



# SPECIAL ECONOMIC FUNDS

Expanding Special Economic Zones beyond spatial and industry boundaries for the development of Mexico's South

## Second Year Policy Analysis

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at

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To Carmen Hinojosa, my mother, who showed me that caring for others makes one's own life meaningful.

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All errors are my own.

## Executive Summary

**Mexico's growth problem starts in the South.** Mediocre average GDP growth in the country as a whole disguises the reality that we have split into two Mexicos: a rapidly industrializing one in the center and North, whose richest states grow at 2.5% per year, and a stagnating one in the South growing at 0.7%.

**The South is stuck because it is fragmented.** Its people are much more rural and indigenous than the rest of Mexico. In spite of much better roads, they cannot afford to commute or move to the cities. They speak different languages, own their lands communally, and are sometimes in conflict with their neighbors. People cannot afford to move or commute because wages are low. Wages are low because business returns are low. There are few suppliers because they do not have clients, and vice versa. Entrepreneurs attempt few new business activities because they often lose out even if their business succeeds.

**Special Economic Zones are Mexico's new flagship productive policy.** The Mexican Federal Government has created three SEZs to revert this trend and industrialize the South. They offer fiscal, regulatory, and infrastructure improvements to manufacturing companies. The Government has implemented fast: in less than two years from now, the first industrial tenants will be ready to move into new industrial parks.

**While the success of SEZs would be transformational for the South, the risk of failure is also very high.** The South has a weak manufacturing base. If SEZs succeed in building it, superlative employment and wage growth would follow. But there is a high risk that no amount of fiscal benefits and industrial parks will make the South attractive to manufacturers. If so, the project fails, because only manufacturers benefit from SEZ provisions.

**"Special Economic Funds" (SEF) can help expand the benefits of the SEZ program.** SEFs can be thought of as a hybrid between an SEZ and a venture capital fund. Professionals are tasked with maximizing the returns of a pool of private and public capital by investing in a portfolio of companies in any sector. The chosen companies receive fiscal and regulatory benefits so long as they provide employment in the region.

**SEFs are designed to encourage the creation of firms that find ways around fragmentation.** Entrepreneurs who find creative ways to turn a profit and employ people, like the mezcal exporters of Oaxaca, benefit from conditions that make their businesses more likely to grow and thrive. Coordination failures are addressed by investing in groups of companies, discovery costs are socialized with a flexible public goods pool and preferential fiscal treatment, and micro risks are reduced by giving both the Federal and the Local governments stakes in the firm's success.

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### **A note on readability**

Figure 15 and above can be found in Appendix 1. Earlier figures are found along the main text.

## Section A: Mexico's growth problem starts in the South

Mexico has a regional inequality problem, and the gap is widening.

Mexico's rate of economic growth is disappointing. Since 2003, real GDP per capita has grown at a compound annual rate of 1.35%<sup>1</sup>. At this rate, a doubling of average incomes to the level enjoyed today by Spain, Israel or Korea<sup>2</sup> would take over 50 years of hard work. This rate does not reflect national aspirations, or indeed the expectations of progress that followed events like a transition to democracy and extensive economic reforms.

Nearly thirty years ago, Mexico made a bet on export-oriented growth<sup>3</sup>. It signed free trade agreements, built infrastructure, and stabilized its macroeconomic conditions. The rewards have been handsome: a booming manufacturing sector which produces everything from cars to chemicals, rates of GDP growth exceeding 4% in many states, and an emerging middle class.

National GDP growth remains at 1.35% due to a dual economic reality. There are two Mexicos: a booming industrial exporter that is integrated into the global economy, and a stagnated survival economy based on informal services and agriculture<sup>4</sup>. There is a broad geographic distinction between the two. Growth in the states in the country's northern and central regions is driven by their transition to "new Mexico", but no such transition is occurring in the southern region. The mediocre economic rate for the whole country is an average of a healthy growing "North" and a stagnated "South".

Mexico's three poorest and southernmost states are Chiapas, Oaxaca and Guerrero (Figure 1). All three have GDP growth rates lower than the national average (Figure 15). This divergence in growth is particularly worrying because the South is already much poorer and less developed than the North, as illustrated in Figure 16.

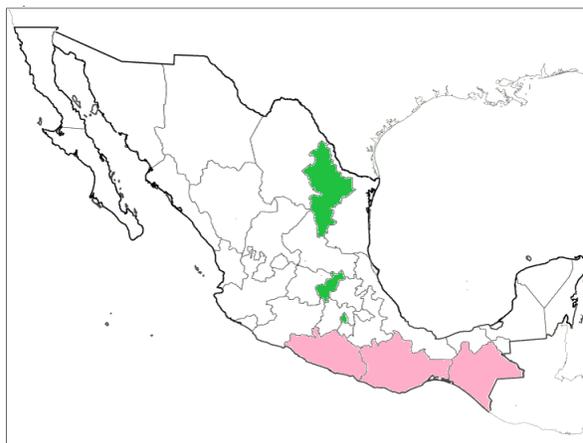


Figure 1 – The three richest states in Mexico, in green, and the three poorest, in red. (Based on 2015 real non-oil GDP per capita)

<sup>1</sup> "Original Analysis with Official CONAPO and INEGI Data."

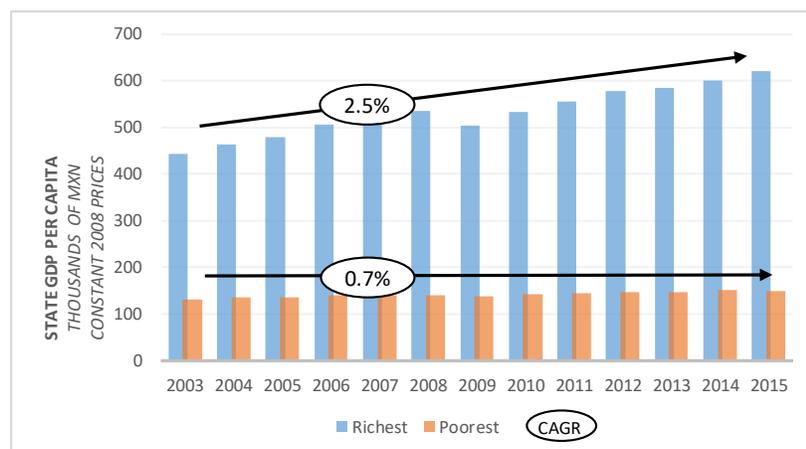
<sup>2</sup> Countries with a GDP per capita, in PPP terms, of around \$34,000

<sup>3</sup> This paragraph follows: Rebolledo, Discussion, Head of the Economic Productivity Unit, Ministry of Finance and Public Credit.

<sup>4</sup> This conceptualization of the problem was first described in the following report: Eduardo Bolio, Jaana Remes, Tomás Lajous, James Manyika, Eugenia Ramirez, and Morten Rossé, "A Tale of Two Mexicos: Growth and Prosperity in a Two-Speed Economy.", and commented on The Economist, "The Two Mexicos."

These three poorest states have an average GDP per capita of MXN 49,724, whereas the three richest, shaded in green in the map, have a GDP per capita of MXN 230,126. The three states in green are nearly five times richer than the three states in red. For comparison, the three richest US states are about twice as wealthy per capita as the three poorest. The size and widening of the gap is illustrated in Figure 2.

Figure 2 - The gap between the richest and poorest states in Mexico widens

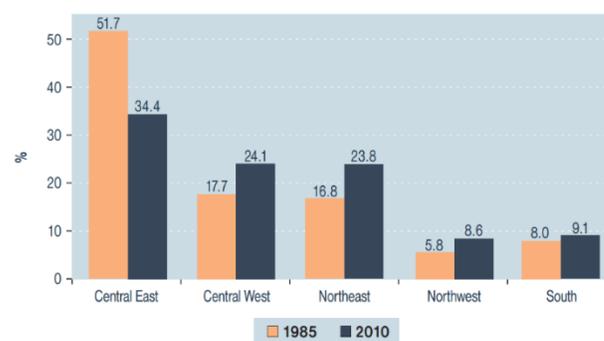


Mexico's three richest states export cars, engines, chemicals, and advanced services. The states of Querétaro and Nuevo León are known for their export-oriented manufacturing industries. They house 13% of the country's population but generate 28% of its non-oil Gross Domestic Product.

Mexico's poor Southern states have an extremely limited manufacturing base. Only 9.1% of their GDP comes from manufacturing, a figure that has barely budged from the 1985 pre-NAFTA statistic (Figure 3<sup>5</sup>). Oaxaca, for instance, only has two major industrial facilities which export goods: a beer bottler and an oil refinery, both decades-old and in decline. Instead, the south exports products like coffee, avocados, and lower value-added manufactures like textiles. 11% of Mexicans live there, but among them we find 32% of the country's extreme poor.

Finally, it is important to highlight regional inequalities within states. A resident in the Oaxacan municipality with highest salaries earns over 12 times more<sup>6</sup> than someone in the poorest one (see Figure 17). Guerrero's wealthiest municipalities, such as Chilpancingo or Acapulco, have a Human Development Index similar to that of Panama. In the poorest, living conditions are similar to those of Guinea-Bissau<sup>7</sup>.

Figure 3 – Manufacturing as a proportion of regional GDP, Evolution from 1985–2010



<sup>5</sup> Figure 3 was sourced from Mesquita Moreira et al., "Too Far to Export."

<sup>6</sup> "Original Analysis Based on the 2010 Population Census (INEGI)."

<sup>7</sup> United Nations Development Programme, "IDH Municipal En México."

## Section B: Why does the South not grow?

The substantial and sustained growth differential between Mexico's regions suggest that the constraints that bind growth are different in the South. This section draws on the growth diagnostics methodology proposed by Hausmann, Rodrik, and Velasco<sup>8</sup> and suggests that coordination and discovery costs are particularly high in Mexico's South due to a syndrome we can call "fragmentation"<sup>9</sup>.

### The growth diagnostics methodology

What should we fix first when everything is broken?

The growth diagnostics methodology is a *"unified framework for analyzing and formulating 'growth strategies' which is both operational and based on solid economic reasoning"*<sup>10</sup>. It is based on the notion that constraints to economic growth are 'binding' in a certain country or region, and under its specific circumstances. Central to the methodology is the idea that some issues may be problematic and yet not be a binding constraint. For instance, a hypothetical country with skyrocketing inflation and severe nationwide electricity blackouts may notice it also has restrictive labor regulations. In the abstract, loosening labor regulations could be associated with economic growth. However, this country is unlikely to see a boom in investment and growth simply by loosening labor regulations, as the other issues keep most business activities unprofitable. Hence, for this country, labor regulations are not a binding constraint to growth.

This methodology works by systematically finding evidence on whether constraints are binding or not, and then finding a syndrome that explains how the particular circumstances of the country or region have allowed those constraints to persist over time. One then systematically moves along a decision tree, like that shown on Figure 4<sup>11</sup>.

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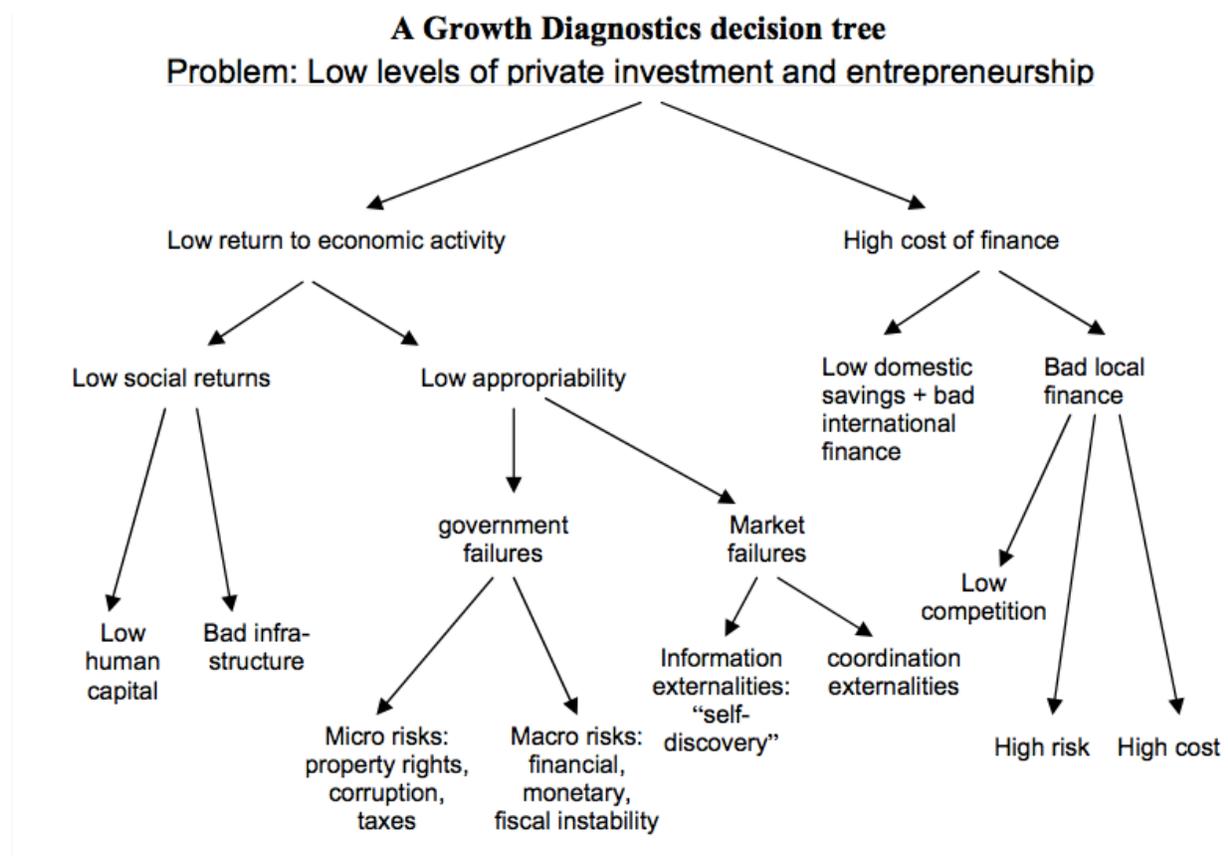
<sup>8</sup> Hausmann, Rodrik, and Velasco, "Growth Diagnostics."

<sup>9</sup> This section draws heavily on research produced for the fulfillment of HKS class "PED309: Development Policy Strategy", which will be presented in a forthcoming working paper. It is henceforth cited as follows: Rivera, Sarmiento Hinojosa, and Serra, "Growth Diagnostic: Oaxaca." It also draws on the 'Chiapas Project' performed by the Center for International Development at HKS, whose papers are cited individually in this section and available at <http://growthlab.cid.harvard.edu/chiapas-project>.

<sup>10</sup> Hausmann, Rodrik, and Velasco, "Growth Diagnostics."

<sup>11</sup> Hausmann, Klinger, and Wagner, "Doing Growth Diagnostics in Practice."

Figure 4 - A Growth Diagnostics decision tree



Fragmentation has led to a low productivity trap

Oaxaca, Guerrero, and Chiapas share a similar orographic profile. All three have a narrow coastal plain to the south, bordered by the forbidding *Sierra Madre del Sur* mountain range. Most of their cities are located in valleys in the highlands, surrounded by the ranges. Beach resorts like Ixtapa, Acapulco and Huatulco, and the mid-sized commercial centers of Salina Cruz and Tapachula are

Figure 5 – Orographic features of Southern Mexico



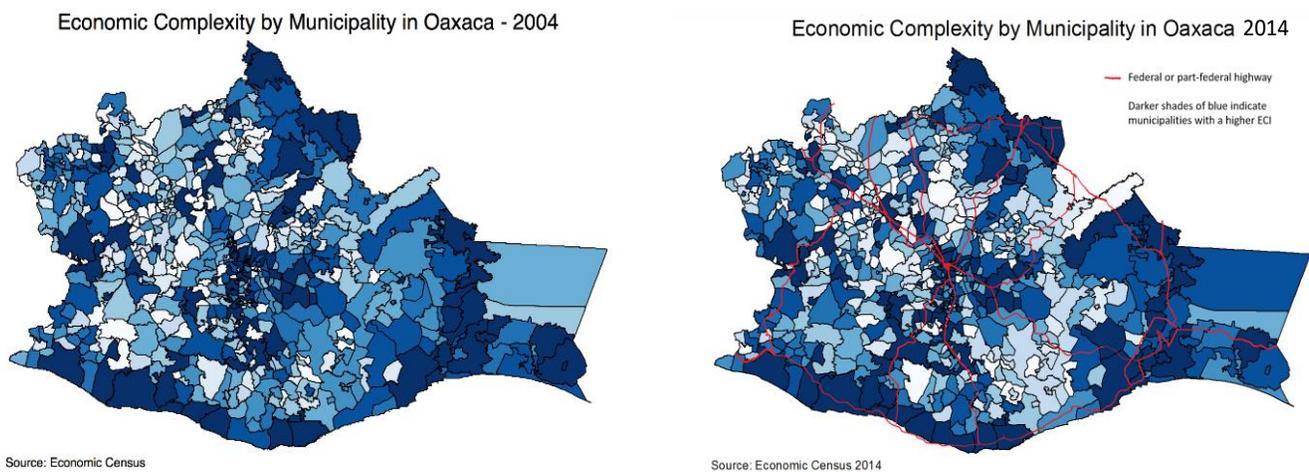
located in the coast, but travel from those cities to the highlands involves lengthy, winding travel across the mountains.

Between 42 and 53% of the population in these states is rural, compared to a national average of 23%. These rural people are much more likely to be indigenous than the average Mexican. In Oaxaca and Chiapas, rather than concentrate in the valleys or along the coastline, the rural population is spread across the state and all over the mountains (Figure 18).

Historically, the ruggedness of the terrain and dispersion of the population led the South to have a sparser road and rail network than the rest of the country. By 1999, the only major cities in the region connected to Mexico City by federal highway were Chilpancingo, Acapulco, and Oaxaca City (Figure 19). Prominent economists Enrique Dávila, Georgina Kessel and Santiago Levy argued then that the infrastructure shortage was holding the state back<sup>12</sup>. In the intervening years, however, the Mexican government has undertaken a very ambitious road construction program. The roads proposed in the Dávila, Kessel and Levy paper have since been built. Figure 20 shows the roads built in Oaxaca, for instance.

In Oaxaca, certain municipalities, such as those in the southeast of the state (the Tehuantepec region), received significant road upgrades that reduced travel times to Oaxaca City, nearby ports, Mexico City, and the southern and northern borders. However, there was very little subsequent change to the complexity of economic activities performed at the municipality level (Figure 6)<sup>13</sup>. In fact, broadly speaking, the same industries continued providing the same jobs. The export profile for the state also

Figure 6 – Relative economic complexity by municipality in Oaxaca in 2004 (left) and in 2014 (right). Darker shades indicate that employment in the municipality is on more complex industries.



<sup>12</sup> Dávila, Kessel, and Levy, "El Sur También Existe."

<sup>13</sup> For an overview of economic complexity and to learn about the methodology behind this analysis, please see Appendix 2.

remained unchanged over the period, with around 80% of exports abroad consisting of the output from the Salina Cruz refinery and the Cervecera del Trópico beer factory.

In the case of Chiapas, Harvard's Center for International Development similarly concludes in its growth diagnostic that "*while Chiapas has potential to improve its road infrastructure, it is unlikely that this is a main cause behind slow economic growth. Although the proportion of roads that are paved or four-lane paved is low in absolute terms, Chiapas ranks above the Mexican average when evaluated in terms relative to its population or its area.*"<sup>14</sup>

While the road infrastructure in the South is not a binding constraint, both the Chiapas and the Oaxaca diagnostic point to the problem of transportation costs. In Chiapas, less than a fifth of working age adults are employed by a third party<sup>15</sup>. In Oaxaca, the figure is a third<sup>16</sup>. One of the factors that explain this self-employment is the high cost of transportation from the dispersed rural settlements and small towns where most people live.

Elsewhere in Mexico, dispersed rural populations gradually converged into urban clusters around job opportunities. Partly, the process is not yet afoot because of a "productivity trap", in which low productivity means urban salaries do not cover the costs of moving, and dispersion keeps productivity low by failing to concentrate employees<sup>17</sup>. However, cultural fragmentation also encourages spatial dispersion. Oaxaca, Guerrero, and Chiapas are known for their large diversity in ethnic groups, languages, and government systems in the region, and the relative lack of trust and frequency of conflict among different groups. Oaxaca has eighteen ethnic groups and seventeen languages. The two largest, the Mixtec and Zapotec peoples, have a history of rivalry dating back to before the Spanish conquest.<sup>18</sup> Eighteen (other) indigenous languages are spoken in Chiapas<sup>19</sup>. This cultural fragmentation sometimes leads to isolationism and conflict, both among the groups and between the groups and the Federal Government. Over 75% of municipalities in Oaxaca are run under the *Usos y costumbres* scheme, in which the community's traditions supersede national legislation. Across the three states, more than a hundred municipalities have opted out of having a police service run by the government. The divisions between

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<sup>14</sup> Hausmann, Espinoza, and Santos, "Diagnostico de Crecimiento de Chiapas: LA TRAMPA DE LA BAJA PRODUCTIVIDAD."

<sup>15</sup> Ibid.

<sup>16</sup> "Oaxaca: Información Laboral."

<sup>17</sup> Hausmann, Espinoza, and Santos, "Diagnostico de Crecimiento de Chiapas: LA TRAMPA DE LA BAJA PRODUCTIVIDAD."

<sup>18</sup> Rivera, Sarmiento Hinojosa, and Serra, "Growth Diagnostic: Oaxaca."

<sup>19</sup> Alonso Bolaños, "Diversidad Étnica Y Patrimonio Cultural En Las Regiones Indígenas de Chiapas."

the Mixtec and the Zapotec persist even in California, where Oaxacan immigrants have created separate advocacy and community groups<sup>20</sup>.

Fragmentation is also manifest in land ownership<sup>21</sup>. Even though reforms in the 1980s and 1990s provide the government with mechanisms to transition land from communal to private property, land titling efforts have made very little progress in the South since then. Communal land ownership creates multiple problems in Southern Mexico. It deprives residents from an asset that could otherwise be sold to acquire capital. It reduces the incentive to invest in the land, or to allow others to invest in it. It makes it very hard to scale any businesses. Land is also often the source of conflict among groups, leading to mistrust and lack of collaboration. In fact, an obstacle for large corporations seeking to build facilities in the South is the acquisition of even a small industrial plot in which none of the land is communal, and hence impossible to buy. The process often takes years.

Finally, it is important to mention that some of the most critical social conflicts in recent Mexican history have been faced in the region. These include strikes, protests, and road blockades with chapters of the school teachers' union in Oaxaca and Chiapas, the Zapatista rebel uprising in Chiapas, the emergence of drug cartels like Guerreros Unidos in Guerrero, the forced disappearance of 43 students in Ayotzinapa, Guerrero, the capture of Oaxaca City's downtown area in 2006 and 2016, and the dirty war of the 1970s in Guerrero. Smaller scale conflict also frequently happens in response to productive investment. The resulting uncertainty leads Oaxaca, Guerrero, and Chiapas to be considered risky places to do business with poor enforcement of property rights, relative to the rest of Mexico<sup>22</sup>.

The conclusions from both growth diagnostics paint a complex picture for Mexico's South<sup>23</sup>. Cultural fragmentation and population dispersion reinforce a low productivity trap in which few known activities provide attractive economic returns. The complicated enforcement of micro rights and relatively high levels of conflict and corruption further decreases the attractiveness of investments in these states. Increasing the complexity of this economy requires breaking the trap by finding new business models (i.e., encouraging discovery) and coordinating economic activities.

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<sup>20</sup> Kearney, "Transnational Oaxacan Indigenous Identity."

<sup>21</sup> This discussion follows: Ordorica, Interview, Senior Partner, McKinsey & Co. Mexico City.

<sup>22</sup> For instance, Chiapas, Oaxaca, and Guerrero rank third to last, second to last, and last, respectively, in the "2016 Index for State Competitiveness" compiled by IMCO, an independent think tank.

<sup>23</sup> More detailed discussions justifying these binding constraints can be found in the growth diagnostics cited for Oaxaca and Chiapas.



## Section C: Special Economic Zones are Mexico's new flagship productive policy

Three Special Economic Zones in Oaxaca, Guerrero, and Chiapas seek to correct the widening growth gap between those states and the rest of the country

The administration of President Enrique Peña Nieto defined the “democratization of economic productivity” as one of three cross-functional goals of the federal government<sup>24</sup>. This goal implies achieving higher total factor productivity growth, and a focus on the regions that have historically lagged behind.

The flagship policy designed to achieve regional development was the creation of Special Economic Zones (SEZs). In November 2014, President Peña Nieto announced the creation of three SEZs<sup>25</sup> as part of a “strategy for the integral development to reduce poverty, exclusion, and inequality” in the region. Each of these three initial SEZs consists of an industrial area with plots ready for construction and streamlined permitting, a package of tax, regulatory and financing



Figure 7 – The three initial SEZs as proposed in 2014

incentives for firms which build facilities within the area, and a major infrastructure improvement. Lázaro Cárdenas SEZ, set in the border area between Guerrero and Michoacán states, will benefit from the upgrading of a major port nearby. In the Isthmus of Tehuantepec, plans are afoot to build a railroad and an oil pipeline connecting Mexico's Atlantic and Pacific coasts and establish SEZs at the industrial cities on both shorelines. The Chiapas SEZ is next to a port close to the Guatemalan border, for which there are also upgrade plans<sup>26</sup>. These three SEZs will be henceforth referred to as “first wave SEZs”.

The SEZ law allows for state and local governments and private companies to request the creation of new SEZs, so long as they are located in one of Mexico's poorest ten states. Four additional SEZs are now in planning for a second wave, but these zones will not benefit from major infrastructure improvements<sup>27</sup>. This SYPA focuses on the first-wave SEZs, as these are the ones located in Mexico's three poorest states.

<sup>24</sup> Secretaría de Hacienda y Crédito Público, “Programa Para Democratizar La Productividad.”

<sup>25</sup> “Presenta El Presidente Enrique Peña Nieto, Diez Medidas Para Mejorar La Seguridad, La Justicia Y El Estado de Derecho.”

<sup>26</sup> Centro de Estudios Sociales and y de Opinión Pública, “Zonas Económicas Especiales En México.”, Chapter V

<sup>27</sup> “Estas 4 Zonas Económicas Especiales Estarán Listas En El 1T17.”

## Productive policies are back in vogue, and SEZs are among the most promising

In November 30<sup>th</sup>, 2000, Mexico's Ministry of Commerce and Industrial Promotion was renamed Ministry of the Economy<sup>28</sup>. This change symbolized the extent to which the country's development policies had followed the "Washington consensus" over the past two decades. Along with much of Latin America, Mexico prioritized fiscal discipline, tax reform, financial and trade liberalization, and privatization of public enterprises and services over old-style "industrial promotion"<sup>29</sup>. This was in part a sobered reaction to the excesses and corruption of industrial policy of the 1960s and 1970s, which focused on import substitution and on 'picking winners' among sectors. If not in practice, at least in aspiration Mexico signaled its agreement with former Polish Minister of Trade Tadeusz Syryczyk's maxim that "no industrial policy is the best industrial policy". Only fully "horizontal" policies –that is, those which favor all economic sectors equally, avoiding distortion– would be acceptable.

The renaming was, paradoxically, coincidental with a shift away from the Washington Consensus. The countries that liberalized radically, in following with recommendations from the likes of the IMF, had mixed results. Some collapsed into crisis. Meanwhile, other countries in East Asia with prescriptive, vertical industrial policy and extensive government direction and ownership experienced growth 'miracles'<sup>30</sup>. The lesson from this experience was that, while the general design principles of development policy stay pretty consistent, they map into unique policy agendas that are context-dependent<sup>31</sup>. This reopened the way for industrial policy, hence renamed "productive policy" to underline a shift away from sector picking and into horizontality.

Multiple economic arguments support the theoretical argument for productive policy<sup>32</sup>. In its different formats, productive policy can address problems like learning spillovers, costs to labor mobility, socializing the discovery cost "wedge", coordination issues among firms or between firms and the government, and encourage activities with positive knowledge or clustering externalities. The arguments against industrial policies are not centered on technical correctness, but rather, on political and bureaucratic feasibility. Economists opposing productive policy argue that, even though productive policy can be technically

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<sup>28</sup> Secretaría de Economía, "MANUAL de Organización General de La Secretaría de Economía."

<sup>29</sup> For a discussion on the principles behind the Washington Consensus, see Rodrik, "Goodbye Washington Consensus, Hello Washington Confusion?". Mexico's implementation of these principles is discussed in Berumen, "Evaluación de Las Reformas Del Consenso de Washington En Brasil Y México."

<sup>30</sup> Chang, *The East Asian Development Experience*.

<sup>31</sup> Rodrik, "Rethinking Growth Policies in the Developing World."

<sup>32</sup> The arguments referenced in the following two paragraphs are laid out in Section 2 of Rodrik, "Industrial Policy."

correct in a second-best world, a scheme in which public money is offered to private companies is likely to result in either corruption or waste.

SEZs are a particularly attractive form of productive policy. Multiple SEZ success stories, discussed in the next section, are evidence that the political and bureaucratic challenges are not prohibitive. Corruption can be kept at bay if access to the SEZ is transparent and the incentives equalized. The challenge of designing the mechanism and finding winning companies is reduced by sticking to a standard formula of promoting export-oriented manufacturing. From a technical correctness perspective, SEZs solve the coordination problem of public good provision that arises between the government and investors. While they may pick sectors, they are less distortive than other forms of productive policy. Crucially, they provide a space for policy experimentation.

### International evidence (mostly) supports the notion of SEZ effectiveness

SEZs played a major role in the Chinese growth miracle. The four SEZs established in 1980 helped the central government promote export-based economic growth while experimenting with new, more liberal policies in a controlled environment<sup>33</sup>. Within a few years, economic growth exploded at multiples that of the rest of the country, and fourteen new zones were promptly established<sup>34</sup>. The model was then successful in encouraging export-oriented production in countries including South Korea, Taiwan, China, Vietnam, Bangladesh, and Mauritius<sup>35</sup>. No wonder why 4,300 SEZs have been established, in three out of every four countries in the world<sup>36</sup>. A major study of a sample of SEZs shows they lead to increased trade<sup>37</sup>.

The success of SEZs in Costa Rica, El Salvador, and the Dominican Republic further encouraged the government for implementation in southern Mexico, as the development conditions in Central America and the Caribbean are similar in some respects. The evaluation on their performance is mixed<sup>38</sup>. The research points at the increase in the number of export-oriented firms after SEZ implementation, and the boom in industries such as textile production in El Salvador. However, it also raises concerns around leakage, i.e., the cost of providing subsidies to companies that would have existed regardless.

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<sup>33</sup> Yeung, Lee, and Kee, "China's Special Economic Zones at 30."

<sup>34</sup> Ibid.

<sup>35</sup> Farole and Akinci, *Special Economic Zones*.

<sup>36</sup> "Not so Special."

<sup>37</sup> Siroën and Yücer, "Trade Performance of Free Trade Zones."

<sup>38</sup> The Central America and Caribbean discussion follows Artana and Templado, "La Eficacia de Los Incentivos Fiscales."

## The Mexican SEZ program has made rapid progress on implementation.

The Mexican SEZ program started in 2014, when the Ministry of the Treasury and Public Credit started exploring the possibility of Special Economic Zones as a policy to encourage TFP growth in the South. By May 31<sup>st</sup> 2016, President Peña Nieto signed the “Special Economic Zones Federal Law”, which mentioned the three SEZs in the “first wave”. On June 30<sup>th</sup>, 2016, the President decrees the creation of the Federal Authority for the Development of Special Economic Zones<sup>39</sup>. The former chairperson of Mexico’s largest business lobby group and Oaxaca native Gerardo Gutiérrez Candiani, was chosen to lead it, reporting directly to the Minister of Finance.

By February 2017, the Federal Authority for the Development of SEZs expected that the installation of the three “first wave” SEZs and the initial investments thereafter should be completed within 20 months<sup>40</sup>, with four more coming later in the year<sup>41</sup>. The final implementation steps, namely the signing of a Coordination Agreement between the Federal and the State governments and a Presidential Decree declaring the specific zones started, are the only legal steps pending. The strong interest showed by state governors led to the approval of four new SEZs in a “second wave”, which are in earlier stages of implementation.

## Current SEZ rules favor manufacturing projects with intensive transport use

Firms wishing to invest in SEZs must comply with the following requirements:

- Obtain authorization to invest in the SEZ from the Ministry of the Treasury and Public Credit<sup>42</sup>.
- *“Build structures and install machinery and equipment to perform productive economic activities in the industrial spaces or lots that correspond to the investor within the Zone.”<sup>43</sup>*

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<sup>39</sup> Comisión Fiscal Concamin, “Nota Informativa - Decreto Por El Que Se Expide La Ley Federal de Zonas Económicas Especiales.”

<sup>40</sup> Zafra, Interview, Head of the Strategic Planning Unit, Federal Agency for the Development of Special Economic Zones, Ministry of Finance and Public Credit.

<sup>41</sup> “Estas 4 Zonas Económicas Especiales Estarán Listas En El 1T17.”

<sup>42</sup> The criteria by which the Ministry will approve or deny authorizations have not yet been published. The Law establishes that each SEZ must have a Master Development Plan, so it is possible that alignment with that Plan will be required. While it is also possible that requirements are set in terms of minimum capital investment, jobs generated, export orientation or other similar criteria, the government has not yet made any announcements to that effect.

<sup>43</sup> “Ley Federal de Zonas Económicas Especiales.”

From the wording of the second requirement above, for the purposes of this SYPA we assume that only firms that perform manufacturing activities will receive investment authorization.

The firms invested in the SEZ will accrue fiscal benefits for a limited<sup>44</sup> period of time. Mainly, these are:

- Value Added Tax (VAT)
  - Exempted from VAT:
    - Goods imported into the SEZ from abroad
    - Goods exported from the SEZ from abroad
    - Services performed within the SEZ
  - Pay VAT at the regular rate:
    - Goods destined for consumption within Mexico
- Corporate tax
  - An incentive has been promised, but details remain to be defined by the Ministry of the Treasury and Public Credit.
  - The kind of investment offered “will encourage productive investment, the formation of human capital, and worker training”
- Customs
  - Expedited customs clearance
  - Payment of duties only upon the point of merchandise leaving the SEZ
  - Potential discounts on tariffs, to be defined

Finally, companies in one of the three “first-wave” SEZs will benefit from significant infrastructure improvements, as discussed at the start of this section. The improvements are centered around major rail and port infrastructure works.

Given these terms, the first-wave SEZs are favorable for industrial companies, and particularly attractive for those with significant transportation costs. This is consistent with the sectors in which investors have expressed preliminary interest so far: steelworks, agroindustry, general manufacture, chemicals, energy, textiles, and paper<sup>45</sup>. SEZs will hence directly support, at most, the 86 manufacturing activities out of the 304<sup>46</sup> industries listed the Economic Census<sup>47</sup>.

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<sup>44</sup> The minimum duration for the benefit is eight years. No maximum duration is specified in the Law.

<sup>45</sup> “Proyecto 41 Mil Mdd Para Zonas Especiales.”

<sup>46</sup> Mexico uses a variation of the NAICS (North American Industrial Classification System). This figure corresponds to distinct four-digit economic activities.

<sup>47</sup> “Original Analysis Based on the 2014 Economic Census (INEGI).”

## Section D: While the success of SEZs would be transformational for the South, the risk of failure is also very high

### The success of SEZs would be transformational for the South

SEZs can break the 'low productivity trap' in the south by encouraging the geographic concentration of population and economic activity. Strong government support and the investment incentives described in the previous section can serve as a signal that breaks the coordination failure.

If SEZs succeed according to the government's estimates, the South of Mexico would be drastically transformed for the better. The Federal SEZ Authority announced that foreign and domestic investors have expressed interest in investing US\$41bn across all SEZs in 48 different investment projects, over fifteen years. The realization of this figure would transform the South, considering that the combined GDP of Guerrero, Oaxaca and Chiapas is US\$32bn, or that FDI inflows into the three states amounted to US\$529 million in 2015<sup>48</sup>.

However, the risk that these tentative investments fail to materialize is substantial. The following sections explore why.

### Industrial activities are very 'distant' from the South's existing economy

As seen in the previous section, first-wave SEZs are most favorable for industrial companies which export their production. These companies will have to weigh the benefits of being in an SEZ with the significant drawbacks of being based in an area with no current industrial vocation, which can create difficulties in terms of securing production inputs and qualified personnel.

In Figure 8, every dot represents an economic activity that is currently not performed in the states illustrated. "Product density" refers the proximity of the industry to the other existing industries in the state, and "Opportunity gain" the value of the capabilities that the state will develop by producing that product. For instance, a brake parts plant will have higher opportunity gain than a pineapple cannery because the brake parts plant makes other auto industry facilities, like a brake factory, more likely. The red dots indicate all industrial activity<sup>49</sup>, the blue ones indicate all other economic activities. Hence,

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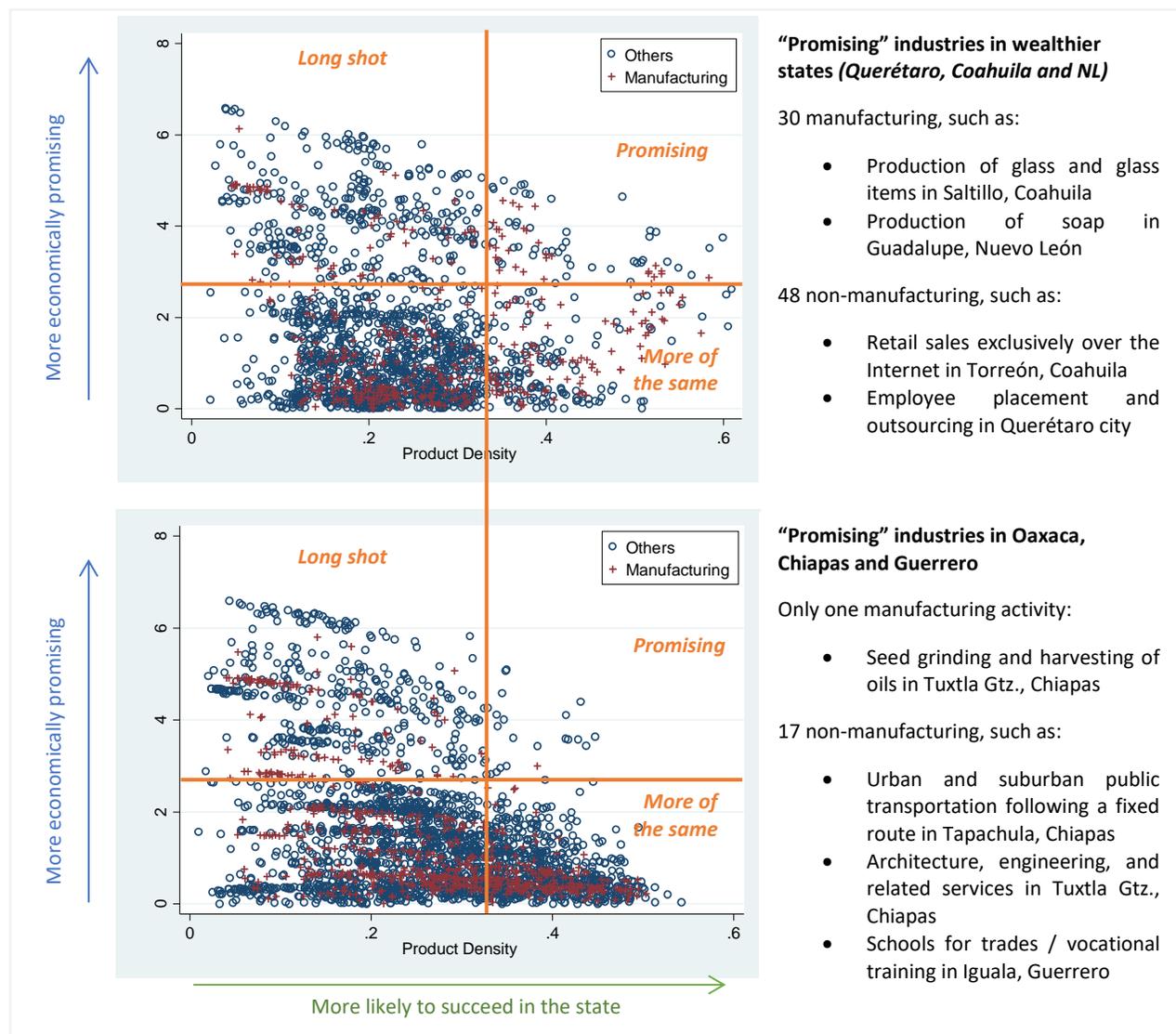
<sup>48</sup> "INFORME ESTADÍSTICO SOBRE EL COMPORTAMIENTO DE LA INVERSIÓN EXTRANJERA DIRECTA EN MÉXICO (Enero-Marzo de 2016)."

<sup>49</sup> Defined as all activities with a SCIAN code starting with 3 in INEGI's industry classification.

activities in the upper-right quadrant are both desirable, due to their effect on the area's future prosperity through production capabilities, and feasible, given what the region already produces. Please see Appendix 2 for description of the methodology behind this analysis.

We can draw a number of conclusions from this figure. The low density of economic activities delivering high opportunity gain in the South is evident in the tighter clustering of activities on the bottom left of the diagram for the poorer states. However, we also notice that the manufacturing activities incentivized by the Special Economic Zone rules are distant from the South's current production capabilities.

Figure 8 – Manufacturing economic activities are distant from the South's production capabilities, according to analysis using the Economic Complexity framework



The severity of this risk depends on the extent to which knowledge and inputs can be shifted from more industrialized states in the country. Intuitively, this will be easier than across nations, but harder than within states. Evidence of Mexico's fastest-growing industries, however, suggests high degrees of regional clustering<sup>50</sup> (Figure 22).

### It is harder to industrialize today than in the 1990s

The rapid industrialization of northern Mexico started in the 1990s after the signing of the North American Free Trade Agreement (NAFTA). Much has changed in the interim years. The US's weighted mean tariff for all products fell from around 4% to around 1.6%. China was admitted to the WTO. Many developing countries chose export-oriented growth as their development strategy. These include the Dominican Republic, El Salvador, Costa Rica, Guatemala, Honduras, and Nicaragua, which are geographically very proximate to Southern Mexico and which signed a free trade agreement with the US. Finally, technological progress has led manufacturers to demand fewer employees. The argument that these forces are driving "premature deindustrialization" in the developing world, or at least making it harder for newcomers to industrialize through export-oriented manufacturing, is gaining much traction<sup>51</sup>.

### Mexican manufacturers may find it harder to access the US market in the near future

In 2014, Mexico sent 79.3% of its exports to the United States<sup>52</sup>. For Guerrero, Oaxaca, and Chiapas, the numbers are 78%, 72% and 73% respectively<sup>53</sup>. Mexico's dependence on the US as a destination for manufacturing exports is a result of geography, the size of the US market, and increasing economic integration under NAFTA.

The election of Donald J. Trump as President of the United States introduced significant uncertainty over the conditions at which Mexican exporters can access the American market. Mr Trump has made multiple public statements promising to renegotiate NAFTA so as to reduce the attractiveness of Mexico as a manufacturing base for the American market<sup>54</sup>. Given the complexity of the deal and of the supply chains

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<sup>50</sup> Gonzalez, Mack, and Flores, "Industrial Complexes in Mexico."

<sup>51</sup> For infinitely more thorough and rigorous treatment of this topic, see Rodrik, "Premature Deindustrialization."

<sup>52</sup> "Atlas de Complejidad Económica."

<sup>53</sup> Ibid.

<sup>54</sup> Irwin, "Will Trump Go After Nafta With Tweezers or a Hammer?"

behind it, its renegotiation could take years<sup>55</sup>. Potential investors are more likely to avoid investments for manufacturing exports before conditions are clearer.

The effect of the uncertainty is partly offset by a depreciation of the Mexican peso relative to the US dollar, which went from 13.31 to the dollar in 2014 (average) to 20.85 in February 2017<sup>56</sup>. This increases the attractiveness of Mexico as an export partner.

### Past attempts to industrialize the South have failed to attract investment

SEZs are not the first attempt at developing the South. Past attempts to build a transport link between the Pacific and the Gulf of Mexico and attract industrial investments around it include<sup>57</sup>:

- A 1907 project, built and operated by a British firm, that built a rail link and the ports of Salina Cruz and Coatzacoalcos. The line still exists today but is disused.
- The Alfa-Omega Plan, proposed in 1980 by the López Portillo administration.
- The Transisthmus Megaproject, proposed in 1996 by the Zedillo administration, which included 145 infrastructure projects.

In the early 2000s, the Panama-Puebla Plan, later renamed Proyecto Mesoamérica, promoted by the Calderón and Fox administration, centered on road improvements and government-supported manufacturing projects.

The IMMEX program, which still operates, provides some similar benefits to those offered under the SEZ program, such as allowing companies to import inputs duty and VAT-free if they will be re-exported, and permit simplification. It does not offer corporate tax or infrastructure benefits. Companies located anywhere in Mexico are eligible. Only 10 out of 6,438 companies authorized to receive the subsidy, and only one out of 647 certified factories are based in Chiapas, Guerrero, or Oaxaca<sup>58</sup>. The absence of export-oriented manufacturers in the region, in spite of the existence of IMMEX, suggests that VAT and duty tax breaks by themselves are not sufficient to make the states of the South competitive for these investments.

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<sup>55</sup> García, "Incertidumbre va Para Largo."

<sup>56</sup> Average exchange rate quotes from WolframAlpha.

<sup>57</sup> "El Megaproyecto Del Istmo de Tehuantepec Y Su Vinculación Con El Plan Puebla Panamá."

<sup>58</sup> Sistema Integral de Información de Comercio Exterior SIICEX, "Directorio de Programas Y Empresas IMMEX."

## The infrastructure component of the SEZs is at risk due to budgetary pressure

The infrastructure component of the first-wave SEZs implies a very significant capital investment. The estimated cost of the 81 infrastructure projects in the “first wave” SEZs is MXN 87 bn over ten years, or around US\$4.35 bn<sup>59</sup>.

The Federal budget is under severe pressure in 2017 due to a combination of the depreciation of the peso, federal debt obligations in dollars, a fall in domestic oil production and domestic oil prices, and increased spending. The 2017 Federal budget suffered a cut of around MXN 240 bn, or around US\$12bn, compared with 2016<sup>60</sup>. The cut alone represents 1.2% of GDP. Scenarios such as a continued depreciation of the peso or a recession following a contraction of exports due to protectionist measures in the United States would impose further pressure on the budget.

Part of the cost of the infrastructure projects can be covered by private investors under a PPP scheme. In fact, the Federal Authority expects two thirds of the cost of the transport projects (MXN 33 bn) to be covered by private parties. However, this leads to a coordination problem. It is unlikely that private investors will want to participate in these projects in contracts with demand risk-sharing, as the arrival of manufacturing investments to the region is far from certain.

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<sup>59</sup> Federal Authority for the Development of Special Economic Zones, “Special Economic Zones Presentation.”

<sup>60</sup> Bibián, “Los Recortes Presupuestales de 2017... Y Cómo Sortearlos.”

## Section E: “Special Economic Funds” (SEF) can help expand the benefits of the SEZ program.

### There is room for a complement to SEZs within existing legislation

This section proposes a new productive policy based on adaptations to the legal and regulatory structure discussed in Sections C and D that can complement SEZs. There is room for alternative mechanisms within the SEZ framework that incentivize all kinds of investment, so as to complement the existing effort on larger scale export-oriented manufacturing firms.

Many of the greatest achievements in the history economic development resulted from bold bets. If SEZs as proposed take off, this new mechanism could support suppliers, ancillary services, and other economic activity associated to the new manufacturers, making the SEZs even more attractive. However, the risks discussed in Section D imply that there is a meaningful probability that the SEZ program will fail to attract investment to Mexico’s South and fail to raise living standards. In that case, this mechanism could provide some new hope for prosperity.

### This SYPA proposes the creation of Special Economic Funds, a figure to complement SEZs

A Special Economic Fund (SEF) can be thought of as a hybrid between a SEZ administrator, in the spirit of existing SEZ law, and a growth capital fund.

A SEF is a corporation with three kinds of shareholders: private investors, local governments, and federal governments. The SEF is run by professional management, whose main responsibility is to find new companies, entrepreneurs, or new subsidiaries of existing companies to invest in. When a company accepts a bid from the SEF, it surrenders an equity stake in exchange for two assets: capital, and a special status as a company in a Special Economic Zone whose administrator is the Fund. The Fund has a board with seven votes: four for the private investor or investors, two for the Federal government and one for the State government.

## Design principles and features of SEFs

The features of the SEF scheme were designed to satisfy the three productive policy design principles laid out in Rodrik (2009): *embeddedness, carrots and sticks, and accountability*<sup>61</sup>.

### Embeddedness

*“An industrial policy that is cognizant of the government’s lack of omniscience has to be constructed as a system of discovery about all those sources of uncertainty. It requires mechanisms for eliciting information about the constraints markets face, and hence close collaboration between the government and the private sector.”*

The management of the SEF will be tasked with choosing portfolio companies that maximize returns for their shareholders. The private investors into the SEF will choose the management. This incentivizes the private investors to reveal, to the best of their knowledge, which businesses they believe will be successful<sup>62</sup>. The businesses can be new, or can be subsidiaries of existing companies, but they cannot be subsidiaries of any of the investors outside of the SEF scheme.

Management faces the following restrictions when selecting portfolio companies:

1. *The portfolio company must provide new employment in the states of Oaxaca, Chiapas, and/or Guerrero.*

This restriction is necessary because the main objective of this productive policy is to promote job creation and economic development in these regions. The precise number of jobs it is required to create could be determined with a formula negotiated during the formation of each fund. The formula could consider the number of jobs generated, pay for each, the public cost of the subsidy, and the typical employment patterns of investment candidates. There are otherwise no location requirements.

The investment can be in an existing company with an expansion project, or in a start-up company with no existing business. Either way, the documentation supporting the investment must identify the jobs created, and why it is unlikely that they would have been created in the absence of the SEF.

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<sup>61</sup> All textual quotes in this section are from Rodrik, “Industrial Policy.”

<sup>62</sup> If a business is a particularly lucrative investment, private parties might not want to share its equity with a fund with part-public ownership. However, in that case the investment would go ahead even without productive policy intervention, so from the perspective of the government this also reveals valuable private information.

2. *Investments must be approved by a simple majority of board members.*

The Federal and State governments choose whether to start a SEF based on a master plan on a case-by-case basis. Once they are participating, vote distribution in the board must be such that a coalition of one investor and both government instances can overrule the other investors, but a unanimous decision by investors cannot be undone by a coalition of the two governments. This mechanism replaces the provision under regular SEZs that the investment is approved by the Ministry of the Treasury and Public Credit.

### **Carrots and sticks**

*“Hence the conduct of industrial policy has to rely on both prongs: it needs to encourage investments in non-traditional areas (the carrot), but also weed out projects and investments that fail (the stick).”*

Portfolio companies benefit from five kinds of ‘carrots’:

1. *Equity investment*

Participation in the program means the business gets an equity injection. This can be in the form of an equity credit line, in which the funds are disbursed as needed by the portfolio company.

2. *Fiscal benefits*

Just like factories in a conventional SEZ, portfolio companies can benefit from fiscal benefits. However, rather than defining the same benefits for all portfolio companies, the investors and government negotiate the fiscal benefits specific to each SEF according to the expected vocation of its portfolio companies. For a tourism-oriented SEF, for instance, a tariff exemption on goods imported for reexport would be worthless, but accelerated depreciation of some of the fixed assets could be very valuable. These benefits would be phased off as detailed in the next section.

3. *“Public goods pool”*

Companies participating in a regular SEZ benefit from an additional implicit subsidy in the form of public goods within the industrial area that are of higher than usual quality. Before even choosing to make the investment, the government secures land rights, builds access roads, installs electricity lines, etc.

Similarly, SEF companies would benefit from tailored provision of public goods. The more heterogeneous nature of these companies requires a more flexible mechanism for disbursement. This SYPA proposes a “public goods pool” inspired by Romer’s “self-organizing industry

investment boards”<sup>63</sup>. The “pool” is a sum of federal money made available to the SEF management. Management would then spend it in a way that supported

4. *Preferential treatment from local authorities*

The state government has an equity stake, and is entitled to all its value creation. Hence, it has an incentive to provide assistance with matters such as land acquisition.

5. *Experimental regulatory benefits*

More radical policy experiments, which for political reasons cannot be tried in a larger scale, can be attempted within the SEZ. For example:

- a. Exemption from the requirement to import/export with a customs broker
- b. Relaxed labor regulations

An additional carrot is available for the private investors in the SEF:

6. In case of a successful exit (sale of the equity share by the SEF, or IPO) **before a certain deadline has passed**, the private investor receives the proceeds of the Federal Government’s equity share, minus the inflation-adjusted original capital contribution.

Four kinds of sticks keep the portfolio companies competitive:

1. *Market discipline*

The government will accept the private investors’ requests to participate in new SEFs insofar as they have a successful track record. This includes both appropriate choice of portfolio firms, and winding down of unsuccessful funds as quickly as possible.

2. *Time limits*

Just as with regular SEZs, all five carrots mentioned above expire after a fixed time period.

3. *Return to equity limit for fiscal benefits*

Firms with exceptional return on equity would see their fiscal benefit phased off faster. As a simplified example, if at the end of the fiscal year the real return on equity were above 15%, the fiscal benefit would be reduced by 25%.

4. *Additional time incentive*

After the deadline mentioned in Point 6 above, the proportion of the Federal government’s equity upside that accrues to the private investor begins to diminish gradually.

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<sup>63</sup> Also quoted in Rodrik (2009)

## Accountability

*“The ultimate “principal” here is the general public and we need to ensure that the industrial policy apparatus is responsive to it.”*

The following two design features keep the funds accountable:

1. *Transparency*

All requests to form a new SEF, minutes of the investment meetings, and financial results of the operations of each fund should be made public.

2. *‘Repeat game’ with improving payoffs*

As will be covered in the following section, multiple SEFs would be raised in succession. For an investor familiar with Southern Mexico and with the fiscal benefits offered, participation in future rounds would be attractive. Failing a state audit or otherwise ending up in a corruption scandal would eliminate the possibility of partnering with the government in larger future funds.

## Non-traditional export models could be supported by SEFs

This section explores three case studies of export-oriented industries that succeeded in environments similar to that of Southern Mexico. None would have been eligible for support under the regular SEZ program, but they could all have been eligible for SEF.

### *Case study 1: Call centers in El Salvador*

Over 152,000 Salvadorans were deported from the United States between 2008 and 2016, many fluent English speakers. Increasingly, they are employed to field customer service and sales calls. Today, “more than ten major call-center firms now operate in El Salvador, employing some twenty thousand people”<sup>64</sup>. The customers on the other side of the line are overwhelmingly in countries other than El Salvador – mostly in the United States.

Call centers are an export-oriented services industry that generate employment and bring in dollars to the Salvadoran economy. However, their set of needs is completely different from that of manufacturing. They do not require large investments in roads, rail, or ports. For these companies, it is crucial to have

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<sup>64</sup> “The Deportees Taking Our Calls.”

access to telecoms markets with competitive prices and high quality service<sup>65</sup>, and efficient transportation for bringing the workers to the call center. The SEZ program would not support the establishment of call centers in Southern Mexico, as the rules preclude non-manufacturing firms.

### *Case study 2: The mezcal boom*

Mezcal is Mexico's second best known spirit, after tequila, and an export success story in the making. It has become an increasingly fashionable drink in both domestic markets and abroad. Production has boomed from 434,000 liters in 2005 to 2 million in 2013, with a third destined to export markets<sup>66</sup>. In Oaxaca, the top mezcal producing state, distillers reported 400% sales growth between 2009 and 2015, and 2015 sales of USD \$200m, equivalent to around 1.5% of state GDP. Their trade body suggests they have generated 30,000 direct and indirect jobs across 148 brands<sup>67</sup>.

Mezcal has a Protected Designation of Origin, and its production is limited to certain municipalities with a history of mezcal brewing and appropriate climate and soil conditions for the agave plant. The norm controlling its production requires that all distillation and bottling takes place in an approved municipality<sup>68</sup>. As potential exporters, and possible users of imported inputs, mezcal producers would stand to benefit from Special Economic Zone treatment. However, they are unable to relocate their physical operations to the Salina Cruz, Oaxaca SEZ.

### *Case study 3: Yazaki takes the factories to the workers*

CID's Chiapas project highlights the case of the only major car part exporter in Chiapas: Yazaki-Arnecom (YA)<sup>69</sup>. YA uses its Chiapas plants for operations intensive in low-skilled labor. Instead of centralizing its production in one major facility, YA has developed five factories and planned two more in various locations across the state (Figure 21). While centralized operations close to a transport hub would probably result in synergies, YA chose to build multiple facilities in order to be closer to dispersed labor.

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<sup>65</sup> "The End of the Line."

<sup>66</sup> Iglesias, "Crecimiento de La Industria Del Mezcal."

<sup>67</sup> SIPSE, "Industria Del Mezcal Reporta Crecimiento Del 400 Por Ciento En Seis Años."

<sup>68</sup> NORMA OFICIAL MEXICANA NOM-070-SCFI-1994.

<sup>69</sup> This whole case study draws from Hausmann et al., "Hacia Un Chiapas Prospero Y Productivo."

For YA or companies with similar models to benefit from the Puerto Chiapas SEZ, the value of the economic incentive for locating in the SEZ is diluted by the increased cost of finding and transporting labor.

### SEF summary process

Figure 9 summarizes the lifecycle of a Special Economic Fund.



Figure 9 – The SEF lifecycle

## Section F: SEFs are designed to encourage the creation of firms that find ways around fragmentation

### Overview

This section explains the channels by which the SEF scheme addresses the binding constraints to growth described in Section B (Figure 10). For the purposes of this paper, that shows how this solution is “technically correct”. Further on, this section introduces other policy alternatives and evaluates them based on their effects on these binding constraints.

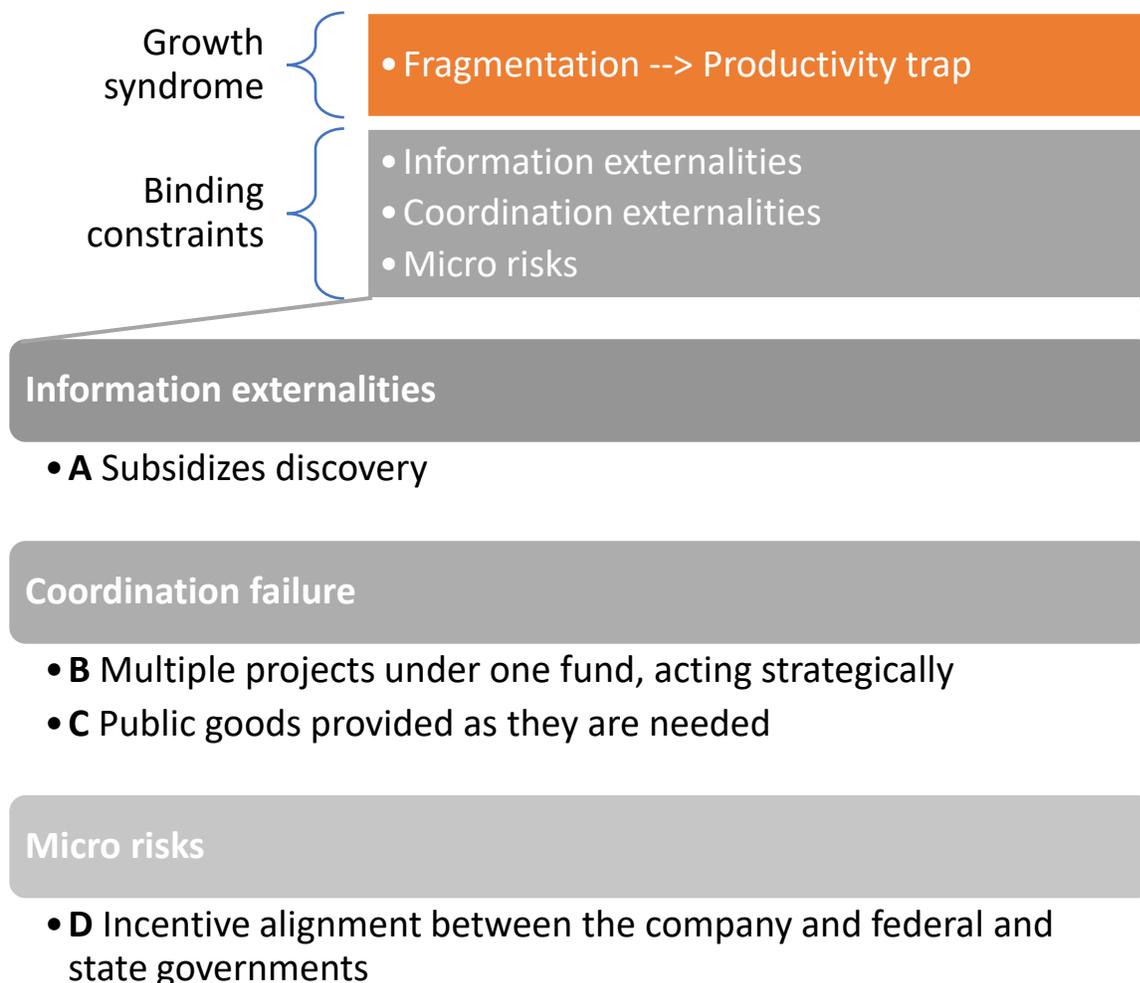


Figure 10 – The binding constraints to growth in Oaxaca and the mechanisms by which SEFs address them

### A Subsidizes discovery

A firm incurs in “discovery costs” when it endeavors a productive activity in a setting in which that activity has not been successful before<sup>70</sup>. Discovery has positive externalities: once a company has incurred the cost and found an activity to be profitable in a certain setting, other companies can set up as competitors without incurring in the cost. For instance, when entrepreneur Anthony Pile first tried to export packaged, cut fruit from Africa to Europe’s supermarkets, he had to convince buyers that his supply would be reliable, offer substantial discounts, help pay for a cold storage chain between his processing plant and the airport, etc<sup>71</sup>. He called his firm “Blue Skies” precisely because of the opportunity and challenges of being the first player in a market. Subsequent participants in the industry then benefited from the existing infrastructure and faced much lower uncertainty around the success of their business. All the discovery costs are borne by the first player, but the benefits are spread over all industry participants and society at large. At equilibrium, these forces keep discovery investment remains below the social optimum.

The SEF offers a vehicle by which the government can subsidize discovery.

### B Multiple projects under one fund, acting strategically

Coordination issues are very commonplace in development. For instance, firms cannot be launched because they cannot find suppliers, but suppliers cannot be started if there are no potential customers. SEFs support an entire portfolio of companies and align their incentives. It also ensures access to capital for them. These companies can now coordinate to launch in a manner convenient for all.

This aspect of SEFs can also be leveraged to support the industrial zones promoted by the existing SEZ program.

### C Public goods provided as they are needed

Public good provision is also subject to coordination failure, especially when they are very industry-specific. Examples include beef traceability systems, such as the one implemented in Uruguay<sup>72</sup> for compliance with phytosanitary safety restrictions in export destinations, or cold-storage facilities for

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<sup>70</sup> Hausmann and Rodrik, “Economic Development as Self-Discovery.”

<sup>71</sup> Site visit, Blue Skies facility, Accra Ghana.

<sup>72</sup> Fernández-Arias et al., *Two to Tango*. Page 257

exporting flowers<sup>73</sup>. The supply of these public goods have coordination failures of two kinds. First, multiple companies must usually coordinate to pay for their provision. Second, when governments are responsible for provision, “chicken and egg” problems arise – a transit agency won’t start a bus route until there is demand, but investors will not build a factory in a place its workers cannot reach.

#### D Incentive alignment between federal and state governments and company

The businesses benefiting from the SEF program will receive financing. This is not motivated by a belief that capital is a binding constraint to the growth of these companies, as detailed in the following section. Rather, capital serves as an incentive alignment mechanism among the parties. In particular, introducing equity stakes in SEFs:

- Generates an incentive for private investors to find high-performing management to run the portfolio company selection process. Maintaining company selection separate from government officers is critical to ensuring the companies with the highest growth potential are chosen to form part of the portfolio.
- Creates incentive to collaborate among portfolio companies, which can offer complementary services, become each other’s suppliers, etc.
- Allows state and federal governments an incentive to work together, even if they are not run by the same political party.
- Provides state governments with a financial incentive to ‘make things happen’ for portfolio companies.

#### The role of capital

The growth diagnostic laid out in Section B does not single out lack of access to capital as a binding constraint to growth in the South. Both the Oaxaca and the Chiapas diagnoses cited point out to evidence suggesting this is not the case. We diagnosed this based on multiple pieces of evidence<sup>74</sup>. Mexico has an open capital account, a freely traded currency, and relatively few restrictions to foreign investment. Stable macroeconomic conditions make it a relatively attractive emerging market to make loans to. The paucity

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<sup>73</sup> Gebreeyesus and Sonobe, “Global Value Chains and Market Formation Process in Emerging Export Activity.”

<sup>74</sup> This argument follows Rivera, Sarmiento Hinojosa, and Serra, “Growth Diagnostic: Oaxaca.”

of bank branches and the low levels of lending in the states of the South could suggest problems in domestic intermediation. However, we find that medium and large companies can easily seek finance elsewhere in Mexico or abroad, and that small companies with high potential have access to a network of credit unions (“*cajas de ahorro*”) that is much larger than traditional banking and that offers relatively expensive credit but with minimum formality or collateral requirements. We find that, in the South of Mexico, *caja de ahorro* lending is used for consumption much more than for productive purposes<sup>75</sup>, which suggests that low returns, and not bad finance, constrains growth.

There are precedents for lower cost government-supplied capital as a subsidy for discovery and coordination, and as an incentive-alignment mechanism for multiple stakeholders, even in countries where capital is not a growth constraint. The Technology Incubation Scheme, set-up by the Government of Singapore under the National Research Foundation, is one such example<sup>76</sup>. Even though Singapore has one of the world’s most effective financial systems, the government set up a scheme to join venture capital funds in investing rounds for technology start-ups. In this scheme, the government funded the majority of the round and after three years offered the entrepreneur the choice to repay the funding at a low interest rate or to convert it into equity. The scheme solved a coordination problem, as it spurred a startup ecosystem in Singapore, attracting talent, incubators, and even co-working spaces.

### Illustrating the channels: Hypothetical scenarios of investments made possible by SEFs

This section illustrates how SEFs could lead to job and value creation in parts of Southern Mexico by encouraging new business models that work their way around the fragmentation inherent to the region. The business models described are very hypothetical.

#### **Hypothetical SEF scenario 1: Tourism complex in Playa Tembo, Oaxaca**

The Mexican Ministry of Tourism planned the Huatulco resort complex in the Oaxacan coast with the intention of replicating Cancun’s success. In spite of its spectacular natural beauty and attractions like a world-class airport, national park, and even excellent surfing conditions, Huatulco has disappointed. It has only around six flights a day, and one-tenth the hotel rooms of Cancun. Local businesspeople speak of a

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<sup>75</sup> To acquire inputs, produce capacity, or replace depreciated equipment.

<sup>76</sup> Pillapakkam, Email communication, Investment Partner, Omidyar Network.

coordination problem: there are no flights without hotels, and there are no hotels without flights<sup>77</sup>. Only two hotels have been built in the destination over the past fifteen years.

This SEF would coordinate typical hotel investors for the upgrading of Playa Tembo bay into a ‘luxury resort within a resort’, similar to Punta Mita near Puerto Vallarta. The public goods pool would be used to incentivize an airline to start and promote a route to the US West Coast, a four-hour flight away.

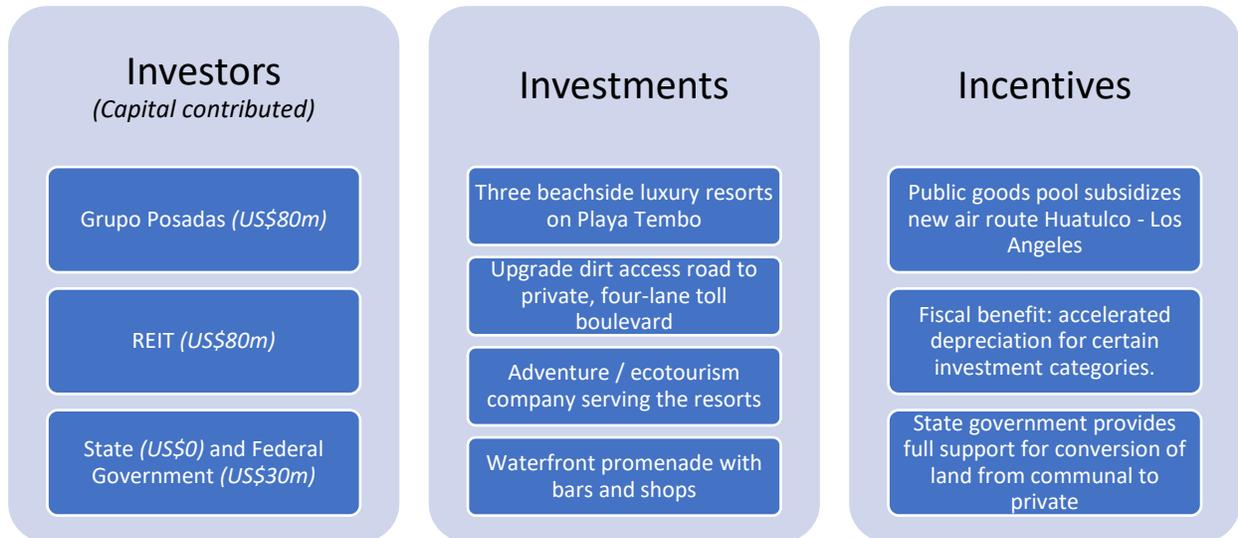
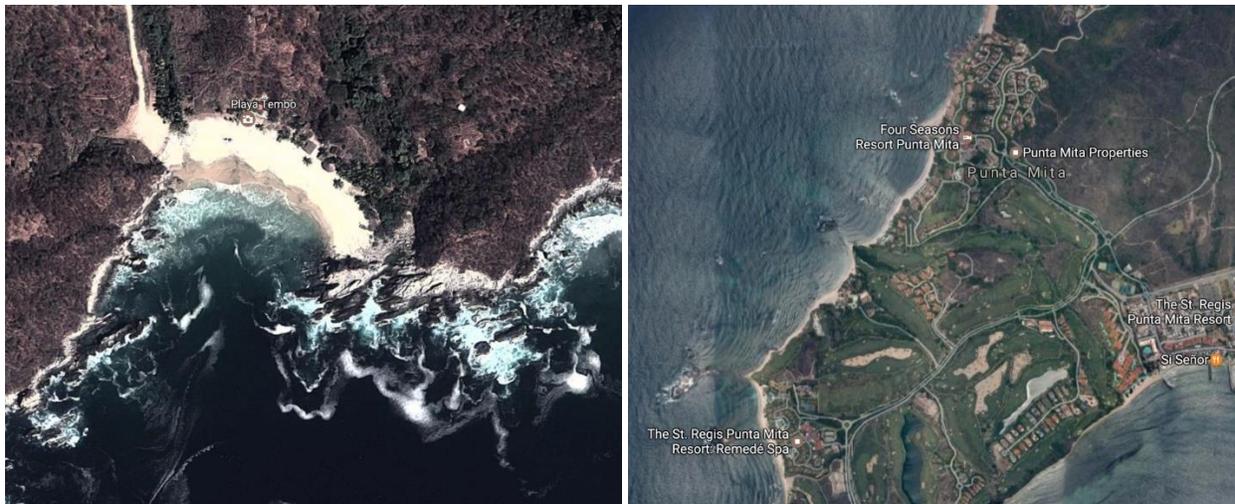


Figure 11 – Playa Tembo’s level of development (left) is restricted to a handful of thatched-roof facilities, in sharp contrast to Punta Mita’s resorts, golf courses, and luxury villas (right).<sup>78</sup>



<sup>77</sup> “Huatulco, El Destino Turístico Que Envejeció Apenas a Los 29 Años.”

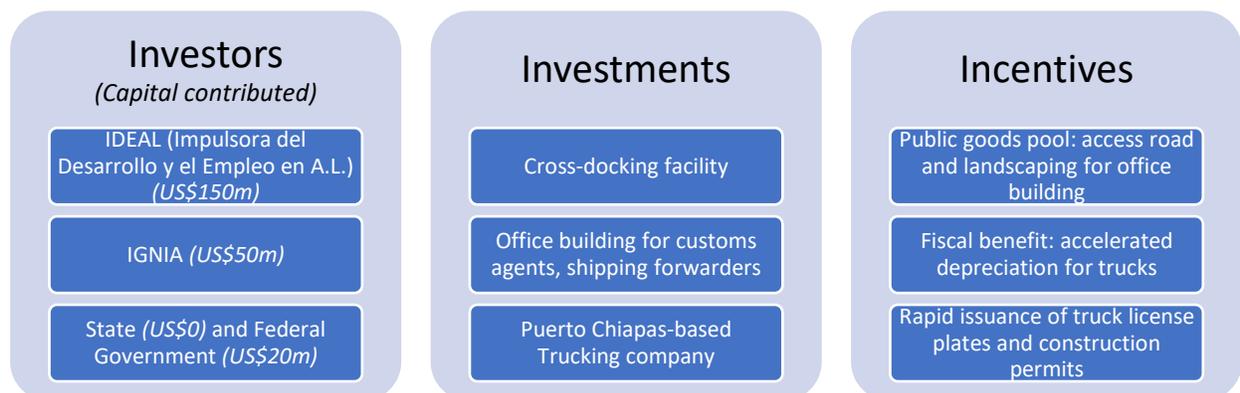
<sup>78</sup> “Google Maps.”

Multiple coordination problems are solved with an SEF implementation. Simultaneously establishing a few hotels allows them to share facilities, from water treatment plants to employee shuttles. Complementary businesses, from tour companies to bars, can start at the same time as the hotels. Co-ownership means the hotels can direct its guests to these businesses. A toll access road can be more certain of expected demand, while the hotels can be sure that its guests can arrive. The high discovery costs of exploring the US West Coast tourism market are socialized by the public goods pool.

Playa Tembo is currently communal property, like most land in the South. Furthermore, it is disputed by at least two groups<sup>79</sup>, which are supported by different local politicians. Significant political capital must be expended in order to privatize the land and compensate the current owners expeditiously. The SEF solves the coordination problem by assuring the State government that, upon spending that political capital, the investment will indeed take place. It also provides the State government with a motivation, in terms of financial return to its equity stake, to invest said political capital.

### Hypothetical SEF scenario 2: Supplementary services at Puerto Chiapas

Currently, many of the exports produced in Chiapas and Tabasco are trucked across the border and exported from Guatemalan ports. The development of the Puerto Chiapas SEZ is promising both in terms of producing more industrial goods for export, and in terms of reducing logistics costs for new and existing exporters. The port at Puerto Chiapas currently only exports 59,000 tons per year<sup>80</sup>. Because the demand is not there yet, there are very few suppliers of services relevant for exporters. Because the services are not there, exporting through Puerto Chiapas is not feasible. This coordination problem can be addressed with a SEF that complements the Puerto Chiapas SEZ.



<sup>79</sup> "Incendian Palapa Comunal En Playa Tembo, Pochutla."

<sup>80</sup> Compared with 12 million tons for the medium-sized port of Coatzacoalcos, for instance. Hausmann, Espinoza, and Santos, "Diagnostico de Crecimiento de Chiapas: LA TRAMPA DE LA BAJA PRODUCTIVIDAD."

## Risks and potential failings of the SEF approach, from a technical correctness perspective

There are two major risks that could hamper the success of SEFs, from a technical correctness perspective. Please note political and implementation risks are addressed in Section G.

The first risk is finding that the SEF scheme as the government is willing to sign it is not attractive enough for private investors. In spite of the value of the three “carrots” discussed in Section E, there is a risk that the restrictions imposed in terms of employment in the region, governance, and project approval are sufficient to dissuade the private investor from participating. It is difficult to calculate the probability of this risk being realized without specifics of the projects the investors might have in mind. The costs in this scenario, however, are very low. If private investors did not apply to start SEFs, the costs sunk on the project at this point should be minimal, and the government should instead focus its energies on longer-term projects to improve the returns on investment in the region more generally.

The second risk is that of inefficiency of public spend by subsidizing inframarginal projects. SEZs are relatively lower risk in this category because there was very little pre-existing manufacturing in these states, and no existing factories plans to expand. In the case of SEFs, however, this form of leakage is more of a risk. Ultimately, whether the projects would have happened regardless of investment by the Fund must be determined by the members of the Board of Directors of each SEF.

## Alternative policy options

This SYPA evaluates four policy options additional to the proposed SEF plan. This section briefly describes those alternatives, and then recommends potential alternatives.

1. **No intervention** – Shutting down of the SEZ program.
2. **Tax cuts to all firms in the existing states** – Extending a set of fiscal benefits to all firms in a given state (whether headquartered there or providing employment there), and shutting down the SEZ program. For simplicity, I assume this benefit would be a reduction in the rate of payroll tax for all employees based in these states.
3. **Traditional vertical sectorial policies** – Targeted subsidies to firms selected by the government due to the promise afforded by their sectors.
4. **Status quo (existing SEZ plan)** – Continuing with the SEZ plan only, as described in section C.
5. **SEF as complement to existing SEZ plan** - Continuing with the SEZ plan, and launching SEFs as described in section D.

Launching the SEF program while canceling the SEZ plan is not considered a politically feasible option, partly because SEFs are built upon the SEZ regulatory framework.

### Evaluation of policy alternatives on their technical correctness

Figure 12 summarizes the evaluation of the technical correctness of the five policy alternatives mentioned above. Technical correctness in this context is interpreted as helping companies develop in Southern Mexico, which means we can evaluate it in terms of the effect of each policy alternative on the three binding constraints to growth identified in Section B. By this ranking, launching SEFs in conjunction with SEZs is the most technically correct alternative, followed by the status quo of launching SEZs only.

Figure 12 – Evaluation of policy alternatives on their technical correctness

<b>Alternative</b>	<b>Information failures</b>	<b>Coordination failures</b>	<b>Micro risks</b>
<b>1. No intervention</b>	<input checked="" type="checkbox"/> Does not address	<input checked="" type="checkbox"/> Does not address	<input checked="" type="checkbox"/> Does not address, does not make worse
<b>2. General tax cuts</b>	<input type="checkbox"/> Makes marginal projects with info. costs NPV positive, but with extremely high leakage	<input checked="" type="checkbox"/> Does not address	<input checked="" type="checkbox"/> Does not address Worsens government fiscal position
<b>3. Traditional vertical</b>	<input type="checkbox"/> Socializing bears discovery cost, but the choice of industry is made by the government	<input type="checkbox"/> Partly addressed, but the government will tend to benefit only one industry and not the ecosystem	<input checked="" type="checkbox"/> May cause corruption, as the government “picks winners”
<b>4. SEZ only / status quo</b>	<input checked="" type="checkbox"/> Fiscal benefit for firms in Zone + requirement that all firms be manuf. + no manuf. in the region now → effective discovery subsidy for manufacturing	<input type="checkbox"/> Partly addressed, as the opening of the zone is a pivot that can serve as a “big push” moment for suppliers of manufacturing facilities	<input checked="" type="checkbox"/> Addresses with measures like regulatory fast tracking
<b>5. SEZ + SEF</b>	<input checked="" type="checkbox"/> Most effective at addressing, as discussed earlier in section F	<input checked="" type="checkbox"/> Most effective at addressing, as discussed earlier in section F	<input checked="" type="checkbox"/> Most effective at addressing, as discussed earlier in section F

## Section G: SEFs are superior to its alternatives when evaluated on their political supportability and bureaucratic feasibility

In Section F, we confirmed that combining SEZs and SEFs is the most technically appropriate productive policy for Southern Mexico. However, if this policy is not politically supportable, implementation efforts will only lead to waste. Similarly, the technical correctness of the solution is predicated upon the assumption that the private and public participants will have the capabilities to conduct the duties described in Section D. This section analyzes whether these assumptions are tenable.

### Evaluation of policy alternatives on their political supportability

The most politically supportable policy alternatives are 3. *Traditional Vertical* and 4. *SEZ only / status quo*. However, SEFs are still politically supportable.

Figure 13 - Evaluation of policy alternatives on their political supportability

<b>Alternative</b>	<b>Expected political effect</b>
<b>1. No intervention</b>	<input type="checkbox"/> The governments currently benefited by SEZs would oppose the termination of the program. The federal government would be attacked due to the unpredictability of its policies.
<b>2. General tax cuts</b>	<input checked="" type="checkbox"/> Substantial tax cuts are an easy sell in the abstract. However, cutting taxes in such a large region would require either higher federal government debt, higher taxes elsewhere, or spending cuts. The whole measure would generate opposition, particularly from businesspeople from the North of the country who already resent the proportion of their taxes that is funneled to the South as federal transfers.
<b>3. Traditional vertical</b>	<input checked="" type="checkbox"/> Although some in the economic right may complain, programs that support companies that generate employment tend to be very popular.
<b>4. SEZ only / status quo</b>	<input checked="" type="checkbox"/> SEZs have been very popular with state governments and have received positive, if modest media coverage.
<b>5. SEZ + SEF</b>	<input type="checkbox"/> Both the public and potential investors would support a policy sold as a program to encourage employment in deprived areas. However, political challenges would arise. These are explored in the following part.

### Political implementation pathway for SEFs

SEFs have been designed to be broadly compatible with existing SEZ law. However, in order to perform a full implementation as described in Section D, the Law would still require amendments to be passed in Congress as follows:

1. Adding a new section describing SEFs as a form of SEZs with the following special exceptions:

- a. No requirement for investment authorization from Ministry of Finance
- b. No requirement to be based in a certain plot of land
- c. No requirement to stick to a centrally planned sectorial master plan by region
- d. No requirement for the government to centrally provide public services

Other more specific provisions, such as board membership, the requirements for portfolio companies to provide employment in the target states, etc. could then be added in the “Reglamento de la Ley de ZEE” (the lower-level regulation stemming from the law).

Major political opposition to these reforms appear unlikely. SEFs do not detract from SEZs, or from other government programs which want to be protected. As will be covered further on, there could be opposition from left-wing legislators, who may oppose to the notion of privately-hired management making investment decisions with partly public money, or with the lack of a centrally defined plan. At least at a superficial analysis, a PAN-PRI coalition for passing this amendment appears possible.

### Risks and potential failings of the SEF approach, from a political supportability perspective

The following four political risks would arise from pursuing SEFs. These explain why the SEZ+SEF alternative was rated “yellow” in Figure 13.

1. **Misappropriation of resources** – There are two sources of public money in the SEF design, and they could be misappropriated in different ways given inadequate oversight. The Public Goods Pool could be directed for private benefit in a variety of ways. The investors could also collude with those running the portfolio companies to receive the equity infusion from the government and then drain the capital out of the company in one of a variety of ways.  
While serious, similar risks also arise with many other government programs, such as the business development programs run by the Entrepreneurship Institute (INADEM) or the development banks. Following similar audit rules as those programs, as well as ensuring high transparency throughout execution, can mitigate this risk.
2. **Optics** – Even if point 1 is avoided, there is a potential problem for a political scandal. At its core, this program involves the government providing money to a small private body to spend relatively discretionally in the pursuit of a profit-making enterprise which is majority private-owned. Communications for this program must emphasize its job creation and poverty fighting aspects to counter.

3. **Other states may request broadening the geographical requirement** – This is already happening to regular SEZs. It is a tricky political challenge for the Federal Government and the legislature to resist broadening the program to states that need it less, but demand it more loudly. Still, they generally must resist, as from a technical correctness perspective, the only justification to allow a much more favorable fiscal regime to VC-owned firms in some states versus others is to compensate for a much worse business environment in the context of Mexico’s very high regional inequality.
4. **The government could use its veto power in board to restrict investments to favored companies, or to certain sectors** – The former results in corruption. The latter results in making the intervention more vertical, and also reduces the attractiveness of future SEF rounds to potential investors. This risk is reduced by requiring the veto to involve both the Federal and State governments and by providing the governments with a share of the returns.

### Evaluation of policy alternatives on their bureaucratic feasibility

The most politically supportable policy alternatives are 3. *Traditional Vertical* and 4. *SEZ only / status quo*. However, SEFs are still bureaucratically feasible.

<b>Alternative</b>	<b>Expected bureaucratic effect</b>
<b>1. No intervention</b>	<input checked="" type="checkbox"/> Not acting means no bureaucratic capabilities are required.
<b>2. General tax cuts</b>	<input checked="" type="checkbox"/> Generally, implementing a tax cut requires no additional bureaucratic capabilities to those required to impose the tax.
<b>3. Traditional vertical</b>	<input checked="" type="checkbox"/> As extensively address in retrospective analyses of vertical industrial policy, the most important factor that leads to its frequent failure is the inability of developing country governments to select sectors and firms that will deliver on growth promises, and then to police those companies.
<b>4. SEZ only / status quo</b>	<input type="checkbox"/> Current SEZs require the government to assess candidate companies, development plans, and select areas to develop SEZs in.
<b>5. SEZ + SEF</b>	<input type="checkbox"/> SEFs are designed to reduce the government’s role in selecting the industries and companies that will benefit from productive policies. However, they still require

### Risks and potential failings of the SEF approach, from a bureaucratic capability perspective

The most important bureaucratic capability risk is lack of human capital in the various steps of the SEF process. Whereas other policies can be analyzed only from the perspective of the bureaucracy’s capabilities, the public-private design of SEFs means that capabilities are required in both the private and public sector. They are addressed in turn:

1. **On the investor side** – The SEF structure requires highly capable investors. They must prepare Fund proposals, hire professional management for the Fund, and approve investment decisions in the SEF’s board.

While there are very capable investors in Mexico, and nothing precludes well-staffed foreign investors from joining the SEF scheme, it is a risk that at this combination of investor restrictions, subsidies, and value of the opportunity the best investors fail to join. The caliber of investors applying for SEFs must be assessed by the government before signing an SEF.

2. **On the management side** – Investors are expected to hire professional management. The latter’s responsibilities include selecting the investments and coordinating their performance. They may need to keep a project pipeline open and to nurture entrepreneurs. All these are challenging tasks.
3. **On the entrepreneur side** – High quality entrepreneurial talent must be found and nurtured by SEF management. Given the skills and education shortage in Southern Mexico, it is possible that the fund management may have to look elsewhere in Mexico for quality projects.
4. **On the federal and state government side** – The Federal government requires the capability to negotiate sets of fiscal incentives and to discern among SEF proposals. Robust capability and business acumen is also needed among those who decide on whether to vote in favor of projects on the SEF board. Finally, robust audit and monitoring capabilities will be needed to monitor the disbursement of public funds.

### Problem-Driven Iterative Adaptation and SEFs

Starting with a smaller fund and then evaluating its performance before launching new funds is good policy from an implementation standpoint as well. Problem-driven Iterative Adaptation (PDIA) theory suggests that policy reform is more likely to be both politically supportable and bureaucratically feasible if four steps are met. SEFs have been designed to comply with PDIA. The way in which they do this is discussed after quoting each step:

*“(i) aim to solve particular problems in particular local contexts”<sup>81</sup>*

SEFs aim to solve the problems of information, coordination, and micro risk externalities that keep companies and entrepreneurs from investing in Mexico’s south. They do this with a very flexible structure

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<sup>81</sup> This quote and the free following ones, as well as the PDIA concept, are sourced from Pritchett, Andrews, and Woolcock, “Escaping Capability Traps through Problem-Driven Iterative Adaptation (PDIA).”

that allows entrepreneurs to find creative solutions to the fragmentation that characterizes the local context.

*“(ii) the creation of an ‘authorizing environment’ for decision-making that encourages experimentation and ‘positive deviance’”;*

The management of the SEF are given extensive latitude to define their specific investments. The government does not have a direct mechanism to control the decisions of the portfolio companies.

Governments can also experiment with different fiscal incentives and other policies that apply only to a small portfolio of firms. The results from these experiments can illustrate larger scale reforms.

*“(iii) active, ongoing and experiential (and experimental) learning and the iterative feedback of lessons into new solutions”*

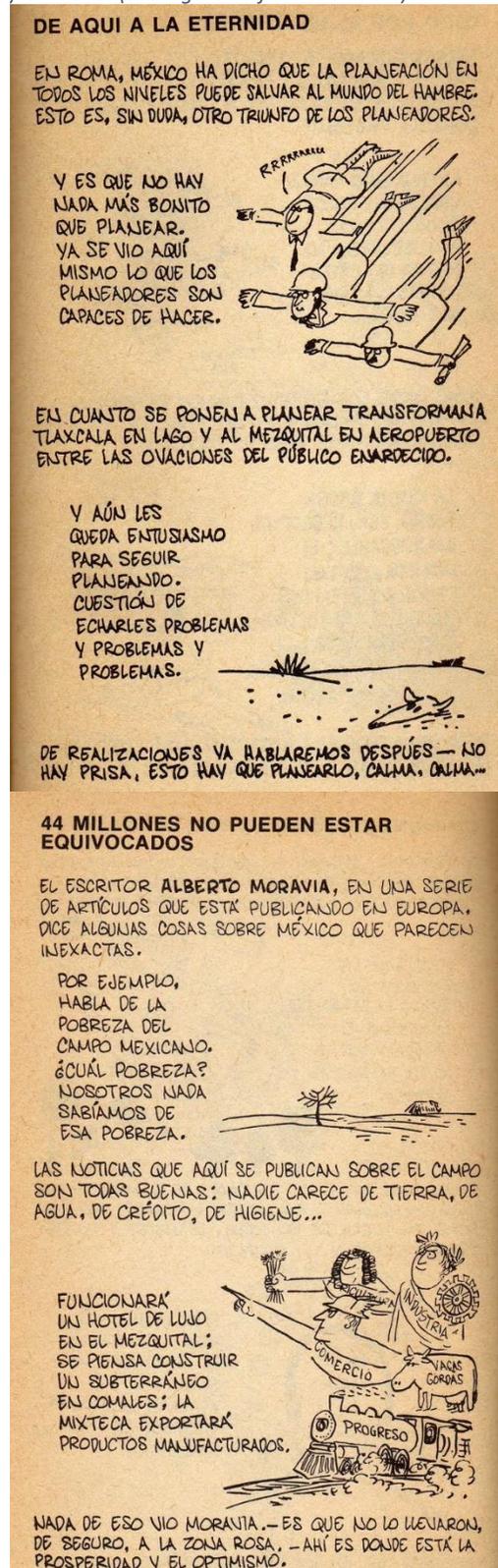
Every new fund is a new iteration in which the government can apply its previous learnings. In the context of the risk discussions in the last two sections, it is important to bear in mind that the overall dimensions of the risk can be contained by limiting the size of the initial funds. The structure of multiple funds, each negotiated independently with different investors at different times, allows the government to iterate and to learn from past experience.

*(iv) engaging broad sets of agents to ensure that reforms are viable, legitimate and relevant—that is, are politically supportable and practically implementable.”*

Risk capital is an incentive alignment mechanism to engage different levels of government with large investors and portfolio companies. The experimentation of later funds can gain political and popular legitimacy from the employment generated by portfolio companies of earlier funds.

## Conclusions

Figure 14 – A perspective on development planning from 1976. (See Figure 23 for translation.)



Forty years after the publication of Abel Quezada's cartoons on Figure 14<sup>82</sup>, the notion that "Oaxaca's Mixtec region will export manufactured products" has a tint of lack of realism, even whimsy. Then as now, the planning to change that has been robust, while the execution has been lacking.

The Peña Nieto administration has been working hard to change that this time around. The rapid deployment of the SEZ program means that we finally get a shot at that reality.

Given the modest political requirements and straightforward implementation procedure, I strongly believe that an initial SEF can be up and running before the end of the current presidential term in December 2018. If the SEZ program succeeds, SEFs would complement it with support services and might even encourage larger spillovers from the industrial zone to the local economy. And if no manufacturers can be persuaded to move to the South, in spite of the SEZ program, SEFs use the same regulatory scaffolding to have another shot at making a difference.

Let us do our best to keep the impoverished citizens of the South from waiting for yet another set of economic planners to drop by and start from scratch.

<sup>82</sup> Quezada, *El Mexicano Y Otros Problemas* /.

## Appendix 1: Additional figures

Figure 15 – Oaxaca, Guerrero, and Chiapas have all grown more slowly than the rest of the country since 2003.<sup>83</sup>

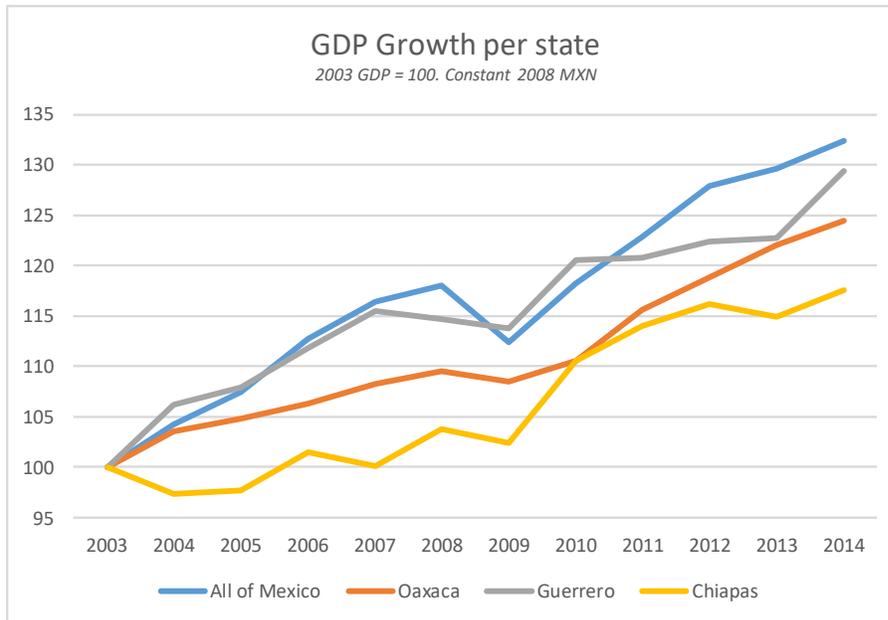


Figure 16 – Comparison of Mexico's three poorest states with the rest of the country.<sup>84</sup>

	Average Mexican state	Oaxaca	Chiapas	Guerrero
<b>Municipalities per 100,000 hab.</b>	2.2	14.7	0.8	2.4
<b>% of population in rural areas</b>	23%	53%	52%	42%
<b>% of population in extreme poverty</b>	10%	24%	32%	24%
<b>% of population which is indigenous</b>	15%	58%	33%	23%
<b>Non-oil exports as % of state GDP (13.31 MXN/USD)</b>	35%	9%	8%	3%
<b>Top 3 export products</b>	1. Crude oil 2. Cars and parts 3. Computers	1. Refined oil 2. Beer 3. Pineapples and/or avocados	1. Crude oil 2. Coffee 3. Pineapples and/or avocados	1. Alcohol 2. Pineapples and/or avocados 3. Hot sauce
<b>Average years of education</b>	7.1	5.7	5.3	5.9

<sup>83</sup> "Original Analysis with Official CONAPO and INEGI Data."

<sup>84</sup> Ibid.

<b>Child mortality</b>	12.0	12.9	12.9	13.6
<b>Dependency ratio</b>	0.64	0.74	0.74	0.76

Figure 17 - There is significant variation in average monthly incomes within Oaxaca.<sup>85</sup>

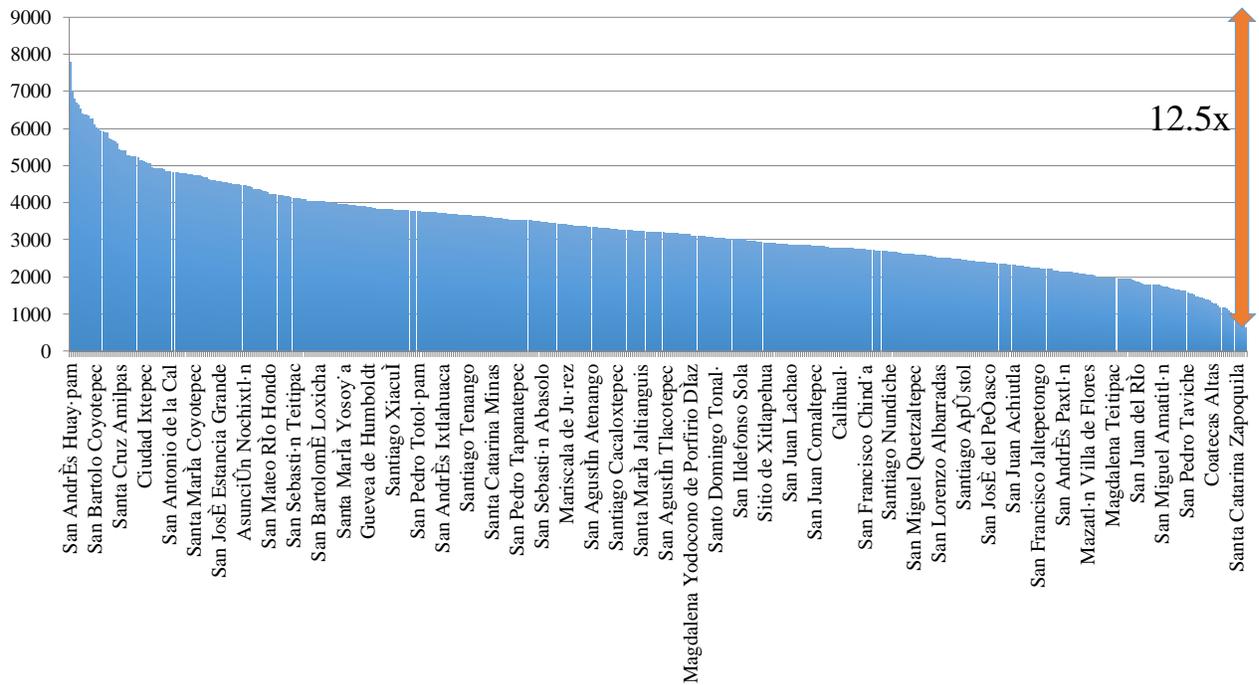
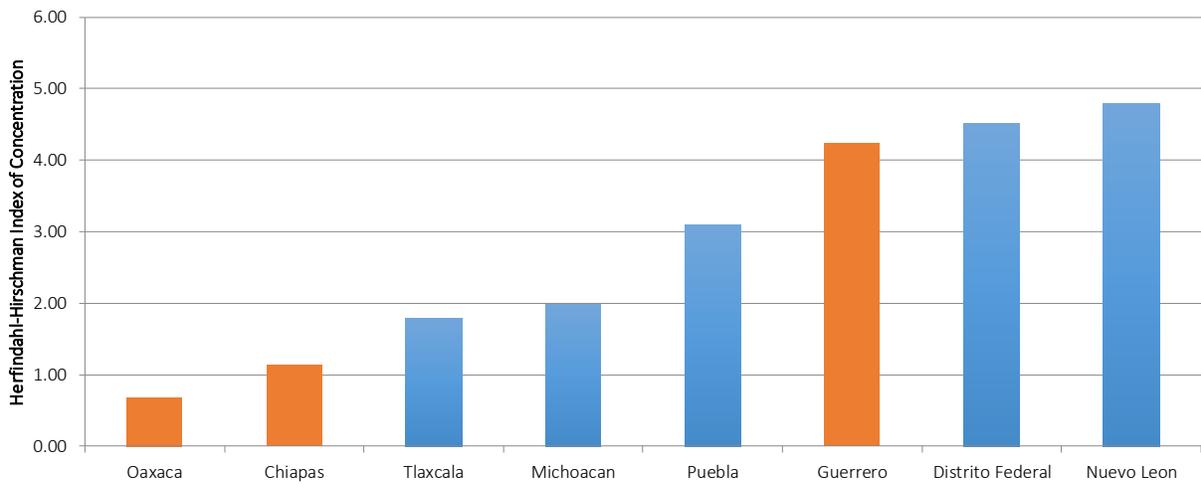


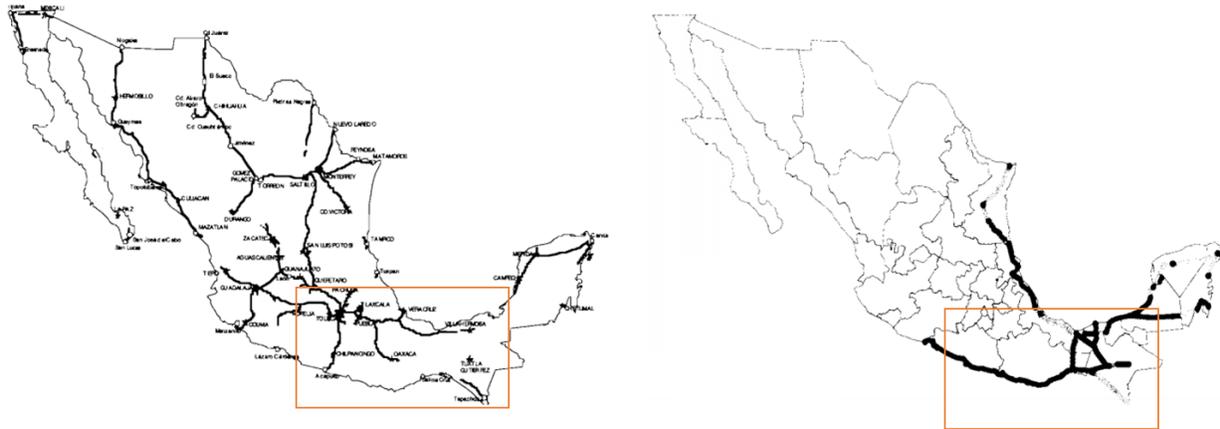
Figure 18 – Herfindahl Index of Concentration of Population (for selected Mexican states), 2010



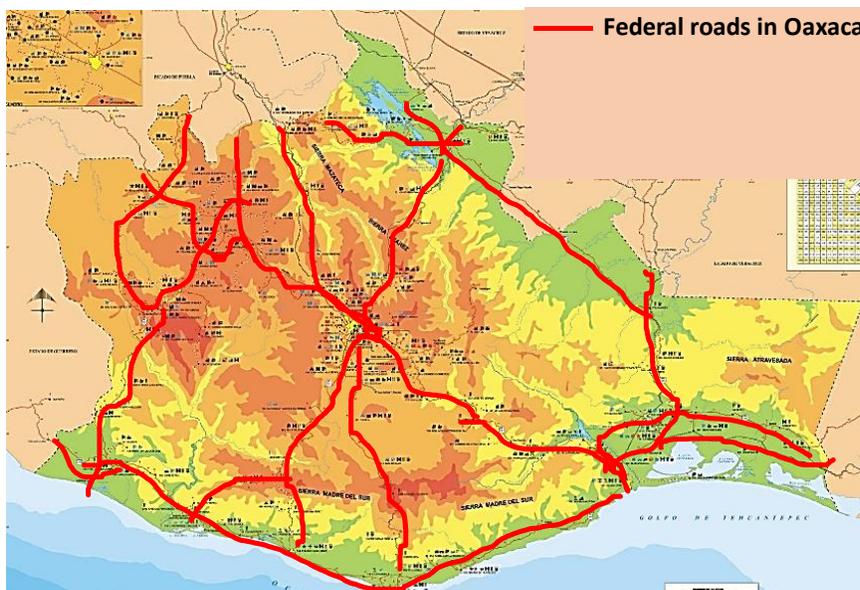
<sup>85</sup> "Original Analysis Based on the 2010 Population Census (INEGI)."

We constructed an “Index of Concentration” for the level of population dispersion in state using the Herfindahl index. Specifically, we applied the following formula to each state:  $\sum s^2$ , where  $s$  is the percentage of people in each municipality.<sup>86</sup>

*Figure 19 – The map on the left shows existing major federal roads in 1999. The map on the right shows the roads Dávila, Kessel and Levy (2002) suggested could unleash development in the South.*



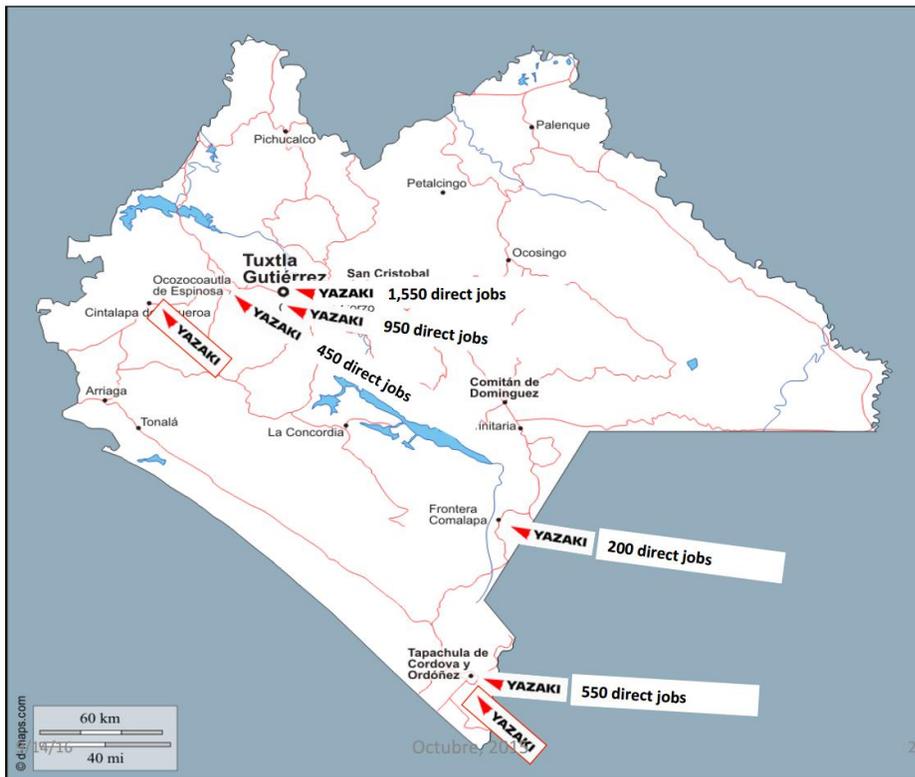
*Figure 20 – Federal roads in Oaxaca as of 2015<sup>87</sup>.*



<sup>86</sup> Rivera, Sarmiento Hinojosa, and Serra, “Growth Diagnostic: Oaxaca.”, with information from the INEGI 2010 Population Census

<sup>87</sup> Ibid.

Figure 21 . Yazaki's current and planned manufacturing units in Chiapas state<sup>88</sup>



<sup>88</sup> Hausmann et al., "Hacia Un Chiapas Prospero Y Productivo."

Figure 22 – The emergence of strong clusters for manufacturing industries suggests barriers to transfer of know-how and resources across regions.<sup>89</sup>

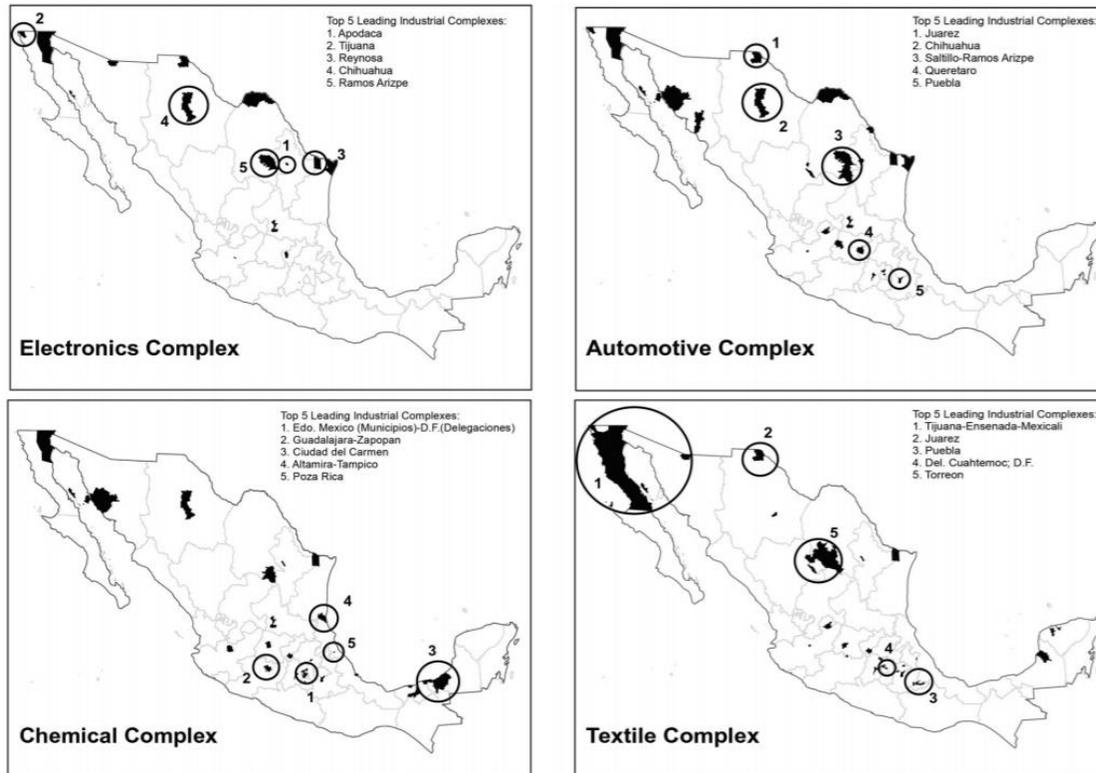


Figure 23 – Translation of Figure 14

### From here to eternity

In Rome, Mexico stated that planning at all levels can save the world from hunger. This is, undoubtedly, another triumph of planners.

There is nothing as beautiful as planning. We have seen right here what planners are capable of doing.

As soon as they start planning, they transform Tlaxcala in a lake, and the Mezquital area in an airport, amidst the clamoring of a fired-up crowd.

And yet, they still have the enthusiasm to continue planning. It is just a matter of piling them on with problems and problems and problems.

We can discuss execution later – there is no rush, that must be planned. Calm down, calm down...

<sup>89</sup> Figure from Gonzalez, Mack, and Flores, "Industrial Complexes in Mexico."

**44 million cannot be mistaken**

Writer **Alberto Moravia**, in a series of articles he is publishing in Europe, says some things about Mexico that appear to be imprecise.

For instance, he speaks of the poverty of rural Mexicans. What poverty? We didn't know anything about that poverty.

The news published here about rural areas are all good: nobody lacks land, water, access to capital, hygiene...

A luxury hotel will run in the Mezquital; an underground train will operate in Comales; the Mixtec [in Oaxaca] will export manufactured products.

[Agriculture] [Industry] [Commerce] [Fat cows] [Progress]

Moravia did not see any of that – the problem, surely, is that he never went to the Zona Rosa [upscale Mexico City neighborhood]. That is where prosperity and optimism can be found.

## Appendix 2: Technical notes

### Complexity analysis

A number of exhibits in the paper are based on an analysis following the Economic Complexity methodology, as put forward by Hausmann et al<sup>90</sup>. These include these exhibits: Figure 6 and Figure 8. This appendix describes this analysis.

### Data

All analysis is based on the 2014 INEGI Economic Census. All economic activity in the country performed in fixed locations, in both the formal and informal sectors, is recorded by census takers. They recorded a total of 6,654,014 economic units. The data set used describes number of people employed per economic activity per municipality. The economic activities are expressed at the four-digit level<sup>91</sup>. Employment figures are recorded as reported to the census takers.

### Methodology

The data is processed using the Stata command *ecomplexity*, developed by Harvard's Center for International Development<sup>92</sup>. Complexity is calculated with the following parameters:

- Location variable: municipality
- Universe of economic activities: activities performed nationally. Given the large gap in economic complexity between the three southern states analyzed and the rest of the country, it is unlikely that this restriction reduces the quality of the analysis
- Product / industry variable: 4-digit SCIAN code
- Varlist / variable on which the complexity calculations will be performed: number of people employed

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<sup>90</sup> Hausmann et al., *The Atlas of Economic Complexity*.

<sup>91</sup> The following book describes the industry classification in use in Mexico: Instituto Nacional de Estadística, Geografía e Informática, *Síntesis Metodológica Del Sistema de Clasificación Industrial de América Del Norte, México SCIAN 2013*.

<sup>92</sup> See Github: "Cid-Harvard/ecomplexity."

The charts displayed as Figure 8 has the following characteristics:

- Every dot or cross represents a combination of economic activity and municipality. Red crosses represent manufacturing activities, i.e., those with SCIAN codes starting with 3. Blue dots represent all other kinds of employers.
- Only dots which represent industries with an M value = 0 are displayed – that is, the industry is “not present” in the municipality. In Economic Complexity, M can equal zero even if that industry offers some employment in that area. Rather, the importance of that industry in the location’s production (measured by share of employment) is below a threshold that is dynamically defined according to the employment shares in other states.
- The first panel include the states of Querétaro, Nuevo León and Coahuila, which have the second, third, and fourth largest GDP per capita respectively. The state with the highest GDP per capita, Mexico City, was excluded due to the particularities of its economy as a small, fully urban area. For instance, much of the manufacturing industry of the Mexico City metropolitan area is located in the State of Mexico and not in Mexico City proper.
- The second panel includes Oaxaca, Guerrero, and Chiapas.
- The four quadrants were defined and named for the purposes of this SYPA. The threshold lines (set at density = 0.33 and opportunity gain = 2.75) were arbitrarily defined, with the objective of having a manageable number of industries in the upper right quadrant. The same thresholds are used for both groups of states.

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