity dispersion	Expected	Busso et al. (2012)
Firm turnover (entry/exit)	Strong	
Entrepreneurship	Strong	GCI, WDI
Productivity dispersion by firm size	Expected	Syverson
Management practices	Expected	WMS
Quality of human capital		
training	Expected	GCI
quality of education	Expected	PISA
female labor force participation	Lagging	
Quality of physical capital		
internet use	Expected	WDI
Information technology capital imports	Expected	WDI
Technological readiness	Expected	GCI
Innovation		
R&D spending, total	Lagging	OECD

¹¹³ The size of the gap is the difference between Chile's level of the productivity determinant compared with a benchmark (say, the OECD average). The impact of closing the gap depends partly on the size of the gap and partly on the size of the partial derivative (changes in productivity relative to changes in the determinant).

Company R&D	Lagging	OECD
R&D researchers	Lagging	OECD
Patent applications	Expected	OECD
Innovation incidence	Expected	OECD
Innovation policy framework	Expected	OECD
Learning-by-doing (technology adoption)	Expected	Eden and Nguyen (2015)
Productivity spillovers		
Firm cooperation	Lagging	OECD
Competition		
Competition policy	Expected	OECD
Domestic Competition	Expected	GCI
Intensity of local competition	Expected	GCI
Extent of market dominance	Lagging	GCI
Average price-cost margins	Expected	Galetovic 2007, Benavente et al 2009
Trade to GDP	Lagging	World Bank (2015b)
Trade policy (goods) – tariffs	Strong	World Bank (2015b)
Export diversification	Lagging	Center for International Development, Harvard
Export concentration	Lagging	Center for International Development, Harvard
Economic complexity	Lagging	Center for International Development, Harvard
Trade liberalization index	Strong	Prati et al (2013)
Trade of services to GDP	Lagging	World Bank (2016)
Trade of services restrictiveness	Expected	Services trade restrictiveness index
FDI-to-GDP	Strong	World Bank
Regulatory structure		
Product market regulation	Expected	OECD
Input market flexibility		
Labor market regulation	Lagging	GCI
Redundancy costs	Lagging	Doing Business indicators
Rigidity of hiring/firing	Lagging	GCI (perception)
Dismissal permanent worker	Strong	OECD
Dismissal temporary	Lagging	OECD
Dismissal individual	Lagging	OECD
Credit-to-GDP	Strong	World Bank
Stock market capitalization	Strong?	World Bank
Financial market development	Strong	GCI
Credit constraint for firms	Strong	World Bank (2015b)
Domestic credit liberalization	Strong	Prati et al (2013)
Capital account liberalization	Strong	Prati et al (2013)
Road	Lagging	International Monetary Fund (IMF 2015)
Electricity	Expected	International Monetary Fund (IMF 2015)
Telecommunications	Expected	International Monetary Fund (IMF 2015)
Logistics performance index	Expected	World Bank (2016)
Doing Business, Trading across Borders	Expected	Doing Business indicators

Source: World Bank.

Note: Doing Business Indicators = Doing Business (database), International Finance Corporation and World Bank, Washington, DC, <http://www.doingbusiness.org/data>. GCI = GCI (Global Competitiveness Index) (database), World Economic Forum, Geneva, <http://reports.weforum.org/global-competitiveness-index/>. For product market regulation, see Indicators of Product Market Regulation (database), Organisation for Economic Co-operation and Development, Paris, <http://www.oecd.org/eco/growth/indicatorsofproductmarketregulationhomepage.htm>. WDI = WDI (World Development Indicators) (database), World Bank, Washington, DC, <http://data.worldbank.org/products/wdi>.

Annex C. Profile of the Poor, 2015

Table C.1. Characteristics: Household, Household Head, and Labor Force

<i>Indicator</i>	<i>All</i>	<i>Nonpoor</i>	<i>Poor</i>
<i>Household</i>			
Daily income pc (nominal Chilean pesos)	11,745	12,803	2,638
Monthly income pc (nominal Chilean pesos)	357,295	389,473	80,248
Household size	3.1	3.1	3.5
Age of household head	52.8	53.4	48.1
Male headed households (%)	60.5	61.7	51.0
Education of head (years)	10.4	10.6	8.6
Urban residence (%)	87.0	88.4	74.7
Proportion age 0–15 (%)	15.1	13.7	26.3
Proportion age 15–25 (%)	15.4	15.0	19.4
Proportion age 25–65 (%)	52.2	53.1	45.1
Proportion age 65+ (%)	17.3	18.2	9.2
<i>Labor force</i>			
Female participation (25–65) (%)	52.9	55.1	34.9
Male participation (25–65) (%)	76.2	78.0	59.8
Employer (%)	2.4	2.5	1.3
Employee (%)	72.5	74.2	50.2
Self-employed (%)	17.2	16.4	26.6
Unemployed (%)	7.6	6.5	21.2
Unpaid Worker (%)	0.4	0.3	0.7
<i>Other labor characteristics</i>			
Private big (%)	39.6	37.9	59.6
Private employee (%)	87.5	86.9	95.3
Private small (%)	60.4	62.1	40.4
Public employee (%)	12.5	13.1	4.7

Source: Calculations based on CASEN data, 2015.

Table C.2. Poverty Rates, by Age and Gender of Household Head, 2006–15

Year	Age-groups				Gender of household head	
	< 15	15–25	25–65	65+	Female	Male
2006	39.0	28.9	25.5	23.2	28.8	25.5
2009	35.3	26.6	22.3	15.7	26.1	21.6
2011	33.7	22.7	19.1	12.8	23.1	17.6
2013	22.6	15.1	12.2	7.8	15.4	11.2
2015	18.3	13.2	9.8	5.9	12.9	8.8

Source: Calculations based on CASEN data, 2006–15.

Annex D. Bottom 40 Pay Gap Regressions

Table D.1. Pay Gap Regressions, Bottom 40

	All		Agriculture		Manufacturing		Construction		Wholesale and retail trade	
	(1)	(2)	(1)	(2)	(7)	(8)	(11)	(12)	(13)	(14)
Bottom 40*2013	0.166*** (0.0185)	0.148*** (0.0166)	0.349*** (0.0586)	0.300*** (0.0546)	0.212*** (0.0475)	0.181*** (0.0425)	0.216*** (0.0668)	0.187*** (0.0559)	0.299*** (0.0451)	0.317*** (0.0427)
Bottom 40	-1.106*** (0.0144)	-0.842*** (0.0136)	-1.192*** (0.0448)	-1.039*** (0.0420)	-1.066*** (0.0345)	-0.867*** (0.0313)	-1.088*** (0.0547)	-0.874*** (0.0473)	-1.025*** (0.0353)	-0.920*** (0.0342)
2013	0.696*** (0.0171)	0.570*** (0.0152)	0.554*** (0.0570)	0.458*** (0.0531)	0.572*** (0.0447)	0.475*** (0.0402)	0.599*** (0.0634)	0.481*** (0.0521)	0.502*** (0.0417)	0.428*** (0.0394)
Male	0.240*** (0.00684)		0.170*** (0.0181)		0.242*** (0.0182)		0.191*** (0.0364)		0.169*** (0.0167)	
Years of education	0.0621*** (0.00105)		0.0481*** (0.00255)		0.0523*** (0.00266)		0.0525*** (0.00283)		0.0392*** (0.00269)	
Age	0.0380*** (0.00145)		0.0249*** (0.00286)		0.0409*** (0.00337)		0.0431*** (0.00458)		0.0414*** (0.00329)	
Age squared	-0.000346*** (1.77e-05)		-0.000215*** (3.48e-05)		-0.000366*** (4.15e-05)		-0.000400*** (5.54e-05)		-0.000396*** (4.00e-05)	
Urban setting	0.00552 (0.00751)		0.00838 (0.0153)		-0.0837*** (0.0189)		-0.115*** (0.0247)		-0.0302 (0.0261)	
Regional indicators	□		□		□		□		□	
Constant	7.365*** (0.0133)	5.583*** (0.0353)	7.171*** (0.0436)	6.025*** (0.0798)	7.388*** (0.0325)	5.718*** (0.0835)	7.499*** (0.0524)	5.810*** (0.118)	7.320*** (0.0328)	5.906*** (0.0830)
Observations	115,659	114,414	17,820	17,660	13,635	13,522	10,034	9,959	20,144	19,979
R-squared	0.411	0.491	0.360	0.410	0.419	0.492	0.415	0.484	0.310	0.360

Source: Tabulations of Equity Lab, Team for Statistical Development, World Bank, Washington, DC, based on data in the SEDLAC database.

Note: The dependent variable is the log of real wage per hour. Column (1) shows wage growth of the bottom 40 between 1990 and 2013 relative to the top 60 during the same period (interaction coefficient B40*2013). Column (2) shows the previous regression but controls for gender, years of schooling, age, age-squared, urban setting, and region. All subsequent columns include the previous regressions by type of sector.

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

Annex E. Consultations

Table E.1. Consultations by the Study Team, March 28–April 1, 2016

Individual	Entity
Solange Berstein	Inter-American Development Bank
Andrea Butelmann	Universidad Alberto Hurtado
José Fernández	Universidad Andrés Bello
Alejandro Micco	Ministry of Finance
Gerardo Uña	Ministry of Finance
Paula Benavides	Ministry of Finance
Claudio Soto	Ministry of Finance
Juan Carlos Feres	Fundación para la Superación de la Pobreza
Fabio Bertraneu	Organización Internacional del Trabajo
Claudio Sapelli	Pontificia Universidad Católica de Chile
Michel Jorrat	Former director, Internal Revenue Service
Javier Bustos	Ministry of Energy
Salvador Valdés	Centro Latinoamericano de Políticas Económicas y Sociales, Pontificia Universidad Católica de Chile
Mauricio Tejada	Universidad Alberto Hurtado
José Pablo Gómez, Andrés Roeschmann, Alejandra Vega, Jessica Chamorro	DIPRES
Rossana Costa	Central Bank
Dante Contreras	COES, Universidad de Chile
Vittorio Corbo	Former president, Central Bank
Andrea Repetto	Universidad Adolfo Ibañez
Osvaldo Larrañaga	United Nations Development Programme
Andras Uthoff	Member of the Bravo Commission
Andrés Zahler	
David Bravo	Pontificia Universidad Católica de Chile, former Head of the Pension Advisory Committee
Esteban Rojas	
Alfie Ulloa	Comisión para la Productividad
Francisco Meneses	Ministry of Education
Veronica Silva	Social Protection Specialist, World Bank

Table E.1 (continued)

Andrea Repetto	Universidad Adolfo Ibáñez
Francisco Jeria, Vivian Heyl, Carolina Méndez	Ministry of Education
Heidi Berner, Isabel Millán, Luis Díaz	Ministry of Social Development
Andras Uthoff	
Andrés Zahler	Member of the Pension Advisory Committee; Bravo Commission
Cristian Herrera	Ministry of Health
Claudio Soto, Cristian Salas	Ministry of Finance
Ricardo Bitrán	Bitrán & Asociados
Victor Orellana, Natalia Silva	Ministry of the Interior and Public Security, ONEMI
Eduardo Engel	Espacio Público
Javier Bustos, Iryna Sikora	Ministry of Energy
Luis Larraín, Francisco Klapp, Paulina Henoch, Alejandra Candia	Libertad y Desarrollo
Daniel Titelman, Jurgen Weller	CEPAL
Dante Contreras	COES, Universidad de Chile
Rossana Costa	Central Bank
Joseph Ramos, Rafael Vergamos, José Luis Contreras y Francisco Carrillo	Productivity Commission
Clelia Beltrán, Isabel Escalante	DIPRES
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References

Executive summary

- Bussolo, Maurizio; Koettl, Johannes; Sinnott, Emily. 2015. *Golden Aging: Prospects for Healthy, Active, and Prosperous Aging in Europe and Central Asia*. Washington, DC: World Bank. © World Bank. <https://openknowledge.worldbank.org/handle/10986/22018> License: CC BY 3.0 IGO.
- Roemer, John E., and Alain Trannoy. 2016. "Equality of Opportunity: Theory and Measurement." *Journal of Economic Literature*, 54(4): 1288-1332

Chapter 1: Introduction

- Araujo, J., M. Brueckner, M. Clavijo, E. Vostroknutova, and K. Wacker. 2014. "Beyond Commodities: The Growth Challenge of Latin America and the Caribbean." World Bank, Washington, DC.
- Roemer, John E., and Alain Trannoy. 2016. "Equality of Opportunity: Theory and Measurement." *Journal of Economic Literature*, 54(4): 1288-1332

Chapter 2: What are the critical factors driving output and productivity growth?

- Álvarez, R., C. Bravo-Ortega, and A. Zahler. 2016. "Innovation and Productivity in Services: Evidence from Chile." *Emerging Markets Finance and Trade* 51: 593–611.
- Alvarez, Roberto, Gustavo Crespi, and Conrado Cuevas. 2012. "Public Programs, Innovation, and Firm Performance in Chile." IDB Technical Note IDB-TN-375.
- Alvarez, R. and R. A. López. 2008. "Is Exporting a Source of Productivity Spillovers?" *Review of World Economics* 144 (4): 723–49.
- Araujo, J., M. Brueckner, M. Clavijo, E. Vostroknutova, and K. Wacker. 2014. "Beyond Commodities: The Growth Challenge of Latin America and the Caribbean." World Bank, Washington, DC.
- Balgrave, P., and M. Santoro. 2016. "Estimating Potential Output in Chile: A Multivariate Filer for Mining and Non-Mining Sectors." Working Paper WP/16/201, International Monetary Fund, Washington, DC.
- Benavente, J. M., S. Dobbelaere, and J. Mairesse. 2009. "Interaction between Product Market and Labour Market Power: Evidence from France, Belgium and Chile." *Applied Economics Letters* 16 (6): 573–77.
- Bergoeing et al. 2002. "Great Depressions and Recoveries: Policy-Driven Productivity in Chile and Mexico in the 1980s and 1990s." *American Economic Association Papers and Proceedings* 92 (2): 16–21.
- Bergoeing, R., A. Hernando, and A. Repetto. 2005. "Market Reforms and Efficiency Gains in Chile." *Estudios de Economía* 37 (2): 217–42.
- Beyer, H. and F. Gallego. 2014. "Education and Productivity: Some New Evidence and Implications for Chile." In *Growth Opportunities for Chile*, edited by V. Corbo. Santiago, Chile: Universitaria.
- Bloom, N., C. Genakos, R. Sadun, and J. Van Reenen. 2012. "Management Practices across Firms and Countries." *Academy of Management Perspectives* 26 (1): 12–33.
- Bravo-Ortega, C., J. M. Benavente, and Á. González. 2014. "Innovation, Exports, and Productivity: Learning and Self-Selection in Chile." *Emerging Markets Finance and Trade* 50: 68–95.
- Bussolo, Maurizio; Koettl, Johannes; Sinnott, Emily. 2015. *Golden Aging: Prospects for Healthy, Active, and Prosperous Aging in Europe and Central Asia*. Washington, DC: World Bank. © World Bank. <https://openknowledge.worldbank.org/handle/10986/22018> License: CC BY 3.0 IGO.
- Calvo, C. and J. M. Beanverte, 2015, "The Impact of Market Structure on Private R&D Expenditures: Evidence from the Chilean Manufacturing Sector." Unpublished working paper.
- CNP (Comisión Nacional de Productividad). 2016. *Documento de Inicio de Investigación: Productividad de la Gran Minería de Cobre*. Santiago, Chile.
- Cochilco (Chilean Copper Commission). 2014. *Productividad de la industria minera en Chile*. Santiago, Chile: Cochilco.
- Corbo, V. 1993. "Economic Reforms in Chile: An Overview." Documento de Trabajo 160, Instituto de Economía, Universidad Católica de Chile.
- Corbo, V. and R. Gonzalez. 2014. "Productivity and Economic Growth in Chile." In *Growth Opportunities for Chile*, edited by V. Corbo. Santiago, Chile: Universitaria.

- Cuberes, M. and D. Teignier. 2015. "Aggregate Costs of Gender Gaps in the Labor Market: A Quantitative Estimate." *Economics Working Paper E14/308*, University of Barcelona, Barcelona.
- De Gregorio and Magendzo. 2015. "La Productividad Total de Factores en Chile." *El Mercurio* (blog) December 26.
- De Vries, K. 2015. "Total Economy Data Base. Sources and Methods." Trusted Insights for Business Worldwide, Conference Board, New York.
- Diaz, F., F. Lefort and M. Morales. 2014. "Finance, Productivity and Growth: Does It Work for Chile?" In *Growth Opportunities for Chile*, edited by V. Corbo. Santiago, Chile: Universitaria.
- Eden, M. and H. Ngyen. 2015. "Reconciling Micro- and Macro-Based Estimates of Technology Adaption Lags in a Model of Endogenous Technology Adoption." In *Understanding the Income and Efficiency Gap in Latin America and the Caribbean*, edited by J. Araujo, E. Vostroknutova, K. Wacker, and M. Clavijo. Washington, DC: World Bank.
- EIU (Economist Intelligence Unit). 2016. "Financial Sector Report." Business Monitor International, third quarter, EIU, London.
- Fernandes, A. and C. Paunov. 2012. "Foreign Direct Investment in Services and Manufacturing Productivity: Evidence for Chile." *Journal of Development Economics* 97: 305–21.
- Forbes, K. 2007. "One Cost of the Chilean Capital Controls: Increased Financial Constraints for Smaller Traded Firms." *Journal of International Economics* 71: 294–323.
- Fuentes, R. 2011. "Una Mirada Desagregada del Deterioro de la Productividad en Chile: ¿Existe un Cambio Estructural?" Documento de Trabajo 401, Instituto de Economía, Universidad Católica de Chile.
- _____. 2014. "Acerca del Crecimiento Económico Chileno: 95 Propuestas para un Chile Mejor."
- Fuentes, R., M. Larraín, and K. Schmidt-Hebbel. 2006. "Sources of Growth and Behavior of TFP in Chile." *Cuadernos de Economía* 43 (127): 113–42.
- Fuentes R. and V. Mies. 2014. "What Impedes Chile's Catching Up with the United States?" In *Growth Opportunities for Chile*, edited by Vittorio Corbo and Ricardo Gonzalez, 321–38. Santiago, Chile: Editorial Universitaria y CEP.
- Galetovic, Alexander. 2007. "Competition Policy in Chile." Unpublished working paper.
- Gallego, F. and N. Loyaza. 2002. "The Golden Period for Growth in Chile: Explanations and Forecasts." In *Economic Growth: Sources, Trends and Cycles*, edited by R. Soto. Santiago, Chile: Banco Central de Chile.
- Global Competition Review*, Rating Enforcement 2016. <http://globalcompetitionreview.com/rating-enforcement>.
- Goodwin, T., and M. D. Pierola. 2015. "Export Competitiveness." Report 23658, World Bank, Washington, DC.
- Hsieh, C., E. Hurst, C. Jones, and P. Klenow. 2013. "The Allocation of Talent and U.S. Economic Growth." NBER Working Paper 18693.
- IMF (International Monetary Fund). 2015. *Chile Article IV Consultation: Selected Issues*. Washington, DC: IMF.
- _____. 2015. "World Economic Outlook. Adjusting to Lower Commodity Prices." World Economic and Financial Surveys, October.
- International Copper Study Group, 2016. "The World Copper Factbook." www.icsg.org
- Kitzmuller, M. and Licetti, M. (2013. "Competition Policy: Encouraging Thriving Markets for Development." ViewPoint Public Policy for the Private Sector 331 (September 30), Finance and Private Sector Development Vice Presidency, World Bank, Washington, DC.
- Koske, I., I.Wanner, R. Bitetti and O. Barbiero. 2015. "The 2013 Update of the OECD Product Market Regulation Indicators: Policy Insights for OECD and Non-OECD Countries." OECD Economics Department Working Paper 1200, OECD, Paris.
- Larrañaga et al. 2011. Informe Final Comisión Revisora del Sistema de Capacitación e Intermediación Laboral.
- Le Fort, G. 2016. "El Crecimiento Tendencial del PIB Chileno en el Próximo Quinquenio." *Trabajos de Investigación en Políticas Públicas* 21, Departamento de Economía: Universidad de Chile, Santiago, Chile.
- Loyaza, N., P. Fajnzylber and C. Calderon. 2005. *Economic Growth in Latin America and the Caribbean: Stylized Facts, Explanations, and Forecasts*. Washington, DC: World Bank.
- Magendzo, I. and Villena, M. 2014. "Evolución de la Productividad Total de Factores en Chile." Corporación de Fomento de la Producción and Universidad Adolfo Ibáñez.
- Maloney, W. and A. Rodríguez-Clare. 2007. "Innovation Shortfalls." *Review of Development Economics* 11 (4): 665–84.
- Micco, A., and A. Repetto. 2014. "Productivity, Misallocation and the Labor Market." In *Growth Opportunities for Chile*, edited by V. Corbo. Santiago, Chile: Universitaria.
- Nguyen, H., and F. Jaramillo. 2016, "Institutions and Returns to Firm Innovation: A Focus on Latin America." In *Understanding the Income and Efficiency Gap in Latin America and the Caribbean*, edited by J. Araujo, E. Vostroknutova, K. Wacker, and M. Clavijo. Washington, DC: World Bank.

- OECD. 2003. *OECD Economic Surveys: Chile*. Paris: OECD.
- _____. 2010. *Measuring Innovation: A New Perspective*. Paris: OECD.
- _____. 2013a. *OECD Economic Surveys: Chile*. Paris: OECD.
- _____. 2013b. *Education Policy Outlook: Finland*. Paris: OECD.
- _____. 2015. *OECD Economic Surveys: Chile*. Paris: OECD.
- _____. 2015b. “Chile: Policy Priorities for Stronger and More Equitable Growth.” Better Policy Series. OECD, Paris.
- _____. 2016. *Education Policy Outlook: Republic of Korea*. Paris: OECD.
- Pavcnik, Nina. 2002. “Trade Liberalization, Exit, and Productivity Improvement: Evidence from Chilean Plants.” *Review of Economic Studies* 69 (1): 245–76.
- Petrin, A., and J. Sivadasan. 2013. “Estimating Lost Output from Allocative Inefficiency, with Applications to Chile and Firing Costs.” *Review of Economics and Statistics* 95 (1): 286–301.
- Prati, A., M. Onorato, and C. Papageorgiou. 2013. “Which Reforms Work and under What Institutional Environment? Evidence from a New Data Set on Structural Reforms.” *Review of Economics and Statistics* 95 (3): 946–68.
- Pritchett, L. 2001. “Where Has All the Education Gone?” *World Bank Economic Review* 15 (3): 367–91.
- Ramondo, Natalia. 2009. “Foreign Plants and Industry Productivity: Evidence from Chile.” *Scandinavian Journal of Economics* 111 (4): 789–809.
- Rivas et al. 2015. “Comision Presidencial Cienia para el Desarollo de Chile.” National Innovation Council for Development, Santiago, Chile.
- Rodrik, D. 2015. “Premature Deindustrialization.” NBER Working Paper 20935.
- Schiffbauer, M., H. Sahnoun, and J.T. Araujo. 2016. “Structural Change in Latin America: Does the Allocation of Resources across Sectors, Products, and Technologies Explain the Region’s Slow Productivity Growth?” In *Understanding the Income and Efficiency Gap in Latin America and the Caribbean*, edited by J. Araujo, E. Vostroknutova, K. Wacker, and M. Clavijo. Washington, DC: World Bank.
- Schmitt-Hebbel, K. 2009. “Chile’s Growth and Development: Leadership, Policy-Making Process, Policies, and Results.” Commission on Growth and Development Working Paper 52, World Bank, Washington, DC.
- Sosa, S., Tsounta, E. and Kim, H. 2013. “Is the Growth Momentum in Latin America sustainable?” Working Paper WP/13/109, International Monetary Fund, Washington, DC.
- Syverson, C. 2011, “What Determines Productivity?” *Journal of Economic Literature* 49 (2): 326–65.
- _____. 2014. “An Analysis of Recent Productivity Trends in Chile.” Unpublished working paper.
- UAI and Corfo. 2014. *Evolucion de La Productividad Total de Factores en Chile*. Universidad Adolfo Ibanez and Corfo.
- World Bank. 2015a. “Strengthening Chile’s National Agriculture and Forestry Innovation System.” World Bank, Washington, DC.
- _____. 2015b. *Peru: Building on Success, Boosting Productivity for Faster Growth*. Washington, DC: World Bank.
- _____. 2016. “Public Expenditure Review: Chile.” Unpublished report, World Bank, Washington, DC.

Chapter 3: What are the critical factors that determine inclusion?

- Arenas de Mesa, A. and M. Marcel. 1999. “Fiscal Effects of Social Security Reform in Chile: The Case of the Minimum Pension.” Paper presented at the APEC Second Regional Forum on Pension Fund Reforms, Vina del Mar, Chile, April 26–27.
- Arenas de Mesa, A. and P. B. Salazar. 2003. *Protección Social en Chile: Financiamiento, Cobertura y Desempeño, 1990–2000*. Santiago, Chile: International Labour Organization.
- Atisba. 2016. *Reporte Metro + Caminatas. Líneas actuales + Propuestas*.
- Avitabile, C., J. Botero Alvarez, M. M. Ferreyra, F. Haimovich Paz and S. Urzúa. 2016. “Higher Education in Latin America and the Caribbean.” World Bank, Washington, DC.
- Azevedo, J. P., M. E. Dávalos, C. Diaz-Bonilla, B. Atuesta, and R. A. Castañeda. 2013. “Fifteen Years of Inequality in Latin America: How Have Labor Markets Helped?” Policy Research Working Paper 6384, World Bank, Washington, DC.
- Azevedo, J. P., G. Inchauste, and V. Sanfelice. 2012. “Decomposing the Recent Inequality Decline in Latin America.” Working paper, World Bank, Washington, DC.
- Barros, R., M. De Carvalho, S. Franco, and R. Mendonca. 2010 “Markets, the State and the Dynamics of Inequality in Brazil.” In *Declining Inequality in Latin America: A Decade of Progress?*, edited by L. F. López-Calva and N. Lustig. Washington, DC: Brookings Institution and United Nations Development Programme.
- Bordon, Paola. 2007. “El efecto de los jardines infantiles en la oferta laboral femenina: análisis del caso chileno.”

- Working paper, CEA.
- Bravo, J. M. 2016. "Subempleo en Chile: Hacia un indicador de subutilización de la fuerza laboral." Documento de Trabajo 24, Centro Latinoamericano de Políticas Económicas y Sociales, Pontificia Universidad Católica de Chile. Santiago, Chile.
- Bucheli, M., N. Lustig, M. Rossi and F. Amábile. 2014. "CEQ Master Workbook: Uruguay." August 18, CEQ Institute, Tulane University, New Orleans.
- Cabezas, G., D. Contreras and O. Larrañega. 2015. "Políticas contra la Pobreza: de Chile Solidario a Ingreso Ético Familiar." United Nations Development Programme, New York.
- Campos, R., G. Esquivel, and N. Lustig. 2012. "The Rise and Fall of Income Inequality in Mexico, 1989–2010." Working Paper 2012/10, UNU-WIDER, Helsinki.
- Cancho, C., and E. Bondarenko. 2016. "The Distributional Impact of Fiscal Policy in Georgia." In *The Distributional Impact of Fiscal Policy: Evidence from Developing Countries*, edited by G. Inchauste and N. Lustig. Washington, DC: World Bank.
- Chen, W.H. et al. 2015. "Nonstandard Work and Inequality." OECD Social, Employment and Migration Working Paper, OECD, Paris.
- Chilean Central Bank. 2016. "Base de Datos Estadísticos." <http://si3.bcentral.cl/Boletin/secure/boletin.aspx?idCanasta= SJNTE3151>.
- Chioda, Laura. 2016. *Work and Family: Latin American and Caribbean Women in Search of a New Balance*. Latin American Development Forum Series. Washington, DC: World Bank.
- Comisión Presidencial Pensiones (Comisión Asesora Presidencial sobre el Sistema de Pensiones). 2015. *Informe Final*. September. Santiago, Chile: Comisión Asesora Presidencial sobre el Sistema de Pensiones.
- Contreras, D., S. Bustos and P. Sepúlveda. 2010. "When Schools Are the Ones That Choose: The Effects of Screening in Chile." *Social Science Quarterly* 91 (5): 1349–68.
- Cuberes, M. and D. Teignier. 2015. "Aggregate Costs of Gender Gaps in the Labor Market: A Quantitative Estimate." Economics Working Paper E14/308, University of Barcelona, Barcelona.
- De Hoyos, Rafael, H. Rogers and M. Székely. 2016. "Out of School and Out of Work: Risk and Opportunities for Latin America's Ninis." World Bank, Washington, DC.
- de la Torre, A., J. Messina, and S. Pienknagura. 2012. "The Labor Market Story behind Latin America's Transformation." Semiannual Report, Regional Chief Economist Office, Latin America and the Caribbean Region, World Bank, Washington, DC.
- Ferreira, Francisco H.G., J. Messina, J. Rigolini, L.F. López-Calva, M.A. Lugo and R. Vakis. 2013. *Economic Mobility and the Rise of the Latin American Middle Class*. Latin America and Caribbean Studies. Washington, DC: World Bank.
- Galasso, E. 2006. *With Their Effort and One Opportunity: Alleviating Extreme Poverty in Chile*. Washington, DC: World Bank.
- Gonzalez-Velosa, C. and S. Urzua. 2015. "Is Higher Education Always a Good Investment?" *Jobs and Development* (blog), February 11. <http://blogs.worldbank.org/jobs>.
- Gonzalez-Velosa, C., G. Rucci, M. Sarzosa and S. Urzua. 2015. "Returns to Higher Education in Chile and Colombia." IDB Working Paper IDB-WP-587, Inter-American Development Bank, Washington, DC.
- Goraus, Karolina, and G. Inchauste 2016. "The Distributional Impact of Taxes and Transfers in Poland." Policy Research Working Paper 7787, World Bank, Washington DC.
- Higgins, Sean, and Claudiney Pereira. 2014. "The Effects of Brazil's Taxation and Social Spending on the Distribution of Household Income." In "Analyzing the Redistributive Impact of Taxes and Transfers in Latin America," edited by Nora Lustig, Carola Pessino, and John Scott, special issue, *Public Finance Review* 42 (3): 346–67.
- Hsieh, Chang-Tai, and M. Urquiola. 2006. "The Effects of Generalized School Choice on Achievement and Stratification: Evidence from Chile's Voucher Program." *Journal of Public Economics* 90 (8–9): 1477–1503
- IDB (Inter-American Development Bank). 2013. "II Encuesta Nacional sobre Mujer y Trabajo en Chile." IDB, Comunidad Mujer. http://www.comunidadmujer.cl/wp-content/uploads/2012/07/RESUMEN-EJECUTIVO_VF.pdf.
- INE (Instituto Nacional de Estadísticas de Chile [National Statistics Institute]). 2015. "Mujeres en Chile y Mercado del Trabajo: Participación Laboral Femenina y Brechas Salariales." Departamento de Estudios Laborales y Departamento de Estudios Sociales. INE, Santiago, Chile.
- Lambiri D., and M. Vargas. 2011. "Residential Segregation and Public Housing Policy: The Case of Chile." Working Paper 29, Facultad de Economía y Empresa, Universidad Diego Portales.
- López-Calva, L. F., N. Lustig, M. Matyszin and D. Popova. 2016. "Who Benefits from Fiscal Redistribution in Russia?" In *The Distributional Impact of Fiscal Policy: Evidence from Developing Countries*, edited by G.

- Inchauste and N. Lustig. Washington, DC: World Bank.
- López-Calva, L. F., N. Lustig, and E. Ortiz-Juárez. 2013. "Deconstructing the Decline in Inequality in Latin America." Policy Research Working Paper 6552, World Bank, Washington, DC.
- MacLeod, W. B., and M. Urquiola. 2009. "Anti-Lemons: School Reputation and Educational Quality." NBER Discussion Paper 15112, National Bureau for Economics Research.
- Martínez Aguilar, Sandra Natalia, Alan Fuchs Tarlovsky, Eduardo Ortiz-Juárez, and Giselle Eugenia Del Carmen Hasbun. 2017. "The Impact of Fiscal Policy on Inequality and Poverty in Chile." Policy Research Working Paper 7939, World Bank, Washington, DC.
- Ministry of Education, Chile. 2014. "Overview of Higher Education in Chile 2014." Servicio de Información de Educación Superior, Santiago, Chile.
- Ministry of Health, Chile. 2015. "Gasto Catastrófico y Gasto de Bolsillo de Salud 1997–2012." Ministry of Health, Santiago, Chile.
- Ministry of Social Development, Chile. 2015a. "Evolución y distribución del ingreso de los hogares (2006–2013): Síntesis de Resultados." http://observatorio.ministeriodesarrollosocial.gob.cl/documentos/Casen2013_Evolucion_Distibucion_Ingresos.pdf.
- . 2015b. "Informe de Desarrollo Social 2015." <http://www.ministeriodesarrollosocial.gob.cl/pdf/upload/IDS2.pdf>.
- Nopo, Hugo R. 2007. "The Gender Wage Gap in Chile 1992–2003 from a Matching Comparisons Perspective." IZA Discussion Papers 2698, Institute for the Study of Labor, Bonn, Germany.
- OECD. 2012a. "PISA 2012 Results, Excellence through Equity: Giving Every Student the Chance to Succeed." Vol. 2.
- . 2012b. "Quality Assurance in Higher Education in Chile" Reviews of National Policies for Education.
- . 2014. "Education at a Glance 2014: Chile."
- . 2015. "Health Statistics."
- . 2015. *OECD Economic Surveys: Chile*. Paris: OECD.
- . 2016. "Going for Growth." OECD, Paris.
- Peña, C. 2002. "Rendimiento escolar en Chile en establecimientos públicos y privados: ¿Qué nos muestra la nueva evidencia?" Estudio de Caso 68, Magíster en Gestión y Políticas Públicas de la Universidad de Chile.
- Perticara, M. and I. Bueno. 2009. "Entendiendo las brechas salariales por género en Chile." ILADES–Georgetown University Working Paper 212, Ilades, School of Economics and Business, Georgetown University, Washington, DC.
- Ravallion, M., S. Chen, and P. Sangraula. 2009. "Dollar a Day Revisited." *World Bank Economic Review* 23 (2): 163–84.
- Redondo, J. M., C. Descouvières and K. Rojas. 2004. "Equidad y calidad de la educación en Chile: Reflexiones e investigaciones de eficiencia de la educación obligatoria (1990–2001)." Vicerrectoría Investigación, Facultad Ciencias Sociales, Universidad de Chile, Santiago, Chile.
- Ruiz-Tagle J. and K. Sehnbruch. 2015. "More But Not Better Jobs in Chile? The Fundamental Importance of Open-Ended Contracts." *International Labor Review* 154 (2).
- Scott, J. 2013. "CEQ Master Workbook: Mexico." September 2, CEQ Institute, Tulane University, New Orleans.
- SEDLAC (Socio-Economic Database for Latin America and the Caribbean), Center for Distributive, Labor, and Social Studies, Universidad de La Plata, La Plata, Argentina; World Bank, Washington, DC, <http://sedlac.econo.unlp.edu.ar/eng/index.php>.
- UNDP (United Nations Development Programme). 2015. *Human Development Report, 2015: Work for Human Development*. New York: UNDP.
- Valdés, S. 2005. "Para Aumentar la Competencia entre las AFP." Estudios Públicos 98, Centro de Estudios Públicos, Santiago, Chile.
- Valenzuela, J. P., and Allende, C. 2012. "Logros en Liceos Públicos de Excelencia en Chile: valor agregado o solo descreme de la élite?" Paper presented at the II Congreso Interdisciplinario de Investigación en Educación, CIIE, Santiago, Chile.
- Valenzuela, J. P.; Bellei C. and D. de los Ríos. 2013. "Socioeconomic School Segregation in a Market-Oriented Educational System: The Case of Chile." *Journal of Education Policy*.
- World Bank. 2011. *Chile's State-Guaranteed Student Loan Program (CAE)*. Washington, DC: World Bank.
- . 2012. "Monitoring Basic Opportunities throughout the Lifecycle with the Human Opportunity Index in Chile." Poverty Reduction and Economic Management Unit, World Bank, Washington, DC.
- . 2014. *Social Gains in the Balance: a Fiscal Policy Challenge for Latin America and the Caribbean*.

- Washington, DC: World Bank.
- _____. 2015a. *Chile: An Incidence Analysis of the 2015 Tax Reform*. Washington, DC: World Bank.
- _____. 2015b. "Working to End Poverty in Latin America and the Caribbean: Workers, Jobs, and Wages." LAC Poverty and Labor Brief (June), World Bank, Washington, DC.
- _____. 2015c. "Chile: Distributional Effects of the 2014 Tax Reform." World Bank, Washington, DC.
- _____. 2016. "Public Expenditure Review: Chile." Unpublished report, World Bank, Washington, DC.
- _____. 2017a. *World Development Report 2017: Governance and the Law*. Washington, DC: World Bank.
- _____. 2017b. "Implementation Completion Report: Chile, Social Inclusion for Shared Prosperity Development Policy Loan Project." World Bank, Washington, DC.
- Zimmerman, S. 2013. *Making Top Managers: The Role of Elite Universities and Elite Peers*. New Haven, CT: Yale University.
- _____. 2017. "Implementation Completion Report Chile: Social Inclusion for Shared Prosperity." Development Policy Loan Project, World Bank, Washington, DC.

Chapter 4: How sustainable are the currents paths of growth and inclusion?

- Alvial, A., Kibenge, F., Forster, J., Burgos, J.M., Ibarra, R., St-Hilaire, S., 2012. "The Recovery of the Chilean Salmon Industry: The ISA Crisis and Its Consequences and Lessons." Global Aquaculture Alliance, <http://www.gaalliance.org/cmsAdmin/uploads/GAA ISA-Report.pdf>.
- Andersen, L., and D. Verner. 2009. "Social Impacts of Climate Change in Bolivia: A Municipal Level Analysis of the Effects of Recent Climate Change on Life Expectancy, Consumption, Poverty, and Inequality." Policy Research Working Paper 5170, World Bank, Washington, DC.
- _____. 2010. "Simulating the Effects of Climate Change on Poverty and Inequality." In *Reducing Poverty, Protecting Livelihoods, and Building Assets in a Changing Climate*, edite by D. Verner, 249–67. Washington, DC: World Bank.
- Bertranou, F. 2016. "Pension Benefits in Chile: Is It Possible to Improve Adequacy and Solidarity?" Paper presented at the ILO–IZA Conference, "Assessing the Effects of Labor Market Reforms: A Global Perspective," Geneva, March 10–11.
- Bauer, C. J. 2015. "Water Conflicts and Entrenched Governance Problems in Chile's Market Model." *Water Alternatives* 8 (2).
- Bitrán, E., Rivera, P., and Villena, M. J. 2014. "Water Management Problems in the Copiapó Basin, Chile: Markets, Severe Scarcity, and the Regulator." *Water Policy* 16 (5): 844–63.
- Brantes, R., and Olivares, G. 2008. *Best Practices and Efficient Use of Water in the Mining Industry*. Chilean Copper Commission.
- Calfucura, Enrique, Astrid Martínez Ortiz, Cynthia Sanborn, and Juan Luis Dammert. 2013. "Natural Resource Extraction: The Good, The Bad and The Ugly." *America's Quarterly* (Winter).
- CDEC and SIC. 2015. *Estudio de Previsión de Demanda 2015–2035 (2050)*. Preliminary version.
- Cochilco (Chilean Copper Commission). 2015. *Hydrological Consumption in Copper Mining for 2014*. Santiago, Chile: Cochilco.
- Conaf. 2015. *Drought Map in Chile for the Communities Updated within the Framework of the National Action Plan Aligned with the Ten-Year Strategy of the United Nations Convention to Combat Desertification*. Santiago, Chile.
- CR2 (Climate and Resilience Research Center). 2015. *National Report, The Mega-drought 2010–2015: A Lesson for the Future*. Santiago, Chile.
- Del Bello Lou. 2013. "UN Disaster Framework 'In Danger of Not Reaching Goals'." *SciDev.Net*. <http://www.scidev.net/global/disasters/news/un-disaster-framework-in-danger-of-not-reaching-goals.html>.
- Everett, T., Ishwaran, M., Ansaldi, G. P., and Rubin, A. 2010. *Economic Growth and the Environment*.
- FAO. 2010. *Global Forest Resources Assessment 2010, Main Report*. Rome.
- Ferreira, Francisco H.G., J. Messina, J. Rigolini, L.F. López-Calva, M.A. Lugo and R.Vakis. 2013. *Economic Mobility and the Rise of the Latin American Middle Class*. Latin America and Caribbean Studies. Washington, DC: World Bank.
- Government of Chile. *Intended Nationally Determined Contribution of Chile towards the Climate Agreement of Paris 2015*.
- _____. *National Climate Change Action Plan 2008–2012*.
- _____. 2013. *National Water Resources Strategy*.
- _____. 2014. *Energy 2050: Chile's Energy Policy*.

- . *National Energy Strategy 2012–2030*.
- Herrera C. 2015. “Chile Commits to 30 Percent Reduction of Greenhouse Gas Emissions by 2030.” NRDC, October 2. <https://www.nrdc.org/experts/carolina-herrera/chile-commits-30-percent-reduction-greenhouse-gas-emissions-2030>.
- Hirschman, Albert O. and Michael Rothschild. 1973. “The Changing Tolerance for Income Inequality in the Course of Economic Development.” *Quarterly Journal of Economics* 87 (4): 544–66.
- IEA (International Energy Agency). 2009. *Energy Policy Review 2009: Chile*. Paris: IEA.
- International IDEA. 2016. “Voter Turnout Database.” International IDEA Institute for Democracy and Electoral Assistance, Stockholm. <http://www.idea.int/vt/countryview.cfm?id=45>.
- López-Calva, L. F., Rigolini, J., and Torche, F. 2012. “Is There Such a Thing as Middle Class Values? Class Differences, Values, and Political Orientations in Latin America.” Center for Global Development Working Paper 286.
- Maddock, A., Young, R. S., and P. Reig. 2015. “Ranking the World’s Most Water-Stressed Countries in 2040.” *World Resources Institute* (blog), August 26. <http://www.wri.org/blog/2015/08/ranking-world%20%80%99s-most-water-stressed-countries-2040>.
- Miller, Sebastian, and Mauricio Vela. 2013. “The Effects of Air Pollution on Educational Outcomes: Evidence from Chile.” IDB Working Paper 468.
- Ministry of Agriculture and CONAF. *Forest Policy 2015–2035*.
- Ministry of Environment, Chile. 2011. *Report on the State of the Environment: Air Pollution*.
- . 2014. “Plans for Atmospheric Decontamination: Strategy 2014–2018 (*Planes de Descontaminación Atmosférica: Estrategia 2014–2018*).”
- Moseley, M., and M. Layton. 2013. “Prosperity and Protest in Brazil: The Wave of the Future for Latin America.” AmericasBarometer: Insights 93.
- OECD. 2009. *Natural Resources and Pro-Poor Growth. The Economics and Politics*. Paris: OECD.
- . 2011. *Maintaining Momentum: OECD Perspectives on Policy Challenges in Chile*. Paris: OECD.
- . 2013. *Chile: Climate Change Impacts on Water Systems*. Paris: OECD.
- . 2014a. *Chile’s Pathway to Green Growth: Measuring Progress at Local Level*. Paris: OECD.
- . 2014b. *OECD Rural Policy Reviews: Chile 2014*, Paris: OECD.
- OECD and ECLAC. 2005. *OECD Environmental Performance Reviews: Chile 2005*. Paris: OECD.
- . 2016. *OECD Environmental Performance Reviews: Chile 2016*. Paris: OECD.
- OECD and LEED. 2014. *Chile’s Pathway to Green Growth: Measuring Progress at Local Level*. Paris: OECD.
- Pearce, F. 2016. “El Niño and Climate Change: Wild Weather May Get Wilder.” Yale Environment 360, February 11. http://e360.yale.edu/feature/el_nino_and_climate_change_wild_weather_may_get_wilder/2960/.
- ONEMI. 1997.
- Penfold M. and H. Trinkunas. 2015. “Prospects for Latin America’s Middle Class after the Commodity Boom.” *Brookings* (blog), February 10.
- Pezzini, M. 2012. “An Emerging Middle Class.” *OECD Observer*. http://www.oecdobserver.org/news/fullstory.php/aid/3681/An_emerging_middle_class.html.
- Rossing T. 2010. “Water Scarcity, Climate Change, and the Poor.” In *Reducing Poverty, Protecting Livelihoods, and Building Assets in a Changing Climate*, edited by D. Verner, 21–56. Washington, DC: World Bank.
- SEDLAC (Socio-Economic Database for Latin America and the Caribbean), Center for Distributive, Labor, and Social Studies, Universidad de La Plata, La Plata, Argentina; World Bank, Washington, DC, <http://sedlac.econo.unlp.edu.ar/eng/index.php>.
- Sepúlveda, M., Arismendi, I., Soto, D., Jara, F., and Farias, F. 2013. *Escaped Farmed Salmon and Trout in Chile: Incidence, Impacts, and the Need for an Ecosystem View*.
- Shepherd, A., Mitchell, T., Lewis, K., Lenhardt, A. J., Lindsey, S. L., and Muir-Wood, R. 2013. *The Geography of Poverty, Disaster, and Climate Extremes in 2030*.
- Smith, R. 2010. *Global Forest Resources Assessment (2000): Main Report*.
- UNISDR (United Nations Office for Disaster Risk Reduction). 2010. *Diagnóstico de la situación de riesgo de desastres en Chile*. Regional Office for the Americas, UNISDR.
- UNDP (United Nations Development Programme). 2014. *Auditoría a la democracia: Más y mejor democracia para un Chile inclusivo*. Santiago, Chile.
- . 2015. *Desarrollo humano en Chile 2015: Los tiempos de la politización* [Human development in Chile 2015: the politicization of Chilean society]. April. Santiago, Chile: UNDP.
- Valdés-Pineda, R., Pizarro, R., García-Chevesich, P., Valdés, J. B., Olivares, C., Vera, M., et al. 2014. “Water Governance in Chile: Availability, Management and Climate Change.” *Journal of Hydrology* 519: 2538–67.

- WDI (World Development Indicators) (database), World Bank, Washington, DC, <http://data.worldbank.org/products/wdi>.
- World Bank. 2000. "Loan to the Republic of Chile for an Environmental Institutions Development Project." Implementation Completion Report, World Bank, Washington, DC.
- . 2009. *Chile: Country Note on Climate Change Aspects in Agriculture*. Washington, DC: World Bank.
- . 2011. "Diagnóstico de la gestión de los recursos hídricos." Department of Environment and Sustainable Development, Latin America and the Caribbean Region, World Bank, Washington, DC.
- . 2013. "Estudio para el mejoramiento del marco institucional para la gestión del agua." Department of Environment and Sustainable Development, Latin America and the Caribbean Region, World Bank, Washington, DC.
- . 2015. *Colombia: Systematic Country Diagnostic*. Washington, DC: World Bank.
- . 2016. "Public Expenditure Review: Chile." Unpublished report, World Bank, Washington, DC.
- Zamorano-Elgueta, C., Benayas, J. M. R., Cayuela, L., Hantson, S., & Armenteras, D. 2015. "Native Forest Replacement by Exotic Plantations in Southern Chile (1985–2011) and Partial Compensation by Natural Regeneration." *Forest Ecology and Management* 345: 10–20.

Chapter 5. Prioritization

- Adalet McGowan, M. and D. Andrews. 2015. "Labour Market Mismatch and Labour Productivity: Evidence from PIAAC Data." OECD Economics Department Working Paper 1209.
- Álvarez, R., C. Bravo-Ortega, and A. Zahler. 2016. "Innovation and Productivity in Services: Evidence from Chile." *Emerging Markets Finance and Trade* 51: 593–611.
- Álvarez, Roberto, Gustavo Crespi, and Conrado Cuevas. 2012. "Public Programs, Innovation, and Firm Performance in Chile." IDB Technical Note IDB-TN-375.
- Barro, R. J. 1991. "Economic Growth in a Cross Section of Countries." *Quarterly Journal of Economics* 106: 407–43.
- Benhabib, J. and M. M. Spiegel. 1994. "The Role of Human Capital in Economic Development: Evidence from Aggregate Cross-Country Data." *Journal of Monetary Economics* 34 (2): 143–73.
- Bordon, Paola, 2007, El efecto de los jardines infantiles en la oferta laboral femenina. análisis del caso chileno, Working Paper, CEA.
- Bravo, J. M. 2016. "Subempleo en Chile: Hacia un indicador de subutilización de la fuerza laboral." Documento de Trabajo 24, Centro Latinoamericano de Políticas Económicas y Sociales, Pontificia Universidad Católica de Chile, Santiago, Chile.
- Buyse, K. 2002. "Human Capital and Growth in OECD Countries: The Role of Public Expenditure on Education."
- Cuberes, M. and D. Teignier. 2015. "Aggregate Costs of Gender Gaps in the Labor Market: A Quantitative Estimate." University of Barcelona Economics Working Paper E14/308.
- Easterly, W. and S. Rebelo. 1993. "Fiscal Policy and Economic Growth." *Journal of Monetary Economics* 32: 417–58.
- Fuentes R. and V. Mies. 2014. "What Impedes Chile's Catching Up with the United States?" In *Growth Opportunities for Chile*, edited by Vittorio Corbo and Ricardo Gonzalez, 321–38. Santiago, Chile: Editorial Universitaria y CEP.
- Hsieh, C., E. Hurst, C. Jones, and P. Klenow. 2013. "The Allocation of Talent and U.S. Economic Growth." NBER Working Paper 18693.
- Levine, R., and D. Renelt. 1992. "A Sensitivity Analysis of Cross-Country Growth Regressions." *American Economic Review* 82 (4): 942–63.
- OECD. 2013. *Going for Growth: Economic Policy Reforms*. Paris: OECD.
- . 2015. *OECD Economic Surveys: Chile*. Paris: OECD.

Annexes

- SEDLAC (Socio-Economic Database for Latin America and the Caribbean), Center for Distributive, Labor, and Social Studies, Universidad de La Plata, La Plata, Argentina; World Bank, Washington, DC, <http://sedlac.econo.unlp.edu.ar/eng/index.php>.
- Syverson, C. 2011, "What Determines Productivity?" *Journal of Economic Literature* 49 (2): 326–65.