

Public Disclosure Authorized

Public Disclosure Authorized

Public Disclosure Authorized

Public Disclosure Authorized

# Mexico Policy Notes

---



© 2019 International Bank for Reconstruction and Development / The World Bank

1818 H Street NW, Washington DC 20433

Telephone: 202-473-1000; Internet: [www.worldbank.org](http://www.worldbank.org)

Some rights reserved

1 2 3 4 21 20 19 18

This work is a product of the staff of The World Bank. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of The World Bank, its Board of Executive Directors, or the governments they represent. The World Bank does not guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Nothing herein shall constitute or be considered to be a limitation upon or waiver of the privileges and

immunities of The World Bank, all of which are specifically reserved.

Rights and Permissions

**Attribution**—Please cite the work as follows: World Bank. 2018. *Mexico – Policy Notes (English)*. Washington, D.C. : World Bank Group. Translations—If you create a translation of this work, please add the following disclaimer along with the attribution: This translation was not created by The World Bank and should not be considered an official World Bank translation. The World Bank shall not be liable for any content or error in this translation.

**Adaptations**—If you create an adaptation of this work, please add the following disclaimer along with the attribution: This is an adaptation of an original work by *The World Bank. Views and opinions expressed in the adaptation are the sole responsibility of the author or authors of the adaptation and are not endorsed by The World Bank.*

**Third-party content**—The World Bank does not necessarily own each component of the content contained within the work. The World Bank therefore does not warrant that the use of any third-party-owned individual component or part contained in the work will not infringe on the rights of those third parties. The risk of claims resulting from such infringement rests solely with you. If you wish to reuse a component of the work, it is your responsibility to determine whether permission is needed for that reuse and to obtain permission from the copyright owner. Examples of components can include, but are not limited to, tables, figures, or images.

All queries on rights and licenses should be addressed to the World Bank's Senior Communications Officer for Mexico; e-mail: [bmmexico@worldbank.org](mailto:bmmexico@worldbank.org).

Cover design: [www.sonideas.com](http://www.sonideas.com) / Alejandro Espinosa

# Contents

1. Fostering Productivity Growth.....	11
<b>INTRODUCTION</b> .....	12
<b>KEY CHALLENGES</b> .....	12
<b>POLICY OPTIONS</b> .....	16
Strengthening Institutions and Programs Working on Productivity Issues.....	17
Implementing Interventions at the Sub-National Level.....	18
Developing an Integrated Strategy to Address Informality.....	18
References.....	19
2. Implementing Energy Sector Reform.....	21
<b>INTRODUCTION AND REFORM PROGRESS</b> .....	21
<b>KEY CHALLENGES</b> .....	23
Market Competition, Equity, and Efficiency.....	23
Natural Gas.....	25
<b>POLICY OPTIONS</b> .....	28
Creating Competitive, Equitable and Economically Efficient Markets.....	28
Decarbonizing the Energy Mix and Developing Sustainable Energy.....	28
Promoting the Adoption of New Technologies.....	29
References.....	30
3. Fostering Digital Development.....	33
<b>CONTEXT AND REFORM PROGRESS</b> .....	33
<b>KEY CHALLENGES</b> .....	34
Connectivity.....	34
Digital Inclusion and Digital Skills.....	36
Interoperability and Digital Identity.....	36
The Legal Framework and Open Data.....	36
<b>POLICY OPTIONS</b> .....	37
Connectivity.....	37
Digital Inclusion and Digital Skills.....	37
Interoperability and Digital Identity.....	37
The Legal Framework and Open Data.....	38
<b>ANNEX 2. BROADBAND SUBSCRIPTIONS</b> .....	39

4. Developing a Deeper, More Inclusive Financial Sector	41
CONTEXT AND REFORM PROGRESS	42
KEY CHALLENGES	43
Financial Inclusion	43
Financial Services for MSMEs	44
Financial-Sector Oversight	45
Development Finance Institutions (DFIs) Efficiency	45
Other Issues	45
POLICY OPTIONS	46
Financial Inclusion	46
Financial Services for MSMEs	46
Financial-Sector Stability	46
DFI Efficiency	47
Other Issues	47
5. Reforming Labor Policies to Encourage Formalization and Promote Productive Inclusion	49
CONTEXT AND REFORM PROGRESS	50
CHALLENGES	51
Lowering the Cost of Formalization for Firms and Workers	51
Integrating Women into the Paid Labor Force	52
Fostering Youth Inclusion	53
Addressing Skills Mismatches	54
POLICY OPTIONS	55
Lowering the Cost of Formalization for Firms and Workers	55
Facilitating the Entry of Female Workers into the Paid Labor Force	56
Fostering Youth Inclusion	56
Addressing Skills Mismatches and Skill Misallocation	56
Reviewing minimum wage legislation	57
References	58
6. Implementing and Expanding Competition Reforms	61
CONTEXT AND REFORM PROGRESS	62
KEY CHALLENGES	64
LOW LEVELS OF COMPETITION CONTINUE TO DISTORT INCENTIVES IN SEVERAL TRANSPORT AND LOGISTICS SECTORS.	66
POLICY OPTIONS	69
References	71
7. Improving the Education System's Equity	73
INTRODUCTION	74
KEY CHALLENGES	75
POLICY OPTIONS	77
Leveraging Performance Incentives to Improve Teacher Quality	77
Adopting a National Early Childhood Development Policy	77

<b>8. Strengthening the Healthcare System</b>	<b>81</b>
<b>CONTEXT AND REFORM PROGRESS</b>	<b>82</b>
<b>KEY CHALLENGES</b>	<b>83</b>
Improving the Efficiency, Scope, and Equity of Health Services	83
Consolidating the Healthcare System	84
Developing a High-Quality, Equitable, Outcome-Driven Healthcare System	85
<b>POLICY OPTIONS</b>	<b>87</b>
Improving the Efficiency, Scope, and Equity of Health Services	87
Consolidating the Healthcare System	87
Developing a High-Quality, Equitable, Outcome-Driven Healthcare System	88
References	89
<b>9. Enhancing Social Protection</b>	<b>91</b>
<b>CONTEXT AND REFORM PROGRESS</b>	<b>92</b>
<b>CHALLENGES</b>	<b>93</b>
Efficiency of Social Assistance System	93
Expanding Access to Opportunities	94
Social Security	94
Infrastructure to Support a More Efficient Social Protection System	96
<b>POLICY OPTIONS</b>	<b>97</b>
Improving the Efficiency in Social Assistance System and Reaching the Marginalized and Poorest	97
Strengthening and Expanding Access to Social and Economic Opportunities for the Poor	97
Providing a Sustainable, Equitable and an Integrated Social Insurance System for a Rapidly Aging Population	98
Building the Infrastructure to Support a More Sophisticated Social Protection System	99
<b>ANNEX- FIGURES</b>	<b>101</b>
References	103
<b>10. Fostering Resilient, Productive and Low-Carbon Rural Territories</b>	<b>105</b>
<b>CONTEXT AND REFORM PROGRESS</b>	<b>106</b>
<b>CHALLENGES</b>	<b>107</b>
Natural resource degradation and vulnerability to climate change in Mexico's rural territories	107
The Unexploited Potential of the Forestry Sector	107
Ensuring a Robust and Sustained Agriculture Growth Pattern	108
<b>POLICY OPTIONS</b>	<b>110</b>
Aligning Productive and Environmental Objectives to support Growth, Conservation, and Resilience	110
Supporting Productivity and Competitiveness of Agriculture/Forestry Sectors and Sustainable Employment	112
<b>11. Sustainably Managing Scarce Water Resources</b>	<b>115</b>
<b>CONTEXT AND REFORM PROGRESS OF THE SECTOR</b>	<b>116</b>

KEY CHALLENGES	117
POLICY OPTIONS	118
<b>12. Fostering Efficient and Sustainable Urban Systems</b>	<b>123</b>
CONTEXT AND REFORM PROGRESS	124
MAIN CHALLENGES	124
Addressing the Lasting Effects of Expansionary Housing Policies	124
Coping with persistent Low-Quality Public Transportation and Limited Mobility Alternatives	125
Reverting the Neglect of Solid Waste Management	126
Addressing Inefficient and Costly Energy Use at the Municipal Level	127
POLICY OPTIONS	129
Renewing Government Efforts to Promote Compact and Inclusive Urban Development	129
Further Strengthening Transportation and Mobility Policies and Institutions	129
Overhauling Solid Waste Management	130
Leveraging the Power of Local Governments to Create More Energy-Efficient Cities	131
References:	132
<b>13. Further strengthening fiscal sustainability with equity</b>	<b>135</b>
CONTEXT AND RECENT DEVELOPMENTS	136
KEY CHALLENGES	137
Domestic Revenue Mobilization	137
EXPENDITURE POLICY	138
FISCAL FRAMEWORK	139
POLICY OPTIONS	139
Tax Policy	139
Expenditure policy	140
Fiscal Framework	141
References	142
<b>14. Improving the Efficiency and Equalization Effects of the Fiscal Federalism Framework</b>	<b>145</b>
CONTEXT AND REFORM PROGRESS	146
KEY CHALLENGES	146
Subnational Taxation	147
Intergovernmental transfers	147
Subnational Borrowing	150
POLICY OPTIONS	151
Increasing Own-Source Revenue Collection in Subnational Governments	151
Improving the Efficiency and Enhancing the Equalization Effect of Intergovernmental Transfers	152
Strengthening Subnational Fiscal Discipline	152

## List of Graphics

Figure 1: Total Factor Productivity Index, Mexico, 1990-2016 (1990=100).....	12
Figure 2: Growth Decomposition, Mexico, 1991-2016.....	12
Figure 3: Labor Productivity at the State Level.....	13
Figure 4: The Distribution of Sectoral Productivity vs. the Distribution of Firm-Level Productivity.....	14
Figure 5: Total Factor Productivity in the Manufacturing Sector by Firm Size, Mexico and the United States.....	14
Figure 6: Example of the Dispersion of Labor Productivity between Firms within Narrowly Defined Sectors: Cut-and-Sewn Apparel Manufacturing.....	15
Figure 7: Indicators of Corruption and the Ease of Doing Business, Mexico and Comparators, 2016.....	15
Figure 8: Distribution of Management Practices, Mexico and the United States.....	16
Figure 9: The Composition of Wholesale Electricity Costs in Mexico.....	22
Figure 10: PPP Procurement Efficiency, Mexico and Comparators.....	23
Figure 11: The Recent and Projected Evolution of Natural Gas Production and Imports, 2005-2040.....	25
Figure 12: Competitive Gas Markets, Mexico and a Hypothetical Best-Practices Frontier, 2017.....	26
Figure 13: Primary Energy Demand, by fuel, 2015.....	27
Figure 14: Drop in Prices in telecommunications services following the reforms.....	35
Figure 15: Household Internet Access Rates among OECD Countries, 2010 and 2016.....	35
Figure 16: Fixed and Mobile Broadband Penetration in Mexico by State, 2016.....	35
Figure 17: Market Share by type of Market, 2017.....	36
Figure 18 Fixed Broadband subscriptions, OECD countries (June 2017).....	39
Figure 19 Mobile Broadband subscription, OECD countries (June 2017).....	39
Figure 20 Private Non-Financial Sector Credit to GDP.....	42
Figure 21 Share of Adults with an Account at a Formal Financial Institution, 2017 (%).....	43
Figure 22: Financial Sector Structure.....	44
Figure 23: DFI-Backed Credit.....	45
Figure 24: The Share of Remunerated Workers without Access to Social Security Benefits by State (%).....	51
Figure 25: The Evolution of Real Labor Income, 2005-2017 (MX).....	52
Figure 26: The Evolution of the Female Labor-Force Participation Rate, 1992-2016.....	52
Figure 27: The Labor-Force Participation Rate by Education Level, Gender, and Age.....	53
Figure 28: Youth Not in Education, Employment or Training (NEET), Mexico and OECD Countries.....	54
Figure 29: The Perceived Effectiveness of Antimonopoly Policy.....	63
Figure 30: The Frequency with which COFECE Applies Competition Policy Tools*.....	63
Figure 31: Number of regulatory restrictions identified in key sectors (overall).....	65
Figure 32: Subcategory: Number of rules that reinforce dominance or limit entry.....	65
Figure 33: Subcategory: Number of rules that are conducive to collusive outcomes or increase costs to compete in the market.....	65
Figure 34: Subcategory: Number of rules that discriminate and protect vested interests.....	65
Figure 35: OECD Product-Market Regulation Indicator, 2013.....	66
Figure 36: Barriers to Entrepreneurship, 2013.....	66
Figure 37: Cargo Transport Prices.....	67
Figure 38: Logistics Performance Indicator.....	67
Figure 39: The Five Pillars of Mexico's Reformed Education Model.....	74
Figure 40: PISA Test Scores for Math and Reading among OECD Countries, 2015.....	75
Figure 41: Spending per Student at the Basic Education Level by State, 2013.....	76
Figure 42: Health Insurance and Health Spending in Mexico.....	82
Figure 43: OOP Spending and Insurance Coverage by Income Quintile.....	84
Figure 44: Financial Flows in the Mexican Health System.....	85
Figure 45: Disparities in the Use of Ambulatory Care and Cardiac Infarction Mortality.....	85
Figure 46: Preventable Hospitalization and the Institutional Strength of Health Jurisdictions.....	86
Figure 47: Expenditures on Social Assistance Programs in Mexico as a Percentage of GDP, 2003-2015.....	93
Figure 48: Expenditures on Social Assistance as a Percentage of GDP by Country, 2000-2015.....	94
Figure 49: Proyección del costo del sistema de pensiones a cargo del Gobierno Federal (% PIB), 2015-2080*.....	95
Figure A1a: Distribution of beneficiaries by income quintiles, 2014.....	101
Figure A1b: Distribution of benefits by income quintiles, 2014.....	101
Figure A2: The 'tax wedge' in Latin America.....	101

Figure 51: Agriculture: Productivity Performance.....	108
Figure 52: Agriculture Land (thousands of hectares) and Contribution to Total Agricultural Output (%) by State.....	109
Figure 53: Water Use in Mexico.....	117
Figure 54: Transportation Breakdown by City Type.....	125
Figure 55: Solid Waste Production by State, 2013 (tons).....	127
Figure 56: Final Energy Consumption, Baseline Scenario versus Transition to Energy-Efficient Technologies, 2010-2050 (petajoules).....	128
Figure 57: Federal Public-Sector Revenue and Expenditure and Federal Public-Sector Debt, 2000-2017 (% of GDP).....	136
Figure 58: General Government Fiscal Balances and Gross Government Public Debt, 2012-2017 (% of GDP).....	137
Figure 59: Tax Structures in Mexico, Latin America and the Caribbean, and the OECD, 2016.....	138
Figure 60: Vertical Fiscal Gaps in Selected Countries.....	147
Figure 61: Per Capita Own-Source Revenues by State.....	147
Figure 62: Property Taxes in Selected Countries (% of GDP).....	148
Figure 63: Per Capita Total Revenues (after transfers) by State.....	149
Figure 64: State and Local Government Debt, 2005- 2016 (MXN billions).....	150
Figure 65: The Aggregate SNG Debt Stock, 2005-2016 (% of GDP).....	150
Figure 66: State Government Debt as a Share of Non- Earmarked Revenues, 2008-2016 (%).....	151

## List of Tables

Table A1. Principales parámetros de los diferentes regímenes de pensiones al nivel federal.....	102
Table 1: National Wealth Estimates, Mexico and Upper-Middle-Income Country Average.....	106
Table 2 : Public Expenditure, 2014-2017 (% of GDP).....	139

## List of Boxes

Box 1. Initial results of pro-competition reforms between 2012 and 2017.....	62
--	----







# 1. Fostering Productivity Growth

**M**exico's economy has grown moderately over the last quarter century, with annual per capita GDP growth averaging just 1.2 percent between 1990 and 2017. The country's weak economic performance reflected a decline in productivity, which fell by 8 percent during that period. Mexico's productivity challenges are associated with large and widening regional disparities and the misallocation of resources between sectors and firms. Large productive firms integrated with Global Value Chains have not developed backward linkages to the rest of the economy and lagging regions. Meanwhile, widespread labor and firm informality contributes to the misallocation of productive resources. Reversing the decline in productivity will require an integrated strategy encompassing multiple policy areas and sectors. This broad strategy should include strategies discussed in other policy notes: (i) alleviating rigidities and distortions in labor markets and improving access to credit; (ii) alleviating existing rigidities and obstacles to competition across sectors and sub-sectors while following through with the structural reforms enacted; (iii) designing and implementing effective interventions at the subnational levels to enhance both product and factor markets; (iv) dealing with the financing of social insurance schemes; and (iv) strengthening rule of law institutions at the federal and local levels. This note focuses on critical aspects of the diagnostic around the productivity dynamics in Mexico. It also links the aspects of the strategy above-highlighted to specific policy recommendations on other Policy Notes of this set given the cross-cutting nature of productivity growth. It also focuses on providing policy directions on: (i) strengthening institutions and programs working directly on the productivity agenda; (ii) selected sub-national interventions to ease the regulatory burden; and (iii) proposing a broad and integrated strategy for fostering formalization.

# INTRODUCTION

1. For over two decades, Mexico’s economy has grown more moderately than those of other upper-middle-income countries. Between 1990 and 2016, its annual GDP per capita growth rate averaged just 1.2 percent, less than half the 3.5 percent average growth rate of upper-middle-income countries during the period.<sup>1</sup>

2. Decomposing the sources of growth reveals that a decline in productivity drove Mexico’s poor performance over the past several decades. Total factor productivity (TFP) is the only component of growth that has consistently diminished for the past 20 years, and falling TFP has partially offset gains from labor and capital accumulation to a lesser extent (Figure 1 and Figure 2). Historical and international comparisons highlight the key role of productivity in economic growth. Mexico’s TFP growth rate was positive between 1950 and 1970. Had TFP continued to grow at the same pace during the past two decades, Mexico’s GDP per capita would be 128 percent higher than its current level. Poland and Mexico had similar levels of GDP per capita in 1990, and had Mexico’s productivity grown at the same rate as Poland’s—keeping factor endowments constant—its GDP per capita would be 56 percent higher than it currently is.<sup>2</sup>

3. The recent structural reforms have the potential to promote productivity growth but they will require a thorough implementation. Given that the enactment of structural reforms in 2013-2015 coincided with a significant fall in oil prices, it is hard to assess the recent impact of structural reform. The structural reforms in the energy, financial and telecom sectors are crucial to improving key product and factor markets, while the education reform would improve the quality of labor. Competition and labor reforms can play a key role in both improving resource allocation

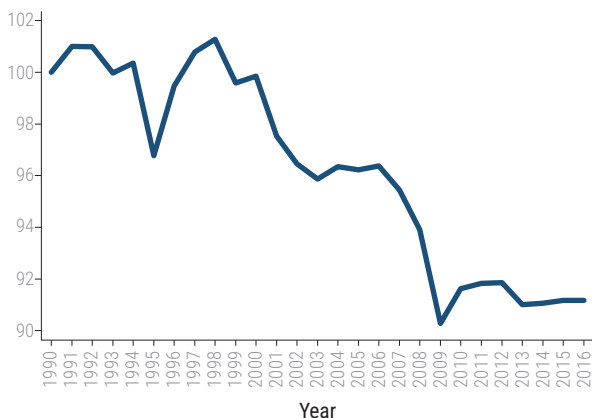
and removing barriers to firm growth. Some of the reforms will need time to display their full impact, but their early results show that there is a significant possibility that they would lead to a higher growth potential for the country if they are fully implemented. Furthermore, these reforms will require the complementary institutional and regulatory adjustment aimed at realigning incentives and reducing misallocation to achieve their full potential benefits.

## KEY CHALLENGES

4. Mexico exhibits large regional disparities in productivity growth, and its regions appear to be diverging economically over time. Stark differences in growth and poverty indicators are evident between the southeastern, northern, and northern-central regions (Figure 3). Productivity, measured by value added per worker, is five times higher in Mexico City than it is in Chiapas (Figure 3a). Relative levels of urbanization, differences in connectivity with the U.S. market, infrastructure, education, among other factors, are associated with these differences. Moreover, these disparities have widened over the last two decades (Figure 3b). Labor productivity in the states of Aguascalientes, Querétaro, Zacatecas, Nuevo León, and Chihuahua increased at an average annual rate of over 1 percent between 1993 and 2015, while labor productivity in Quintana Roo, Chiapas, Oaxaca, Tlaxcala, and Hidalgo declined.<sup>3</sup> Economic connectivity and market access contribute to these disparities, and in some cases expanding market access by improving road infrastructure could boost employment by as much as 2.1 percent, output by 7 percent, and employment specialization by 3.4 percent.<sup>4</sup>

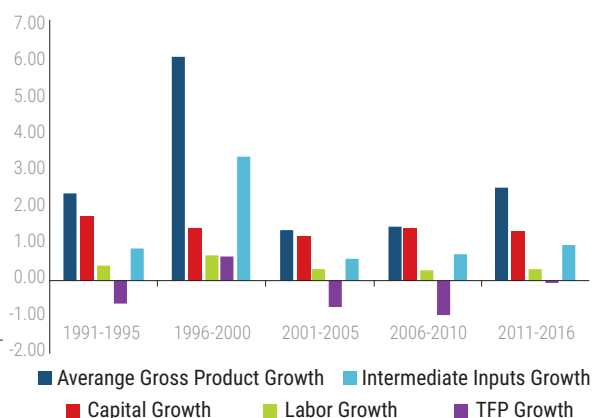
5. Mexico’s high rate of informality, which also drags productivity growth, reflects its still burdensome labor and other regulations. States with higher informality rates also tend to have lower labor productivity. At micro level, for-

**Figure 1: Total Factor Productivity Index, Mexico, 1990-2016 (1990=100)**



Source: World Bank staff calculations with data from INEGI.

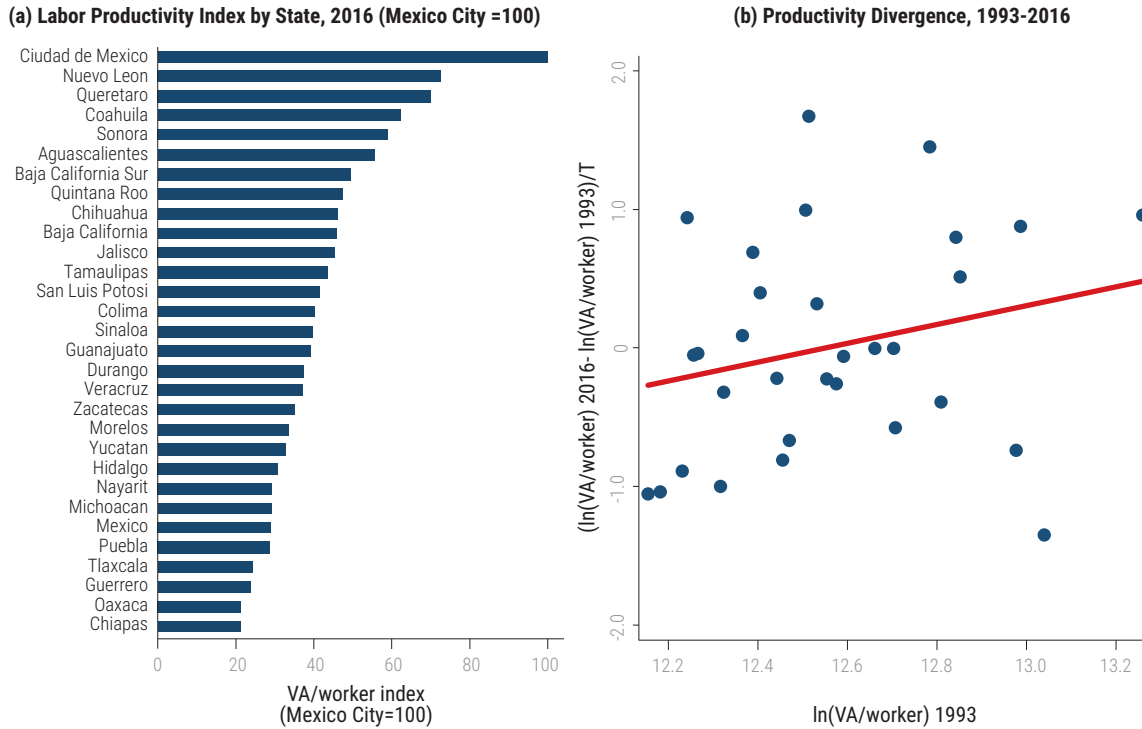
**Figure 2: Growth Decomposition, Mexico, 1991-2016**



Source: World Bank staff calculations with data from KLEMS, INEGI

1 World Bank (2018) World Development Indicators (WDI).  
 2 World Bank staff calculations using data from Feenstra et al. (2015) (TFP) and INEGI (GDP per capita).  
 3 If labor productivity in the latter group of states were the same as in Aguascalientes, their current GDP per capita would be 81 percent higher.  
 4 Blankespoor et al., 2017.

Figure 3: Labor Productivity at the State Level



Source: World Bank staff calculations based on data from INEGI

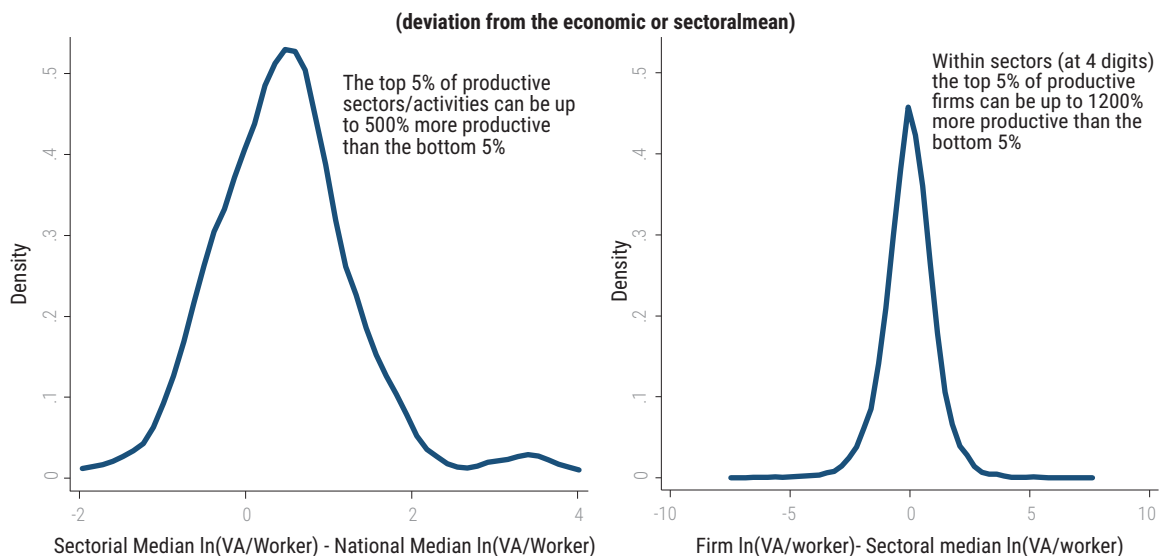
formal firms are 84 percent more productive than the informal firms of the same size.<sup>5</sup> Moreover, in the last twenty years, the number of informal firms and capital and labor allocated to them increased significantly, being one of the key factors contributing to misallocation.<sup>6</sup> Informality also slows the accumulation of human capital, compounding the problem of inefficient input markets.<sup>7</sup> In addition to self-selection into the informal sector<sup>8</sup> and despite recent positive reforms, onerous labor regulations—including taxes, social security contributions, and firing costs—are the root causes of informality as they generate, at the same time, an implicit subsidy to informality and an implicit tax on formality.<sup>9</sup> For example, firing costs, measured as severance pay for redundancy dismissal in Mexico’s major cities, are double those in Brazil and five times those in United Kingdom and France.<sup>10</sup> This high firing costs limit the ability of firms that hire formal workers to respond to shocks, therefore, generating incentives for informality.<sup>11</sup> The regulatory roots of informality generate, in turn, a dynamic problem as it slows down formal firms’ growth, affecting the life cycle of firms and their investment decisions about innovation, technology, and labor training.

**6. While productivity differences between sectors are large, productivity dispersion between firms within sectors are**

**even larger.** In recent years, as labor productivity in the manufacturing sector declined, its share of total labor fell. At the same time, productivity also decreased in the services and commerce sectors, yet their share in total labor increased. However, reallocation between sectors does not explain the sluggish productivity trend as maintaining sectoral labor shares constant at 1990 level would have only marginally improved productivity growth. Instead, it is misallocation within the three sectors the main culprit of low productivity growth. In fact, comparing the distribution of productivity across sectors (Figure 4) with the distribution of productivity across firms within each sector reveals that firm-level productivity is significantly more dispersed and has a larger standard deviation, with most firms below the sectoral average and a fat left tail of unproductive firms (Figure 5). Productivity dispersion is much higher in Mexico than it is in the United States or in any other Latin American country for which comparable data are available.<sup>12</sup> These productivity differences persist even within narrowly defined sectors, such as cut-and-sewn apparel manufacturing, where the most-productive firms are about 8 times more productive than the least-productive firms (Figure). Thus, the analysis suggests misallocation of factors between firms within sectors rather than misallocation between sectors as key feature of the Mexican economy.

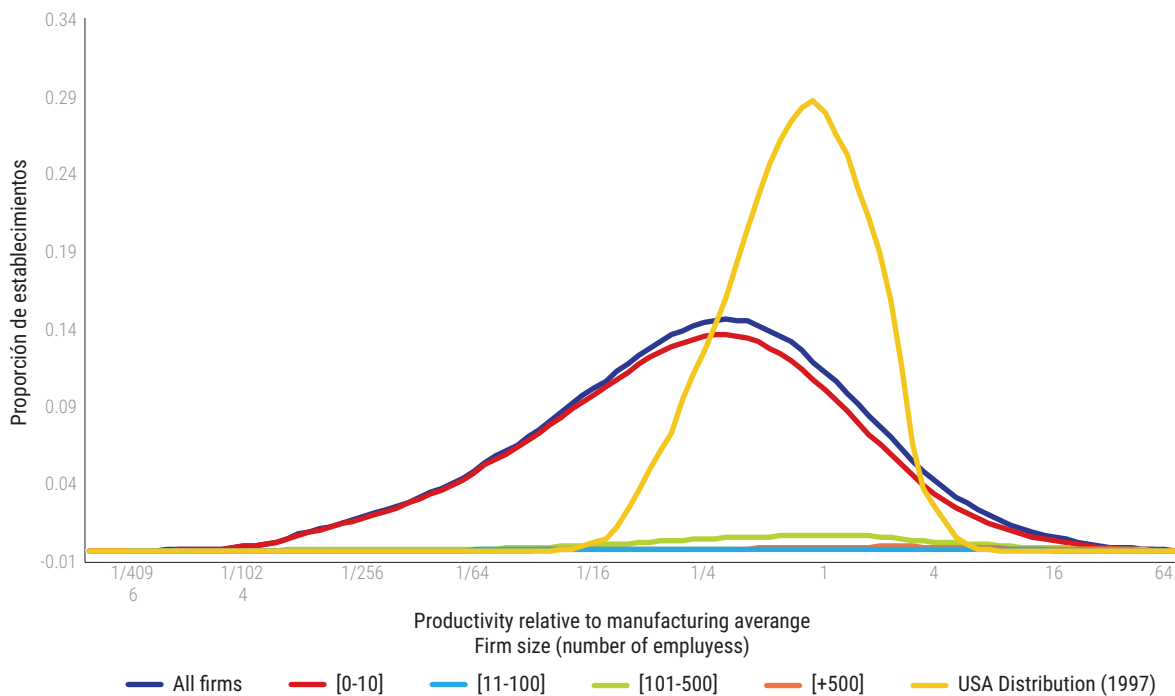
5 Busso et al., 2012.  
 6 Busso et al., 2012; Levy, 2018  
 7 Hanson, 2010; Arias et al., 2010.  
 8 Maloney, 2004.  
 9 Busso et al., 2012; Levy, 2018  
 10 For more information on the drivers of informality and possible solutions, see Policy Note 5 on Reforming Labor Policies to Encourage Formalization and Promote Productive Inclusion.  
 11 Levy (2018)  
 12 Busso et al., 2013

**Figure 4: The Distribution of Sectoral Productivity vs. the Distribution of Firm-Level Productivity**



Source: World Bank staff calculations with data from ENAPROCE 2015, INEGI

**Figure 5: Total Factor Productivity in the Manufacturing Sector by Firm Size, Mexico and the United States**



Source: World Bank staff calculations with data from INEGI and Pages (2010)

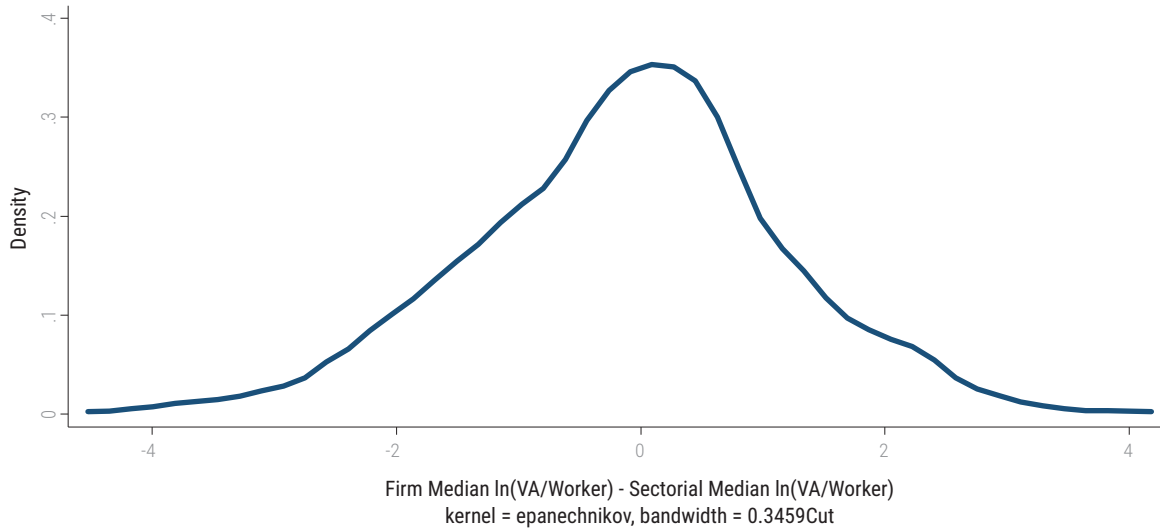
7. Micro, small, and medium enterprises (MSMEs) account for 99.8 percent of all firms in Mexico and 76.4 percent of employment, yet they only contribute 31.5 percent to total value added.<sup>13</sup> By contrast, MSMEs in countries such as Portugal and Spain account for a similar share of firms and employment, but their contribution to value added is almost double that of MSMEs in Mexico.<sup>14</sup> Due to competitive distortions, less-productive microenterprises in Mexico do not exit the market, while more-productive small

and micro enterprises are unable to grow significantly. This unhealthy dynamic for the economy has also generated a “missing middle”<sup>15</sup> effect in the manufacturing sector, which contains few highly productive small and medium firms (Figure 5).

8. The misallocation of resources among Mexican firms reflects the country’s rigidities in product and factor markets and the disincentives to formalization due to regulatory

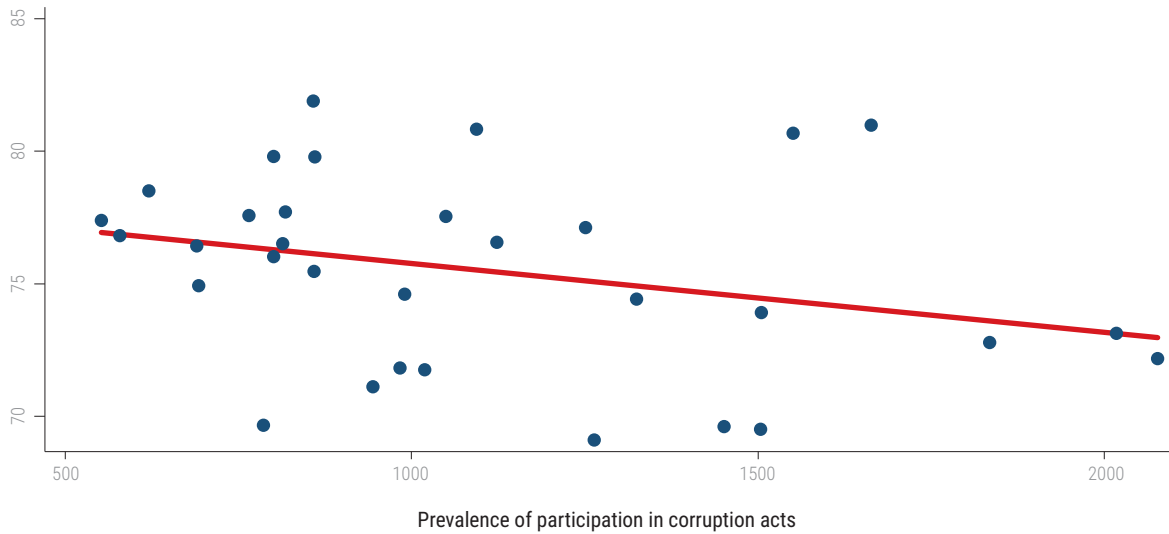
13 These figures are from Mexico’s 2014 Economic Census.  
 14 SME Finance Forum, MSME Country Indicators, 2011  
 15 Tybout, 2015

**Figure 6: Example of the Dispersion of Labor Productivity between Firms within Narrowly Defined Sectors: Cut-and-Sewn Apparel Manufacturing**



Source: World Bank staff calculations with data from ENAPROCE 2015

**Figure 7: Indicators of Corruption and the Ease of Doing Business, Mexico and Comparators, 2016**



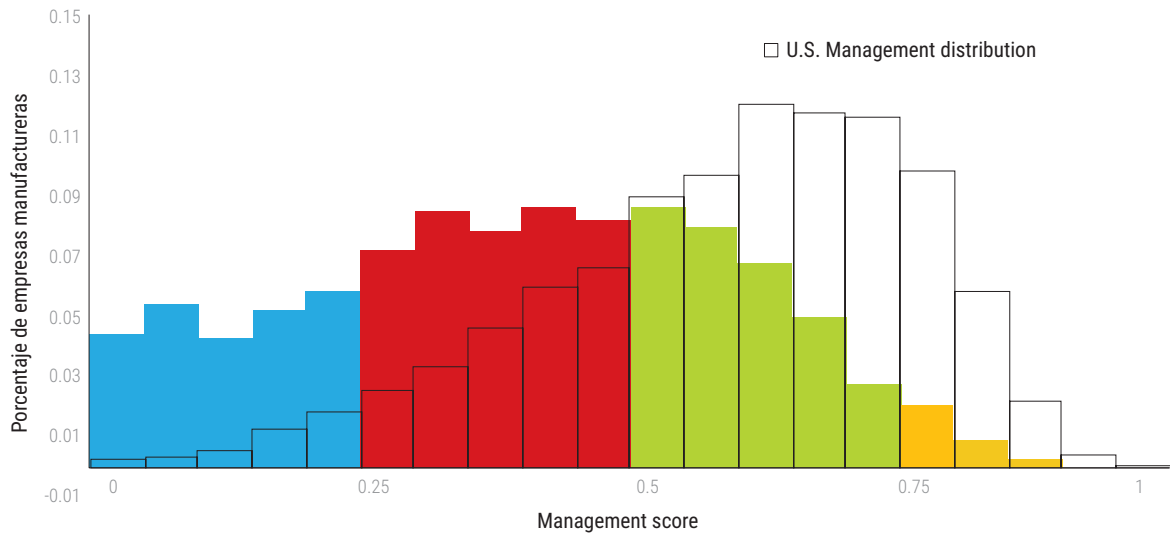
Source: World Bank staff calculations based on data from ENCRIGE 2016, INEGI, and the World Bank's 2016 Doing Business report.

distortions the social security obligations.<sup>16</sup> Despite improvements over the last years, limited access to credit markets contribute to the misallocation of resources and the “missing middle” effect. Only 12 percent of firms have access to financing, and microenterprises are especially credit-constrained.<sup>17</sup> There is still limited flow of credit to young, dynamic firms with high-growth potential.<sup>18</sup> At the same time, the still onerous costs of firing (including on the legal and regulatory side) and other labor rigidities deter labor demand in the formal sector. Moreover, the payroll tax (rates) linked to social security of salaried workers (see Note 5 on Labor Markets) creates disincentives for employers (taxes and other obligations) and employees (take home pay) for formalization. Additionally, many obstacles

remain at the local level despite commendable reforms at the national level (see below). If these distortions that also lead to misallocation were eliminated, the reallocation of resources from less-productive to more-productive firms could significantly boost aggregate productivity in Mexico.<sup>19</sup> In contrast, the corresponding estimates for the United States and China are just 43 and 86 percent, respectively,<sup>20</sup> underscoring the magnitude of the misallocation of productive resources in Mexico.

**9. The service sector is especially vulnerable to imperfect competition, as most services are delivered at the local level where significant obstacles persist and trade cannot create appropriate competitive pressure.** In some subsectors a

16 Busso, et al., 2012  
 17 ENAPROCE, 2015  
 18 Banerjee, 2014; Haltiwanger et al., 2013  
 19 By an order of magnitude up to 200 percent as suggested by Busso et al., 2012  
 20 Hsieh and Klenow, 2009

**Figure 8: Distribution of Management Practices, Mexico and the United States**

Source World Bank staff calculations based on data from ENAPROCE 2015, INEGI, and Bloom et al., 2013.

small group of firms in each local market enjoys large markups.<sup>21</sup> High prices for inputs such as logistics, professional services and telecommunications services<sup>22</sup> tend to put smaller firms and startups at a disadvantage, especially firms that rely heavily on such services, and given their size cannot internalize them. Moreover, weaknesses in the rule of law, excessive local regulations and corruption<sup>23</sup> exacerbate the misallocation of productive resources and encourage firms to remain small and “under the radar” to limit their interactions with public authorities and benefit from incentives for smaller firms.<sup>24</sup>

10. **Beyond the misallocation of productive resources between firms, within-firm growth explains (year on year)<sup>25</sup> about two-thirds of total annual TFP growth in the manufacturing sector,<sup>26</sup> which also highlights the importance of building firm-level capabilities.** Mexico is far from the global technological frontier, and many manufacturing firms fall short of even the domestic frontier. Enhanced management practices can boost firm-level productivity, and recent studies have found that they may account for over 30 percent of cross-country differences in productivity.<sup>27</sup> Management practices in Mexico are generally poor, and the management scores of the country’s top firms are close to the median of the U.S. distribution (Figure 8).<sup>28</sup>

11. **Insufficient investment in innovation and research and development (R&D) also affect productivity at the firm level.** Only about 14 percent of small, medium, and large Mexican firms invest in innovation, and less than 2 percent report pursuing R&D activities. Although many programs implemented at both the national and subnational levels

support investment in innovation and R&D, programmatic duplication and fragmentation weaken their effectiveness. For example, programs implemented by the National Institute of the Mexican Entrepreneur (*Instituto Nacional del Emprendedor Mexicano*, INADEM) overlap with some National Science and Technology Council (*Consejo Nacional de Ciencia y Tecnología*, CONACYT) programs. State-level interventions are also subject to duplication. Moreover, all programs tend to focus on investment in the early stages of the innovation process, without adequate follow-up at higher levels of technological maturity. Innovation and R&D decisions and strategies also appear to be inconsistent. For example, a tax credit for R&D was eliminated in 2010 and then reinstated in 2017 without any apparent assessment of its effectiveness.

12. **There is an important connection between high level of misallocation “between” firms and poor “within” firm productivity growth.** It is important to stress that high levels of misallocation are likely to reduce incentive for firms to accumulate firm-level capabilities and innovate as the returns from these investments are lower when misallocation and distortions are high.

## POLICY OPTIONS

13. **Reversing the decline in productivity will require an integrated strategy encompassing multiple policy areas and sectors.** This strategy should include: (i) alleviating rigidities and distortions in factor markets (see Policy Notes 4, 5); (ii) alleviating rigidities and obstacles in product markets (see Policy Notes 2, 3 and 6); (iii) dealing with the

21 For more information on barriers to competition and reforms to improve market efficiency, see Policy Note 6 on Refining the Institutional and Policy Framework for Competition.

22 For more information on challenges in the telecommunications sector, see Policy Note 3 on Fostering Digital Development.

23 For more information on the drivers of corruption and specific proposal to address it, see Policy Note 14 on Fostering Transparency and Accountability to Curb Corruption.

24 A recent nationally representative firm-level survey (ENGRIGE 2016, INEGI) found that firms are most likely to engage in corruption to speed up procedures and avoid sanctions.

25 Year on year calculation tend to over-emphasize the importance of the “within” firm growth component.

26 Brown et al., 2015

27 Syverson, 2011; Bloom et al., 2016

28 ENAPROCE, 2015



financing of social insurance schemes (see Policy Notes 8 and 9) and (iv) strengthening rule of law institutions at the federal and local levels. The rest of this note focuses only on: strengthening institutions and programs working directly on the productivity agenda; selected sub-national interventions to ease regulatory burden; and proposing an ambitious and inter-sectoral strategy for fostering formalization.

## Strengthening Institutions and Programs Working on Productivity Issues

**14. The role of National Productivity Committee (Comité Nacional de Productividad, CNP) and Economic Productivity Unit (Unidad de Productividad Económica, UPE) could be strengthened.** Following the 2015 Productivity and Competitiveness Law, which establishes the roles and attributions of the CNP and UPE, it is necessary to ensure that the implementation of this law complies with the following needs. First, UPE should become more independent and be strengthened as a high-level institution, technically strong, well-staffed and respected, tasked with proposing and assessing reforms to promote productivity and overseeing the implementation of the CNP's recommendations. This reform could follow the examples of the Productivity Commissions established by Chile and Australia, or Mexico's own National Committee for the Evaluation of Social Policy (*Consejo Nacional de Evaluación de la Política de Desarrollo Social, CONEVAL*). In Chile, the Productivity Commission<sup>29</sup> is an independent and high-level institution tasked with proposing and assessing reforms to promote productivity. The government is expected to either follow through on its recommendations, or provide a technical justification for not following them. Australia's Productivity Commission plays a similar role. In Mexico, CONEVAL provides a useful example of an independent advisory body with substantial resources and institutional clout. Second, the CNP, while a high-level public-private body chaired by the Minister of Finance<sup>30</sup> with a strong mandate, needs to strengthen the enforcement of its recommendations,<sup>31</sup> and define clear implications and sanctions for lack of their implementation.<sup>32</sup> Similarly, the CNP should maintain its high-level profile and play a key role as the institutional space responsible for coordination between key ministries and non-governmental institutions (i.e. universities, private sector) to define strategic guidelines and recommendations to promote entrepreneurship, formalization and key multi-sectoral challenges. Third, the M&E chapter of the law should be fully implemented and include, among other evaluations, a periodic firm-level survey encompassing a representative sample of manufacturing and services firms in each state which would allow poli-

cymakers to track the evolution of productivity and its determinants both at federal and state level.<sup>33</sup> Fourth, it is important that the design of the Special Program of Productivity and Competitiveness, outlined in the Law as part of the National Development Plan (PND), ensures that the UPE works on the basis of a well-defined annual workplan approved by the CNP rather than focusing on short-term priorities and demands of the SHCP.

**15. Strengthening the effectiveness of INADEM will be important.** INADEM plays a crucial role in supporting enterprise development and entrepreneurship through its SME Fund (*Fondo PyMEs*).<sup>34</sup> INADEM operates numerous programs, but only some of them are grounded in rigorous evidence and effectiveness evaluation. INADEM provides support to SMEs almost exclusively through "open calls" (*convocatorias*), yet a range of mechanisms (e.g., vouchers, innovative financing schemes, etc.) can be used to support firm-level productivity, encourage the adoption of better management practices, and improve access to finance for enterprises with high growth potential. INADEM could be strengthened by: (i) launching an independent review of its large program portfolio; (ii) strengthening the programs' criteria to foster firm growth in terms of number of employees and other aspects; (iii) requiring that any public intervention be rigorously justified and that its impacts be regularly evaluated; and (iii) building INADEM's organizational capacity, especially in the area of monitoring and evaluation or outsourcing this to UPE with a clear mandate.

**16. A systematic assessment of enterprise development and entrepreneurship support programs will be necessary to enhance their impact on productivity.** Under the institutional leadership of the Ministry of the Economy (*Secretaría de Economía*), INADEM, CONACYT, and SHCP, the federal government and many state governments invest substantial resources in programs designed to promote productivity and innovation among entrepreneurs. However, duplication and fragmentation limit the effectiveness of these programs, and decisions to introduce or discontinue specific interventions are not based on rigorous empirical evidence. A thorough review of enterprise development and entrepreneurship programs could help to: (i) identify opportunities to consolidate or harmonize programs, (ii) assess the relative effectiveness of alternative programmatic approaches, and (iii) evaluate the cost-efficiency of different interventions. These evaluations should become routine, and their results should inform the design of new programs. Investment in enterprise development and entrepreneurship support must be accompanied by efforts to promote competitive and well-functioning markets, as the incentives created by a competitive business environ-

29 See <http://www.comisiondeproductividad.cl/> for Chile and <https://www.pc.gov.au/> for Australia.

30 While its "honorary" chair is the President of the Mexican Republic only twice the CNP meeting has been chaired by the President in the last 5 years.

31 These recommendations are "de jure" binding for Federal Government Officials but "de facto" there is no established sanction or consequence for the lack of their follow up.

32 For instance, in the case of the Chile's productivity commission the Government is by law obliged to follow through its recommendations or provide a technical justification for not following them.

33 The National Productivity and Competitiveness Survey for MSMEs (*Encuesta Nacional sobre Productividad y Competitividad de las Micro, Pequeñas y Medianas Empresas, ENAP-ROCE*) would provide a useful example. See [http://www.inegi.org.mx/est/contenidos/proyectos/encuestas/establecimientos/otras/enaproce/default\\_t.aspx](http://www.inegi.org.mx/est/contenidos/proyectos/encuestas/establecimientos/otras/enaproce/default_t.aspx)

34 *Fondo PyMEs'* budget has risen from MXP10 billion (US\$750 million) in 2014 to MXP7.8 billion pesos (US\$430 million).

ment are vital to the success of firm-level programs and industrial policies.<sup>35</sup>

**17. Supporting the adoption of improved managerial practices could enhance firm-level productivity.** As most Mexican firms currently operate far from the technological frontier, improving firm productivity will require focusing on building firm capabilities and encouraging the adoption of good management practices before investing in innovation and R&D. Completing at least one managerial improvement program should be a prerequisite for entrepreneurs for participating in programs designed to promote innovation and R&D.<sup>36</sup>

### *Implementing Interventions at the Sub-National Level*

**18. Improving connectivity to markets by investing in infrastructure and making logistic services more efficient could help lagging regions catch up to the rest of the country.** Mexico's declining productivity is partly driven by its economically disadvantaged regions, and promoting regional convergence will require targeted geographical interventions. In addition, a demand-driven suppliers' development program could connect large investors to local SMEs while consolidating existing programs that support productivity and promote the development of firm capabilities. A site-specific skills development program, agreed and cost-shared with private firms, could attract investors and better equip workers to meet the demands of employers. Reducing the mismatch between workers' abilities and the skills demanded by firms will require both investment in workforce training and the creation of systems to reduce information asymmetry in the labor market.

**19. Regulatory streamlining is needed to improve the business climate at the subnational levels (and federal level as well).** Competitive markets (with fair market mark-ups) require simple and consistent regulations both at federal and local level. Excessive regulatory compliance costs distort market competition, encourage informality, and invite corruption. Local governments could greatly simplify business regulations by establishing one-stop shops for licenses and permits and enabling investors to interface with the public administration in a more transparent manner.

Detailed recommendations for improving the regulatory framework and boosting competition at the local level are presented in Policy Note 6 on Refining the Institutional and Policy Framework for Competition.

### *Developing an Integrated Strategy to Address Informality*

**20. Informality is a complex, multi-policy, and multi-agency challenge, and addressing it will require a comprehensive strategy supported at the highest level of the administration.** Building on the positive 2017 labor reforms, which reduced firing costs and increased the flexibility of contracts, the strategy should support the further elimination of burdensome labor-market regulations by eliminating various contingent costs (including of the firing process) that may have a good protection intent, but discourage formal hiring and thus formal protection of more workers. It would also require a close look at the taxation system that finances social insurance programs as well as other taxes and subsidies at the firm level. And would also need a review of other regulatory issues such as contract enforcement. Moreover, there seems to be an endogenous relationship between productivity and informality, and thus other policies that impact productivity may need to come into play. Tackling this thorny issue is difficult in a piece meal fashion. It requires the coordination of all the issues above discussed, and some other. This requires that the highest government authority sets a structure, leadership, and discipline for the work and reforms needed.

**21. A first step is a thorough revision of the many positive measures already implemented and of all barriers to formality (the overall "formality tax") that are still pending to be tackled.** Then it is critical that a multi-disciplinary team be working on the task, and can make fit all the reform proposals together to ensure internal consistency of policies and incentives, and fiscal viability. This process should also bring all stakeholders to the table. Other Policy Notes, including Policy Note 4, 6, 9 and 13 give some ideas that could be part of the discussion, including in the areas of taxation, social insurance programs, firm and competition regulatory issues, technology and business services, access to finance, and access to public procurement, among other.

<sup>35</sup> Aghion et al. 2015, Iacovone et al. 2016a, 2016b.

<sup>36</sup> This approach was developed by CORFO in Chile. Other experiences that could provide relevant lessons include programs to improve managerial capacity in Japan, Korea, and Singapore (Cirera and Maloney, 2017, 2018).

## References

- Aghion, Philippe, Jing Cai, Mathias Dewatripont, Luosha Du, Ann Harrison, and Patrick Legros. (2015). "Industrial Policy and Competition." *American Economic Journal: Macroeconomics*, 7(4): 1-32.
- Arias, Javier, Oliver Azuara, Pedro Bernal, James J. Heckman, and Cajeme Villarreal. (2010). "Policies to Promote Growth and Economic Efficiency in Mexico." Institute for the Study of Labor Discussion Paper 4740
- Banerjee, Ryan (2014). SMEs, Financial Constraints and Growth, BIS Working Paper N. 475.
- Blankespoor, B., Bougna, T., Garduno Rivera, R., & Selod, H. (2017). Roads and the geography of economic activities in Mexico.
- Bloom, Brynjolfsson, Foster, Jarmin, Saporta-Eksten and Van Reenen, J. (2013). Working papers, U.S. Census Bureau, Center for Economic Studies.
- Bloom, N., Sadun, R., & Van Reenen, J. (2016). *Management as a Technology?* (No. w22327). National Bureau of Economic Research.
- Brown, J. D., Crespi, G. A., Iacovone, L., & Marcolin, L. (2015). Productivity Convergence at the Firm Level: New Evidence from the Americas. *Growth*, 2, 1-5.
- Busso, M., Fazio, M. V., & Levy Algazi, S. (2012). (In) formal and (un) productive: the productivity costs of excessive informality in Mexico. IADB Working Paper.
- Busso, M., Madrigal, L. & Pagés, C. (2013). Productivity and resource misallocation in Latin America. *The BE Journal of Macroeconomics*, 13(1), 903-932.
- Cirera, X., & Maloney, W. F. (2017). *The Innovation Paradox: Developing-Country Capabilities and the Unrealized Promise of Technological Catch-Up*. World Bank Publications.
- Cirera, X., & Maloney, W. F., Sarrias, M. (2018) Management Quality as an Input for Innovation in Developing Countries. Mimeo.
- Feenstra, Robert C., Robert Inklaar and Marcel P. Timmer (2015), "The Next Generation of the Penn World Table" *American Economic Review*, 105(10), 3150-3182, available for download at [www.ggd.net/pwt](http://www.ggd.net/pwt)
- Haltiwanger, J., Jarmin, R. S., & Miranda, J. (2013). Who creates jobs? Small versus large versus young. *Review of Economics and Statistics*, 95(2), 347-361.
- Hanson, G. H. (2010). Why isn't Mexico rich?. *Journal of Economic Literature*, 48(4), 987-1004.
- Hsieh, C. T., & Klenow, P. J. (2009). Misallocation and manufacturing TFP in China and India. *The Quarterly journal of economics*, 124(4), 1403-1448.
- Iacovone, L., Pereira-López, M., & Schifffbauer, M. (2016a). ICT Use, Competitive Pressures, and Firm Performance in Mexico. *The World Bank Economic Review*, 30, S109-S118.
- Iacovone, L. & Pereira- Lopez, M. & Schifffbauer, M. (2016b). "Competition makes IT better : evidence on when firms use IT more effectively," Policy Research Working Paper Series 7638, The World Bank.
- Iacovone, L., Jiménez, F., Sánchez-Bella, P., Yuki, K. (2017). Building shock absorbers: The role of better local business regulations in response to a large external shock, Mimeo, Washington D.C.; Banco Mundial.
- INEGI (2018), Banco de Información Económica (BIE), Aguascalientes, Mexico, INEGI. Retrieved from: <http://www.inegi.org.mx/sistemas/bie/>
- INEGI (2016). ENAPROCE 2015, Aguascalientes, Mexico, INEGI. INEGI (2017). ENCRIGE 2016, Aguascalientes, Mexico, INEGI.
- INEGI (2017), Sistema de Cuentas Nacionales de Mexico: Productividad Total de los Factores, 1991-2016, Aguascalientes, Mexico, INEGI. Retrieved from: <http://www.inegi.org.mx/est/contenidos/proyectos/cn/ptf/default.aspx>
- International Monetary Fund (2017). Country Report No. 17/147
- Levy Algazi, S. (2018). Under-Rewarded Efforts: The Elusive Quest for Prosperity in Mexico. Inter-American Development Bank.
- Maloney, W. F. (2004). Informality revisited. *World development*, 32(7), 1159-1178.
- Ministerio de Economía y Finanzas de Perú (2017). Estrategia de Formalización de la Economía Peruana.
- Pagés, C. (2010). The Age of Productivity: Transforming Economies from the Bottom Up (No. 31278). Inter-American Development Bank.
- Restuccia, D., & Rogerson, R. (2017). The causes and costs of misallocation. *Journal of Economic Perspectives*, 31(3), 151-74.
- SME Finance Forum (2014). MSME Country Indicators. Retrieved from: <https://www.smefinanceforum.org/data-sites/msme-country-indicators>.
- Syverson, C. (2011). What determines productivity?. *Journal of Economic literature*, 49(2), 326- 365.
- Tybout, James (2015). The missing middle revisited. *American Economic Review Papers and Proceedings*, May 2015.
- World Bank (2018). World Development Indicators (WDI), Washington, D.C. Retrieved from: <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>



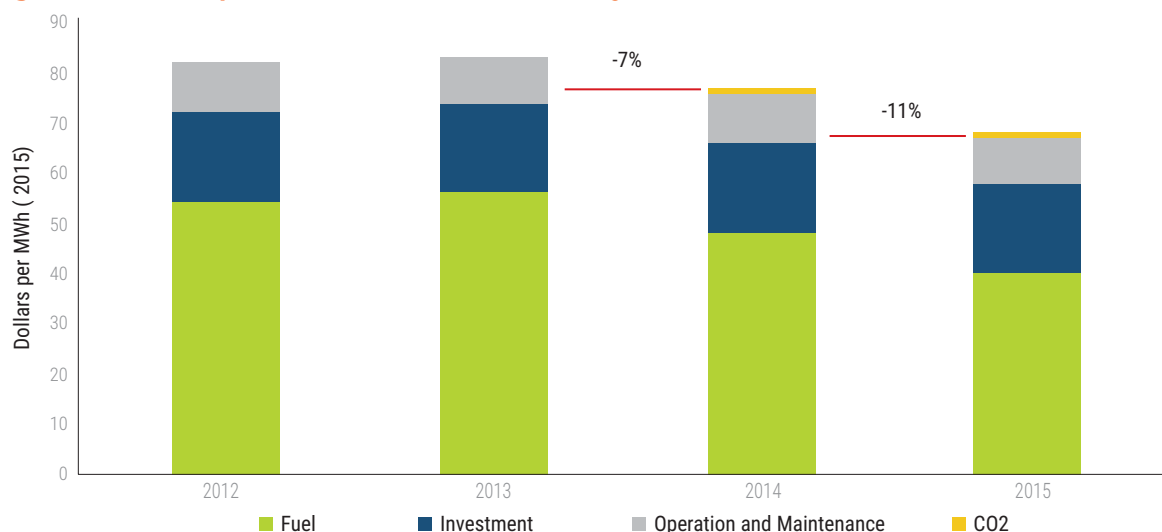
## 2. Implementing Energy Sector Reform

**T**he comprehensive energy reforms passed in 2013-14 are creating new market structures and stimulating investment in the energy sector, with significant potential for future economic growth. However, further implementation efforts will be necessary to realize the full benefits of the reforms and complete the transition to a competitive, well-regulated energy market that effectively leverages cleaner energy sources and takes full advantage of modern technologies. Moreover, inclusive growth requires that firms and households have access to affordable and reliable power sources, across the country. Expanding the share of renewable and lower-carbon alternatives in the generation mix can also help ensure that economic growth is environmentally sustainable. Going forward, the following priorities for the energy sector should be considered: (i) sustained nationwide investment in infrastructure, particularly attracting private investment and financing, and improving investment prioritization (ii) stronger institutional capacity while providing policy certainty, (iii) improved price signals, (iv) policies and regulations that support the adaptation of the system to emerging technology innovation, and (iv) the accelerated adoption of digital and data-driven solutions by market operators and incumbents.

### INTRODUCTION AND REFORM PROGRESS

22. In December 2013, the Government of Mexico amended the Constitution to introduce a set of sweeping energy-sector reforms covering the oil, natural gas, and electricity subsectors. These ambitious reforms were designed to attract private investment and increase economic efficiency across the supply chain while lowering energy

prices, improving transparency, and promoting environmental sustainability. The reforms created a new policy, legal, and regulatory framework for the energy sector. They converted two major state-owned enterprises—Mexican Petroleum (*Petroleos Mexicanos*, PEMEX) and the Federal Electricity Commission (*Comision Federal de Electricidad*, CFE) into “state productive enterprises,” launched a series of bidding processes for private participation in the oil, gas, and electricity subsectors, and created new

**Figure 9: The Composition of Wholesale Electricity Costs in Mexico**

Source: IEA, 2017

Note 1. Mexico introduced a tax on fossil fuel sales in January 2014 (excludes natural gas) as carbon emissions reduction measure.

market platforms to promote competition and attract new players.<sup>37</sup>

**23. These reforms have an especially strong potential to boost FDI and medium-term growth.** Expected FDI expected through the reforms is between US\$150-170bn over the next years, which could boost the FDI current structure and can have a significant impact on GDP growth potential. Ending PEMEX's state monopoly in the oil sector is expected to reverse the decline in oil production and exports observed during the past decades. Reforms to the power and natural gas subsectors can have a great impact on firms and households. If implementation takes place as expected, they would reduce the cost of a key firm input and a major household expenditure category. This in turn would generate important economy-wide improvements in productivity and household disposable income. These subsectors are also closely linked, as natural gas has replaced oil as the primary fuel for power generation, helping to reduce the marginal cost and carbon emissions.

**24. Hydrocarbon sector reform focuses on increasing the productivity of PEMEX while attracting foreign investment to the industry.** Private companies can now participate in the exploration and extraction of hydrocarbons as well as in refining, gas processing, transportation, storage distribution and petroleum market activities. Several rounds to tender contracts for upstream investments awarded 107 hydrocarbon exploration and extraction licenses between 2015 and 2018 that, if successful, could generate an estimated investment of US\$161bn. The low oil price during the early stages of reform implementation may have prevented and delayed investments, though the contracts awarded as well as additional tenders could increase oil production from less than 2 million bbls/d in 2018 to 3-3.5

million bbls/d by 2040.<sup>38</sup> Reform of the corporate structure and governance of PEMEX, an overhaul of the company's pension system introducing more flexibility in its labor relations as well as significant cost cutting measures in the areas of procurement and investment should, if continued, increase cost efficiency and allow the company to concentrate on profitable exploration and production opportunities, in partnership with other companies. Despite the relevance of oil in the energy sector modernization, energy security and as a means boost to overall output growth, this note focuses on the challenges faced in electricity, natural gas and sustainable energy as the Bank has developed expertise through policy dialogue and project implementation activities in these areas in the case of Mexico.

**25. Significant investment commitments in the electricity and hydrocarbon sectors as well as the entrance of new firms have already marked the beginning of the transformation.** Lower prices for imported natural gas and oil, and the substitution of natural gas for fuel oil in power generation, have contributed to an 18 percent decline in the average cost of electricity supply since 2013. This has already reduced the cost of what is both an important item of household expenditure and a key input to commercial and industrial businesses. However, the impact of the reform on electricity price through increased investment and competition in generation is expected to materialize over the medium term. Late-2017 saw the announcement of the results of the third long-term electricity auction to take place since the energy reform, relating to the installation of a further 2.6 GW in mostly-renewable power generation capacity (on top of the 4.9 GW in capacity arising from the two auctions in 2016). Together, contracts awarded through the three auctions are expected to generate \$8.6bn in investment by 2021. The average prices of winning bids

<sup>37</sup> For a detailed description of the reform process, see Chanona, 2016; Vitor et al, 2017; and *Comision Reguladora de Energia*, 2018.

<sup>38</sup> IEA (2016) Mexico Energy Outlook



have fallen in successive auctions, resulting in some of the lowest prices globally for such contracts (\$20.57 / MWh in the third auction, down from \$33.47 / MWh in the second auction in 2016). These results hold out the promise of even more competitive pricing benefiting end-consumers in the future. In addition, new regulations on distributed generation (net metering, net billing and total sale) allow consumers to generate, consume, store, and sell electricity to the grid with “behind-the-meter” small-scale power generation in households and businesses, opening new opportunities for higher quality of service and lower prices (e.g.; rooftop solar photovoltaic with batteries). Distributed generation in Mexico is growing at exponential rates since 2013.<sup>39</sup> In the natural gas industry, the extension of pipeline infrastructure south from the U.S. border, along with increases in their capacity, have also allowed more Mexicans to benefit from imports of low-cost shale gas. Lower gas and electricity prices have already benefitted the dynamic manufacturing sector in northern and central Mexico, although sustained investment in natural gas domestic production and pipeline infrastructure, will be necessary to expand access to natural gas throughout the country.

26. Mexico’s reformed energy-sector institutions have achieved significant progress in establishing new market structures, but key challenges remain. Further efforts will be necessary to foster competitive, equitable and economically efficient markets, to decarbonize the energy mix, adopt cutting-edge technologies to boost efficiency, and create a pipeline of strategic projects with the needed financing.

## KEY CHALLENGES

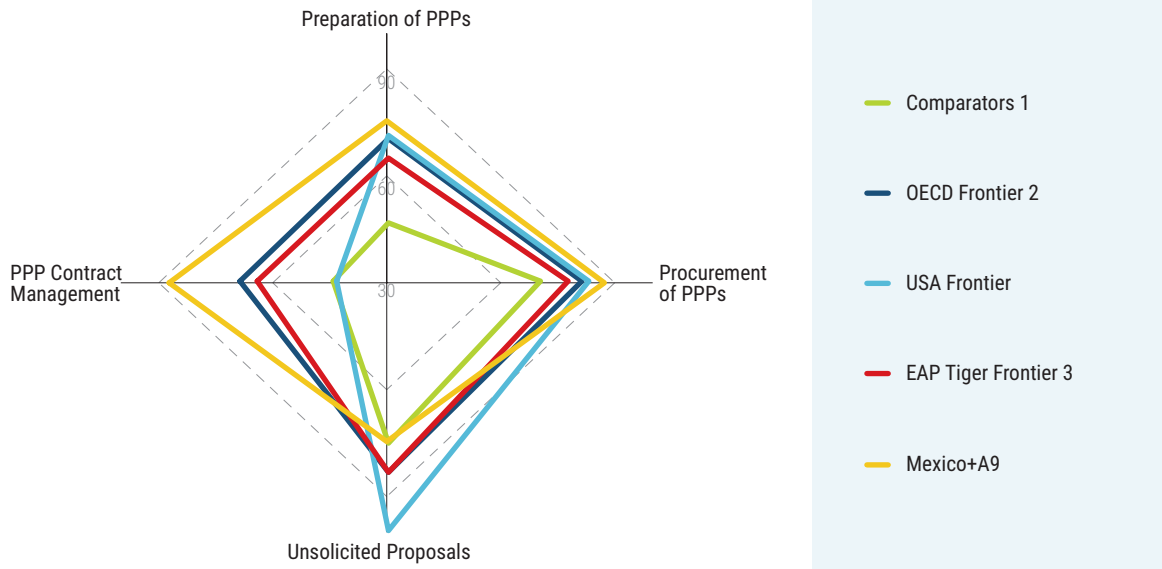
### Market Competition, Equity, and Efficiency

#### Electricity

27. The power sector reform established a complex market architecture, one that will take time to fully implement. Although the new system has replicated most of the standard features of power –sector reforms around the world—notably the Pennsylvania-Jersey-Maryland (PJM) model—it is also unique in two critical aspects. First, whereas most electricity markets allow for competition at least in the distribution segment, and in many Latin American and Caribbean (LAC) markets transmission expansion is also competitive, Mexico’s transmission and distribution system remains under the control of the incumbent utility, CFE. Second, Mexico’s electricity sector is highly complex in terms of the number of markets, products, and types of contracts, as well as the regulations and procedures for overseeing and administering transactions.<sup>40</sup> Mexico’s energy-sector agencies now face the challenge of rapidly implementing complex institutional and regulatory frameworks, which may strain administrative capacity.

28. Residential energy subsidies are regressive and costly. Falling energy prices have enabled the government to start adjusting electricity subsidies, and the average tariff was reduced by about 10 percent between 2010 and 2015.<sup>41</sup> The structure of the residential subsidy, however, remains highly regressive, and further efforts to phase it out could improve both expenditure efficiency and equity while generating new fiscal space.<sup>42</sup> The subsidy to res-

Figure 10: PPP Procurement Efficiency, Mexico and Comparators



1. Comparators: China, Malaysia, Turkey, Romania and Thailand  
 2. OECD: Australia, Canada, Chile, France (PPP), Italy, Korea, Rep., Poland, Portugal, Turkey, United Kingdom  
 3. EAP Tigers: China, Korea and Singapore

39 Reaching 434 MW in 2017 and expected to grow to 6.7 GW in 2023 (CREG, 2018).  
 40 For example, the market allows multiple approaches for structuring bilateral contracts: (i) bilateral power-purchasing agreements (PPAs), (ii) equity investments with PPAs, (iii) equity investments without PPAs, (iv) design-build-finance-operate contracts (DBFOs), and (v) PPAs via competitive procurement.  
 41 IEA, 2017. The reforms began the process of transferring the subsidy burden from CFE to the Ministry of Finance (SHCP) by introducing it as an explicit item in the national budget.  
 42 SENER, 2017. The total cost of Mexico’s electricity subsidies reached approximately US\$5.5-5.75 billion in 2016.

idential electricity cost an estimated \$6.2bn, or 0.54% of GDP, in 2017.<sup>43</sup>

**29. Further cost reductions will require increased efficiency across the value chain, including through the accelerated adoption of advanced technologies and reduced distribution losses.** Compared to many global and regional peers, Mexico fares relatively well on core performance indicators such as electricity tariff levels and network losses, yet its system is still far from international best practice frontiers. For example, electricity tariffs for residential and industrial users in Mexico are now closer to OECD levels, but they remain well above those in the United States despite low natural gas prices, and commercial users in Mexico continue to face high electricity tariffs. The recent decline in electricity tariffs largely reflects external factors, and considerable scope remains—especially for the CFE—to further reduce costs across the value chain by harnessing clean-energy resources and adopting new technologies such as smart grids and digital solutions. Transmission losses are mainly caused by technical inefficiencies, and distribution losses caused by theft, metering inaccuracies, and data-handling errors.<sup>44</sup> Reducing these losses will require expanding and modernizing the T&D infrastructure.

**30. The mobilization of private sector investment could play a larger role in financing investment in T&D infrastructure, if the project preparation and structuring were improved.** The CFE still holds a large share of the generation market, at about 62 percent of total installed capacity, and it maintains its T&D monopoly. However, the new legal framework allows it to form strategic alliances or use PPPs to develop new T&D lines. Greater private participation could help address some of the industry's most pressing challenges, such as reducing energy losses, deploying smart-grid technology, digitalizing the grid, managing congestion, and integrating renewable energy into the grid. However, although in general Mexico has a relatively strong capacity at the federal level to develop PPPs in infrastructure (Figure 10), the capacity of CFE to prepare and structure PPPs in T&D is evolving and demonstrate particular scope for improvement (notably on identifying risks and assessing the market conditions and bankability).

**31. The new regulatory framework mandates a shift from a subsidized, zone-based pricing system to locational marginal pricing, which is expected to improve the operational efficiency of the electricity network, but accomplishing this shift will require allocating financial transmission rights (FTRs) transparently and creating effective incentives to invest in transmission expansion.** Mexico's transmission grid needs significant upgrades and expansion. The energy reform introduced a new system of nodal prices to refine and improve price signals for transmission expansion and FTRs

to reduce the risk that price fluctuations resulting from transmission congestion pose to market participants.<sup>45</sup> SENER and the Energy Regulatory Commission (*Comisión Reguladora de Energía*, CRE) must design the nodal pricing system, define initial FTR allocations, and subsequently recalculate subsidies in a more progressive way to better target low-income households. Key challenges include: (i) allocating FTRs appropriately,

**32. (ii) ensuring that price signals effectively attract investment in transmission expansion, and (iii) enhancing institutional efficiency.**<sup>46</sup> In addition, using legacy FTRs as the basis for introducing progressive subsidies presents an important institutional challenge, since energy subsidies in Mexico are not handled by the CRE, the National Energy Control Center (*Centro Nacional de Control de Energía*, CENACE), or SENER, but rather by the Ministry of Finance and Public Credit (*Secretaría de Hacienda y Crédito Público*, SHCP). Thus, decision-making around energy subsidies is controlled by an entity whose aims and distributional concerns extend beyond the electricity sector. Recent analysis suggests, moreover, that the current “cost-plus” regime may not be sufficient to regulate network investments, and that the CRE will need to consider other incentives in its future transmission-tariff methodology, implying a shift from cost-of-service to incentive-price regulation.<sup>47</sup>

**33. The process of restructuring the CFE into a corporatized public-sector utility is underway, but it remains incomplete.** The authorities began unbundling the vertically integrated utility in January 2016 to promote competition, reduce barriers to entry, increase operational efficiency and transform the CFE into a financially sustainable entity. The CFE has been restructured into a holding company with subsidiaries separated for functional and accounting purposes. As part of a new emphasis on transparency, the CFE is obliged to disclose corporate and technical information, and it is now subject to performance evaluations. However, the process of modernizing the CFE has been gradual, and there is a risk that its newly formed subsidiaries may continue to communicate among themselves, and even with CENACE, whose personnel previously performed similar functions under the vertically integrated CFE.

**34. As a large incumbent electric utility, the CFE's power and potential strategic behavior represents a key challenge to market competition and a significant source of uncertainty for potential market participants.** The CFE's transformation will be gradual, especially the shift in its organizational culture from that of a state-owned enterprise to that of a corporate entity. The CFE's ongoing transformation, and the progressive delinking of its decision-making processes from government control, represents a key barrier to entry for new market participants and to the efficient

43 World Bank based on SENER, 2017.

44 In 2012, the CFE reported that annual distribution losses accounted for 16 percent of transported volumes, representing US\$3 billion in lost revenue.

45 An FTR is a financial instrument that entitles the holder to receive compensation for costs that arise when the transmission grid is congested. FTRs allow market participants to hedge against potential price effects.

46 Zenon and Rosellon, 2017; Kunz et al., 2017.

47 Zenon and Rosellon, 2017.



implementation of pro-competition reforms. For example, the CFE can directly influence price formation in the wholesale market, including the energy-capacity and certificates markets, as well as the determination of nodal prices and the allocation of FTRs. Establishing truly competitive wholesale markets will hinge on the capacity of energy-sector institutions, and particularly the CRE and the Federal Economic Competition Commission (*Comisión Federal de Competencia Económica, COFECE*), to monitor the CFE's behavior and enforce prohibitions on collusion and conflicts of interest. Because potential investors and private participants will continue to observe market dynamics and the CFE's strategic behavior, the success of efforts to control the CFE's power and reducing information asymmetries will be vital to attract new investments and increase private-sector participation.

### Natural Gas

35. Mexico's consumption of natural gas has increased significantly in recent years, driven both by demand from the power sector and from industry, and Mexico has become increasingly dependent on natural gas imports, especially from the United States. Demand for natural gas in Mexico has grown at an average annual rate of 3.5 percent over the past decade, due to rising demand from the electricity sector and from the metals and chemicals industries, which use it as a direct input. Industrial demand for natural gas is concentrated in northeastern and central states, and a stronger U.S. economy and a shift toward energy-price parity on both sides of the border will cause Mexican industrial demand to rise by another 0.2 billion cubic feet per day (Bcf/d) by 2020.<sup>48</sup>

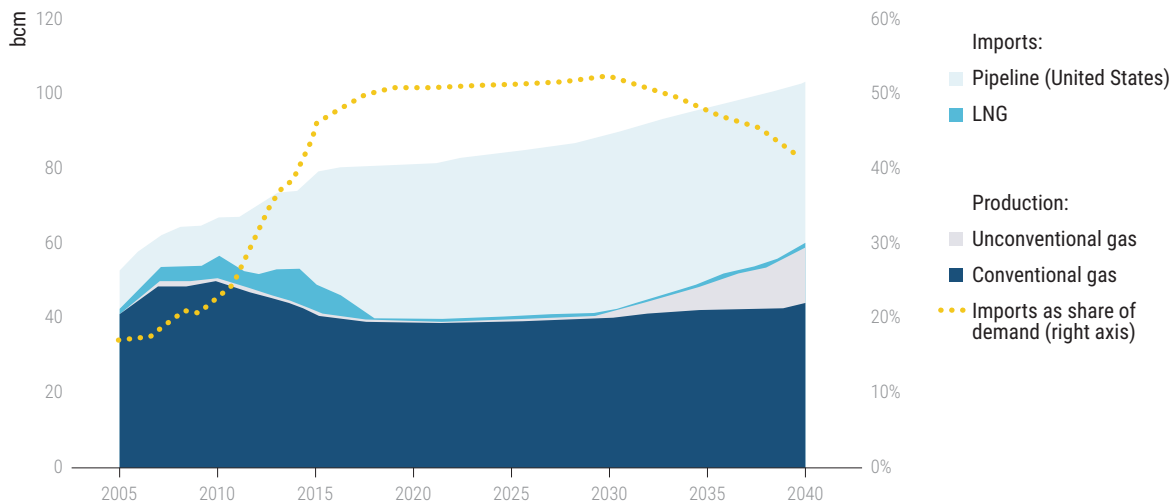
36. While Mexico's demand for natural gas has risen, gross production has gradually fallen since 2009, due to declining non-associated gas production from mature legacy basins.

Multiple factors have contributed to the decline in natural gas production, but the most important is PEMEX's limited capacity to finance investments (including in new technologies) to lead the exploration and production process for both conventional and unconventional gas. U.S. pipeline export capacity to the Mexican border has increased from 2.9 Bcf/d in 2015 to 7 Bcf/d in 2017, but a lack of downstream infrastructure capacity has caused export volumes to fall in recent years. The total cost of investments in improving the connectivity of the Mexican gas grid and deploying the natural-gas-based generation capacity planned for 2020 is estimated at US\$9.7 billion.

37. The country will need to evaluate different options and design a long-term strategy that delivers the most secure and cost-effective solutions for consumers. For example, expanding its import pipeline infrastructure would help reap the benefits of the recent boom in U.S. shale production, while developing domestic gas fields would reduce import dependence. The International Energy Agency (IEA) forecasts a significant increase in Mexico's demand for natural gas through 2040—at which point it will constitute 70 percent of all primary energy—but only a modest increase in domestic gas production (Figure 11). In the baseline scenario, Mexico will continue to rely on U.S. pipeline imports to satisfy at least half of its gas demand until the mid- 2030s.

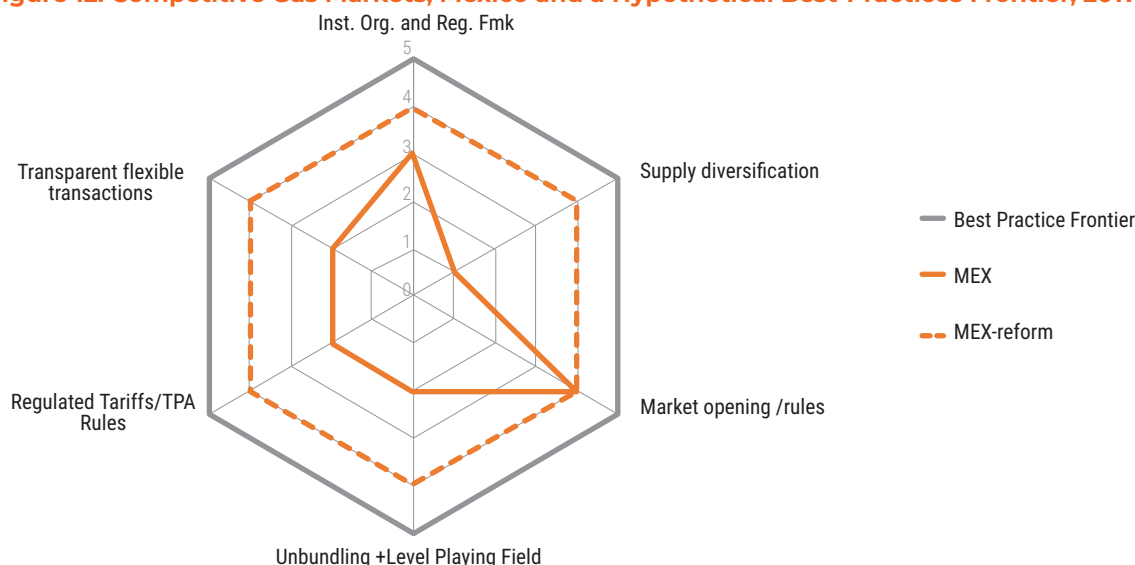
38. Mexico needs to step up investment in its domestic gas-production capacity, as well as physical and institutional infrastructure. A necessary first step would be to improve the technical performance of the gas sector across the value chain, optimizing production and reducing gas flaring and losses in operational units, storage, transportation and delivery.<sup>49</sup> The IEA predicts that Mexico will be able to increase its domestic production after 2025, primarily by tapping the country's significant unconventional gas

Figure 11: The Recent and Projected Evolution of Natural Gas Production and Imports, 2005-2040



Source: IEA, 2016

48 Goldman Sachs Commodities Research, March 2016.  
 49 In 2016, PEMEX flared close to 500 million cubic feet a day (mcf/d) of natural gas.

**Figure 12: Competitive Gas Markets, Mexico and a Hypothetical Best-Practices Frontier, 2017**

Source: Elizondo-Azuela, Barbalho et. Al. (2018)

reserves,<sup>50</sup> though this will require significant investment and expertise as well as efforts to improve the investment climate to attract new companies into exploration and production. A solid regulatory environment, including further efforts to transition toward market-based price formation, will be essential to attract the required investment.<sup>51</sup> Expansion of the gas pipeline network has failed to keep pace with the boom in gas demand, and the pipeline system has reached its maximum capacity on multiple occasions.<sup>52</sup> In addition, the gas distribution grid remains limited and gas pipeline networks are barely present in the southernmost parts of the country. Compared to both other competitive gas markets in the region and a hypothetical best-practice frontier, Mexico still has considerable scope to improve the functioning of its energy market. Such institutional improvements, allied to the full transformation of PEMEX into a state productive enterprise and the full implementation of the new pricing methodologies and wholesale price index promulgated by the CRE in late-2017, can help remove remaining bottlenecks to the needed investment in infrastructure across the natural gas supply chain.

### Energy Mix

39. **Despite the shift from oil to natural gas in recent decades, and significant investment in renewable capacity, fossil fuels still account for 90% of Mexico's primary energy supply.** The first decade and a half of the 21st century saw a 25% increase in Mexico's primary energy demand, to reach 187 million tons of oil equivalent (Mtoe) by 2015. This is roughly in line with economic growth over the same period. Recent years have seen a significant switch

in the country's energy mix, with oil increasingly being displaced by cheaper, cleaner natural gas, which met just over a third of primary energy demand in 2015 (Figure 13). Oil still accounted nearly half of energy demand, with coal accounting for a further 7%. Although renewable energy—including hydropower—represents only 8% of total primary energy demand and 17% of electricity generation, the targets introduced in the 2016 Energy Transition Strategy are ambitious: share of renewable energy in electricity to increase to 35% by 2024, 37.7% by 2030, and 50% by 2050.

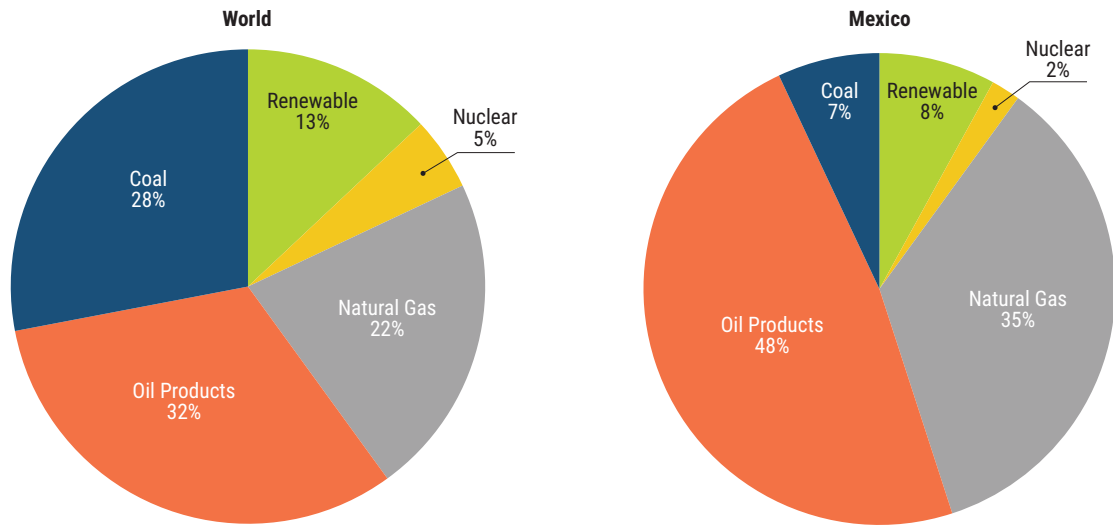
40. **In addition to supply-side measures to increase domestic production and improve the functioning of the natural gas market, continued efforts to diversify the energy mix can reduce Mexico's dependence on imported gas and accelerate the decarbonization of the economy.** These objectives can be achieved by increasing the use of renewable energy, enhancing energy efficiency, and improving demand-side management—as natural gas already represents 60 percent of total power generation. Emerging technologies are expected to play a key role in enhancing the overall technical and economic efficiency of clean energy solutions. Mexico's renewable energy potential is considerable. While hydro power generation has long been part of the country's topography. Moreover, reduced reliance by households on traditional biomass to meet their energy needs in recent decades has been one factor behind the fall of the renewables share in the energy mix. Mexico is already legal framework for further development of the sector. However, it is in solar and wind energy where perhaps the greatest scope lies for boosting the share of renewables in the energy mix, as evidenced by the globally competitive pricing

50 Options for tapping unconventional gas reserves include: (i) the development of non-associated gas in deep-water fields in the Coatzacoalcos area, (ii) the further development of the Chicontepec basin, and (iii) the development of shale gas in the Burgos and Sabinas basins. Because these measures will be costly, and their implementation will be slow, they will have a limited effect on import dependence and supply vulnerabilities in the short term. However, over the longer term domestic production could expand significantly, given substantial private capital, the adoption of best practices, improved managerial skills, strong environmental stewardship in ecologically fragile areas, and appropriate regulatory and fiscal regimes.

51 In June 2015, the CRE eliminated the previous price-setting methodologies to incentivize natural gas production.

52 Vitor et al., 2017; IEA, 2017

Figure 13: Primary Energy Demand, by fuel, 2015



Source: Based on data from the International Energy Agency

of winning bids in the country's recent series of long-term electricity auctions. Although Mexico's solar power potential derived from average daily irradiation of around 5.5 kilowatt-hours per square metre (kWh/m<sup>2</sup>) (SENER, 2012) is roughly double the levels seen in Germany, for example, installed solar generation capacity in Mexico is less than 1% of that in Germany. While supportive policies in Germany have led to installed capacity reaching (IEA, 2016). There is significant scope to boost both solar and wind generation capacity across the northern and southern parts of the country, with significant investment in both expected to come onstream in the coming years on foot of contracts awarded in the long-term electricity auctions.

**41. Further reducing the share of coal and oil in electricity generation and final consumption will require removing constraints on the production and use of natural gas.** The development of domestic non-associated gas will require strong environmental regulations and oversight. The energy sector reforms introduced fiscal incentives to promote the production of non-associated gas.<sup>53</sup> Building institutional capacity to develop and enforce regulations that protect communities and the environment will be crucial to ensure the sustainable development of shale or other non-conventional gas sources.<sup>54</sup> Ensuring sound regulation, oversight, and enforcement will be challenging, given the complexity of shale gas development and the limited experience of Mexico's environmental enforcement agencies.

**42. Mexico has set ambitious targets for climate-change mitigation and clean energy generation, and the government has introduced important policy and procurement measures to deliver on these commitments.** However, Mexico still lacks the institutional capacity and adminis-

trative efficiency to ensure the energy sector's social and environmental sustainability.<sup>55</sup> For example, the slow and uncoordinated development of appropriate regulations, including licensing rules and the issuance of permits to minimize social and environment impacts, as well as weaknesses in oversight and enforcement reduce the effectiveness of sustainable energy policies. Administrative processes are complex and involve multiple institutions as well as subnational governments. Some functions, such as the approval of SENER's social impact assessments, are still subject to acute bottlenecks, and there are still gaps in the regulatory framework, especially in terms of the minimum requirements for social and community consultations.<sup>56</sup>

**43. Emerging technological innovations could generate substantial efficiency gains and carbon emissions reductions, but adopting new technologies will require market participants to modernize their assets.** The emergence of cost competitive, clean energy and more efficient digital technologies—including new sources of renewable energy, improved batteries, smart grids, intelligent sensors, wireless device connectivity, electric vehicles, etc.—is revolutionizing energy supply chains and service-delivery models across the world. The authorities are taking steps to promote the adoption of new technologies. However, among the most important challenges facing Mexico will be to modernize PEMEX and the CFE, build their capacity for strategic planning and technological adoption, and transform their business models to accommodate digitalization, data analytics, interfacing with consumers, improved harnessing of demand-side resources, and other innovations.

**44. Access to finance remains a significant challenge for clean energy projects.** The authorities have developed a

<sup>53</sup> These projects are exempted from royalties when gas prices are equal to or below US\$5 per MBTU

<sup>54</sup> See Castro-Alvarez et al. (2018) for a thorough discussion of the U.S. experience with horizontal drilling and hydraulic fracturing, and lessons as well as recommendations for Mexico are elaborated and discussed in

<sup>55</sup> Government of Mexico, 2016; SENER, 2016; and IEA, 2017.

<sup>56</sup> On June 1st, 2018, SENER introduced a resolution that presents the general provisions for the preparation of Social Impact Assessments in energy infrastructure projects, and associated administrative procedures for their review and approval.

new, market-listed investment vehicle to attract private capital for the financing of energy infrastructure: the Investment Trust for Investment in Infrastructure (*Fideicomiso de Inversión en Energía e Infraestructura, Fibra E*)<sup>57</sup> Their asset base, however, must be sufficiently mature to deliver stable and predictable revenue flows to bondholders. Existing gas pipelines, along with transmission and distribution assets, are considered ideal for monetization through Fibra E, given the low-risk nature of their operations and their use of long-term contracts. However, a preference among institutional investors for stable, proven assets creates a barrier to investment in renewable energy and demand-side projects in areas such as energy efficiency or distributed generation, which are less mature and which have less-stable revenue flows.

## POLICY OPTIONS

### *Creating Competitive, Equitable and Economically Efficient Markets*

**45. The CFE and the CRE could reduce electricity production costs by improving the operational efficiency of power plants and by reducing technical and nontechnical losses in the distribution network.** The deployment of storage technology can also introduce higher operational efficiency as the share of variable renewable energy increases, however this will depend on amendments by CREG to ancillary services regulation. Both SENER and the CRE could promote the uptake of smart grid and emerging digital technologies to boost energy efficiency and support the development of renewable energy resources.

**46. Residential electricity subsidies could improve their progressivity while reducing fiscal costs.** Coordinating the allocation of FTRs and designing progressive electricity subsidies will involve the CRE, CENACE, SENER, and the SHCP. Higher progressive of subsidies could also be accompanied by a reduction in the fiscal costs (which currently run above 0.5% of GDP). SENER could complement these measures by introducing a program to support the installation of rooftop solar panels in the residential sector, as distributed generation for low-income households has the potential to reduce the volume of subsidies for grid-connected electricity services.

**47. Competition could be stimulated.** Policymakers should accelerate the functional and accounting separation of CFE's subsidiaries and strengthen its corporate governance by insulating its decision-making processes from government influence. Establishing a consolidated system for collecting, processing, and analyzing relevant market data along entire energy value chain will support effective regulation and oversight. Creating an integrated information system will require the active involvement of the CRE,

SENER, and CENACE. An effective monitoring framework should be complemented by the introduction of remedial and enforcement measures to discourage the exercise of market power, collusion among CFE subsidiaries, or other forms of anticompetitive behavior. The CRE and COFECE should work together to strengthen the capacity of regulatory agencies to gather information, redress complaints through a routine process, and oversee the vertical and horizontal unbundling of the electricity and gas industries.

**48. The CRE and CENACE should counterbalance the incentives of incumbents to abuse market power.** Welcome measures would include nodal markets, day-ahead and real-time markets, contracts markets, FTRs, clean energy certificates, and ancillary markets. The CRE and COFECE should be afforded sufficient administrative independence and adequate financial and human resources to fulfill their mandates. It is important also to ensure coordination among different enforcing and regulating entities. Creating an energy regulators' group composed of representatives from COFECE, the CRE, and the Office of the Federal Prosecutor for the Consumer (*Procuraduría Federal del Consumidor, PROFECO*) would help align the medium- and long-term strategic objectives and actions of sectoral regulators.

**49. The government should take steps to reduce natural gas losses across the value chain and to increase gas production.** Key priorities include reducing gas flaring, increasing gas production, and building storage capacity. Existing fiscal measures to promote shale gas production could be complemented by: (i) the establishment of a sound regulatory environment by the CRE that uses market-based price formation and calibration, and (ii) the elaboration of a solid legal framework by SEMARNAT and the Agency for Safety, Energy and Environment (*Agencia de Seguridad, Energía y Ambiente, ASEA*), backed by adequate monitoring and enforcement capacity to prevent and address negative social and environmental impacts.

**50. The government should expand the urban gas pipeline network.** This will require the CRE and CENEGAS to develop a functional gas market by: (i) monitoring the efficiency of the regulatory framework to ensure that pricing promotes investment in the distribution pipeline network, (ii) leveling the playing field for distribution companies, (iii) ensuring open access to the pipeline system, (iv) maintaining close cooperation and regular information flows between the CRE and CENEGAS, and (v) monitoring and controlling the power of incumbents.

### *Decarbonizing the Energy Mix and Developing Sustainable Energy*

**51. The government should streamline the authorization of clean energy infrastructure projects by enhancing the efficiency of the ESIA approval and licensing process.** SEN-

<sup>57</sup> The Mexican Securities Industry Association estimates that Fibra E could help raise US\$70 billion in additional investment.

ER, SEMARNAT, and PROFEPA should work together to improve institutional coordination and administrative efficiency, simplify the approval processes by creating a dedicated window, and evaluate the potential adoption of complementary instruments such as sectoral and technical standards with strong monitoring and stringent sanctions. SENER and the CRE should monitor the performance of renewable energy auctions to identify bottlenecks or delays in the construction of plants. Finally, SENER and the CFE should promote investment in transmission and distribution infrastructure to support the integration of renewable energy, and they should introduce clear rules for implementing T&D expansion projects via PPPs.

**52. To help consumers save energy and reduce carbon emissions, the CRE and CFE should digitalize the grid, share information, and modernize billing.** With the support of SENER and the CRE, CENACE should establish a data platform or hub to enable the secure storage of metered data on customer usage, telemetry data on network operations, and other information, as participants in a dynamic retail markets require timely and nondiscriminatory access to data relevant to competition.

**53. The authorities should improve the accuracy of market price signals.** The CRE should shift from zonal or nodal locational marginal pricing to real and reactive locational

market pricing at distributional nodes, and from time-of-use tariffs to intraday and real-time spot pricing. The SHCP should update Fibras E guidelines and redesign the vehicle to level the playing field among all energy projects while giving appropriate consideration to the characteristics of clean energy projects.

**54. The government should further strengthen existing externality-pricing mechanisms.** SENER, SEMARNAT, and the SHCP should use the proceeds of the carbon tax to support clean energy financing. The carbon tax should be expanded to include natural gas, and its rates should be aligned with the relative carbon intensity of different fuels.

### *Promoting the Adoption of New Technologies*

**55. SENER should work with other ministries to plan energy sector infrastructure from a multi-sectoral perspective.** Infrastructure plans should focus on economic efficiency and low-carbon development, particularly in cities, which offer opportunities to expand electric transportation and digital infrastructure. The government should build the capacity of CENACE, the CRE, and the CFE to leverage digital solutions. Policymakers should also provide proactive regulatory support to innovative business models such as local energy services, bundled services energy-service companies, and peer-to-peer energy.

## References

- Alcaraz, Carlo, Villalvazo, Sergio. 2016. *The effect of natural gas shortages on the Mexican Economy*, Energy Economics 66 (2017) 147-153.
- International Energy Agency, 2017. *Energy Policies Beyond IEA Countries: Mexico 2017*. OECD/IEA, Paris, France.
- International Energy Agency, 2016. *Mexico Energy Outlook*, OECD/IEA, Paris, France.
- Vitor, Richard H.K., Sheldahl-Thomason H.; January 2017. *Mexico's Energy Reform*, Harvard Business School, Paper 717-027.
- Comision Reguladora de Energia, 2018 (a). *Informe de Labores 2016-2017*, [https://www.gob.mx/cms/uploads/attachment/file/276001/Informe\\_de\\_Labores\\_2016\\_-\\_2017\\_de\\_la\\_CRE.pdf](https://www.gob.mx/cms/uploads/attachment/file/276001/Informe_de_Labores_2016_-_2017_de_la_CRE.pdf)
- Comision Reguladora de Energia, 2018 (b). Distributed Generation in Mexico and Thoughts on Regulatory Innovation, presentation at the World Bank workshop "Distributed Energy Markets: International Experience and Impact of Disruptive Technologies", May 15, Washington DC
- Chanona Robles, Alejandro. 2016. *Tracking the Progress of Mexico's Power Sector Reform*, Wilson Center, Mexico Institute, [https://www.wilsoncenter.org/sites/default/files/tracking\\_progress\\_of\\_mexicos\\_power\\_sector\\_reform.pdf](https://www.wilsoncenter.org/sites/default/files/tracking_progress_of_mexicos_power_sector_reform.pdf)
- Oxford Institute for Energy Studies, June 2017. *Mexican Energy Reforms*, Issue 109, University of Oxford.
- Government of Mexico, 2016. Mexico's Climate Change Mid-Century Strategy, [https://unfccc.int/files/focus/long-term\\_strategies/application/pdf/mexico\\_mcs\\_final\\_cop-22nov16\\_red.pdf](https://unfccc.int/files/focus/long-term_strategies/application/pdf/mexico_mcs_final_cop-22nov16_red.pdf)
- Secretaria de Energia, 2016. Estrategia de Transicion para Promover el Uso de Tecnologias y Combustibles mas Limpios, [https://www.gob.mx/cms/uploads/attachment/file/182202/20161110\\_1300h\\_Estrategia\\_CCTE-1.pdf](https://www.gob.mx/cms/uploads/attachment/file/182202/20161110_1300h_Estrategia_CCTE-1.pdf)
- Secretaria de Energia, 2012. Prospectiva de Energias Renovables 2012 – 2026, (Prospects for Renewable Energy 2012-2026), [www.gob.mx/cms/uploads/attachment/file/62954/Prospectiva\\_de\\_Energias\\_Renovables\\_2012-2026.pdf](http://www.gob.mx/cms/uploads/attachment/file/62954/Prospectiva_de_Energias_Renovables_2012-2026.pdf)
- Castro-Alvarez, Fernando, Marsters P. Ponce de Leon Barido D., Kammen, D. 2018. *Sustainability Lessons from Shale Development in the United States for Mexico and other Emerging Unconventional Oil and Gas Developers*, Renewable and Sustainable Energy Reviews, 82 (2018), 1320-1332.
- Zenon, Eric, Rosellon, Juan. 2017. *Optimal Transmission Planning Under the Mexican New Electricity Market*, Energy Policy Journal 104 (2017) 349-360.
- Kunz, Friedrich, Rosellon J., Kemfert C. 2017. *Introduction of Nodal Pricing into the New Mexico Electricity Market Through FTR Allocations*, The Energy Journal, Vol. 38, S11.
- OECD, 2017. *Driving the Performance of Mexico's Energy Regulators*, OECD Publishing, Paris.
- SENER. 2017. *Solving Mexico's Electricity Subsidy and Energy Poverty Granting Solar Bonuses for PV Solar Rooftops*, draft paper shared by Subsecretaria de Transicion Energetica.
- World Bank, PPIAF; 2017. *Benchmarking Public-Private Partnership Procurement: Assessing Government Capability to Prepare, Procure, and Manage PPPs*, World Bank, Washington DC.







# 3. Fostering Digital Development

In 2013, the launch of the National Digital Strategy, coupled with a sweeping telecommunications reform, led to great advances in Mexico's information and communications technology (ICT) sector and in its broader digital economy. Prices for telecommunication services have fallen significantly and access for the population has expanded following the reform. The new "red compartida" is a critically important reform and investment initiative that needs to continue implementation. Looking ahead, there still significant challenges and opportunities, including reducing access gaps and regional disparities in services. More competition across ICT markets will require further efforts on the regulatory side. A growing digital environment needs the strengthening of the cybersecurity regulatory framework to protect critical infrastructure and data. Critically, to encourage productive inclusion in an increasingly technologically advanced workplace, the government may want to consider a stronger role of digital technology in the education curricula at all levels. Existing programs to promote technological uptake, including for girls at school and women, would also need to be scaled up. Mainstreaming the current interoperability of systems, digital-identity initiatives, and open data platforms will also be essential. These initiatives could have a large impact in terms of fiscal savings of public resources, improving government transparency and supporting anti-corruption efforts.

## CONTEXT AND REFORM PROGRESS

56. Information and communications technology plays a vital role in supporting productivity growth, competitiveness, and productive inclusion. Recognizing the pivotal importance of a robust digital ecosystem, the Mexican govern-

ment highlighted the ICT reform as part of the Pact for Mexico, an agreement signed by all major political parties before the general elections of December 2012. The telecommunications reforms included the approval of Constitutional amendments in June 2013 and the passage of the Federal Telecommunications and Broadcasting Law in July 2014. The reforms encompassed commendable measures

designed to: (i) increase competition in the telecom sector; (ii) develop fixed and mobile telecommunications infrastructure, including a national backbone for broadband networks; and (iii) ensure equal access to telecommunications. While these reforms created a framework for greater ICT connectivity, a thriving digital economy requires a strong regulatory and institutional framework. Policies and regulations need to be fully implemented, updated and new ones introduced to keep up with rapidly changing technologies and business models. Finally, accountable institutions are vital to ensure that new advances in digital technology empower citizens.<sup>58</sup> Mexico's National Digital Strategy (*Estrategia Digital Nacional*, EDN) seeks to address priority challenges in the ICT sector, focused in the areas of connectivity, public institutions, the economy, education, health, and citizen participation.

**57. In recent years, Mexico has made considerable progress in expanding access to telecommunications services, digitization technologies, and the delivery and creation of public services through digital solutions.** The 2013 reforms established that telecommunications are public services of general interest, and therefore the government must guarantee the universal coverage of high-quality telecommunications services provided through open competition supported by a strong and independent regulatory authority. To achieve this goal, the Secretariat of Communications and Transport (SCT) launched the Transportation and Communications Infrastructure Investment Program (2013-2018), which enabled the creation of a nationwide Shared Network (*Red Compartida*)—a wholesale broadband wireless network that offers high-speed data capacity to other network and virtual operators. When fully implemented, the *Red Compartida* will extend broadband service coverage to 92.5 percent of the population. The operator, Altan Networks, has already reached its first milestone for urban service, but the bulk of the total investment requirements estimated at US \$7 billion is still to be deployed over the next few years.

**58. In February 2017, the SCT announced the Digital Connectivity Program, which will complement the Red Compartida by implementing a proposed 10 projects<sup>59</sup> focused on the nationwide provision of fixed and mobile telecommunications infrastructure.** The Digital Connectivity Program includes (i) a passive infrastructure project that will allow 10,500 public buildings to be rented for telecommunications purposes; (ii) the network backbone (*red troncal*), currently in its design phase, which will create a public-private partnership to leverage the existing fiber-optic infrastructure of the Federal Electricity Commission (*Comisión Federal de Electricidad*, CFE) to create a robust national telecommunications network; and (iii) the Connected Mexico (*México Conectado*) project, which has created 101,322 Wi-Fi hotspots in schools and other public buildings in rural and remote areas.

**59. The government has also implemented a series of legal and regulatory reforms aimed at increasing access to affordable quality telecom services.** Mexico's revamped regulatory regime for ICT is built on two pillars, an autonomous and capable regulatory agency with real sanctioning power and new operating rules for the sector. The new agency, the Federal Telecommunications Institute (*Instituto Federal de Telecomunicaciones*, IFT), has various powers to restrain "dominant market operators," companies whose market share exceeds 50 percent. These include: (i) mandatory interconnection and infrastructure-sharing offers; (ii) approval over final and wholesale prices that can be matched by other competitors; (iii) explicit prohibitions on commercial plans differentiating between on-net and off-net prices; and (iv) measures to ensure accounting separation, and non-discriminatory network access. These rules have opened telecommunications markets to new domestic firms and foreign competitors, partly reducing the dominance of Mexico's telecom incumbent operator over the mobile broadband market. The IFT has also established a databank for telecommunications services, improving transparency, data collection, and analytics.

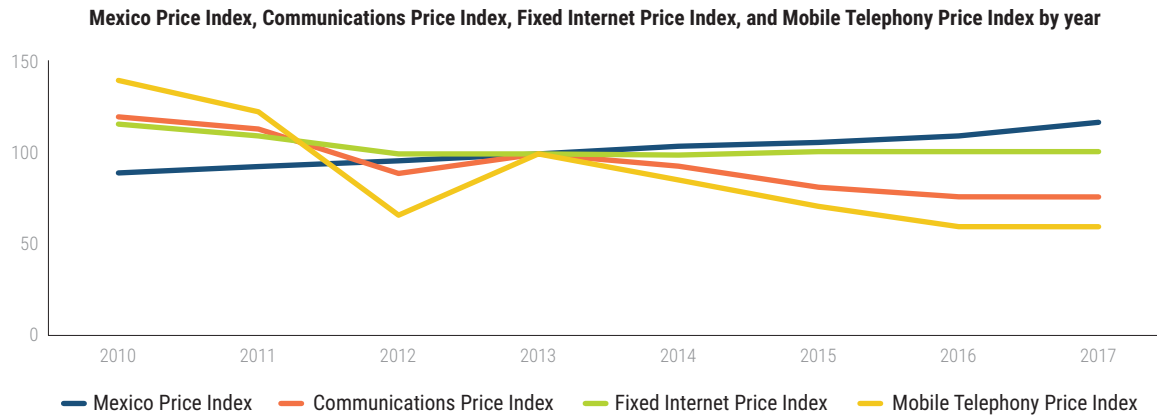
**60. The authorities have consolidated and strengthened the legal framework for implementing the EDN.** The EDN strives to expand digital inclusion to enable all social sectors to benefit from ICTs. The EDN includes two initiatives focused on digital inclusion and digital skills: (i) Mexican Connection Points (*Puntos México Conectado*), a network to increase the standard of living and take advantage of income-generating opportunities provided by ICTs; and (ii) Code X (*Código X*), a project designed to increase ICT participation among women and girls.<sup>60</sup> Recent modifications to the regulations for completing government processes and measures to increase data openness have created the statutory basis for implementing EDN initiatives to promote the growth of the digital economy. In addition, the government published guides, manuals, and procedures in the Official Gazette. The procedures are mandatory for all government agencies, while the guides and manuals provide clarity on compliance with the new procedures.

## KEY CHALLENGES

### Connectivity

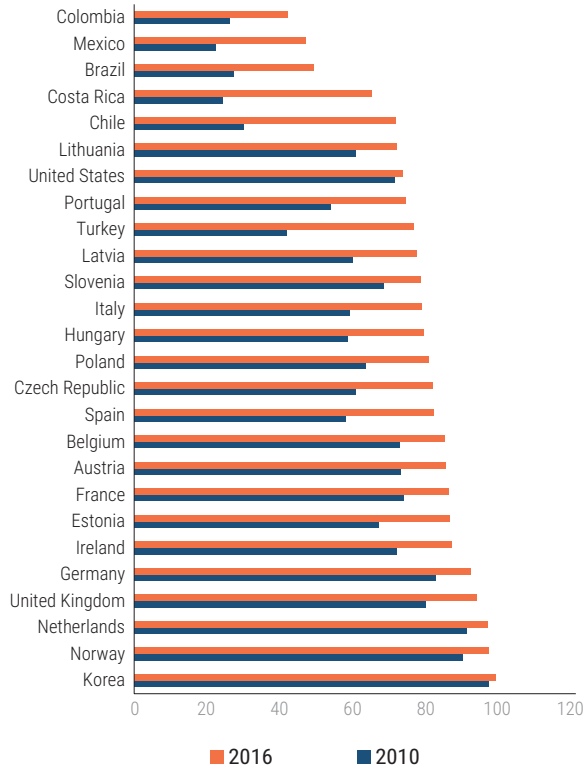
**61. Prices for telecommunications services have fallen and access has expanded, but significant access gaps and disparity remain compounded by competition and regulatory challenges.** At the end of 2017, while the National Consumer Price Index of Mexico cumulative increased 17.31 percent with respect to the end of 2013, the Communications Price Index decreased 23.76 percent in the same period (Figure 14). Recent reforms and policy actions have boosted the number of households with internet access to 47 per-

Figure 14: Drop in Prices in telecommunications services following the reforms



Source: OECD, Internet access. Total, % of all households, 2005 – 2017

Figure 15: Household Internet Access Rates among OECD Countries, 2010 and 2016

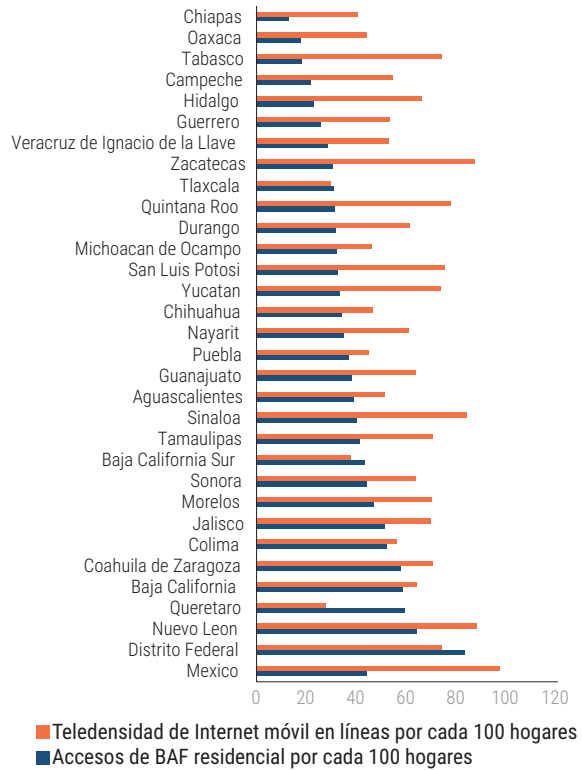


Source: IFT, Banco Datos Telecomunicaciones. Price Index Base Year 2013

cent in 2016. However, Mexico’s access rate remains well below the OECD average of 82 percent in 2015, as well as the averages for comparable countries (Figure 15). Within Mexico, access rates vary substantially by state (Figure 16). Despite Mexico’s successful regulatory reforms, limited competition continues to constrain access to high-quality broadband services.

62. The IFT has acknowledged that information asymmetries persist between the incumbent operator in the tele-

Figure 16: Fixed and Mobile Broadband Penetration in Mexico by State, 2016

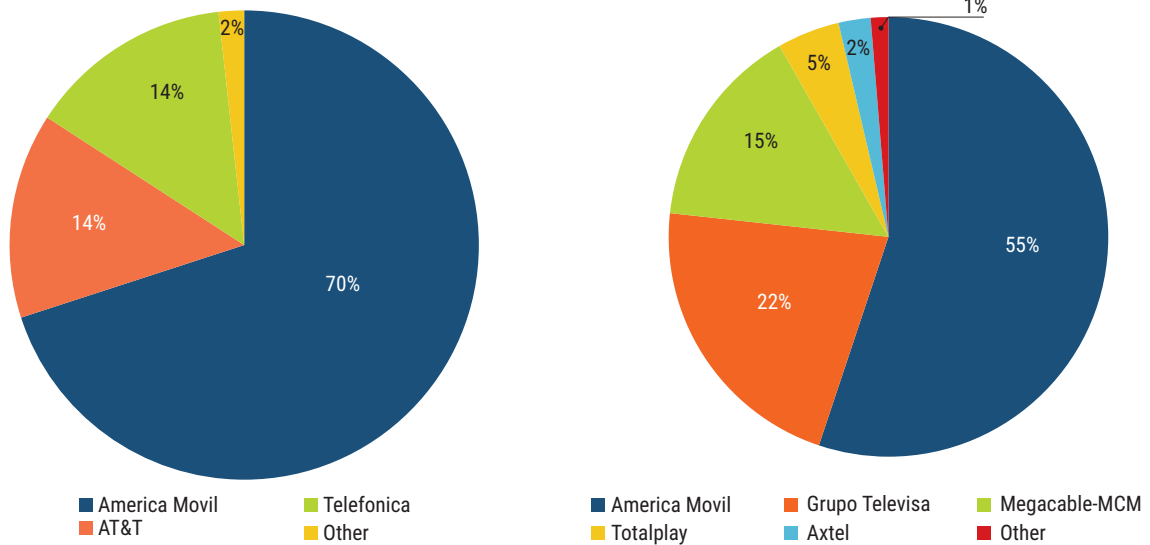


Source: IFT, Banco de Informacion de Telecomunicaciones, 2016

communications sector and competitors seeking access to unbundled local loops.<sup>61</sup> This continued asymmetry partly reflects delays by the market dominantoperator in implementing the Electronic Management System (EMS). These delays stem from a slow and burdensome IFT processes and the failure of the preponderant operator to meet IFT deadlines. When complete, the EMS will provide concessionaires and other firms with complete and updated information on the preponderant operator’s network and those facilities subject to shared access or co-location.

61 40ECD Telecommunication and Broadcasting Review of Mexico 2017: <http://www.oecd-ilibrary.org/docserver/download/9317021e.pdf?expires=1516744894&id=id&acname=guest&checksum=FB2AFDBD0F82198E03F3BB3BB7E92B19>

Figure 17: Market Share by type of Market, 2017



Source: IFT, Banco de Información de Telecomunicaciones, 2016

63. **Expanding access to digital services intensify risks to cybersecurity, and Mexico will have to take the necessary steps to protect its critical infrastructure.** Mexico experiences the second-most cyberattacks in Latin America, and the number of attacks increased by 40 percent between 2013 and 2014. Cyberattacks affected approximately 10 million people in 2014, and each year they impose an annual cost of between US\$3 and US\$5 billion dollars.<sup>62</sup> Mexico's National Cybersecurity Strategy (*Estrategia Nacional de Ciberseguridad*, ENC) calls for the Scientific Unit of the Federal Police and the National Response Center for Cyber Incidents to launch public awareness campaigns focusing on cybersecurity issues. The ENC's regulatory framework has yet to be elaborated, and several important challenges inhibit its implementation: limited capability from public and private sectors and the lack of a regulatory framework, the critical infrastructure, and a harmonization between federal and local policies.

### Digital Inclusion and Digital Skills

64. **Mexico's key challenge in the areas of digital inclusion and digital skills will be to scale up current initiatives, ensure their sustainability, and replicate their success at the subnational level.** Two years after their establishment, the *Puntos México Conectado* centers are approaching their maximum capacity of 400,000 registered members. Meanwhile, the *Código X* program has thus far reached only about 1,000 women and girls.

### Interoperability and Digital Identity

65. **Interoperability is necessary to create a unique digital identification system and facilitate the exchange of informa-**

**tion between government institutions.** In 2011, the government signed the Interoperability and Open Data Scheme for the Federal Public Administration Agreement (*Esquema de Interoperabilidad y de Datos Abiertos de la Administración Pública Federal*, EIDA), which defined the regulatory and policy framework for integrating processes and sharing platforms among federal government institutions. The EIDA designated six "trusted sources" of personal identification that can be used to complete government procedures online. These trusted sources include the Unique Population Registration Code (*Clave Única de Registro de Población*, CURP), birth certificates, and e-signatures. Trusted sources allow agencies to share information through standardized fields established as part of the government's digital procedures. The CURP can now be used to complete 44 government procedures. Three procedures do not need a physical birth certificate, and 478 government procedures can be completed with an e-signature.

66. **Once the basis for interoperability has been established, the challenge is to incorporate an increasing number of procedures and expand access to digital public services.** Trusted sources such as the CURP or e-signature greatly expedite government processes, yielding substantial savings for both citizens and the public administration.

### The Legal Framework and Open Data

67. **The new legal and institutional framework for digital government requires continued work to keep up with growing digital economy.** The legal and institutional framework increased the volume of digital procedures and services and created rules, guidelines, standards, and mechanisms to solve technological problems in each agency. Continu-

ity and compliance will be required to further elaborate the legal framework and continue the process of digitizing procedures and services. A long-term digital government policy will need to be continuously updated, and mechanisms to ensure compliance among subnational governments will be necessary to consolidate the use of digital procedures and services by the government, the private sector, and civil society. Maintaining a strong regulatory framework is vital to the development of the digital economy and to promoting inclusion, connectivity, civic innovation, open contracting, and other objectives.

**68. The quality and quantity of open data must be significantly improved and needs to be utilized more effectively to enable the growth of the digital economy and enhance digital government services.**<sup>63</sup> The General Directorate of Open Data (*Dirección General de Datos Abiertos*, DGDA) was created to implement Mexico's open data policy, which was established in 2013 as part of the EDN. The open data policy both mandates availability of data in open standards, and facilitates the link between the demand and supply of open data. However, the quality and quantity of open data is lower than in OECD countries leading this Agenda, and Mexico's private sector and civil society should be strengthened to use open data effectively. Certain databases are not consistently available in open data standards to the public, and technical constraints inhibit these of open data at the state level. Moreover, public institutions, civil-society organizations, journalists, the private sector, and academia have relatively little experience using open data and are therefore they are not able to leverage its full potential. Only nine of Mexico's 32 states are members of the Open Data Network, and the sophistication of data openness varies widely across local governments.

## POLICY OPTIONS

### Connectivity

**69. Revise the Universal Service Strategy to reduce coverage disparities between rural and urban areas.** The SCT and the IFT should jointly analyze alternative options for providing coverage in rural areas and incorporate them into a new Universal Service Strategy. Universal service policies aim to facilitate telecommunications access in areas where the costs of providing service may exceed the commercial returns. Universal service frameworks can also advance specific policy objectives by providing services to target groups, such as low-income households or people with disabilities. The decision-making process should clearly define the type of services required, establish whether market mechanisms will be able to provide those services at affordable rates, assess the merits of imposing a universal service obligation relative to alternative policies, and evaluate those alternatives in light of broader policy objectives and other ongoing programs.<sup>64</sup>

**70. Adopt new administrative procedures to increase competition and reinforce the innovative regulatory framework.** The level of competition in wholesale markets directly influences the retail price of internet services. As in other ICT subsectors, information asymmetry and market dominance by the incumbent can diminish competition. The government should analyze the causes of information asymmetry in the internet-service subsector, the obstacles to establishing an EMS, and the methodology for establishing rates for wholesale services. The authorities should then consider imposing additional conditions to the dominant market operator designed to decrease tariffs and expand access to essential network facilities.

**71. Obligate infrastructure sharing across public and private passive infrastructure to lower costs and increase access to broadband services.** Major cities in Italy, Japan, Korea, Spain, and Sweden successfully employed public-private partnerships to leverage the full value of public infrastructure. Maximizing the functionality of existing ICT networks and related infrastructure can reduce spending on public works and substantially reduce retail costs.

**72. Strengthen cybersecurity regulatory framework, increase public awareness and prioritize implementation.** The government may address this challenge by: (i) launching a national cybersecurity awareness campaign designed to encourage stakeholders to take steps to protect information collected and shared through servers, networks, transactions, and other means; promoting stakeholder investment in designing a national cybersecurity training program; and establishing appropriate data-privacy regulations.

### Digital Inclusion and Digital Skills

**73. Promote technological uptake of the Puntos Mexico Conectado program by increasing the availability of internet services in public spaces and providing training in digital skills.** To increase the value of Mexico's existing ICT infrastructure, the government should strengthen the digital inclusion strategy and work with state governments to ensure its sustainability and increase its impact. To encourage productive inclusion in an increasingly technologically advanced workplace, the government may want to consider a stronger role of digital technology in the education curricula at levels, starting from early childhood. It could redefine the strategy for encouraging women to pursue careers in science, technology, engineering, and mathematics.

### Interoperability and Digital Identity

**74. Scale up the current interoperability and digital-identity initiatives to include more government procedures and expand the availability of e-government services.** Subnational admin-

<sup>63</sup> OECD, Open Government Data Review of Mexico, 2016  
<sup>64</sup> UNIVERSAL SERVICE POLICIES IN THE CONTEXT OF NATIONAL BROADBAND PLANS, OECD, [https://one.oecd.org/document/DSTI/ICCP/CISP\(2011\)10/FINAL/en/pdf](https://one.oecd.org/document/DSTI/ICCP/CISP(2011)10/FINAL/en/pdf)

istrations are responsible for collecting information crucial to the delivery of public services. To promote the further digitization of public services, subnational administrations should be integrated into the existing Federal Government interoperability framework. The government should analyze the most valuable public services used by citizens and the private sector and harmonize its digitization mechanisms at the national level. A clear case for this, which would reduce overlapping of benefits and improve public spending efficiency, is using ICT to support a unique national identifier to the beneficiaries of social assistance and social insurance programs (see Note on Social Protection).

### *The Legal Framework and Open Data*

**75. Design and implement a national open data program in collaboration with subnational administrations.** Overall, these type of data platforms at the federal and sub-national levels would be key to support the government transparency agenda, and could be used effectively by the newly established anti-corruption agency technical secretariat in its monitoring and risk assessment functions. Moreover, open data, in which Mexico has already made a lot of progress, can help streamline government services, encourage innovation, improve public safety, and reduce

corruption. The data generated by Mexico's subnational administrations have great value to citizens, NGOs, the private sector, and other public administrations. A national open data program should include: (i) the development of a guide for integrating the "open data enabler" into state and municipal development plans and creating the necessary legal framework; (ii) measures to promote the development of local open data regulations; (iii) an analysis of existing government funds that subnational administrations can use to implement open data policies; (iv) the sharing of lessons learned by states and municipalities that have implemented open data initiatives; and (v) collaboration between subnational governments and international experts in open data and e-government services.

**76. Increase quantity and quality of open data and stimulate demand for its effective use.** Open data programs are most successful when they adopt an "ecosystem" approach, under which governments invest not only in supplying data but also in building the capacity of the public sector, priorities and data demands of different groups; (iii) build the technological capacity of the public and private sectors; (iv) support existing open data communities; and (v) increase data literacy among potential users, including journalists, nonprofit organizations, academics and software developers.

## Annex 2. Broadband Subscriptions

Figure 18 Fixed Broadband subscriptions, OECD countries (June 2017)

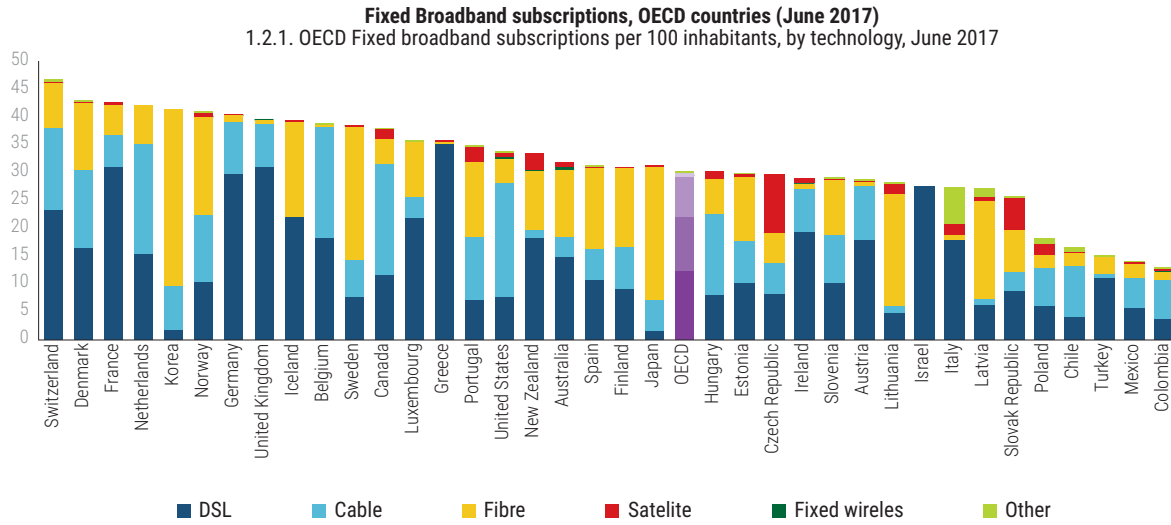
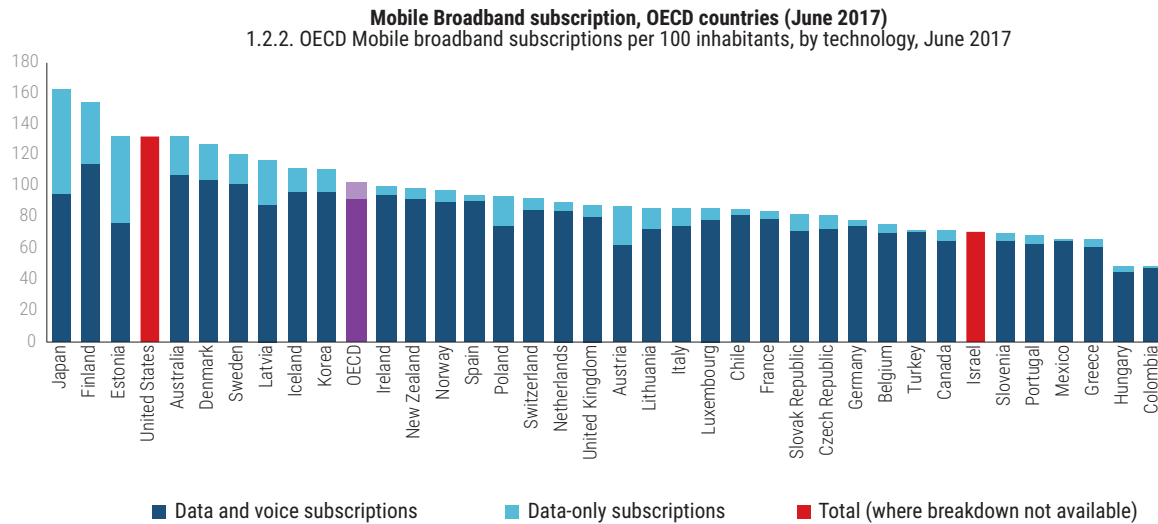


Figure 19 Mobile Broadband subscription, OECD countries (June 2017)



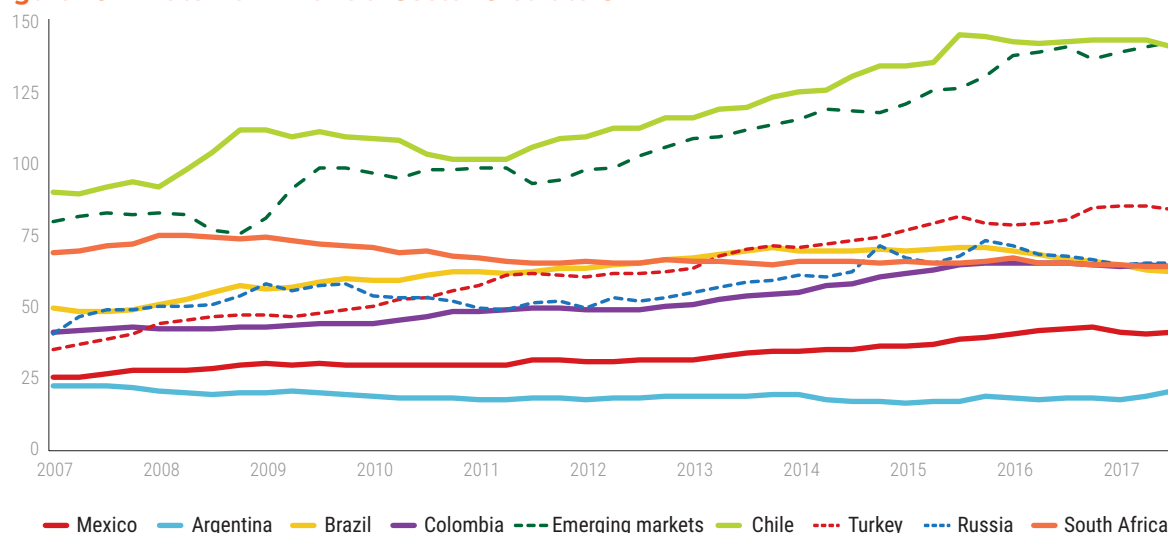




## 4. Developing a Deeper, More Inclusive Financial Sector

Reforms over the last 4 years in the sector have been welcome and highly positive in deepening of the financial sector. Credit (as a share of GDP) to the private sector increased and people with bank account increased by more than 10 percentage points due to the reforms. Yet there is a way ahead to implement the reforms and pass further reforms. Credit to the private non-financial sector is just 41.6 percent of GDP, well below the 72.5 percent average for the other LAC-5 countries and far below the 143.2 percent average for emerging markets worldwide. Moreover, a large share of the population still lacks access to financial services, perpetuating economic inequality (37 percent of adults had an account in a formal financial institution in 2017). MSMEs provide 71 percent of the employment, but only 20 percent of them use bank credit due to affordability and access issues. The country's financial sector remains highly concentrated, and stronger competition may lead to more efficient intermediation. To fill the gaps the 13 DFIs owned by the federal government have grown rapidly and now support one-third of total credit to the private sector. Despite progress the authorities would need to take further measures to maximize the financial sector's contribution to inclusive growth, which include: (i) strengthening and consolidating NBFIs, including cooperatives; (ii) developing financial infrastructure including the development of asset-based lending (ABL) to expand access to finance for MSMEs; (iii) incentivizing banks to pilot ABL programs and products, for example with DFIs offering a second-loss partial credit guarantee; (iv) shifting from quantitative lending targets in DFIs to a system based on multiple development outcome indicators to sharpen efficiency in achieving intended objectives; (v) placing greater emphasis in crowding-in private financing by adjusting the focus of DFI instruments which can also be used to bring in the capital markets. Additionally, there is a great source for growth and inclusion that needs to be harnessed. Mexico has one of the largest financial-technology subsectors in Latin America. To foster financial inclusion and access through this new and vibrant segment, the issuance of secondary regulations to the Fintech law and the adoption of adequate oversight mechanisms should be given a high priority.

Figure 20 Private Non-Financial Sector Credit to GDP



Source: Bank of International Settlements

## CONTEXT AND REFORM PROGRESS

77. **A deeper Mexican financial sector would help increase productivity and reduce inequality.** A well-functioning financial sector transforms savings into productive investment, manages a range of economic risks, and provides the necessary infrastructure for financial transactions.

78. **Mexico's financial sector remains small relative to the country's level of development.** It allocates only a moderate amount of capital and is dominated by a banking sector that is too small for the size of the economy. Credit to the private non-financial sector amounts to just 42.9 percent of GDP (Figure 20), of which bank lending represents 19.4 percentage points.<sup>65</sup> This level is well below the 72.5 percent average for the other LAC-5 countries and far below the 143.2 percent average for emerging markets<sup>66</sup> worldwide. A large share of the population lacks access to financial services, perpetuating economic inequality. Only 29 percent of adults in the bottom four income deciles have an account at a financial institution, below the LAC average of 41 percent and the upper middle-income average of 63 percent. Although Mexico's pension system covers 73 percent of the population, contributory pension schemes cover just 26 percent, limiting the size of pension savings. Similarly, the size and depth of capital markets are well behind levels in peer countries. Whereas responsible macroeconomic management and a resilient financial system have helped maintain financial stability in Mexico, oversight authorities lack independence, which could impede their ability to manage stress

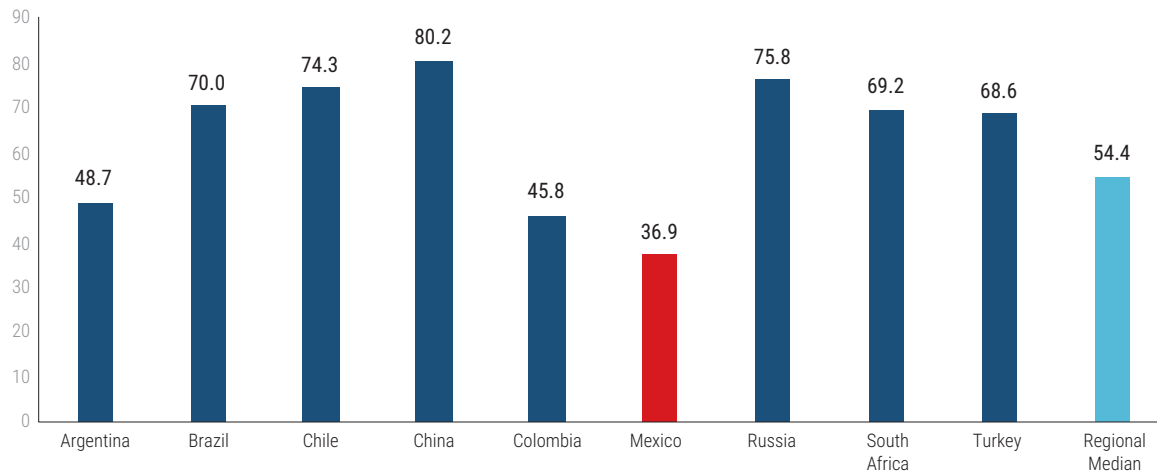
79. **Recognizing the role of finance for development, reforms have aimed to expand financial services.** In particular, the 2014 Financial Reform Law<sup>67</sup> increased the role of federal Development Finance Institutions (DFIs). Moreover, the 2016 National Financial Inclusion Policy and the 2017 National Financial Education Strategy included reforms designed to: (i) strengthen the institutional capacity of the National Banking and Securities Commission (*Comisión Nacional Bancaria y de Valores, CNBV*); and (ii) disburse government payments and transfers from the largest social-protection programs through dedicated accounts. Complementary efforts to address gaps in the financial infrastructure, accelerate the rollout of new products, facilitate the spread of access points, increase the transparency of financial services, and enable large-volume payments would enhance the impact of recent reforms.

80. **Recently, on March 2018, Mexico adopted an umbrella law on Fintech (*Ley para Regular las Instituciones de Tecnología Financiera*).** The new law is the first one of its kind worldwide and provides a regulatory framework for the authorization, operation and supervision of Fintech institutions (*Instituciones de Tecnología Financiera, ITFs*) focusing on two particular types: crowdfunding institutions and electronic payment funds institutions. The Law also introduces the legal underpinnings for a regulatory sandbox environment for innovative companies, the concept of open data for non-confidential aggregate data and for transactional data with consumers' consent through the Application Programming Interfaces (APIs) and a provision to recognize virtual assets and regulate their usage and operation in Mexico. The Fintech Law provides an opportunity to expand access to financial services while enabling innovation in the industry.

65 According to the Bank of International Statistics (BIS), as of Q4 2017. Credit is provided by domestic banks, all other sectors of the economy and nonresidents. The private non-financial sector includes non-financial corporations (both private-owned and public-owned), households and non-profit institutions serving households as defined in the System of National Accounts 2008. In terms of financial instruments, credit covers loans and debt securities

66 Emerging markets in this note comprise Argentina, Brazil, Chile, China, Colombia, the Czech Republic, Hong Kong SAR, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Poland, Russia, Saudi Arabia, Singapore, South Africa, Thailand and Turkey

67 The 2014 financial reform was based on four main pillars: (a) increase competition in the financial sector by inhibiting anti-competitive practices; (b) encourage credit through development banks by strengthening their legal framework, mandate and operating capacity; (c) explore ways that financial authorities can encourage private financial institution to channel more credit to productive activities and; (d) maintain a stable and solid financial system.

**Figure 21 Share of Adults with an Account at a Formal Financial Institution, 2017 (%)**

Source: Global Findex database 2017

## KEY CHALLENGES

**81. Despite significant reform progress, challenges remain ahead.** The key challenges facing the Mexican financial sector fall under five broad categories. They are: (i) expanding financial inclusion; (ii) providing credit and financial services to micro, small and medium enterprises (MSMEs); (iii) strengthening financial-sector oversight;<sup>68</sup> (iv) enhancing the efficiency of DFIs; and (v) boosting the supply of long-term savings and investment.

### Financial Inclusion

**82. Expanding financial access among lower-income households remains a top priority.** Mexico's unbanked population is far larger than the country's level of economic and financial-sector development would predict. The share of adults with an account at a formal financial institution slightly decreased from 39 percent in 2014 to 37 percent in 2017, far below the level of most comparator countries (Figure 21). Among households in the bottom 40 percent of the income distribution, 74 percent of adults remained unbanked in 2017.<sup>69</sup> Developing these initiatives, including in urban microfinance, among others, requires adopting responsible finance policies and a framework for financial education and consumer protection.

**83. Banks dominate Mexico's financial sector, but in recent years the growth of the nonbank sector has outpaced the growth of banks.** Commercial banks account for over 41 percent of the financial sector's assets, and development banks represent another 10 percent (Figure 22). Regulated and unregulated non-deposit-taking financial companies (*sociedades financieras de objeto múltiple*, SOFOMES), savings and credit institutions, and deposit warehouses are small, representing a combined 6 percent of the financial sector's assets, yet they play an important role in microfi-

nance and financial inclusion. Altogether, pension funds, mutual funds and insurance account for 37 percent of financial sector assets.

**84. Banking infrastructure in Mexico is heavily concentrated in urban areas.** Only 29 percent of the rural population has an account at a formal financial institution, far below the LAC average of 41 percent. As in other LAC countries, Mexican banks have used agent banking to reach areas where a traditional branch would not be viable. However, Mexico's agent-banking model remains focused on urban areas<sup>70</sup> and relies heavily on large retail chains rather than small shops. Agent-banking services also tend to be limited to taking deposits and accepting loan repayments. There is also a large gap in coverage of agents between northern Mexico and the center and south of the country. Within the five states with the largest number of commission agents per adult, four are located in the north of the country. In contrast, the five states with the smallest number of agents per adult are located in the south and center of the country.

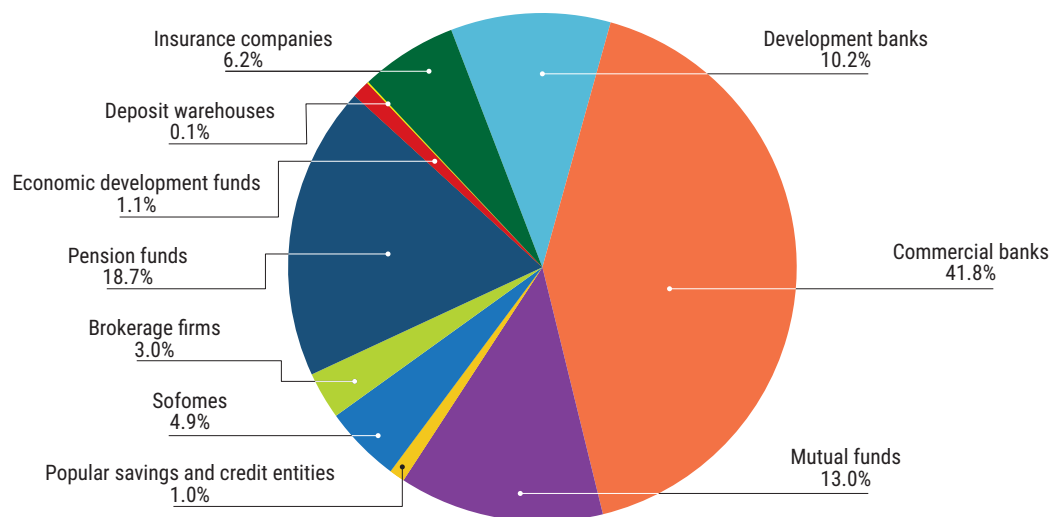
**85. Mexico's financial sector is concentrated, and stronger competition may lead to more efficient intermediation.** The financial sector includes a diverse range of financial intermediaries and many small institutions, but assets remain concentrated in large banks and financial conglomerates, and intermediation margins have been rising. The seven largest banks account for about 80 percent of total bank assets, and the sector is concentrated relative to Latin American peers. With economies of scale, more concentration does not necessarily lead to less efficient outcomes, and various measures of competition estimated over 2012-15 illustrate the competitive conduct of banks. The H-statistic, a commonly used measure of output price elasticity with respect to input prices, is higher than in other major Latin American markets suggesting competitive conduct is strong. Meanwhile, a Lerner index higher

68 Including in emerging areas such as Fintech, as well as in financial consumer protection, among several others.

69 According to Mexico's National Financial Inclusion Survey (*Encuesta Nacional de Inclusión Financiera*), between 2012 and 2015 the share of adults with a transaction account ("cuenta de depósito" or "cuenta de ahorro") at a regulated financial-services provider increased from 35.5 to 44.1 percent.

70 Agent banking only covers 19 percent of rural areas.

Figure 22: Financial Sector Structure



Source: World Bank staff calculations based on data from Banxico.

than in other major Latin American countries suggests that mark ups are high. The Boone indicator, a measure of profit elasticity with respect to marginal costs, is not as strong as in the peer countries suggesting significant room for competition improvements. The diverging conclusions from measuring different aspects of competition illustrate its complex nature and impact on efficient outcomes. The country has liberalized entry both by allowing foreign banks into the market, allowing small non-bank intermediaries to operate, and by introducing niche bank licenses that allow for the entry of less complex banks with commensurately lighter regulatory burdens.

**86. Mexico has one of the largest financial-technology sub-sector in Latin America, with 238 registered startups in 2017.** Startups in Mexico are concentrated in lending (23% of startups), payments and remittances (22%), enterprise and personal financial management (15 and 10%, respectively), crowdfunding (9%), and insurance (6%). The latter is on the rise, leading the highest growth segments in 2017. According to the Finnovista report, particular features of the Mexican market that make it a fertile environment for fintech include: (i) a high Internet and smart mobile devices penetration; (ii) a strong ecosystem of entrepreneurship and e-commerce; (iii) a low banking penetration, and; (iv) an undeveloped consumer lending offer. Most fintech startups are currently concentrated around Mexico City, Monterrey and Guadalajara. Before the Fintech Law, non-banks were not allowed to issue mobile money accounts. With the necessary legal framework and physical infrastructure in place, both the e-money issuers created by the Fintech Law (i.e. the IFPEs) as well as banks will be in a better position to develop products and business models that can reach the unserved in remote areas, most likely through mobile money eco-systems.

**87. Small nonbank financial institutions have the potential to expand financial-service provision to lower-income groups, but their small size, limited funding capacity, and low profitability remain key challenges.** Many SOFOMES

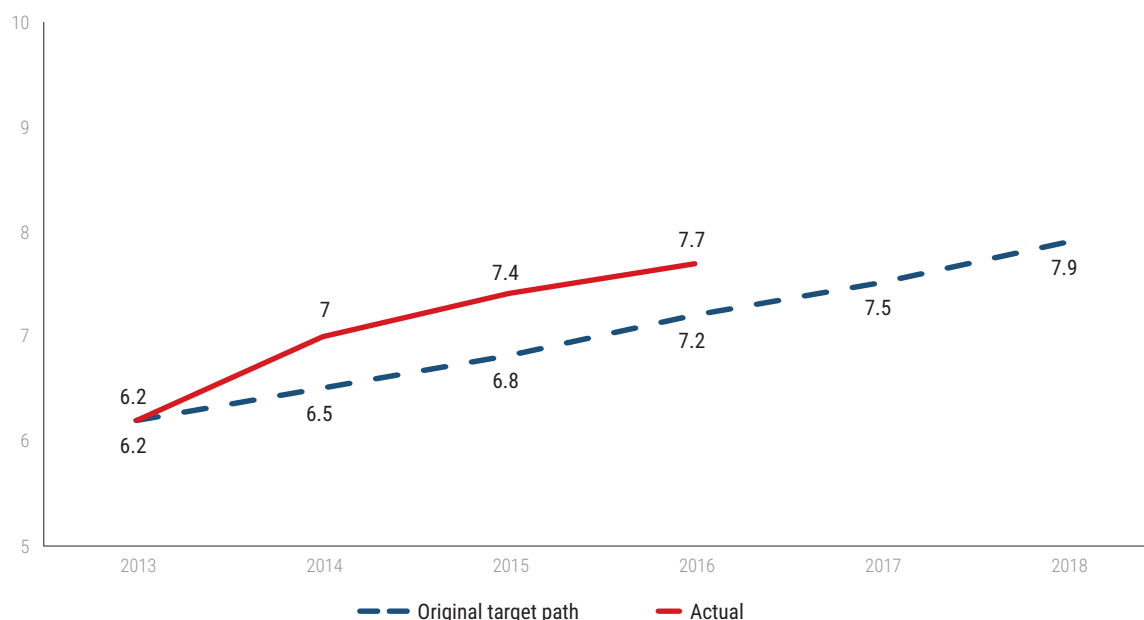
have not yet recovered after the global financial crisis and have been unable to access private credit. Mexico's nonbank financial institutions (NBFIs) have struggled to overcome efficiency issues and have not taken advantage of the agent-based models. Popular financial companies (*sociedades financieras populares, SOFIPOs*) face high regulation costs and have generally been unable to increase profitability and would likely benefit from greater consolidation, while many savings and loan cooperatives (*sociedades cooperativas de ahorro y préstamo, SOCAPs*) face competitiveness challenges and would benefit from more professional management.

### Financial Services for MSMEs

**88. MSMEs remain underserved by the formal financial sector.** Mexican MSMEs provide 71 percent of employment and earn 51 percent of business income. However, 73 percent of MSMEs are informal, and only 20 percent use bank credit. MSMEs receive just 11 percent of all commercial bank credit, a significant share of which is backed by DFI guarantees. MSMEs often lack access to appropriate types of credit, as high levels of credit risk limit the range of products available to MSMEs.

**89. The 2016 Financial Sector Assessment Program found that although progress has been made in easing financial constraints among MSMEs, challenges remain in terms of affordability and access.** MSMEs with access to finance reported facing relatively favorable credit conditions, especially for credit backed by DFI guarantees, with relatively low interest rates and average maturities of 24-36 months. However, MSMEs that were unable to obtain credit cited high interest rates and cumbersome procedures as binding constraints. MSMEs with relatively few employees and low debt levels, and those in the initial stages of development, reported facing significantly less-favorable conditions than larger, more well-established MSMEs. Pervasive informality further hinders access to finance in the MSME sector.

Figure 23: DFI-Backed Credit



Source: SHCP and Diario Oficial de la Federación, December 16, 2013, third section.

### Financial-Sector Oversight

90. **Responsible macroeconomic management and a resilient financial system have helped maintain financial stability in Mexico.** The 1994 crisis underscored the importance of a stable financial system to Mexico's economic performance. Five of the country's seven largest banks are subsidiaries of large international banking groups, which helps mitigate domestic risks, but also increases exposure to external shocks, as the 2008 global financial crisis demonstrated. These institutions form the core of systemic risks in the country. No major financial institution has failed in recent years, but a large number of housing-finance providers struggled in the aftermath of the global financial crisis, and many smaller institutions remain financially weak despite generally favorable economic conditions. Both institutional capacity and independence are critical to oversight authorities' ability to handle threats to financial stability. Whereas the Central Bank enjoys substantial independence, the CNBV has more limitations on this front.

### Development Finance Institutions (DFIs) Efficiency

91. **The 13 DFIs owned by the federal government have grown rapidly and now support one-third of total credit to the private sector.** Following the 1994 crisis, the government liberalized financial markets and eased restrictions on the entry of foreign banks, yet these measures failed to adequately deepen the financial sector, and the government responded by enhancing the role of DFIs. New legislation in 2013 facilitated a rapid expansion in DFI credit and set ambitious quantitative financing targets (Figure 23). These targets, however, created incentives to increase the volume of lending without adequate emphasis on development impact and on associated risks including the risk of crowding out private finance. It is unclear the

extent to which DFIs (i) reach the segments of the financial market they aim to support, (ii) effectively balance costs and benefits, (iii) promptly phase out obsolete programs, (iv) crowd out private finance, or (v) contribute to the excessive accumulation of risk. Moreover, the number of federal DFIs is high relative to emerging market peers. They have been established at different points in time to serve objectives considered important at the time. However, the large number of DFIs reduces the flexibility to reorient the DFI activities to current priorities.

### Other Issues

92. **An inadequate supply of long-term savings and financing instruments constrains investment options for pension-fund managers and limits the availability of financing for large infrastructure projects.** Capital markets in Mexico are comparatively shallow vis-à-vis peer countries and their further deepening would benefit areas of the economy and the financial system. As well, Mexico's pension funds have too few contributors, contribution amounts are insufficient, and asset returns will not provide an adequate income level for future retirees. Under the defined-contribution schemes, pension payments are expected to replace just 28-34 percent of labor income. Pension assets are excessively invested in government instruments, which entail little risk but offer low returns. Meanwhile, infrastructure projects that could yield significantly larger returns have difficulty obtaining funding. Some progress has been made in developing corporate equity and debt markets, but equity markets and specialized funds for financing infrastructure remain small, expensive, and illiquid. Despite its potential to help close Mexico's large infrastructure gap, the market for infrastructure-related bonds is not fully developed. Infrastructure bonds can consolidate public and private financing into a single instrument, and projects that generate a direct financial return (e.g., via user fees or other tariffs) are especially well suited to bond issues.



## POLICY OPTIONS

### Financial Inclusion

93. **The issuance of secondary regulations to the Fintech law and the adoption of adequate oversight mechanisms should have a high priority.** The Fintech Law provides an opportunity to enhance the enabling environment for financial inclusion through the adoption of innovative business models that have broad reach. The authorities have outlined a roadmap for secondary regulations to follow the implementation of the Law within 6, 12 and 24 months. Two cross-cutting issues for secondary regulation that need to be taken into consideration are: (i) monitor and protect against regulatory arbitrage and maintain a level playing field especially between Fintech and incumbent entities; and (ii) ensure consistency across secondary regulations associated with various financial sector laws. Given that Fintech firms may operate within the mandates of multiple agencies, strong coordination mechanisms on a bilateral basis between agencies as well as in relation to two new bodies created by the law (the Fintech Innovation Group and the Interinstitutional Committee) would be key. Moreover, strong focus is needed to develop internal capacity, processes and procedures for licensing, monitoring and supervising fintech services and providers under the new legal and regulatory framework. In addition, recent developments across the world and in Mexico, show the need for a comprehensive cyber security framework for the financial sector industry.

94. **To facilitate financial access, development of remote access channels, in particular those supporting the widespread operation of mobile banking, should be prioritized, while at the same time seeking enhanced coverage of bank, non-bank and third-party physical access points.** An appropriate combination of physical access points and remote channels, and a balance between in-house services and third-party providers, can decrease both time and travel costs on the demand side and transaction and overhead costs on the supply side, enabling financial firms to sustainably expand operations in remote and underserved areas of the country. Streamlining the regulatory and policy framework and facilitating the adoption of enhanced business models could mitigate distortions and ease constraints on the expansion of financial access points and remote channels.

95. **The authorities should continue to strengthen and consolidate NBFIs, including cooperatives.** Increasing the aggregate scale of the SOFOMES, SOFIPOs, and SOCAPs sector would lower costs and expand the range of financial products and services. Priority measures include: (i) swiftly implementing corrective actions through the merger, acquisition, or liquidation of NBFIs when improprieties and regulatory breaches are detected; (ii) requiring NBFIs to develop multiyear strategic plans; and (iii) tightening supervision by developing ear-

ly-warning indicators and improving coordination between the CNBV and auxiliary supervisory bodies.

### Financial Services for MSMEs

96. **Development of financial infrastructure through asset-based lending (ABL) could expand financial access among MSMEs.** The government's financial inclusion policy calls for developing private credit products aimed at underserved market segments, particularly MSMEs. ABL can advance this objective by providing MSMEs with revolving lines of credit to cover startup and operational costs on an ongoing basis. However, ABL requires a modern financial infrastructure, including: (i) a clear legal framework that allows for flexible transactions while maintaining legal certainty between the parties involved; (ii) an efficient system for registering interests in collateral and that provides priority to the first party to register as against subsequent third-parties; and (iii) enforcement mechanisms that enable creditors to recover the outstanding amount of the loan by realizing the collateral in an extrajudicial manner after a debtor's default.<sup>71</sup> Emerging areas to include, among others, include the use of electronic invoices by MSMEs and Fintech firms.

97. **The government could incentivize banks to pilot ABL programs, for example by having DFIs offer a second-loss partial credit guarantee (SLPCG).** This guarantee would allow banks to develop and introduce ABL type products, putting Mexico's legal, registry and enforcement reforms to the test, while providing a safety net for lenders in case elements of the system do not perform as designed. The SLPCG would become eligible after the bank exhausts its rights and remedies under the secured transactions system, standardizing the value of movable collateral and hedging against both enforcement risks and risks that the collateral's liquidation value will be less than its assessed value. These measures should be accompanied by efforts to raise awareness within the financial sector regarding ABL process and requirements, and the authorities could offer advisory assistance to financial institutions interested in piloting ABL credit programs for SMEs.

### Financial-Sector Stability

98. **Increasing the institutional, supervisory, and budgetary independence for some financial-sector regulators is important.** Whereas the Central Bank rightly enjoys substantial independence, which should be upheld, other key financial-sector agencies like CNBV, the National Commission for the Retirement Savings System (*Comisión Nacional del Sistema de Ahorro para el Retiro*, CONSAR), the National Insurance and Bond Commission (*Comisión Nacional de Seguros y Fianzas*, CNSF), and the Institute for the Protection of Bank Savings (*Instituto para la Protección al*

71 Mexico is advancing reforms in all three areas: (1) reforms to the secured transactions law took place between 2002 and 2014; (2) creation of the collateral registry took place in 2010; and (3) development of summary and extrajudicial remedies took place in 2014. To determine whether these collective reforms have reached a level for the introduction of ABL the IFC consulted three top banking law firms in 2017 regarding the legal feasibility of ABL. All three broadly agreed that ABL is now possible in Mexico, though additional legal and regulatory reforms could facilitate its introduction. In addition, the IFC also commissioned an operational and technological diagnostic of the movable-collateral registry ("Registro Unico de Garantías") to determine if its structure and features are also presently suited for the introduction of ABL. The National Law Center consultancy, which performed the diagnostic, concluded that the system as it stands supports the introduction of ABL, although further technological updates are necessary.

*Ahorro Bancario*, IPAB) have limited autonomy. Although it is funded by supervisory fees, the CNBV's budget is subject to SHCP approval. The longstanding salary freeze may impede the CNBV's ability to retain high-quality staff which is in high demand in this complex sector. Moreover, CNBV staff receive inadequate legal protections.

## DFI Efficiency

99. **Consolidating DFIs could help align their activities with current development finance priorities and increase their efficiency.** For example, when Infonacot was established to lend to low-income workers, it filled a gap in the market, but payroll deduction loans are now widely available from commercial banks a merger with BANSEFI could be considered. Similarly, a merger between NAFIN and Bancomext has been considered in the past and could be re-evaluated.

100. **Shifting from quantitative lending targets to a system based on multiple outcome indicators could sharpen efficiency incentives among DFIs.** Refining the overarching strategy and objectives for DFIs could increase their efficiency and enhance their impact. Ongoing evaluations, pro-transparency efforts, and improved coordination could provide the basis for a revised DFI strategy. The results framework for DFIs should be expanded beyond lending volume to include financial-inclusion indicators, the number of new borrowers, and other outcomes directly relevant to development objectives. Having over-achieved towards their quantitative goals, DFIs could shift focus to target these objectives.

101. **Policymakers could place greater emphasis on crowding-in private financing by changing the focus of DFI instruments.** DFIs use both guarantees and second-tier lending to promote the growth of the private credit market. However, much of DFI lending could potentially be crowding out the development of private sector credit on a long-term basis. Further shifting DFI's funding (e.g., via more strategic and broader use of guarantees), risk, and client-interaction activities for the private sector could more effectively leverage private capital and liquidity, encouraging more sustainable development of the financial sector for long term finance. Thus, greater use of guarantees instead of loans or by providing second tier finance rather than direct finance, and exiting from markets where private financial institutions can serve the market will help maximize DFIs' impact for the level of risk assumed.

102. **DFI corporate governance could be improved.** A recent evaluation of DFI governance recommended revising the composition of board members and reforming mechanisms for electing CEOs.<sup>72</sup> Better governance could enhance DFI efficiency.

103. **DFIs could reform their products to foster a more diverse and effective infrastructure- finance market.** These include state banks such as the National Bank of Public Works and Services (*Banco Nacional de Obras y Servicios Públicos*, BANOBRAS) and others. Consolidating loan-guarantee products into basic guarantee streams could help investors better understand the products which can be separated by creditor financing risks versus project sponsor contractual risks. Creating refinancing facilities could help as a mode of providing contingent loan guarantees for follow up funding. The use of guarantee instruments could help promote continued investment financing through capital market instruments after short-to-medium-term bank credits expire. Finally, expanding the use of first-loss guarantees to creditors could incentivize bond investors to invest in public-private partnerships. These instruments would promote better use of commercial long-term credit rather than DFI credit competing with the private sector.

## Other Issues

104. **Focusing more on higher-yield investments while reducing administrative costs would help in the aim that future retirees have better replacement rates.** Given low anticipated income-replacement rates in the defined-contribution pension systems, retiring contributors will likely experience a sharp drop in income. This could present a serious fiscal liability if political pressures lead to the adoption of supplementary pension programs. A package of policies on the revenue, expenditure, investment, and administration sides of the pension system would need to be envisaged.

105. **Establishing a long-term lifecycle benchmark for pension institutions would better align the incentives of asset managers with those of contributors.** Compensating asset managers based on investment returns encourages them to seek short-term gains. The pension supervisor, CONSAR, has already strengthened incentives for asset managers to make longer-term investments, but adopting a single long-term benchmark designed by an independent committee would be a clear improvement over the current system of multiple undisclosed benchmarks.

106. **In order to increase the availability of investable securities capital market development should be incentivized via a multi-pronged approach.** Corporate governance improvements and market regulations could be streamlined for mid-sized firms, and measures taken to promote issuance of private sector bonds. As discussed above, DFIs can support bond issuances through targeted risk guarantees in specific areas and alternative assets such as PPP projects. Mexico's membership in the Pacific Alliance and MILA<sup>73</sup> should be further exploited to augment the diversity and liquidity of available securities on the market, including, inter alia, more issuances of private sector fixed income securities.

72 To facilitate financial access, development of remote access channels, in particular those supporting the widespread operation of mobile banking, should be prioritized, while at the same time seeking enhanced coverage of bank, non-bank and third-party physical access points. An appropriate combination of physical access points and remote channels, and a balance between in-house services and third-party providers, can decrease both time and travel costs on the demand side and transaction and overhead costs on the supply side, enabling financial firms to sustainably expand operations in remote and underserved areas of the country. Streamlining the

73 Mercado Integrado de Latinoamericano, an initiative integrating the stock markets and listing and trading practices, among Mexico, Chile, Colombia and Peru.





## 5. Reforming Labor Policies to Encourage Formalization and Promote Productive Inclusion

**M**exico has low unemployment rates by the standards of its regional peers, its labor force is increasingly better educated, and the share of workers employed in the informal sector fell from 60 percent in 2012 to 56.5 percent in 2017. These are important achievements that were brought about by policy reforms over the last years. Yet labor-force participation rates among women remain stubbornly low, dropout rates in upper secondary school are high, young workers face limited economic opportunities, and a large share of informal workers (among the largest in Latin America) inhibits the growth of productivity and wages. Indicators of allocative efficiency in the Mexican labor market are low, and wages are barely rising. Multiple barriers constrain women and youth from accessing job opportunities. Across the entire labor force, skills mismatches and misallocation hinder the expansion of firms. Successfully fostering productive inclusion will require a multifaceted formalization strategy that promotes formal employment addressing the incentives faced by firms and employees. Such a strategy must integrate a multiplicity of actors and institutions to coordinate a wide array of policies. The main policies under the proposed formalization strategy should include: tax policy, social protection reform, administrative simplification, reduction of burdensome regulation (particularly at the sub-national level), enhanced enforcement, cutting the costs for hiring and firing, and reducing the length of legal procedures in labor courts, among other. Fostering participation in the formal labor force of

women and youth is also critical. Policies geared toward this objective include: facilitating access to affordable, high-quality childcare; promoting publicly funded afterschool programs; facilitating school-to-work transitions, including through wage subsidies to formal firms to take on young workers and train them to perform a job; and enhancing access to job-search and training support as part of a broader set of active labor market programs. In this context, strengthening the relationship between the education system and the private sector to equip young workers and women with the skills demanded by employers will also be necessary. In terms of wage legislation, Mexico is the country in LAC with most room to increase its low minimum wage without significantly affecting compliance or the wage distribution. However, it is crucial to assess potential impacts on productivity, human capital investment and wage inequality, to understand the advantages and drawbacks of different levels of increase in the wage floor under the specific dynamics of the Mexican labor market.

## CONTEXT AND REFORM PROGRESS

**107. Mexico's unemployment rate is very low by the standards of both Latin American and OECD countries, yet the composition of the workforce reveals serious inclusion challenges.** The labor-force participation rate (LFPR) varies substantially by gender, discouraged workers make up a significant share of the economically inactive population, and informality is pervasive. Of the 82 million Mexicans between the ages of 15 and 65, just 63.2 percent (52 million) participate in the labor market, leaving an economically inactive population of 30 million. The LFPR for women is 35 percentage points lower than it is for men. Of the roughly 50 million employed workers, 35 million are salaried employees and 10 million are self-employed. The remaining 5 million (or just over 9 percent of the employed population) are divided equally between employers and unpaid family workers. While Mexico's unemployment rate is low at just 3.6 percent (1.8 million people), an estimated 16.1 percent of the economically inactive population (5 million people) are willing and able to work but are discouraged or believe there no suitable available jobs

**108. The informal economy is complex and heterogeneous.** Recognizing the diversity of actors, motivations and causes behind informality is essential for policy action. The definition of informality used in this note includes all those workers engaged in economic activities in a context in which they cannot invoke the legal or institutional framework to govern their economic inclusion, independently of the circumstance or reason for it.<sup>74</sup> Informal employment is therefore comprised of workers with no salaried contractual relations or subordination of a worker to a firm or boss in exchange for a wage, such as small family firms, farmers in sharecropping agreements, workers remunerated on the basis of units sold, among others;<sup>75</sup> it also includes

the self-employed; and, those hired in formally registered firms that do not comply with the obligation of enrolling them in contributory social insurance. The discussion of policy action requires the distinction of formalization of informal firms, entailing regulation enforcement for registering and taxing them; and formalization of employment, entailing assurance of social protection, registration of labor contracts and law enforcement for the protection of labor rights. Moreover, taxes, social programs and labor regulations are parts of a single incentive structure that has large implications for productivity.<sup>76</sup>

**109. Widespread informality suppresses wage growth.** In 2017, 56.5 percent of employed workers were engaged in the informal sector, and more than 60 percent of wage employees earned less than three times the minimum wage. Informality is especially high in poorer areas of Mexico, which contributes to regional and rural-urban disparities. Rates of formal employment are highest in the states of Nuevo Leon, Coahuila, and Chihuahua and lowest in Chiapas and Oaxaca.<sup>77</sup> Gender disparities are also substantial, as the rate of formal employment among men significantly exceeds the rate among women. Although the sector that has the greatest proportion of formal workers is manufacturing (62 and 55 percent of men and women respectively), informality remains high across sectors showing that the phenomenon is not sector-specific. Asymmetric regulation of the relations between workers and firms for salaried and non-salaried workers compounds misallocation of resources towards the informal sector and contributes to low productivity.

**110. The reform process over the last decade brought attempts to increase flexibility to the labor market and facilitate the formalization of firms and jobs.** In 2012, Mexico's Congress approved a set of reforms aimed at increasing labor market flexibility especially for young workers. The

74 INEGI (2014) "La informalidad laboral, marco conceptual y metodológico"

75 According to Mexico's labor and social security laws, there is no obligation that non-salaried workers be enrolled in contributory social insurance. The distinction between salaried and non-salaried contracts in Mexico is significant, as many institutions and policies have been designed separately providing different benefits for workers depending on the type of contract they hold (Anton et al, 2013; Levy 2018).

76 Levy (2018)

77 INEGI, ENOE 2017

reforms also increased enforcement by adding to the resources available to inspection of employers' fulfillment of the regulation, and increasing the penalties for noncompliance. Since 2014, measures designed to reduce the cost of formalization, such as simplified tax procedures, have played a role in encouraging firms to join the formal sector. As part of the fiscal strategy "Crezcamos juntos", the efforts to increase the tax base have been successful in formalizing firms and their employees as well as increasing revenue. On the social security side, IMSS' strategy against informality implied a significant reduction of the administrative burden for enrollment, reaching 2.9 million additional formal workers enrolled between 2012 and 2017.<sup>78</sup>

Despite progress driven by positive reforms, challenges remain ahead.

## CHALLENGES

### Lowering the Cost of Formalization for Firms and Workers

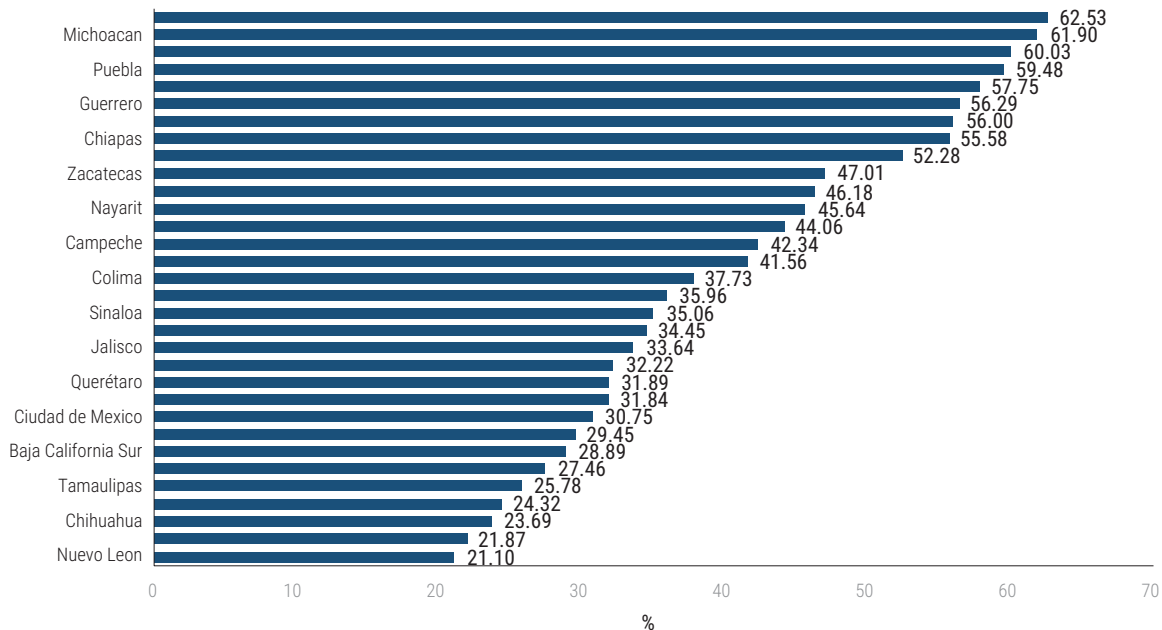
111. **The supply of educated workers is increasing relatively quickly, but firms and employment are both growing faster in the informal sector than in the formal sector, across sectors.** Between 2005 and 2017, the share of the labor force with at least some high school education increased from 24 to

37 percent, while the share of the labor force with some complete secondary school education increased from 31 to 35 percent. However, while educational attainment is rising among younger workers, their informality rates are the same as those of earlier, less educated cohorts.<sup>79</sup>

112. **Strict labor regulations along with lengthy and costly dismissal procedures diminish incentives for formality.**<sup>80</sup> Burdensome labor legislation implies high costs in hiring and firing, place an implicit tax on formal employment, incentivizing firms away from formal contracts. Restrictions on the hours of work and non-standard work, increases the hiring costs of formal hiring.<sup>81</sup> The severance pay requirements are very high, placing the burden on individual firms and discouraging formal hiring. The average severance pay for redundancy dismissal in Mexico is more than double compared to that of in Brazil, and more than quadruple of those in United Kingdom and France.<sup>82</sup> Uncertain, complex, and lengthy legal procedures for dismissal further diminish incentives for formality. Most dismissals end up being contested in labor courts, where processes may take 3 or more years, and the dismissal cannot be declared effective until the court reaches a verdict.<sup>83</sup>

113. **Informality is linked to low productivity and low wages.** Informality is associated to firm size, being more prevalent among small firms. Such firms employ the vast majority of Mexican workers, especially in the south. The 2012 labor reform introduced more-flexible hiring practices, but fell

**Figure 24: The Share of Remunerated Workers without Access to Social Security Benefits by State (%)**



Source: INEGI. ENOE  
 Note: Data are for 3Q 2017.

78 IMSS 2017, *Estadísticas de asegurados*.

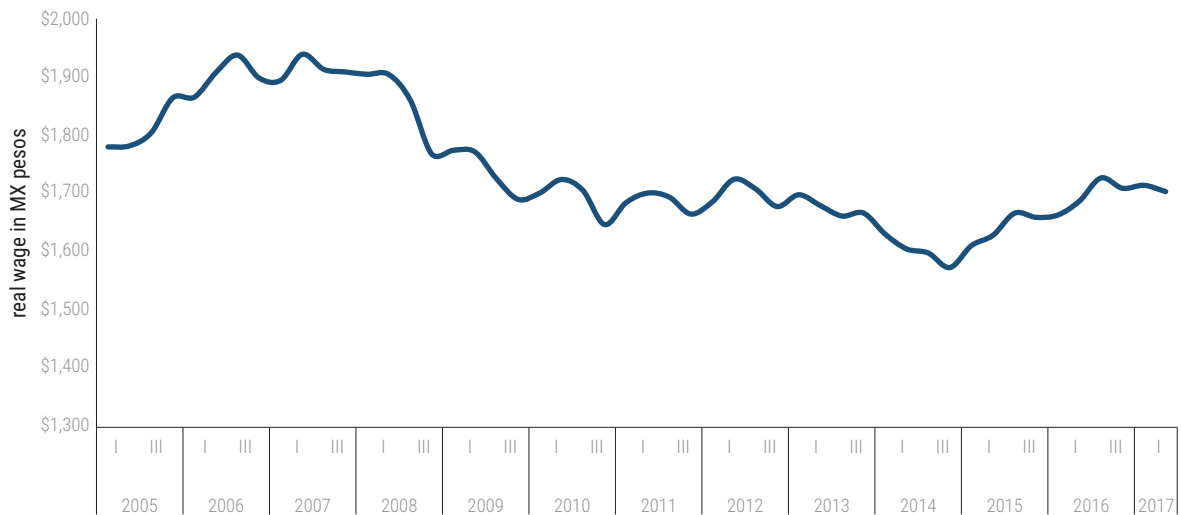
79 Levy and Szekely (2016)

80 There are several other factors that may contribute to the high levels of informality, i.e. social protection system, tax system, and product market regulations (barriers to entry, licensing etc.), which are covered in Policy Notes for Social Protection, Fiscal, and Productivity respectively.

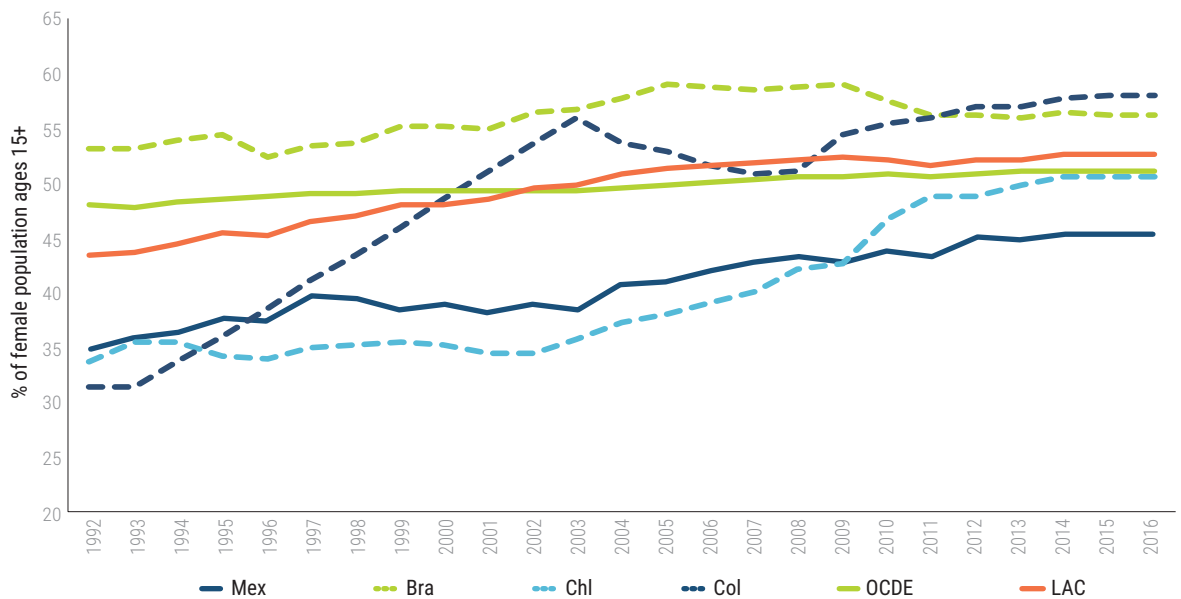
81 The maximum number of hours for daytime work is designated as 8 hour and 7 hours for night shifts s (Art. 61 Federal Labor Code), with a 100% premium for overtime work (Art. 66 Federal Labor Code)

82 The severance pay for redundancy dismissal for a worker (average of severance pay with 1, 5 and 10 years of tenure) in Mexico is 22 weeks of salary, compared to 9 weeks in Brazil, 4 weeks in United Kingdom, and almost 5 weeks in France. This difference is more drastic for workers with short tenures: 14 weeks in Mexico, compared to 1.7 weeks in Brazil, 0 weeks in United Kingdom, and 0.9 weeks in France (Doing Business, 2018). <http://www.doingbusiness.org/data/exploretopics/labor-market-regulation>

83 See Policy Note on Rule of Law for further details on the functioning of Labor Courts and the linkages with informality.

**Figure 25: The Evolution of Real Labor Income, 2005-2017 (MX)**

Source: ENOE 2005-2017

**Figure 26: The Evolution of the Female Labor-Force Participation Rate, 1992-2016**

Source: World Development Indicators 2017

short of creating unemployment insurance, increasing the share of temporary workers.<sup>84</sup> Administrative barriers and high employer and employee social contributions levied at low and very low-income levels continue to encourage the allocation of resources to small, low-productivity firms, which employ less-educated workers, depressing wage rates<sup>85</sup>.

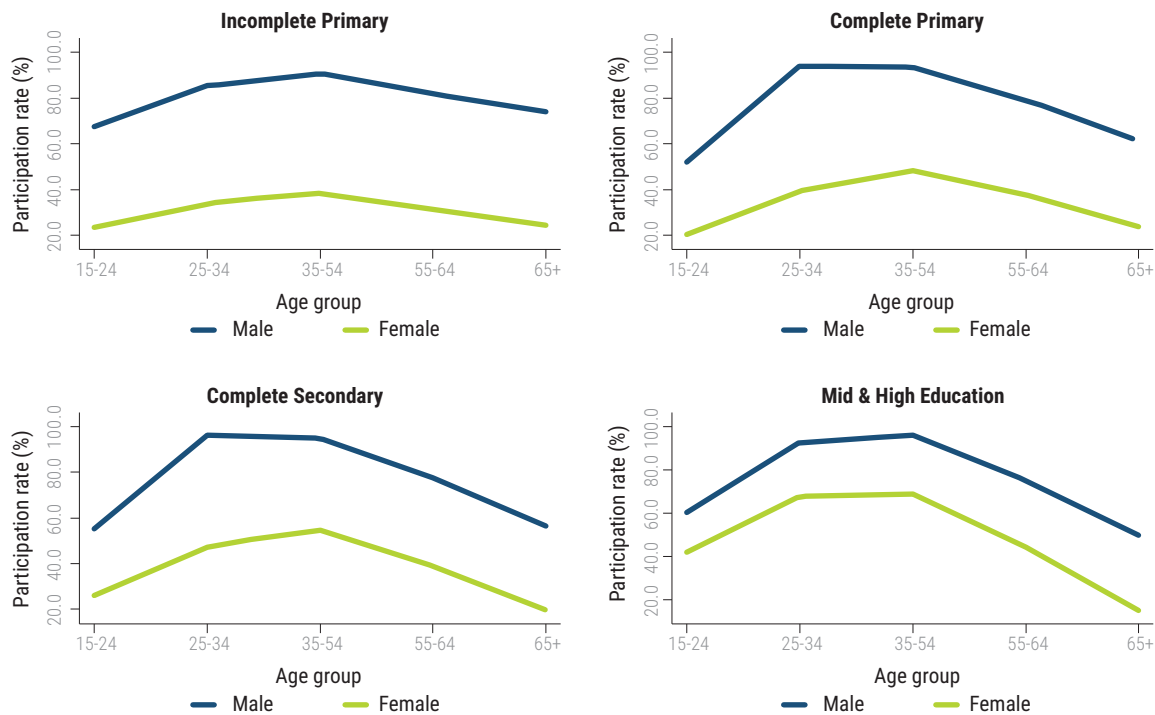
114. **More than 90 percent of the workers making up to the minimum wage are informal.** Currently, the minimum wage is under the poverty line (minimum wellbeing line) defined by CONEVAL. During the first trimester of 2018, there were 8.6 million people whose labor income was up to the minimum wage, representing 16 percent of the employed population. The great majority of these

workers are informal.<sup>86</sup> Increasing the minimum wage is argued to reduce income inequality and raise the living standards for impoverished workers. However, the measure could be inadequate if it does not go hand in hand with other actions to increase productivity and ultimately reduce informality.

### *Integrating Women into the Paid Labor Force*

115. **While Mexico's female LFPR is improving, it still lags the rates of most OECD countries and regional peers.** Only 45.5 percent of working-age Mexican women participate in the labor force, well below the averages of 53 percent for LAC countries and 51 percent for the OECD. Mexico's female

84 Approval of the unemployment insurance element by the legislature is still pending.  
85 Levy and Lopez-Calva (2018).  
86 INEGI, Tabulados ENOE I-2018.

**Figure 27: The Labor-Force Participation Rate by Education Level, Gender, and Age**

Source: ENOE 2017.  
Note: Data are for 3Q 2017.

LFPR is below the rates of regional peers such as Brazil (56 percent), Colombia (58 percent) and Chile (52 percent), the latter two had female LFPRs in the 1990s that were close to or below the rate for Mexico (Figure 26). The gender differential in LFPR is more pronounced among young adults and those with lower levels of educational attainment (Figure 27). A recent study estimated that Mexico's gender gap in LFPR costs the country a staggering 22 percent of per capita GDP.<sup>87</sup>

**116. Multiple barriers hinder women's entry into the labor force, and many women are forced to balance the demands of unpaid work against paid work and education.** In Mexico, women shoulder nearly 77 percent of all unpaid housework. The average woman spends six hours each day doing unpaid housework, compared to an average of two hours for men. A large household labor burden presents a serious challenge for women attempting to attend school or work a full- or even part-time job. Moreover, almost 30 percent of employees in Mexico work very long hours (more than 40 hours in a usual week),<sup>88</sup> far above the OECD average of 13 percent, which compounds the challenge of balancing multiple obligations and acts as a barrier to women's entry in the labor market.<sup>89</sup> Social norms also are a determinant factor of labor supply: Mothers, and especially younger mothers, are far less likely to work or attend school than are non-mothers.

### Fostering Youth Inclusion

**117. Young workers in Mexico face elevated rates of unemployment and informality, as well as precarious employment conditions.**<sup>90</sup> Although youth unemployment rate in Mexico (6.9 percent) is low compared to most of its regional peers (for example 18.4 and 30.5 percent in Colombia and Brazil respectively), it is two to three times higher than the rates for other age groups. An estimated 67 percent of employed youth work in the informal sector, 10 percentage points higher than the average for the working-age population. In addition to the high turnover and exclusion from social security programs that characterize work in the informal sector, informal jobs are less likely to impart the skills valued in the formal labor market, reinforcing the economic exclusion of informal workers. Moreover, 29 percent of workers aged 15 to 19 earn less than the minimum wage, and 46 percent earn just one to two times the minimum wage.<sup>91</sup>

**118. A large share of<sup>92</sup> Mexico's youth is not in employment, education or training (NEET).** In 2016, a quarter of Mexicans aged 20-24 were in this group, far above the OECD average of 16 percent (Figure 26). Being out of school or training during adolescence has a negative long-term impact on productivity, lowering lifetime wages and employment prospects and slowing overall economic

87 Cuberes and Teigner (2017)

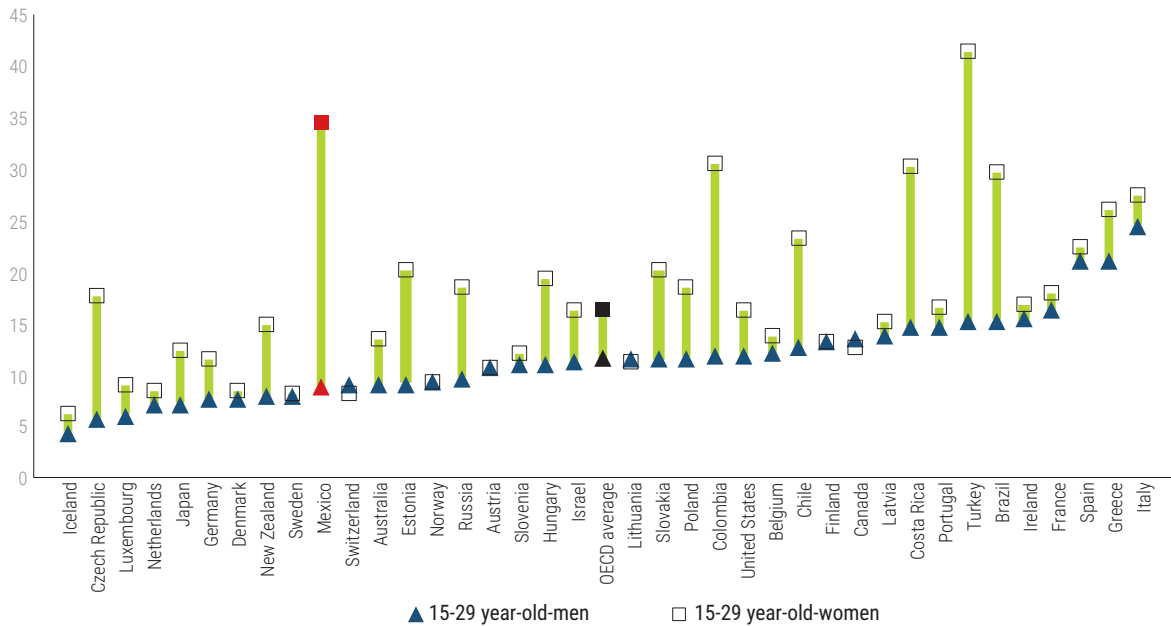
88 According to OECD statistics, in Mexico the average usual weekly hours worked is 45.6, one of the highest among OCDE and LAC countries.

89 OECD, Better Life Index, 2016.

90 Unless otherwise noted, youth are considered those in the 15 to 29 age range.

91 Ibid.

92 INEGI, 2017a.

**Figure 28: Youth Not in Education, Employment or Training (NEET), Mexico and OECD Countries**

Source: OECD (2018), Youth not in employment, education or training (NEET)

growth.<sup>93</sup> For any given age cohort, a 1 percentage point increase in the share of youth NEET is associated with a 7 percent reduction in earnings for that cohort 20 years later.<sup>94</sup> The prevalence of population NEET also has negative implications for poverty reduction and shared prosperity, as almost 60 percent of Mexico's population NEET come from households in the bottom 40 percent of the income distribution.<sup>95</sup> Mexico's low female LFPR contributes to the large share of population out of work, training or work. Young women in Mexico are nearly four times as likely as young men to be NEET, and 35 percent of young women are currently in this status—the second-highest rate in the OECD. Motherhood is a key driver of NEET status, and Mexican mothers in all age groups are far less likely to be engaged in paid employment than are mothers in most OECD countries. Among men, dropping out of high school is the most reliable predictor of NEET status, followed by previous unemployment.<sup>96</sup> Roughly four out of five youth NEET were previously employed, and only one in five became a NEET immediately after leaving school.

**119. Unemployment and informality among young workers can have lasting negative effects on employability and wages in adult life.** In any six-month period, only 17.1 percent of high school graduates that have been employed in the informal sector successfully transition to a formal job. By contrast, 85 percent of high school graduates that obtain formal employment stay in the formal sector.<sup>97</sup> In addition, less-skilled workers experience greater wage losses and larger persistence effects.<sup>98</sup> In the short term, high school

graduates who pursued general studies are less likely to find a job than those who graduated from vocational tracks.

**120. NEET status has important intergenerational implications.** A sizeable share of Mexico's youth is not accumulating the human capital necessary to fully leverage economic opportunities. Meanwhile, the higher incidence of NEET status among youth from households in the lowest quintiles of the income distribution perpetuates poverty and inequality. Moreover, disengagement from education and the labor market is associated with other social problems that increase vulnerability to poverty traps, including incomplete education, teen childbearing, youth unemployment, crime, and violence.

### Addressing Skills Mismatches

**121. Roughly one-third of Mexican firms cite difficulty finding qualified workers as an obstacle to productivity and expansion.** More than 40 percent of Mexican employers struggle to fill vacancies—particularly in semi-skilled trades—compared to an average of 31 percent in comparable countries.<sup>99</sup> The lack of technical specialists is most acute in the mechanics (22 percent), automotive (18 percent), aerospace (16 percent), electrician services (12 percent), and electronics (10 percent) subsectors, inter alia.<sup>100</sup> The positions that are hardest to fill are for machinery operators, salespeople, administrative staff, technicians, and certified workers.

93 Szekely and Karver (2015)

94 de Hoyos et al. (2016)

95 de Hoyos et al. (2016)

96 de Hoyos, Rogers and Székely (2016)

97 Calderon (2015)

98 See, e.g.: Heckman and Borjas (1980); Arulampalam, Gregg, and Gregory (2001); Cruces, Fields, Jaume and Viollaz (2015).

99 Hays (2016); Baz et al. (2014)

100 Manpower Group (2015)



122. **This mismatch between labor supply and demand reflects a combination of factors, including inadequate skills, ineffective signaling, and high search costs.** Enrollment rates in upper secondary and tertiary education have improved, but progress has been uneven among regions and population groups. The share of Mexican adults with upper secondary and tertiary education remains below the OECD average. 48.9 percent of employers attempting to fill vacancies in semi-skilled trades report seeking candidates who have completed high school (*educación media superior*), while 45.6 percent report seeking candidate with a college education (*educación superior*), and only 20.9 percent report hiring individuals with a middle-school education or less (*educación básica*).<sup>101</sup> Firms hiring semi-skilled technical staff report encountering a range of challenges, including a lack of technical talent (33.5 percent), long learning curves (26.9 percent), low performance (14.3 percent), high training costs (13.7 percent), and insufficient education and technical skills (11.5 percent). A full 72 percent of firms report that they are willing to pay more for candidates with hands-on experience, training, and practical knowledge appropriate to the position. Firms of all sizes state that they would pay an extra 22 percent, on average, to workers with the right experience and skills.<sup>102</sup>

## POLICY OPTIONS

### *Lowering the Cost of Formalization for Firms and Workers*

123. **A multifaceted “formalization strategy” that promotes formal employment and addresses the multiple incentives to firms and employees to become or remain informal is needed.** Such a strategy must integrate a multiplicity of actors and institutions to coordinate a wide array of policies. The main policies under this strategy to generate the right incentives to formalization should include: tax policy adjustments, social protection reform, administrative simplification, reduction of burdensome regulation (especially at the sub-national level), enhanced enforcement, cutting the costs for hiring and firing, and reducing the length of legal procedures in labor courts. Achieving large gains in reducing informality will also require strong enforcement in the labor justice system and the overall rule of law.

124. **Consider reducing payroll taxes (compensating with increased indirect taxation) to promote formalization of employment.** Eliminating some of the ancillary benefits currently financed by social security contributions and payroll taxes, such as housing support, could reduce the tax burden associated with formalization. The impact of this change on formal employment will depend on the

extent to which workers value additional income more than the benefits provided by social security contributions and payroll taxes. Research shows that low-income workers are especially likely to favor immediate income over long-term benefits.<sup>103</sup> The benefits of formality for workers are mainly associated with services, for example health. Ensuring good quality of these services and aligning the services provided with their perceived cost can also help encouraging formality. Considering alternative ways of financing social insurance premia (i.e., increasing indirect taxation, as discussed in Social Protection Policy Note) to alleviate the tax-burden associated with formalization. Moreover, the success of these reforms will also depend on complementary implementation of other measures aimed at reducing labor legislation rigidities, such as reduction in severance pay requirements, that inhibit labor demand.

125. **Promote careful design and rigorous evaluation of pilots to evaluate the potential effects on formalization of targeted reductions in labor taxation.** The experiences of advanced economies suggest that in-work tax credits and benefits targeted to low-wage and part-time earners could increase the demand for low-skilled formal labor.<sup>104</sup> The evidence points, however, to higher probability of expected effects on formal employment under certain conditions,<sup>105</sup> namely (i) Minimum wages present a binding constraint for employment creation in the country; (ii) services financed with payroll taxes are perceived to be of low value; (iii) few constraints to the expansion of labor demand; and of especial importance, (iv) workers have the skills to work in the industries that are expected to expand as a result of a payroll tax cut. For example, in the case of Colombia, binding minimum wages could explain the relatively larger employment effects than in other countries.<sup>106</sup> In Turkey, the accompanying measures of income tax credits and subsidies on land and electricity consumption could have been key to the relatively large employment effect.<sup>107</sup>

126. **Existing evidence also shows that benefits of employment creation need to be weighed against a potentially large reduction in the amount of taxes collected and the need for alternative sources of financing social insurance.**<sup>108</sup>

127. **Provide direct incentives to firms for formalization through targeted programs to informal firms.**<sup>109</sup> The benefits of formality for firms are associated with access to market opportunities and productivity-enhancing public goods, for example access to finance, public procurement, technology adoption and other types of relevant business services. Ensuring provision of such benefits would improve the incentives to formal establishment of firms' businesses.

101 Manpower Group (2015)

102 Mourshed et al. (2012)

103 Cunningham and Maloney (2001); Levy (2008); and, Anton, Hernandez and Levy (2013)

104 OECD (2015, 2016)

105 Pagés (2017)

106 Kugler et al. (2017)

107 Betcherman et al. (2010)

108 See Social Protection Policy Note for the exploration of alternative financing for social insurance.

109 See Policy Note on productivity for a more exhaustive discussion.

## Facilitating the Entry of Female Workers into the Paid Labor Force

128. **Facilitate access to affordable, high-quality childcare care to boost female participation in the labor force.** Efforts to expand coverage and enforce mandatory preschool via the Children's Program for Working Mothers (*Programa Estancias Infantiles para Madres Trabajadoras*) have had significant positive effects in maternal employment.<sup>110</sup> Further efforts to increase affordability and improve the quality of childcare programs, along with more-flexible operating hours and scheduling options, could significantly increase female LFPR.

129. **Promote publicly funded afterschool programs to further reduce the opportunity cost of employment among mothers.** The gap between work and school schedules can make it difficult for both parents to hold paid jobs. Studies have shown that afterschool programs can increase the likelihood of work, the number of hours worked, and the quality of employment among working mothers.<sup>111</sup>

130. **Expand access to flexible work arrangements for both men and women to ease gender disparities in paid employment and household labor.** Both in the public and private sectors, policies that encourage flexible work arrangements are critical to women's prospects for employment and career advancement. Options include parental leave, temporary part-time employment, telecommuting, and compressed workweeks. In 2014, paternity leave was recognized as a right in Mexico, and employers—not the social security system—are now obliged to offer five days of paid paternity leave. While paternity leave is an important step toward greater paternal engagement in childrearing, the legislative and policy framework for ensuring adequate work-life balance among workers with children is still very limited. Evaluating the impact of existing programs aimed at promoting work-life balance, such as the Family-Responsible Company (*Empresa Familiarmente Responsable*) program, could strengthen the analytical underpinnings for flexible work policies. There is also need of exploring the prevailing attitudes related to parental involvement in household activities and childcare, and measuring if and how these attitudes can be influenced by behaviorally informed interventions to empower parents (particularly fathers) to play an active role in their children's development.

## Fostering Youth Inclusion

131. **Facilitate school-to-work transitions and tackle school dropouts to improve employment prospects of younger workers.** In Mexico, public employment services play an

increasingly prominent role in reducing information asymmetries in the labor market, improving employability, and enhancing workforce adaptability. However, job-intermediation services and more intensive interventions such as career counseling and remedial education must be adapted to address the unique challenges faced by younger workers. Linking employment services with complementary interventions and with private-sector firms and industry associations can facilitate the school-to-work transition. These can include wage subsidies paid to formal firms to take on young workers and provide them the training they need to perform a job. These wage subsidies should have a sunset clause for each worker and each firm.

132. **Enhance access to job-search support and workforce training to increase the likelihood of obtaining formal employment.**<sup>112</sup> While multiple programs attempt to foster youth inclusion, most are fragmented, duplicative, and/or underfunded. Evidence suggests that a combination of programs yields better results than individual interventions.<sup>113</sup> A comprehensive approach to promoting youth employment that incorporates intermediation, skills training, wage subsidies, and self-employment support, *inter alia*, has proven to have a greater impact than the sum of the individual programs.<sup>114</sup> Other key elements of successful active labor market policies include private-sector engagement, adequate screening and targeting of vulnerable groups, and providing sustained support early in the job-search process.<sup>115</sup> Like other forms of support, job-search assistance is more effective when combined with intermediation services that match employers with jobseekers.<sup>116</sup>

## Addressing Skills Mismatches and Skill Misallocation

133. **Strengthen the relationship between the education system and the private sector to equip workers with the skills demanded by employers.** If schools are unable to communicate to firms what is being taught in the classroom, education attainment will have limited signaling value for employers, and if firms are unable to communicate the type of skills they need, the school system may not adequately equip students to succeed in the labor market. While employers continue to demand cognitive and technical skills, a recent survey found that 40 percent of Mexican firms identified socioemotional skills—including communications, customer relations, teamwork, and leadership—as the most difficult skillset to find.<sup>117</sup> Recent education reforms have highlighted a growing awareness of the importance of socioemotional skills, but these skills remain insufficiently valued by the education system.

110 Mateo and Rodriguez-Chamussy (2016).

111 Contreras et al. (2010); Berthelon and Kruger (2011)

112 CONEVAL (2005)

113 Blundell et al. (2013), Graversen and van Ours (2008), Gueron and Hamilton (2012)

114 Kluve et al. (2016)

115 IEG, 2012, Kluve et al. (2016)

116 See policy note on productivity.

117 Baz et al. (2014)



134. **Promote demand-driven training and internship programs to bridge the gap between the skills imparted by the education system and those demanded by employers.** Mexican firms cite lack of work experience as the main reason for not filling vacancies, followed by inadequate education, lack of technical skills, and lack of socioemotional skills.<sup>118</sup> The international experience suggests that well-targeted training and internship programs that adequately reflect the need of employers can enhance the efficiency of the labor market.<sup>119</sup>

135. **Expand the availability of training programs to enable workers to adapt to the evolving needs for more sophisticated technical skills.** Producing graduates equipped to work in high-tech sectors is vital to Mexico's continued growth. While recent labor reforms have enhanced skills certification, options for training and professional certifications that can be obtained while studying for a degree are needed.

### *Reviewing minimum wage legislation*

136. **Enhance empirical evidence on the advantages and drawbacks of increasing the wage floor - under the specific dynamics of the Mexican labor market.** Understanding potential impacts of wage legislation is crucial to guide the institutional wage-setting scope and mechanisms under

the National Commission on Minimum Wages (CONSAMI). Reviewing the existing international evidence, it is clear that the effects on productivity, human capital investment and employment are context-specific. Although the research of the impacts of changes in minimum wages on the labor market outcomes, such as employment and informality, and on human capital accumulation, has been extensive, up to date it has not led to a consensus in either the theoretical or the empirical literature.<sup>120</sup> Theoretically, predictions of the effects on employment and informality point in different directions, depending on the assumptions about characteristics of the market and the size of the change in the minimum wage. Empirical evidence for Mexico suggests that small increases in the minimum wage are likely to trigger minimal or no changes in the labor market (employment and informality) and school attendance.<sup>121</sup> In particular, the increase in the minimum wage resulting from the alignment of different minimum wage zones in 2012 seem to have had no negative effects on employment and positive -but small- effects on the probability of being an formal worker among those affected by the wage rise policy.<sup>122</sup> Nonetheless, the studied increases in the minimum wage have been relatively small and departed from very low initial levels. More research is needed to estimate potential thresholds at which further increases may start producing effects and to increase robust evidence as base for CONSAMI to fulfill its mandate.

118 Manpower Group (2017a)  
 119 European Commission (2015)  
 120 Cunningham et al (2016)  
 121 Perova and Trujillo (2016)  
 122 Campos-Vazquez et al (2017)

## References

- Anton, A., F. Hernandez and S. Levy (2013) "The end of informality in Mexico?: fiscal reform for universal social insurance". Inter-American Development Bank, Washington, D.C.
- Argente, D. and J. L. Garcia. (2015) "The price of fringe benefits when formal and informal labor markets coexist". *IZA Journal of Labor Economics* 4:1
- Arulampalam W., P. Gregg and M. Gregory (2001) "Unemployment Scarring" *The Economic Journal*, Vol. 111, Issue 475, 577-584.
- Baz, V., Martinez, J., Garcia, E., Cañedo, A.P., and Meza, M. (2014). *Encuesta de Competencias Profesionales 2014*. Ciudad de Mexico: Centro de Investigacion para el Desarrollo, A.C. (CIDAC).
- Berthelon, M. E. and D. I. Kruger (2011) "Risky behavior among youth: Incapacitation effects of school on adolescent motherhood and crime in Chile" *Journal of Public Economics*, 2011, vol. 95, issue 1, 41-53.
- Betcherman, G., D. Meltem, and C. Pagés. (2010). "Do employment subsidies work? Evidence from regionally targeted subsidies in Turkey." *Labour Economics* 17:4 (2010): 710-722.
- Blundell R., M. Costa Dias, C. Meghir, and J. Van Reenen. 2004. Evaluating the Employment Impact of a Mandatory Job Search Program. *Journal of the European Economic Association* vol. 2, issue 4, 569-606.
- Busso, M., M. V. Fazio, and S. Levy. (2012) (In)formal and (un)productive: The productivity costs of excessive informality in Mexico, Inter-American Development Bank working paper number IDB-WP-341, August 2012
- Campos-Vazquez, R. M. and N. Lustig. (2017). Labour income inequality in Mexico. Puzzles solved and unsolved. *WIDER Working Paper* 2017/186. November 2017.
- Campos-Vazquez, R. M., G. Esquivel and A. S. Santillan. (2017) "The impact of the minimum wage on income and employment in Mexico", *CEPAL Review* No. 122, Santiago, Chile.
- CONEVAL. (2015). Informe de la Evaluación Específica de Desempeño 2014-2015, Programa de Apoyo al Empleo. Mexico City: CONEVAL. Contreras, D., P. Sepulveda and S. Cabrera (2010) "The effects of lengthening the school day on female labor supply: Evidence from a quasi-experiment in Chile" Working Papers 323, University of Chile, Department of Economics.
- Cruces, G., G. Fields, D. Jaume and M. Viollaz (2015) "The growth-employment-poverty nexus in Latin America in the 2000s. Mexico country study" *WIDER Working Paper* 2015/079
- Cunningham, W.V., X. del Carpio, L. Iacovone, J. M. Moreno, L. Pabon and E. Perova. 2016. "El Salario Mínimo y la Productividad Empresarial, Laboral y General con un Enfoque en el Caso de Mexico". *Mimeo*
- Cunningham, W.V. and W. F. Maloney (2001) "Heterogeneity among Mexico's Microenterprises: An Application of Factor and Cluster Analysis." *Development and Cultural Change* 50 (1): 131-156.
- de Hoyos, R., A. Popova, R. F. Halsey (2016) "Out of school and out of work: a diagnostic of ninis in Latin America," *Policy Research Working Paper Series* 7548, The World Bank.
- de Hoyos, R., 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. European Commission. (2015). European Employment Policy Observatory Review. Upskilling Unemployed Adults: The Organization, Profiling and Targeting of Training Provision.
- Graversen, B. K. and J. van Ours (2008) "How to help unemployed find jobs quickly: Experimental evidence from a mandatory activation program" *Journal of Public Economics*, 2008, vol. 92, issue 10- 11, 2020-2035.
- Gueron, J. M., and G. Hamilton. 2002. "The Role of Education and Training in Welfare Reform." *Welfare Reform and Beyond Policy Brief*. Washington, DC: The Brookings Institution. [http://www.brookings.edu/papers/2002/04poverty\\_gueron.aspx](http://www.brookings.edu/papers/2002/04poverty_gueron.aspx). Hays Recruiting Experts Worldwide. (2016). *Reporte Laboral Mexico* 2016
- Heckman, J. and G. Borjas (1980) "Does Unemployment Cause Future Unemployment? Definitions, Questions and Answers from A Continuous Time Model of Heterogeneity and State Dependence" *Economica*, 47 (187), 247-83. Hendra, R., Greenberg, D., Hamilton, G., Oppenheim, A., Pennington, A., Schaberg, K., and Tessler, B. (2016). "Encouraging Evidence on a Sector-Focused Advancement Strategy: Two-Year Impacts from the Work Advance Demonstration." Washington, DC: MDRC.
- Independent Evaluation Group (2012) "Youth Employment Programas: An Evaluation of World Bank and International Finance Corporation Support". IEG 2012.
- ILO (2017) "Labour Overview Latin America and the Caribbean", ILO Regional Office for Latin America and the Caribbean. Lima: 2017.
- ILO (2018) "Notes about Public Employment Services in Selected Latin American and Caribbean countries. Mexico"
- INEGI. 2005 to 2017. "Encuesta Nacional de Ocupación y Empleo. (ENOE)" Instituto Nacional de Estadística y Geografía. Mexico.
- INEGI. (2017a) . "Encuesta Nacional de Ocupación y Empleo. (ENOE)" Instituto Nacional de Estadística y Geografía. Base de datos, tercer trimestre 2017. Mexico.
- Kluve, J., Puerto, S., Robalino, D., Romero, J.M., Rother, F., Stöterau, J., Weidenkaff, F., and Witte, M. (2016). *Interventions to Improve Labor Market Outcomes of Youth: A Systematic Review of Training, Entrepreneurship Promotion, Employment Services, and Subsidized Employment Interventions*. IZA discussion paper Series. DP10263.
- Kugler A. D., M. D. Kugler and L. O. Herrera-Prada, (2017). "Do Payroll Tax Breaks Stimulate Formality? Evidence from Colombia's Reform" *Economía Journal*, The Latin American and Caribbean Economic Association -LACEA vol. 0 (Fall 2017), 3-40.
- Levy, S. (2008). Good Intentions, Bad Outcomes. Social Policy, Informality and Economic Growth in Mexico. Brookings Institution Press, Washington, D.C.
- Levy, S. and M. Szekely. (2016) "¿Más escolaridad, menos informalidad? Un análisis de cohortes para México y América Latina", *El Trimestre Económico*, Vol. 83, Num. 332
- Levy, S. (2018) "Under-Rewarded Efforts. The Elusive Quest for Prosperity in Mexico" Inter-American Development Bank, Washington, D.C.
- Levy, S. and L. F. Lopez-Calva. (2018) "Persistent Misallocation and the Returns to Education in Mexico," *The World Bank Economic Review*, Forthcoming.
- Mateo Diaz, M. and L. Rodriguez-Chamussy (2016). "Cashing-in on Education", World Bank Publications, Latin American Development Forum Series, The World Bank.
- Manpower Group. (2015). *Puestos Tecnicos 2015*. Retrieved from [https://www.manpowergroup.com.mx/uploads/estudios/Puestos\\_Tecnicos\\_2015.pdf](https://www.manpowergroup.com.mx/uploads/estudios/Puestos_Tecnicos_2015.pdf)
- Manpower Group Mexico. (2016). *Encuesta de Expectativas de Empleo Manpower Group Mexico: Q1 2017*. Mexico.
- Manpower Group. (2017a). *Encuesta de Escasez de Talento 2016/2017. Resultados de Mexico*. Retrieved from <https://www.manpowergroup.com.mx/uploads/estudios/Escasez-de-Talento-MX.pdf>
- Manpower Group (2017b). *Encuesta de Expectativas de Empleo Manpower Group Mexico Q4 2017*. Retrieved from [https://www.manpowergroup.com.mx/uploads/encuesta\\_de\\_expectativas/MX\\_0417.pdf](https://www.manpowergroup.com.mx/uploads/encuesta_de_expectativas/MX_0417.pdf)
- Messina, J. and J. Silva. (2018) *Wage Inequality in Latin America: Understanding the Past to Prepare for the Future*. Latin American Development Forum. Washington, DC: World Bank.
- Mourshed, M., Farrell, D., and Barton, D. (2012). *Education to employment: Designing a system that works*. McKinsey&Company. Retrieved from [http://www.compromisorse.com/upload/estudios/000/222/Education-to-Employment\\_FINAL.pdf](http://www.compromisorse.com/upload/estudios/000/222/Education-to-Employment_FINAL.pdf)
- Observatorio de Salarios (2017). Informe del Observatorio de Salarios 2017. Puebla: Universidad Iberoamericana Puebla
- OECD (2015) *OECD Employment Outlook 2015*, OECD, Paris. OECD (2016) Better Life Index, Country Reports. OECD, Paris. OECD (2016a) *OECD Employment Outlook 2016*, OECD, Paris.

- Padilla-Perez, R. and F. G. Villarreal. (2017). Structural Change and Productivity growth in Mexico 1990- 2014. *Structural Change and Economics Dynamics* 41 (2017) 53-63.
- Pagés, C. (2017) "Do payroll tax cuts boost formal jobs in developing countries?" *IZA World of Labor* 2017: 345 doi: 10.15185/izawol.345
- Perova, E. and J.D. Trujillo. (2016) "The Effects of a Change in the Minimum Wage on Schooling, Employment and Informality: The Case of Mexico", *Mimeo*
- The World Bank Group. (2013a). *Country Partnership Strategy for the United Mexican States for the period FY2014-2019*. Washington, D.C: World Bank Group.
- The World Bank Group (2013b). *Mexico Reform Agenda for Inclusive and Sustainable Growth*. Washington, D.C: World Bank Group.
- The World Bank Group. (2017). *World Development Indicators [Data file]*. Retrieved from <http://databank.worldbank.org/data/reports.aspx?source=2&series=NY.GDP.MKTP.KD&country=MEX>
- Székely, M. and J. Karver. (2015) "Youth Out of School and Out of Work in Latin America: A Cohort Approach" Policy Research Working Paper No. 7421. World Bank, Washington D.C.



## 6. Implementing and Expanding Competition Reforms<sup>123</sup>

**M**exico has laid out a significantly improved base for a comprehensive national competition policy. During the last five years, it has substantially revised its competition policy at the constitutional and legislative levels, and has taken steps toward establishing a new institutional framework to foster and regulate competition. Operationalizing the revamped competition framework, and implementing and enforcing sector-specific competition reforms, would materialize in accelerated productivity growth over the medium term. But further measures will be necessary to unleash the full potential of the new competition policy in Mexico. Key priorities include embedding competition principles at the subnational level, where ineffective regulations continue to: inhibit interstate trade, create local monopolies and oligopolies, and stifle local entrepreneurs and farmers. Moreover, the country could further improve regulation for access to, and interconnection of, networks and transport services to keep input costs competitive. The authorities can also pass sector-specific reforms and strengthen regulatory oversight to further enhance contestability in key markets such as telecommunications and agriculture. On the latter, it could eliminate regulatory barriers to domestic trade in agricultural goods. To face intermediary market power, it could make available information on prices to small agriculture producers across local markets, enhance the storage infrastructure for smaller farmers, and tackle anti-competitive behavior. To improve the checks and balances in the system, the authorities could grant COFECE as well as other bodies (e.g. Federal Telecommunications Institute, IFT) the power to contest national and subnational laws that (appear to) violate the constitutional principle of competition.

<sup>123</sup> This note was prepared by Tanja Goodwin (Senior Economist, MTI), Martha Licetti (Lead Economist, Markets and Competition Policy Global Lead, MTI), and Soulange Gramegna (Consultant, MTI), with inputs from Seidu Dauda (Economist, MTI).

## CONTEXT AND REFORM PROGRESS

137. Continued progress on Mexico's competition policy and institutional framework could substantially accelerate growth and boost shared prosperity. Barriers to competition slow the reallocation of productive factors, contributing low productivity. A decade ago, the Central Bank of Mexico estimated that constraints on competition reduced the GDP growth rate by 1 percentage point per year.<sup>124</sup> Recent studies by the OECD and the World Bank (2017) corroborate this estimate.

138. Limited competition has a particularly negative impact on lower-income households, especially in rural areas.<sup>125</sup> The exercise of market power in the food, beverage, and pharmaceutical markets costs Mexican households in the lowest income decile about 20 percent more than households in the highest decile.<sup>126</sup> In rural areas, the cost to households in the lowest decile is 23 percent higher than the cost to households in the highest decile. The entry of foreign supermarkets into Mexico boosted the welfare of the average household by an estimated 6.2 percent of initial household income, underscoring the scope of the gains to increased competition. However, wealthier households were most likely to use supermarkets and therefore most able to benefit from the entry of new competitors.<sup>127</sup>

139. Enhancing competition in the services sector could accelerate GDP growth. Regulations in Mexico's services sector are not conducive to competition. Because firms across economic sectors rely on transportation, telecommunications, energy, and professional services, pro-competition reforms in the services sector can lower economy-wide input costs. A simulated reduction in the regulatory restrictiveness of Mexico's services sector suggests that targeted reforms could yield an additional 0.4 to 0.5 percentage points of GDP growth each year, *ceteris paribus*.

140. Spurred by a growing national consensus regarding the economic damage caused by anticompetitive behaviors and policies, Mexico has made significant progress in elaborating and implementing the legal framework for competition over the past five years. The *Pacto por México* set in motion constitutional changes that established the Federal Commission for Economic Competition (*Comisión Federal de Competencia Económica*, COFECE), overhauled the regulatory framework for the telecommunications sector, and opened the energy sector to private investment, among other key reforms. Recent achievements include

### Box 1. Initial results of pro-competition reforms between 2012 and 2017

#### Energy market reform (2013):

- Expected investment between 175 and 200 US\$bn.
- Around 70 new energy firms.

#### Telecommunication reforms (2013)

- Prices for mobile broadband services have fallen between 61 and 75 percent.
- Growth of mobile broadband subscriptions by 380 percent.

#### Payment systems reforms (2014)

- Concentration in point of sales among acquirers has dropped by at least 30 percent.

#### Reform of competition legal framework (2013)

- Double in fines for anti-competitive practices

Sources: Government of Mexico, 2018; Prices for mobile broadband baskets (high, medium and low-usage), in USD PPP, and mobile broadband subscriptions per 100 inhabitants (OECD 2017a); HHI of number of POS (Banxico, 2016); SHCP (2018).

the awarding of the wholesale broadband shared-network concession to an operator that competes with the dominant telecom provider, the awarding of contracts to private firms in the petroleum sector, and the initiation of COFECE's first investigations and corrective measures in the airport and local trucking sectors. A complementary presidential initiative, *Everyday Justice (Justicia Cotidiana)*, launched in 2015, placed special emphasis on improving the regulatory environment.<sup>128</sup> With support from the World Bank Group, the National Commission for Regulatory Improvement (*Comisión Nacional de Mejora Regulatoria*, CONAMER, formerly COFEMER<sup>129</sup>) systematically reviewed existing rules and regulations in three priority sectors across all 32 states to identify and remove anticompetitive barriers.<sup>130</sup> These achievements reflect a broad understanding among public officials and opinion leaders that a robust competition policy not only requires effective law enforcement, but also the adoption of pro-competition regulations.

141. The structural reforms supported by COFECE have started to show results in opening key sectors to competition at the national level (see Box 1). As of February 2018, the Secretariat of Energy (*Secretaría de Energía*, SdE) reported that concessions totaling US\$175 billion had been awarded to 69 private-sector firms.<sup>131</sup> Reforms in the telecom sector have caused mobile broadband prices to fall to among the lowest levels in the OECD.<sup>132</sup> In the financial sector, the introduction

124 *The New York Times*, 2006.

125 World Bank & OECD, 2017.

126 Urzúa, 2013.

127 Atkin, et al., 2015.

128 Not only was "better regulation" established as a constitutional principle, but a new General Law on Regulatory Improvement obliged subnational governments to enhance their regulatory policies and procedures.

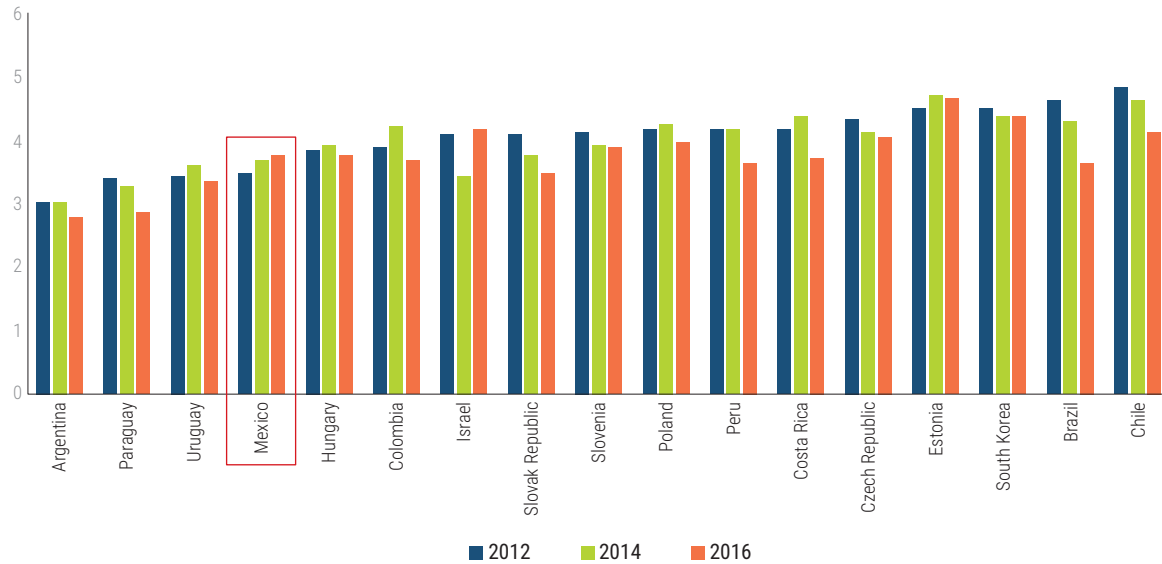
129 According to the General Law of Better Regulation, approved in May 2018, and its 10th transitory provision, the former *Comisión Federal de Mejora Regulatoria* will now be denominated *Comisión Nacional de Mejora Regulatoria* (CONAMER), and all previous mentions to COFEMER shall now refer to CONAMER.

130 The World Bank Group has been supporting Mexico's efforts to strengthen competition policy since 2012. It developed the Markets and Competition Policy Assessment Tool (MCPAT), a groundbreaking methodology to identify, prioritize, and address the most harmful subnational regulations.

131 Government of Mexico, 2018.

132 OECD, 2017a.

Figure 29: The Perceived Effectiveness of Antimonopoly Policy



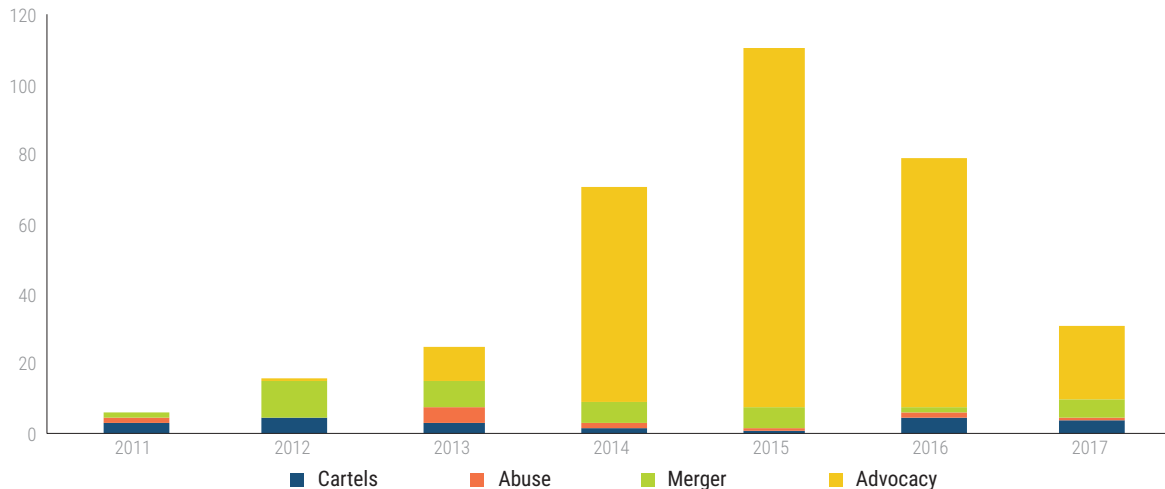
Source: WEF, Global Competitiveness Report. (Higher value = effectiveness)

of “aggregators” for payments and transfers, open technology for different card networks, and interoperability among clearing houses for card payments have reduced concentration in the points of sale (POS) segment.<sup>133</sup>

14.2. As COFECE itself has become increasingly effective as an antitrust authority, Mexico has been recognized as one of the leaders in pro-competition reform. In 2014, *Global Competition Review*, a leading antitrust journal, awarded COFECE 3 out of 5 stars, placing it on par with the competition agencies of Chile, Israel, and New Zealand.<sup>134</sup> Indicators published by the World Economic Forum (WEF) suggest that the perceived effectiveness of antimonopoly policy has increased, contrary to the trend among Mexico’s comparators. COFECE has increasingly applied its policy and enforcement tools to disrupt cartels, pre-

vent the abuse of market dominance, regulate mergers, and pursue advocacy cases, often changing the dynamics of entire markets. New tools, such as an effective leniency program and criminal sanctions, appear to have increased both the detection and deterrence of cartel agreements, but COFECE will need to continuously expand its range of investigative techniques to uncover more sophisticated types of collusion. Mexico now has an opportunity to assume a lead role in Latin America’s efforts to foster open and competitive markets and pioneer new tools, such as private enforcement of anti-competitive practices (where firms initiate legal actions against their suppliers for forming cartels, for example, and as opposed to public enforcement). This has been underdeveloped in LAC in general, and Mexico has a mature system where this can work.

Figure 30: The Frequency with which COFECE Applies Competition Policy Tools\*



\* The figure shows the total number of incidences in which COFECE took an administrative action designed to alter market dynamics. The “cartels” and “abuse of dominance” categories include fines imposed to punish anticompetitive behavior; “mergers” includes conditioning or blocking mergers; and “advocacy” includes changing an existing anticompetitive government policy or preventing one from being established, investigating barriers to competition and issuing binding recommendations, and conducting studies on market dynamics that led directly to reforms. During this period, COFECE also issued 60 binding opinions regarding individual bids or auctions for concessions and licenses.

Source: Author’s own elaboration, based on data from Global Competition Review, COFECE’s annual reports and the WBG Anti-Cartel Enforcement Database.

133 Banxico, 2016.  
134 Global Competition Review, 2017.



## KEY CHALLENGES

**143. Despite the significant reform progress, competition constraints still impact key services markets, with negative spillover effects on large segments of the Mexican economy.** Anticompetitive behavior, trade protection measures, and incomplete or weakly enforced regulatory mechanisms distort important input markets and enable the exercise of significant market power. For instance, between 2009 and 2012 seven shipping lines formed a cartel and divided up the entire market for roll-on, roll-off cargo, which includes automobiles and agricultural equipment.<sup>135</sup> Eliminating the exercise of market power by global shipping cartels could increase trade across Latin America by an estimated 15 percent.<sup>136</sup> Tariff and nontariff barriers in the steel industry also appear to be reinforcing market dominance of major firms, adversely affecting large parts of Mexico's automotive and construction industries. Lack of effective regulation poses challenges in the railway sector. Mexico's railways move about 80 million metric tons of cargo each year and are critical to the production of cereal grains and other bulk commodities. Railways also play a key role in automotive value chains linked to the US. However, a lack of effective interconnection regulation may reduce their efficiency and raise freight rates.<sup>137</sup>

**144. Over the past five years, regulators have discovered cartel agreements and other anticompetitive practices affecting transactions with a total value of up to 2 percent of annual GDP.** Between 2003 and 2006, a conspiracy among six pharmaceutical companies to rig public procurement bids cost the Mexican Institute for Social Security (*Instituto Mexicano del Seguro Social, IMSS*) more than US\$30 million in overcharges.<sup>138</sup> In 2014, a single cartelization agreement among pension funds affected a volume of sales equal to 2.3 percent of GDP.<sup>139</sup> Between 2010 and 2014, explicit anticompetitive agreements between firms that were revealed and sanctioned by the authorities affected a volume of annual sales equivalent to 1.1 percent of GDP (see Annex 1). As massive as these figures are, anticompetitive behavior likely affects a much larger share of the economy, as only an estimated 10 to 30 percent of cartels are ever detected.<sup>140</sup>

**145. The government's main challenge will now be to align its market interventions with pro-competition principles while continuing to police anticompetitive behavior.**

Governments can intervene in markets as: (i) a buyer, via public procurement, (ii) an legislative and executive power, via licensing and permits, (iii) a referee of markets, via controls on the abuse of market power, (iv) a regulator, via laws on network industries and others with natural monopolies, (v) a financial supervisor, via rules for banking, financial, and insurance firms, and (vi) signatory of international treaties, via trade agreements and import-export laws.<sup>141</sup> While the government has strengthened its role as a referee and a regulator in some sectors, many government interventions are not conducive to competition, especially in the areas of licenses and permits, network regulation, and international trade.

**146. Many legislative and executive actions by subnational governments do not mirror reform progress at the federal level and unintentionally damage competition in local markets.** States and municipalities maintain restrictive regulations that the federal government abandoned decades ago. State governments have particularly strong regulatory discretion in the agriculture, construction, transportation, and professional-services sectors, while municipalities wield considerable authority over local construction, retail, and real estate.<sup>142</sup> While systems have been established to align the federal regulatory framework with pro-competition principles, no corresponding mechanisms are in place at the local level. For example, the federal government opened the trucking industry to competition in the 1990s, but several states continue to limit the number of licensed operators and even grant monopolies to trucking unions in specific municipalities. Similarly, while national price controls have been largely abolished in product markets where competition is viable, some municipalities continue to regulate prices for certain consumer goods.<sup>143</sup>

**147. New data reveals that numerous barriers to competition distort the level playing field in key sectors for local economies, such as agriculture, transport, public procurement and professional services.** A series of joint World Bank-CONAMER studies revealed that in at least 2417 incidences across 32 states, subnational regulations limit entry, reinforce dominance, facilitate collusive outcomes, or distort the level playing field.<sup>144</sup> Data collected between 2017 and 2018 reveals that in one state alone, up to 165 of such barriers were identified in three priority sectors (Figure 31). As part of a 2016 exercise designed to identify the "most absurd regulatory

135 COFECE, *Segundo Informe Trimestral*, 2017, p. 29-30, available at <http://www.senado.gob.mx/sgsp/gaceta/63/2/2017-07-19-1/assets/documentos/2IT2017.pdf>

136 Hummels et al., 2009.

137 COFECE, 2017.

138 "Estimación de los beneficios obtenidos por la sanción de un cartel en licitaciones públicas del IMSS en México", p. 4, COFECE, 2015. Available here: [http://www.cofece.mx/attachments/articulo/37/IMSS\\_Evaluacion\\_ex-post.pdf](http://www.cofece.mx/attachments/articulo/37/IMSS_Evaluacion_ex-post.pdf)

139 COFECE, 2015.

140 Combe et al., 2008; Miller, 2009.

141 Tirole, 2016.

142 Substantial economic regulation is defined as those norm-giving instruments that regulate the economic activity of a specific sector, including entry, operations/service provision, prices or tariffs or the role of associations. See Licetti et al., 2016b.

143 For meat from a different Mexican state to be sold in Sonora, the vendor requires a prior favorable opinion by the Regional Cattle-Raising Union. The state law on cargo transportation explicitly establishes a preference for granting concessions to firms that already operate in the market and especially to older firms. Sonoran state law also explicitly allows agricultural unions to establish minimum prices for their produce.

144 Licetti et al., 2016a; Licetti et al., 2016b.



**Figure 31: Number of regulatory restrictions identified in key sectors (overall)**



**Figure 32: Subcategory: Number of rules that reinforce dominance or limit entry**



**Figure 33: Subcategory: Number of rules that are conducive to collusive outcomes or increase costs to compete in the market**



**Figure 34: Subcategory: Number of rules that discriminate and protect vested interests**



Source: CONAMER, MCPAT application under *Justicia Cotidiana*. Note: The prevalence of regulations of different nature and effects varies: While Baja California features more rules that discriminate and protect vested interests, Tamaulipas features more rules that are conducive to collusive outcomes or increase costs to compete in the market, and Queretaro features 26 rules that reinforce dominance and limit entry.

obstacle,” COFECE already found 220 “regulations that limit the capacity of individuals or firms to compete in the market, or restrict the options of goods and services for consumers, without achieving the social or economic benefit they intended.”<sup>145</sup> In 7 states, regulations discriminate against agricultural producers from other states. Local suppliers are given an explicit advantage in public procurement in 11 states and in the transport sector in 13 states. Professional associations act as licensing authority and can propose fee schedules for their services in another 13 states.

**148. These barriers affect firm competitiveness, artificially inflate consumer prices, and even the efficiency of public spending.** In Tabasco, for example, monopoly transportation unions overcharge for transport of construction materials, increasing the cost of road works by an estimated 15 percent.<sup>146</sup> In Oaxaca, reforms that ease regulations on the operating hours of commercial establish-

ments have been associated with a more than 6 percent increase in annual retail sales.<sup>147</sup> In Mexico State, more stringent barriers to market entry are associated with fewer competing supermarket chains.<sup>148</sup> Restrictive regulations can also facilitate anticompetitive practices. For example, many municipalities either allow incumbent tortilla vendors to bar the entry of new competitors, establish minimum distances between tortilla vendors, or maintain rules that allow for price coordination.<sup>149</sup> Since 2005, COFECE has uncovered at least six cartel agreements among tortilla producers.<sup>150</sup>

**149. The regulatory framework for network industries and other services sectors is still not fully-adequate to curb the abuse of market power or incentivize efficiency.** In 2013<sup>151</sup>, the aggregate score for Mexico’s product market regulation still lagged behind those of other recent OECD members, with barriers to entrepreneurship, trade and investment imposing especially serious constraints

<sup>145</sup> COFECE, 2017c.

<sup>146</sup> Licetti, et al., 2016b; Teravaninthorn & Raballand, 2008; Osborne, Pachón, & Araya, 2014.

<sup>147</sup> Licetti & Dauda (forthcoming)

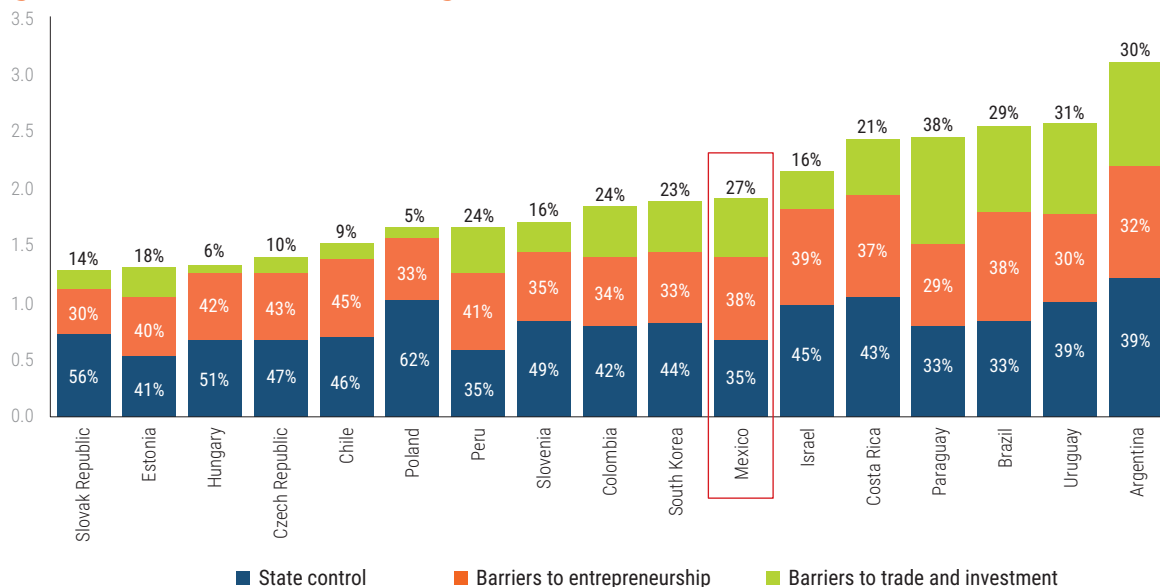
<sup>148</sup> Licetti et al., 2016a.

<sup>149</sup> In Michoacán, 28 municipalities establish minimum distances between tortilla stores, and 9 municipalities require consent from competitors for new tortilla shops to enter in the market. The minimum tortilla prices set collectively by local producers in Lazaro Cardenas municipality are 30% higher than the average prices for the occidental region. (García & García Soto, 2010)

<sup>150</sup> Government of Mexico, 2016.

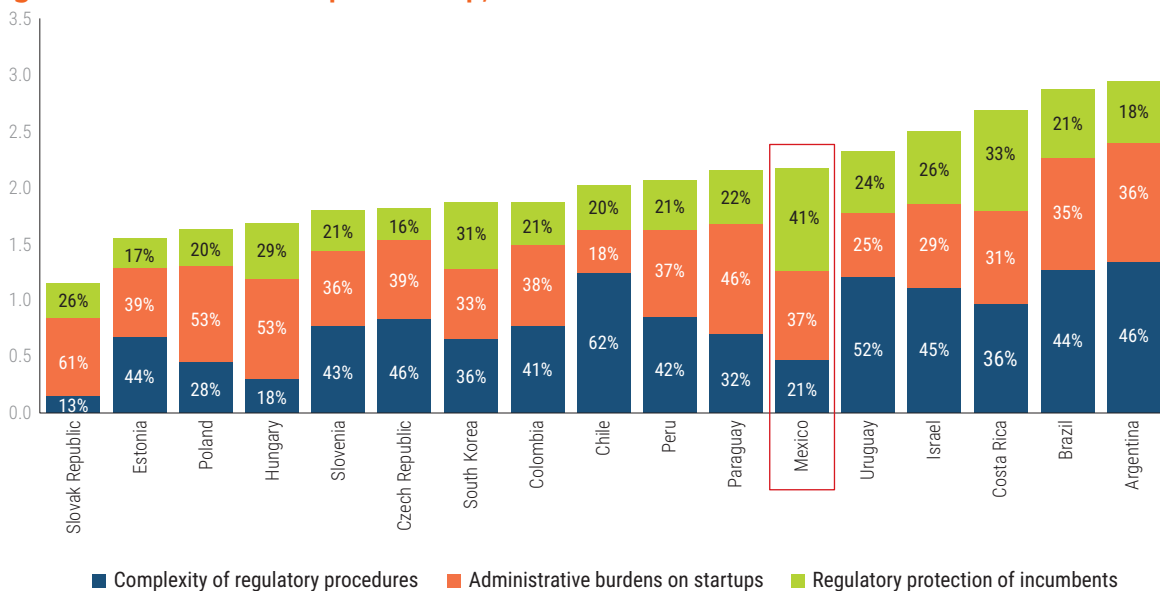
<sup>151</sup> Data on Product Market Regulation is collected by OECD (and WBG in case of several non-OECD countries) every 5 years. The 2018 data was not yet available as of July 2018.

**Figure 35: OECD Product-Market Regulation Indicator, 2013**



Source: OECD PMR Database; WBG-OECD PMR Database, 2013, as of March 2018. Note: Some figures may not sum up to 100% due to rounding issues.

**Figure 36: Barriers to Entrepreneurship, 2013**



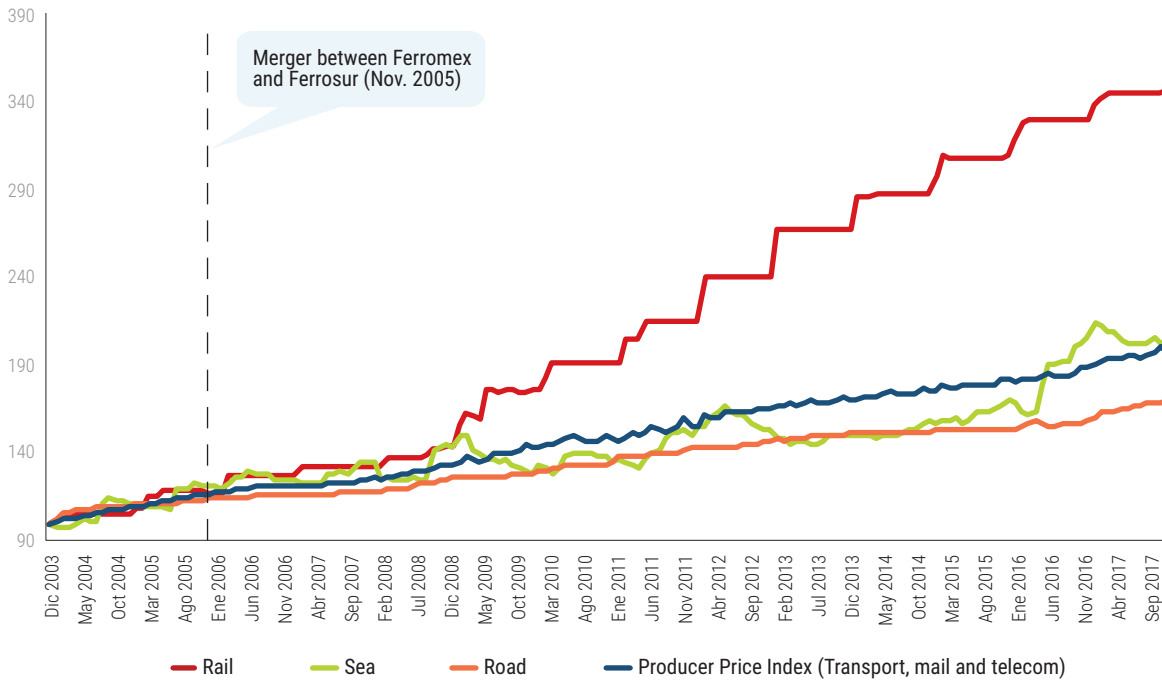
Note: Some figures may not sum up to 100% due to rounding issues.  
Source: OECD PMR Database; WBG-OECD PMR Database, 2013, as of March 2018.

on competition (Figure 35). Mexico’s regulatory protection of incumbent firms posed a greater barrier to entrepreneurship than in any other recent OECD member (Figure 36). While major reforms have opened some sectors to competition through recent reforms some federal product market regulations still constrain competition in some sectors and add to the recently uncovered subnational barriers to competition. Such federal restrictions include, inter alia, a lack of third-party access in electricity, restrictions on the number of competitors in electricity generation, and the involvement of professional associations in establishing and enforcing entry regulations in road transportation.

## Low levels of competition continue to distort incentives in several transport and logistics sectors.

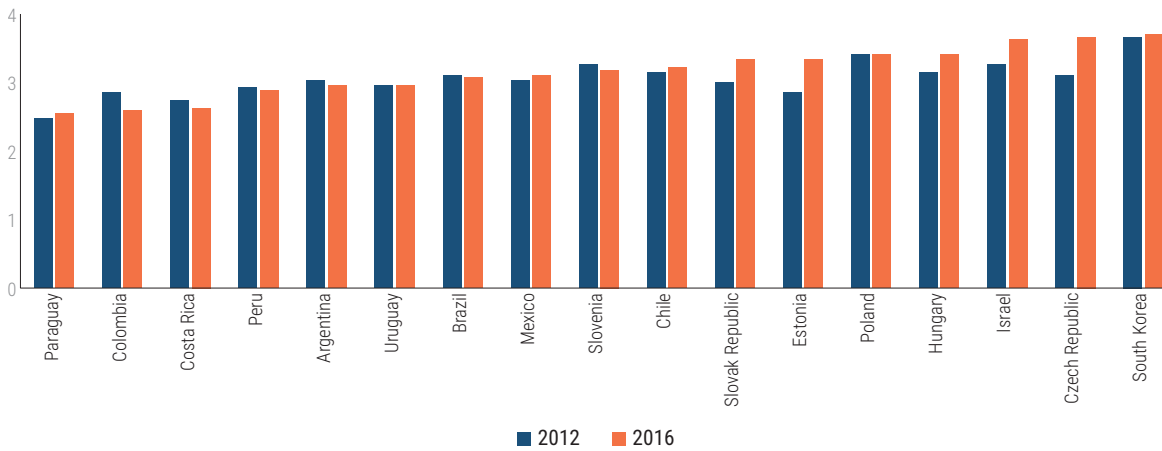
150. Anticompetitive railway mergers are likely responsible for the rapidly increasing cost of railway transport. The former antitrust authority opposed railway mergers in 2002 and 2006, but a higher court approved the mergers in 2011. Since then, rates for railway freight transport have risen substantially, outpacing price increases in other transportation subsectors, and currently, average per-kilometer fares on rail sections operated by an interconnecting concessionaire are more than eight times higher than on the

Figure 37: Cargo Transport Prices



Note: Nominal non-seasonally adjusted producer price index (December 2003 = 100) until June 2012, projected until January 2018 based on corresponding nominal non-seasonally adjusted producer price index (June 2012=100) for each cargo transport service. Source: INEGI

Figure 38: Logistics Performance Indicator



Source: WBG, Logistics Performance Index (LPI) 2012 - 2016. Note: LPI – 5=best performance; sample=155 countries in 2012, 160 countries in 2016. Israel's score in 2012 corresponds to 2014, since it was not available in the 2012 LPI database.

rest of the rail route (Figure 37).<sup>152</sup> Although COFECE has identified potential lack of competition in interconnection services between rail networks, no corresponding regulatory adjustment has yet been implemented.<sup>153</sup> High rail-freight costs likely have negative spillover effects on other transportation and logistics subsectors, given the importance of the railway network to competition in broader container shipping and intermodal transportation and its function as a substitute for road transportation.<sup>154</sup>

151. The allocation of user rights for congested transportation infrastructure is a critical competition-policy chal-

lenge, especially given Mexico's substantial infrastructure gap. Landing slots in the Mexico City International Airport (*Aeropuerto Internacional de la Ciudad de México, AICM*) are concentrated among a small number of airlines. In 2014, two airlines controlled 65 percent of the slots and accounted for 67 percent of all flights. About 30 percent of daily flights were assigned a slot shortly before takeoff or landing. Competitor airlines have difficulty obtaining terminal and runway access, and the resulting lack of competition on routes in and out of Mexico City accounts for 40 to 80 percent of the difference in airfare between AICM and other Mexican airports.<sup>155</sup> Following an investigation,

152 COFECE, 2017.

153 In March 2017, COFECE's Investigation Authority published a report concluding preliminarily that there was lack of competition in interconnection services in several key railway lines. In 2018, the Plenary of the Commission judged that there was not yet sufficient information to confirm the lack of competition in the entire network, but also indicated that the existence of effective competition could not be confirmed either.

154 OECD, 2017b.

155 Ros, 2010.

COFECE declared landing and take-off slots, and use and control of airport infrastructure at AICM 'essential facilities', without which other airlines will not be able to compete. COFECE proposed corrective measures, including increased transparency, the elimination of "grandfather clauses," and the authorization of secondary trading of terminal and runway access, but these measures have not yet been fully implemented.<sup>156</sup>

**152. Additional efficiency-enhancing solutions, such as the adoption of optimal appointment and vehicle-booking systems, could be applied to congested maritime ports or multimodal transportation infrastructure.** Mexico's logistics performance is relatively strong by the standards of Latin America, but it has not improved as much as other recent OECD member countries in Eastern Europe (Figure 38). Mexico currently ranks 5th from the bottom among recent OECD members in terms of "timeliness of logistics."

**153. The pace of implementation of the new regulatory framework for the energy and telecommunications sector, both at the national and subnational levels, could weaken its benefits to consumers.** While recent reforms have helped foster competition, Mexico's telecommunications and digital-services markets remain concentrated by the standards of comparable countries. As of end-2016, the dominant operator, Telcel, continued to hold 71 percent of all subscriptions in the mobile broadband market. In the energy sector, while new private competitors to the national oil and gas company, Mexican Petroleum (*Petróleos Mexicanos*, PEMEX), may reduce gasoline prices, subnational regulations often establish minimum distances of more than 1 kilometer between gas stations, reducing the benefit to consumers by granting significant pricing power at the point of sale. These issues are discussed in greater detail in the policy notes on energy and telecommunications.

**154. Information asymmetries and other market failures could be exacerbating market power along agricultural value chains.** Between 2005 and 2014, food prices in Mexico grew by 23.3 percent above non-food items, more than in other OECD countries.<sup>157</sup> While this price increase benefited producers more than consumers in most cases, there is evidence that price increases are passed on to consumers faster than price reductions.<sup>158</sup> Around half of agricultural production in many products is sold to through intermediaries.<sup>159</sup> While intermediaries can offer efficiencies in aggregating produce from small individual producers, they may be able to exercise significant market power when primary producers lack alternative commercialization

options. Authorities could promote more local wholesale markets, farmers markets and collection centers that offer auction-based price-determination mechanisms. Better storage facilities for grains, and a proper regulatory framework for warehouse storage quality, receipts and electronic auctioning platforms could moderate seasonal price hikes. Stalls in traditional markets can often only be reassigned according to discretionary rules involving negotiations with existing stall holders. Secondary tradition of stall rights or auctions could facilitate entry. As pointed out earlier, restrictions to the trade of agricultural goods among states can further reduce contestability.

**155. Redesigning government interventions in the agricultural sector could further level the playing field and enhance contestability.** As in many other countries, Mexico's agribusiness input markets are highly concentrated<sup>39</sup>. In 2009, 95 percent of planted hybrid seeds were produced only by two corporations.<sup>160</sup> COFECE has recommended legalizing parallel imports to address the risk of further harm to competition. For machinery and equipment, subsidy programs should not be conditional on certifications, which only 8 companies have been able to achieve. More broadly, subsidy programs can be highly overlapping. Corn, chili and tomato producers can be eligible for up to 14 different federal programs.<sup>161</sup> Some subsidy programs are available only to a limited number of producers (such as concessionaires for water wells with high usage). Water rights should be efficiently assigned – especially in scarcity situations<sup>162</sup>. Barriers to foreign investment in the cargo transport sector could be lifted to increase contestability in cold chain transport which is underdeveloped in Mexico. In general, associations and market participants should not take part in regulatory activities.<sup>163</sup>

**156. Pro-competition measures are essential to encourage a highly concentrated banking sector to operate efficiently.** Measured by bank assets, the Mexican banking sector was more concentrated than in Argentina or Colombia, between 2007 and 2011. As of 2013, 74 percent of all credits and 80 percent of all ATMs were held by five banks. While this concentration is in part explained by network effects and economies of scale, it is also associated with higher profit margins than in Brazil, Uruguay and Chile<sup>164</sup>. COFECE's investigations have revealed initial evidence for explicit anti-competitive practices in the banking sector. Allegedly, various intermediaries agreed to jointly limit competition in auctions of the country's public debt market<sup>165</sup>. The competition authority has started to successfully advocate for pro-competition measures in several market segments, including payment services. Most recently,

156 COFECE, 2017b. Presentation by COFECE to International Chamber of Commerce in Mexico (April, 2016).

157 (COFECE, 2015)

158 In most of the cases, the price increase for consumers was below the price increase for producers (except for beef, eggs, soft drinks and beer), but price transmission is often asymmetric (see COFECE, 2015).

159 At least one study suggests that intermediation increases food prices by 400 percent (IPD, 2014)

160 Namely, Monsanto and Pioneer. See Luna et al. (2012).

161 (COFECE, 2015)

162 For additional recommendations on how to improve economic regulation of the water sector that enables private sector participation and promotes efficiency in operation and service delivery, incl. water tariff reform, more PPP involvement, competitively tendered concessions and management contracts, refer to Policy Note 1.

163 COFECE, 2015)

164 [https://www.cofece.mx/cofece/images/Estudios/COFECE\\_trabajo\\_investigacion\\_prot.pdf#pdf](https://www.cofece.mx/cofece/images/Estudios/COFECE_trabajo_investigacion_prot.pdf#pdf)

165 Filing number IO-006-2016, available here: <https://www.cofece.mx/investiga-cofece-la-intermediacion-de-valores-de-deuda-emitidos-por-el-gobierno-mexicano/>

as per the Fintech Law, approved in March 1st, 2018, financial entities will be prohibited from charging different rates to FinTech Institutions and other customers. Further remaining challenges are discussed in greater detail in the policy notes on financial services.

**157. Some trade-policy measures may restrict or distort foreign competition.** While Mexico's economy is relatively open, its tariffs are still high compared to those of its major trading partners. Mexico imports rice, beans, beef, and chicken from countries with which it holds free-trade agreements, while imports of these goods from potentially more competitive countries are diverted due to remaining import tariffs.<sup>166</sup> In some sectors, trade measures may be facilitating the exercise of significant market power (and lead to prices above the competitive level). For example, Mexico recently renewed an ostensibly temporary six-month unilateral increase in steel tariffs of 15 percent for the fourth time. Steel also has the highest number of tariff lines subject to anti-dumping measures. In addition, all but one of the 114 tariff lines that require an import approval (*aviso automático*),<sup>167</sup> referred to a steel product. Concomitantly to these various protectionist measures, steel imports fell by 23.5 percent between 2015 and 2016. The steel sector is traditionally prone to high concentration, oligopolistic market structures, and collusive agreements. Barriers to imports may accentuate domestic market power: Within the steel-transformation subsector numerous countervailing duties apply to specific products for which there are few producers, or only one producer, in Mexico. In February 2018, COFECE opened an investigation into alleged cartel agreements in the steel market<sup>168</sup>.

**158. Overall, operationalizing the new institutional framework for competition will inevitably encounter resistance from entrenched interests.** The ineffective application of new regulatory powers or state- and municipal-level rules could still undermine the implementation of these reforms. New investigative and analytical tools developed by COFECE and CONAMER have shed light on remaining gaps in the policy and institutional framework, especially at the subnational level. Advancing the reform agenda will require broad ownership among stakeholders, including the general public. Outreach and awareness-raising efforts will be a key challenge to spread knowledge of the benefits of competition<sup>169</sup> and build an understanding of good regulatory principles and best practices among state and local governments, and awareness of business on competition law – especially at the local level.

## POLICY OPTIONS

**159. The government could align its market interventions more closely with pro-competition principles, especially in its roles as a regulator of network industries, a gateway to international trade, an issuer of licenses and permits, and a referee of competition.** COFECE can coordinate actions across the public sector and provide the analytical inputs necessary to continuously refine and enhance the government's understanding of market conditions and competition dynamics. Meanwhile, CONAMER can support reforms involving subnational governments. To facilitate interinstitutional collaboration, COFECE, CONAMER, and other agencies that regulate or intervene in markets could develop an information-sharing system to identify and address barriers to competition, and even allow for a complaint and redress mechanisms for firms and citizens.<sup>170</sup>

**160. The government can ensure that state and local authorities have the tools and support by CONAMER, and the incentives to remove barriers to competition in priority sectors.** This will entail: (i) fully implementing the three-priority-sector reform plan initiated under *Justicia Cotidiana*, led by CONAMER in partnership with state and local governments; (ii) helping subnational governments replicate successful structural reforms adopted under *Justicia Cotidiana* at the local level across all states; (iii) implementing the *Programa de Reforma a Sectores Prioritarios* under CONAMER and based on the World Bank's Markets and Competition Policy Assessment Tool;<sup>171</sup> and (iv) setting up a mechanism to reward subnational governments for implementing pro-competition reforms.<sup>172</sup> The government can also take advantage of new rules obliging subnational authorities to conduct regulatory impact assessments (*manifestaciones de impacto regulatorio*) by embedding a simplified competition checklist and COFECE's review process into the assessment methodology to prevent the establishment of new obstacles to competition, such as price controls, restrictions on interstate trade, or the granting of local monopoly rights in sectors where competition is viable.

**161. The government can pass sector-specific reforms and strengthen regulatory oversight to enhance contestability in key markets such as transport, telecommunications and agriculture.** Priority actions include: (i) facilitating open access to infrastructure by, inter alia, revising the rules for allocating slots at AICM, consider regulating interconnection services between railway networks, creating transparent booking systems for port services, and analyzing other

166 COFECE, 2017a.

167 The *"aviso automático"* is an automatic authorization to import or export merchandise.

168 Filing number DE-020-2017, available here: <https://www.cofece.mx/investiga-cofece-posibles-practicas-monopolicas-absolutas-en-el-mercado-del-acero-adquirido-por-autoridades-publicas/>

169 In 2015, 26% of Mexicans associated competition with "the state offering more and better products and services," and 7% with "better firms growing until there's only one left." See: Ipsos Public Affairs & USAID, 2015.

170 Models for such institutional mechanisms that can act upon complaints about government-imposed barriers on competition include the Australian Government Competitive Neutrality Complaints Office (AGCNCO) that provides independent advice to the Government following private sector complaints about unfair competition from the public sector, and the Commission for Elimination of Bureaucratic Barriers in Peru that can eliminate illegal or unjustified public sector actions that hinder market entry or permanence.

171 The *Ley General de Mejora Regulatoria* stipulates in the transition clauses that one of the tasks for CONAMER will be to publish guidelines within one year on the *Programa de Reforma a Sectores Prioritarios* (Art. 11.VII).

172 For example, Australia implemented – as part of its National Competition Policy program – monetary compensation mechanisms (competition payments) to states and territories that implemented committed competition reforms. Payments were a share of additional revenue raised by the Australian Government due to reforms.

intermodal transportation bottlenecks; (ii) continuing to promote open competition in telecommunications and digital services by using regulatory oversight to prevent the abuse of market power by incumbent firms; and (iii) eliminating regulatory barriers to domestic trade in agricultural goods, making available information on prices to agriculture producers across markets, and strengthening the storage infrastructure for smaller farmers.

**162. The government can strengthen federal checks and balances mechanisms to remove and prevent anti-competitive policies and actions by public bodies.** This will require: (i) undertaking a comprehensive review to identify and eliminate federal-level barriers to competition in key sectors; (ii) expanding mandatory regulatory impact assessments to cover draft legislation and additional policy areas; and (iii) granting COFECE as well as other bodies (e.g. Federal Telecommunications Institute, IFT) the power to contest national and subnational laws that appear to violate the constitutional principle of competition.

**163. The government can remove trade policy measures that unduly restrict contestability in domestic markets.** To accomplish this, the authorities will need to: (i) review

existing anti-dumping measures and countervailing duties; (ii) refrain from repeatedly renewing temporary tariff increases to create effectively permanent tariff barriers; (iii) replace the *aviso automático* system with an electronic notification mechanism; and (iv) assess options for ending the outdated Sectoral Promotion Programs (*Programas de Promoción Sectorial*, PROSEC) and extending special tariffs to entire industries in a nondiscriminatory manner; and (v) subject all normative instruments issued by government to the regulatory improvement process to prevent the adoption of anticompetitive policies.

**164. Finally, the government can increase the elimination and deterrence of anti-competitive practices by further prioritizing COFECE's resources, and incentivizing compliance.** This would entail: (i) improving the system for differentiating complex and fast-track mergers to free up resources for cartel enforcement, advocacy, and other functions; (ii) developing a class-action and private-damages framework to deter anticompetitive agreements; and (iii) encouraging a culture of compliance by launching awareness programs, especially among firms operating at the state and local levels.



## References

- Agencia EFE, 2017. *Agencia EFE*. [En línea] Available at: <https://www.efe.com/efe/america/mexico/mexico-reporta-80-000-millones-de-dolares-en-inversion-por-reforma-energetica/50000545-3354911> [Último acceso: 29 January 2018].
- Aghion, P., Braun, M. & Fedderke, J., 2008. Competition and productivity growth in South Africa. *Economics of Transition*, 4(16), pp. 741-768.
- Atkin, D., Faber, B. & Gonzalez-Navarro, M., 2015. Retail Globalization and Household Welfare: Evidence from Mexico. *National Bureau of Economic Research*.
- Chiquiar, D. & Ramos-Francia, M., 2009. Competitiveness and Growth of the Mexican economy. *Banco de Mexico, Working Papers*, Volumen 11.
- COFECE, 2014. *Control de Concentraciones*, s.l.: s.n.
- COFECE, 2015. *Public version of the final ruling with file number IO-003-2015*, s.l.: s.n.
- COFECE, 2015. *Reporte sobre condiciones de competencia en el sector agroalimentario*. s.l.:s.n.
- COFECE, 2017a. *Política comercial con visión de competencia*, Mexico City: COFECE.
- COFECE, 2017b. *COFECE notifies Mexico City's International Airport (AICM) of measures to regulate slot allocation*. [En línea] Available at: <https://www.cofece.mx/cofece-notifica-medidas-para-regular-la-asignacion-de-horarios-de-despegue-y-aterizaje-en-el-aicm/> [Último acceso: 29 January 2018].
- COFECE, 2017c. *Resultados: Premio para identificar el obstáculo más absurdo para competir y emprender, 2016-2017*, Mexico City: COFECE.
- COFECE, 2017. *Final Report in Investigation DC-002-2016*. [En línea] Available at: [https://www.cofece.mx/cofece/images/AI/Dictamen\\_DC-002-2016.pdf](https://www.cofece.mx/cofece/images/AI/Dictamen_DC-002-2016.pdf)
- COFECE, 2017. *Segundo Informe Trimestral*, s.l.: s.n.
- Combe, E., Monnier, C. & Legal, R., 2008. *Cartels: The probability of getting caught in the European Union*. s.l.:s.n.
- El Financiero, 2015. *Suprema Corte avala caso contra farmacéuticas; pide rebajar multas*. [En línea] Available at: <http://www.elfinanciero.com.mx/economia/suprema-corte-pide-rebajar-multas-por-fraude-de-farmacéuticas-al-imss.html> [Último acceso: 30 January 2018].
- Expansión, 2017. *El regulador multa a 7 navieras por colusión en transporte marítimo de autos*. [En línea] Available at: <https://expansion.mx/empresas/2017/06/09/el-regulador-multa-a-7-navieras-por-colusion-en-transporte-maritimo-de-autos> [Último acceso: 30 January 2018].
- Forni, L., Gerali, A. & Pisani, M., 2010. Macroeconomic Effects Of Greater Competition In The Service Sector: The Case Of Italy. *Macroeconomic Dynamics*, 05(14), pp. 667-708.
- García, F. & García Soto, C. E., 2010. *Brujula de Compra - Inhiben Ayuntamientos Competencia en Tortillas*, Mexico City: Profeco.
- Global Competition Review, 2017. *Rating Enforcement 2017*, London: Law Business Research Limited. Gobierno de México, 2016. *Evolución de Precios*. [En línea] Available at: [https://www.gob.mx/cms/uploads/attachment/file/234822/XII\\_Evolucion\\_de\\_los\\_precios\\_-\\_febrero\\_2016.pdf](https://www.gob.mx/cms/uploads/attachment/file/234822/XII_Evolucion_de_los_precios_-_febrero_2016.pdf) [Último acceso: 29 January 2018].
- Griffith, R., Harrison, R. & Macartney, G., 2007. Product market reforms, labour market institutions and unemployment. *The Economic Journal*, 519(117).
- Hummels, D., Lugovskyy, V. & Skiba, A., 2009. The trade reducing effects of market power in international shipping. *Journal of Development Economics*, 1(89), pp. 84-97.
- Licetti, M. & Dauda, S., forthcoming. *The impact of Shopping Hour Regulations on Retail Sector Performance: Evidence from Mexico*, Washington, D.C.: World Bank Group.
- Licetti, M., Goodwin, T. & Villarán, L., 2016a. *Competition Reform in Tabasco State: Combatiendo regulaciones que restringen la competencia a nivel sub-nacional: Estado de México, México*, Washington, D.C.: World Bank Group.
- Licetti, M., Goodwin, T. & Villarán, L., 2016b. *Combatiendo regulaciones que restringen la competencia a nivel sub-nacional: Estado de Tabasco, México*, Washington, D.C.: World Bank Group.
- Licetti, M. y otros, 2018. *Strengthening Argentina's integration in the global economy : policy proposals for trade, investment, and competition*. Washington, D.C.: World Bank Group.
- Milenio, 2017. *Cofece lleva a suprema corte caso de slots en AICM*. [En línea] Available at: [http://www.milenio.com/negocios/slots-aicm-aeropuerto-ciudad\\_mexico-cdmx-cofece-suprema\\_corte-sc-jn-horarios\\_0\\_1071493079.html](http://www.milenio.com/negocios/slots-aicm-aeropuerto-ciudad_mexico-cdmx-cofece-suprema_corte-sc-jn-horarios_0_1071493079.html) [Último acceso: 30 January 2018].
- Miller, N., 2009. Strategic leniency and cartel enforcement. *American Economic Review*, 99(3), pp. 750-68.
- NYTimes, 2006. *www.nytimes.com*. [En línea] Available at: <http://www.nytimes.com/2006/06/03/world/americas/03slim.html?pagewanted=2&r=1> [Último acceso: 29 January 2018].
- OECD, 2017a. *OECD Telecommunication and Broadcasting Review of Mexico*, Paris: OECD Publishing. OECD, 2017b. *Review of the Regulation of Freight Transport in Mexico*. Paris: OECD Publishing.
- Productivity Commission, 2005. *Review of National Competition Policy Reforms*. Report No. 33 ed. Canberra: s.n.
- Ros, A., 2010. *A Competition Policy Assessment of the Domestic Airline Sector in Mexico and Recommendations to Improve Competition*, s.l.: Documentos Cofeco/OCDE.
- Sekkat, K., 2009. Does competition improve productivity in developing countries?. *Journal of Economic Policy Reform*, 2(12), pp. 145-162.
- Symeonidis, G., 2008. The effect of competition on wages and productivity: evidence from the United Kingdom. *The Review of Economics and Statistics*, 90(1), pp. 134-146.
- Syverson, C., 2011. What determines productivity?. *Journal of Economic literature*, 2(49), pp. 326-65. Tirole, J., 2016. *Economics for the Common Good*. s.l.:Princeton University Press.
- Urzúa, C. M., 2013. Distributive and regional effects of monopoly power. *Economía Mexicana. Nueva Época*, Volumen 22.2.
- World Bank; Organisation for Economic Co-operation and Development, 2017. *A Step Ahead : Competition Policy for Shared Prosperity and Inclusive Growth*. Washington D.C.: World Bank.
- World Bank, 2014. *The unfinished revolution : bringing opportunity, good jobs and greater wealth to all Tunisians*. Washington, D.C.: World Bank Group.





## 7. Improving the Education System's Equity

**M**exico's 2013 education reforms introduced key changes to the sector's financial and personnel management strategy. The reforms established a professional system for hiring, evaluating, training, and promoting teachers and provided full autonomy to the National Institute for the Evaluation of Education. Further action will be necessary to consolidate these gains and address remaining challenges. For example, the evaluation of incumbent teachers continues to be politically contentious, and a comprehensive approach to improving the equity of the education system would need to be defined and implemented. Moreover, important components of the education sector are not yet aligned with the objectives of the reform program. The country's teacher-training colleges (normales) do not adequately prepare teachers for the new education curriculum, and the results of teacher evaluations do not inform training and staffing decisions. Going forward, the authorities could focus on (i) improving the design and implementation process of the professional teaching service (servicio profesional docente), (ii) aligning all elements of the new education model toward learning, (iii) creating a national early child development program, (iv) adjusting the intergovernmental transfers for education, making them more based on needs (per student) and with a stronger equalization component for lagging states, and (v) reorienting the sector's financial and personnel career policies and incentives to improve the equity of the education system.

## INTRODUCTION

165. **Human capital is the most important determinant of productivity and the engine of long-term economic growth.** However, years of schooling only partially reflect the contribution of human capital to productivity, growth, and improved social and economic wellbeing, whereas the quality of education—measured in terms of acquired skills—drives the relationship between education and development.<sup>173</sup>

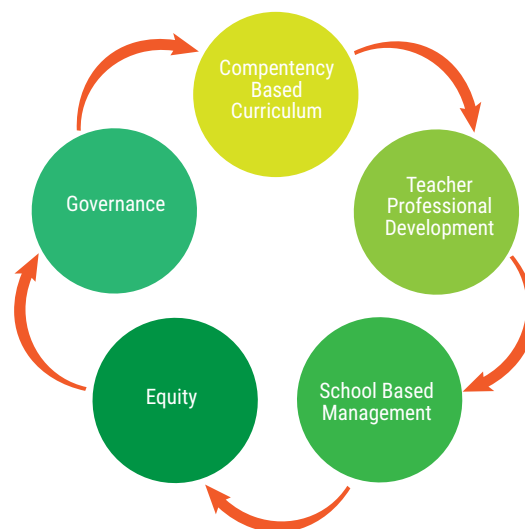
166. **Poor educational outcomes have important long-term welfare effects, both at the household level and at the national level.** Children from poor households often enter school with limited cognitive and socioemotional skills. Despite significant improvements, Mexico's elementary schools are still ill-equipped to remediate those deficits, diminishing the chances that students from poor households will graduate from the upper secondary level. Most students who drop out of upper secondary school leave the education system without the minimum skills to secure a job in the formal sector. Instead, many take low-paid, low-productivity jobs in the informal sector, increasingly the likelihood that they will remain poor. This process is one of the mechanisms through which poverty and inequality are transmitted from one generation to the next. At the national level, this process slows the growth of human capital, increases the burden on the social protection system, and contributes to Mexico's low overall productivity.

167. **As is the case in other Latin American countries, Mexico's educational indicators are well below what its level of per capita GDP would predict, jeopardizing the country's long-term development prospects.** The results of the 2015 PISA show that while a large majority of 15-year-olds are

enrolled in the Mexican education system, only half acquire the necessary foundational skills to fully leverage their productivity in the labor market or responsibly exercise their rights as citizens. Educational outcome indicators are even lower among children from marginalized households, exacerbating the country's already vast economic and social inequalities. Despite its relatively large budget, which equals 6 percent of GDP and accounts for over 20 of total public spending, Mexico's education sector remains characterized by poor overall performance and stark disparities between students from households at different income levels.<sup>174</sup>

168. **In 2013, the government launched an ambitious education reform program designed to improve educational outcomes, particularly among students from poor households and marginalized communities.** The reform program established a professional teaching service (*servicio profesional docente, SPD*) with standard systems for hiring, evaluating, training, and promoting teachers. It asserted the independence of the National Institute for the Evaluation of Education (*Instituto Nacional para la Evaluación de la Educación, INEE*) to oversee all evaluation functions throughout the education system, including measuring and monitoring the performance of students, teachers, school directors, supervisors, and schools. And it used school grants and technical assistance to strengthen school autonomy and promote school-based management (SBM). Building on these reforms, the government recently adopted a new competency-based curriculum, introduced equity-enhancing policies, and formulated a strategy to improve the education system's governance. These changes have given rise to a new education model, based on five pillars, which will be implemented over the next several years (Figure 39).

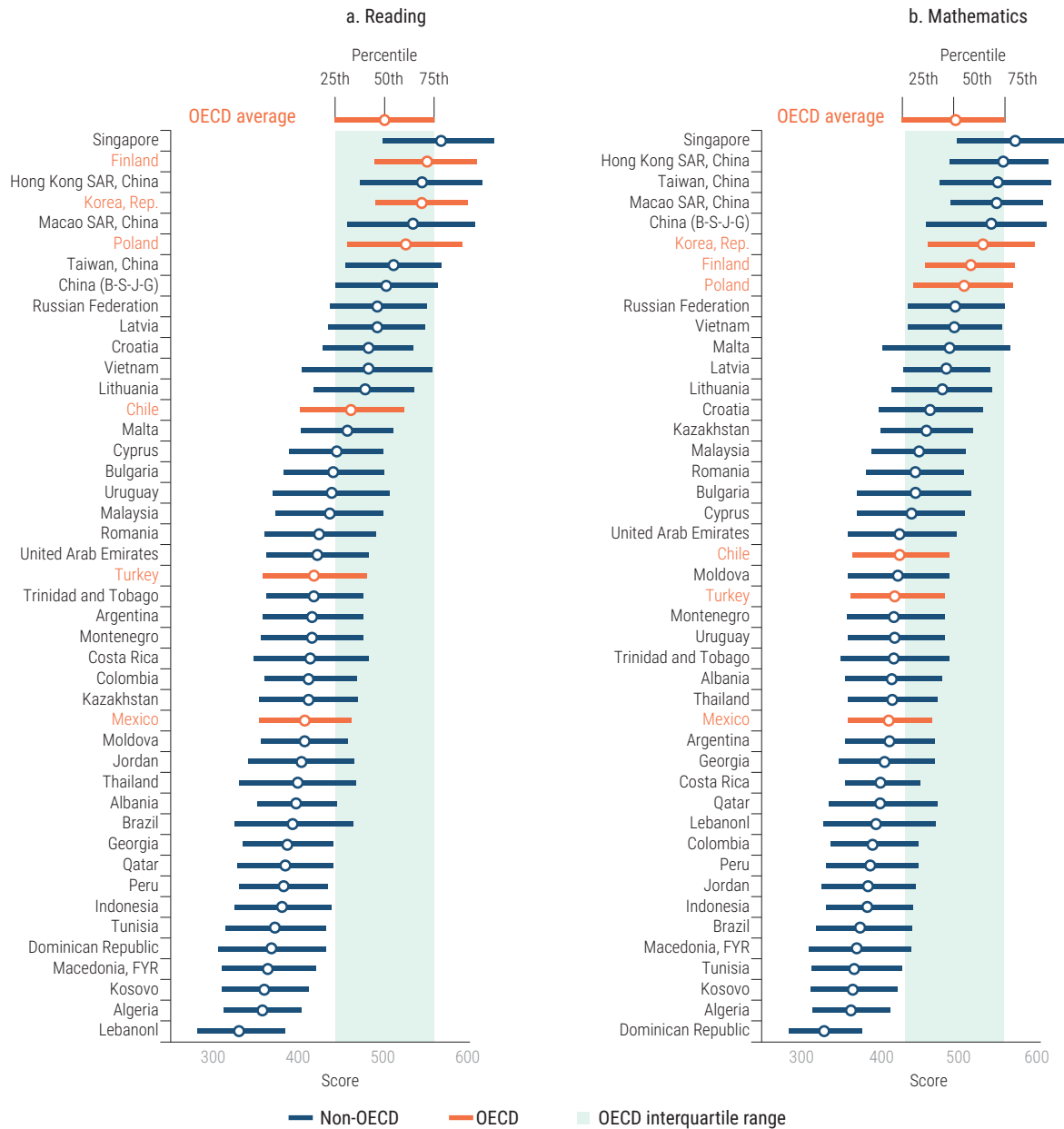
**Figure 39: The Five Pillars of Mexico's Reformed Education Model**



173 World Bank, 2018. World Development Report. Washington, DC: The World Bank

174 World Bank, 2016. Mexico: Public Expenditure Review. Washington DC: The World Bank

Figure 40: PISA Test Scores for Math and Reading among OECD Countries, 2015



## KEY CHALLENGES

169. During the last 30 years, Mexico’s primary and lower secondary enrollment rates have significantly improved, but retention rates at the upper secondary level and overall educational attainment indicators continue to lag those of Mexico’s regional and OECD comparators. For instance, only 6 out of 10 students who enroll in upper secondary ultimately graduate, and graduation rates are even lower among students from poor and vulnerable households. Mexican students score poorly on national and international standardized tests, with wide gaps between students from poor and non-poor households. Mexico’s PISA scores in mathematics, reading and science are relatively low: only half of all Mexican students achieve the min-

imum competency levels, and a small fraction reach the OECD average (Figure 40).

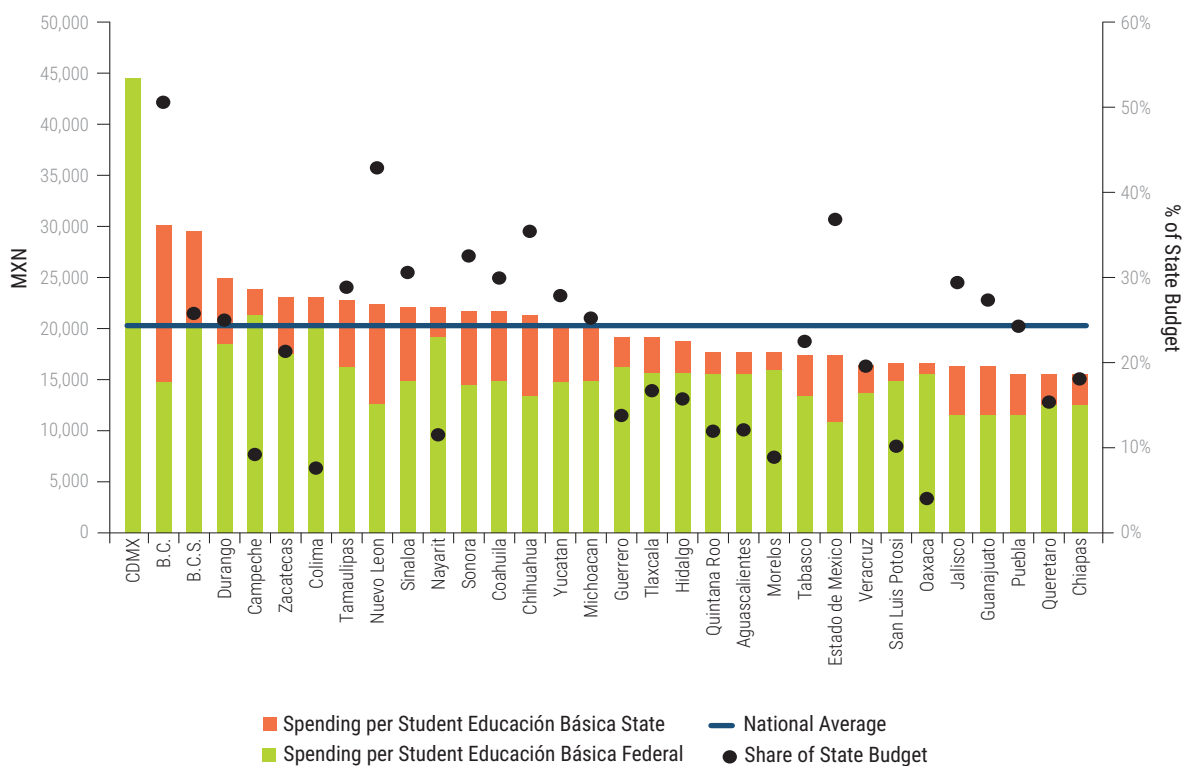
170. Education outcomes vary substantially across regions. For example, the populations of Mexico City and Nuevo León have an average of 10.5 and 9.8 years of education respectively, while the average for Chiapas is just 6.3. Children in southern Mexico not only spend fewer years in school, they also learn less than their peers in other areas of the country. In the 2017 PLANEA test, roughly three-quarters of students finishing lower secondary (grade 9) in Guerrero and Tabasco were not adequately proficient in math, compared to about half in Puebla and Mexico City. These regional disparities account for much of the differences in education trajectories between students from poor and non-poor households; only 7 per-

cent of students from marginalized households finish upper secondary on time and with minimum learning outcomes versus close to 30 percent among non-marginalized households.<sup>175</sup>

171. **Poor educational outcomes reflect both a lack of student preparation—especially among students from marginalized households—and the inability of the system to meet the needs of inadequately prepared students.** Household factors play a crucial role in educational attainment, explaining up to half the variation in outcome indicators observed at any given point in time. Because the education system must provide foundational skills to all students, regardless of household factors or other initial conditions, teacher quality is the most important determinant of success. Before the 2013 reforms, teachers in Mexico were selected on a discretionary basis; once hired, they were neither evaluated nor motivated to improve their performance. The resulting process of adverse selection attracted relatively poor candidates to the teaching profession.<sup>176</sup> Before 2013, in-service teacher training was driven by supply and based on unclear criteria. Although the reforms created the possibility of developing a teacher-training system based on evaluation results, such a system has yet to be established.

172. **Many factors contribute to the gap in educational outcomes between students from higher- and lower-income households, including differences in early childhood development and in the quality of education services.** Poorer households lack critical information about early childhood development. They also have fewer resources to invest in children’s health and education and relatively low expectations regarding the returns to such investment. Consequently, parents in lower-income communities are less likely to engage in activities that can contribute to their children’s cognitive and non-cognitive development. A lack of early stimulation has especially significant and lasting effects on the lifetime accumulation of cognitive and socioemotional skills. In extreme cases, such as when pregnant women are undernourished, children from the poorest households are at a disadvantage from birth. When these children enter the formal education system, they already face a significant skills deficit compared with children from non-poor households. Moreover, children from the poorest households often attend the worst-performing schools, which suffer from deficient infrastructure, inadequate learning materials, and unqualified teachers. Rather than leveling the playing field for students at different income levels, the Mexican education system tends to exacerbate social and economic inequalities.

**Figure 41: Spending per Student at the Basic Education Level by State, 2013**



Source: World Bank (2016)

175 De Hoyos, Estrada and Vargas (2018) "Predicting individual wellbeing through test scores: evidence from a national assessment in Mexico", Policy Research working paper, no. WPS 8459. Washington, D.C.  
 176 Estrada (2015) Rules rather than discretion, teacher hiring and rent extraction. [http://cadmus.eui.eu/bitstream/handle/1814/36535/MWP\\_2015\\_14.pdf](http://cadmus.eui.eu/bitstream/handle/1814/36535/MWP_2015_14.pdf)

173. Mexico spends just 0.6 percent of its GDP on developmental programs for children under the age of five, and spending is heavily concentrated among children in the three-to-five age group.<sup>177</sup> Mexico's universal preschool policy for children between the ages of three and five is responsible for the overwhelming majority of spending on children under five. Mexico spends just 0.02 percent of GDP on early stimulation for children under three, well below the levels of other middle-income countries in the region. By contrast, Colombia and Chile spend 0.19 and 0.25 percent of GDP, respectively.

174. A regressive distribution of financial resources contributes to the positive correlation between school quality and household income level. In relatively affluent areas such as Mexico City and Nuevo León, investment per student at the basic education level is above the national average of roughly MX\$20,000 per year, whereas in Guerrero, Chiapas, and Oaxaca, the poorest states in Mexico, investment per student is significantly below the national average (Figure 41). The unbalanced distribution of resources reflects both federal transfers with limited equalization power (for needs and revenue capacity) and differences in education investment by state.

## POLICY OPTIONS

### *Leveraging Performance Incentives to Improve Teacher Quality*

175. **Align all the elements of the education system into a coherent whole.** Harmonizing the different components of the education system would enhance the effectiveness of the reforms and create the foundation for a long-term national education strategy. The adoption of the new education model is a strong first step in aligning the system, but some parts of the SPD remain inconsistent with the overall approach to education quality.

176. **Strengthen the effectiveness of Mexico's teacher-training colleges (normales).** Without improving the quality of the institutions responsible for training teachers, the SPD will have a limited impact on student learning outcomes. The *normales* could improve their effectiveness by applying the SPD's rules and evaluation criteria to their own instructors, and over the medium term, the authorities could mandate that the *normales* adopt merit-based systems for selecting and promoting instructors. The *normales* could also draw on the results of the SPD evaluations to inform their institutional improvement strategies.

177. **In-service teacher training could enhance student learning, but the system must incorporate some additional features into its design.** The international evidence has identified three best practices for effective in-service

teacher training: (i) providing complementary learning materials, (ii) focusing on a specific subject, and (iii) conducting follow-up visits. The SPD could better leverage the information generated by in-service teacher evaluations to increase the effectiveness of its training strategy. Until recently, teacher training in Mexico was entirely supply-driven, and all teachers received the same instructional content. Teacher evaluations implemented as part of the SPD provide the Secretariat of Public Education (*Secretaría de Educación Pública*, SEP) and the National Institute for the Evaluation of Education (*Instituto Nacional para la Evaluación de la Educación*, INEE) generates all the necessary information to align the provision of teacher training with the demands of Mexican teachers. Training materials, focus areas, and follow-up schedules could be customized to reflect the needs of teachers, increasing the relevance of training and enhancing its impact on student learning.

178. **In-service teacher-training strategies should be designed at the school level and incorporated into school-improvement plans in line with the five pillars of the SPD and the government's SBM strategy.** The SBM strategy introduces new managerial practices focused on improving student learning. It provides school directors with tools to monitor learning outcomes in math and reading comprehension and enables administrators to observe teachers in the classroom via a technique known as Stallings classroom observations. The SBM strategy also enables school directors to accurately appraise teacher performance and provide timely feedback on areas for improvement. Incorporating the results of SPD teacher evaluations into the SBM strategy could increase the amount of performance information available to school directors, allowing them to design more effective teacher-training plans. It would also strengthen the coherence of education policy and more fully align the education system with the objective of improved student learning.

### *Adopting a National Early Childhood Development Policy*

179. **A significant share of the observed developmental gaps between children from households at different income levels emerge before age three, and early childhood development programs should primarily target disadvantaged children.** In Mexico, however, spending on children under three is both low overall and disproportionately focused on children in urban areas. The center-based services offered by the Secretariat of Social Development (*Secretaría de Desarrollo Social*, SEDESOL) and the Mexican Institute of Social Security (*Instituto Mexicano del Seguro Social*, IMSS) have the greatest coverage. IMSS centers are relatively well-funded and have low children-to-teacher ratios. In rural areas, the National Council for Educational Development (*Consejo Nacional de Fomento Educativo*, CONAFE) provides community-based early stimulation

programs run by local non-professional teachers for children under age four. However, the quality of CONAFE programs is far below international standards, and extremely high overhead costs appear to indicate low expenditure efficiency.<sup>178</sup>

**180. The successful implementation of an early childhood development policy depends crucially on the quality of the individual programs and the infrastructure that supports those programs.** According to the literature there are four elements of the system's infrastructure that are key for the delivery of quality, equitable and sustainable services: governance, finance, quality assurance, and human capacity. In each of these four areas Mexico has scope for significant improvements.

**181. Governance.** One possible solution to improve horizontal (across sectors) and vertical (across government levels) coordination could be the creation of a boundary spanning entity (BSE) – an institution with an explicit mandate to coordinate efforts among the myriad of relevant institutions. Similar to the approach followed by De Cero a Siempre (DCAS) in Colombia, the central coordinating agency might not be part of any particular line ministry, but rather of the president's office, signaling a strong political mandate for coordination. The new agency might potentially rely on Sedesol as operational structure on the ground.

**182. Financing.** Proper financing mechanisms ensure sufficient resources initially and secure funding for the life of the program. In order to maximize both efficiency and equity, ECD policies should target the most disadvantaged with high quality provisions. Mexico spends too little in policies for children age 0-3 belonging to the most disadvantaged households. Using as benchmarking the cost per child of a cost-effective ECD program implemented in Peru (Cuna Mas), we have simulated the cost of covering all children who belong to the "población objetivo" of Prospera and Conafe. This would require increasing the spending per capita from 0.02 to 0.20 percent of the GDP, that could be partly funded through an increase in income tax and the reduction in inefficient public spending. Nuñez (2017) finds that in 2015 19.7 percent of the public expenditure was used for items different from those originally budgeted for.

**183. Quality assurance.** National measures and standards to supplement program-specific standards are required. While Mexico has made significant progress in collecting anthropometric measures for children age 0-3, there is very little information about child cognitive and socio-emotional development, as well as on the quality of child-care provision. The availability of data is also key for the evaluation of single programs.

**184. Human resources.** While human resource development may be included as an individual program feature, the actual availability of a pool of well-trained potential personnel depends on elements that transcend the individual programs. Mexico might take advantage of the reform of the Escuelas Normales in order to create teachers with ECD specific profiles.

### *Realign the National Education Budget to Provide an Equitable Distribution of Resources*

**185. To equalize opportunities between students at different income levels, investment in education should be allocated progressively, and it should reflect student need.** Revising the resource allocation criteria used in the joint federal-state system for education financing could produce a more equitable and efficient distribution of resources. For example, funds could be allocated on a per student basis, adjusted according to the relative marginalization of each school's local community, and complemented by additional results-based financing. The results indicators used to allocate financing could include final outcomes, such as improvements in standardized test score, as well as instrumental goals such as the implementation of the SPD, the SBM approach, or other key policies.

**186. Based on the entry examinations, the authorities could create a system of financial and professional/career progression incentives designed to encourage high-performing teachers to work in schools in marginalized communities.** Despite its limitations, the entry examination into the SPD is a sound proxy for future teacher performance, and it allows the authorities to identify the most effective teachers entering the education sector.







## 8. Strengthening the Healthcare System

**R**ecent reforms have expanded access to health care significantly and improved health outcomes. National statistics indicate that the share of the population without access to healthcare has been halved in less than a decade, falling from 38.4 percent in 2008 to 15.5 percent by 2016. Seguro Popular covered 52.6 million Mexicans who previously lacked health insurance. Despite increased spending, a combination of allocative and technical inefficiencies weakens the impact of the health budget. Out-of-pocket spending remains high, especially among lower-income households. Large disparities in the quality of health services across states compound larger regional socioeconomic inequalities. Nationwide, an aging population and changing lifestyle factors are driving an increase in chronic noncommunicable diseases and degenerative conditions, which are intensifying spending pressures on the healthcare system, including for long term care. Overall, the health system is fragmented, contributing to cost and service inefficiencies. The role of primary care providers has been weak, and local entities responsible for managing primary care vary substantially in their capabilities to handle it. Dealing with growing needs and medium-term spending pressures while maintaining fiscal sustainability for the system will require further reforms. They include, among other, (i) strengthening pharmaceutical regulation, procurement, and supply-chain to help reduce expenditure across systems; (ii) better coordinating between healthcare schemes (e.g., through reciprocity agreements for exchange of services) to pursue efficiency gains and a better use of facilities; (iii) kickstart the process of harmonization of benefits packages across insurance systems; (iv) start working on a more substantial administrative integration of the insurance systems, including patient data; (v) integrating some financing and investment planning functions within each health insurance scheme; and (vi) reorganizing health jurisdictions around a primary-care-based model.

## CONTEXT AND REFORM PROGRESS

187. During the first half of the 2000s, Mexico implemented major reforms that greatly expanded insurance coverage and substantially improved health outcomes. Aside from the private sector Social Protection System for Health (IMSS) and that for public sector employees (ISSSTE), a noncontributory health care system for vulnerable households, better known as *Seguro Popular*, was established in 2003. By 2012, *Seguro Popular* covered 52.6 million Mexicans who previously lacked health insurance. Since then, access to health services has continued to expand. National statistics indicate that the share of the population without access to healthcare has been halved in less than a decade, falling from 38.4 percent in 2008 to 15.5 percent in 2016.<sup>179</sup> Since 2000, the maternal mortality rate has fallen by 50 percent, and infant mortality has dropped by more than 40 percent.

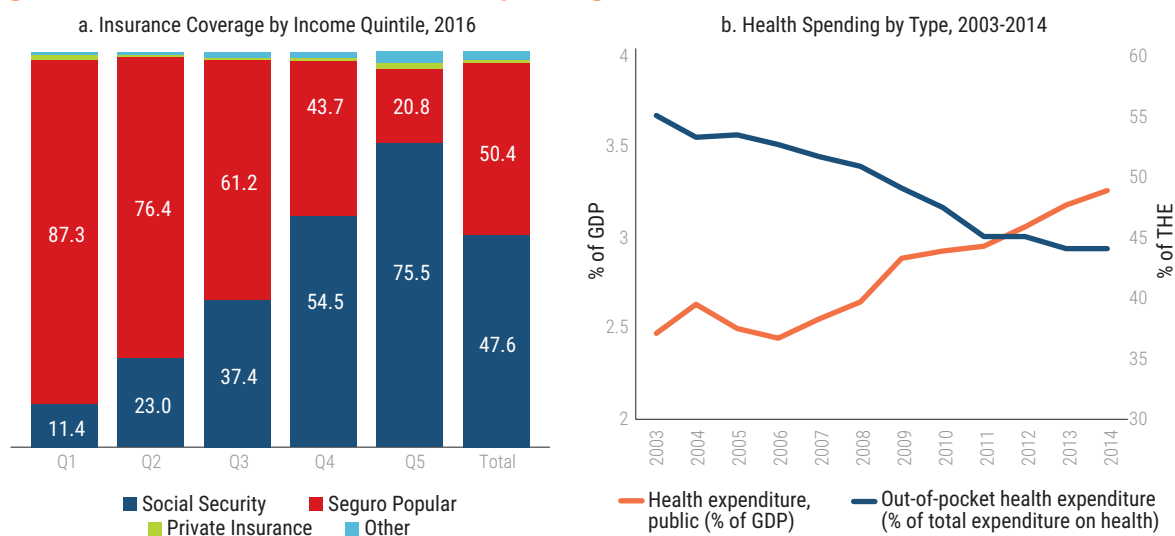
188. The establishment of *Seguro Popular* significantly increased the amount of public resources invested in the health sector. Between 2004 and 2014, public health spending as a share of GDP rose by approximately 43 percent. Importantly, *Seguro Popular* significantly reduced the incidence of catastrophic and impoverishing health spending among lower-income households. Between 2004 and 2014, catastrophic health spending by households the poorest income quintile declined by 11 percent, and impoverishing health spending fell by 54 percent (González Block & Martínez, 2015). Mexico's health spending remains relatively low by global and regional standards. In 2014, Mexico's total health expenditures

were about 43 percent of the OECD average and below the Latin American average. Mexico public spending on health is also lower than most individual regional comparators, with the notable exception of Argentina. Additionally, important savings have been achieved through the consolidated purchasing of pharmaceuticals and the role of the General Health Council (*Consejo General de Salud*), established to coordinate the adoption of new pharmaceuticals and medical devices for six insurers.<sup>180</sup> Its role is determining, through a cost-benefit analysis, whether those insurers should only purchase products deemed safe and effective by the Federal Commission for the Protection Against Health Risk (*Comisión Federal para la Protección contra Riesgos Sanitarios*).

189. Despite these advances and growing public spending, Mexico continues to face important challenges in ensuring equitable access to quality health services. Despite an increase in total health spending from 4.9 percent of GDP in 2000 to 6.3 percent in 2014, Mexico's health spending remains relatively below comparators. In 2014, Mexico's total health expenditure was about half the OECD average and below the Latin American average of 7.2 percent. Public sector health spending, including both government schemes and compulsory health insurance, also represents a modest share of total health spending: in 2015, public spending comprised 52 percent of total health spending, versus an OECD average of 70 percent and lower than most individual regional comparators, with the notable exception of Argentina.

190. The health system is fragmented, contributing to a number of costs and service inefficiencies. Several disconnected sub-systems provide healthcare, and employ-

**Figure 42: Health Insurance and Health Spending in Mexico**



179 It refers to people with access barriers, even though they may have an insurance affiliation. Source: National Council for the Evaluation of Social Development Policy (CONEVAL), <https://www.coneval.org.mx/Medicion/Paginas/Evolucion-de-las-dimensiones-de-pobreza.aspx>, <https://www.coneval.org.mx/Medicion/EDP/Paginas/Datos-del-Modulo-de-Condiciones-Socioeconomicas.aspx>.

180 In 2014, the consolidated procurement of pharmaceuticals yielded an estimated savings of 0.03 percent of GDP. However, even consolidated procurement still involves several discreet processes, and the procurement system remains largely confined to pharmaceuticals.

ment status determines insurance coverage and access to provider networks.<sup>181</sup> The Mexican Social Security Institute (*Instituto Mexicano del Seguro Social*, IMSS) covers private-sector workers and their families. The Institute for Social Security and Services for State Workers (*Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado*, ISSSTE) covers federal government employees. The poor and unemployed are enrolled in *Seguro Popular*. Self-employed, non-salaried, and informal workers are covered by one of several federal programs managed by the Secretariat of Health (*Secretaría de Salud*), including *Seguro Popular* and the conditional cash-transfer program *IMSS-Prospera*. Despite widespread coverage, income levels are closely correlated with health outcomes: infant mortality rates, for example, are 20 times higher in the most marginalized (poorer) municipalities than in the least marginalized.

**191. An aging population and an ongoing epidemiological transition are intensifying pressure on Mexico's healthcare system.** The dependency ratio—i.e., the number of people over age 64 relative to the number between the ages of 15 and 64—rose from 7.4 percent in 1985 to 10 percent in 2016. The aging of the population, compounded by behavioral factors such as diet and exercise, is shifting the disease burden from acute communicable diseases to chronic degenerative diseases. By 2015, all five leading causes of death in Mexico were noncommunicable diseases, and the country's obesity rate was among the highest in the world. The 2016 National Health and Nutrition Survey (*Encuesta Nacional de Salud y Nutrición*, ENSANUT) found that 72.5 percent of adults were overweight or obese, along with 36.3 percent of adolescents, and 33.2 percent of children age 5 to 11. Managing chronic diseases associated with old age and lifestyle factors tends to be far more complex and expensive than treating acute communicable diseases, and addressing the challenges facing the Mexican health sector will require changing the way healthcare is organized, funded, and managed at both the national and regional levels.

## KEY CHALLENGES

### *Improving the Efficiency, Scope, and Equity of Health Services*

**192. Health spending suffers from both technical and allocative inefficiencies.** Administrative costs accounted for almost 10 percent of total health spending in 2014, the highest level in the OECD. These high administrative costs, which chiefly stem from the fragmentation of the system, squeeze the fiscal envelope for the health sector's invest-

ment budget, resulting in a very low rate of gross fixed capital formation, which reached just 0.1 of GDP percent in 2015. The lack of coherent prioritization criteria within and across subsystems is also one of the causes of inefficiencies and inequities.

**193. Despite the expansion of insurance coverage, out-of-pocket (OOP) spending remains high and disproportionately impacts the poorest households.** OOP spending fell from 55 percent of total spending in 2003 to 44 percent in 2014, but remains a key source of inefficiency and a major barrier to health access among the poorest households. In Mexico, OOP health expenditures are largest for ambulatory care, and pharmaceutical costs are especially high. OOP spending is also highly regressive: 45 percent of total ambulatory OOP health costs are borne by households in the first three income quintiles, and 28 percent are borne by non-insured households across all income quintiles, especially non-insured households in quintile four.<sup>182</sup> Also, the poorer quartile of the population spends a significantly higher (37 percent) higher proportion of their income on health than the richest quartile. The data do not indicate why high levels of OOP spending persist, but they may reflect dissatisfaction with the quality or accessibility of services provided by institutions covered by health insurance, prompting patients to seek care from private health providers as shown in Figure 43a. OECD, 2016.<sup>183</sup>

**194. Health access has expanded, but insurance coverage of services for high costs treatments is unequal.** *Seguro Popular* now covers 50.4 percent of the insured population, while the various social security programs cover 47.6 percent.<sup>184</sup> The coverage packages provided by *Seguro Popular* and the social security programs have converged over time and are now very similar, particularly coverage for primary care. In addition, the fact that persons from higher level income quintiles are also affiliated to *Seguro Popular* indicate that many households view SPSS enrollment as a complement to social security enrollment rather than a substitute.<sup>185</sup> However, coverage for high-cost treatments still differ significantly. About 38 percent of IMSS affiliates lose their medical benefits each year and become eligible for *Seguro Popular*.<sup>186</sup> At any given time, an estimated 13.4 percent of the population lacks a comprehensive coverage of high-cost conditions, though *Seguro Popular* still covers adverse health events.<sup>187</sup> While *Seguro Popular* reduces the incidence of catastrophic health expenditures,<sup>188</sup> these effects vary across population groups and health conditions. Moreover, the estimated reduction in catastrophic health expenditures is only a few percentage points, implying that the risk is still substantial.

181 OECD, 2016.

182 González Block, 2015.

183 OECD, 2016.

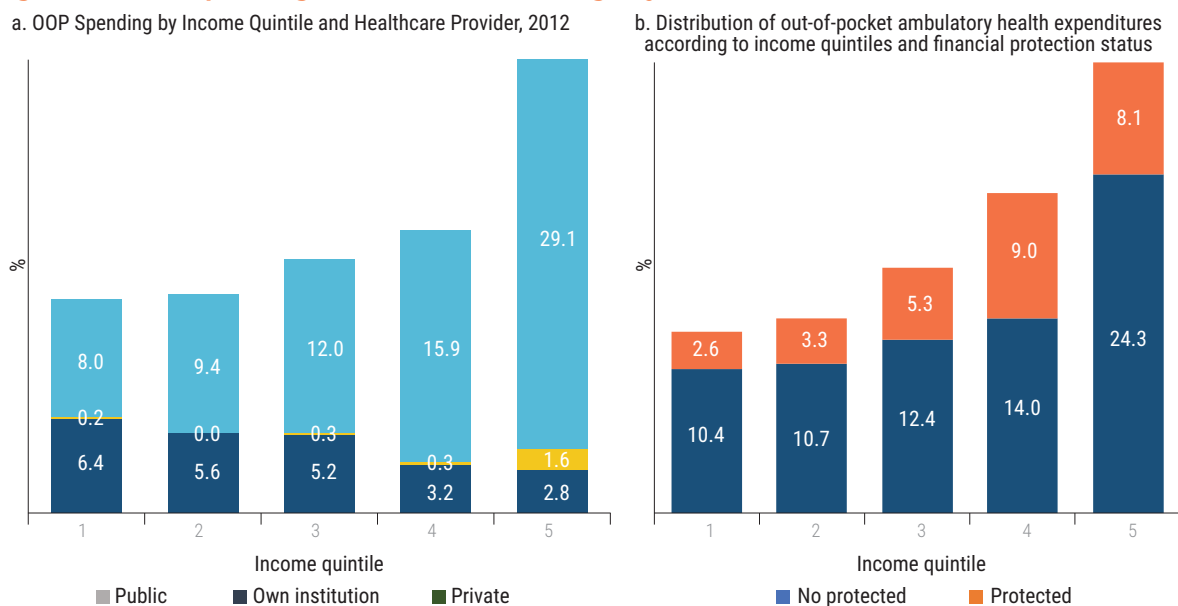
184 The remaining 2% are covered by specific social security arrangements for public institutions such as the armed forces or the national oil company.

185 See, for instance, Kurovski and Villar, 2012.

186 Guerra et al., forthcoming.

187 ENSANUT, 2016.

188 See: Ávila-Burgos, et al., 2013; King, et al., 2009; Grogger et al., 2015; Knox, 2016.

**Figure 43: OOP Spending and Insurance Coverage by Income Quintile**

Source: González Block MA 2015 based on ENSANUT 2012

Source: Gonzalez Block 2017 based on ENSANUT 2016

## Consolidating the Healthcare System

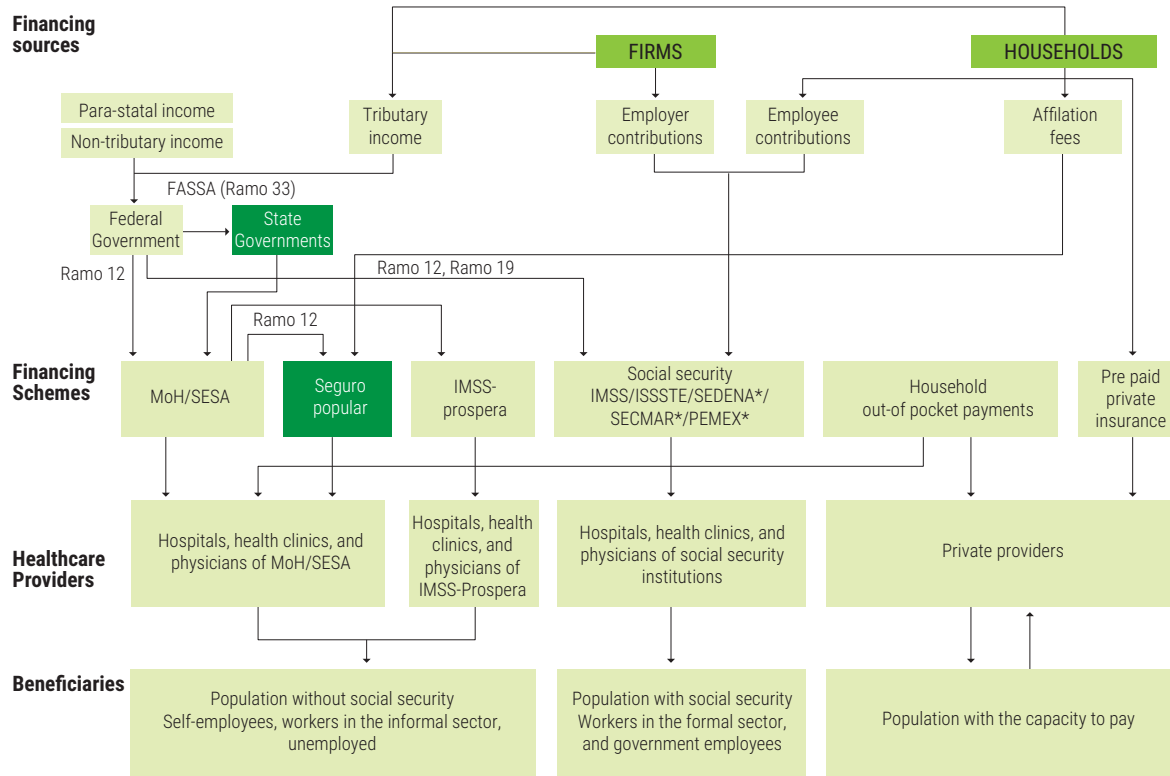
195. **The fragmentation of Mexico's healthcare system contributes to inefficient spending and use of assets and services.** The current structure prevents the materialization of economies of scale, results in redundancy, unequal access to services, and the suboptimal utilization of human and physical capital. Moreover, the size and effectiveness of cross-subsidies among public health institutions are difficult to measure due to the lack of a unique roster of beneficiaries. The fragmentation of the health system into separate, vertically integrated insurance programs also limits patient choice and weakens efficiency incentives. It also inhibits access to care, since patients can only use healthcare providers within their insurer's network, regardless of geographic location, service availability or medical condition, and is the primary determinant of the already noted high administrative and insurance costs (almost ten percent of total health expenditures, compared to three percent in the OECD). The absence of system-wide planning produces an inefficient allocation of facilities and resources, leading to excess supply in some areas and shortages in others. Each insurer maintains its own pharmaceutical and medical-device supply chains and develops its own standards of care, which can vary substantially.

196. **The problems of fragmentation are compounded by differences in resource allocation and socioeconomic conditions across states.** The geographic distribution of public health resources does not reflect the needs of the population, as transfer to states, despite improvements, fall short in equalizing local resource availability and spending needs. In addition, financial management capacity

varies across states and is especially low in the poorest regions, contributing to the overall inefficiency of the sector.<sup>189</sup> Chronic disease and homicide rates contribute to disparities in life expectancy at the state level that also reflect the socioeconomic differences that extend beyond the health sector.<sup>190</sup> States with high marginalization rates exhibit the largest health risks in terms of sexual protection, tobacco use, and alcohol consumption, potentially indicating differences in the scope and efficacy of public health outreach. The service quality provided by each insurance scheme also varies, with particularly large gaps in the quality of care for myocardial infarction mortality.<sup>191</sup> Mortality rates within 30 days of hospitalization for cardiac infarction vary from 3 percent among high-income, mostly privately insured patients with access to private care to 6.5 percent among IMSS-insured patients cared for at IMSS facilities and reach a staggering 59 percent among patients cared for elsewhere. This disparity is due largely to the fact that *Seguro Popular* only covers cardiac infarction cases in patients under age 60. Hospitals are often unwilling to devote substantial resources to treating uninsured patients, as they are unlikely to be reimbursed.

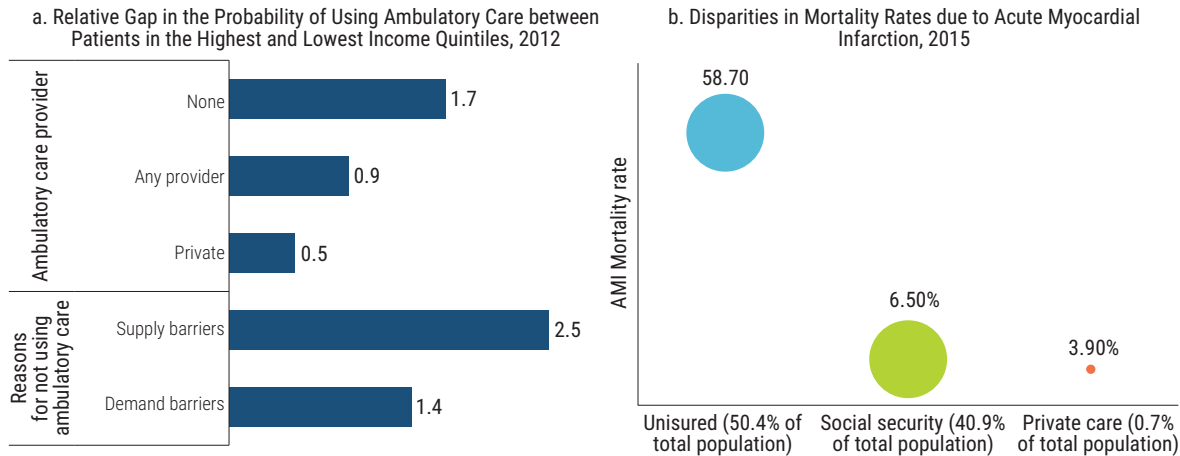
197. **Efforts to harmonize the activities of insurance providers have been only partially effective.** The effectiveness of the General Health Council (*Consejo General de Salud*) has been limited because, in practice, insurers still conduct internal reviews of medical products and make independent decisions regarding the definition of their prioritization criteria, benefit packages and use of medical devices and pharmaceuticals—decisions that are often based on budgetary constraints. Consequently, individuals covered by different insurers have access to very different medicines and services.

**Figure 44: Financial Flows in the Mexican Health System**



Source: Adapted from Avila-Burgos et al. (2016), Gonzalez-Block et al. (forthcoming) and Frenk and Gómez-Dantes (2015)

**Figure 45: Disparities in the Use of Ambulatory Care and Cardiac Infarction Mortality**



Source: Adapted from Bautista Arredondo et al. (2013)

Source: Azpiri-López (2016); ENSANUT-MC (2016).

**Developing a High-Quality, Equitable, Outcome-Driven Healthcare System**

198. The role of primary care providers has been weak, and local entities responsible for managing primary care lack clearly defined roles and their capabilities vary substantially. Despite the introduction of a new comprehensive health-care model (*Modelo de Atención Integral de Salud, MAI*), in practice there is no single model of care in the coun-

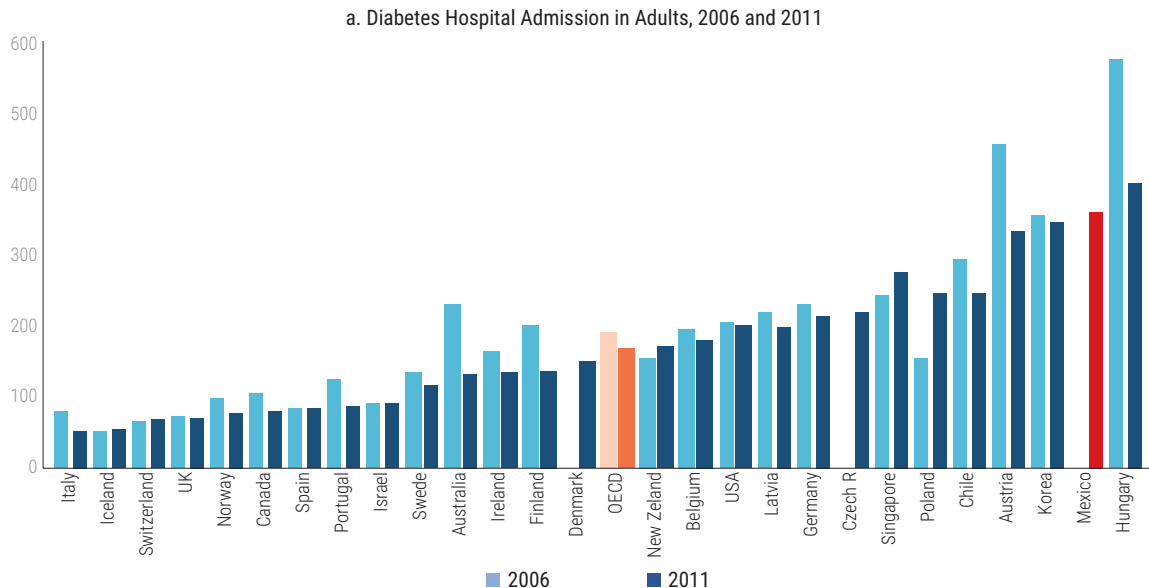
try. The focus of health care provision is often curative, with relatively few preventive interventions. In the IMSS, primary care is the purview of a small number of family physicians, who are trained in-house, while the Ministry of Health uses general practitioners, noncertified family physicians, or social-service interns.<sup>192</sup> The rate of avoidable hospitalizations in hospitals run by the Ministry of Health increased from 13.4 per 10,000 insured people in 2001 to 19.7 in 2011, even though the expansion of *Seguro Popular* increased access to primary care.<sup>193</sup> Lower-income

192 Comisión Nacional de Protección Social en Salud, 2014.

193 Lugo Palacios et al., 2015. Avoidable hospitalizations may reflect a low quality of care by primary-care providers that fail to prevent or treat a condition that later requires hospitalization.

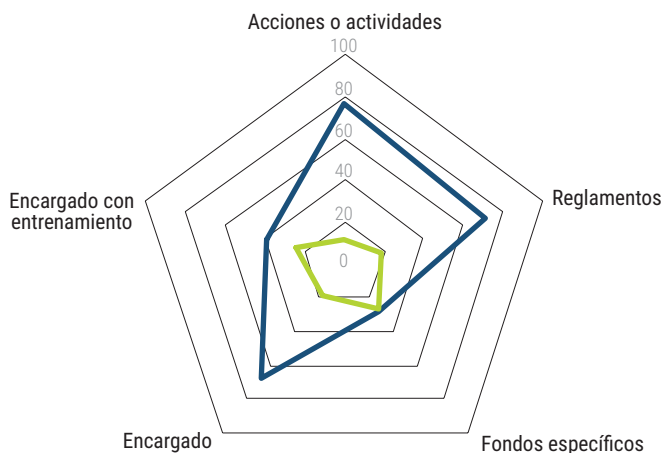


**Figure 46: Preventable Hospitalization and the Institutional Strength of Health Jurisdictions**



Source: OECD Health Statistics 2014

b. Institutional Strength of Jurisdictions: National Average



Source: The World Bank – HNSP Mexico 2017

households with low levels of educational attainment and households living in highly marginalized areas are less likely to use ambulatory care providers than wealthier households with greater educational attainment in less-marginalized areas. Health jurisdictions (*jurisdicciones sanitarias*) are responsible for directing, managing, and operating primary care facilities, along with the State Health Services (*Servicios Estatales de Salud, SESAs*). Health jurisdictions are tasked with designing and implementing health programs that reflect local needs, whereas SESAs are responsible for providing human, material, and financial resources to medical units. However, the health jurisdictions and SESAs have not been adapted to suit the post-Seguro Popular health system. The institutional capacity of the health jurisdictions varies, but their capabilities are generally limited. Capacity differences reflect an uneven allocation of resources, an outdated geographical distribution of facilities, and a lack of normative instruments to regulate their responsibilities under the MAI. Consequently, health jurisdictions lack the capacity and the resources necessary to address the new challenges and responsibilities introduced by the MAI, which emphasizes primary care as the basis for the overall model of care.

199. The use of parallel, inconsistent data-collection and information systems complicates sectoral monitoring, oversight, and policymaking. States, social security institutions, healthcare providers, and health jurisdictions have created multiple data-collection systems that do not follow the same parameters and are not interoperable, i.e. they are not able to exchange and/or make use of the same information. The inadequate scope and quality of the available data inhibit the adoption of a patient-centered model of care. Multiple initiatives with data-integration components are underway, including the rollout of the National Health Information System (*Sistema Nacional de Información Básica en Salud, SINBA*), the Comprehensive Health Quality System (*Sistema Integral de Calidad en Salud*), Seguro Popular’s Health Payroll System (*Sistema Nómina en Salud*), and IMSS Digital, among others. However, the institutional complexity of the health sector, legal restrictions, political cycles, and insufficient budgetary resources to finance the large-scale deployment of new technology have hindered these efforts. Integrated information systems will be critical to the success of various interventions currently being discussed by policymakers, such as the strategic procurement of supplies, the unification of ben-

efit plans, the adoption of risk-based budgeting, and the use of uniform evaluations for medical technology.<sup>194</sup>

## POLICY OPTIONS

### *Improving the Efficiency, Scope, and Equity of Health Services*

**200. Adopt performance incentives and other innovative instruments to improve results and resource allocation.** The government could explore innovative mechanisms to allocate the budget transparently across states based on projected expenses, local health needs, and demographic characteristics. Performance-based payment systems and other financial incentives could encourage greater investment in prevention, increasing the system's ability to resolve health problems (resolutive capacity), and integrate patient management across administrative levels and healthcare providers. Adopting performance benchmarks could enhance hospital and provider-network autonomy. Developing internal markets, i.e. markets for health products and services, especially those related to primary care services, could ensure more equitable financing for primary care and essential hospital interventions. The government could also consider introducing a risk-based formula for resource allocation that accounts for differences across regions—based on more rigorous and comprehensive data—and increasing the contribution of private resources, such as copayments and complementary private insurance, to fund the care of non-poor patients. At a provider level, options such as Public Private Partnerships (PPP) have shown potential for efficiency gains, contributing to fill the infrastructure gaps and introducing international standards of quality, with little or none fiscal impact.

**201. Strengthen pharmaceutical regulation and supply-chain to help reduce expenditure across systems.** The international experience has shown that controlling pharmaceutical prices through market mechanisms can be very effective in reducing healthcare costs. Policymakers can stimulate competition among suppliers of generic drugs while controlling prices for expensive patent-based name-brand-name drugs. The prices of drugs covered by benefit plans should be frequently revised to reflect evolving market dynamics, technological innovations, and new information about therapeutic effectiveness. This can be complemented by the mandatory substitution of generic alternatives and centralized procurement. Implementing these measures will require: (i) building the capacity of the National Center for Technological Excellence in Health (*Centro Nacional de Excelencia Tecnológica en Salud*) to conduct robust, independent assessments of health technology; (ii) strengthening supply-chain management for pharmaceuticals by supporting the Coordinating Commission for Negotiating Prices for Medicines and Other Health Supplies (*Comisión Coordinadora para*

*la Negociación de Precios de Medicamentos y Otros Insumos para la Salud*) and improving both the distribution of medicines across states and the management of drug stocks in individual health units; and (iii) harmonizing prioritization criteria across the different subsystems.

### *Consolidating the Healthcare System*

**202. In the short term, better coordination between health-care schemes could yield major efficiency gains.** In the short term, reciprocity agreements enabling the exchange of services between different healthcare schemes could maximize the value of healthcare facilities and infrastructure—the emergency obstetric care agreement should serve as a model for cross-scheme collaboration.

**203. Kickstart the process of harmonization of benefits packages across insurance systems.** The authorities have made progress in aligning primary-care interventions, and criteria have been established to update benefits based on cost-effectiveness, affordability, financial protection, the opinion of the scientific community, supply and demand factors, and social acceptance. The Health Secretariat could lead efforts to define an explicit reference package, strengthen the process for evaluating medical technology, update benefits based on the established criteria, and launch a round of technical negotiations with the social security institutions to discuss parameters and a timeline for harmonizing benefits. This process can help to reduce disparities in the quality and comprehensiveness of care.

**204. Eliminating beneficiary duplication can render fiscal savings.** Eliminating duplications in *Seguro Popular* coverage alone could have saved 0.1 percent of GDP in 2014 alone. There are, in addition, further potential savings from eliminating IMSS and ISSSTE duplications. There is an urgent need to consolidate beneficiaries in a single verifiable roster. Efforts are underway to create a unique roster of beneficiaries across public health institutions, and the government is coordinating the process of information exchange and cross-checking. However, this project is still in its early stages and has not yet been used to eliminate redundant payments.

**205. Start working on a more substantial integration of administrative systems.** This would entail automatically registering former IMSS beneficiaries with *Seguro Popular* and establishing mechanisms to coordinate enrollment and the management of clinical data. In addition, a transparent process for purchasing services across all insurance systems (i.e., service-exchange agreements) could optimize the utilization of health infrastructure in areas covered by both social security institutions and *Seguro Popular*, while also expanding overall coverage and improving the financial outlook of both healthcare providers and public insurers. Leveraging new technologies for managing ap-

194 OECD, 2016.

pointments based on capacity could further boost the efficiency of health-sector resources by taking full advantage of underutilized infrastructure.

**206. There are also potential inefficiencies linked to the integration of financing and investment planning.** This current system hampers any opportunity for strategic purchasing and thus getting the best value for the money. In addition, provider payment mechanisms are not linked to results; they remain mostly based on historical budgets with little or no incentive for cost- containment, or improving service delivery to patients. Greater investment coordination between healthcare schemes would also increase the impact of future capital spending.

**207. Consolidate data-collection systems and adopt mechanisms to improve the quality and comprehensiveness of data.** The authorities could strengthen, integrate, and expand the various databases used by different elements of the health sector, with the goal of building a national electronic health records system encompassing both patients and providers. This system would allow policymakers to track data on patients and illnesses across levels of care, geographic locations, insurance systems, socioeconomic groups, and other domains. More precise and comprehensive administrative data will be vital to accurately assess provider performance, build a strong primary-care-oriented health system, and introduce new mechanisms for

payment and budgeting. The government's strategy for integrating electronic health records should be informed by two promising initiatives: *Seguro Popular's* Health Payroll System and IMSS Digital. Establishing an integrated national health information system will require dedicated budgetary resources and well-designed rules for managing health data that reflect international best practices and enjoy broad political support.

### *Developing a High-Quality, Equitable, Outcome-Driven Healthcare System*

**208. Reorganize health jurisdictions around a primary-care-based model.** As the frontline units of the health system, health jurisdictions should be central to the government's strategy for preventing and managing non-communicable diseases and chronic health conditions. Building the capacity of health jurisdictions will require: (i) updating their operational guidelines, (ii) publicizing effective strategies for preventing and managing chronic diseases, (iii) allocating the funds necessary to implement those strategies, (iv) adapting personnel training to reflect the evolving disease profile, and (v) increasing the autonomy and capacity of jurisdictions to address local challenges. Finally, the Secretariat of Health should create forums for representatives of health jurisdictions to share their experiences and learn from one another.

## References

- AMIS (2016), Diseño de productos innovadores de aseguramiento en colaboración Government- privada. Análisis de necesidades de salud y de protección financier. Presentación al Comité Ejecutivo de AMIS. AMIS, noviembre.
- Azpíri-López, JR (2016), "Observations in relation to myocardial infarction: Are there three different Mexicos?" *Medicina Universitaria* 18, no. 72: 181-84. doi:10.1016/j.rmu.2016.06.003.
- Avila-Burgos L, Cahuana-Hurtado L, Montañez-Hernandez J, Servan-Mori E, Aracena-Genao B, and Del Río-Zolezzi A (2016), "Financing Maternal Health and Family Planning: Are We on the Right Track? Evidence from the Reproductive Health Subaccounts in Mexico, 2003–2012." *Plos One* 11, no. 1. doi:10.1371/journal.pone.0147923.
- Barraza-Lloréns M, Panopoulou G, and Yádira Díaz B (2013), "Income-related inequalities and inequities in health and health care utilization in Mexico, 2000 - 2006." *Revista Panamericana de Salud Pública* 33, no. 2: 122-30. doi:10.1590/s1020-49892013000200007.
- Bautista-Arredondo S, Serván-Mori S, Arantxa Colchero M, Ramírez-Rodríguez B, and Sosa-Rubí SG (2014), "Análisis del uso de servicios ambulatorios curativos en el contexto de la reforma para la protección universal en salud en México." *Salud Pública de México* 56, no. 1: 18. doi:10.21149/spm.v56i1.7319.
- Cahuana-Hurtado L, Chilian-Herrera O, Bautista-Arredondo S, Contreras-Loya D, Franco-Marina F, González-Vilchis JJ, and Lozano R. (2015), "Corrección de la mala clasificación de las muertes por sida en México. Análisis retrospectivo de 1983 a 2012." *Salud Pública de México* 57: 142. doi:10.21149/spm.v57s2.7602.
- Castro Arantxu VS and Kaufman H. (2015), "Assessing equitable care for Indigenous and Afrodescendant women in Latin America" *Rev Panam Salud Publica* 38, no 2 :96–109
- Comisión Nacional de Protección Social en Salud (2016), Catálogo Universal de Servicios de Salud 2016. México, SSA.
- Consejo Nacional de Evaluación de la Política de Desarrollo Social (CONEVAL), <https://www.coneval.org.mx/Medicion/Paginas/Evolucion-de-las-dimensiones-de-pobreza.aspx>, <https://www.coneval.org.mx/Medicion/EDP/Paginas/Datos-del-Modulo-de-Condiciones-Socioeconomicas.aspx>
- Danese-DI, Santos LG., Sosa-Rubí SG and Valencia-Mendoza A (2011), "Analysis of changes in the association of income and the utilization of curative health services in Mexico between 2000 and 2006." *BMC Public Health* 11, no. 1. doi:10.1186/1471-2458-11-771.
- El Financiero* (2015), ¿Cómo se distribuye el ingreso en México? Ciudad de México, 16th July.
- Guerra Guerra G, Ridríguez E, Doubova S, Saldago de Snyder N, Borja VH & González Block MA (Pending publication), Annual loss of job-related right to healthcare due to employment turnover affects over a third of private sector workers in Mexico and affects primarily the elderly). *Demography*.
- Gómez-Dantes H, Fullman Nancy, Lamadrid-Figueroa H, Cahuana-Hurtado L, Darney B, Avila- Burgos L, Correa-Rotter R (...) n& Lozano R. (2016), Dissonant health transition in the states of Mexico, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013'. *The Lancet* 388:2386-2402
- González Block MA (Coord.) (2015), Diagnóstico de los retos al Sistema Nacional de Salud Universal. México, Cofemedir-Funsalud.
- González Block MA & Martínez González G, (Coords) (2015) Hacia la cobertura universal de la protección financiera de la salud en Mexico. Ciudad de México, AMIS.
- González Block MA and Scott J. (2010), "Equidad y salud. Retos, avances y perspectivas". In Cortes F & Oliveira O (Coords), Los grandes problemas de México. V. Desigualdad social. pp 211-234
- Gonzalez Perez GJ, Vega Lopez MG, Cabrera Pivaral CE, Vega Lopez A, Muñoz de la Torre A. (2010), "Marginación Social y Mortalidad Evitable en México". En: Gonzalez Perez GJ, Vega Lopez MG, Cabrera Pivaral CE (Coordinadores). Desigualdad social y equidad en salud: perspectivas internacionales. Universidad de Guadalajara. Guadalajara, Jalisco.
- Guendelman S, Gemmill A, Thornton D, Walker D, Harvey M, Walsh J and R Perez-Cuevas (2017), "Prevalence, Disparities, And Determinants Of Primary Cesarean Births Among First-Time Mothers In Mexico" *Health Affairs* 36, no.4:714-722 doi: 10.1377/hlthaff.2016.10842017
- Gutiérrez JP (2013), "Gaps in effective coverage by socioeconomic status and poverty condition". *Salud Publica Mex* 2013;55 supl 2:S106-S111.
- Gutiérrez JP, García-Saisó S, Espinosa-De La Peña R, and Balandrán DA (2016a), "Desigualdad en indicadores de enfermedades crónicas y su atención en adultos en México: análisis de tres encuestas de salud." *Salud Pública de México* 58, no. 6: 666. doi:10.21149/spm.v58i6.7923.
- Gutiérrez JP, García-Saisó S, Espinosa-De La Peña R, and Balandrán DA (2016b), "Desigualdad en indicadores de comportamientos de riesgo en adolescentes en México: análisis de dos encuestas de salud." *Salud Pública de México* 58, no. 6 (2016b): 657. doi:10.21149/spm.v58i6.7922.
- Gutiérrez JP, García-Saisó S, Espinosa-De La Peña R, and Balandrán DA (2016c), "Desigualdad en indicadores de resultados y acceso a la salud para niños en México: análisis de tres encuestas de salud." *Salud Pública de México* 58, no. 6: 648. doi:10.21149/spm.v58i6.7921.
- Gutiérrez JP, García-Saisó S, Espinosa-De La Peña R, and Balandrán DA (2016d), "Monitoreo de la desigualdad en protección financiera y atención a la salud en México: análisis de las encuestas de salud 2000, 2006 y 2012." *Salud Pública de México* 58, no. 6: 639. doi:10.21149/spm.v58i6.7920
- Human Reproduction Program (2015), WHO Statement on Caesarean Section Rates. Geneva, WHO.
- Institute of Medicine (1994), *America's Health in Transition: Protecting and Improving Quality*. Washington, DC: The National Academies Press.
- Instituto Nacional de Salud Pública Prospera, Unicef (2016), Desarrollo infantil temprano de niñas y niños de tres a cuatro años en hogares beneficiarios de PROSPERA: identificación de factores de riesgo y de protección. Mexico City, INSP.
- Kurowski, C., and Manuela Villar-Urbe. 2012. "Mexico's Social Protection in Health and the Transformation of State Health Systems." Washington, DC: World Bank.
- Leyva-Flores R, Infante-Xibille C, Gutiérrez-Reyes JP, Quintino-Pérez F (2013), "Inequidad persistente en salud y acceso a los servicios para los pueblos indígenas de México, 2006-2012" *Salud Publica Mex*;55 supl 2:S123-S128
- Linares-Pérez N, López-Arellano O (2012), "Inequidades en salud en México". *Gaceta Médica de México*; 148:591-7
- Lugo-Palacios, D G, & Cairns J (2015), "Using ambulatory care sensitive hospitalisations to analyse the effectiveness of primary care services in Mexico." *Social Science & Medicine* 144 (2015): 59-68. doi:10.1016/j.socscimed.09.010.
- Secretaría de Salud (2012), Observatorio del Desempeño Hospitalario 2011. Dirección General de Evaluación del Desempeño, Secretaría de Salud, México.
- Secretaría de Salud, Seguro Popular, Prospera (2016), Encuesta Nacional de Salud y Nutrición, ENSANUT de Medio Camino 2016. Resultados del Módulo PROSPERA. Mexico City, SSA. (Presentation).
- Shamah Levy T, Cuevas Nasu L, Rivera Dommarco J, Hernández Ávila M (2016), Encuesta Nacional de Salud y Nutrición de Medio Camino 2016. Informe final de resultados. Mexico City, INSP.
- Shengelia B, Tandon A, Adams OB, Murray C (2005), Access, utilization, quality, and effective coverage; an integrated conceptual framework and measurement strategy. *Social Science and Medicine*.;61: 97-10.
- Strouse, C., R. Perez-Cuevas, M. Lahiff, J. Walsh, and S. Guendelman (2016). "Mexico's Seguro Popular Appears To Have Helped Reduce The Risk Of Preterm Delivery Among Women With Low Education." *Health Affairs* 35, no. 1: 80-87. doi:10.1377/hlthaff.2015.0594.
- Villalobos A, Allen-Leigh B, Salazar-Alberto J, De Castro F, Barrientos-Gutierrez T, Leyva- Lopez A, et al. (2017), Quality of reproductive healthcare for adolescents: A nationally representative survey of providers in Mexico. *PLoS ONE* 12(3): e0173342. doi:10.1371/journal.pone.0173342
- Wagstaff A, Dmytraczenko T, Almeida G, Buisman L, Hoang-Vu Eozenou P, Bredenkamp C, Cercone JA, Diaz Y, Maceira D, Molina S, Paraje G, Ruiz F, Sarti F, Scott J, Valdivia M, and Werneck H (2015), "Assessing Latin America's Progress Toward Achieving Universal Health Coverage". *Health Affairs* 34, No. 10:1704-1712.



## 9. Enhancing Social Protection

**A**fter a prolonged period of stagnation, poverty rates have more recently fallen. This reduction can partly be attributed to social protection programs, which have expanded over the past decade and continue to play an increasingly important role in strengthening the economic resilience of the poor and vulnerable. However, reaching the most marginalized and poorest remains a challenge. The proliferation of a myriad of social assistance programs with overlapping purposes and beneficiaries (at least 5,491 social programs operate today at the federal, state and local levels) reduces efficiency and the effectiveness of the social assistance system. Sustainably raising the incomes of the poor and expanding their access to opportunities continue to be challenging especially considering the limited spending and orientation of productive and labor inclusion programs. At the same time, multiple social insurance schemes, with disparities in benefits and coverage, exist in parallel, and along with lack of clarity in roles and integration across SA and SI, limit labor mobility, and potentially create unintended disincentives to work and save. The ageing population of Mexico and the need to provide a fiscally sustainable and equitable pension system will only magnify these challenges. Successfully addressing them will require a concerted effort on multiple fronts. The SA system will require consolidation, eliminating overlapping and poor performing programs and better funding those that reach the poor meeting adequate objectives. This will also require a more sophisticated SP infrastructure, specially a unique digital ID for all beneficiaries of all non-contributory and contributory SP programs and linking administrative databases across all programs. Designing adequately funded productive programs that are better adapted to improve social mobility and using a social intermediation approach for the high-priority communities, will help upward mobility of the poor. Providing a fiscally sustainable, equitable, and an integrated pension system will require: consolidation and integration of schemes; consideration of alternative ways of financing social insurance premia (e.g. relying less on payroll taxes and shifting the burden to indirect taxation); and parametric reforms of the existing schemes (e.g. gradual equalization of retirement ages, increase in contribution rates, raising level of non-contributory with an affluence test).



## CONTEXT AND REFORM PROGRESS

209. **After remaining broadly unchanged for several years, poverty rates have recently fallen.** Between 2010 and 2014, the official multidimensional poverty headcount index stagnated at 46 percent, mostly explained by the lack of improvement in the income poverty rate, which in turn reflects the limited opportunities for the poor to earn an income. Recent data from the National Council for the Evaluation of the Social Development Policy (*Consejo Nacional de Evaluación de la Política de Desarrollo Social*, CONEVAL) indicate that the multidimensional poverty headcount rate, which is now measured according to a new methodology, fell to 43.6 percent in 2016, while the extreme poverty rate declined from 11.3 percent in 2010 to 9.5 percent in 2014 and reached 7.6 percent in 2016. Similarly, the monetary poverty rate, measured according to the new methodology, fell from 53.2 percent in 2014 to 50.6 percent in 2016 as labor income rose.<sup>195</sup>

210. **However, disparities in poverty rates and access to services between regions and demographic groups continue to persist.** In 2016, more than 40 percent of poor households were located in just five states: Chiapas, State of Mexico, Oaxaca, Puebla, and Veracruz. These states have some of the country's lowest average per capita income levels,<sup>196</sup> highest inequality indicators, largest indigenous populations, and widest gaps in educational attainment. These states are also home to numerous remote communities with limited connectivity to the national economy or the public administration; their labor markets are characterized by low-productivity jobs and high rates of informality; and they are among the most populous states in Mexico. Nationwide, poverty and extreme poverty rates among indigenous groups are far above the national average.<sup>197</sup>

211. **Social protection plays a key role in reducing poverty and promoting equity and resilience.** Effective social protection systems reinforce the economic resilience of lower-income households by shielding them against adverse shocks faced throughout the life-cycle, and improve equity by reducing (extreme) poverty through redistribution. They also expand economic opportunity by preserving and building human capital and by providing access to better employment opportunities, which can help individuals and households escape poverty. Well-functioning social protection policies and programs provide a foundation for inclusive growth, social stability, and sound macroeconomic management.<sup>198</sup>

212. **Mexico's social protection system includes numerous programs with diverse objectives and varying degrees of coverage and effectiveness.** The country's contributory social insurance schemes offer pensions and health insurance to formal sector workers, helping protect them against income shocks and smoothing consumption over the long term. In addition, non-contributory health insurance (*Seguro Popular*) and non-contributory (social) pension provide coverage for those not include in contributory schemes. A wide range of social assistance (SA) programs—including Mexico's flagship conditional cash-transfer scheme (*Programa de Inclusión Social*, PROSPERA<sup>199</sup>)—constitute an important part of the social protection system. SA programs are designed to directly or indirectly reduce poverty and develop human capital. Labor market programs, which promote employability and link workers to job opportunities, constitute a small but important part of the broader SP system.

213. **Mexico's flagship poverty-reduction programs had a demonstrably positive impact on human capital development and mitigated the negative impact of shocks.** The coverage of programs, particularly PROSPERA and the Elderly Adults Program (*Programa Adultos Mayores*, PAM), has expanded substantially over the past decade, boosting consumption, improving nutrition, health and education outcomes, increasing household resilience, and directly reducing poverty.<sup>200</sup> Overall, flagship SA programs<sup>201</sup> are progressive. Between 2012 and 2016, more than 60 percent of SA beneficiaries were in the bottom two per capita consumption quintiles, and more than 60 percent of benefits (78 percent for PROSPERA) went to households in the bottom two quintiles (See Annex Figure 47.a and 47.b). Moreover, during the global financial crisis, such programs reduced economic losses among the poor, containing the increase in poverty rates to just 1 percentage point between 2006 and 2008.<sup>202</sup> Had the coverage of PROSPERA's predecessor, OPORTUNIDADES, not been expanded, the income of households in the poorest quintile could have fallen by 25 percent or more.<sup>203</sup> Social protection programs have also enabled households to cope more effectively with recent natural disasters, such as the September 2017 earthquake, by rapidly mobilizing and channeling resources to the affected areas.

214. **Recent efforts led to increased coverage of the pension system, though it remains far more limited than originally envisioned.** Between 2012 and 2017, the number of employees covered by social security (IMSS) increased by more than 3 million compared to an increase of just over one million in the 2006-2011 period. During the

195 World Bank, 2018.

196 Per capita incomes in State of Mexico, Oaxaca, and Veracruz stagnated from 2010 to 2014.

197 As of 2016, three in four indigenous people were poor according to multi-dimensional poverty index, while only about 40 percent of the non-indigenous population lived in conditions of poverty. ENIGH.

198 World Bank, 2012.

199 PROSPERA succeeded two earlier programs, OPORTUNIDADES and PROGRESA, and reflect a continuous policy intervention.

200 Hoddinott et al., 2000; Gertler et al., 2006; Angelucci and De Giorgi, 2009; Gertler, 2004; Skoufias and Parker, 2001.

201 This analysis relies on information from the Household Income and Expenditure Survey (*Encuesta Nacional de Ingresos y Gastos de los Hogares*, ENIGH) and is therefore limited to the programs covered in the survey, which include PROSPERA, the Elderly Adults Program (*Programa Adultos Mayores*, PAM), the Temporary Employment Program (*Programa Empleo Temporal*, PET), the Direct Rural Support Program (*Programa de Apoyos Directos al Campo*, PROCAMPO) and various scholarships classified as "other social programs."

202 Grosh, Bussolo, and Freije, 2014

203 Ibid.



same period, the percentage of the labor force considered to be working in the informal sector<sup>204</sup> was reduced by three percentage points from 59.5 to 56.5 percent.<sup>205</sup> This progress may have been due to increased labor inspections as well as attempts to incorporate small enterprises through favorable tax treatment.<sup>206</sup> Efforts to increase voluntary pension contributions were only marginally successful.

## CHALLENGES

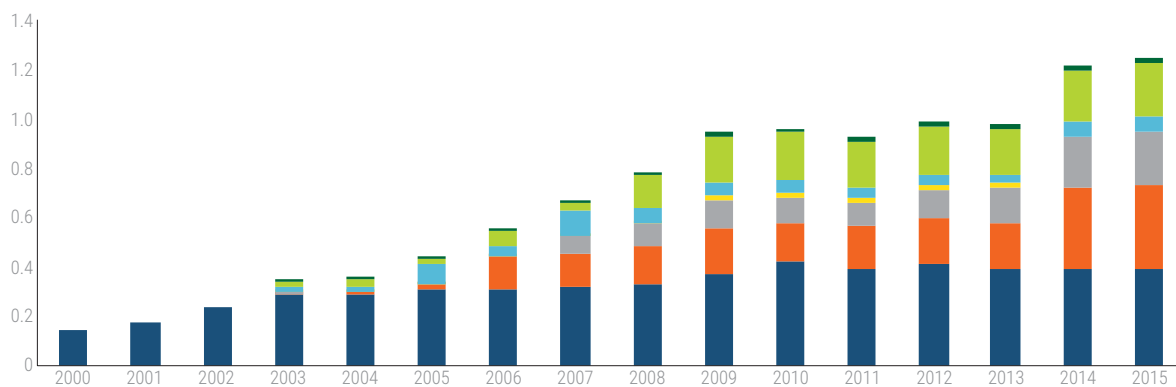
### Efficiency of Social Assistance System

215. While Mexico's flagship social assistance programs perform well overall, reaching the marginalized and the poorest remains a challenge. Flagship SA programs have significantly improved access to healthcare and education among poor households at a modest fiscal cost. Indeed, social programs were responsible for an estimated 63.3 percent of the net reduction in multidimensional poverty observed over the past decade.<sup>207</sup> At about 1.2 percent of GDP, Mexico's SA spending is similar to that of other countries in the region (Figure 47 and Figure 48), but relatively low both in absolute terms and compared to the OECD average of 2.2 percent of GDP.<sup>208</sup> Despite the effectiveness of SA programs, the territorial differences persist in multiple dimensions, hampering the economic and human capital development of marginalized regions. In 2016, about 40 percent of poor households (and 60 percent of extremely poor households) were located in just five states<sup>209</sup> which

reflects a broader disparity in development indicators and social service provision between northern and southern Mexico.<sup>210</sup> The disparities between indigenous and non-indigenous peoples are also extensive; in 2016, extreme poverty for indigenous populations was six times higher than for non-indigenous populations.<sup>211</sup> Even with PROSPERA's extensive and largely successful efforts to reach the indigenous population, more than half of the indigenous extreme poor are not covered by any of the three large scale programs.<sup>212</sup>

216. Despite the significant progress made over the past decades, multiple interventions by institutions at different levels of government, and by different institutions within each level of government, reduce the overall efficiency of the system. Mexico operates at least 5,491 social protection and social development programs at the federal, state, and local levels.<sup>213</sup> While steps were taken to consolidate social programs recently, especially at the federal level,<sup>214</sup> the proliferation of many small-scale programs persists. Inadequate coordination results in social spending inefficiencies, duplicative coverage and coverage gaps, a less equitable distribution of benefits, and weak transparency and accountability. The most recent assessment by CONEVAL identified 20 programs that were 100% similar with up to three other programs.<sup>215</sup> The fragmentation of social programs also creates unintended disincentives to work and save.<sup>216</sup> The government is currently developing an Integrated Social Information System (*Sistema Integrado de Información Social, SISI*),<sup>217</sup> which will consolidate data on potential and actual beneficiaries of social programs at all three levels of government.

Figure 47: Expenditures on Social Assistance Programs in Mexico as a Percentage of GDP, 2003-2015



Source: World Bank Atlas of Social Protection Indicators of Resilience and Equity

204 Please see Labor and Productivity Policy Notes for more details on informality.

205 Among Latin American countries, only Mexico and Ecuador did not reduce the share of workers in the informal sector between 1993 and 2013. See: OECD, 2016.

206 Kaplan, 2017.

207 World Bank, 2018

208 World Bank, 2016

209 Chiapas, State of Mexico, Oaxaca, Puebla, and Veracruz.

210 In 2016, the share of households lacking access to basic services was four times higher in the southeastern states (Chiapas, Guerrero, and Oaxaca) than in the northern border states (Baja California, Sonora, Chihuahua, Coahuila, Nuevo Leon, and Tamaulipas). Similarly, educational outcomes and access to social security are far lower in southern states than in northern states, while the incidence of food security was 1.5 times higher in the south.

211 As of 2016, with the exception of lack of access to health care services indicator, the difference between the indicators of social deprivations for indigenous peoples was at least 12 percentage points higher than for the non-indigenous group and, in some cases, much larger, such as the lack of basic household services. ENIGH (2016).

212 ENIGH (2016). The three large scale-programs that are covered in the survey are: PROSPERA, PAM, and PROCAMPO.

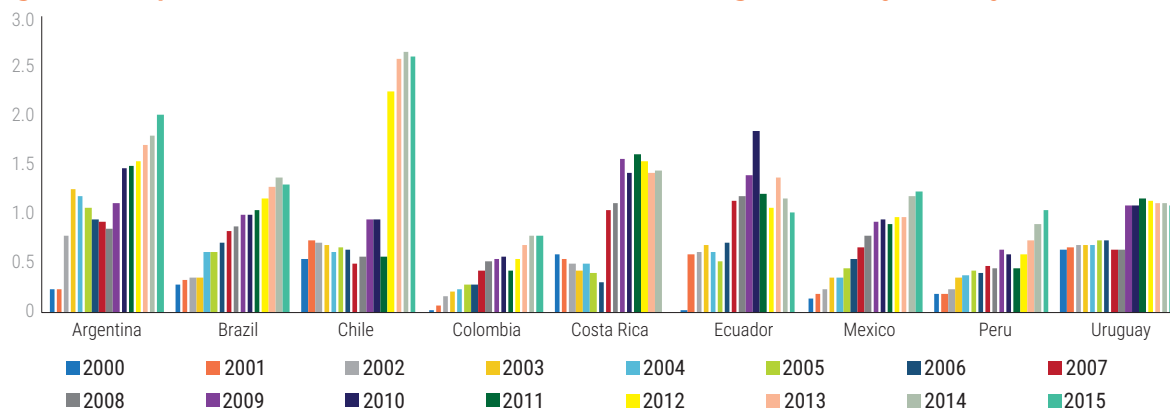
213 CONEVAL, 2017.

214 As of 2016, there are 152 social programs at federal level, a significant reduction from 2010 when 273 federal social programs were present.

215 [https://www.coneval.org.mx/Evaluacion/IEPSM/Documents/Consideraciones\\_para\\_el\\_proceso\\_presupuestario\\_2018.pdf](https://www.coneval.org.mx/Evaluacion/IEPSM/Documents/Consideraciones_para_el_proceso_presupuestario_2018.pdf)

216 World Bank, 2012.

217 The SISI will contain information on both potential and actual beneficiaries of social programs at all three levels of government.

**Figure 48: Expenditures on Social Assistance as a Percentage of GDP by Country, 2000-2015**

Source: World Bank Atlas of Social Protection Indicators of Resilience and Equity

## Expanding Access to Opportunities

217. **Early indications suggest that social assistance programs support a sustained increase in the human capital of the poor, nevertheless sustainably raising their income continues to be challenging.** There are early indications that these investments are paying off; children with exposure to PROGRESA- OPORTUNIDADES-PROSPERA exhibited better educational attainment, geographic mobility, labor-market outcomes, and household economic indicators in early adulthood.<sup>218</sup> However, despite steady expansion in coverage and evidence of protection against negative impact of shocks, most of the poor are still not able to get out of poverty. International experience indicates that social programs that provide complementary programs and services (i.e. Cash Plus) have a greater impact than cash transfers alone. These include promoting support for employment and income-generating opportunities along with greater access to social services and measures to promote overall wellbeing. In recent years a series of steps were taken towards this (e.g. establishment of programs aimed at improving beneficiaries' employment prospects and access to social services, linking beneficiaries with income generating activities and paid work etc.) but implementation so far has proven challenging.

218. **Active labor market programs are limited.** Between 2003 and 2013, Mexico spent less than 0.2 percent of its GDP on active labor-market programs, significantly less than Argentina, Brazil, Chile, Colombia, and Uruguay.<sup>219</sup> Most of the resources in the broader definition of active labor market programs goes to income-generation and productive programs. A significant share of these programs focuses on agricultural production, where they tend to benefit large agricultural producers with limited impact on poverty. There are some signs of increased access of the poor to these programs: for instance, the share of PROSPERA beneficiaries that participate in productivity and labor-inclusion programs is on the rise following its redesign in 2014. However, these programs remain limited,

and are neither targeted nor tailored to the needs of poor households; thus, are underutilized by the poor.

219. **Increasing labor participation and productive inclusion among poor households requires addressing household-level constraints.** For instance, the likelihood that vulnerable mothers will get a job increases if adequate childcare services are provided, and improving the employment prospects of mothers can have positive developmental implications for their children. In 2016, over half of the economically active population worked in the informal sector and lacked access to the childcare services offered to formal workers. While SEDESOL provides subsidized childcare to some working mothers, this program component has just 300,000 potential beneficiaries and does not explicitly target poor mothers.<sup>220</sup> Similarly, a large portion of the vulnerable youth is neither employed nor in education or training. However, most existing programs are fragmented and underfunded limiting their impact. Improving labor participation and productive inclusion among poor households will require a more comprehensive strategy with adequate funding.

## Social Security

220. **Lack of clarity in roles and lack of integration across SA and SI potentially contributes to incentive compatibility issues.** The lack of integration of contributory pensions and health insurance with the non-contributory programs has led to misallocation of scarce resources and poor targeting. For example, participating in a contributory pension program may disqualify an individual from participating in noncontributory pension programs. Receiving even a modest contributory pension benefit bars beneficiaries from obtaining a noncontributory pension—effectively imposing a 100 percent marginal tax on contributory pension income, which along with the eligibility conditions for *Seguro Popular* can encourage individuals to remain in the informal sector. Meanwhile, the lack of connectivity between beneficiary registries enable households to

218 Parker and Vogl 2017; Kugler and Rojas, 2018

219 World Bank Atlas of Social Protection Indicators of resilience and Equity (ASPIRE)

220 The labor market policy note provides a more detailed analysis of employment constraints and related interventions.

manipulate the system by having one household member enrolled in the contributory scheme, who obtains benefits for the entire household, while other household members collect benefits from the noncontributory schemes. The inability to identify overlapping benefits also applies to health insurance, reflecting a lack of coordination between state and federal social programs.<sup>221</sup> While the perverse incentives created by social programs may discourage formal employment,<sup>222</sup> the available evidence does not suggest that they are the primary cause of informality.<sup>223</sup>

**221. Disparities in the benefits packages offered by different SI schemes inhibit labor mobility.** Social insurance programs for formal workers are designed to address risks related to old age, ill health, disability, and survivorship.<sup>224</sup> Different schemes for public and private sector workers are offered by the national, state, and municipal governments, and there are separate pension schemes for employees in the oil, banking and utility sectors. The benefits offered by these schemes vary, and the prospect of shifting from a more-generous to a less-generous benefits package limits labor mobility.<sup>225</sup> Moreover, the lack of integration between contributory pension and health insurance programs and non-contributory programs contributes to the misallocation of scarce resources and undermines beneficiary targeting.

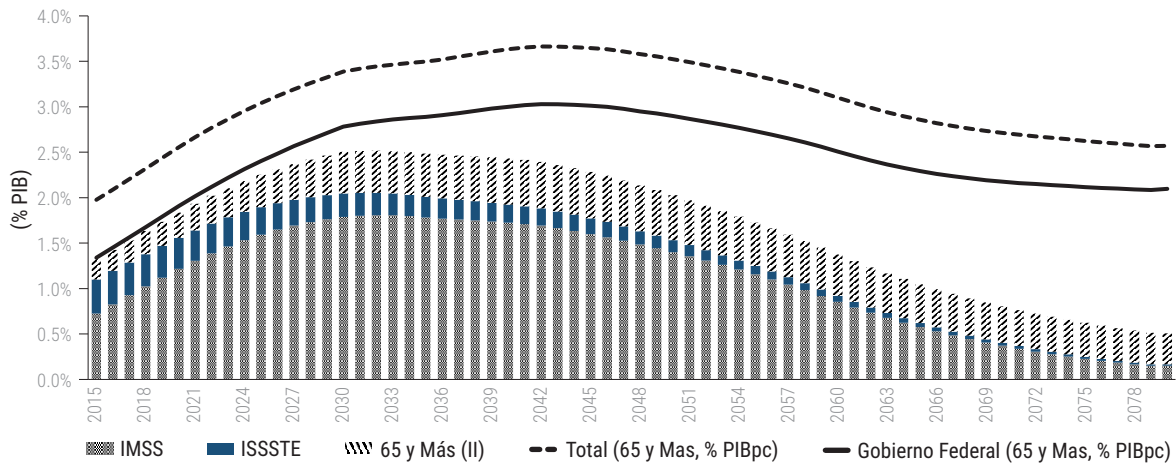
**222. Mexico's numerous social protection programs do not include unemployment insurance, and recent attempts to introduce unemployment insurance have been unsuccessful.** A draft law for an unemployment insurance scheme

that covers formal salaried employees combining an individual account with a solidarity fund was prepared but has not been approved by the Congress.<sup>226</sup> Lack of an unemployment insurance scheme combined with lengthy and costly dismissal procedures and high severance pay requirements diminishes incentives for formality.<sup>227</sup> Temporary payments to unemployed workers would buffer the impact of economic shocks at the household level and help stabilize aggregate spending during downturns in the business cycle.

**223. The aging of Mexico's population over the next two decades will intensify pressure on pension systems and health spending.** As fertility rates fall and life expectancy rises, the number of people over age 60 as a share of those ages 20-59 is projected to double from 18 percent to 37 percent between 2015 and 2040. Mexico's aging population will substantially increase spending on pensions and health-care. The 1997 pension reform introduced a privately managed, defined-contribution system to replace the defined-benefits scheme that covered workers in the formal private sector. While the reforms made the system more financially sustainable, liabilities inherited from the main defined-benefit system will not be cleared until the middle of the century.

**224. In the meantime, federal pension spending is projected to double as a share of GDP by 2030, and spending on state government pensions is also expected to increase rapidly in the coming decades.** The state and local government pension schemes are of particular concern since most have

**Figure 49: Projections of federal pension spending (% of GDP), 2015-2080**



221 These issues are discussed in detail in the health sector policy note.  
 222 Levy, S., 2008; Aterido et al., 2011; Azuara and Marinescu, 2013.  
 223 Please see Labor and Productivity Policy Notes for more details on informality and potential underlying drivers.  
 224 Unemployment insurance is not covered in Mexico.  
 225 This may contribute to the misallocation of labor across sectors limiting productivity. See Productivity Note for an exhaustive discussion on the low total factor productivity and underlying challenges.  
 226 The funding of the scheme was one of the main reasons for the lack of its approval, with the 3% contribution rate proposed to be drawn from the current 5% contribution that goes into *Infonavit*, a housing savings scheme.  
 227 The dismissal costs present a significant problem in the labor market, since virtually all dismissals end up being contested in labor courts, where processes may take 3 or more years. The parties to the dismissal argue on the payment of severance pay, forgone earnings and other compensations, while the dismissal cannot be declared effective until the court reaches a verdict. Even when the court reaches a positive verdict, a significant share of the workers does not receive any compensation. See Policy Notes on Rule of Law and Labor Market Policies.

not reformed and there are no estimates of current spending much less projections of future spending. Spending on the non-contributory pension program will increase as the population ages. In fact, if the non-contributory pension scheme maintains its value relative to the average income level and covers the entire elderly population that lacks a contributory scheme, pension spending would more than double in the next two decades.<sup>228</sup>

**225. Even as spending increases due to the legacy IMSS scheme, cohorts that entered the system after the 1997 reforms will see sharply lower pensions than those grandfathered in the reform.** The replacement rates for workers that have contributed to a pension scheme during most or all of their working-age years are projected to drop by as much as half compared to those that began working before 1997.<sup>229</sup> This trend reflects the relatively low contribution rate of the defined-contribution scheme – 6.5 percent compared to at least 10 percent in similar schemes in the region. Such a drastic decline in benefits would likely prove socially and politically difficult and may prompt policymakers to extend the guarantees of the defined-benefit scheme. Alternatively, there could be pressure to increase the non-contributory pension and allow workers with contributory pensions to receive them (as is the case today in Chile).

**226. An additional adequacy problem stems from low contribution densities, as many workers spent years outside the formal sector.** Most Mexican workers have, at one time or another, established an individual account with a pension-fund management company known as AFORES.<sup>230</sup> However, because the share of their working lives spent in the formal sector is directly related to their income levels, many low-income workers will reach retirement with balances that are too low to provide adequate pensions. At any given point in time, just over half of the labor force is not contributing to a pension scheme, and some workers have never contributed.

### *Infrastructure to Support a More Efficient Social Protection System*

**227. Key elements of the infrastructure required for an integrated social protection system are not yet in place.** Programmatic fragmentation and disconnected information systems hinder efforts to integrate and rationalize SA and SI programs both within and between levels of government. Without unique identification numbers, the authorities cannot cross-check beneficiary databases to correct errors and identify fraud. For instance, in the health sector, double enrollment in the IMSS and *Seguro Popular* health insurance systems results in an estimated US\$300 million dollars per year in fraudulent outlays.<sup>231</sup> In addition to reducing waste, the use of unique identification numbers

can facilitate the implementation of more coherent and sophisticated policies.

**228. Most middle-income countries, including all except Brazil in Latin America, have introduced a national, digital identification system, while Mexico still lacks one.** These systems generate unique numbers by using biometrics to ‘deduplicate’ the database, not allowing the same individual to be registered more than once. In a growing number of countries, the agency managing the identification system offers authentication services to government and even private sector entities. By checking the number against biometric or demographic information, fraudulent transactions such as ghost beneficiaries can be significantly reduced. On the other hand, Mexico has planned to introduce a unique identification number for over two decades, but this policy has yet to be implemented. The Unique Population Registry Code (*Clave Única de Registro de Población*, CURP), is not effective, and attempts to replace it with a biometrically verified identification number have proven unsuccessful. Despite improvements in the CURP registration system, there are more unique identification numbers than there are people in Mexico, indicating that many individuals hold multiple “unique” numbers.<sup>232</sup> In the absence of a reliable national identification system, major social programs spend tens of millions of dollars on their own discrete, noncompatible systems.

**229. A robust identification system that is used by all of the major government programs help also identify ineligible households by allowing public agencies to cross-check multiple administrative databases (e.g., property registries, tax records, etc.) to target beneficiaries and scale benefits progressively.**<sup>233</sup> Multiple programs can use the same targeting system, which reduces program costs. Connected databases can also be used to migrate beneficiaries from one program to another: for example, the ability to connect databases allowed Chile to phase out its noncontributory pension program much more smoothly than Mexico. Chile’s experience also illustrates how linked databases using unique identification numbers can improve transparency: by inputting their identification numbers into a government website, Chilean households can view all the benefits that they receive, while public agencies can view a mirror image showing which programs are serving the same households. Strict rules regarding data protection and data sharing ensure that households’ personal information is protected. Availability of high quality administrative data was key in the success of the Chilean system, while the quality of existing administrative data remains a challenge in Mexico, with issues of incomplete and inconsistent data and lack of regular quality and internal consistency checks.

<sup>228</sup> World Bank, 2015.

<sup>229</sup> Inter-American Development Bank, forthcoming.

<sup>230</sup> Administradoras de Fondos para el Retiro. Please see Financial Sector Policy Note for the challenges faced by pension fund management companies.

<sup>231</sup> World Bank, 2017.

<sup>232</sup> There are an estimated 180 million CURPs issued for a population of around 130 million people.

<sup>233</sup> For instance, in Turkey, the unique ID allows the government to use 28 databases (e.g. property, taxes, etc.) to differentiate between those that need a full subsidy and those that can afford to pay part of the health insurance premium.

## POLICY OPTIONS

### *Improving the Efficiency in Social Assistance System and Reaching the Marginalized and Poorest*

230. **Operationalize SISI, which will be an important tool for identifying inefficiencies, with a proper legal framework to ensure its use and sustainability.** Improving the well-being of poor households require integrated support provided by multiple agencies at different levels of government. Adopting modern management tools would enhance planning and facilitate coordination and reduce inefficiencies. To this end, operationalizing the SISI will be crucial to identify duplications and reducing fragmentation, and it will allow for a deeper analysis of the overall distribution of spending on social programs at various levels. To avoid risks that could jeopardize the SISI's successful implementation and consolidation, its governing legal framework needs to be reformed, establishing SISI as the information system for all social programs and mandate its use in management of such programs.

231. **Identify duplications, coverage gaps, and opportunities for consolidation/harmonization to inform the redesign for a more efficient and coherent SA system.** An in-depth assessment of social assistance system from different perspectives, including identifying duplications, gaps, opportunities for consolidation/harmonization (e.g. use of a harmonized targeting system across programs, combination of small programs with similar objectives and/or target population etc.), as well as the institutional coordination aspects, will be a key first step towards improving efficiency and enhancing the coherence of the SA system. The availability of critical information from SISI – such as social development indicators, employment status, coverage of existing programs, and regional, demographic and household-level characteristics for actual and potential beneficiaries, will facilitate such analysis. While the evidence is an important element, redesigning the SA system may prove politically complex, given the federal structure in Mexico, and the limited coordination and articulation of social programs across different levels of Government. The recent reform of the welfare system in the UK, consolidating and simplifying almost all programs into one single scheme (Universal Credit), indicates that such reform/redesign is feasible, if strong political will exists, and the reforms are carefully planned, communicated in advance, and implemented.

232. **Explore ways to expand reach of social assistance system to poorest and most marginalized, including through more dynamic targeting.** Social assistance programs can be a critical entry point for other services. The monetary transfers may remove the income barrier, while co-responsibilities or some programs further facilitate/encourage access to other services. A robust targeting mechanism, is key for

the social assistance programs. While flagship social assistance programs are progressive in Mexico, the difficulty in reaching the poorest and most marginalized could be alleviated by moving towards more dynamic targeting systems. In Mexico, demand based open applications do not exist (i.e. applications to programs are not accepted continuously) and recertification happens very infrequently (e.g. 8 years for PROSPERA). Thus, a poor household who was not present during the new application/recertification process will not be protected and will have to wait until the next application period many years in the future. Introducing more frequent recertification, and moving towards an open demand-based application, through changes in the operational rules/regulations would allow for improving the inclusion of the poor, and exclusion of the no-longer poor in a more dynamic manner. In fact, the social assistance programs in most of Europe, as well as most OECD countries, have open demand-based applications, with yearly or biyearly recertification.

233. **Other instruments, such as better targeted FAIS<sup>234</sup> could help narrow the gap in access to social services across regions and groups, particularly access to basic services.** While FAIS is not an SP tool per se, it has the potential to increase territorial equity in access to basic services, especially given the oversight role SEDESOL has on its planning and targeting of FAIS. FAIS is a US\$3.5 billion decentralized fund allocated to subnational governments. It aims to close the social infrastructure gap and improve social development indicators. FAIS support is particularly important to small and poor municipalities, and it represents an average of 47 percent of the budget of municipalities classified as “very highly marginalized.” An improved allocation criteria and enhanced performance management system for municipalities and institutional capacity-building at different levels of government could enhance the impact on this mechanism.

### *Strengthening and Expanding Access to Social and Economic Opportunities for the Poor*

234. **Consolidate programs, eliminating poor performing ones and designing programs that are better adapted to poor with adequate funding.** First and foremost, the design of productive inclusion programs needs to consider the poor and vulnerable. For instance, targeted outreach efforts could raise awareness of the available programs and provide information on the application process and any potential implications for participating in other social programs. Preliminary indications from linking PROSPERA beneficiaries to productive-inclusion programs and social services suggest the lack of adequate capacity/funding was a binding constraint. An evaluation of the implementation and impact of this experience could yield important lessons. In addition, the programs need to address the main constraints faced by the poor. For instance, poor

234 Fondo de Aportaciones para la Infraestructura Social.



youth are more likely to drop out without finishing high school. This has important scarring effects for their labor market outcomes and lifetime earnings. This high share of drop outs, as well as high rates of inactivity in this group indicate that greater effort is required to ensure school completion and to facilitate the school- to-work transition to improve employment outcomes and boost income levels. The international evidence indicates that programs need to be designed in close collaboration with the private sector to ensure that they provide access to income-generating activities or wage employment by developing the specific skills demanded by firms. In addition, making national employment services more responsive to the needs of poor households—for example, by training front-office workers and counselors on techniques for working with poor and vulnerable applicants—would enhance the impact of productive-inclusion programs. Indeed, evidence from European Union suggests that well-targeted internship and training programs which reflect the need of employers have positive employment effects,<sup>235</sup> especially if combined with effective referrals/intermediation.<sup>236</sup> Given the very limited resources devoted to these programs, ensuring adequate funding will be critical to expand access to productive opportunities.

**235. Explore a social-intermediation approach for high priority areas and marginalized communities.** Social-intermediation services are a form of case management: they provide information and psychosocial support based on a set of results/goals and mutual responsibilities defined for each household according to its specific circumstances. The international experience indicates that combining cash transfers with social services (e.g., healthcare, counseling, and productive inclusion) tailored to the specific needs of households have a greater impact than cash alone. Multiple countries in Latin America and the Caribbean have implemented social-intermediation services, notably Chile and Colombia, as have various European countries. In Mexico, the States of San Luis Potosí and Guanajuato have already implemented a social-intermediation approach with the robust support of their state governments with mixed results. In addition, PROSPERA designed and implemented a pilot program (*Acompañamiento Familiar*) in Guerrero State, with support from the World Bank. These experiences underscore the importance of political ownership in implementing and sustaining this approach and highlight potential challenges related to cross-sectoral management as well as gaps in supply of services. While implementing the social-intermediation approach nationwide at scale will neither be fiscally feasible nor necessary, the targeted deployment of this approach in high-priority areas, to address the challenges of most marginalized communities, could maximize the value of limited resources.

**236. Address important gaps, such as early childhood development, potentially through social intermediation and use**

**of technology.** A combined life-cycle approach to social intermediation services could ensure that all members of the poor households are linked to essential services, most of which would be provided by local governments. For example, parents of young children need access to appropriate health, nutrition, and parenting information—some of which is provided by PROSPERA—as well as information and access to early childhood development programs. Access to appropriate child development/stimulation programs within the first 1,000 days of life is especially vital for children from poor and vulnerable households, as by age 3 the effects of socioeconomic disparities are already evident. In Mexico, spending on early childhood development programs is low and not necessarily targeted to the areas that are most in need. Moreover, only half of the 1.5 million children that comprise CONEVAL's target population are enrolled in early childhood development programs. Similarly working age adults need to be better informed about and linked to employment support as well as and livelihoods programs. Innovative technological approaches can help address supply-side gaps, especially in remote areas. For example, Mexico's high degree of cellphone penetration would enable the authorities to deliver program information directly to beneficiaries via text message.

### *Providing a Sustainable, Equitable and an Integrated Social Insurance System for a Rapidly Aging Population*

**237. Gradually integrate the main contributory pension schemes.** Many OECD countries are consolidating their pension schemes, and most now include civil servants and private sector workers in the same scheme. This major policy shift reflects both the need to increase labor mobility and the lack of justification for disparities between pension systems. Consolidation may also lower administrative costs by leveraging economies of scale.

**238. Ensure portability with minimal transaction costs across pension schemes.** Even when schemes are not fully consolidated, portable pension benefits can enable workers to move between the public and private sectors without losing pension wealth in a way that discourages efficient labor mobility. This applies not only to IMSS, ISSSTE, as well as schemes covering workers in public sector banks, PEMEX and even state governments.

**239. Integrate contributory and non-contributory systems and applying better targeting.** Currently, the receipt of a contributory pension essentially disqualifies an individual from receiving the non-contributory pension. This effectively places a tax on contributions, encouraging people (along with other benefits such as *Seguro Popular*) to remain in the informal sector. The incentive problems may become more significant to the extent that the non-contributory benefit is increased in the future. It is also not clear that everyone

<sup>235</sup> European Commission (2015)

<sup>236</sup> Blundell et al. (2013), Graversen and van Ours (2008)

that is not receiving a contributory pension should qualify to receive the non-contributory pension as it is meant as an anti-poverty pension. A better approach would apply an affluence test based on household income and then apply a partial offset for contributory pension income as is done in Chile. This potentially reduces fiscal costs while improving incentives for formalization.

**240. Consider alternative ways of financing social insurance premia, especially for workers with low wages.** The tax wedge in Mexico is among the largest in Latin America (see Annex figure 2) contributing to the various incentives in the Mexican labor market that encourage informality. As pointed out by Levy (2018) the combination of the introduction of non-contributory pensions and health along with the increased tax wedge (from both income taxes and social insurance taxes) add to other distortions that encourage informality. The shift away from payroll tax financing has already taken place in some countries (e.g., Uruguay, Colombia) with a positive impact on formal employment.<sup>237</sup>

**241. Over the medium term, and if the fiscal envelope allows it, introduce unemployment insurance that combine a solidarity fund with individual accounts to foster risk-pooling while limiting moral hazard.** The design will need to be complemented by search requirements as well as complementary services to facilitate quick re-employment (e.g. reporting on search efforts periodically, participating in the designated training or placement programs etc.). The financing of the scheme can partly be obtained through unbundling of some services that are covered under the current payroll tax (e.g. housing), as proposed previously, but will need to be carefully communicated to ensure buy-in. Having a well-designed unemployment benefit system will reduce reliance on severance pay as income support (which, unlike unemployment benefits puts financial the burden on individual firms), and will enable a reform of severance pay at the same time. Furthermore, having a carefully designed unemployment benefit system in place will allow income-smoothing for unemployment risk at the household level and will also serve as an automatic stabilizer for aggregate economic shocks. The financial cost of the scheme will need to be considered within the overall fiscal framework and the priorities, while factoring in its multitude benefits.

**242. Reform the existing defined-benefit schemes, including the legacy IMSS scheme to improve both the fiscal sustainability and equity of the pension system.** Currently, Mexico's various pension schemes provide highly disparate benefits to different workers, particularly those in the public or quasi-public sector.<sup>238</sup> Retirement ages should be gradually equalized across these schemes and incentives for early retirement eliminated. Retirement ages should be linked to changes in life expectancy going forward includ-

ing for the legacy IMSS scheme. A gradual convergence of new entrants into the reformed system, perhaps with supplementary occupational schemes would facilitate portability and take advantage of economies of scale in administration. While there is little information available regarding state and local plans, it is likely that they would require a number of parametric reforms ranging from longer career averaging periods for the calculation of the initial DB pension to automatic inflation indexation. Finally, the tax treatment of pension income should be reviewed and special exemptions that benefit high income individuals restricted.

**243. Consider raising contribution rates for the defined-contribution scheme to the levels originally planned.** It is well known that the defined contribution scheme will not provide adequate pensions to most workers, even those with fairly good histories of consistent contributions. However, increasing contribution rates from the current level of 6.5 percent to about 10 percent which is close to both the original target level and the levels of comparable countries combined with the aforementioned increase in retirement age, could mitigate the impending decline for future cohorts.

**244. Continue the implementation of ongoing initiatives to reduce informality.** Evidence from other countries such as Brazil, Colombia, and Costa Rica suggest that a combination of incentives and enforcement can increase the coverage of self-employed workers.

**245. If benefits of non-contributory pension are increased, they should include applying an affluence test to better target resources in fiscally sustainable way.** Non-contributory pension benefits in Mexico are indeed low relative to those of non-contributory schemes in comparable countries. This will create pressure to supplement low pensions. At the same time, limited fiscal resources should be focused on the elderly poor. Projections that assume constant benefit levels relative to per capita income indicate that spending will already triple from 0.2 to 0.7 percent of GDP over the next 20 years. Raising the benefit levels without parallel measures is not sustainable. Costs could be reduced by applying an affluence test (as in the Chilean case which limits benefits to households in the lowest 60 percent of the population. Raising the benefit level will likely prove necessary to prevent a large increase in poverty rates among the growing elderly population.

### *Building the Infrastructure to Support a More Sophisticated Social Protection System*

**246. Establish a unique, digital identification number for all Mexican citizens.** This will be essential to upgrade the social protection system. A digital identification system

<sup>237</sup> See Anton (2014).

<sup>238</sup> World Bank (2016): Análisis del Sistema de Pensiones: Parte 2: Portabilidad e Integración de Sistemas de Pensiones Contributivos y no Contributivos: Recomendaciones de Política, Diseño e Implementación



would allow for accurate and timely verification of beneficiaries. It would also allow the government to compare individual and household data from different databases. Augmented by an interoperability framework and secure data-sharing protocols, a national digital identification system could enhance targeting, reduce fraud and duplication, and enable the implementation of more sophisticated social policies.

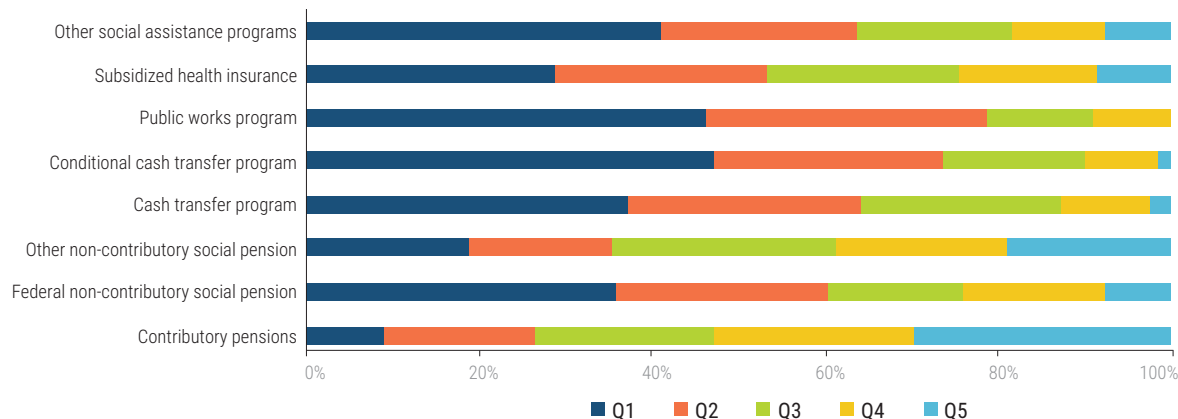
**247. Link administrative databases to enhance the efficiency and impact of social protection programs.** Many comparable countries have built integrated identification systems that link dozens of major databases (e.g., tax, property, auto registration, financial assets, etc.) In Chile and Turkey, creating this type of system required multiple years and a strong political commitment to breaking down barriers between institutions. The social information system in Turkey was key to reducing the time and cost of providing

social assistance services at the local level. It reduced the processing of a large number of paper documents and the time spent on the applications by guaranteeing the availability of information from other institutions. Also, through the use of this system 10% of social assistance benefits were identified to be duplicates.

**248. Invest in improving the quality of existing administrative data.** Consistent efforts to improve data quality contributed to the success of the linkages of administrative databases in many countries. Ensuring consistency in the use of identification classifiers and use of metadata standards, would alleviate the issues of incompleteness and missing classifiers. In addition, introducing quality controls, which imply cleaning of existing but messy data; and undertaking internal quality checks when the existing data is not consistent internally or/or with other databases will further improve the quality of administrative data.

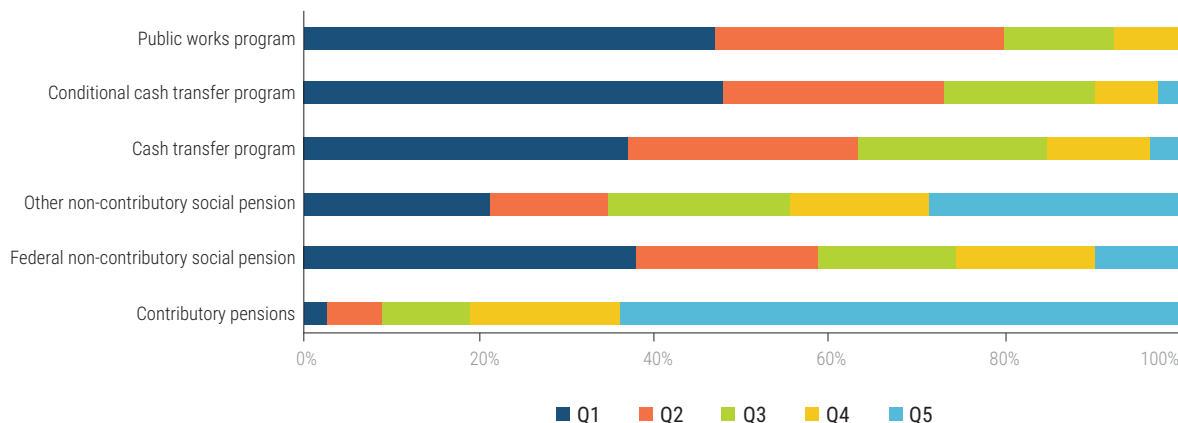
# ANNEX- FIGURES

**Figure A1a: Distribution of beneficiaries by income quintiles, 2014**



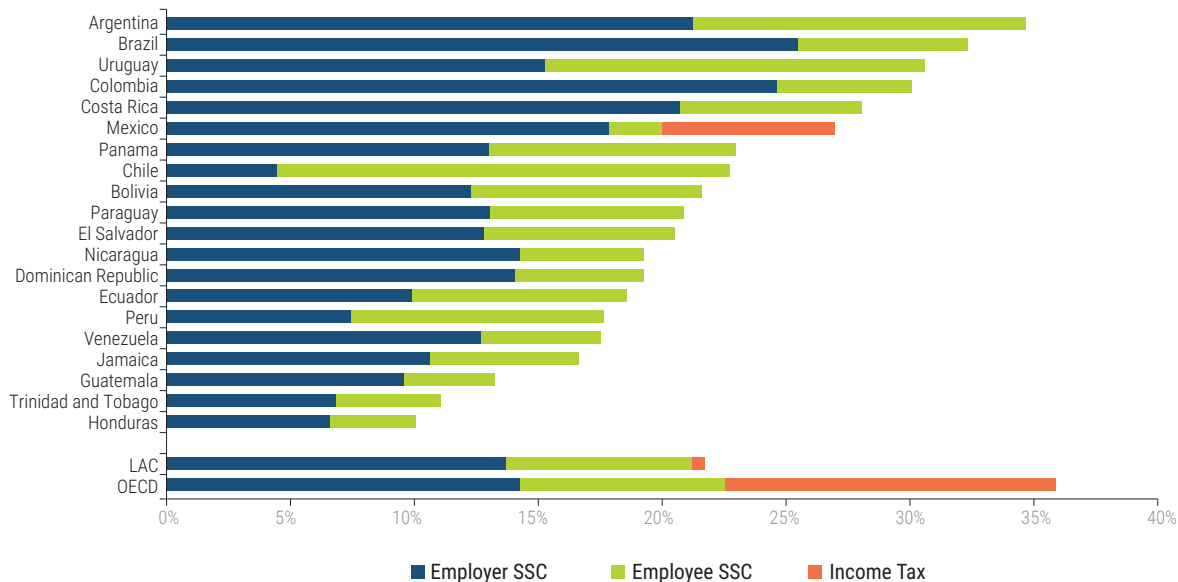
Source: World Bank staff calculations based on ENIGH 2014 and using ADePT

**Figure A1b: Distribution of benefits by income quintiles, 2014**



Source: World Bank staff calculations based on ENIGH 2014 and using ADePT

**Figure A2: The 'tax wedge' in Latin America**



Source: OECD

**Table A1. Main parameters of the different federal pension schemes.**

Year of the reform	IMSS	ISSSTE	PEMEX	Federal Social Pension Program
	1997	2007	No reform	Implemented at the national level since 2013
Coverage	Private sector workers	Federal government workers and some workers of the state governments	PEMEX workers	Elderly without a contributory pension
Retirement age	65	60 (in 2018)	55	65
Required weeks of contribution to qualify for pension	1250 weeks	15 years of service	25 years of service	None
Contribution rate	5.15% (Employer), 1.125% (Employee), 0.225% (Government)	5.175% (Employer-Government Agency), 1.125% (Employee), 0.225% (social contribution)	No contribution	No contribution
Replacement rate	From 75% of the average of the base salary of the latest 5 years with 60 years of age to 100% of the average of the base salary of the latest 5 years contributed with 65 years of age.	From 50% with 15 years of work to 95% with 29 years of work.	From 80% of the average base salary over the last additional year of work, plus 4% for each additional year of work after 25 years of work, until reaching 100% as maximum.	\$580 pesos per month
Minimum pension guaranteed	24 years of service	15 years of service	Not applicable	Not applicable

\*State-level Information not available.

Social contribution of the federal government (IMSS) to each worker's pension fund, based on the range of minimum wages earned by the worker up to 15 minimum wages: 7 minimum wage; 1.01 to 4 minimum wages; 4.01 to 7 minimum wages; 7.91 to 10 minimum wages; 10.01 to 15 minimum wages.

## References

- Antón, A., F. Hernández and S. Levy (2012), "The End of Informality in Mexico? Fiscal Reform for Universal Social Insurance", Inter-American Development Bank.
- Antón, A., F. Hernández (2011), "Financing Universal Social Insurance in Mexico." mimeo.
- Avila-Parra, C., Escamilla-Guerrero, D. 2017. "What are the Effects of Expanding a Social Pension Program on Extreme Poverty and Labor Supply? Evidence from Mexico's Pension Program for the Elderly." Wprld Bank Policy Research Papers No: 8229. World Bank, Washington, DC
- Blundell R., M. Costa Dias, C. Meghir, and J. Van Reenen. 2004. Evaluating the Employment Impact of a Mandatory Job Search Program. *Journal of the European Economic Association* vol. 2, issue 4, 569- 606.
- CONEVAL. (2017). "Informe de Evaluacion de la Politica de Desarrollo Social 2016." Federal District: Government of Mexico
- CONEVAL. (2014). "Indicadores de acceso y uso efectivo de los servicios de salud de afiliados al Seguro Popular." Federal District: Government of Mexico
- Edmonds, E. V. (2006). "Child Labor and Schooling Responses to Anticipated Income in South Africa," *Journal of Development Economics* 81, No. 2, pp. 386-414.
- European Commission (EC). (2015). European Employment Policy Observatory Review. Upskilling Unemployed Adults: The Organization, Profiling and Targeting of Training Provision.
- Fernald L., Gertler P., Neufeld L. (2009). "The 10-year Effect of *Oportunidades*, Mexico's Conditional Cash Transfer Programme, on Child Growth, Cognition, Language, and Behaviour: a Longitudinal Follow-Up Study."
- Gertler, P. (2004). Do Conditional Cash Transfers Improve Child Health? "Evidence from PROGRESA's Control Randomized Experiment." *American Economic Review*, 94(2): 336-341.
- Graversen, B. K. and J. van Ours (2008) "How to help unemployed find jobs quickly: Experimental evidence from a mandatory activation program" *Journal of Public Economics*, 2008, vol. 92, issue 10-11, 2020-2035.
- Grosh, M., del Ninno, C., Tesliuc, E., Ouerghi, A. (2008). "For Protection and Promotion: The Design and Implementation of Effective Safety Nets." Washington, DC: World Bank.
- INEGI. (2017). "Resultados de la Encuesta Nacional de Ocupacion y Empleo, Cuarto Trimestre de 2016." Boletín de Prensa No. 66/17. Aguascalientes, Mexico.
- Inter-American Development Bank (forthcoming), "Pension Trends in LAC and Path for Reform". Kaplan, D. (2017), "La evolución de empleo registrado con IMSS", presentation at the Inter-American Development Bank.
- Levy (2018). Under-Rewarded efforts: The elusive quest for prosperity in Mexico, Inter-American Development Bank.
- Levy, S., (2008), Good Intentions, Bad Outcomes: Social Policy, Informality and Economic Growth in Mexico, Brookings Institution Press
- OECD (2016), "Taxing Wages in Latin America and the Caribbean."
- Rodriguez-Castelan, C. 2017. The Effects of Mexico's Social Infrastructure Fund (FAIS) on Regional Development." Mimeo.
- Schulz, P. (2004). "School Subsidies for the Poor: Evaluating the Mexican *Progresá* Poverty Program." *Journal of Development Economics*, Volume 74, Issue 1, pp. 199-250.
- Silva-Mendez, J. 2017. "Mexico's Social Infrastructure Fund: Characteristics and Relevant International Experience." Mimeo.
- World Bank (2012). "The World Bank 2012-2022 Social Protection Strategy: Resilience, Equity, and Opportunity."
- World Bank (2015). "Análisis Cuantitativo del Sistema de Pensiones" informe del Banco Mundial para el Ministerio de Hacienda, 2015.
- World Bank (2016a). "Mexico Public Expenditure Review." Washington, DC: The World Bank. <https://openknowledge.worldbank.org/handle/10986/25062>
- World Bank (2016b). "Mexico: Análisis del Sistema de Pensiones, Parte 1 – Análisis Cuantitativo." Washington, DC. World Bank.
- World Bank (2017). "Identity Management Systems Analysis: Mexico." Washington, DC: The World Bank
- World Bank (2018). "Mexico Systematic Country Diagnostic" Washington, DC: The World Bank



# 10. Fostering Resilient, Productive and Low-Carbon Rural Territories

**N**atural resources are an important contributor to Mexico's output and a major component of its national wealth. However, unsustainable exploitation and increasingly severe climatic events are rapidly depleting the country's natural capital. Mexico faces the challenge of conserving and sustainably managing its forests while also meeting a growing demand for timber products. Public programs and investments in multiple sectors could be aligned to reduce deforestation, forest degradation, and other natural resource deterioration, while at the same time generating economic opportunities, including for the rural poor. Mexico's agricultural sector has performed below potential, particularly in some areas of the country in which land fragmentation and subsistence agriculture prevails. Addressing specific logistics and facilitation infrastructure (including storage) gaps, reducing market (price) information asymmetries, improving intermediaries' competition in captured markets, and reducing other market access constraints to smallholder farmers and small-scale forestry enterprises could bolster productivity and incomes in lagging regions.

## CONTEXT AND REFORM PROGRESS

249. Mexico's natural resources—which include agricultural land, forests, fisheries, water, and coastal areas—are an important contributor to GDP and a major source of employment. In 2014, natural capital represented 13.2 percent of the country's national wealth.<sup>239</sup> Key resources include cropland, pastureland, and subsoil assets, which together comprise nearly 80 percent of Mexico's natural capital (Table 1). Mexico's diverse geography, abundant natural resources, generally favorable climate, and geographic proximity to large and dynamic markets drive the growth of its agricultural sector. Crop and livestock production employs about 13.5 percent of Mexico's labor force. Mexico also has 88 million hectares of forest, which cover almost 45 percent of its territory. Forested areas are home to about 12 million people, many of whom depend directly on natural resources for their livelihoods.

250. In addition to their direct economic value, natural resources provide critical ecosystem services. Healthy ecosystems regulate the hydrological regime and improve water quality, control coastal erosion, and provide habitats for a wide range of species. Mexico is among the world's most biodiverse countries and contains an estimated 10 percent of global biodiversity.

251. However, a combination of unsustainable exploitation and the intensifying effects of climate change are straining Mexico's natural resources. Unchecked agricultural expansion, overgrazing, water pollution, poorly managed coastal development, and illegal logging contribute to an ongoing process of deforestation<sup>240</sup> and land degradation<sup>241</sup> that is diminishing Mexico's natural capital. Soil erosion affects almost half of the national territory, and 38 percent of Mexico's rivers are considered highly polluted. Integrated management and planning of rural territories can conserve natural resources and build economic and

ecological resilience to the impact of climate change while also sustainably increasing the productivity of natural capital and enhancing its contribution to income generation and employment.

252. Mexico has become a leader in the global climate agenda. The country has taken important steps to support a resilient and low-carbon growth path, via policy and institutional reforms. Cross-sectoral instruments include the National Development Plan, the National Climate Change Strategy, the National REDD+ Strategy, and Mexico's National Strategy on Biodiversity. Mexico introduced a Climate Change Policy in 2012 to support the transition to a competitive, sustainable and low carbon economy, reduce vulnerability of the population and ecosystems, and assign competencies within government. Internationally, the country committed to reducing greenhouse gas (GHG) emissions by up to 22 percent by 2030 in its National Determined Contribution (NDC). In fact, Mexico was the first developing country to pledge its NDC. Under the Bonn challenge, the country pledged to restore over eight million hectares of degraded land by 2020. Despite these important steps, much remains to be done to realize the country's ambitions to move toward a productive, resilient and low carbon development path, for which the agriculture, forest and other land uses sector (AFOLU) is expected to be an important contributor.

253. One of the main achievements in terms of natural resource protection, but particularly in building social capital, comes from community incentive programs to improve forest management, established by the government in the 1990s. These programs cover a comprehensive range of activities on forest lands related to social organization, capacity building, land-use planning, sustainable forest management and protection, as well as the extraction, processing, and marketing of forest goods and services. A key example is the Payment for Environmental Services (PES) program, the largest such program in Latin

**Table 1: National Wealth Estimates, Mexico and Upper-Middle-Income Country Average**

Per Capital Total Wealth	Mexico	Average for Upper-Middle-Income Countries	Per Capital Total Natural Capital	Mexico	Average for Upper-Middle-Income Countries
(2014 US\$)	110,471	112,798	(2014 US Dollars)	14,629	18,960
Share by subsector	%	%	Share by subsector	%	%
Produced Capital	36.1	25.3	Forests	14.8	9.1
Natural Capital	13.2	16.8	Protected Areas	6.9	8.6
Human Capital	53.7	58.3	Crop and Pastureland	38.7	47.4
Net Foreign Assets	-3.1	-0.4	Subsoil Assets	39.6	34.9

Source: The Changing Wealth of Nations 2018; World Bank.

239 National wealth includes produced capital, natural capital, human capital, and net foreign assets. It complements GDP and other macroeconomic indicators by measuring changes in a country's underlying asset base.

240 The General Law on Sustainable Forest Management defines deforestation as the complete or partial removal of vegetation from forest lands for non-forestry purposes.

241 The General Law on Climate Change defines degradation as the reduction in the carbon content of natural vegetation, ecosystems, and soils caused by human activity. Forest degradation includes both the reduced capacity of forest ecosystems to provide environmental services and damage to their productive capacity.



America, which, since 2003, has spearheaded the application of economic instruments for forest conservation and the promotion of sustainable forest management practices.

**254. The development of community forestry in Mexico can be attributed to the system of collective land ownership and sound community governance structures: this system is unique in terms of its scope and impact on local communities, in which an estimated 61 percent of Mexico's 66 million hectares of temperate and tropical forests belong to agrarian communities.** Many of these forests have greater potential for timber production than the national average. Despite the productive potential of communally-owned forests and the successful experiences in community forest management to date, most forest dwellers continue to live in conditions of great marginalization and poverty, and few agrarian forest communities invest in their forests or engage in sustainable and profitable forest management over the long term. While forest management can become a significant source of income and employment for forest dwellers, public policies on forest management must be maintained and strengthened, and efforts must be made to promote access to finance and involve the private sector.

## CHALLENGES

### *Natural resource degradation and vulnerability to climate change in Mexico's rural territories*

**255. Although deforestation and forest-degradation rates have declined in recent years, the clearing of forested land for agriculture and cattle ranching continues to be a challenge.** A 2015 Forest Resource Assessment found that forest cover has declined by 5.4 percent since 1990, reflecting more than 3.7 million hectares lost during this 15-year period.<sup>242</sup> Deforestation rates vary, but are highest in tropical dry forests and tropical rainforests. High poverty rates and limited economic alternatives in forested areas incentivize activities that generate short-term returns, leading to the unsustainable exploitation of forest resources. The low marginal productivity of many agricultural and forest activities encourages farmers and ranchers to expand crop and pastureland rather than intensifying production. Unsustainable logging, fuel-wood collection, forest fires, and pests and diseases further damage and degrade Mexico's forests, and deforestation is a significant cause of GHG emissions.

**256. Agriculture and cattle ranching are among Mexico's largest sources of GHG emissions.** Agriculture and cattle ranching are also the third-fastest-growing sector in terms of emissions generation, after the automotive and mining

industries. As part of its NDC under the Paris Climate Accord, Mexico committed to reducing emissions from the agriculture and livestock sector by 22 to 36 percent relative to baseline projections between 2020 and 2030.

**257. Block pricing for water and low water tariffs promote the misuse of limited water resources.** While this problem is not unique to agriculture, given that approximately 78 percent of Mexico's water use is for agriculture, ensuring efficient water use by the sector is critical. The expansion of agriculture and agribusiness activities in the north of the country has created especially severe environmental pressures; concentrated economic activity and increased population density have led to overexploitation of land and water resources and the degradation of local ecosystems. Nationwide, approximately 80 percent of Mexico's agricultural land exhibits some level of degradation due to overgrazing, excessive pesticide use, and/or improper water management.

**258. The agricultural sector not only contributes to climate change, it is also highly vulnerable to its effects.** Projections to year 2050 indicate that climate change could reduce Mexico's agricultural output significantly. The scenarios suggest reductions in potential maize production of between 12 and 27 percent. In northern Mexico, farmers are exposed to a range of extreme weather events, such as drought and frost.<sup>243</sup> In southern states such as Guerrero, Chiapas, and Oaxaca, farmers face climate-related risks such as floods and pest infestations. Nationwide, approximately 76 percent of Mexico's total cultivated area is rainfed, which leaves production highly sensitive to changes in rainfall and temperature. Addressing the short- and long-term risks posed by climate change will require substantial investments in both adaptation and mitigation.

### *The Unexploited Potential of the Forestry Sector*

**259. Mexico faces the challenge of conserving and sustainably managing its forests while also meeting a growing demand for timber products, which currently exceeds production by a factor of three.** In 2006, 80 percent of the volume of timber production came from communally owned forests.<sup>244</sup> Over the last two decades, community-based forest enterprises (CFEs) have flourished in Mexico. However, while Mexico has the capacity to more than double its current production of standing timber, the rising number of CFEs has not yet been matched by a commensurate increase in timber production. Instead, legal timber production fell from 9.4 million cubic meters in 2000 to 5.9 million in 2012, even as domestic demand for timber increased. This trend is due in part to the failure of sectoral incentives to balance conservation and economic objectives. In 2015, almost 1,500 harvesting permits<sup>245</sup> were granted, but harvesting only occurred in 46 percent of the

242 Mexico has between 66 and 88 million hectares of forest, depending on the definition used.

243 A drought in 2011 cost corn farmers an estimated US\$645 million and bean farmers US\$430 million.

244 Merino Pérez et al., 2014.

245 Based on an analysis of the SEMARNAT series on the extent of authorized production and the volume of real production.

Figure 51: Agriculture: Productivity Performance

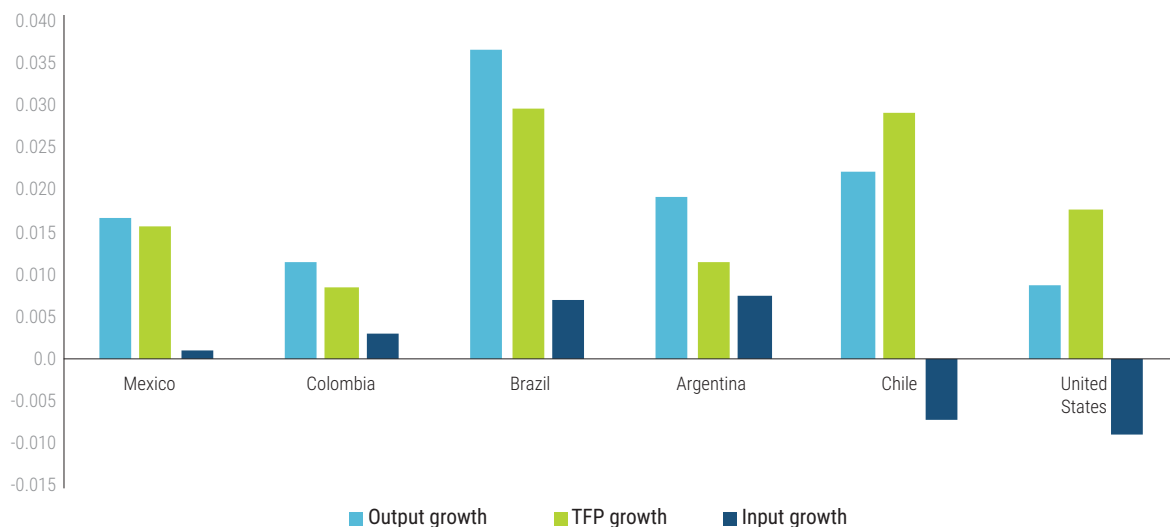
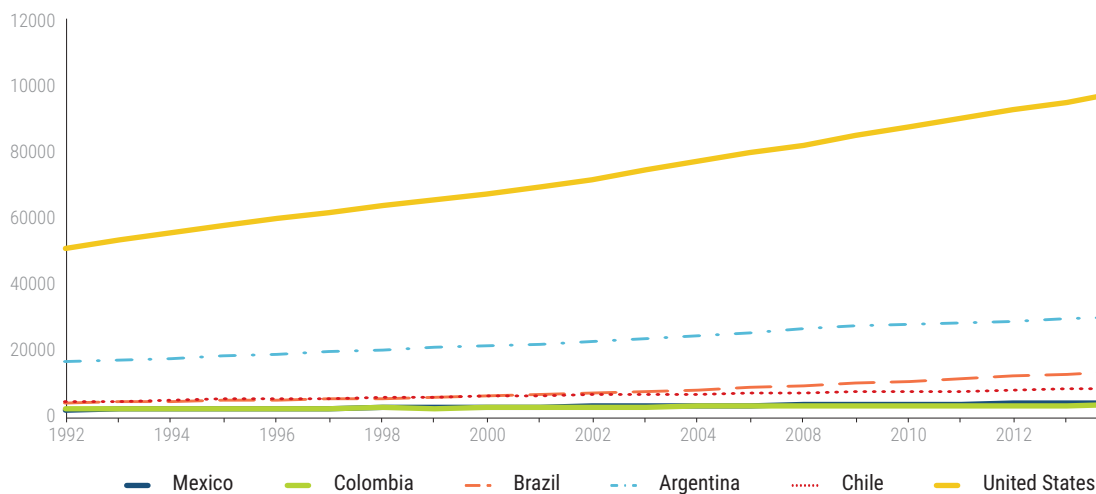


Figure 1 (b) Labor Productivity, Output per worker (2004-2006 USD\$/worker)



Source: Calculations based on data from USDA ERS - International Agricultural Productivity.

approved area. A recent study<sup>246</sup> revealed that the most accessible forested areas could produce 60 million cubic meters of round-wood, while the priority areas identified by the National Forestry Commission (*Comisión Nacional Forestal*, CONAFOR)—including major watersheds and the states of Campeche and Quintana Roo—could produce up to 16 million cubic meters. Even with lower projections, the benefits of improving forest production are significant. For example, if the 2018 national forest production goal of 11 million cubic meters of round- wood per year is met and annual forest productivity is increased from 1 to 3 percent, it is expected that the number of formal jobs generated in the forestry sector by 2025 could be on average 21,216 per year.

260. **The challenge of meeting timber demand is further hampered by CFE’s limited capacity.** Access to finance is one of the main challenges facing CFEs, in which their long-term competitiveness can only be assured through

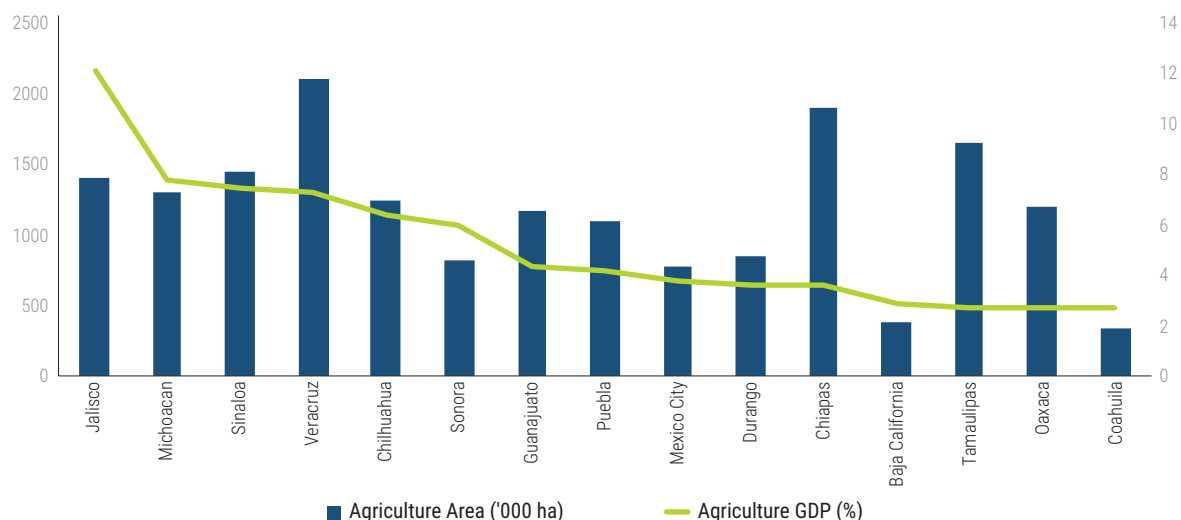
strong capital injection. Currently there is also little private sector investment in timber product value chains. Other CFE capacity constraints include challenges in managing forests and in processing to add value; lack of technical, administrative, management, and innovative capacities; limited market access; lack of access to basic communications for the purposes of marketing; and limited access to key information on market prices for timber and real timber production costs. CFEs need to have better access to finance and a closer partnership with the private sector if they are to better access Mexico’s timber production market.

### Ensuring a Robust and Sustained Agriculture Growth Pattern

261. Mexico’s agricultural sector has performed below expectations; improving the sector’s productivity can increase its contributions to inclusive economic development. Total

246 IMCO and World Bank (forthcoming).

**Figure 52: Agriculture Land (thousands of hectares) and Contribution to Total Agricultural Output (%) by State**



Source: SAGARPA/SIAP (2017) and INEGI (2016). Data for year 2015.

factor productivity (TFP) has been a source of agricultural growth in Mexico, but a decomposition of output growth suggests that the gains in productivity have been smaller compared to other countries (Figure 51(a)). Technological change in countries like Chile and Brazil is happening faster, as reflected in more efficient use of inputs in the production process. Furthermore, labor productivity is very low in Mexico, in which the output generated per worker in Chile is 1.8 times higher than in Mexico, and the respective figures for Brazil and Argentina are 3.0 and 6.4 times higher than in Mexico (Figure 51(b))

**262. Addressing disparities in agricultural performance between states and regions could benefit thousands of poor and vulnerable households.** In 2015, five northern and central states—Jalisco, Michoacán, Sinaloa, Chihuahua, and Sonora—contributed 50 percent to agricultural output, even though Mexico's southern states are home to the largest share of agricultural producers and have an important share of Mexico's agriculture land (e.g., Chiapas and Oaxaca states) (Figure 52). Moreover, regional disparities in agricultural production are widening over time: between 2004 and 2010, primary agricultural output grew by 2.5 percent in the north, 1.3 percent in the center, and just 0.1 percent in the south. In 2015, Jalisco's agricultural sector comprised 6 percent of the state's economic output and 8.5 percent of employment, and contributed 12 percent to Mexico's total agricultural production. By contrast, among southern states agriculture provides a far larger share of employment, but contributes much less to economic output. In Oaxaca, agriculture accounts for 32 percent of employment but just 6 percent of economic output. In Chiapas, despite having 1.9 million hectares of agriculture land, the sector contributes just 3.7 percent to Mexico's total agriculture economic output (Figure 52).

**263. Geographical and biophysical differences contribute to regional performance gaps, however, structural and technological factors play a major role in determining agricultural productivity and competitiveness across regions.** The northern and central states have the largest share of high-value crops and high-yielding, irrigated commercial production, while agricultural sectors in southern states tend to rely on less-productive, smaller-scale operations using traditional cultivation techniques. Important disparities in agricultural performance both between and within regions and across the production scale reduce average yields. Nationwide, the average corn yield is about 3 metric tons per hectare, less than half the US average of 8 metric tons. Studies have estimated that technological improvements implemented across less than half of Mexico's corn-producing area could boost agricultural output by 8 percent and spur a 2 percent increase in the growth of related industries such as animal feed. Irrigation is especially crucial, as the average corn yield on irrigated land is 8 tons per hectare, compared to just 2.3 tons on rainfed land.<sup>247</sup>

**264. Land fragmentation is a challenge to agricultural development.** About 73 percent of plots are smaller than 5 hectares, many of which are worked by semi-subsistence farming households employing traditional, rainfed production practices, especially in the central and southern parts of the country. The small size of plots prevents the formation of economies of scale, except in cases where effective farmer organizations are in place. Low marginal productivity also impedes financial access. Households farming small plots in remote or isolated areas face additional productivity and competitiveness challenges. A recent study suggests that the land reforms of the *ejido* system in 1992, which created opportunities for complete property rights (*Dominio Pleno*) have limited impacts in

terms of growth of agriculture added value, in the absence of comprehensive complementary agricultural and rural development programs.<sup>248</sup>

**265. Logistical and value chain constraints result in inefficiencies, and limit innovation and market inclusion.** Mexico faces wide logistical constraints due to the country's high dependency on road transportation (which is costly, with poor road conditions and insecurity adding to costs), poor connectivity between production nodes and consumer markets, lengthy cross border times, and limited quality storage infrastructure.<sup>249</sup> Furthermore, although the agriculture and food system in Mexico has transformed rapidly, it is still at a mixed stage of development. For example, while this system has modern characteristics, consolidated in segments such as supermarkets and other modern retail and wholesale markets, and characterized by growing innovation and some levels of "dis-intermediation" (supermarkets buying directly from processors, or urban wholesalers buying directly from farmers), it is also largely traditional and fragmented, with high levels of intermediation, little value addition and high inefficiencies. These inefficiencies can be significant, in which food losses and waste in Mexico have been estimated at 20.4 million tons annually, with 70 percent of these losses occurring from production to distribution.<sup>250</sup> Achieving higher efficiencies in the way off-farm components of the food system are carried out (processing, packaging, logistics, etc.) is critical to improve outcomes for farmers and other value chain actors, as well as for consumers.<sup>251</sup>

## POLICY OPTIONS

### *Aligning Productive and Environmental Objectives to support Growth, Conservation, and Resilience*<sup>252</sup>

**266. Align policies and programs around productive and conservation objectives to address threats to Mexico's natural capital.** Public programs and investments in multiple sectors could be aligned to reduce deforestation, forest degradation, and other natural resource deterioration, while at the same time generate improved livelihood opportunities. An effective low-carbon rural development strategy will require an unprecedented degree of policy and institutional coordination, particularly at the local level and between stakeholders in the agricultural and forestry sectors. The government has already introduced pol-

icies and programs designed to support sustainable agriculture and forestry development under the leadership of CONAFOR and the Secretariat of Agriculture, Livestock, Rural Development, Fisheries, and Food (*Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación*, SAGARPA). In December 2016, SAGARPA, and the Secretariat of Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales*, SEMARNAT) signed an agreement to collaboratively promote sustainable rural development and address climate change. In the short term, the government can strengthen cross-sector coordination by establishing a set of common policy orientations, such as mainstreaming zero-deforestation approaches into agricultural support programs and sectoral development planning.<sup>253</sup> Preparing a joint workplan could help coordinate environmental and agricultural policies and maintain focus on priority areas. In the medium-to-long term, launching joint programs with shared goals and budgets could more effectively leverage public resources, and establishing joint mechanisms to prioritize and design public investments at the national and regional levels could maximize the impact of the investment budget. At the institutional level, further efforts will be necessary to coordinate and leverage climate finance through the creation of the Climate Change Fund (*Fondo para el Cambio Climático*, FCC).<sup>254</sup> Performing sectoral environmental assessments of current programs and policies could also help identify entry points to foster sustainable program and policy outcomes.

**267. Enhance capacities for spatial territorial planning, management and monitoring.** Mexico has recently taken important steps towards strengthening its policy and institutional framework to support territorial development, including the restructuring of the Ministry of Agrarian and Urban Development (*Secretaría de Desarrollo Agrario, Territorial y Urbano*, SEDATU)<sup>255</sup> and issuing of the general law on territorial development,<sup>256</sup> which recognizes the relevance of anchoring territorial planning and management strategies in cross-sectoral, as well as regional and local, priorities. The new law is expected to address regional unbalances, bring both urban and rural perspectives into territorial planning, as well as climate risks management approaches and environmental dimensions. A new National Strategy on Territorial Development will be developed, with a long-term perspective. In the short-term, however, there are important areas of capacity strengthening that can enhance emerging efforts to promote integrated territorial planning and management, as discussed below.

248 Property Rights Reform in Mexico: Impact on agricultural, rural, and structural transformations. Alain de Janvry, Elisabeth Sadoulet, Marco Gonzalez-Navarro, Kyle Emerick (TU), Eduardo Montoya, Matthew Pecenco, Daley Kutzman (NWU). Presentation at the Annual World Bank Conference on Land and Poverty, March 2018.

249 Mexico has low storage capacity (4 million m<sup>3</sup>) compared to Brazil (5.7 million m<sup>3</sup>) and Japan (34 million m<sup>3</sup>). Also, the available cold storage infrastructure is significantly more expensive (e.g., for tomato) in relation to its competitors.

250 Pérdidas y desperdicios de alimentos en México. Banco Mundial, 2017.

251 Some reports estimate that consumers in Mexico could pay up to 86 percent higher prices resulting from high levels of intermediation.

252 The World Bank has recently approved two operations to support resilient, productive and low-carbon environments.

253 Cross-sector coordination should also entail the inclusion of environmental considerations and conditions into large agricultural support programs managed by SAGARPA, such as integrating eligibility criteria into the operating rules for agricultural activities to prevent the expansion of the agricultural frontier to the detriment of the forests.

254 The FCC was created by the General Climate Change Law, Chapter VII, Articles 80–86.

255 SEDATU's mandate is the planning, coordination, administration, generation and execution of public policies for territorial ordinance, provide access to decent dwellings, urban and rural development and granting legal certainty to agrarian populations, seeking to improve Mexicans' quality of life, prevent human settlements in risk areas and assist in case of natural phenomena for immediate attention. <https://www.gob.mx/sedatu/que-hacemos/> Last access: January 21st, 2018.

256 La Ley General de Asentamientos Humanos, Ordenamiento Territorial y Desarrollo Urbano, Nov 28, 2016.

**268. Continue enhancing capacities for integrated environmental monitoring.** Since the 1990s, Mexico has created numerous national parks and protected areas. While this is an effective approach to conservation, national parks and protected areas require sustained budgetary outlays. Mexico has made significant progress in establishing an integrated environmental monitoring system for protected areas and compiling biodiversity and forest inventories.<sup>257</sup> In addition, the National Institute of Ecology and Climate Change (*Instituto Nacional de Ecología y Cambio Climático*, INECC) and CONAFOR periodically conduct national assessments of GHG emissions. The government could enhance its environmental oversight framework by refining the carbon-monitoring methodology used by the national monitoring, reporting, and verification system for land use, land-use change and forestry, and by further integrating monitoring systems at the territorial level.

**269. Enhance interinstitutional data-sharing mechanisms to enable authorities to more effectively coordinate policies and programs.** SEMARNAT's environmental monitoring systems could be linked with SAGARPA's food and fisheries information service, as well as the information systems used by CONAFOR, SEDATU, state and municipal governments, local authorities, and community leaders to support coordinated environmental planning and management. These data-sharing mechanisms could be designed to support planning processes at the national, regional, and local levels, and they could integrate ecological analyses, including assessments of land-use suitability and climate risks.

**270. Validate and scale-up approaches to improve local territorial governance, planning and management.** The Sustainable Production Systems and Biodiversity Project implemented by the Commission for Knowledge and Use of Biodiversity (*Comisión Nacional para el Conocimiento y Uso de la Biodiversidad*, CONABIO) and the Biodiversity in Productive Forests and Certified Markets Project implemented by CONAFOR attempt to link productive investments with environmental outcomes. However, initiatives that would take these efforts to scale and frame them within the context of integrated territorial management are relatively new in Mexico. Two recently approved World Bank operations will help mainstream, to a territorial level, the approaches applied in earlier projects, however, close monitoring and evaluation will be necessary to continuously identify lessons and incorporate them during the implementation of these operations.

**271. Promote climate-smart technologies and adopt proven strategies for addressing climate challenges to bolster resilience of producers in the agriculture and forestry sectors.** SAGARPA is advancing the country's ambitious climate goals through, inter alia, a program to modernize

irrigation, incentives for renewable energy investment, efforts to promote the production of organic and mineral-based fertilizers, and credit guarantees to support green investments. The impact of these efforts should be assessed to identify and scale up effective interventions. Further measures could support the development of enhanced seed varieties and build an enabling environment for climate-smart investment. Adopting integrated pest-management strategies, using price-correction mechanisms to discourage the misuse of water and land, and creating contests, auctions, challenge funds and other programs to support innovative climate-smart solutions could enhance the efficiency of resource use. Plans to reduce emissions in specific sectors as part of the NDC represents an opportunity to identify and prioritize high-impact mitigation opportunities, sustainable practices, technologies, and investments. With respect to the cattle ranching subsector, GHG emission reductions could be generated by adopting climate-smart systems and practices, such as silvopastoral production systems, fodder reserves/banks, supplemental feeding, and improved pasture management and animal husbandry, all of which also contribute to improved productivity and enterprise resilience. The private sector can play a pivotal role in supporting the shift toward more sustainable investment by adopting environmental-compensation approaches, signing zero-deforestation agreements, launching reforestation programs, and supporting the development and testing of climate-smart technologies. Market mechanisms can also be leveraged

**272. to reduce water scarcity.** The authorities could adopt a pricing and marketing system for wholesale water resources (*aguas nacionales*) that reflects regional and temporal changes in water levels, aligning the cost of water resources with their relative scarcity. The government could also strengthen mechanisms for resolving water conflicts. Policymakers should discourage the incipient shift in commercial agriculture toward the south of the country, where water is still plentiful, by removing subsidies and potentially imposing taxes. Investment incentives should be used to encourage water preservation, collection, treatment and reuse schemes.

**273. Engage vulnerable groups in efforts to halt deforestation and forest degradation and implement integrated territorial management.** Historically, rural households without formal land titles have had very little input into decision-making processes regarding forest management and productive activities, even when these activities were critical to their livelihoods. Efforts to include vulnerable groups should draw on lessons learned from international and national experience, including those fostering financial inclusion and supporting transparent mechanisms for resource allocation. Special attention should be devoted to the specific obstacles that inhibit women's participation in natural resource management.

<sup>257</sup> The information system includes the Monitoring of Ecosystem Diversity in Natural Protected Areas of Mexico System (SAR-MOD), the Wide Coverage System for Monitoring Diversity (SAC-MOD); and the National Forest and Soil Inventory (INFyS), among others.



## Supporting Productivity and Competitiveness of Agriculture/ Forestry Sectors and Sustainable Employment

**274. Enhance the effectiveness of current support to agriculture, forestry, and other productive resource-based sectors, by focusing on building long-term productivity and competitiveness.** The country has relied heavily on its comparative advantages to develop its agriculture and forestry sectors, particularly around its natural capital endowments and geographical location; further gains will come from improving productivity and strengthening its competitiveness position. On the supply side, accelerating the adoption of new technologies could sustain productivity growth in the primary sector and reduce vulnerability to environmental hazards and economic shocks.

**275. Enhance the competitive position of Mexico's agri-food and forest products via logistical improvements.** Empirical evidence highlights the relevance of investments in the transport network on improved market access and local employment and specialization.<sup>258</sup> In Mexico, despite important investments in road infrastructure, bottlenecks remain particularly in hinterland connections to primary domestic markets and ports. Investments in port and road infrastructure need to be maintained and enhanced. There is also a need for continued investments in enhancing cold chain and storage infrastructure. Furthermore, system investments supporting user-friendly price and climate information can contribute to improving the ability of producers, and private and public entities to make decisions and can be an effective means to reduce market power of intermediaries and increase competition. Supporting the development of market access and linkages programs, as well as general programs aimed at enhancing producers and other key supply chain actors capacities in the post-farmgate segments, can contribute to improve supply chain efficiencies, generate value addition and improve competition. Strengthening phytosanitary and sanitary capacity could also further expand export opportunities, while mainstreaming risk-based inspection approaches could help address key food-safety issues in the domestic market.

**276. Increase effectiveness of public support to the agricultural sector.** Rising concerns have emerged on the effectiveness of public support for the agricultural sector, which is seen as regressive and disproportionately benefiting large-scale producers, especially programs that provide direct payments based on cultivated land area or the size of livestock herds. While direct payments to farmers have fallen in recent years,<sup>259</sup> they continue to comprise about 80 percent of producer support. Large-scale "market support" subsidies appear to privilege northern states

and relatively large, well-off producers. A thorough analysis of agricultural support programs could provide a sound basis for reform. International experience suggests that support to agriculture innovation and expanding access to services and input markets by enhancing the roles of the public and private sectors, drives technological uptake and improve productivity and competitiveness.

**277. Address specific constraints to the competitiveness of smallholder farmers and small-scale forestry enterprises to bolster productivity and enhance market integration.** SAGARPA's and CONAFOR's extension systems should be maintained and strengthened by collaborating with national and international institutions that have proven effective in promoting rural development and building human capital among agricultural, forestry and related service workers.<sup>260</sup> In addition, further efforts to facilitate financial inclusion, including for green investments, and mainstream innovative public-private partnership models to facilitate access to markets and technical services, such as the "productive alliance approach" could expand commercial opportunities for smallholder farmers, ejidos and rural entrepreneurs. Farming and forestry workers with limited scope for commercialization may benefit from an approach that integrates productivity support with health and nutrition, education, and social-protection programs. For transitional producers with greater commercial potential, productivity improvements should be complemented by efforts to strengthen market linkages, provide technical assistance, facilitate credit access, and develop entrepreneurial and administrative skills. Smallholder farmers and small forestry enterprises require capital to grow, and they need access to a supportive private sector to diversify and integrate into larger value chains. Private-sector partnerships with entrepreneurs and community-based forestry enterprises are especially vital to the sustainable exploitation, processing, and marketing of timber and non-timber forest products. While Mexico's timber-processing sector is growing, there is still considerable scope for improvements in quality and efficiency. For farmers and forestry producers that are already well integrated into markets, creating an enabling business environment could help improve productivity and enhance competitiveness.

**278. Strengthen links between rural social and economic programs to enhance opportunity for rural workers.** Integrating the information systems used by SAGARPA, CONAFOR, SEDATU, and Mexico's major health, education and social protection programs could enhance inter-institutional collaboration. Establishing a comprehensive system to monitor the delivery of support to rural communities and track its effectiveness could yield important information on beneficiary targeting and programmatic design.

<sup>258</sup> Roads and the Geography of Economic Activities in Mexico. Policy Research Working Paper 8226. World Bank, October 2017.

<sup>259</sup> Direct producer support fell from an average of 29 percent of agricultural spending between 1993 and 2004 to an average of 10 percent between 2014 and 2016, well below the OECD average (OECD, 2017).

<sup>260</sup> For example, the International Maize and Wheat Improvement Center (CIMMYT) implements the highly successful Sustainable Modernization of Traditional Agriculture program with the support of SAGARPA and MASAGRO.







# 11. Sustainably Managing Scarce Water Resources

**M**exico's water resources are diminishing, pollution levels are rising, competition between users is intensifying, and inefficiency in the use of water in the agricultural and other sectors is significant. Rising global temperatures and shifting precipitation patterns are already affecting the country's hydrological cycles, and the increasing strain on the country's scarce water resources is leading to the overexploitation of groundwater and productivity losses. Water security and access is a critical priority. In this context, strengthening water management will require modernizing the current policy and institutional framework. A more efficient allocation and better valuation of water resources could also ease stress on hydrological systems, attenuate conflicts among water users, and reduce the risk of shortages. Improving coverage and quality of water and sanitation services will require addressing regional and rural-urban disparities, improving infrastructure and finding efficiencies, including in the investment planning and execution process. Investment would also be needed for the construction and rehabilitation of key projects (e.g., dams, canals, pumping stations). Some options to achieve efficiencies and better use the fiscal space of the sector include: (i) introducing multi-year budget for CONAGUA (with a long-term planning that transcends political cycles) and other investments in the sector; (iii) establishing a pool/pipeline of priority projects at the national and subnational government levels; (ii) revisiting water pricing to improve service efficiency, manage sustainably water resources and reduce fiscal burdens from subsidies; (iv) formulating a water-infrastructure and resilience strategy within the budget process of the sector, and (v) adopting innovative financing strategies and instruments (including expanding the use of Public-Private Partnerships (PPPs) beyond water supply and wastewater) and developing performance-based management contracts for Water Supply and Sanitation (WSS) services. Additionally, an assessment of governance and accountability measures in the sector is needed to identify gaps and overlapping competencies.

## CONTEXT AND REFORM PROGRESS OF THE SECTOR

**279. Improving WSS quality is critical to achieving Mexico's Sustainable Development Goals (SDGs).** As of 2015, drinking water and sanitation coverage reached 92.5 percent<sup>261</sup> and 91.4 percent<sup>262</sup> of Mexico's population, respectively. However, almost 9 million people still lack access to drinking water, and 11 million lack access to sewerage, most of whom are in poorer states such as Guerrero, Chiapas, and Oaxaca. Approximately only 57 percent of the collected wastewater is treated, technical and nontechnical losses consume 30-50 percent of the water in the distribution networks, and very few WSS utilities achieve cost recovery. Moreover, millions of households continue to receive WSS services that do not meet SDG standards for safety and service quality.

**280. Rapid urbanization, robust economic and population growth, and suboptimal resource management are putting increasing stress on Mexico's water resources.** Meanwhile, the inefficient use of water resources is compounding the impact of overexploitation and water pollution. Mexico's northern-central region encompasses 32 percent of the country's water resources but is home to 77 percent of the population and contributes 79 percent to its GDP. By contrast, the south-southeastern region encompasses 68 percent of Mexico's water resources, but is home to only 33 percent of its population and contributes to 21 percent to GDP. The regional disparities between water availability and GDP contributions of northern and southern areas of Mexico are exacerbated by copious water resources: they cannot be considered as suitable as supplies of water for the country's rural population, mostly in the poor south, because of their levels of pollution<sup>263</sup>. Urban areas have taken precedence in higher investments due to their political and economic power, whereas rural areas have lower economies of scale due to scattered populations. As Mexico's population has grown, water availability per capita has fallen sharply, dropping from 18,035 m<sup>3</sup> per year in 1950 to 3,392 m<sup>3</sup> per year in 2015. The National Water Commission (*Comisión Nacional del Agua*, CONAGUA) projects that water resources per capita will reach 3,250 m<sup>3</sup> by 2030.<sup>264</sup> More than 35 million Mexicans have limited access

to water or receive low-quality water services. More than 100 of the country's 731 watersheds face severe shortages, and the number of overexploited aquifers more than tripled from 32 of 653 in 1975 to 115 in 2016. Groundwater provides more than 65 percent of all water used by Mexican cities.

**281. Water use in the agricultural sector<sup>265</sup> is highly inefficient, and agricultural runoff increasingly pollutes freshwater lakes and rivers.** Mexico's agricultural sector accounts for 77 percent of total water use, but its efficiency rate is just 40 percent<sup>266</sup>. In 2016, agriculture contributed with 4.1 percent to GDP. The government subsidizes water and electricity for agricultural production, both of which contribute to inefficient water use. The implicit electricity subsidy provided to Mexican farmers for pumping groundwater has been estimated at about US\$1 billion per year.<sup>267</sup> In addition, approximately 50 percent of the wastewater discharged into the rivers comes from the agricultural sector, primarily nonpoint pollution sources<sup>268</sup>. Mexico has approximately 6.5 million hectares of irrigated land, and the federal government plans to expand irrigation to another

**282. 1.5 million hectares at a cost of almost US\$5 billion over the next 10 years.**<sup>269</sup> Nevertheless, there are still positive initiatives in terms of strengthening new dam-safety norms, which have recently been formulated, and risk assessments of several dams are currently underway for better resilience and bulk distribution of water. In addition, the government has recently introduced policies to promote more efficient irrigation through irrigation-management transfer programs, but these programs remain limited to a few locations.

**283. Inefficient water management imposes large economic costs.** The decline in water resources represents 28 percent of the total economic cost of natural-resource depletion, or twice the cost of deforestation.<sup>270</sup> In 2015, the cost of declining water resources and the degradation of water quality represented half of a percentage point of GDP. Moreover, while the pace of deforestation and fossil-fuel extraction appear to be slowing, water depletion accelerated by 0.7 percent per year between 2003 and 2015.<sup>271</sup>

261 Drinking-water access rates range from 95.7 percent in urban areas to 81.6 percent in rural areas.

262 Sanitation access rates range from 96.6 percent in urban areas to 74.2 in rural areas.

263 Shretha, S., Anal, K., Salam, A., & van der Valk, M. (2015). *Managing Water Resources under Climate Uncertainty: Examples from Asia, Europe, Latin America, and Australia*. New York, NY: Springer.

264 CONAGUA, 2016. "Numeragua Mexico." Secretaría de Medio Ambiente y Recursos Naturales and Comisión Nacional del Agua.

265 The agricultural sector in the country consumes around 70 percent of available water in the country.

266 From the total amount consumed by the agricultural sector in the country, only 40 percent is actually used for irrigation. The remaining 60 percent is lost to evapotranspiration, surface runoff (whereby water ends up in the drain) and water losses of the water distribution network used for irrigated croplands. Water efficiency for irrigation is calculated through conveyance efficiency (which represents the efficiency of water transport, canals, distribution networks), and field application efficiency (which represents the amount of water actually used in irrigated land).

267 In Mexico, electricity prices for the agricultural sector remain well below cost. See: OECD, 2017. "Mexico's efforts to phase out and rationalize its fossil-fuel subsidies." These subsidies also respond to political support to the agricultural sector and its organization committees that is creating faster depletion and unsustainable use of resources, as excess demand for irrigation is encouraged by the subsidy to electricity used for groundwater pumping, and where farmer groups pay less than 1/5 of the cost of generating and distributing electricity for pumping water.

268 Of all non-municipal wastewater, 29.9 m<sup>3</sup>/s, or 15.8 percent of the total, are treated. 63.52 m<sup>3</sup>/s of non-municipal wastewater comes from sugar refineries and are used to irrigate sugarcane fields (See: *Water Resources in Mexico: Scarcity, Degradation, Stress, Conflicts, Management, and Policy*, second edition 2014, Springer).

269 Mexico ranks 19th worldwide in water-storage capacity, with 150 km<sup>3</sup> of stored water and 667 big dams. Mexico ranks 6th in total irrigated area, with 6.9 million hectares under irrigation. Cutting-edge irrigation technologies in the north and rain-fed solutions in the south can make viable expanding farming irrigated land, along with higher reuse and conversion from treated wastewater, given the limited replenishment and endowment of surface and underground water in the country. See: CONAGUA, 2016.

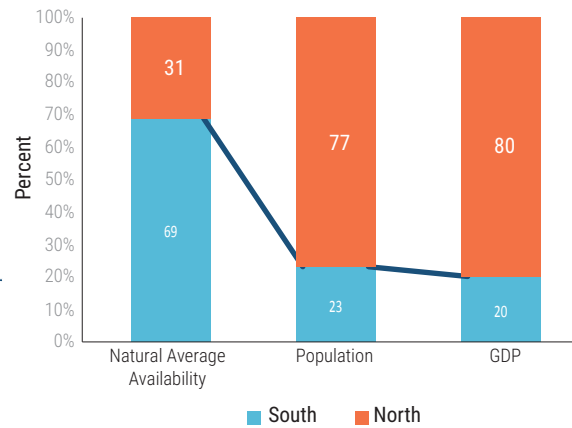
270 Instituto Nacional de Geografía e Informática (INEGI) (2016) *Cuentas Económicas y Ecológicas de México*.

271 In addition, Mexico's 2016 water accounts show that the annual depletion of groundwater cost an estimated at 27.9 billion pesos in 2015, while the cost of untreated wastewater was 57.4 billion pesos.

Figure 53: Water Use in Mexico



Source: CONAGUA, 2010



## KEY CHALLENGES

**284. Despite significant reforms, policy challenges remain ahead.** For instance, incomplete legal and institutional reforms weaken the efficiency of water-sector management. Legislation in 1993 and 2004 embraced integrated water-resources management as critical to sustainable development. However, administrative and regulatory challenges prevent the government from fully operationalizing this principle. CONAGUA is responsible for regulating water resources, and for developing, operating, and overseeing hydraulic infrastructure and other water-sector investments. However, CONAGUA's broad mandate reduces the efficiency of its regulatory functions and its regulatory autonomy since it is responsible for the management of water resources, for service provision (bulk water) and the construction and operation of large water infrastructure. Moreover, legal instruments such as the Financial System for Water (*Sistema Financiero del Agua*), which was proposed in the 2004 Water Law<sup>272</sup>, have not been implemented, and most operators and water users' associations continue to depend on unpredictable, sometimes poorly targeted federal investment programs and subsidies, which represent 50 percent of total investment in the water sector.

**285. Limited access to water services is a major contributor to nonmonetary poverty.** In 2016, the monetary poverty rate was 36 percent (representing 44 million people living below the poverty line), and the extreme monetary poverty rate was 7.6 percent (representing 9.4 million people).<sup>273</sup> Under the government's new multidimensional poverty-estimation methodology, the share of the population with inadequate access to basic public services—including water and sanitation—is

**286. 19.3 percent, greater than the share with low levels of educational attainment (17.4 percent), very poor housing quality (12.0 percent), or inadequate access to basic health services (15.5 percent).** Other multidimensional poverty estimates<sup>274</sup> indicate that water supply and sanitation account for 10 percent of nonmonetary poverty in rural areas, comparable to the impact of education (12.5 percent).

**287. Climate change is increasing the frequency and intensity of weather-related extreme events and changing precipitation patterns, with a disproportionate impact on the most vulnerable households.** Weather-related disasters inflicted US\$44 billion in damages between 1980 and 2015, with floods and hurricanes together costing US\$1.6 billion in 2015 alone.<sup>275</sup> Deviations from historical rainfall trends can harm crop production, especially corn grown on rainfed land,<sup>276</sup> and the agricultural sector accounts for a large share of the economic losses caused by climate change. Poor and vulnerable households are especially sensitive to climate-related risks to agricultural production, food prices, and food security<sup>277</sup>. Ongoing efforts to address water-security issues in the Valley of Mexico and among communities near its headwaters have yielded valuable lessons, and effective approaches can be scaled up at the national level. However, policymakers continue to lack accurate and timely weather and climate information, and interinstitutional coordination is weak. The 2014-18 National Development Plan, the National Infrastructure Plan, and the National Water Program all call for greater coordination between sectors, but the institutional framework does not support multisector investment in climate change adaptation and mitigation projects.

**288. Limited investment in key water management infrastructure is exposing Mexico to higher climate and non-climate**

272 The 2004 Water Law also mandated the restructuring of CONAGUA's key functions by transferring responsibilities from the central level to subnational Basin Agencies and Basin Councils. These Basin Agencies and Basin Councils were established, but many of their proposed functions—such as setting rates, collecting fees, and preparing financial plans—remain under the purview of CONAGUA

273 CONEVAL, 2016.

274 See, e.g., Oxford Poverty and Human Development Initiative (OPHI) Country Briefing: Mexico, 2017.

275 Maskrey, A. (2015) Evaluación global de reducción de riesgos por desastres 2015. United Nations-UNISDR.

276 The study found that a 10 percent increase in rainfall variations reduced output to be 0.8 percent for maize and other crops. See: Yunez and Meza (2015) The Effect of Rainfall Variation on Agricultural Households: Evidence from Mexico. <https://ideas.repec.org/p/ags/iaae15/212457.html>

277 The government has identified several priority actions to reduce the vulnerability of people and property to the impact of extreme weather events, including reforming national, state, and city water-planning processes.

matic related risks while increasing opportunity costs of underinvestment. Mexico ranks 19th worldwide in water-storage capacity, with 150km<sup>3</sup> stored in 667 large dams. However, some of these dams were built more than 50 years ago, and increased investment in maintenance and rehabilitation will be vital to ensure their continued operation and to protect local populations from potential dam failures, and improve efficiency of hydropower generation. Noteworthy, that tightening fiscal constraints are still reducing investment for efficient management and distribution of water among competing users. The pressures on federal, state and municipal budgets make the need for alternative sources of funding and a more efficient public expenditure in the water sector more urgent. However, ambitious capacity-building and changes in roles and responsibilities of planning, funding and implementing efficiency improvement programs will be required to fully implement these norms and make spending more efficient.

**289. Inefficient water use in the agricultural sector intensifies pressure on scarce water resources.** Because water for irrigation is not subject to abstraction charges, farmers have little incentive to use water efficiently. This policy has been the subject of intense policy discussion, as irrigated agriculture accounts for most of non-hydropower water abstraction and consumption. The 2030 Water Resources Group has developed tools for public-private partnerships of large-scale irrigation projects through non-traditional PPP model for agricultural water use. The national infrastructure fund (FONADIN) of the Secretary of Finance of Mexico (SHCP) is exploring the viability of PPPs in irrigation in water stressed by high-productive areas.

**290. Increasing urbanization, demographic growth, and climate change are intensifying competition between rural and urban water users.** The Integrated Urban Management (IUWM) framework can complement traditional engineering approaches to resolving WSS challenges. IUWM is underpinned by three core concepts: (i) that cities both directly impact, and are fundamentally dependent on, the wider watershed; (ii) that traditional, supply driven, hard infrastructure approaches are not sufficient to close the water cycle and ensure sustainable services, and (iii) that water management and WSS policies must incorporate all consequences of urban water use, including its implications for ecological sustainability, and account for them via instruments such as payments for environmental services. Under an IUWM approach, planning for the water sector is integrated with other urban sectors, such as land use, housing, energy, industry, and transportation to overcome urban planning fragmentation with the aim of improving system-wide performance. IUWM also incorporates the interests of other users in the river basin—including other cities, regional industries, and the local environment—which have unique water quantity and quality needs that may evolve over time. An effective IUWM approach usually requires coordinated action across multiple jurisdictions, both within the municipality and in the larger river basin.

**291. The water sector faces both cyclical and structural financial challenges, which weakens incentives to use public resources efficiently, and hampers government's long-term planning of the sector.** The sector is spending inefficiently because of complex public investment management system and operating rules. The annual budget cycle discourages multi-year investment projects. Most water and sanitation funds are allocated annually with no guarantee of future financing. An inefficient planning process results in frequent delays and creates incentives to misrepresent the status of ongoing projects. In some cases, local governments, particularly in disadvantaged areas, may lack the technical capacity to fulfill the complex requirements of the planning process. Feasibility studies often ignore the asset lifecycle, further favoring investment over operations and maintenance. The discretionary authority of CONAGUA for funding execution within and across municipalities creates delays and shifts in resource allocation within a fiscal year.

**292. Water is almost always priced below its true economic, cultural and social value in Mexico.** Increasing tariffs to levels that approach the actual value of water resources would discourage waste, boost cost recovery and increase the financial envelope for infrastructure investment and maintenance. However, raising water tariffs beyond the level required to cover basic operation and maintenance costs has thus far proven politically unfeasible. The federal government recently reduced CONAGUA's budget by up to 70 percent, compounding an ongoing decline in the agency's capacity to properly execute and supervise public works, which has led to delays and cost overruns in construction contracts. Nevertheless, the government is committed to realigning price incentives and restoring financial balance to the water sector. Hence, the sector's budgetary process should aim for more flexibility accompanied by greater transparency in decision making and reporting.

## POLICY OPTIONS

**293. Introduce multi-year budgetary planning for CONAGUA to improve spending efficiency and revisit water pricing to improve consumption efficiency.** Strengthening water security will require precisely valuing water resources, scaling up payments for environmental services, improving interinstitutional collaboration (all functions of basin agencies and councils), and incorporating climate resilience into planning processes at the federal, state, and municipal levels. For rural areas, the government should further adapt water quality standards to reflect basin-level objectives and expand the autonomy of Basin Agencies, Basin Councils, and municipal water utilities over local WSS service delivery. For urban areas, many cities are vulnerable to an array of climate and non-climatic risks, and face the prospect of droughts and/or floods. Existing planning and investment design frameworks are not sufficient to ensure water security in urban areas.



294. **Establish a pool/pipeline of priority projects at the national and subnational government levels.** This initiative also would need developing the feasibility studies for that pipeline of projects. This would also allow subnational governments with more limited to take advantage of projects when resources become available.

295. **Formulate a water-infrastructure and resilience strategy within the budget process of the sector**<sup>278</sup>. To mitigate risks related to water security, cities should mainstream climate resilience into their urban planning and water-infrastructure investment processes. Optimizing the use of existing infrastructure, strengthening sectoral management, and promoting water reuse, recycling, and recovery could improve the systemic efficiency of urban water management, reduce the cost of WSS services, and help close the water cycle within cities. The federal government could support these efforts by expanding and increasing payments for environmental services in states with high levels of water overexploitation and scarcity. Across different levels of government, promoting green-growth models that reflect scarcity, uncertainty, and stress on water resources could increase the structural efficiency of water use, and creating an interinstitutional framework for sharing data on water resources and environmental externalities could strengthen the analytical underpinnings of water policy.

296. **Increase WSS investments for the construction and long-term operation of capital projects.** A particular case of increasing investments in the maintenance and rehabilitation of dams will help enhance climate-change resilience. Options to increase funding relate to scaling up the use of public-private partnerships and performance-based contracts to multiply the potential public funding into the sector<sup>279</sup>, while incentivizing an increase in the operational efficiency of local operators. Moreover, federal transfers are the main source of investment capital, supported to varying degrees by local taxes and international aid in the country. Due to this condition, the investment strategy of the sector should incorporate local sources of financing to multiply the number of local projects, increase local revenues, and promote efficiency in project implementation by introducing incentives to ensure that the health and productivity benefits from water supply and sanitation projects outweigh the public funds invested.

297. **Introduce and scale up PPPs in the water sector, including for financing where the framework and tariffs can support improvements in operational and financial efficiency.** This will require adopting strategies for long-term financial sustainability of water supply and sanitation operators and infrastructure. Adopting innovative financing strategies and instruments, developing performance-based management contracts for WSS services, and expanding

the use of PPPs beyond water supply to include irrigation, flood management, water conservation, and wastewater treatment could enable the authorities to accomplish key sectoral objectives in a resource-constrained environment and free fiscal resources for social projects.

298. **Instrument private strategies within the programs of CONAGUA to advance sectoral policy objectives in an environment of tight budget constraints and foster competition.** First, by including Public Private Partnerships (PPPs) beyond water supply and wastewater treatment. These options can help municipal governments through concessions or management contracts to improve water utility services locally. Second, by enabling CONAGUA to tap into private-sector financing and investment in other areas such as data collection (e.g., weather, climate, hydrological), agricultural water management, and flood management and prevention. Budget constraints provide an opportunity to develop a financing strategy that improves the efficiency of public expenditures, avoids cost overruns, and incentivizes private-sector participation by expanding the use of performance-based contracts and results-based financing, impact investments, and climate finance.

299. **Establish formal institutional incentives to integrate related sub-sectors into the overarching water management objectives and targets.** Integrating water supply, drainage, sewerage, wastewater, and disposal services (i.e., on-site sanitation) into urban water supply and sanitation (WSS) infrastructure can boost efficiency by leveraging economies of scales. Several municipalities in Mexico have begun exploring alternatives to traditional WSS planning and investment processes under the rubric of integrated urban water management (IUWM). IUWM can be more effective if instrumented vis-à-vis with other important components like setting tariffs with efficient water valuations, restructuring of CONAGUA's management and implementing functions, and introducing water competition to providers with PPP funding to align performance with cost recovery thresholds. Also, by incentivizing the integration of related sub-sectors that enable better management of water and natural resources, while treating effectively pollution and waste the country can accelerate the pace to reach water and environment SDGs.

300. **Design and implement economic instruments for better water resources valuation to encourage states and municipalities to adapt coordinated policies and programs to build resilience against climate change and reinforce water security.** The authorities should promote new economic instruments for equitably allocating water rights, controlling pollution, valuing water resources, and balancing the interests of competing water users. The government should also build the capacity of Basin Agencies, Basin Councils,

278 Large funding gaps requires investments canalized through "brown field projects" bringing an additional level of complexity to the PPP schemes to be deployed but with potential of optimizing economic returns of those investments and enable resilience within cities and large municipalities.

279 It is worth mentioning that these arrangements are fostering competition rather than privatizing services. Competitive tendering for concession agreements, for instance, are being implemented by CONAGUA. The *Programa de Indicadores de Gestión de Organismos Operadores* (PIGOO) is benchmarking service and efficiency performance of operators reporting to CONAGUA. These benchmarks are used to determine viability of contract expansions and modifications at the state, city and hydrographic regions. The indicators include the ratios between operation and maintenance costs and volumes produced and consumed per operator, as well as efficiency performance indicators of management and customer satisfaction.

and Irrigation Districts and Units to strengthen resilience in vulnerable areas. A long-term integrated strategy for harmonizing irrigation programs and promoting water conservation (e.g., through volumetric pricing, water extraction charges), increasing productivity, and discouraging waste and pollution should be designed as part of a comprehensive green growth agenda for water-sector institutions. Finally, integrating water value chains in cities, increasing public awareness of water issues, and promoting policy dialogue on IUWM could improve the quality of urban water infrastructure.

**301. Assess governance and accountability measures of the sector to identify inefficiencies and overlapping competencies.** Administrative reforms have stalled, budget constraints are reducing infrastructure investment, and federal subsidies are decreasing. Revising the regulatory framework for water services could address operational gaps and redundancies and clearly assign responsibilities at each level of government. An analysis of risks to economic efficiency and financial sustainability in the water sector could inform a strategy for improving the distribution of public expenditures, including federal subsidy programs in the water sector.

**302. Complement the decentralization of CONAGUA's functions with the design of transparent and efficient intergovernmental financing mechanisms.** These include the use of intergovernmental capital matching grants to incentivize investments in the sector and incentives to improve revenue collection to improve the distribution of sector funding between the federal and subnational governments. In addition, strengthening the capacity of Basin Agencies and Basin Councils could improve sectoral governance and contribute to more efficient planning, resource allocation, and investment at the local level. Moreover, the decentralization of water and sanitation services has not closed the gap between urban and rural areas because policies assign to each municipality the responsibility of their own water management. Nevertheless, in most rural areas, water supply does not cover their entire population

and it is not of the same quality as in urban areas. Therefore, CONAGUA and some high-performing water utilities still face challenges in providing adequate services in the poorest rural areas, where the financial framework and capabilities to manage water supplies locally are lacking<sup>280</sup>.

**303. Consider harmonizing, modernizing and simplifying the water management framework over the medium- and long-term.** This will imply conducting a deep review of subsidy programs<sup>281</sup> that hinders efficient management of water resources in agriculture. These subsidy programs for irrigation directly contribute to overuse and waste, and a comprehensive water management framework strategy should be improved gradually by phasing out these subsidies, promoting incentives for efficient water allocation among competing uses and establish stewardship principles for a more efficient inter-sectoral water management. Improving oversight of public investment in the water sector, enforcing sector's regulations, and strengthening contract management could help prevent cost overruns and maintain service quality over time.

**304. Develop an integrated water information system with multi-sector information for effective decision-making processes.** Institutional fragmentation and an unclear regulatory framework weaken data quality, and inadequate information undermines the effectiveness of sectoral planning. More detailed data could enable the government to pilot the use of extraction charges based on water valuations for large irrigation users and test their effectiveness at scale. Better data could also improve program targeting and reduce regional disparities in access to WSS services. Expanded monitoring of water quality in watersheds, tighter oversight of groundwater extraction and quality, and expanded civil-society participation in basin planning could support more effective water policies. Finally, developing an integrated monitoring and evaluation system that includes data on financial flows, investment projects, water resources, hydrologic conditions, and WSS services could greatly improve policymaking in the water sector.

280 Silva-Rodriguez, J.A. (2016) Rural Water Supply in Mexico. Cuad. Desarro. Rural vol.13 no.78 SCielo.

281 The Tarifa 9 Program (electricity subsidy of water pumping for irrigation run by the Federal Commission of Electricity), the Program for Improving Water Efficiency in Agricultural Areas (a program run by SEMARNAT) and the Special Program for Energy Use in Agriculture (PEUA, Programa de Energía de Uso Agrícola, run by SAGARPA).







# 12. Fostering Efficient and Sustainable Urban Systems

Investment in urban infrastructure and services has not kept pace with Mexico's rapid urbanization, leading to a range of social, economic, and environmental challenges in metropolitan areas. The most pressing problems are: (i) the difficulty to revert the effects of the expansion of single-use housing developments on the urban periphery of cities that was boosted in the 2000s; (ii) the traffic congestion, for which a very conservative estimated US\$70 billion in urban public transportation investment would be required to reduce it to the average level in developed countries; (iii) the environmental costs associated with deficient solid waste management systems, as only 78 percent of all solid waste produced in Mexican cities is sent to final disposal sites, and a mere 11.5 percent of disposal sites comply with environmental regulations; and (iv) the challenge of increasing economic productivity in cities while limiting climate change effects in the context of an inefficient use of energy. Policy action will be needed to cope with these challenges, notably to: (i) renew government efforts to promote compact and inclusive urban development; (ii) strengthen urban planning institutions at the local level to attract investment and deliver services to a denser population; (iii) strengthen regulations on minibus services and renew the fleet with clean technology equipment; (iv) increase the funding and enlarge the scope of action of the Federal Program to Support Mass Transit (PROTRAM); (v) focus increased attention to non-motorized transport infrastructure, travel demand management initiatives, use of cleaner technologies in transport, and transit oriented development interventions; (vi) improve the institutional architecture for the solid waste management sector, strengthen capacities at all levels of government and improve financing options; (vii) focus on the construction or rehabilitation of final disposal facilities, the closure of existing open dumps, the acquisition of state of the art collection equipment, and the installation of biogas-capture and waste-to-energy technologies; (viii) promote behavioral change regarding all the steps of solid waste management and recycling; (ix) raise awareness of the benefits of energy-efficient investments; (x) balance the interests of multiple stakeholders in the municipal energy sector; and (xi) engage the private sector in expanding energy-efficient infrastructure.

## CONTEXT AND REFORM PROGRESS

305. Over the past 30 years, urban development in Mexico has been characterized by the rapid, uncoordinated, and dispersed growth of urban and peri-urban areas. The population of Mexican cities increased sevenfold, and the country's 11 largest metropolitan areas are now nine times larger than they were in the 1980s.<sup>282</sup> The creation of vast public housing developments on relatively inexpensive land far from city centers in the 1990s and early 2000s drove the growth of urban sprawl in areas that lacked social services and were far from jobs, creating numerous social, economic, and environmental challenges.

306. Investments in urban housing and other urban services have not been able to keep pace with the rapid urbanization. Nine million housing units were built between 2000 and 2014, yet the national housing deficit remained broadly stable in absolute terms at 9.2 million units in 2016.<sup>283</sup> Moreover, the construction of new housing was not accompanied by commensurate investment in mass transit, and an estimated US\$70 billion in public transportation investment would be required to reduce traffic congestion in Mexican cities to the average level of developed economies.<sup>284</sup> Just 78 percent of all solid waste produced in Mexican cities is sent to final disposal sites, and only

307. 11.5 percent of disposal sites comply with environmental regulations.<sup>285</sup> In Mexico City alone, about 15 percent of the 13,000 tons of solid waste produced daily ends up in the streets, clogging drainage systems and contributing to floods.

308. Urban service provision remains inadequate even as municipalities spend a large share of their budgets on services. The ongoing urbanization process and the expansion of the middle class are increasing pressure on municipal budgets, limiting the fiscal space for investment. Inadequate service provision and underinvestment in infrastructure have constrained the ability of cities to boost economic growth, foster social inclusion, raise living standards, leverage economies of agglomeration, and promote environmental sustainability.

309. The authorities have adopted policies designed to mitigate climate change at the city level. Reforms have covered multiple sectors, including: (i) designing a program to include location parameters in the definition of housing subsidies; (ii) developing a federal program to support the design, investment and implementation of Bus Rapid Transit (BRT) options in the largest cities;

310. (iii) establishing an ambitious public bicycling sharing system in Mexico City; (iv) approving the National Law on Solid Waste Management and the National Program for Prevention and Integrated Solid Waste Management; and (v) launching studies to improve energy efficiency at municipal level in all the state capitals of the country. These objectives are mutually consistent and reflect Mexico's commitments under the Paris Climate Accord and other international agreements. The government has an opportunity to build on these efforts by extending the scope and quality of urban services, including housing, transportation, solid waste management, and water and sanitation, with a focus on energy efficiency.

## MAIN CHALLENGES

### *Addressing the Lasting Effects of Expansionary Housing Policies*

311. The explosive growth of large, low-density, single-use housing developments over the past two decades has fueled urban sprawl. Mexico began to radically transform its housing sector in the early 2000s. The supply of low-cost housing increased by about one million units each year between 2006 and 2011, but as housing developers sought to produce more housing units while keeping land costs low, they increasingly built on rural tracts far from city centers. Limited attention was paid to the overall functionality and accessibility of new developments on the outskirts of cities that lacked proximity and access to basic public services such as education and health. Long distances to jobs in urban centers also pose challenges in terms of commuting times, costs, and air pollution. Moreover, the resulting patchwork of dispersed housing developments substantially increased the marginal cost of providing electricity, water, and other services, exacerbating social exclusion.

312. In 2013, housing policies rightly shifted to promote more compact and sustainable cities. To discourage low-density urban expansion, the revised rules of the new housing policy scale the amount of direct support by location type, with larger subsidies offered to "well-located" housing units in dense urban areas, close to employment and with access to basic services. This was a very positive shift. Nonetheless, it brings the challenge of affordability to fore as "well-located" housing tends to be relatively expensive, and sometimes higher-cost units are ineligible for the program. In 2017, only 9.8 percent of direct support was allocated to units in core urban areas, and 19.3 percent went to areas that were fully serviced by infrastructure networks.<sup>286</sup> This suggests that the greater direct support offered to core urban units was unlikely to compensate for higher land values in city centers, prompting

282 La Expansión de las Ciudades 1980-2010, SEDESOL, 2012

283 CONAVI, 2016.

284 RAS engagement, WB 2012.

285 Informe de la Situación del Medio Ambiente en México, SEMARNAT 2015.

286 CONAVI, 2016.

developers to produce high-end unsubsidized units rather than affordable subsidized units. Consequently, increasing the stock of well-located housing that is within the financial reach of lower-income households remains among the most critical challenges in the housing sector.

**313. Despite the efforts to increase the supply of low-income housing, a substantial housing deficit remains, and much of the current housing stock does not meet formal construction standards.** Over 10 million housing units were built between 2000 and 2018, but a similar increase in the number of households left the housing deficit largely unchanged in nominal terms at about 9.2 million units.<sup>287</sup> Nationwide, 5.5 million units do not meet formal construction standards, in most cases because they lack access to basic services. This is known as the qualitative deficit. Another 3.7 million units are overcrowded, located in high-risk areas, or in such poor condition that they must be fully replaced. This is known as the quantitative deficit. Formal annual production of new housing units would need to increase by 70 percent to both meet new demand and eliminate the quantitative deficit by 2030.<sup>288</sup>

*Coping with persistent Low-Quality Public Transportation and Limited Mobility Alternatives*

**314. In many Mexican cities, employment is concentrated in the urban core, yet a large share of the population lives in peripheral areas, leading to intense traffic congestion.** An estimated 30 percent of residents of the greater Mexico City area spend over 120 minutes each day commuting, reducing productivity by an estimated 3.3 million hours per day. Rising rates of private vehicle ownership are exacerbating congestion.

Between 2009 and 2014, the size of the national vehicle fleet increased by 23.1 percent, from 30.8 million to 38 million vehicles, and it is expected to reach 70 million by 2030. Meanwhile, households in the lowest income decile spend approximately 13 percent of their total income on public transportation. In some large cities, the cost of transportation exceeds one-third of the minimum wage. Moreover, it is not uncommon for commuters to use multiple types of transportation in a single trip, which significantly increases the time and cost of commuting.<sup>289</sup> Urban sprawl and congestion have also led to an increase in pollution emissions.

**315. Public transit remains the primary mode of transportation in urban Mexico, accounting for 60 percent of total trips, yet low-quality bus services continue to make up 90 percent of public transportation, with the remaining 10 percent covered by Bus Rapid Transit (BRT) options.** Buses are responsible for approximately 55 percent of the 30 million daily trips in the Mexico City metro area—making them one of the world’s largest bus-transit systems. Meanwhile, rapid bus lines, subways, and light rail systems in large cities still represent less than 8 percent of total transportation.

**316. Bus transportation in Mexico City is broadly representative of public transportation in nearly every urban area of the country.** Bus networks consist of numerous, largely informal private operators providing low-quality bus services under vague contractual conditions. They rarely employ formal labor and contribute little or no tax revenue. The Bus business model is fundamentally inconsistent with the provision of modern, clean, safe, and affordable transit services. While per-trip fares are often low—e.g., US\$0.23 in Mexico City—Buses are not integrated with other transit services, and most trips require one or more

**Figure 54: Transportation Breakdown by City Type**



Source: Estimated data from questionnaires administered in 40 of Mexico’s 93 cities (Moliner, 2013).

287 Data from the Registro Único de Vivienda. <http://sniiv.conavi.gob.mx/oferta/cuboregistro.aspx>.  
 288 Based on 2014 estimates from CONAVI.  
 289 INEGI, 2010; Corredor Insurgentes S.A. (CISA), 2012.

transfers, each with an additional full fare. Consequently, low-income households often spend a large share of their income on transportation. In the greater Mexico City area, households in the lowest income quintile spend an average of 18 percent of their income on transportation, and this share rises to 25 percent in the urban core. Informal Bus operators have limited access to capital and often neglect fleet maintenance or renewal, while the authorities rarely enforce regulatory standards.

**317. Despite a number of important achievements, the Federal Program to Support Mass Transit (Programa de Apoyo Federal al Transporte Masivo, PROTRAM) is struggling to keep pace with the demand for BRT projects.** Launched in 2008, PROTRAM is designed to mitigate the negative effects of increasing motorization, strengthen local governmental capacity to manage urban transportation, and offer financial support to local governments to develop mass-transit infrastructure. By providing financial and technical support to state and municipal governments, PROTRAM has contributed to important improvements in transportation quality, with positive economic, social, and environmental implications. PROTRAM's current nationwide portfolio comprises a pipeline of more than 46 projects in different stages of development: identification, planning, evaluation, implementation, and operation. The total cost of this portfolio is US\$6.4 billion, of which PROTRAM will finance US\$1.2 billion directly, and the remaining US\$5.2 billion will be raised from private and public sources. PROTRAM's investments have not achieved their full potential, and the financial sustainability of its projects remains in doubt. Many PROTRAM-supported projects suffer from insufficient cashflow, and service quality often deteriorates after a few months of operation. Private equity investment is low, as investors are reluctant to take on project risks. Furthermore, risk analyses are rarely conducted during project preparation, making it difficult to persuade private stakeholders that a project is viable, let alone profitable.

**318. Subnational transit authorities face governance challenges, institutional capacity constraints, fiscal limitations, jurisdictional overlaps, and an ambiguous relationship with the federal government.** Subnational governments often lack sufficient financial resources, which leads them to use public-private partnership schemes as a funding mechanism rather than a value-for-money strategy to leverage private equity and project revenues to finance infrastructure development. This focus on funding is problematic, because subnational governments do not prioritize risk allocation. Properly identifying design, social, political and regulatory, commercial, operational, and fiscal risks is the first step to achieving bankability and improving the private sector's willingness to participate in transportation projects that advance social policy objectives.

**319. Urban transportation alternatives have garnered little attention.** While public transportation is primarily the responsibility of state governments, alternative mobility options such as non-motorized transportation (e.g., walking and cycling) are under the purview of municipal governments. Limited normative and financial incentives for cooperation among different levels of government, including joint project planning, combined with inadequate technical capacity at the local level have contributed to underinvestment in walkable areas, bike lanes, and other forms of non-motorized transportation. Travel-demand management initiatives, grants for cleaner technologies, and transit-oriented development interventions remain limited.

### Reverting the Neglect of Solid Waste Management

**320. Inadequate solid waste management in Mexican cities has major economic, environmental, and public health consequences, yet it receives far less attention than other municipal policy areas.** In 2015, Mexican cities produced 53.1 million tons of solid waste, up 61.2 percent from 2003. Industrial development and urbanization are continuing to increase in solid waste output.<sup>290</sup> According to the Secretariat of Environment and Natural Resources (*Secretaría del Medio Ambiente y Recursos Naturales*, SEMARNAT), the cost of inadequate solid waste management is estimated to amount to 0.5 percent of GDP.<sup>291</sup> This cost partially reflects increased health expenditures and lost productivity resulting from exposure to disease, and solid waste is a disease vector to which low-income households are particularly exposed. Additional costs arise from water, soil, and air pollution at improperly managed disposal sites, flooding caused or exacerbated by waste-clogged drains, and lost revenue from the tourism sector and other economic activities. In addition, inadequate solid waste management is among Mexico's five largest sources of greenhouse gas emissions.

**321. All aspects of solid waste management require attention and improvement.** The 2003 National Law on Solid Waste Management and the 2008-2012 National Program for Prevention and Integrated Solid Waste Management established standards and principles for solid waste management at the federal, state, and local levels. However, solid waste management remains highly inefficient. Mexico currently recycles just 10 percent of the 120 million tons of waste it produces each year, while 78 percent is sent for final disposal, and the destination of the remaining

**322. 12 percent is unknown.** Only 11.5 percent of final disposal sites comply with Mexico's Environmental Law, and an average of just 84 percent of municipal waste is collected. Among the governments of Mexico's 31 states and the

Figure 55: Solid Waste Production by State, 2013 (tons)



Source: Dirección General de Equipamiento e Infraestructura en Zonas Urbano-Marginadas, Sedesol, México. 2013

Federal District, only 12 perform selective collection<sup>292</sup> of municipal waste. Most of Mexico's solid waste management indicators are low by the standards of comparable countries in the region, and all are well below the average for OECD member states.

323. **At the federal level, a lack of interinstitutional coordination inhibits solid waste management.** SEMARNAT is responsible for establishing the policy framework and channeling federal resources to states and municipalities. However, SEMARNAT faces numerous challenges, including: (i) a lack of staff; (ii) inadequate resources from the federal government; (iii) weak technical capacity; (iv) the low priority accorded to solid waste management at the national level; and (v) limited collaboration with state and municipal governments on solid waste management issues.

324. **The National Bank for Public Works and Services (Banco Nacional de Obras y Servicios Públicos, BANOBRAS) administers the National Infrastructure Fund (Fondo Nacional de Infraestructura, FONADIN), which provides funding for municipal solid waste infrastructure through its Solid Waste Program (Programa de Residuos Sólidos, PRORESOL).** However, since its inception in 2002, PRORESOL has financed just three municipal projects due to: (i) complex and cumbersome internal regulations and approval criteria that have not been specifically adapted to the solid waste management sector; (ii) a lack of qualified technical staff; and (iii) weak collaboration with SEMARNAT in leveraging complementary financing. PRORESOL also lacks a strategy for social inclusion and a plan to promote recycling, reutilization, and waste minimization, and it has been unsuccessful at forming partnerships with industrial, commercial, or tourism-related firms. Consequently, although about US\$100 million has been invested in the sector over the last two years, little progress has been achieved.

325. **Municipalities are primarily responsible for solid waste management, but they often lack the knowledge, technical capacity, resources, and political will to address key challenges.** Mayors serve a single three-year term, which limits the types of support and collaboration that can be pursued by federal and municipal governments. In principle, states enforce municipal compliance with environmental laws and encourage cooperation among adjacent municipalities on environmental and waste management issues, yet in practice both regulatory enforcement and inter-municipal cooperation are rare. And while 65 percent of Mexican states have formulated regulatory frameworks for solid waste management, these frameworks are not standardized, and compliance is weak. In consultations with World Bank staff, SEMARNAT has indicated that a lack of reliable information from states and municipalities affects its ability to assess the current situation and develop a clear strategy and policies for the sector. Finally, inadequate cost-recovery schemes (compared with other sectors) limit local investment, leaving solid waste management projects highly dependent on federal technical and financial support.

### *Addressing Inefficient and Costly Energy Use at the Municipal Level*

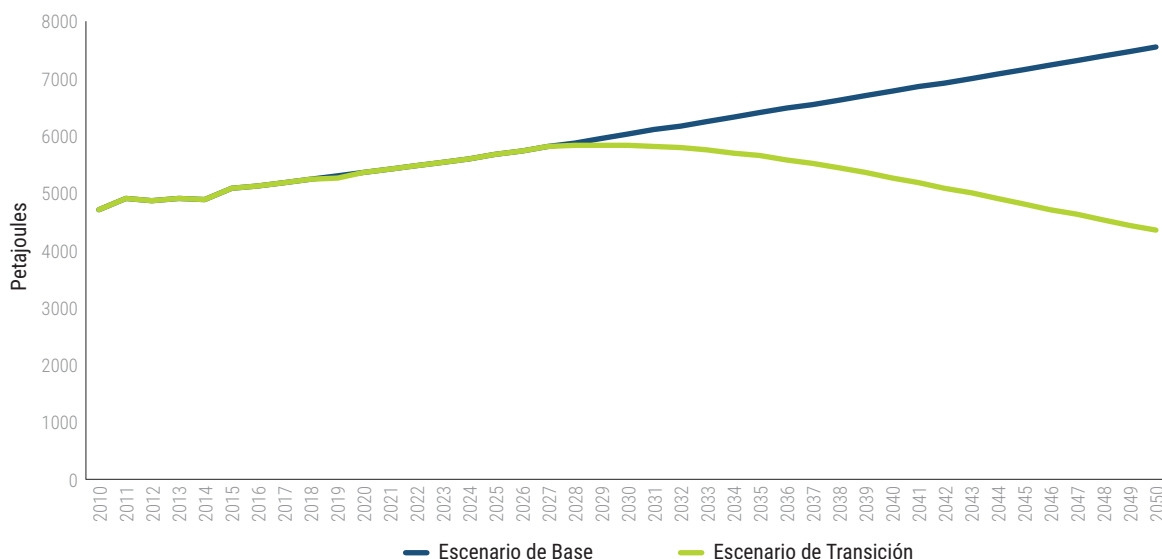
326. **Energy inefficiency constrains productivity and contributes to environmental degradation.** From 2000 to 2015, Mexico's energy consumption grew by 30 percent, driven by transportation, industry, and the residential sector. Electricity consumption by end users increased by 60 percent between 2000 and 2015.<sup>293</sup> The transportation sector relies heavily on fossil fuels and is responsible for 46 percent of end consumption. Given the projected growth of the transportation sector, transitioning to a cleaner energy mix will require the adoption of new technologies to reduce reliance on fossil fuels. The industrial sector accounts for 30 percent of end consumption. It consumes electricity

292 Selective collection refers to the mandatory separation of organic and inorganic.

293 SENER. 2016. *Estrategia de Transición para Promover el Uso de Tecnología y Combustibles más Limpios.*



**Figure 56: Final Energy Consumption, Baseline Scenario versus Transition to Energy-Efficient Technologies, 2010-2050 (petajoules)**



Source: SENER, CONUEE

and coke, and the most energy-intensive subsectors are iron, steel, and cement production. The residential and commercial sectors together account for 19 percent of end consumption, and the residential sector consumes natural gas, biomass, and electricity.

**327. Mexico's energy consumption is expected to double by 2050.** As the country continues to urbanize, it will need to build more buildings, provide more services, and transport more people and goods in the coming decades. Energy should be an integral part of long-term transportation and urban development policies, and policymakers should strive to avoid committing to investments in inefficient fossil-fuel-based transportation and energy-intensive urban development models. Measures to increase energy efficiency and promote electric and nonmotorized transportation would help Mexico reach its target of reducing energy consumption by 40 percent by 2050.

**328. Investing in energy efficiency could significantly reduce municipal energy expenditures and open fiscal space to expand public service provision.** Municipal service providers have many opportunities to adopt new technologies for street lighting, interior lighting, air conditioning, water pumping and heating, inter alia,<sup>294</sup> as well as test operational and financial mechanisms for energy efficient upgrading. After salaries, Mexican municipalities' largest expenditures are on street lighting, water services, and wastewater treatment. In 2014, street lighting accounted for 58 percent of total public electricity consumption at the municipal level, while water-pumping and related activities comprised the remaining 42 percent. These subsectors have grown substantially since 2002: electricity consumption for street lighting increased by 32 percent, and electricity consumption for water services increased

by 78 percent. Replacing existing technology with more energy-efficient alternatives could reduce the amount of electricity consumed by street lighting alone by 36 to 74 percent.<sup>295</sup> As cities in Mexico continue to experience rapid demographic and economic growth, municipalities will face increased pressure to expand high-quality and affordable public services. Efforts to improve energy efficiency at the municipal level have thus far yielded limited results. These efforts have focused mainly on retrofits to street-lighting and water-pumping systems. The National Commission for the Efficient Use of Energy (*Comisión Nacional para el Uso Eficiente de la Energía*, CONUEE) and BANOBRAS have supported a municipal street-lighting retrofit program since 2010. The Secretariat of Energy (*Secretaría de Energía*, SENER) provided direct support of up to 15 percent of the total investment cost to 27 street-lighting subprojects, generating an average energy savings of 38 percent.<sup>296</sup>

**329. Municipalities implementing energy-efficiency measures, particularly street-lighting and water-pumping projects, face numerous challenges.** These include: (i) a lack of information regarding the available technologies, their prospective benefits, and the methods of financing and implementing them; (ii) limited capacity to identify, design, finance, implement, monitor, and verify savings from energy-efficiency projects, due in part to the absence of metering for most street-lighting infrastructure; (iii) the short time horizon of municipal governments and the medium-to-long term nature of energy-efficiency gains; (iv) restrictive budgeting procedures that prevent municipal governments from retaining operational cost savings to make debt-service payments in subsequent budget years; (v) a procurement process that focuses on upfront costs rather than lifecycle costs; and (vi) limited access to financ-

<sup>294</sup> Ibid.

<sup>295</sup> National Energy Efficiency Program, Balance 2010-2016, CONUEE.

<sup>296</sup> Ibid.

ing, especially among marginally creditworthy municipalities, as well as constrained debt capacity and difficulty obtaining long-term credit to cover initial investment costs. The Government is piloting an innovative operational and financing mechanism to support energy efficiency at the municipal level. The pilot program (PRESEM) covers public facilities, including street-lighting networks, municipal buildings, water utilities, public schools, and public hospitals and is designed to address key barriers to energy efficiency, foster the growth of markets for energy-efficient technology, provide budgetary relief to public entities, enhance the quality of energy services, and contribute to meeting Mexico's environmental goals<sup>297</sup>.

## POLICY OPTIONS

### *Renewing Government Efforts to Promote Compact and Inclusive Urban Development*

**330. The government should continue and strengthen its policies to provide differentiated up-front housing subsidies depending on location.** Supporting social housing using a larger share of its existing envelope of subsidies in strategic locations could help bolster the supply of affordable housing in the core of urban centers and reduce pressure to further expand housing developments on the urban periphery.

**331. Targeted reforms could expand CONAVI's housing program to a larger share of the population.** These include: (i) diversifying available housing solutions by enabling eligible households to acquire new or existing units, improve their houses, purchase serviced plots, self-construct, or rent; and (ii) adjusting program parameters to focus benefits on the groups that are most in need of housing support.

**332. CONAVI and the Secretariat of Agrarian, Land, and Urban Development (Secretaría de Desarrollo Agrario, Territorial y Urbano, SEDATU) could partner with municipalities to reduce regulatory constraints and strengthen urban planning at the local level.** Demand-side support should be complemented by regulatory reforms and fiscal and land-use incentives. CONAVI is responsible for setting Mexico's housing policy, while local governments are tasked with formulating and implementing urban development plans and other land-use strategies. Local governments can designate areas suitable for housing development and regulate housing standards, densities, zones and uses, permits and licenses, and parking rules, inter alia. These regulations directly impact developer costs and housing affordability. CONAVI and local governments could collab-

oratively explore innovative approaches combining direct support with more efficient urban regulations to create more affordable units in urban centers. For example, creating denser mixed-use developments could spread high real estate costs across a greater number of units and households at different income levels, boosting the supply of affordable housing in Mexican cities.

**333. Support the development of robust urban-planning institutions at the local level.** The benefits of increased population density can only be realized if local institutions have the capacity to deliver services effectively and to allocate or attract the necessary investment to serve a denser population. Capacity constraints and limited resources at the state and municipal levels have restricted local urban-development and land-use planning to the preparation of specific investment projects and the creation of intricate land-use regulations. Moreover, these limited plans and regulations are prepared without a comprehensive assessment of population growth, demand for housing and basic services, land-use and pricing trends, growth corridors, social issues, or the government's own implementation capacity. The federal government can build the planning capacity of local authorities by offering incentives to create long-term strategic visions for city development and to better integrate land-use planning, housing development, and transportation investment. Moreover, well-functioning municipal cadastral systems (including fiscal cadasters) will be necessary to raise more local revenue and face the growing local service delivery pressures (see Policy Note on Subnational Finances).

### *Further Strengthening Transportation and Mobility Policies and Institutions*

**334. Strengthen the regulatory and institutional framework that governs bus services and introduce financial instruments to support fleet renewal.** Most Mexican cities have declared that replacing old transit vehicles is an important policy goal. Achieving this goal will require: (i) an analysis of alternative business models, including private-sector debt financing, the use of special purpose financial vehicles, and project financing, and (ii) an analysis of the regulatory framework for formal bus-service providers and the range of available policy tools and incentives, including travel-demand management and land-value capture mechanisms.

**335. Revamp PROTRAM by reviewing its internal processes and structure.** Internal procedures for approving federal support for mass-transit interventions should formalize the role of PROTRAM'S decision-making body, the Consultative Working Group, and consider ways to involve other

<sup>297</sup> PRESEM is a World Bank financed project. It supports an energy-efficiency fund operated by the Electricity Energy Savings Trust Fund (*Fideicomiso para el Ahorro de Energía Eléctrica, FIDE*). Under the program, FIDE, SEDER, and grant beneficiaries sign energy-savings agreements for eligible investment projects. PRESEM's methodology is designed to account for the limited technical capacity and financial constraints of prospective investors. In December 2017, the bidding process was successfully completed, and the first contract was awarded for a street-lighting project in the Municipality of Leon. Competition during the tendering process resulted in a final cost that was 43 percent lower than originally estimated based on list prices, revealing the considerable gains in value-for-money offered by market-based mechanisms for promoting energy-efficient investments.

ministries in its deliberative process.<sup>298</sup> PROTRAM's management unit also requires additional human resources to handle its large and growing agenda and to monitor project implementation in detail. Investing in tools to gather and analyze transportation data could advance the decision-making process for federal support.

**336. PROTRAM's funding should be increased to cover the program's current and future scope.** The inclusion of medium-sized cities will add at least 20 cities to PROTRAM's current pipeline. However, the growing needs of FONADIN's other supported sectors may reduce the resources available for PROTRAM. In this context, PROTRAM should explore alternative sources of funding to support transportation projects in medium-sized cities.

**337. Strengthen the capacity of subnational governments to improve mobility.** The federal government should provide financial support and technical assistance to build the planning and coordination capacity of state governments. This measure will increase the prospects of success of a National Urban Mobility Plan. It would also allow state governments to coordinate with federal and municipal entities to promote housing policies and programs that incorporate access to both mass transit and rapid transportation services to reduce neighborhood segregation, promote equitable growth, alleviate pollution, and boost productivity in Mexican cities. At municipal level there should be a greater focus on Transit Oriented Design (TOD) policies to promote the creation of compact, walkable, pedestrian-oriented, mixed-use communities centered around mass transit stations. This would increase the efficiency of transportation, reduce the need for long commutes, and improve quality of life. Attention at the local level should also cover travel demand management initiatives, in which the private sector plays a very important role. Some of these initiatives are: alternative work schedules, telecommuting options, car sharing, bus transport for employees, and company incentives to use alternative transportation systems, among others. The use of technology to improve sustainability and efficiency in transport is also essential. Some of the latest developments in intelligent transport technologies include: semi-autonomous vehicles, technology enabled models of taxi services, mobile applications to support shared us mobility, enhanced traveler information applications, adaptive traffic signal control, dynamic lane reversal, etc.

### Overhauling Solid Waste Management

**338. Effectively managing the large and growing volume of solid waste produced by Mexican cities will require institutional capacity-building at all levels of government.** SEMARNAT can strengthen its capacity for solid waste management by: (i) fully assessing the costs associated with improper solid waste management; (ii) establishing

a robust technical and administrative team; (iii) creating a joint operating platform with FONADIN/BANOBRAS to prioritize and finance municipal solid waste management projects; (iv) establishing a national commission for solid waste management comprising representatives from SEDESOL, SEDATU, FONADIN, and other key agencies; and (v) strengthening the role of the Federal Prosecutor for Environmental Protection (*Procuraduría Federal de Protección al Ambiente*, PROFEPA) in enforcing solid waste management regulations at the state and local level and across both the public and private sectors. BANOBRAS could enhance its effectiveness by: (i) streamlining internal procedures for approving solid waste management projects; (ii) designing internal eligibility criteria that differ from the criteria used for large transportation and water projects; (iii) adopting flexible financing schemes for private-sector participation; and (iv) developing a joint operating platform with SEMARNAT to prioritize and finance municipal solid waste management projects. Meanwhile, the federal government should prioritize solid waste management and allocate the resources necessary to address current and future challenges.

**339. State governments could take a more active role in promoting, financing, and supporting solid waste management projects in partnership with municipal authorities.** To collaborate effectively, states need to strengthen their capacity to promote, co-finance, and oversee solid waste management projects. In addition, municipal governments will need to: (i) more accurately assess the costs and financial implications of solid waste management systems and cost-recovery schemes; (ii) strengthen their technical teams and build the overall capacity of their human resources; (iii) take advantage of new technological and operating approaches to solid waste management; and (iv) prioritize solid waste management as a matter of municipal public policy.

**340. Better equipment and infrastructure will be needed to achieve SEMARNAT's emissions-reduction targets.** Investment should focus on the construction or rehabilitation of final disposal facilities, the closure of existing open dumps, and the installation of biogas-capture technologies and waste-to-energy equipment. Funding should be provided to selected municipalities to develop efficient integrated solid waste management systems that include transfer and separation stations, containerization, recycling equipment, composting plants, and collection systems, inter alia.

**341. Boosting the participation of the private sector in solid waste management through public-private partnerships could augment the limited resources of the federal, state, and municipal governments.** There is a great opportunity for PPPs in solid waste management as several municipalities are already working with private investors to structure projects. Encouraging greater private-sector engagement will require: (i) creating an open and fair platform for na-

<sup>298</sup> For example, the Ministry of Energy could be engaged in future electro-mobility initiatives.

tional and international companies to compete for solid waste management projects;<sup>299</sup> (ii) fostering an enabling environment for public-private partnerships; and (iii) incentivizing private firms to introduce innovative operational systems and technologies for solid waste management.

**342. Behavioral change is needed to improve solid waste management at all three levels of government.** Public outreach campaigns promoted in partnership with civil society groups and NGOs can both facilitate the transition to improved solid waste management systems and publicize their benefits. Cross-cutting issues such as recycling, waste minimization, waste treatment, and e-waste management, as well as cost-recovery mechanisms, could be incorporated into a national plan to comprehensively improve solid waste management.

### *Leveraging the Power of Local Governments to Create More Energy-Efficient Cities*

**343. Strengthen the capacity of local governments to create an enabling environment for investment in energy-efficient infrastructure.** The federal government should collaborate with local authorities to build their technical and financial capacity to identify, vet, manage, monitor, evaluate, and expand energy-efficiency projects. Collecting data on energy consumption by sector and assessing energy efficiency at the municipal level will help local governments understand the costs and benefits of alternative projects and policies, develop sound project-vetting criteria, and prepare a robust project pipeline.

**344. The federal government should provide non-reimbursable direct support to subnational authorities to incentivize investment in energy-efficient projects.** The policy discontinuity caused by the rapid turnover of municipal administrations is a major barrier to implementing energy-efficient investments. Direct support from the federal

level would help shorten payback periods and encourage investment in more sophisticated (and costly) forms of energy-efficient infrastructure and technology.

**345. At the federal level, a new publicly financed energy-efficiency program could help overcome the challenges faced by current initiatives, demonstrate the benefits of energy efficiency, and help develop a market for private investment in energy-efficient public works.** This program could incorporate representatives from SENER, the Federal Electricity Commission (*Comisión Federal de Electricidad*, CFE), CONUEE, and FIDE. It could focus on improving the institutional framework for energy-efficient investment, increasing transparency, strengthening procurement processes, and creating financial systems that verify repayment through achieved savings. The program's goals could include: (i) establishing clear rules for determining energy-consumption baselines; (ii) testing project budgeting and financing systems; (iii) enhancing technical capacity for procurement at the federal and local levels, (iv) improving systems to monitor and verify energy savings; and (v) building a credible record of municipal repayments. Facilitating a sufficient number of projects to enable the private sector to accurately assess costs, risk profiles, expected savings, and contractual mechanisms could enable the development of a dynamic and sustainable market for energy-efficient investment.

**346. Build private-sector confidence in energy-efficient investment.** The government can draw on the experience of the municipal energy efficiency pilots as they strive to raise awareness of the benefits of energy-efficient investment, balance the interests of multiple stakeholders, and engage the private sector in expanding energy-efficient infrastructure nationwide. As Mexico is widely regarded as a leader in economic development policy, especially in Latin America, the lessons and insights generated by the pilots could inform the design and implementation of similar mechanisms for scaling up energy-efficient investment across the region.

299 Currently, four to five national firms receive the contracts for all solid waste management projects

## References:

- INEGI. 2016. Encuesta Nacional Ingreso y Gasto de Hogares 2016. Mexico City, Mexico. Mexico Informal Transit Reform Support (P156729)
- OECD. 2015. OECD Urban Policy Reviews: Mexico—Transforming Urban Policy and Housing Finance. Paris: OECD.
- PAD Improving Access to Affordable Housing Project (P157932)
- PAD Municipal Energy Efficiency Project (P149872)
- PAD Reform of the Federal Support Program for Mass Transit (P165724)
- PCN National Integrated Solid Waste Management (P154801)
- SEDATU (Secretaria de Desarrollo Agrario, Territorial y Urbano). 2013. Programas Nacionales de Desarrollo Urbano y de Vivienda 2013–2018. Mexico City, Mexico: SEDATU. [http://www.economia.unam.mx/cedrus/descargas/PNDUyV\\_PNDUV\\_Corregido.pdf](http://www.economia.unam.mx/cedrus/descargas/PNDUyV_PNDUV_Corregido.pdf)
- SENERMEX. 2013. Proyecto de Transporte Masivo de Pasajeros en la Modalidad de Tren Ligero entre los Municipios de Zapopan, Guadalajara y Tlaquepaque, Jalisco. México.
- World Bank, 2016. Mexico Urbanization Review- Managing Spatial growth for Productive and Livable Cities in Mexico
- SEDESOL and CONAPO (Consejo Nacional de Población). 2012. Sistema Urbano Nacional. Mexico City, Mexico: SEDESOL.







# 13. Further strengthening fiscal sustainability with equity

**F**iscal policy has been a core pillar to maintain macroeconomic stability in Mexico. In the context of the fall in commodity prices, the country pursued prudent policies, including through a comprehensive tax reform in 2013 and measures to contain and enhance the efficiency of public spending taken between 2015 and 2017. Mexico's fiscal stance remains strong and sustainable, but it faces secular pressures in non-discretionary spending driven by a combination of demographic change, policy commitments and systemic budgetary rigidities. As population's aspirations rise, there are higher pressures on public service delivery. Moreover, higher growth rates over the medium term require a higher level of public infrastructure investment (complemented with private resources). To open the fiscal space for these pressures, efforts will need to continue to identify technical and allocative efficiencies and fiscal savings on the spending side, while also planning the next wave of tax reforms. Tax collection in Mexico remains below the LAC regional average and is the lowest among OECD countries. Even after the highly positive 2013 reforms, extensive tax expenditures (e.g., exemptions, zero rates, deductions) continue to impose major fiscal costs and could be significantly reduced while guarding for equity impacts. There is a growing digital economy that remains untaxed, presenting an opportunity for a new revenue base that did not exist years ago. Fiscal savings on the spending side can be harnessed while improving efficiency and not harming equity in public sector procurement and by streamlining overlapping transfer programs. There are also efficiency gains in reducing fragmentation in the health sector. Efficiency in managing public infrastructure is key as more fiscal space is opened for this needed outlay. More broadly, significant progress has been made in establishing a solid fiscal responsibility framework, though enhancement to that framework coupled with the establishment of an independent fiscal council could signal a continued strong commitment to fiscal discipline.

## CONTEXT AND RECENT DEVELOPMENTS

347. **Fiscal policy has been a core pillar to maintain macroeconomic stability in Mexico.** The fiscal authorities have been successful in accommodating public expenditures to available revenue. Robust performance of public revenue, combined with moderate additional deficit financing, enabled the government to substantially increase public expenditures over the past 15 years (Figure 57). Following the global financial crisis, a widening gap between revenues and expenditures increased the public debt-to-GDP ratio. More recently, falling oil revenue required significant fiscal adjustments, which have been applied adequately: (i) by fully implementing a tax reform designed in 2013 to keep up with growing spending pressures; and (ii) by taking measures subsequently to control and reduce spending. The cumulative effect of fiscal consolidation enabled the government to achieve a primary surplus in 2017 and to set the debt-to-GDP ratio on a declining path. These actions permitted the country to weather a difficult time for the Latin American region and many commodity-exporting emerging market economies (Figure 58).

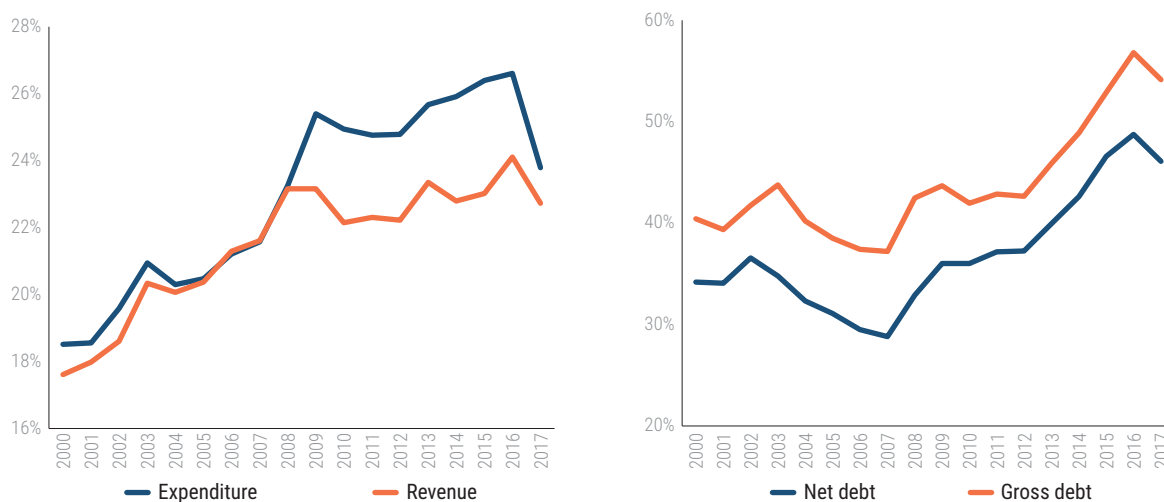
348. **The comprehensive tax reform package of 2013, helped to boost non-oil tax revenue by more than 3 percentage points of GDP.** Successive governments revised the tax regime in 2007, 2009, and 2013, eliminating exemptions, introducing new taxes, and increasing tax rates. These changes, coupled with improvements in tax administration, significantly boosted tax revenue. The relatively steady growth of tax revenue stands in contrast to the volatility and secular decline of oil revenue. The share of non-oil tax revenue in the federal public-sector budget increased from 42 percent in 2008 to 58 percent in 2017, while oil revenue decreased from 37 percent to 17 percent over the same period. The 2013 reforms were designed to raise revenue to address rising public

spending pressures and create the fiscal space necessary to finance additional public investment while reducing the public debt-to-GDP ratio. A subsequent sharp drop in global oil prices as of the second half of 2014 and a continued decline in the volume of oil production led to falling oil revenue largely offsetting the significant rise in non-oil revenue.

349. **Measures to contain and enhance the efficiency of public spending were taken between 2015 and 2017.** These measures included a significant containment of the public-sector wage bill and a consolidation in federal programs for current spending subsidies and transfers. These public spending adjustments in response to falling oil revenue present a valuable opportunity to lock-in efficiency improvements. Despite the needed measures, the consolidation also relied heavily on cuts to public investment, with potentially negative implications for medium-term growth. Public debt in Mexico started to stabilize and more recently to decline, leading the way among emerging and developing economies. All this occurred while the economy continued to grow close to its average pace.

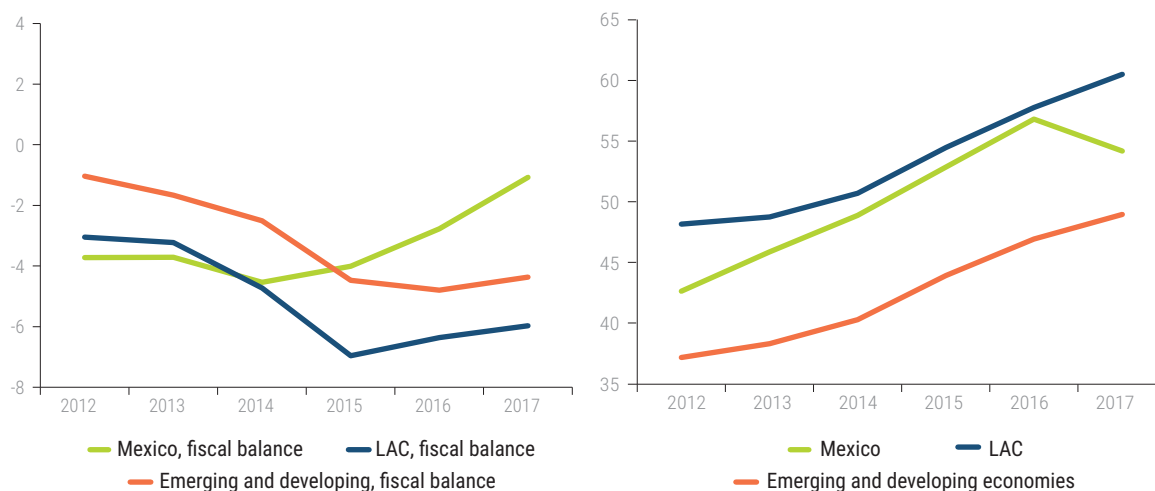
350. **Mexico's fiscal stance remains strong and sustainable, but managing secular public spending pressures and significant investment needs will pose an increasingly complex challenge over the medium term.** Mexico faces a secular increase in non-discretionary and inflexible expenditures driven by a combination of demographic change, policy commitments and systemic budgetary rigidities. As population's aspirations rise, there are higher pressures on public service delivery. Moreover, to support higher growth rates over the medium term, a significantly higher level of public infrastructure investment (complemented with private resources) will be needed. To open the fiscal space for these pressures, efforts will need to continue to identify technical and allocative efficiencies and fiscal savings on the spending side, while also planning the next wave of tax reforms.

**Figure 57: Federal Public-Sector Revenue and Expenditure and Federal Public-Sector Debt, 2000-2017 (% of GDP)**



Source: Bank staff estimates based on SHCP, INEGI and IMF

**Figure 58: General Government Fiscal Balances and Gross Government Public Debt, 2012-2017 (% of GDP)**



Source: IMF, World Bank estimates

## KEY CHALLENGES

### Domestic Revenue Mobilization.

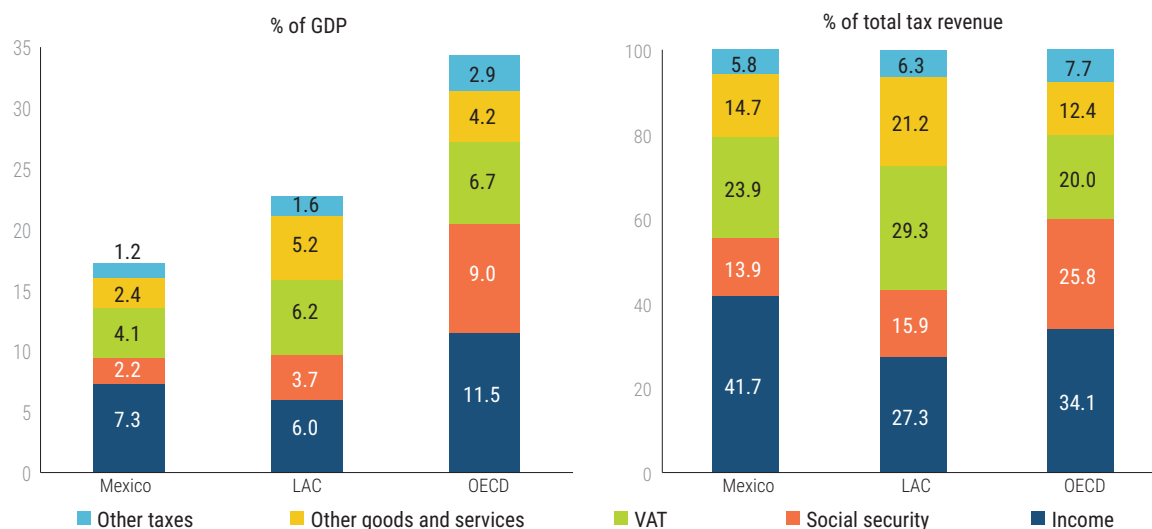
**351. In 2013, a comprehensive tax-reform program significantly increased nonoil tax revenue.** The reforms eliminated tax benefits and preferential tax regimes, limited tax deductions, introduced dividend and capital gains taxes, raised the top marginal income tax rate, and replaced the tax regime for small businesses. The reforms also eliminated a preferential VAT rate that had been applied in border regions. They introduced new excise taxes on carbon, sugar-based beverages and high-calorie foods. The negative excise tax on domestic fuel sales was phased out in the context of low international oil prices and energy-sector reforms. The federal government's non-oil tax revenue rose from 10 percent of GDP in 2013 to 13.1 percent in 2017. Rising income tax collection contributed 1.4 percentage points of GDP to the increase in non-oil tax revenue, fuel excise taxes contributed 1.0 percentage point, VAT contributed 0.3 percentage points, and other excise taxes contributed the remaining 0.2 percentage points. The total increase in non-oil tax revenue largely offset a decline in oil revenue equal to 4 percentage points of GDP.

**352. Nevertheless, tax collection in Mexico remains below the regional average and is the lowest among OECD countries.** International comparisons of tax collection employ a broad concept of tax revenue, which includes social security contributions and subnational taxes. Under this definition, Mexico's tax-to-GDP ratio increased from 13.4 percent in 2010 to 17.2 percent in 2016. However, during this period average tax-to-GDP ratios also increased among other countries in the region, and Mexico's tax burden remains below the Latin America and the Caribbean (LAC) regional average of 22.7 percent. Mexico's tax-to-GDP ratio is also the lowest among OECD countries, amounting to just half the OECD average of 34.3 percent.

**353. Moreover, Mexico's tax structure relies heavily on income taxes compared to relevant peers.** Income tax revenue makes up nearly 42 percent of Mexico's total tax revenue, well above the averages for both the LAC region and the OECD. By contrast, Mexico derives less than 40 percent of its revenue from indirect taxes, whereas these taxes account for over half of revenues in LAC countries (Figure 58). Mexico's tax structure reflects differences in its revenue-generating capacity and has economic and distributional implications. For example, due to broad exemptions and zero-rating in the VAT regime, Mexico collects only 31.5 percent of the revenue that it could theoretically collect if VAT was applied at the standard rate to all goods and services. By contrast, this VAT Revenue Ratio is 42.6 percent in Colombia, 55.1 percent in Peru and 64.4 percent in Chile. Furthermore, Mexico's personal income tax reduces gross income inequality more than any other system in Latin America.<sup>300</sup>

**354. Even after the positive 2013 reforms, extensive tax-expenditures continue to impose major fiscal costs.** Tax expenditures include exemptions, deductions, deferrals, and preferential rates applied to specific activities or types of taxpayers. Forgone revenue through tax expenditures is estimated at 3.7 percent of GDP. Tax expenditures are incurred, *inter alia*, through exemptions and zero-rating in the VAT regime (1.5 percent), since 2017, through a discount to the excise tax on fuel (0.7 percent), exemptions to wage income (0.4 percent of GDP) and pension income (0.2 percent), a negative income tax designed to encourage formal employment (0.2 percent).

**355. In addition, tax evasion continues to inflict significant revenue losses, although they have been declining in recent years.** These losses were estimated to be close to 2.5 percent of GDP in 2016, of which income tax evasion amounted to 1.5 percent of GDP and VAT evasion amounted to 1.0 percent. However, tax evasion appears to have fallen

**Figure 59: Tax Structures in Mexico, Latin America and the Caribbean, and the OECD, 2016**

Source: OECD et al. (2018)

significantly over the past few years, likely due to improvements in tax administration.

**356. Liberalization of domestic fuel prices facilitates a change to a more efficient fixed excise tax and lock in revenue levels.** Prior to 2017, when the government liberalized the retail fuel sales market, the domestic sale prices for gasoline and diesel were administratively determined. As the final sales prices were fixed, any change in the underlying international reference prices was reflected in a variation in the (implicit) excise tax. High oil prices between 2006 and 2014 effectively led to a negative fuel excise tax, whereas a subsequent drop in international oil prices turned the tax positive again, generating average revenue equal to 1.3 percent of GDP in 2015 and 2016. Upon the gradual liberalization of the fuel retail sales market during 2017, the variable fuel excise tax was replaced by a fixed per-unit excise tax. To moderate the initial effect and to smooth the impact of variations in international reference prices on retail sales prices, the authorities adjusted fuel excise taxes on a weekly basis in 2017 and 2018 by applying a variable discount to the excise tax, which resulted in a costly tax expenditure of 0.7 percent of GDP in 2017.

**357. Technological progress poses new challenges to include a growing digital economy in the country's tax base.** Following global trends, Mexico's digital economy is growing rapidly, supporting economic development more broadly. Although from a low base, between 2010 and 2016, the share of the adult population that had ordered goods or services online increased by a factor of 4.5, the largest such increase of all OECD countries. Meanwhile, it has been estimated that Mexico's business-to-consumer (B2C) e-commerce market could grow to \$40.8bn by 2019, of which nearly two thirds would consist of digital services.<sup>301</sup> New market entrants armed with disruptive technologies can increase the choice, improve the quality, and reduce the price of inputs to firms and of goods

and services to final consumers in Mexico. Coupled with rapid increases in fixed internet and mobile broadband penetration, these market dynamics mean that more and more consumers are in a position to reap the benefits of the digital economy. Typically, digital services consumed in Mexico are subject to VAT, whether provided by a foreign or domestic supplier, with the obligation to collect and remit the VAT on the seller or the resident importer in the case of purchases from abroad. Since in the case of digital services there may be no business need for foreign suppliers to establish a physical or legal presence in the country, there is not necessarily an entity that charges and remits the VAT owed on digital services imported by final consumers, and that revenue is effectively foregone by the Mexican authorities. Moreover, since Mexican-resident firms selling digital services in the domestic market are obliged to collect VAT on their sales, they may be at a pricing disadvantage vis-à-vis non-resident competitors.

## Expenditure policy

**358. Mexico's federal public-sector expenditures have increased substantially over the years, and pressures will continue to mount.** The country experienced a secular increase in public spending driven by a combination of policy decisions, demographic trends, legacies, and other spending rigidities. This has resulted in a decade-long rise in health, education, social protection, and public security spending. The number of people aged 65 and older will more than double to 18.4 million over the next two decades and pension costs on the federal public-sector budget, due to this increase in the number of elderly combined with the favorable treatment of this cohort in past pension reform, is projected to increase by about 1 percent of GDP per decade before ultimately peaking between 2040 and 2050. Population aging is also intensifying pressure on Mexico's public healthcare system by shifting the disease burden to chron-

**Table 2 : Public Expenditure, 2014-2017 (% of GDP)**

	2014	2017	change
Total	25.9%	23.8%	-2.1%
Wages and salaries	5.8%	5.3%	-0.6%
Other operating costs	5.8%	5.7%	-0.1%
Subsidy and transfer programs	3.8%	3.1%	-0.7%
Physical investment	4.7%	2.6%	-2.1%
Other capital expenditures	0.4%	1.0%	0.6%
Participaciones	3.3%	3.5%	0.2%
Interest payments	2.0%	2.5%	0.5%

Source: Bank staff estimates based on SHCP and INEGI

ic degenerative diseases, with population aging accounting for nearly 60 percent of the increase in public health spending to 3.1 percent of GDP in 2015 and an increase by 0.5 percent of GDP over the previous decade. These long-term trends underscore the importance of improving the efficiency and effectiveness of public expenditures.

**359. Expenditure rationalization over the past few years took place across several categories, but it hit hard public investment.** Spending containment and cuts took place on subsidy, transfer programs, and the public-sector wage bill. However, general government public investment (including federal investment projects and transfers for state and municipal investments) was affected significantly, dropping from 4.7 percent of GDP in 2014 to 2.6 percent in 2017 (Table 1). These cuts also included PEMEX capital expenditures, potentially affecting its future production capacity.

**360. The Mexican budget contains a relatively high degree of expenditure rigidity that limits the ability of policymakers to rapidly shift budget resources in response to changing circumstances.** Budget rigidities come as legal and contractual obligations, such as pension payments, wages and salaries of public sector workers, and transfers to subnational governments, other entitlements that are extremely difficult to alter in practice, and interest payments. The lack of flexibility in the level and composition of spending may undermine the quality of fiscal adjustment efforts in the future, as expenditure cuts will fall hardest on those sections of the budget that can be more easily modified, such as public investment.

## Fiscal Framework

**361. Recent modifications to the Federal Budget and Fiscal Responsibility Law strengthened the fiscal policy framework, but some enhancements to the framework may be warranted.** Amendments to the LFRH in 2014, *inter alia* (i)

set an explicit annual target for the Public-Sector Borrowing Requirement (PSBR), which is more comprehensive measure of the federal public-sector balance; (ii) capped current expenditure growth to avoid a procyclical expansion of public spending in times of revenue buoyancy; and (iii) specified the amount of resources to be transferred annually to the budget from a newly created sovereign wealth fund, the Mexican Petroleum Fund (*Fondo Mexicano de Petróleo*, FMP). Between 2015 and 2017, the government met its annual targets for the PSBR and respected the cap on current expenditures. Nevertheless, use of the escape clause to the balanced-budget rule in 2014<sup>302</sup> pushed the PSBR targets for 2015 and 2016 to levels that were incompatible with reducing the debt-to-GDP ratio. Moreover, the frequent use of this clause may indicate that the framework has some limitations enabling a countercyclical stance in the future.

## POLICY OPTIONS

### Tax Policy

**362. Revenue-enhancing tax reforms could ease fiscal pressures, finance new government programs, and address infrastructure gaps as well as competitiveness, productivity and equity challenges.**

**363. Reducing tax expenditures** (i.e., eliminating exemptions, deductions, and preferential rates in the income tax and VAT regimes) would broaden the tax base and increase revenue collection. The government could use the additional revenue to ease fiscal pressures, finance additional spending (including compensatory programs), lower statutory tax rates, and/or increase the personal income tax threshold. The proliferation of special provisions in both the income tax and VAT regimes pushes Mexico's tax revenue below the regional average. Though typically justified by worthwhile objectives, tax exemptions, deductions, and preferential regimes reduce fiscal revenue, distort market prices, encourage tax evasion and avoidance, and in many cases do not meet intended objectives.

**364. When designing reforms that broaden the tax base, policymakers should consider including efficient compensatory mechanisms to offset any negative impact on poor households.** Many exemptions, deductions, and preferential regimes are designed to combat poverty or reduce income inequality. However, the rise of targeted cash-transfer systems has made these types of tax expenditures largely obsolete. As tax expenditures are reduced or eliminated, cash transfers can be used to compensate poor households for any increase in their tax burden.

**365. The discount on the fuel excise tax could be phased out and be replaced with more permanent approach.** Imposing a fixed excise tax on fuel while allowing its sales price to

<sup>302</sup> The escape clause to the balanced budget rule had previously been invoked in 2010 following a sharp contraction in economic activity because of the global financial crisis. The use of the escape clause allows an increase in deficit financing, which should be phased out gradually over a three-year period.



vary with market conditions would be consistent with international good practices. The purpose of the excise tax should be to internalize the social costs of fuel consumption, including air pollution, traffic congestion, and greenhouse gas emissions. As part of the transition to retail fuel price liberalization, the authorities have adjusted the fixed excise tax on a weekly basis since 2017 by applying a discount to the legally established excise tax rate. While these discounts have smoothed the impact of changes in the international reference price on domestic retail sales prices, they can only do so by reducing the applicable excise tax. Excessive price volatility may require more symmetric smoothing mechanisms. For example, Chile has established a Mechanism for Stabilizing Fuel Prices (*Mecanismo de Estabilización de Precios de los Combustible*, MEPO) based on a fuel excise tax with both a fixed and a variable component. Unlike the Mexican system, which applies only discounts to the excise tax, the variable component of the MEPO includes both discounts and surcharges. Under a perfectly designed smoothing mechanism, these excise surcharges and discounts would cancel each other out over time.

**366. The tax authorities could raise revenues and level the playing field between domestic and non-resident suppliers of digital services by fostering reforms to tax more actively the digital economy.** Some key reforms could include (i) enlist providers of platform-enabled services to report transactions of individual service providers, prefill tax declarations or withhold and remit value added and income taxes owed by these service providers, (ii) require foreign digital service providers to final consumers to withhold and remit VAT on those transactions by facilitating the registration of these firms for VAT purposes, or by transferring the responsibility for withholding and remitting the VAT on these transactions to financial intermediaries, (iii) amend permanent establishment rules to include “significant economic presence” in domestic legislation and renegotiate double taxation agreements accordingly to start collecting income tax on income generated by virtual establishments from their business in Mexico or, in the meantime, introduce a free standing charge on the turnover of these companies withheld and remitted by businesses with a permanent establishment in Mexico.

### *Expenditure policy*

**367. To accommodate medium-term fiscal pressures and create fiscal space for public investment, further technical and allocative efficiency measures will be needed.**

**368. Efforts to contain the growth of the wage bill should not exacerbate distortions by incentivizing the use of temporary workers or disparities in the central pay scales.** Asserting greater control over the temporary personnel budget would be an important first step in containing the growth of the wage bill. Increased demand for temporary staff is partly the result of tighter controls on the creation of permanent positions, as well as the assignment of new mandates and responsibilities to federal institutions. However, over-reliance on temporary workers has poten-

tially negative implications for the efficiency of the public administration, and the use of temporary employees to perform staff functions represents a potential legal and financial liability for the government. At the same time, marginally accelerating the attrition of administrative staff would enable the creation of new positions in the areas of greatest need. As most of the federal workforce is assigned to administrative roles, reintroducing the voluntary retirement program for administrative staff may create space to introduce new positions to fill identified skills gaps. A centralized payroll database would enable more frequent analyses of the federal workforce, enhance transparency, facilitate comparisons between budgeted and actual compensation, and provide more detailed and disaggregated information to inform human resource policies.

**369. Public procurement could generate additional fiscal savings.** While a comprehensive analysis for the identification of specific areas to gain fiscal savings in public procurement is needed, experience across countries show this is possible by mainstreaming framework agreements and better using the purchasing power of the public sector. In the case of Mexico, this would need to be accompanied by better linking public procurement processes to expenditure budgeting and outlay systems.

**370. Further consolidation of public sector programs is needed.** Rationalization efforts will be necessary to reduce beneficiary duplication, redundancy, fragmentation and systemic costs. A proliferation of programs occurred throughout the public sector, though this phenomenon has been particularly marked in the areas of social protection, rural development and small and medium enterprise (SME) support. Highly effective programs could be scaled up, while underperforming programs should be eliminated, and programs with similar objectives could be consolidated to leverage economies of scale. This effort will also require the establishment of a single registry and identification number system for all beneficiaries across all programs. Sector specific recommendations on enhancing the efficiency and effectiveness of public sector spending can be found in the sectoral policy notes on Health, Education, Social Protection, Productive Landscapes and Productivity as well as the Mexico Public Expenditure Review (World Bank, 2016).

**371. Efficiency in managing public infrastructure is key as more fiscal space is opened for this needed outlay.** There has been significant progress in this area, particularly under the leadership of SHCP work, but further efforts are needed to consolidate the strategic planning of public investment across areas. This would include having a cross-sectoral national master plan that establishes key federal priorities and also takes into account the more sizable sub-national projects that typically may have externalities across state jurisdictions. Building a master plan and a proper pipeline of projects requires significant effort and clear and transparent criteria, as these plans typically go beyond a single administration. This planning, would enable a more strategic targeting of the limited budget for investments and a better use of additional resources as the fiscal space opens for more

infrastructure spending. The whole cycle of the Public Investment Management (PIM) would also need to be streamlined. This includes increased coordination among federal agencies, with a fully empowered lead planning entity, and better coordination between federal and sub-national entities.

**372. Promoting coordination and transparency in evaluating and reporting on PPPs can help maximize value-for-money and reduce fiscal risks.** The decline in public investment has led to an increased reliance on private sector participation for the delivery of public infrastructure projects. In 2017, total private participation in infrastructure reached \$8.6bn, surpassing the previous peak of \$6.5bn seen in 2007. Once largely focused on toll roads, these investments have become more diverse. The mobilization of private participation in infrastructure could be expanded even further to support the public sector in this area. But a number of issues need to be streamlined. At present, the authorities are obliged under the PPP Law to prepare a comparative assessment of financing a project via PPP vis-a-vis financing it through public procurement. To improve transparency and accountability, consideration should be given to publishing these assessments alongside the cost-benefit analyses already made available on the *Obra Pública Abierta* database. In addition, systematic reporting on longer-term budget commitments, terms in the contracts that could impact future payments or revenues, and other contingent liabilities should be part of decision making process and the periodic budget documentation. Given the decentralized nature and limited coordination of the investment process, it is harder for suitable private entities to find opportunities for PPPs. A clearer and defined pipeline of projects, with some centralized reporting would help, among other measures, in reducing information asymmetries and coordination problems.

## Fiscal Framework

**373. It would be prudent to maintain a target of the PSBR (maximum) at 2.5 percent of GDP.** Given the rising costs of debt and with current macroeconomic assumptions, Mexico's debt-stabilizing primary surplus would need to be around 0.8 of GDP.<sup>303</sup>

**374. Significant progress has been made in establishing a solid fiscal framework, though some adjustments to the framework may signal a continued strong commitment to fiscal discipline.** The 2014 LFPRH called for an annual numerical target and an indicative multi-year path for the PSBR to complement the traditional budget balance. Without changing the current framework, a positive development would be to establish the fixed numerical cap of the PSBR (consistent with a downward-sloping debt path) in legislation, as a signal of a continued strong fiscal policy anchor moving forward. This could be complemented with tighter criteria on the use of the escape clause. A deeper adjustment to the fiscal rule framework, with the aim to enhance

its pro-cyclicality power while preserving sustainability would be a combination of an adjusted expenditure rule (i.e, some adjustments to the existing expenditure rule) and an explicit ceiling on the public debt-to-GDP ratio. This could be complemented with corrective measures at certain thresholds of debt to GDP below the ceiling. Yet another alternative would be to simply add the debt ceiling to the existing framework. The authorities could also consider lowering the threshold for longer-term oil-rent savings now that oil revenue has fallen to less than half its previous level. The FMP saves all revenue from oil and gas exploration and extraction contracts above the current threshold of 4.7 percent of GDP, while revenue below the threshold is transferred to the Treasury. The current threshold reflects the level of oil revenue received by the federal government in 2013. The FMP began operating in 2015, when oil revenue had already declined from its 2013 level. Less than 2 percent of GDP in oil revenue accrued to the Treasury each year, and the FMP therefore accumulated no savings between 2015 and 2017. Lowering the threshold would attenuate the distortive impact of oil revenue on the budget, which is likely to become more pronounced as oil revenue rebounds.

**375. Mexico's fiscal framework could be complemented by the establishment of an independent fiscal council that promotes sound fiscal policies through independent oversight.** Fiscal councils have been adopted by different countries around the world in addition to fiscal rules over the past few decades as an institutional device to strengthen the credibility of governments' commitment to sustainable public finances. Despite a diversity of institutional arrangements, a fiscal council is generally defined as a permanent agency with the mandate to assess publicly and independently government's fiscal policies and performance against macroeconomic objectives related to long-term fiscal sustainability and medium-term macroeconomic stability.

303 Estimates of the fiscal adjustment necessary to maintain medium-term debt sustainability are highly sensitive to the underlying assumptions regarding the current debt-to-GDP ratio, the interest rate, and the economic growth rate.



## References

- Cetrángolo, Oscar, Juan Pablo Jiménez and Ramiro Ruiz del Castillo. 2010. "Rigidities and fiscal space in Latin America: a comparative case study." Santiago, Chile: La Comisión Económica para América Latina y el Caribe (CEPAL).
- Escolano, Julio. 2010. "A Practical Guide to Public Debt Dynamics, Fiscal Sustainability and Cyclical Adjustment of Budgetary Aggregates." Washington, DC: IMF.
- OECD, et al. (2018), *Revenue Statistics in Latin America and the Caribbean 2018*, OECD Publishing, Paris. [http://dx.doi.org/10.1787/rev\\_lat\\_car-2018-en-fr](http://dx.doi.org/10.1787/rev_lat_car-2018-en-fr)
- Secretaría de Hacienda y Crédito Público (SHCP). 2017. "Presupuesto de Gastos Fiscales 2017." Mexico: SHCP. <https://www.gob.mx/shcp/documentos/presupuesto-de-gastos-fiscales-2017>
- Valencia, Fabian. 2015. "Strengthening Mexico's Fiscal Framework" IMF Country Report No. 15/314. Washington D.C. IMF <http://www.imf.org/en/Publications/CR/Issues/2016/12/31/Mexico-Selected-Issues-43399>
- World Bank (2016), "Mexico Public Expenditure Review." Washington D.C. World Bank <http://documents.worldbank.org/curated/en/284151472615491033/Mexico-Public-expenditure-review>





# 14. Improving the Efficiency and Equalization Effects of the Fiscal Federalism Framework

**M**exico's fiscal federalism arrangements underpin the provision of public goods and services by subnational governments (SNGs). Because the decentralization of expenditure responsibilities was not fully supported by a significant decentralization of own revenues, among other factors, Mexico's intergovernmental fiscal model is characterized by large vertical gaps (between the expenditure needs and own-source revenue capacity of SNGs) and horizontal gaps (among states' capacity to cover their spending needs). A first key step would be to help narrow the vertical gap, through improved collection of key existing levies such as the property tax, which collects much less than in comparable countries. Other policies could follow, including the creation of SNG surcharges (piggybacks) on federal income or additional indirect taxes. A second key step, would be to enhance the efficiency of federal transfers and place a stronger emphasis on equalization across states. The "Aportaciones" transfers (primarily focused on health and education) could be allocated with stronger spending needs criteria and more purposeful equalization adjustments. Over the medium term, the unconditional revenue-sharing transfer (Participaciones) could be further enhanced to more strongly reflect local expenditure needs, fiscal capacity, and fiscal effort. The government could reduce or re-shape existing discretionary transfers to subnational entities such as Ramo 23, turning them into formula based capital transfer or matching grant to support strategic investments. The government has begun implementing a new and highly improved legal framework for fiscal discipline of subnational governments. Consolidating this framework will require strengthening enforceability mechanisms, improving SNGs' financial reporting and accounting systems, making specific technical adjustments to the regulation, and eliminating SNGs' recourse to extraordinary transfers from the federal government.

## CONTEXT AND REFORM PROGRESS

376. **Mexico's subnational governments (SNGs) play a critical role in public spending.** Throughout the 1990s and 2000s, the federal government transferred substantial responsibility for providing essential public goods and services, such as education, health, and basic infrastructure, to SNGs. Whereas SNGs were responsible for 20 percent of all public spending in the 1990s, by 2016 this share had risen to over 50 percent. Consequently, ensuring that public spending effectively supports economic growth will require improving expenditure efficiency among SNGs. Moreover, equalizing the spatial distribution of fiscal resources among SNGs could help alleviate Mexico's large regional socioeconomic disparities, improving fiscal equity and service delivery to reduce poverty and foster long term growth.

377. **During the last decade, the government implemented multiple reforms to the fiscal decentralization framework designed to increase SNGs' tax revenues, strengthen the equalization effect of intergovernmental transfers, promote expenditure efficiency, and**

378. **tighten fiscal discipline among SNGs.** In 2007, the government adjusted the assignment of tax bases, and modified the distribution criteria for unconditional revenue-sharing transfers (*Participaciones*) and several of the major conditional earmarked transfers (*Aportaciones*) that support decentralized service delivery. The changes to the distribution formula for *Participaciones* favored regional fiscal equalization and introduced incentives to improve SNGs' tax collection. To promote expenditure efficiency and fiscal equalization, *Aportaciones* were modified to incorporate demand-side distribution criteria. Further modifications were made in 2014, including important adjustments to the transfer supporting decentralized education services. Meanwhile, the authorities devolved responsibility for property tax (*Predial*) and vehicle tax (*Tenencia*) to state governments in 2012 and established an excise tax on gasoline to be collected by the federal government and transferred to state governments. Between 2015 and 2017, the government passed a landmark Fiscal Responsibility Law for Federative Entities<sup>304</sup> and Municipalities (*Ley de Disciplina Financiera para Entidades Federativas y Municipios*, LDFEFM) and its implementing regulations in an effort to ensure fiscal sustainability among SNGs. The implementation of the new regulatory framework for controlling SNG indebtedness began in 2018. The statutory requirements of the LDFEFM become binding of state governments in 2018 and local governments in 2019.

379. **Despite these reforms, Mexico's intergovernmental fiscal framework remains characterized by a large asymmetry between revenue and expenditure decentralization, as well as substantial regional disparities in the provision of public**

**goods and services.** Improvements in subnational tax-revenue collection have been modest, and a heavy dependence on intergovernmental transfers weakens SNGs' incentives to improve their own-source revenue capacity. In addition, despite improvements, intergovernmental transfers still have limited equalization impact, perpetuating the large regional disparities in public spending across states.

380. **This policy note outlines reform options to improve SNG tax collection, enhance expenditure efficiency, and further adjust intergovernmental transfers to promote equitable service delivery.** The proposed option for reform are designed to consolidate the LDFEFM, strengthen regulatory compliance among SNGs, and reinforcing subnational fiscal sustainability. The policy options described below focus on increasing the own-source revenue capacity of subnational governments, improving the ability of intergovernmental transfer mechanisms to promote fiscal equalization, sharpening expenditure-efficiency incentives among SNGs, and strengthening the effectiveness of the LDFEFM in controlling SNG borrowing.

## KEY CHALLENGES

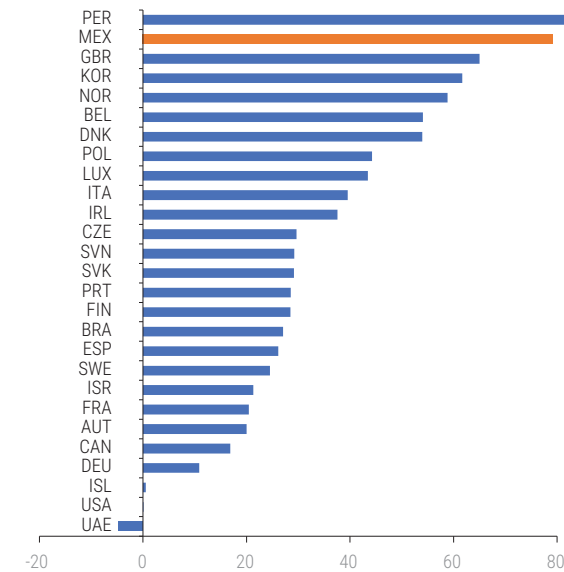
381. **The large vertical fiscal gap is a distinctive feature of Mexico's fiscal decentralization framework.** Since the early 1990s, responsibility for providing education, healthcare, public security, and local infrastructure has been progressively transferred to state governments, while municipalities have become responsible for implementing the bulk of basic social services and urban infrastructure investment. In the 2000s, the rapid expansion of public education and health services, coupled with new demands on the social protection and security sectors, accelerated expenditure decentralization. However, this process was not accompanied by a commensurate decentralization of revenue authority. Whereas SNGs are responsible for over 50 percent of total spending, they collect about 10 percent of total tax revenue—the largest vertical fiscal gap among OECD countries (Figure 60).

382. **While gaps between expenditure and revenue decentralization are common in federal republics or other decentralized public administrations, Mexico's vertical fiscal gap is unusually large and potentially problematic.** Transfers from the federal government account for about 90 percent of SNG revenues. An excessive reliance on transfers weakens the incentives for SNGs to collect own-source revenues, as the costs of public goods are not fully internalized. Consequently, SNG tax collection remains modest despite the expanded tax bases granted to SNGs in 2007.

383. **Mexico's system of fiscal federalism is also marked by large horizontal fiscal imbalances, with important implications for the regional distribution of public goods and services.** The relative economic strength of different regions

304 The phrase "federative entities" refers to Mexico's 32 states.

**Figure 60: Vertical Fiscal Gaps in Selected Countries**



Source: OECD. World Bank staff calculations

and municipalities directly influences local revenue capacity. Per capita state and municipal tax collection in the northeast and center-north regions is 4.5 times the level of the southwest (Figure 61). Mexico City collects 15 times more state and municipal revenues per capita than Chiapas, Oaxaca, and Tlaxcala and over 10 times more than Guerrero and Zacatecas, the states with the lowest levels of subnational tax collection.

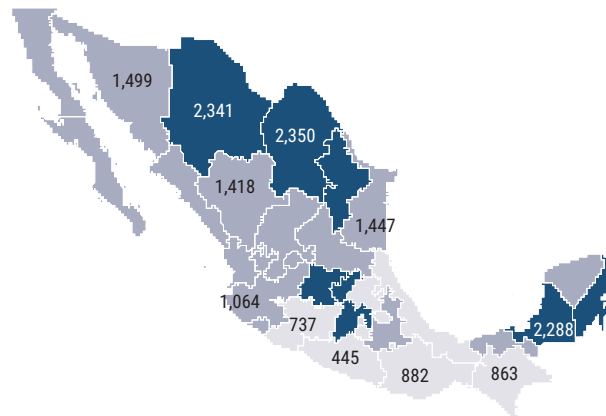
### Subnational Taxation

**384. The federal government has expanded the tax base of states over the last years.** The gradual adoption of the payroll tax (*Nómina*) by state governments, the devolution of the tax on motor vehicles (*Tenencia*) from the federal to the state level, and the imposition of state taxes on specific services have expanded state governments' own-source revenue capacity. In 2012, the federal government transferred the authority to collect the *Tenencia* to the states, including the ability to set the tax rate, but inter-state tax competition greatly reduced this measure's revenue impact. Most states slashed *Tenencia* rates, established exemptions and subsidies that eroded the tax base, or eliminated the *Tenencia* altogether. Overall, the devolution of the tax to the state level reduced *Tenencia* revenue by 30 percent.

**385. However, low levels of subnational tax collection are a persistent feature of Mexico's fiscal federalism system.** Subnational tax revenues amount to less than 1 percent of GDP, with state taxes totaling 0.7 percent and municipal taxes 0.3 percent. This level is far below both the average of over 10 percent for large federations globally and the OECD average of 9 percent. It also fares below LAC federal republics like Argentina (5 percent of GDP) and Brazil (11 percent of GDP).

**386. Low subnational revenue levels reflect the limited tax powers and weak collection efforts of SNGs.** Due to econo-

**Figure 61: Per Capita Own-Source Revenues by State**



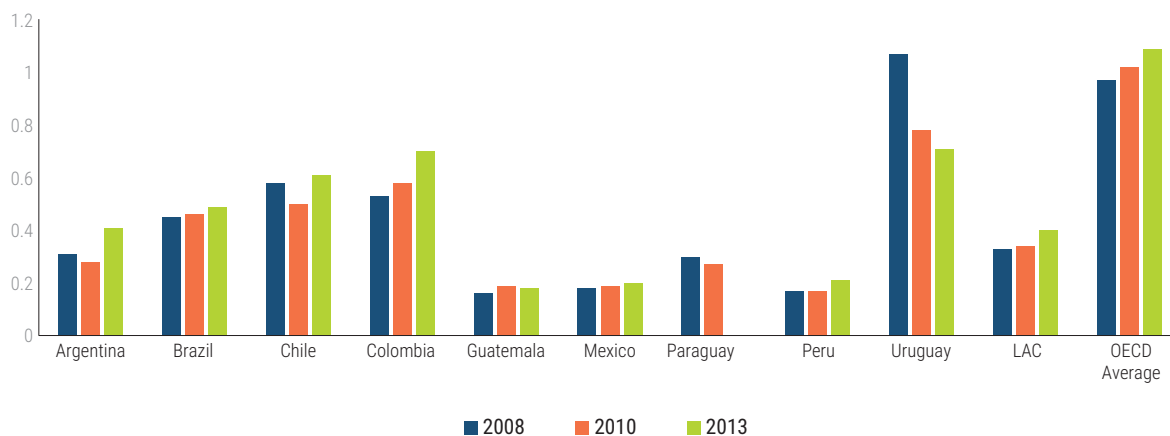
Source: Ministry of finance, SHCP. World Bank

mies of scale and institutional incentives, major tax bases such as personal and corporate income taxes, social security contributions, and broad-based indirect taxes are more efficiently administered at the federal level. Consequently, state governments are relegated to minor tax bases such as payrolls, motor vehicle, and lodging taxes. Municipalities have also narrow tax bases including the property tax (*Predial*) and a real estate transfer tax (*Impuesto sobre Adquisiciones Inmuebles – ISAI*). Mexico's property tax (*Predial*) revenues are low compared to those of other regional and OECD countries. Revenue collected from these taxes amount to 0.3 percent of GDP, below the 0.5 percent level observed in Argentina, Colombia, and Chile and far below the OECD average of 1.9 percent.

**387. Limited institutional and technical capacity reduce the efficiency of property-tax collection.** Municipalities with modest administrative resources have difficulty maintaining up-to-date property registries, or "cadas- ters." Municipal tax-administration units often have few staff with limited technical qualifications, and high fixed costs increase the financial burden of maintaining cadasters in small municipalities. Finally, efforts to update property values and collect property taxes often face political resistance.

### Intergovernmental transfers

**388. Intergovernmental transfers are aimed to help bridge the vast vertical imbalances (i.e., gap between the expenditure responsibilities of SNGs and their limited own-source revenue capacity).** *Participaciones* are the government's primary mechanism for reducing vertical and horizontal fiscal imbalances. Through *Participaciones*, the federal government shares more than 20 percent of its tax revenues (or around 4 percent of GDP) with SNGs. Most of the remaining gap is covered by *Aportaciones*, a set of conditional earmarked transfers that amount to about 5

**Figure 62: Property Taxes in Selected Countries (% of GDP)**

Source: OECD

percent of GDP, which finance basic education, healthcare, security, and social infrastructure. Finally, voluntary grants negotiated between federal agencies and SNGs amount to about 0.5 percent of GDP each year.

**389. But they have very limited equalization power to reduce horizontal imbalances (among SNGs) despite positive reforms.** Established in 1978, the *Participaciones* system was originally designed to compensate SNGs for the centralization of tax bases that were previously within the purview of state governments. The distribution formula of *Participaciones* was revised in the early 1990s and the reimbursable or devolution principle was watered down. In 2007 a new formula was introduced and was based on the state-level economic growth as a proxy for federal collections in each state (devolution component) and for the growth of states' own-source tax collection (tax collection effort incentive) and the level of states' own-source tax collection (compensate for revenue efforts made by the states in the past). A "hold harmless" clause was also introduced to ensure that no subnational entity will suffer an absolute loss relative to the level of transfers it previously received.

**390. Although, that the formula aimed to reward economic activity as a proxy of federal collections in each state and the states' own tax effort, the effectiveness of these terms is muted because these components are weighted by the states' population shares, making unclear the distributive impact of *Participaciones*.** Indeed, because each state's population share directly influences all variables in the 2007 formula, relative population size drives the distribution of *Participaciones*. The population-based component of *Participaciones* has a modest equalizing effect, as a large share of federal taxes is collected in the most-developed regions and distributed across the country on an equal per capita basis. However, the revised formula had not had strong equity impacts, as the distribution criteria had not taken into consideration indicators that reflect expenditure need, economic conditions or the low revenue capacity. Moreover, the hold harmless clause slows down the tran-

sition to an equal per-capita transfer and makes difficult to identify what are the factors driving the horizontal distribution of *Participaciones*. In fact, the overall distribution of *Participaciones* remains regressive, as reflected by the direct relationship between per capita transfers and per capita GDP. In 2016, the amount of *Participaciones* per capita received by Campeche was twice the amount received by Chiapas, Guerrero, and Oaxaca.

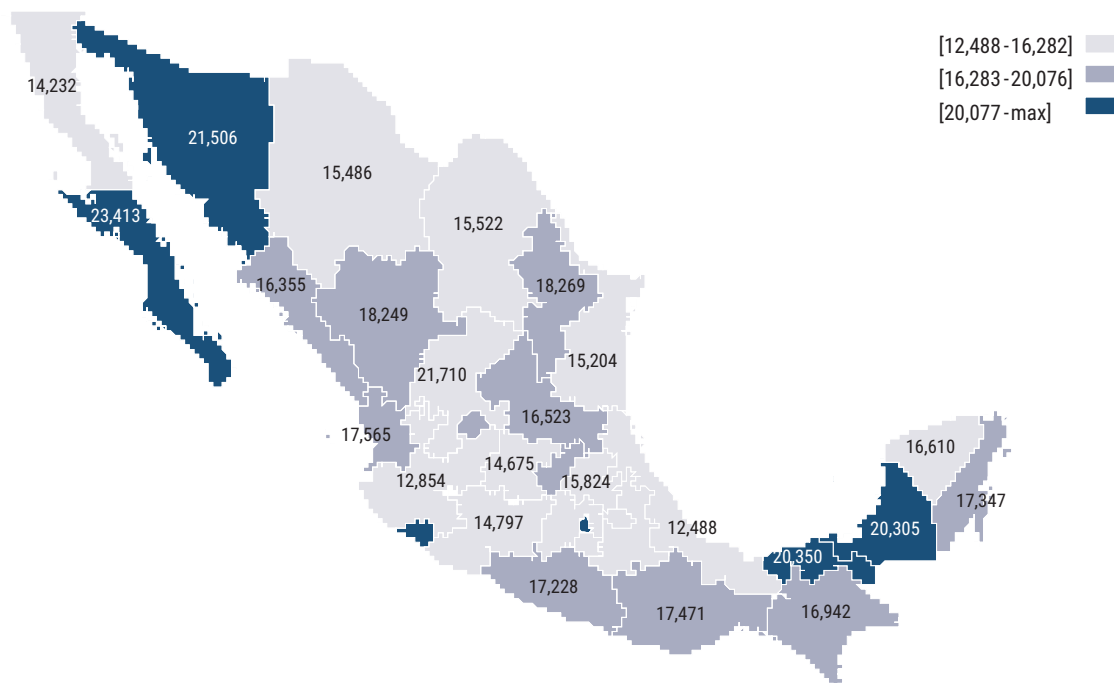
**391. *Aportaciones* were primarily designed to cover the costs associated with the decentralization of public service delivery.** Because they were intended to facilitate the transfer of responsibility for providing public goods and services from the federal government to SNGs, the distribution criteria for *Aportaciones* were driven by supply-side considerations, and an inadequate emphasis on transparency, accountability, and results undermines their efficiency. Moreover, because the distribution criteria were defined at the time when the various services were decentralized, the allocation of *Aportaciones* has a strong inertial component, and costs considerations are often absent from their distribution criteria. Indeed, *Aportaciones* have increased service-delivery costs without generating corresponding improvements in service quality.

**392. Recognizing these limitations, the distribution formula was reformed for the largest *Aportaciones* in an effort to improve their efficiency and equalization effect.** The distribution criteria for the Earmarked Transfer Fund for the Education Payroll and Operating Expenses (*Fondo de Aportaciones para la Nómina Educativa y Gasto Operativo*, FONE)<sup>305</sup> were modified in 2007 to introduce some demand-side considerations. The new FONE distribution formula included the number of students enrolled in basic education, as well as indicators of education quality. A compensatory component was also added the formula to provide additional funds to states with per-student transfers below the national average, and the new formula included a factor designed to encourage SNGs to invest their own resources in education. In 2014, under pressure from states that had had their transfers reduced by the

305 FONE was previously known as the Earmarked Transfer Fund for Basic Education (*Fondo de Aportaciones para la Educación Básica*, FAEB).



Figure 63: Per Capita Total Revenues (after transfers) by State



Source: Ministry of Finance, SHCP. World Bank.

new formula, and recognizing that the reforms had failed to eliminate perverse incentives, the government modified the FONE distribution formula to include both a supply-side component (the teacher payroll and school operating costs) and a demand-side component (the number of students in each state).

393. Much like FONE prior to the 2007 reforms, the distribution formula for the Earmarked Transfer Fund for Health Services (*Fondo de Aportaciones para los Servicios de Salud, FASSA*) is driven by supply-side factors, including the number of decentralized federal health workers and the operating costs of federal health facilities in each state. While FASSA also incorporates equalization criteria, the distribution of resources is largely defined by historical budget allocations, which in turn reflect the supply-side conditions that prevailed when health services were decentralized. Because wealthier regions tend to have larger numbers of federal health workers, more-qualified health workers, and better health facilities, FASSA may have exacerbated regional disparities in health services.<sup>306</sup>

394. However, FASSA's equalizing effects should be assessed within the context of other sources of health financing that interact with FASSA, such as the universal health program, *Seguro Popular*. *Seguro Popular* distributes an amount equal to 0.4 percent of GDP among states based on the size of their uninsured populations. The establishment of *Seguro Popular* and its rapid expansion is gradually correcting the unequal and inertial regional distribution of FASSA transfers.

395. While some *Aportaciones* have clear equalizing effects, the overall system of *aportaciones* does little to correct horizontal fiscal imbalances. The Earmarked Transfer Fund for Social Infrastructure (*Fondo de Aportaciones para la Infraestructura Social, FAIS*) finances investment in social infrastructure by state and local governments via the Social Infrastructure Fund of the States (*Fondo para la Infraestructura Social de Estados, FISE*) and the Social Infrastructure Fund of Municipalities (*Fondo para la Infraestructura Social de Municipios, FISM*). FISM represents about 88 percent of FAIS. FAIS distributes 2.5 percent of federal taxes (equivalent to 0.3 percent of GDP) to the states through a formula based on poverty indicators and unmet basic needs. State governments then distribute funds to municipalities according to a similar formula. However, while FAIS clearly favors less-developed states, it does not necessarily favor less-developed municipalities, as a relatively poor municipality in a relatively wealthy state could receive less than a relatively wealthy municipality in a relatively poor state. Moreover, the loose definition of "investment in social infrastructure" and the fragmentation of resources reduce the efficiency of FAIS transfers, and a World Bank evaluation of FAIS found that it has had a limited impact on monetary and nonmonetary poverty indicators.<sup>307</sup> In addition, the Earmarked Transfer Fund for Strengthening Federative Entities (*Fondo de Aportaciones para el Fortalecimiento de Entidades Federativas, FAFEF*) distributes 1.4 percent of federal taxes (or 0.2 percent of GDP) to the states according to the inverse of their average per capita economic output. However, because FAFEF resources finance SNG debt obligations, pension liabilities, and institutional and

306 For more details on *Seguro Popular*, see Policy Note X on the health sector.

307 World Bank, (2017). *El Efecto del Fondo de aportaciones para la Infraestructura Social FAIS en el Desarrollo Regional de Mexico*. Mimeo. Washington DC: The World Bank.

**Figure 64: State and Local Government Debt, 2005-2016 (MXN billions)**

Source: Ministry of Finance, SHCP

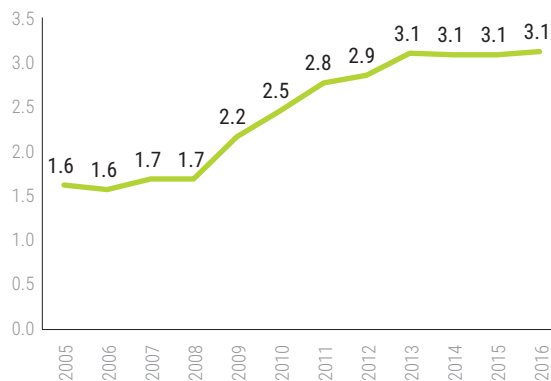
technical capacity-building, the fund has no direct impact on regional fiscal disparities.

396. **The discretionary use of extraordinary federal transfers (e.g., Ramo 23)** may help undermine the credibility of the subnational fiscal-discipline framework. Registered under *Ramo 23*, extraordinary federal transfers managed through agreements between the Federation and state governments create an ad hoc system, with limited efficiency and transparency in the intergovernmental transfer system. They also intensify budgetary unpredictability, and may foster soft budget constraints.

### Subnational Borrowing

397. **Mexico's subnational public debt stock has increased significantly over the past decade.** In the wake of the global financial crisis, the Mexican economy suffered a sharp contraction that negatively affected subnational fiscal and debt dynamics. Between 2008 and 2013, faced with rising spending obligations and a limited capacity to raise own-source revenues, SNGs increased their borrowing to finance widening deficits (Figure 64). The aggregate SNG debt stock rose from 1.7 percent of GDP in 2008 to 3.1 percent in 2013, where it stabilized (Figure 65).

398. **While the total subnational debt stock remains low and is not a source of systemic risk, an increasing number of states have experienced various types of fiscal distress, including rising debt levels, shrinking fiscal space, and liquidity problems.** Poor revenue performance and mounting recurrent expenditure pressures have resulted in declining fiscal balances and high debt levels, while rising debt obligations have further narrowed the fiscal space for investment. Between 2008 and 2012, the number of state governments with debt levels exceeding 50 percent of non-earmarked revenues rose from 7 to 12, and the number with debt levels exceeding 100 percent of non-earmarked revenues rose from 0 to 5. By 2016, 18 state governments had debt levels exceeding 50 percent of non-earmarked revenues,

**Figure 65: The Aggregate SNG Debt Stock, 2005-2016 (% of GDP)**

Source: Ministry of Finance, SHCP

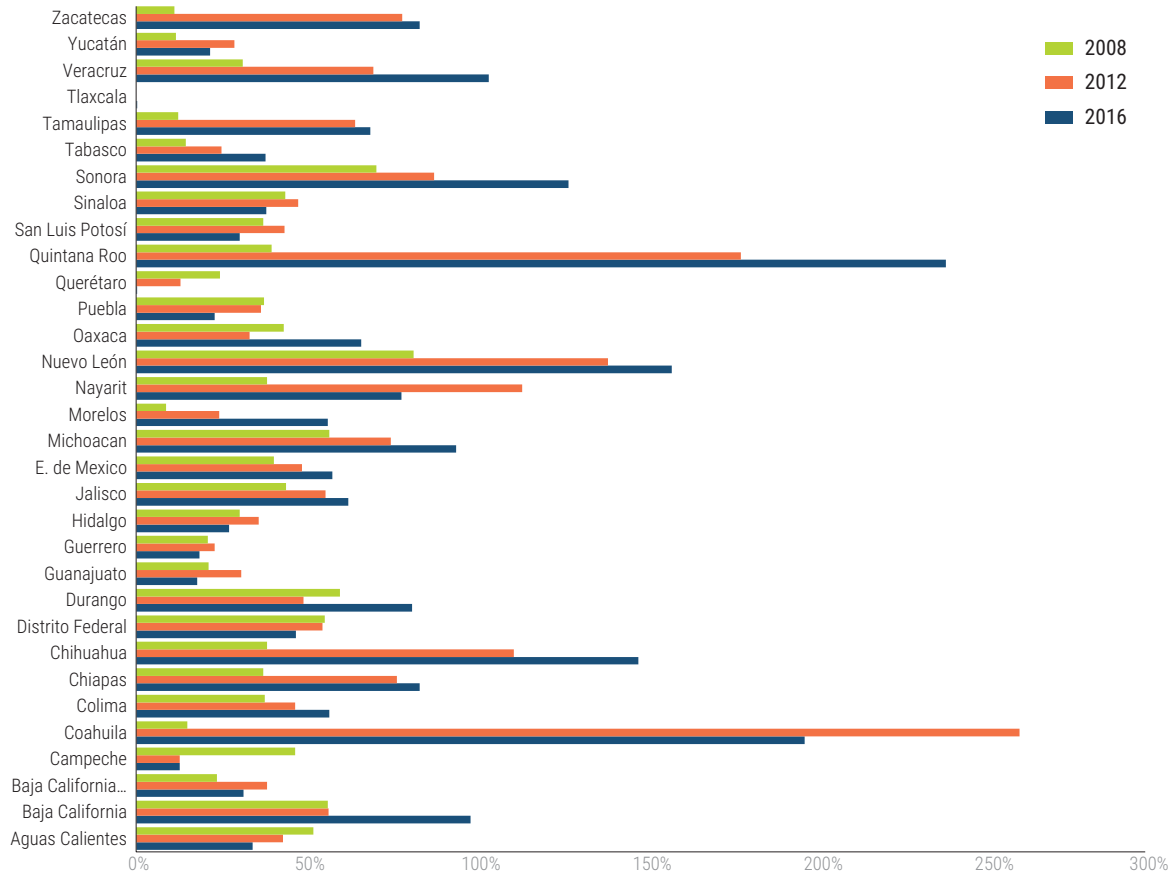
and 7 had debt levels exceeding 100 percent. Moreover, an increasing number of SNGs have faced liquidity problems and financing gaps requiring extraordinary transfers from the federal government.

399. **The new subnational fiscal responsibility law provides the cornerstone for an institutional framework to control SNG borrowing.** In 2015, the government passed a Constitutional amendment granting the federal government the authority to regulate SNG borrowing.<sup>308</sup> This paved the way for the passage of the LDFEFM in 2016, with supplementary regulations approved in March 2017. The LDFEFM provides a sound basis for controlling SNG borrowing and promoting responsible fiscal management. The fiscal rule included in the law is simple and transparent, and compliance is easily verified, which should help stabilize SNG debt over the medium term. The LDFEFM classifies SNG debt levels as either “sustainable,” “under observation,” or “high,” and it defines a fiscal deficit or net financing ceiling for each category. The LDFEFM also allows the federal government to participate in subnational fiscal adjustments and debt-restructuring operations by providing partial federal guarantees on SNG debt to reduce debt-service costs.

400. **However, implementation challenges could weaken the LDFEFM's enforceability and undermine its effectiveness.** The federal government's limited ability to observe and enforce compliance with the LDFEFM—combined with SNGs' variable levels of technical and institutional capacity, data constraints, inconsistencies in public finance accounting rules and practices, and weaknesses in public financial management, especially at the local level—could prevent the full implementation of the new framework. Moreover, the LDFEFM is a numerical fiscal rule, and as such the government will face incentives to use creative accounting to remain within its parameters.

401. **The government may need to adjust the technical design of the LDFEFM's regulatory framework.** The law's pri-

Figure 66: State Government Debt as a Share of Non- Earmarked Revenues, 2008-2016 (%)



Source: Ministry of Finance, SHCP

mary purpose is to control the growth of borrowing and mitigate financial stress among subnational governments. However, the thresholds for classifying the ratio of debt to non-earmarked revenue as either “under observation” or “high” were set at such an elevated level that only one state government was prevented from incurring a fiscal deficit and engaging in net borrowing in 2018. In addition, some provisions of the LDFEFM may be difficult to comply with and monitor.

## POLICY OPTIONS

### Increasing Own-Source Revenue Collection in Subnational Governments

402. **The government could prioritize efforts to strengthen the administration of property taxes.** Whereas small and medium size municipalities lack the resources to ensure efficient *predial* collection, their states tend to have a greater capacity for tax administration. With support from the federal government, administrative cooperation agreements between state and municipal revenue agencies have yielded positive results. The government could build on these recent successes by establishing a national

framework for cooperation between state and municipal revenue agencies, or by developing administrative cooperation agreements for outsourcing tax administration to regional agencies.

403. **Creating national or state fiscal cadasters (while improving the existing ones in larger cities) could greatly improve the efficiency of property-tax administration.** Technological advancements such as satellite imaging have facilitated the creation of more accurate and comprehensive property cadasters. Establishing national or state cadasters could leverage economies of scale and reduce the influence of local interest groups over property taxation. Colombia, Uruguay and Spain have already created national or state cadasters. While a national or state agency would maintain the cadaster, property taxes would still be set and collected locally, and a regular schedule for reassessing property values could improve revenue collection.<sup>309</sup>

404. **Improvements in SNG tax administration could be accompanied by the expansion of their tax bases in the future.** While improving the collection efficiency of existing subnational taxes could boost SNG revenues, expanding the tax bases available to state and municipal governments could greatly enhance their own-source revenue capacity and ease political pressure for additional federal

309 For example, Guanajuato’s *predial* law requires that municipalities update property values in the cadaster every two years. The Municipality of León adopted an innovative strategy in which it automatically charges an additional 0.234 percent of the value of properties that were assessed within the past two years and as much as 0.681 percent for properties that have not been revalued for several years.

transfers. Allowing states to impose a surcharge on federal taxes could greatly increase subnational revenues at a very modest administrative cost. For example, each state could impose a 1-3 percent flat-rate surcharge on the federal income tax. Restricting the surcharge to between 1 and 3 percent would help prevent a “race to the bottom” in which states attempt to outcompete each other for investment by lowering their tax rates. The Tax Administration Service (*Servicio de Administración Tributaria - SAT*) could collect the surcharge, easing the administrative burden on the states. State governments could also impose surcharges on other federal taxes, such as excise taxes.

### *Improving the Efficiency and Enhancing the Equalization Effect of Intergovernmental Transfers*

405. **In terms of the Aportaciones transfers, the FONE resources could be distributed with a stronger emphasis on a per-student and needs-based allocation.** Thus, the modified proposed formula could reflect a core per-capita component that is adjusted for the costs of delivering a standard service across the country (favoring poorer regions). It could also include an equalizing factor designed to accelerate the convergence of education indicators of lagging states. This proposed system would rely on distribution criteria similar to those used prior to the 2007 reform, but simpler and with a much stronger equalization component.

406. **Prospective adjustments to other Aportaciones could yield additional efficiency gains, but require further assessment.** Merging FISE with FISM could reduce the fragmentation of the *Aportaciones* system. Because FISE represents a very small share of FAIS, and municipal governments implement most social infrastructure projects, which mainly deliver local benefits with limited spatial spillovers, merging the two transfers could yield a modest efficiency gain. The authorities would need to simplify the two-stage distribution rule to prevent two municipalities with identical conditions from receiving different amounts just because they are located in different states.

407. **FASSA could be distributed on per uninsured person basis.** While *Seguro Popular* is gradually improving both, the coverage of uninsured population and the regional equalizing impact of federal transfers to the health sector, a new distribution criterion for FASSA transfers may accelerate progress in these fronts. As a transition, the federal government could distribute the same amount of resources in nominal terms in a given year (hard hold clause) and the annual increase in the transfer could be distributed on equal per uninsured person basis.

408. **The government could reduce or re-shape existing discretionary transfers to subnational entities such as Ramo 23.** *Ramo 23* resources could be transformed into a capital grant which can be used by the federal government to finance investments by SNGs that have strategic national or/and regional spillovers. Using formula based matching

grants instead of ad-hoc transfers could help to improve accountability at the subnational level. Other options would be to consolidate resources from Ramo 23 and FAIS, to enhance the latest and use its distribution criteria or the establishment of a capital transfer with clear equalizing criteria.

409. **Over the medium term, the effectiveness of Participaciones transfer could be improved by dividing their pool of funds into 2 pools: a pure revenue-sharing component and an equalization-transfer component.** The formula for the pure revenue-sharing component could be designed to ensure that transfers reflect the amount of tax revenue collected within the administrative boundaries of SNGs (i.e., a derivation or origin-basis criterion). As most federal taxes that finance *Participaciones* cannot be apportioned to states (e.g., VAT and corporate income tax), states' economic output can be used to approximate the federal revenue collected in each state. The distribution criteria for the equalization component could be designed to cover the gap between the expenditure needs and fiscal capacity of SNGs. Expenditure needs (not actual expenditures) are defined as the amount each SNG would need to spend to provide a standard level of public services based on the size of its population, local socioeconomic conditions, and the costs of providing the necessary public services. Revenue capacity (not actual revenue collection) is the ability of a government to raise own-source revenues based on an average level of administrative effort, adjusted for the size of the government's assigned tax bases and the funds received through pure revenue-sharing *Participaciones*. This equalization transfer would increase with SNG expenditure needs and decrease with SNG revenue capacity. Allocating equalization transfers according to expenditure needs and revenue capacity would eliminate perverse incentives that encourage excessive or inefficient spending and discourage collection efficiency. This formula would also need a very strong coefficient to reflect fiscal effort (i.e., improvements in collection above the average of what would be expected given the revenue capacity of the state).

### *Strengthening Subnational Fiscal Discipline*

410. **While a thorough evaluation of the LDFEFM would be premature, the law appears to be strengthening fiscal discipline among SNGs.** Since 2014, improved fiscal balances and an increased awareness of borrowing controls have helped stabilize the debt-to-GDP ratios of SNGs. The rigorous application of the LDFEFM regulatory framework remains critical to ensure fiscal discipline at the subnational level.

411. **The LDFEFM's technical design may require some minor adjustments.** Because the current indicative thresholds for the ratio of debt to non-earmarked revenue are too high to serve as a binding constraint on most state governments, the LDFEFM does not adequately restrain SNGs from incurring fiscal deficits or from increasing their public debt stocks to levels that could generate liquidity

or solvency problems. Reducing these thresholds would increase the effectiveness of the LDFEFM. An assessment of the LDFEFM and its implementing regulations could provide a sound analytical basis for further revising and rationalizing the fiscal framework.

**412. Effectively controlling subnational indebtedness will require improvements in the government's financial reporting and accounting systems.** While the General Government Accounting Law (*Ley General de Contabilidad Gubernamental*) has increased financial transparency, data constraints and incomplete accounting standardization across SNGs limit the ability of creditors to assess financial risk and prevent policymakers from addressing weaknesses in the

fiscal framework. Additional federal technical assistance to SNGs will be critical to close data gaps and harmonize accounting standards.

**413. Eliminating the discretionary use of extraordinary federal transfers could enhance the credibility of the fiscal discipline framework for SNGs.** Allowing the federal government to transfer extraordinary resources to SNGs weakens fiscal discipline. By contrast, the federal government's ability to issue a partial guarantee on subnational debt within the context of a fiscal adjustment or debt-restructuring program provides a much more direct and transparent way for the federal government to support SNGs that are experiencing financial distress.



WORLD BANK GROUP

