

Regional Economic Report

January – March 2020

BANCO DE MÉXICO

June 11, 2020

Outline

I. Regional Economic Report

II. Results January – March 2020

A. Economic activity

B. Inflation

C. Economic outlook

(based on data collected between March 23 and April 23, 2020)

III. Final remarks

Regional Economic Report

- The Regional Economic Report is a quarterly publication on the trends in economic activity, inflation and business agents' expectations in Mexico's regions.
- The information presented herein is taken into account by Banco de México's Governing Board when evaluating the economic situation and the forecast for the Mexican economy.
- The economic performance and inflation in the regions in Q1 2020, and the prospects of surveyed business agents between March 23 and April 23 for regional economic activity over the following 12 months are analyzed herein.

Outline

I. Regional Economic Report

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III. Final remarks

Regional Economic Activity

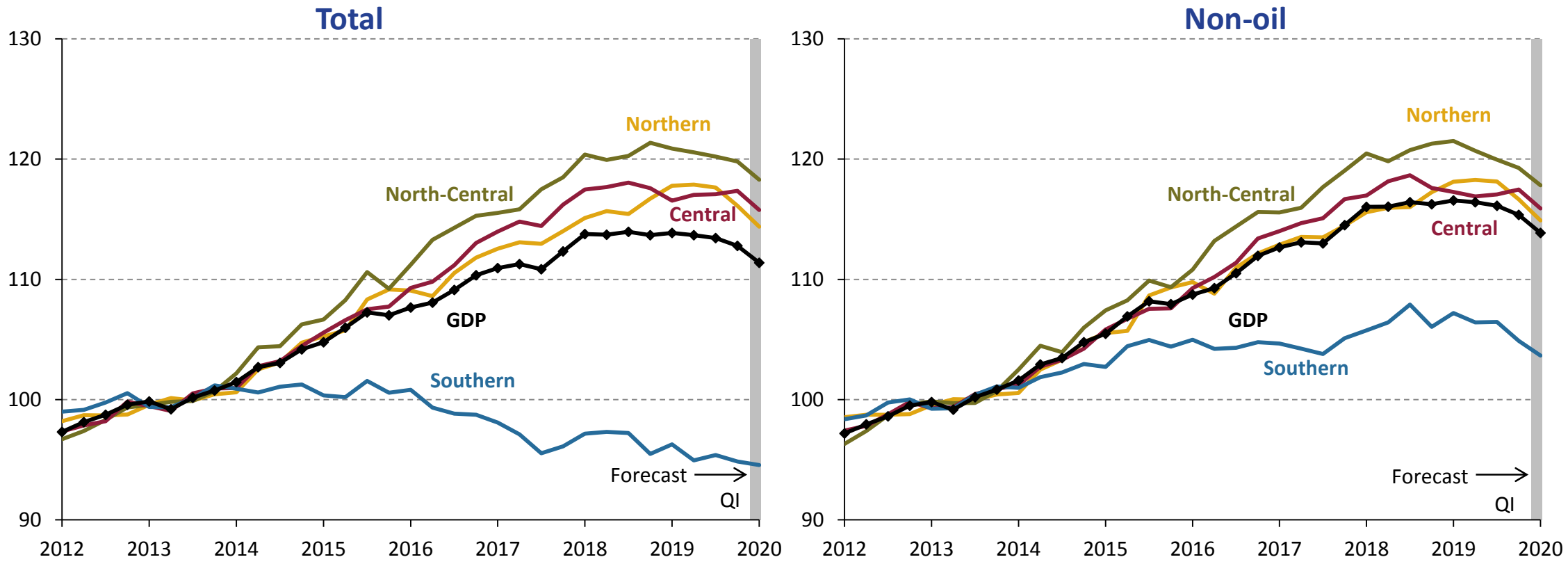
- Although since the beginning of 2020 and prior to the COVID-19 spread, economic activity in Mexico remained weak as had been the case for several quarters, at the end of the first quarter of 2020 production of goods and services was severely affected by the measures adopted to contain the spread of the pandemic in Mexico, by the major weakening of the global economy, and by the resulting disruption of global value chains. As a result, economic activity contracted considerably in the quarter as a whole.

- The contraction of economic activity observed during the quarter under analysis derived from a fall in productive activity across all regions.

Based on available information for Q1 2020, economic activity in all regions of Mexico appears to have contracted, largely as a result of the consequences of the pandemic.

Quarterly Indicator of Regional Economic Activity 1/

Index 2013=100, s. a.



s. a. / Seasonally adjusted data.

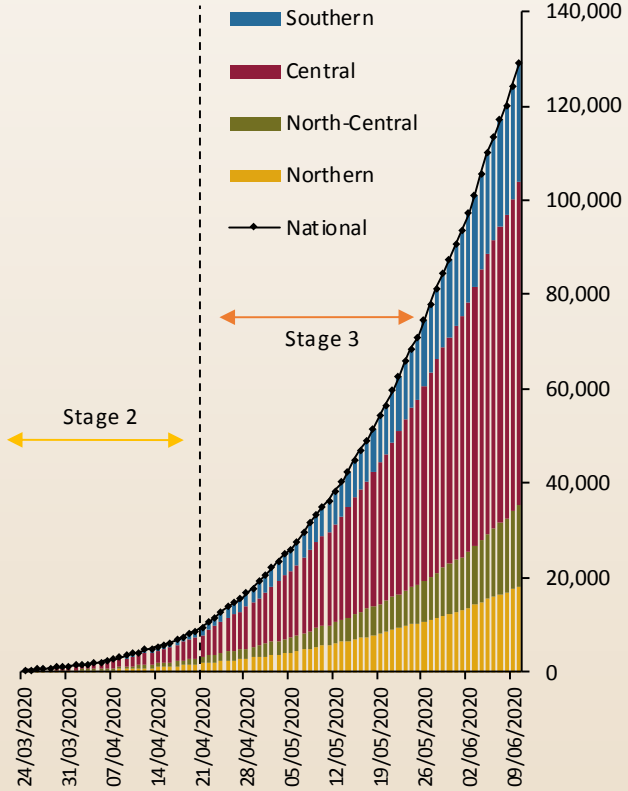
1/ The value of Gross Domestic Product (GDP) for Q1 2020 corresponds to observed data.

Source: Estimated by Banco de México with seasonally adjusted series of domestic GDP and the Quarterly Indicator of Economic Activity by State (INEGI).

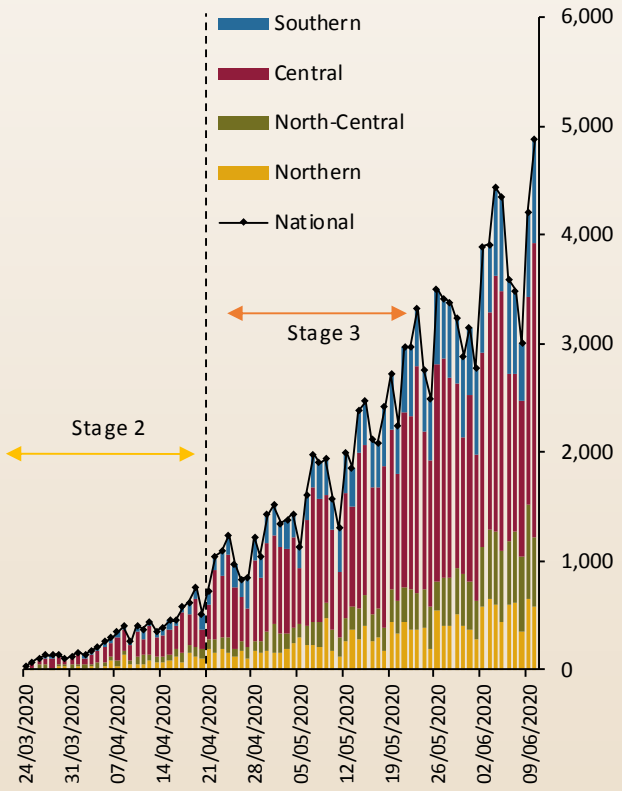
COVID-19 Spread in Mexico's Regions

Development of the COVID-19 Pandemic in Mexico

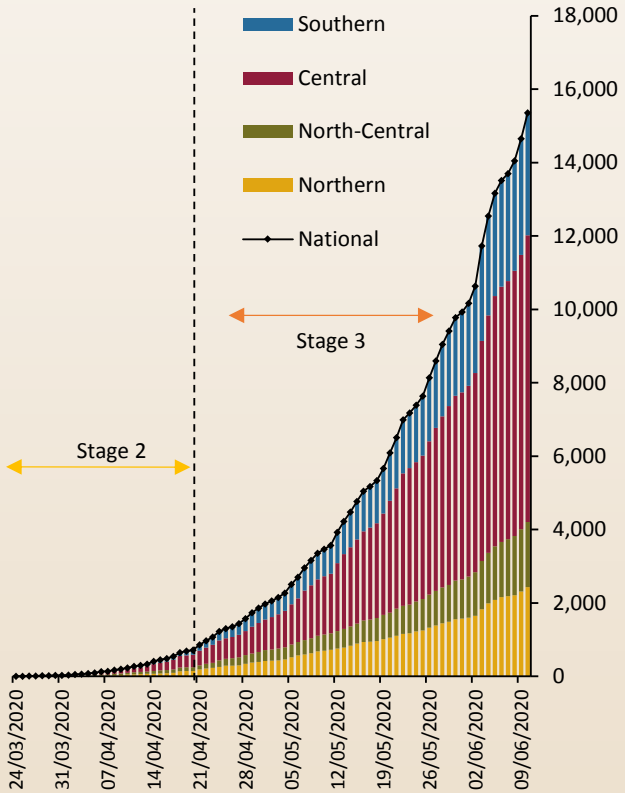
Cumulative number of confirmed COVID-19 cases in Mexico
Number of cases



Number of new confirmed daily cases
Number of cases



Number of confirmed deaths
Number of cases

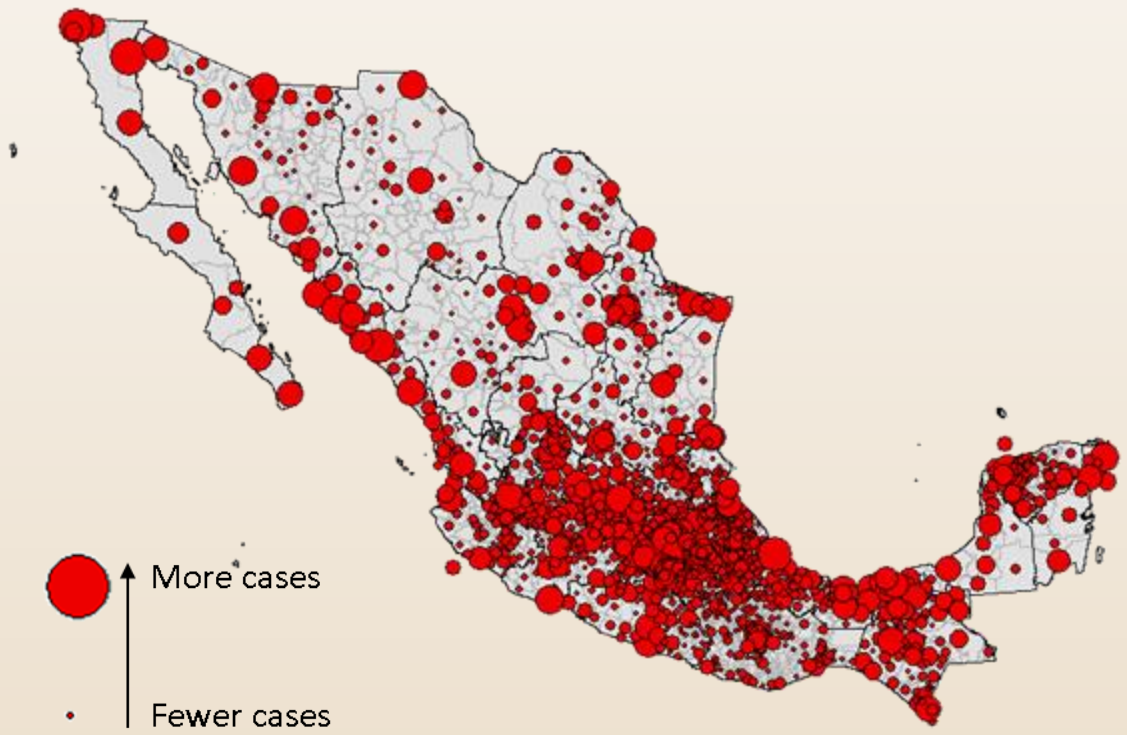


Note: Data as of June 10th, 2020.
Source: Estimated by Banco de México with data from the Ministry of Health.

COVID-19 Spread in Mexico's Regions

Number of Cumulative Confirmed Cases by Municipality

Data as of June 10th, 2020



Source: Estimated by Banco de México with data from the Ministry of Health.

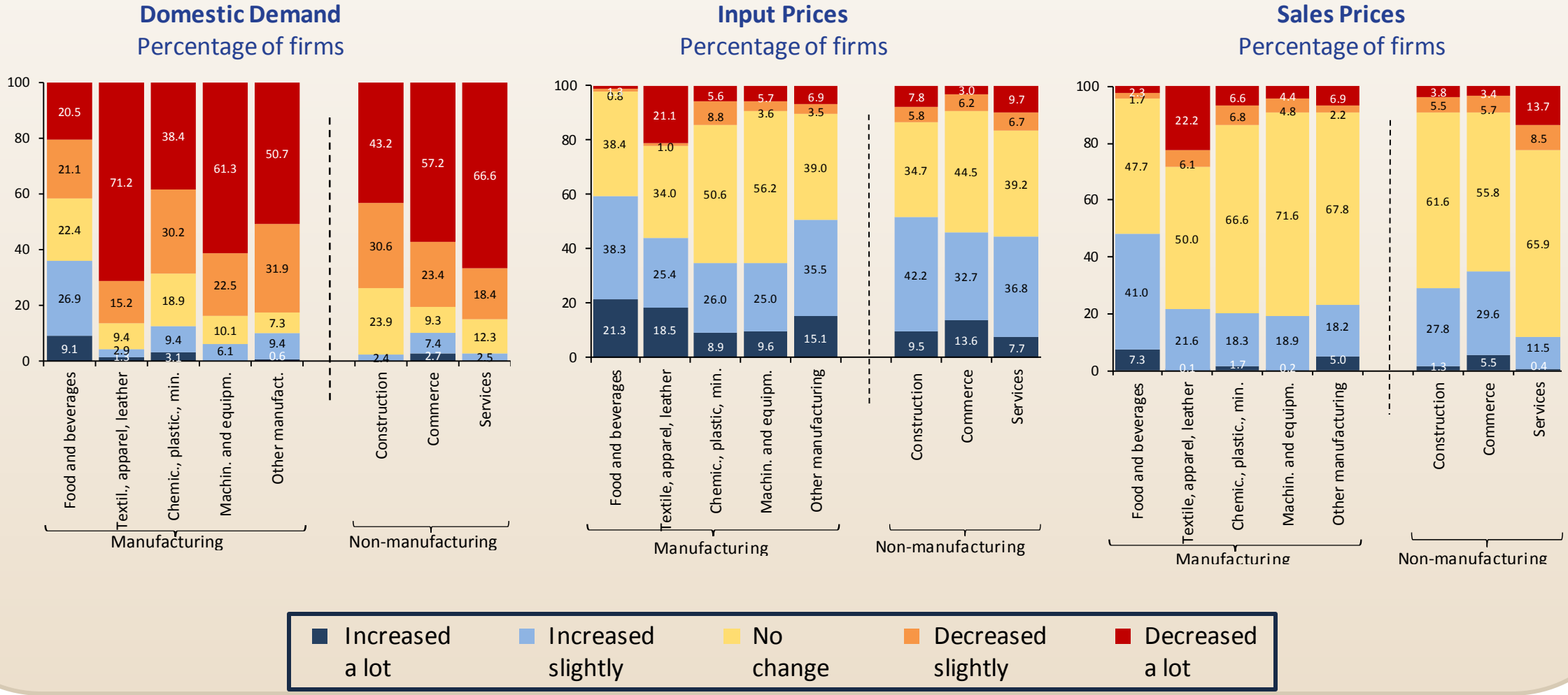
Number of Confirmed Cases by Metropolitan Area

Data as of June 10th, 2020

Metropolitan area	Percentage of cases	Number of cases	Incidence rate 1/	Percentage of population 2020 2/	Share in economic activity 2019 3/
Valle de México	39.06%	50,455	22.99	17.3%	24.3%
Puebla-Tlaxcala	3.18%	4,111	12.93	2.5%	1.5%
Villahermosa	2.68%	3,468	39.02	0.7%	0.7%
Mexicali	2.61%	3,376	31.04	0.9%	0.6%
Tijuana	2.04%	2,634	13.10	1.6%	1.0%
Toluca	2.00%	2,580	10.85	1.9%	0.5%
Veracruz	1.95%	2,521	26.36	0.8%	0.8%
Guadalajara	1.78%	2,297	4.38	4.1%	3.4%
Culiacán	1.58%	2,040	21.19	0.8%	1.2%
Monterrey	1.53%	1,973	3.84	4.0%	5.4%
Acapulco	1.44%	1,857	20.19	0.7%	0.2%
Mérida	1.27%	1,645	13.29	1.0%	0.4%
Cancún	1.23%	1,593	18.36	0.7%	0.6%
León	1.15%	1,492	7.93	1.5%	0.8%
Total	63.51%	82,042	16.85	38.3%	41.4%

1/ Cases per 10,000 inhabitants.
2/ Share with respect to total population of Mexico.
3/ Estimate based on luminosity in metropolitan areas.
Source: Prepared by Banco de México with data from the Ministry of Health, CONAPO population projections, data from INEGI, and the Earth Observation Group-Payne Institute for Public Policy.

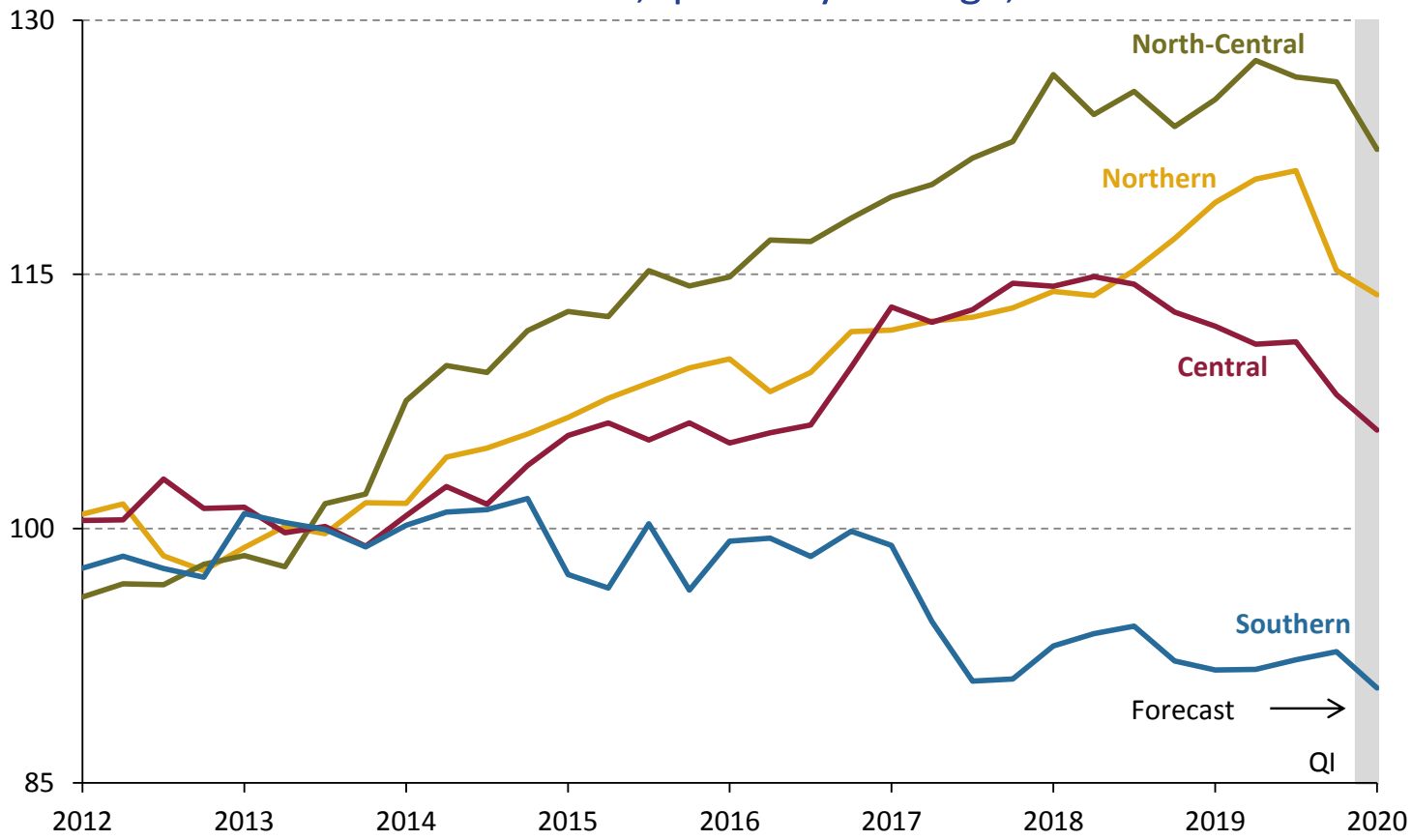
Impact on Firms Caused by the COVID-19 related Contingency



Although manufacturing had been already showing a downward trend in January and February, in March this negative trajectory intensified due to the consequences of the pandemic both at the global and national levels. For Q1 as a whole, a contraction of manufacturing activity is anticipated in the four regions of Mexico.

Regional Manufacturing Indicator

Index 2013=100, quarterly average, s. a.



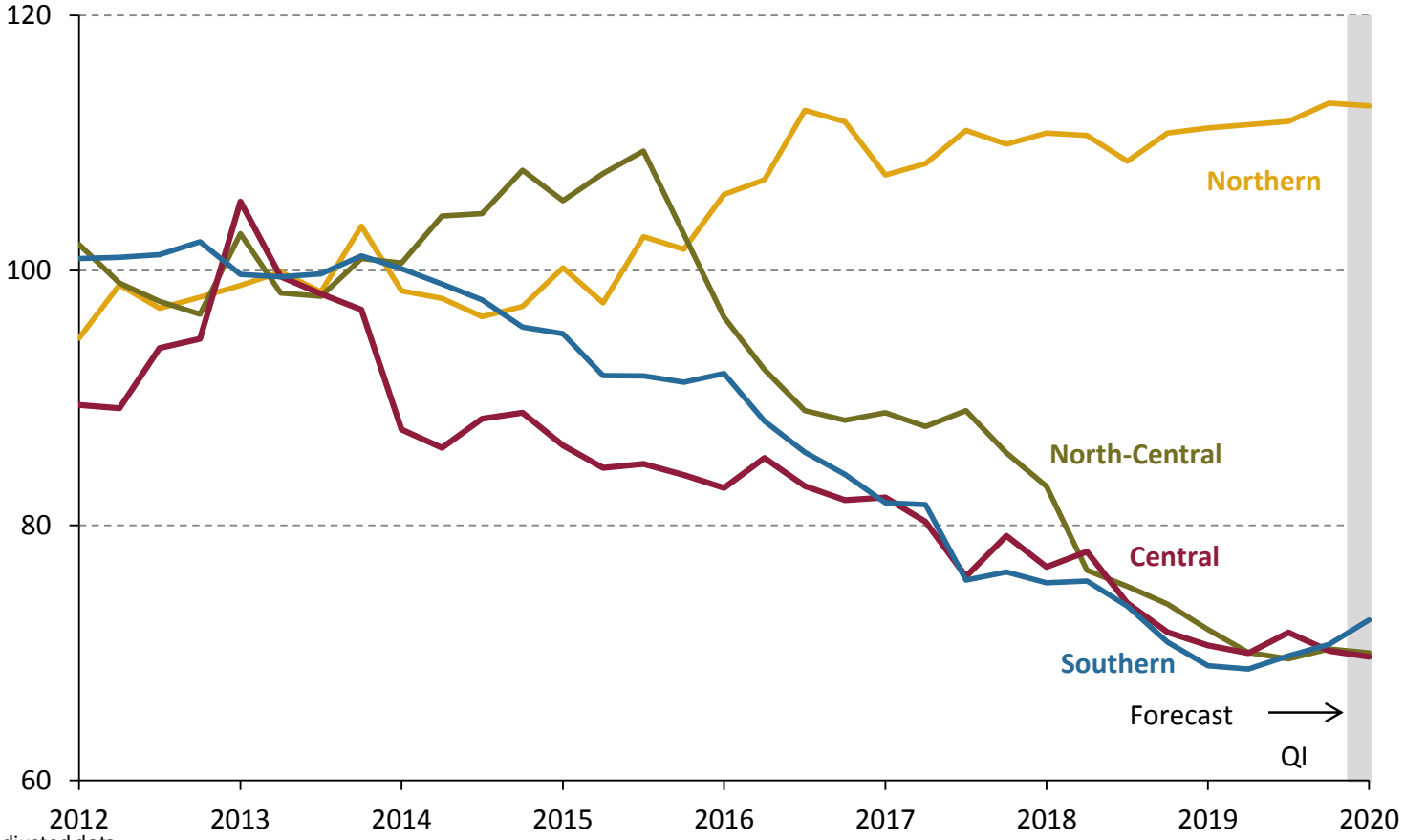
s. a. / Seasonally adjusted data.

Source: Estimated by Banco de México with seasonally adjusted series of the Monthly Indicator of Manufacturing Activity by State (INEGI).

In Q1 2020, mining maintained a certain upward trend in the Southern region, largely driven by higher levels of crude oil extraction. Mining in the Northern and Central regions is estimated to have contracted.

Regional Indicator of Mining, Quarrying, and Oil and Gas Extraction

Index 2013=100, quarterly average, s. a.



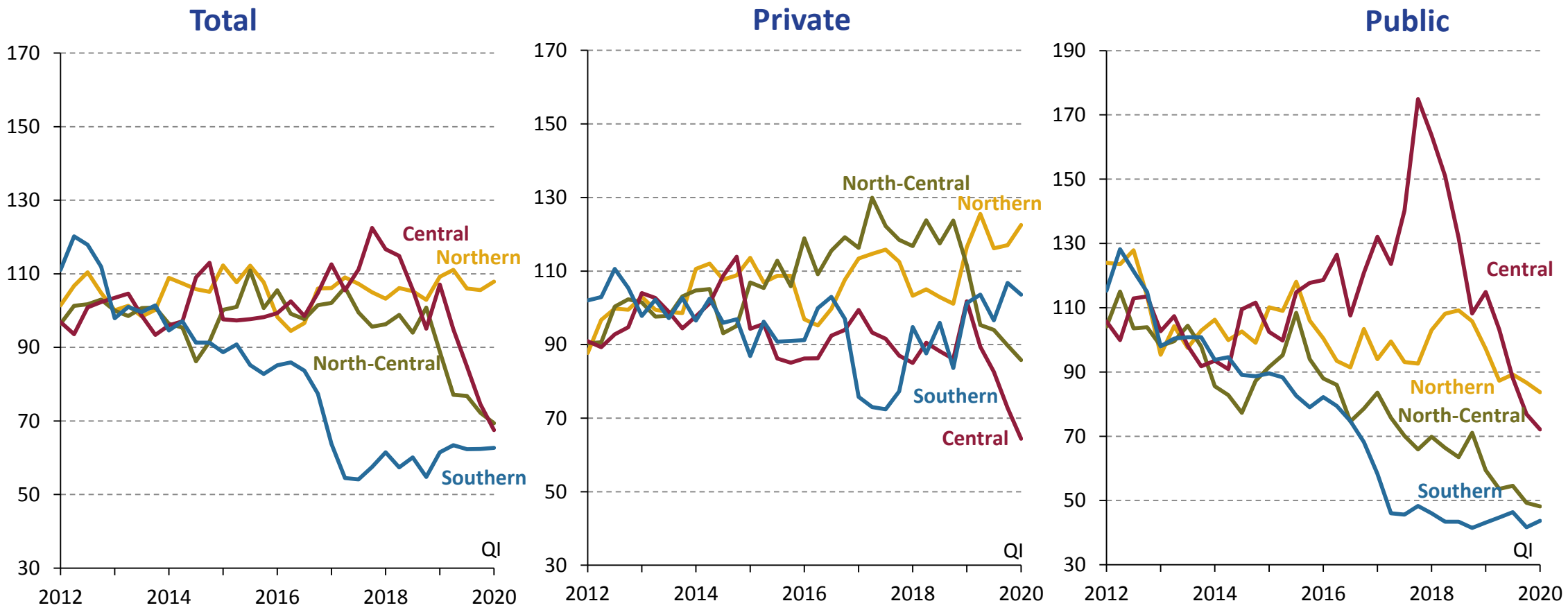
s. a. / Seasonally adjusted data.

Source: Estimated and seasonally adjusted by Banco de México with the series of the Monthly Indicator of Mining Activity by State (INEGI).

The construction industry in all regional economies exhibited a weak performance during Q1 2020, especially in the Central regions.

Real Value of Production in the Construction Industry by Region

Index 2013=100, quarterly average, s. a.



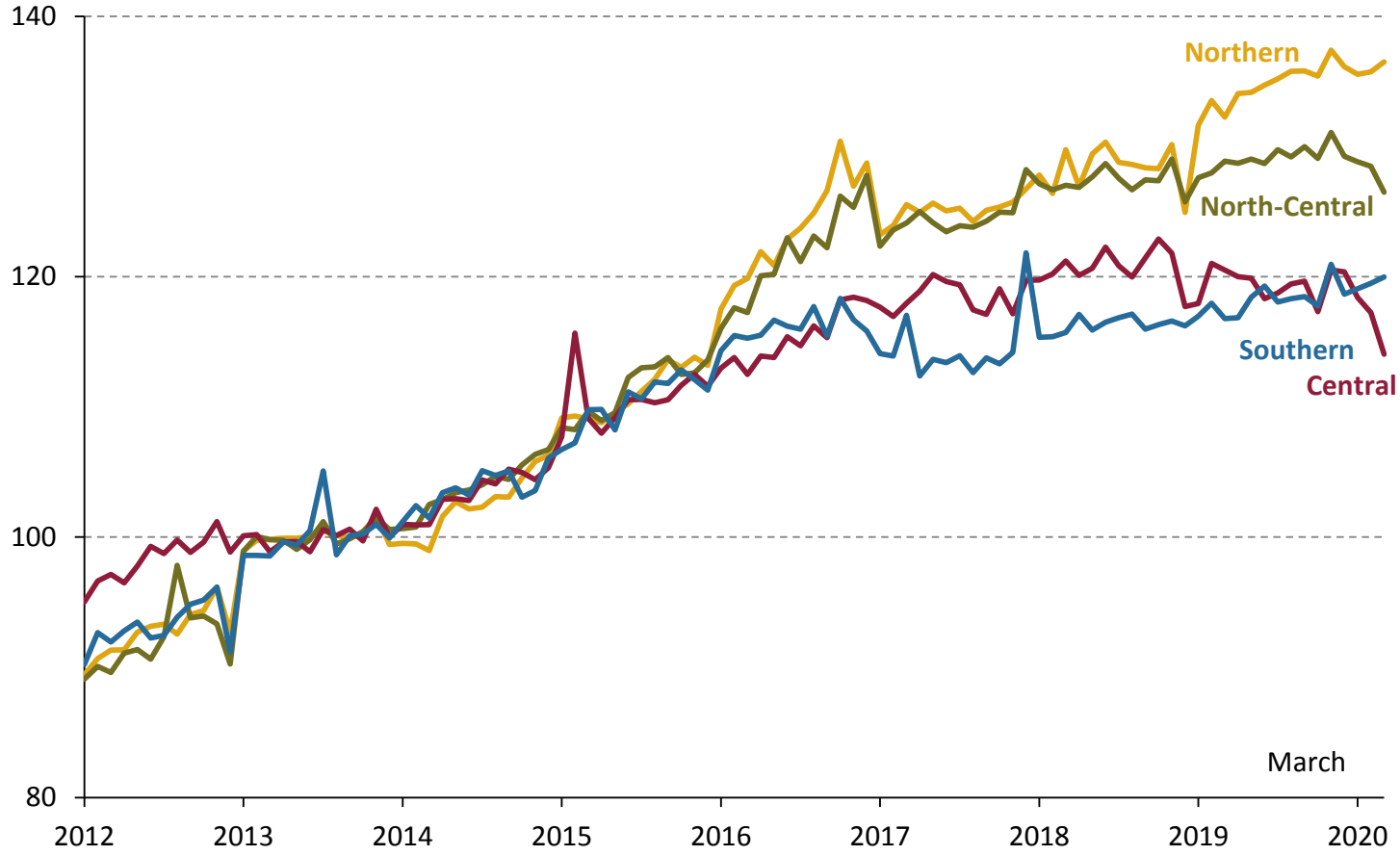
s. a. / Seasonally adjusted figures.

Source: Prepared and seasonally adjusted by Banco de México with data from the National Survey of Construction Companies (INEGI).

During Q1 2020, retail trade exhibited weakness in most regions of Mexico, which became more notorious in the Central regions in March.

Regional Retail Trade Indicator

Index 2013=100, s. a.



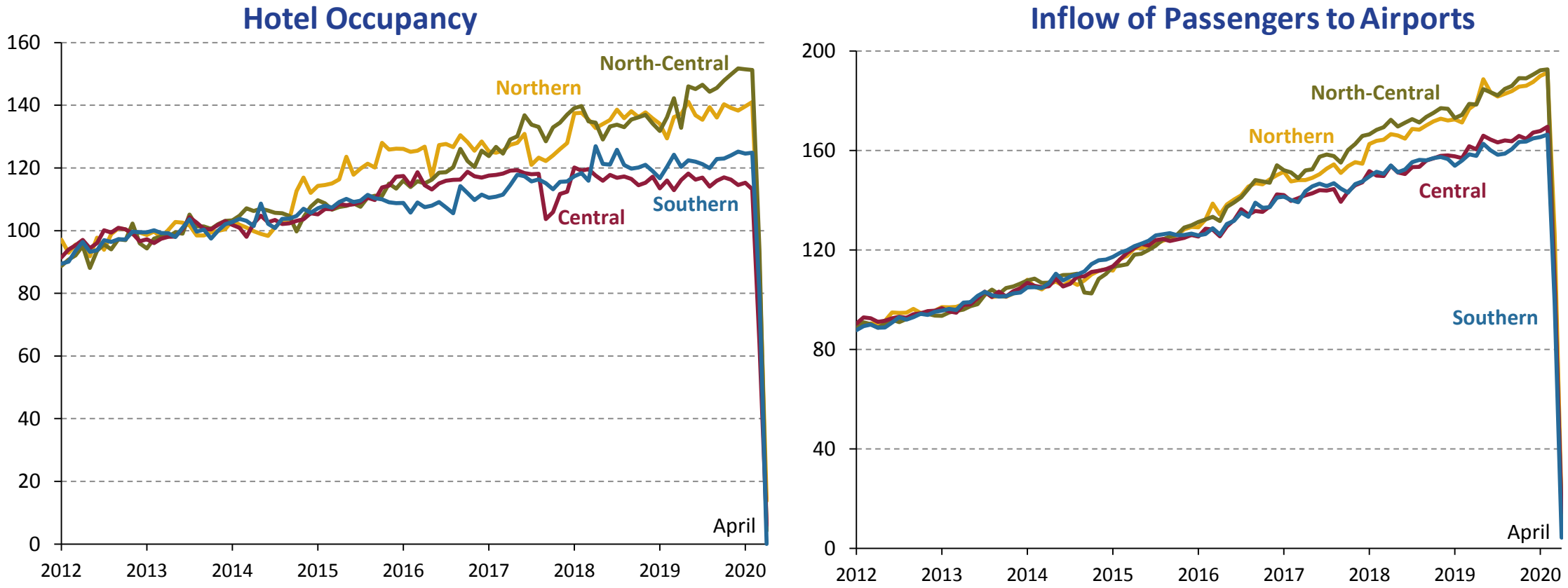
s. a. / Seasonally adjusted data.

Source: Prepared and seasonally adjusted by Banco de México with the series of Revenues from Retailers' Supply of Goods and Services by State (INEGI).

Tourism activity, measured by hotel occupancy and inflow of passengers to airports, has strongly contracted in all Mexican regions since March 2020, as a consequence of the COVID-19 pandemic.

Regional Indicators of Tourism

Index 2013=100, s. a.



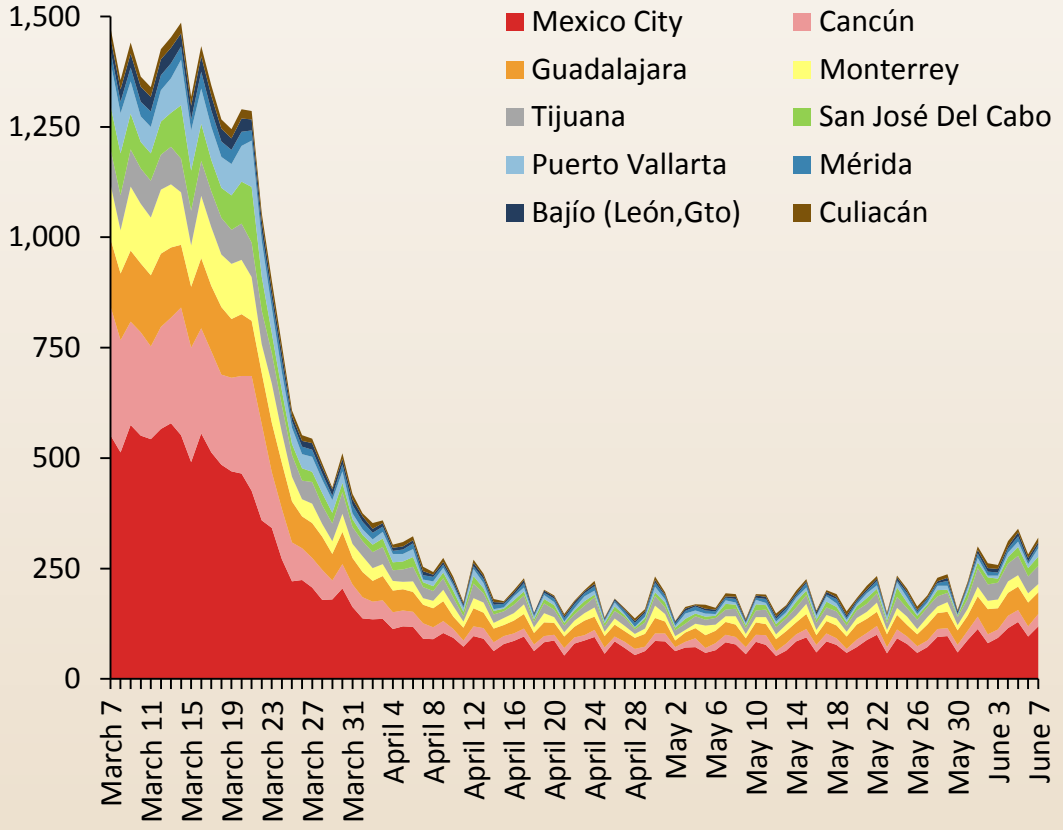
s. a. / Seasonally adjusted figures.

Source: Prepared and seasonally adjusted by Banco de México with data from the Mexican Secretariat of Tourism and the state-owned company Airport and Auxiliary Services (ASA, for its acronym in Spanish).

Impact of the COVID-19 Pandemic on Air Passenger Transportation in Mexican Regions

Flight Arrivals in 10 Major Airports [1/]

March – June 2020

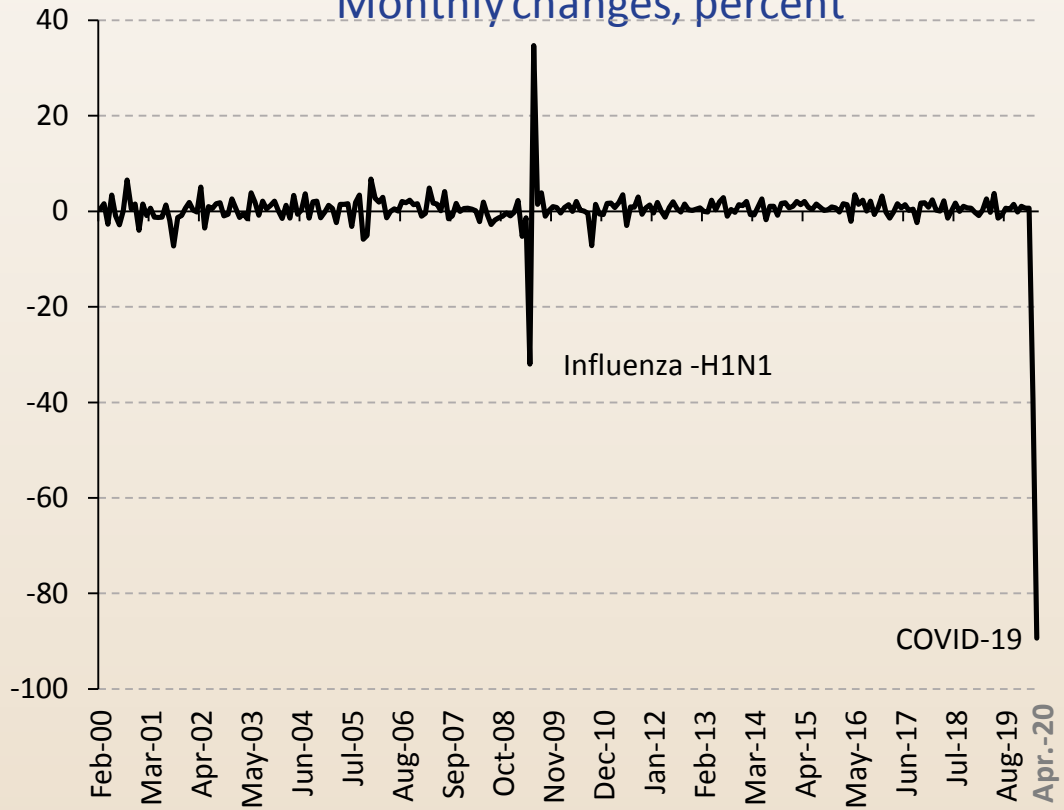


1/ According to ASA, the 10 major airports represent 82% of total flight arrivals in Mexico during 2019 ASA.

Source: Estimated by Banco de México with data from Flightradar 24.

Passenger Arrivals to Mexican Airports, s. a.

Monthly changes, percent

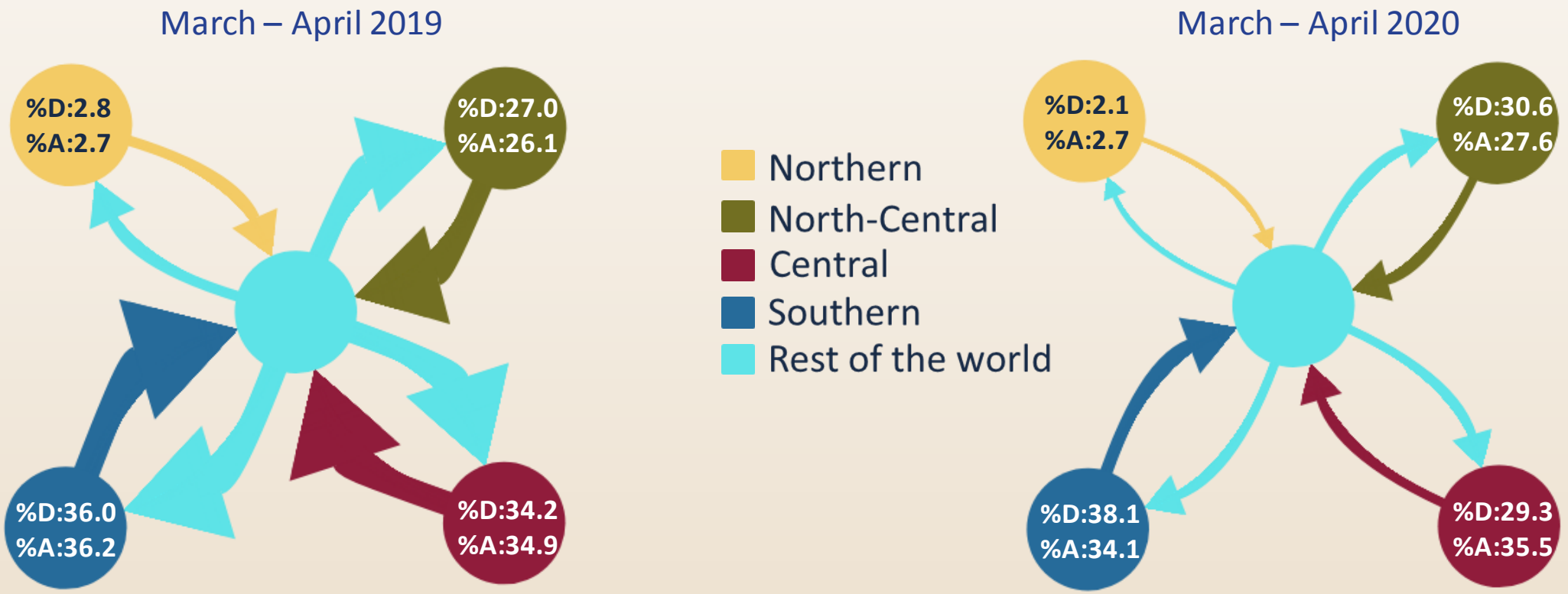


s. a. / Seasonally adjusted figures.

Source: Prepared by Banco de México with data from ASA.

Impact of the COVID-19 Pandemic on Air Passenger Transportation in Mexican Regions

Regional Flow of International Passengers [1/]

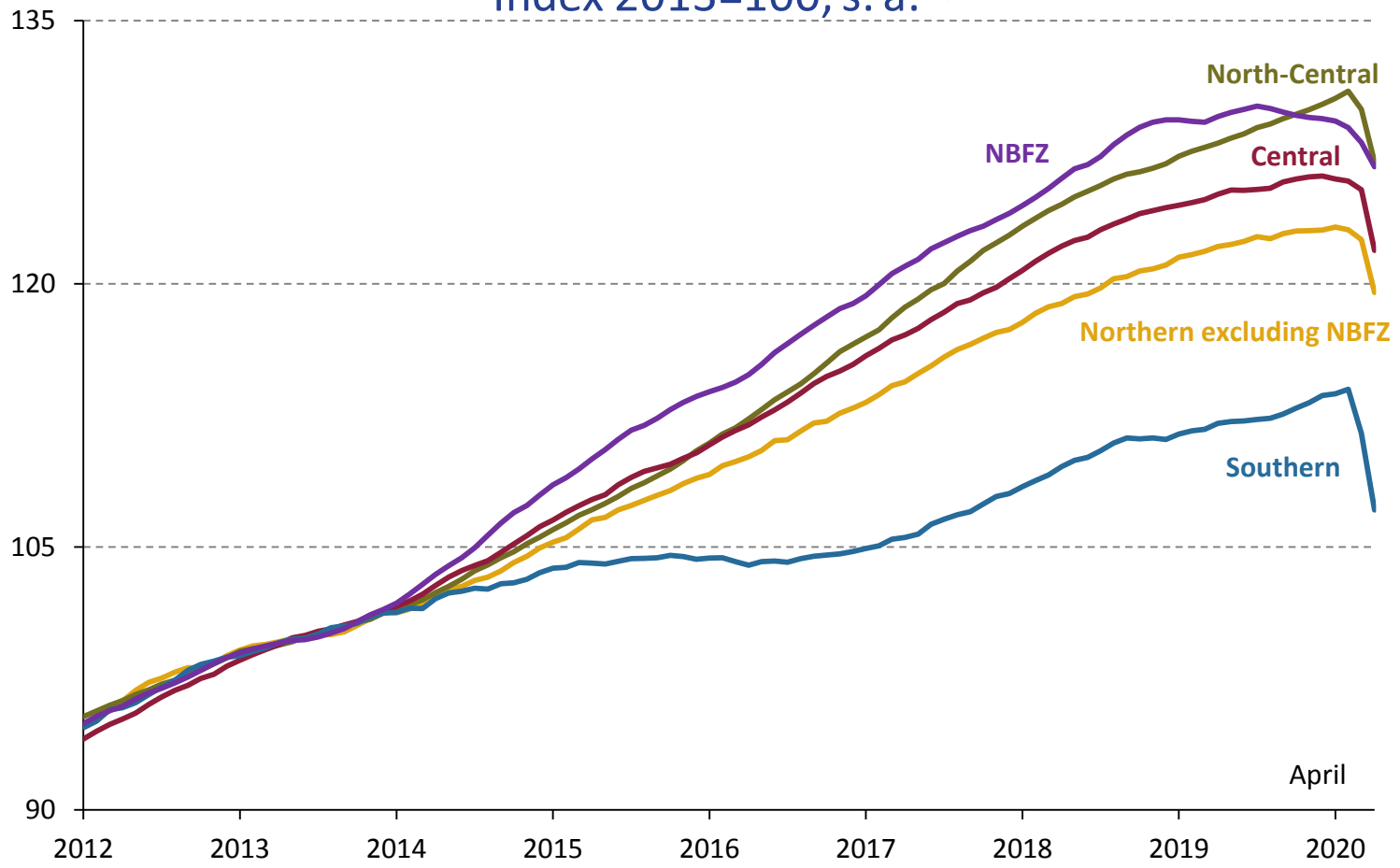


Note: %D represents the share of each region in total international departures from Mexico's airports. Similarly, %A represents the regional share in total international arrivals.
1/ The chart shows flights between Mexico and the rest of the world. The direction of arrows indicates the origin and destination of different connections and their width is proportional to the size of passengers flow, which can be compared between both periods. Thus, it is possible to observe the flow between each region and the rest of the world in March-April 2019 and in March-April 2020. The width of arrows decreased considerably in 2020 with respect to 2019, which indicates a significant fall in the number of passengers who traveled between the regions and the rest of the world.
Source: Estimated by Banco de México with data from the Secretariat of Communications and Transportation.

In the first two months of 2020, the growth rate of newly created IMSS-insured jobs remained weak. Starting from March, and, more notably in April, the effects of the COVID-19 pandemic on economic activity caused a very significant contraction of employment (an accumulated fall of 685,840 jobs during the same period).

Number of IMSS-insured Workers

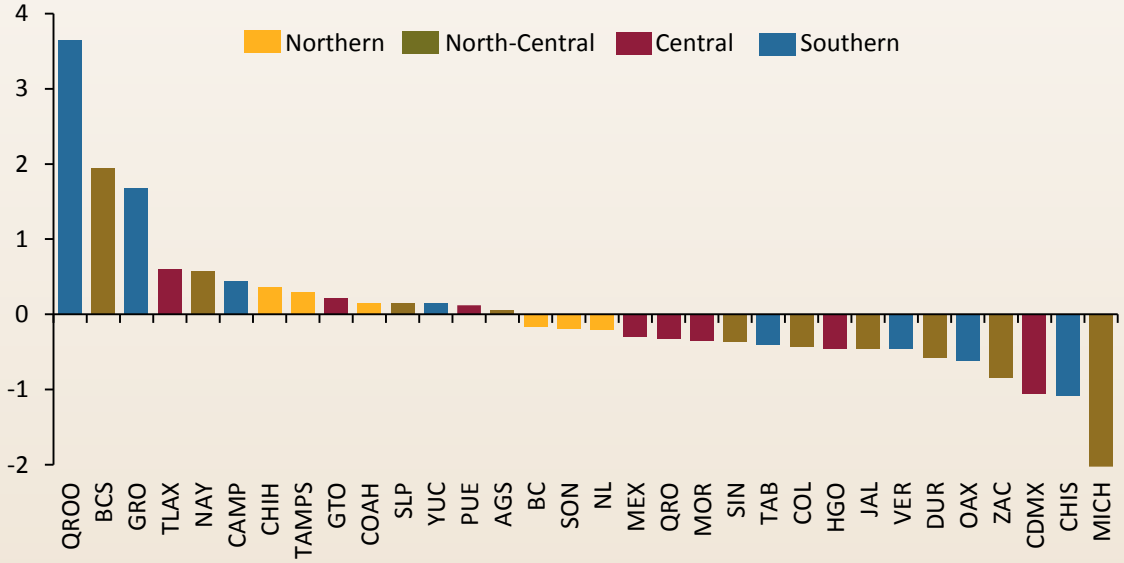
Index 2013=100, s. a. 1/



s. a. / Seasonally adjusted data.
1/ Permanent and temporary jobs in urban areas.
Source: Estimated and seasonally adjusted by Banco de México with data from IMSS.

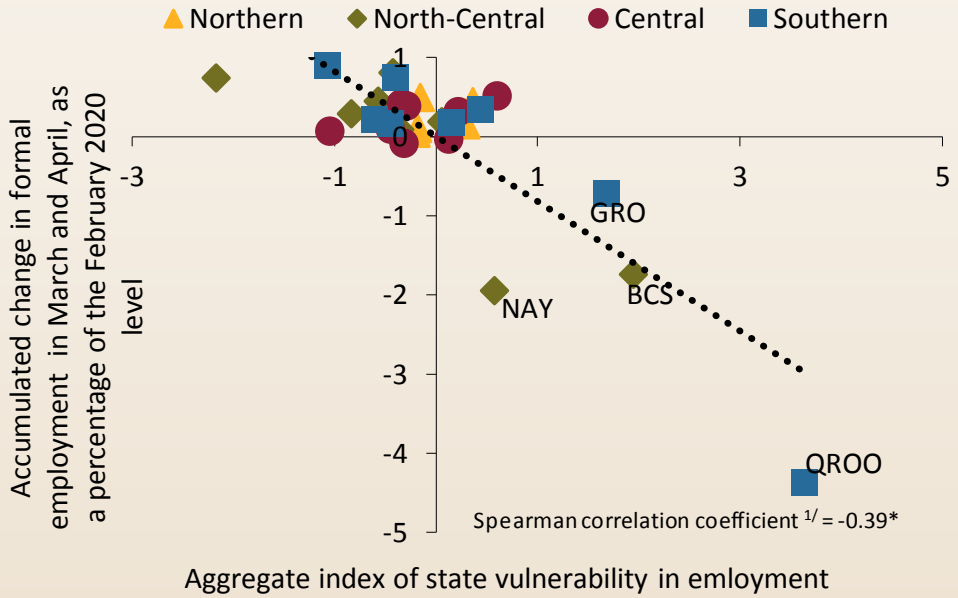
The COVID-19 Pandemic and its Effects on Employment in Mexican Regions

Aggregate Index of State Vulnerability in Employment



•The index is composed of the simple average of three standardized variables: the aggregate index of state vulnerability in employment, the relative specialization of unskilled employed population in the state, and the remote working feasibility index.

Accumulated Change in Formal Employment in March and April as a Share of the Employment Level in February 2020 vs the Aggregate Index of State Vulnerability in Employment



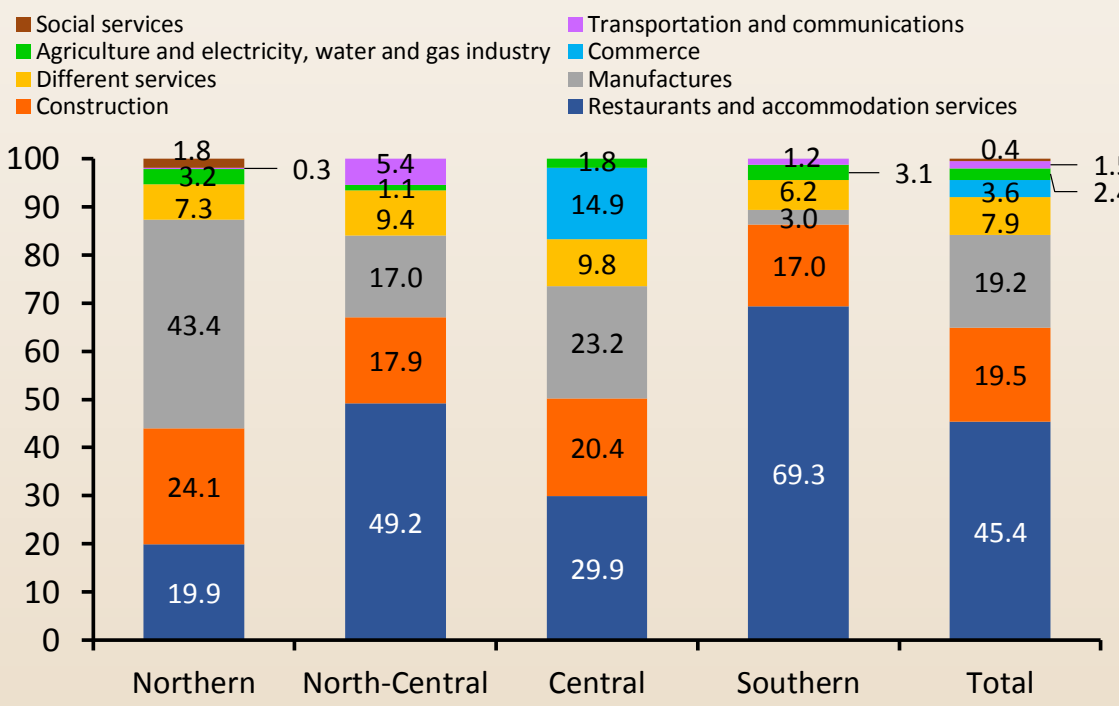
*/ Correlation coefficient significant at 5%.
1/ Correlation coefficient significant at 10%, even when Quintana Roo and/or Baja California Sur are excluded.

The COVID-19 Pandemic and its Effects on Employment in Mexican Regions

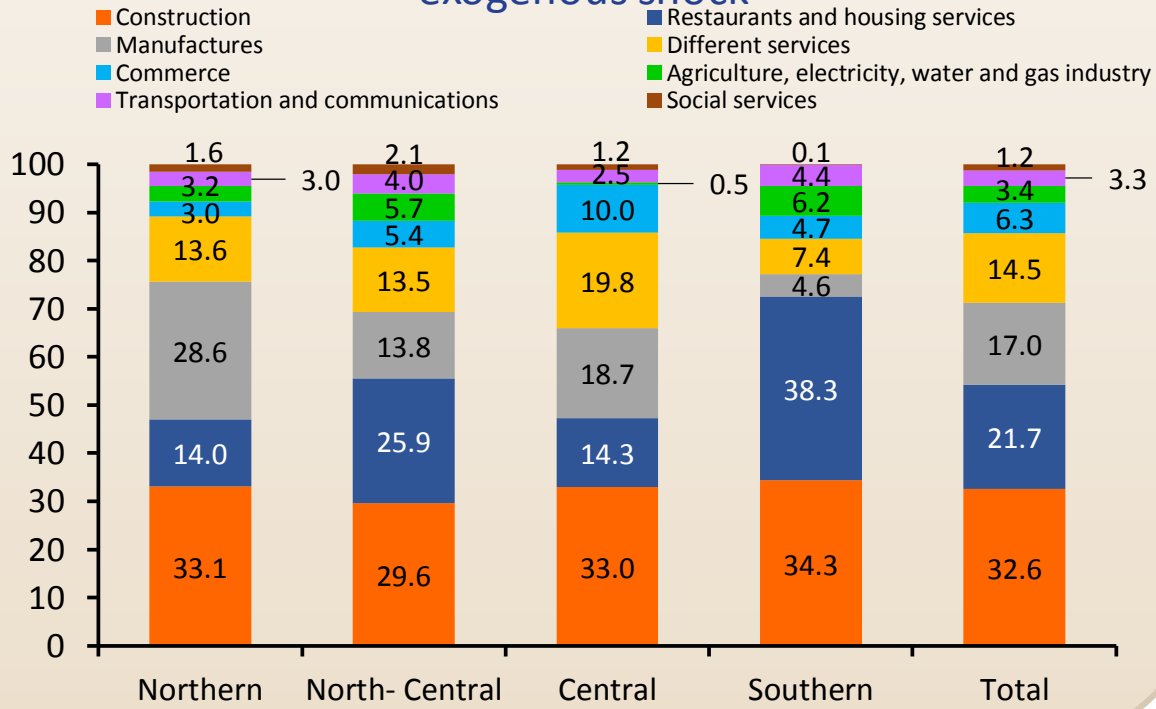
Composition of the Initial Shock Caused by the COVID-19 Pandemic on Formal Employment

Percentage

a) Assuming the fall in employment in March as an initial exogenous shock



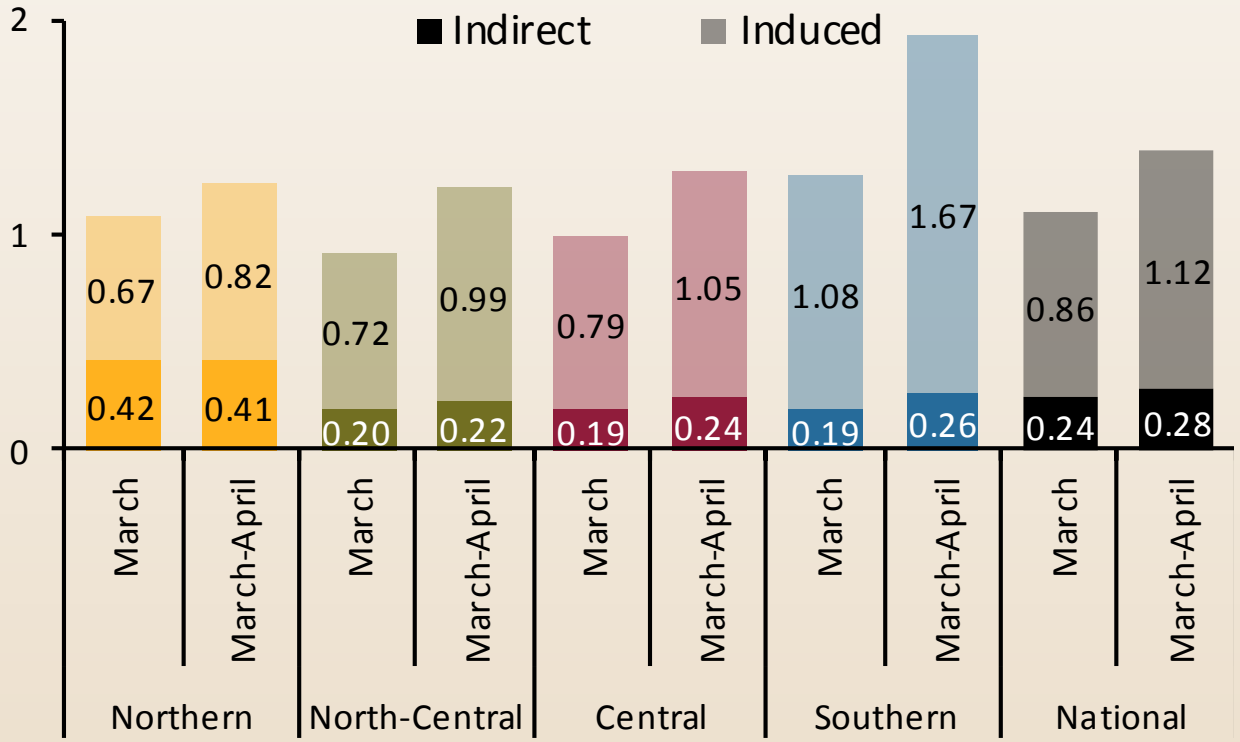
b) Assuming the accumulated fall in employment in March and April as an initial exogenous shock



Source: Estimated by Banco de México with regional social accounting matrices, 2013.

The COVID-19 Pandemic and its Effects on Employment in Mexican Regions

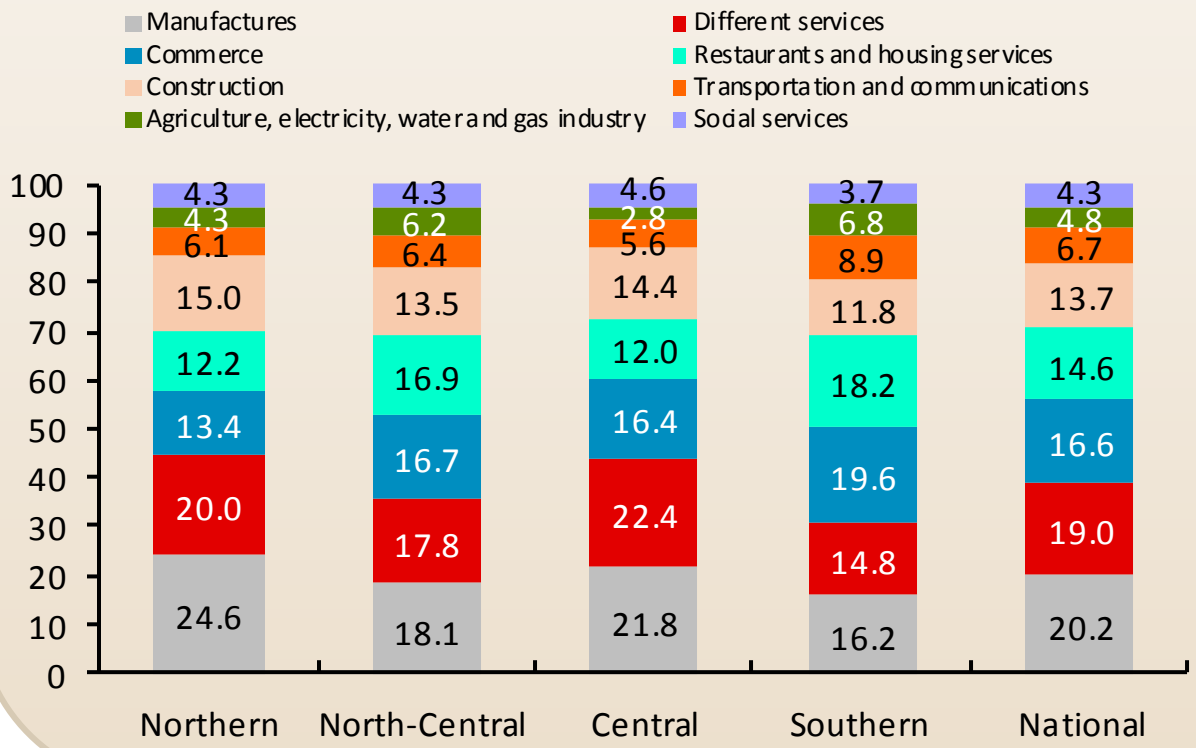
Ratio of Estimated Indirect and Induced Jobs to Direct Jobs in Scenarios of an Exogenous Shock in March and in March-April



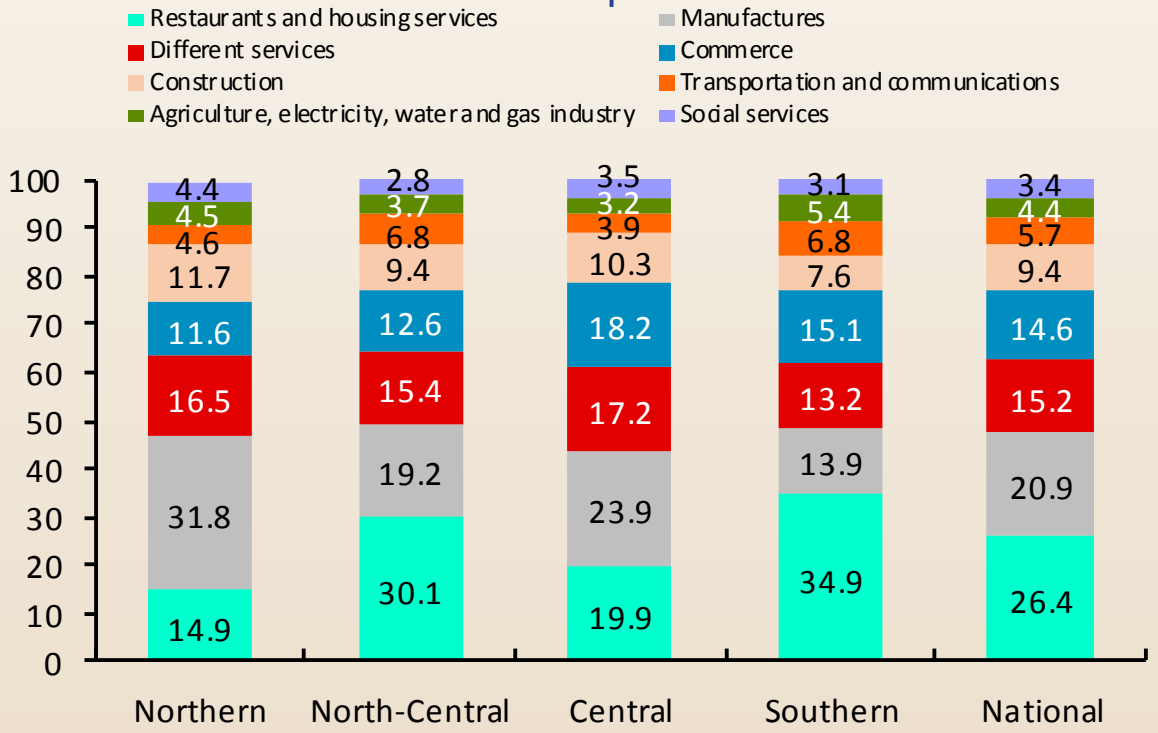
The COVID-19 Pandemic and its Effects on Employment in Mexican Regions

Sectoral Composition as a Result of the Total Estimated Fall in Formal Employment (Direct, Indirect and Induced effects)

a) Total effect caused by the March shock



b) Total effect caused by the accumulated March-April shock



Source: Estimated by Banco de México with regional social accounting matrices, 2013.

Outlook

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II. **Results January – March 2020**

A. Economic activity

B. **Inflation**

C. Economic outlook

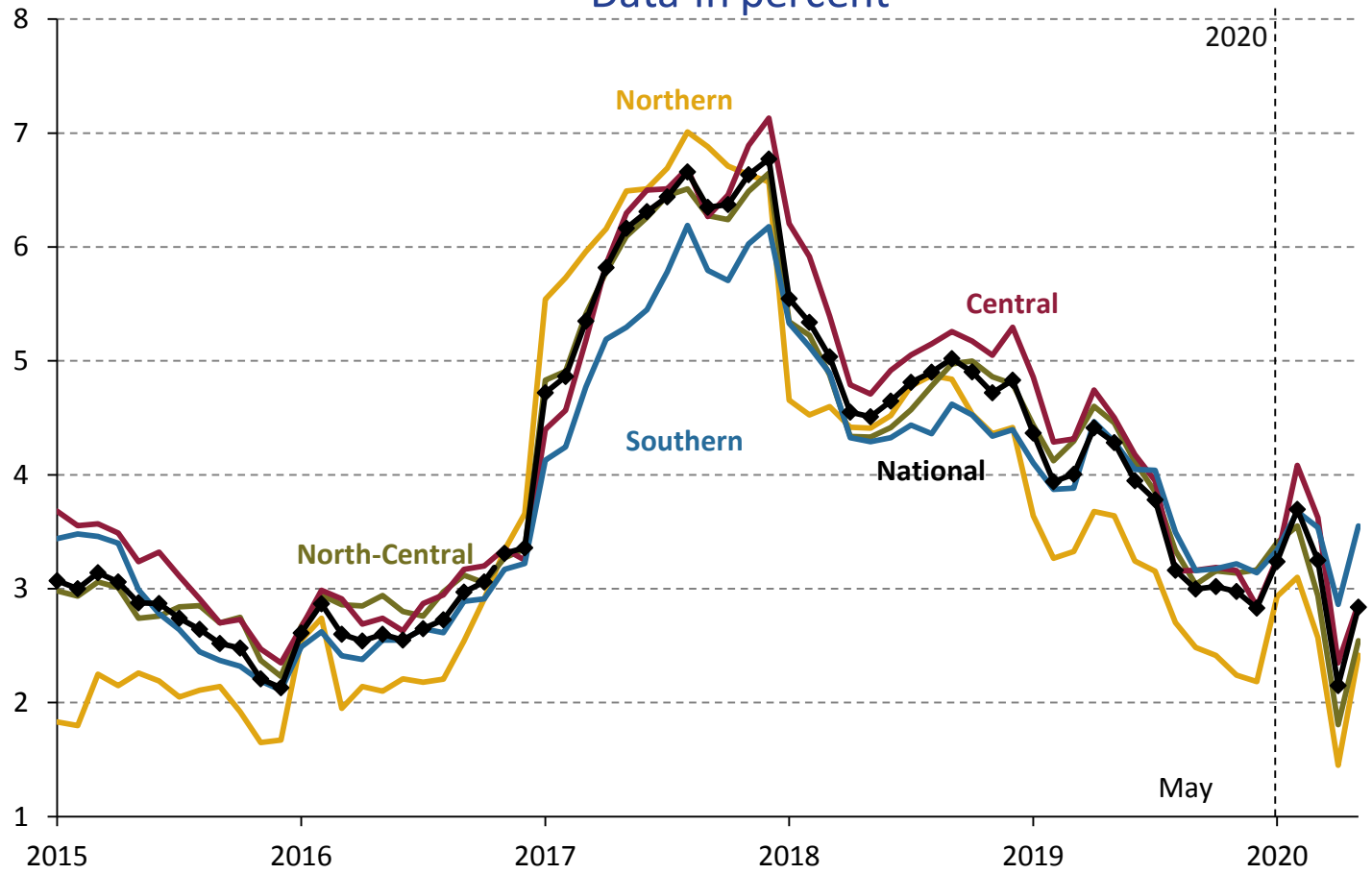
(based on data collected between March 23 and April 23, 2020)

III. Final remarks

The recent evolution of inflation in Mexico, both at the national and regional levels, has been affected by the impact of the COVID-19 pandemic.

Annual Headline Inflation by Region

Data in percent

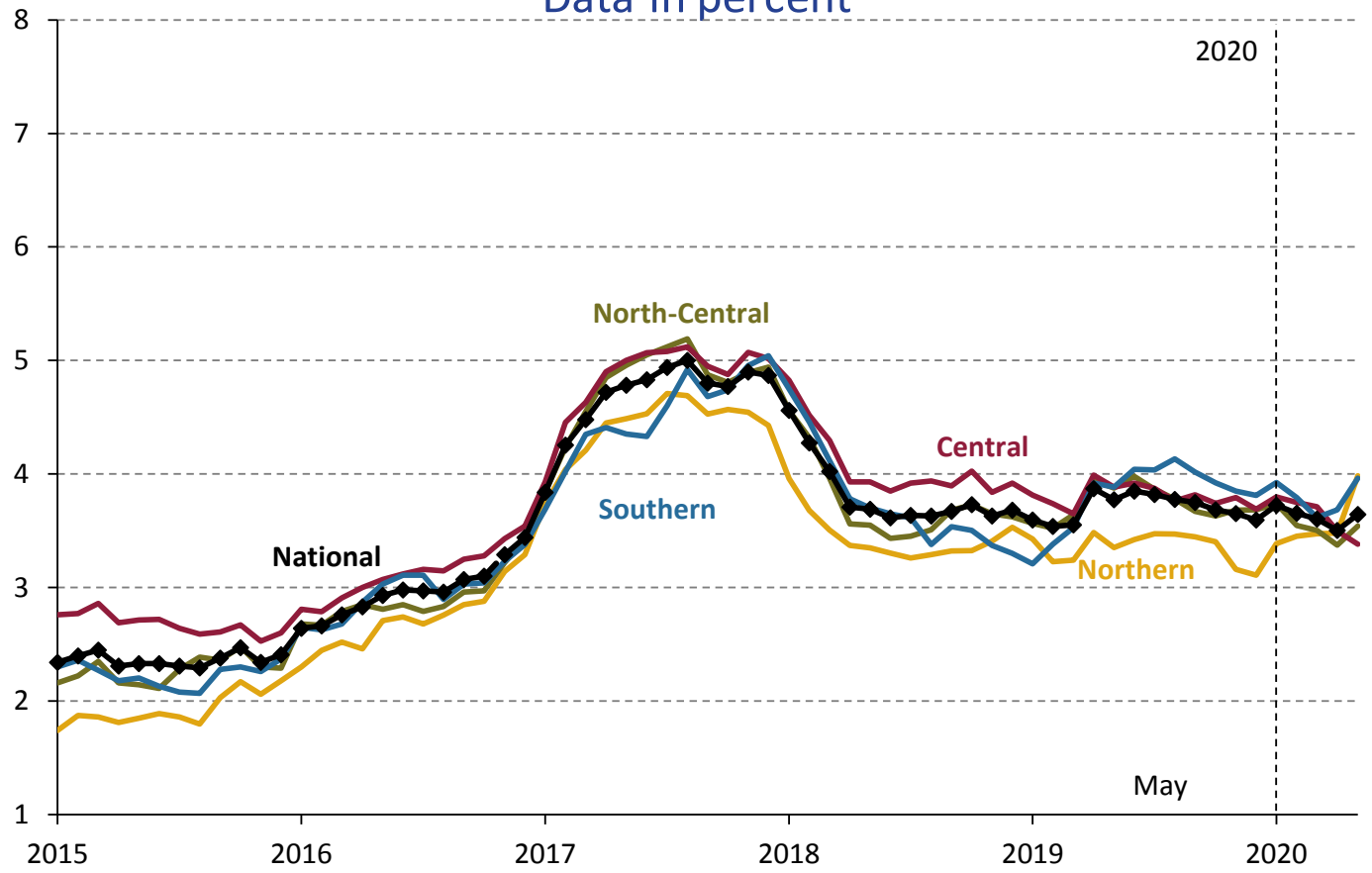


Source: Prepared by Banco de México with data from INEGI and Banco de México.

Annual core inflation in most regions decreased in April, mainly due to lower annual changes in the prices of the services subindex, and, to a lower degree, in non-food merchandise prices. However, in May, core inflation in most regions rebounded, once the upward pressures, which had been already observed on food merchandise, intensified.

Annual Core Inflation by Region

Data in percent

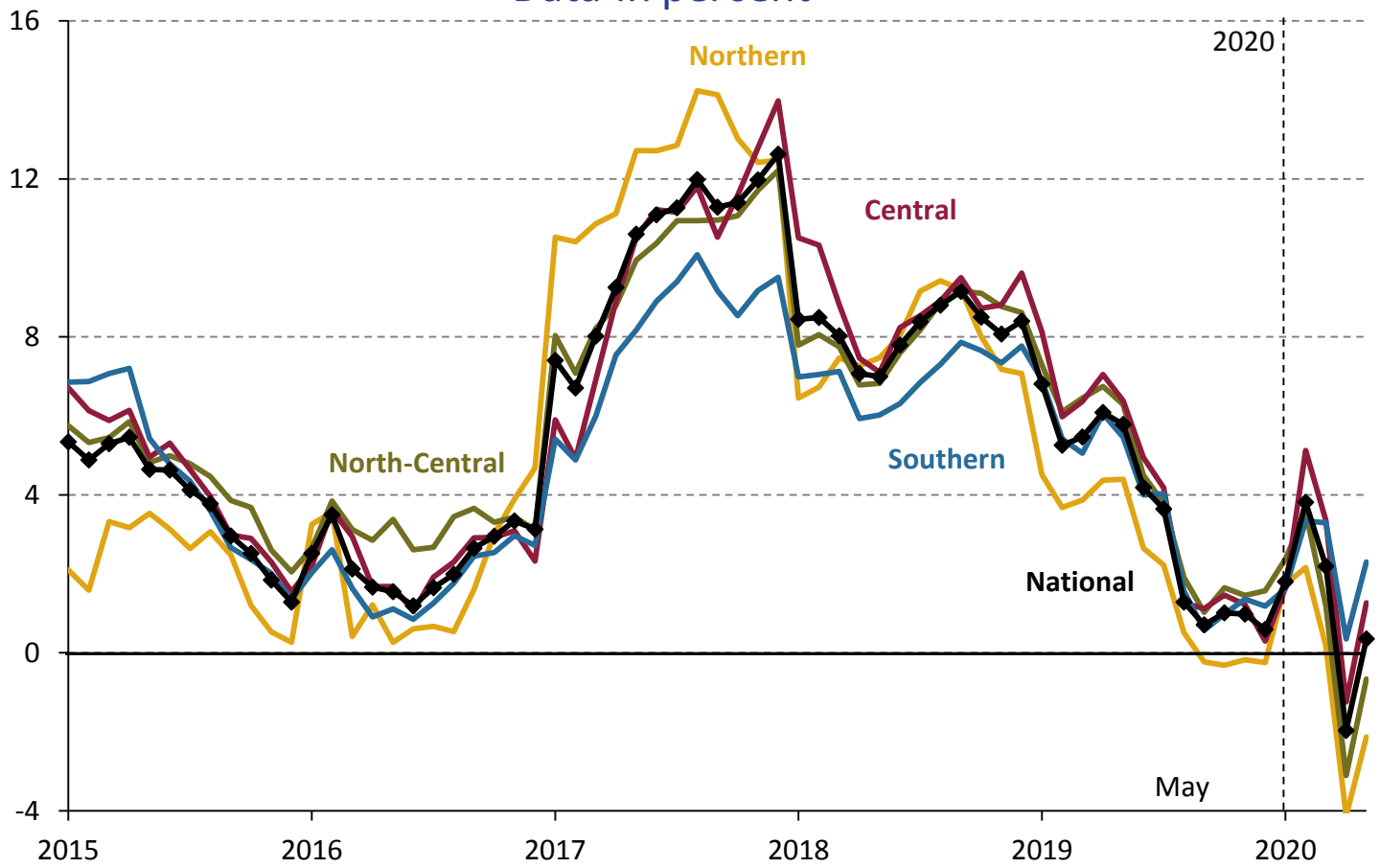


Source: Prepared by Banco de México with data from INEGI and Banco de México.

The impact of the significant fall in energy prices in April, which was associated to the evolution of their international references in the context of the COVID-19 pandemic, considerably decreased non-core inflaiton in all regions. Subsequently, in May, non-core inflation rebounded in all regions.

Annual Non-core Inflation by Region

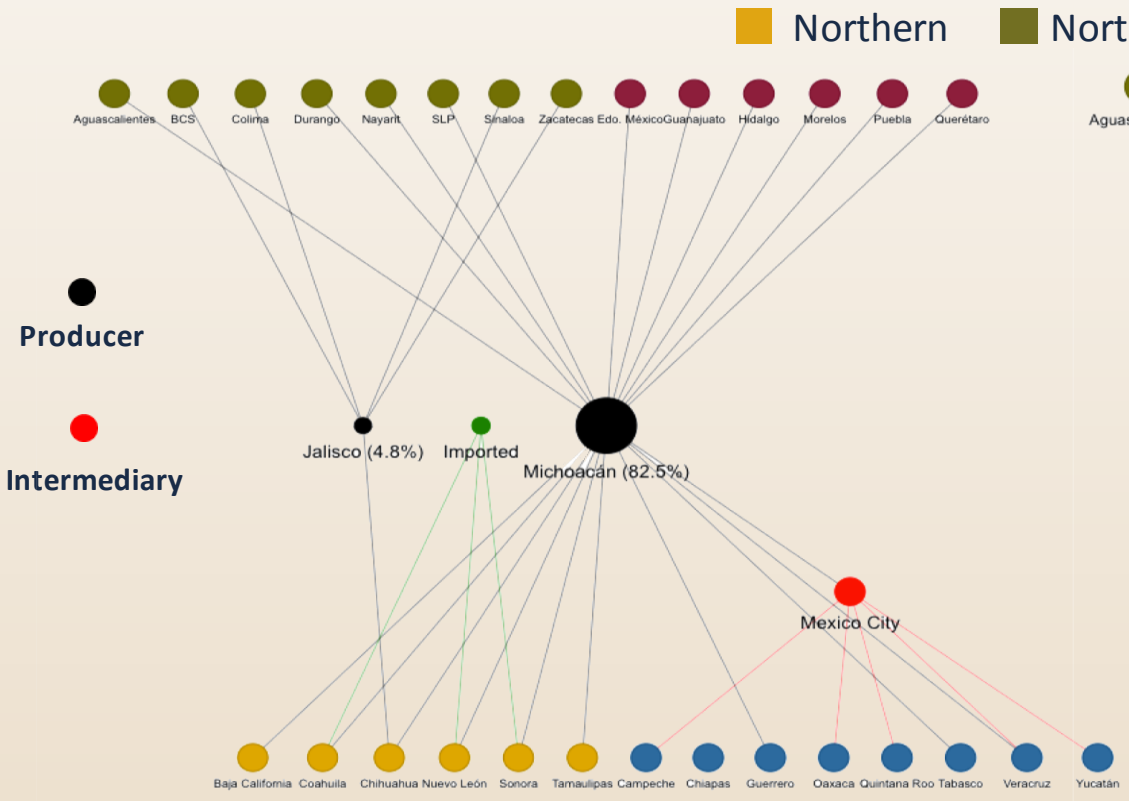
Data in percent



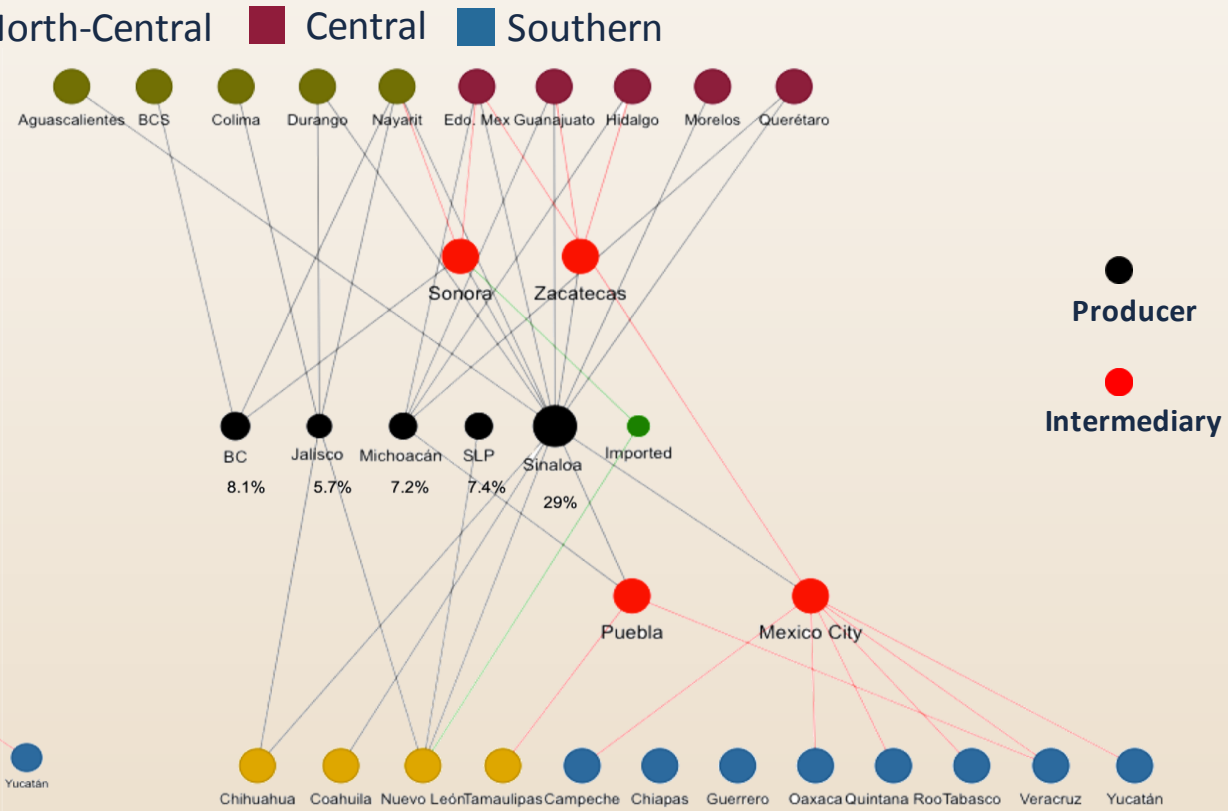
Source: Prepared by Banco de México with data from INEGI and Banco de México.

Distribution of Fruit and Vegetables in Wholesale Points of Sale in Mexico

Avocado Distribution Network from Producers to Wholesale Points of Sale [1/]



Tomato Distribution Network from Producers to Wholesale Points of Sale [1/]



1/ The percentage of accumulated production between 2004 and 2020 by state and based on data from SIAP is shown in brackets.
Note: Tlaxcala is not included in the report because SNIIM does not include data on this state.
Source: Estimated by Banco de México with data from SNIIM and SIAP, 2004-2020.

Distribution of Fruit and Vegetables in Wholesale Points of Sale in Mexico

Relative Convergence

Evidence suggests that relative price levels across cities are stationary, as a result of which differences in prices in different cities converge to the long-term level.[1/]

$$\Delta q_{i,t} = \beta_i q_{i,t-1} + \sum_{l=1}^{L_i} \theta_{il}\, \Delta q_{i,t-l} + \alpha_i + \eta_t + \varepsilon_{i,t}$$

1/ Where $q_{i,t}$ corresponds to the logarithm of relative prices in city i during month t; β_i is the parameter of interest; θ_{il} are the coefficients of lags in the process that characterize $q_{i,t}$; the fixed effect by city is represented as α_i; η_t is the common time effect and $\varepsilon_{i,t}$ is the error term.

Prices

The supply of fruit and vegetables through intermediaries seems to generate certain upward pressures on prices, as compared to what would be observed if cities obtained supplies directly from producers.

$$\begin{aligned}\text{Log}P_{g,i,t} = \alpha_{g,i} &+\beta_1 Intermediary_{g,i,t} \\ &+\beta_2 Imports_{g,i,t} \\ &+\beta_3 Log\ distance_{g,i,t} \\ &+\beta_4 Log\ production_{g,t} \\ &+\beta_5 \text{Log}\ gasoline_{i,t} \\ &+\gamma_{mt} + u_{g,i,t}\end{aligned}$$

Shortage

The supply of fruit and vegetables to cities through intermediaries also seems to slightly increase the probability of a shortage in the short term.

$$Prob\left(E_{g,i,t} = 1|\boldsymbol{X}\right) = \Phi[\boldsymbol{X'\beta}]$$

where $\boldsymbol{X}$ represents a set of explanatory variables:

$Intermediary_{g,i,t}$;
$Imports_{g,i,t}$;
$Producers_{g,i,t}$;
$Log\ distance_{g,i,t}$;
$Log\ production_{g,i,t}$

Distribution of Fruit and Vegetables in Wholesale Points of Sale in Mexico

- Based on these results, in the current context of contingency declared as a result of the COVID-19 pandemic, the suspension of operations in wholesale markets, which function as intermediaries to other states in the country, could increase the risk of disruptions in fresh food supply chains in the country.

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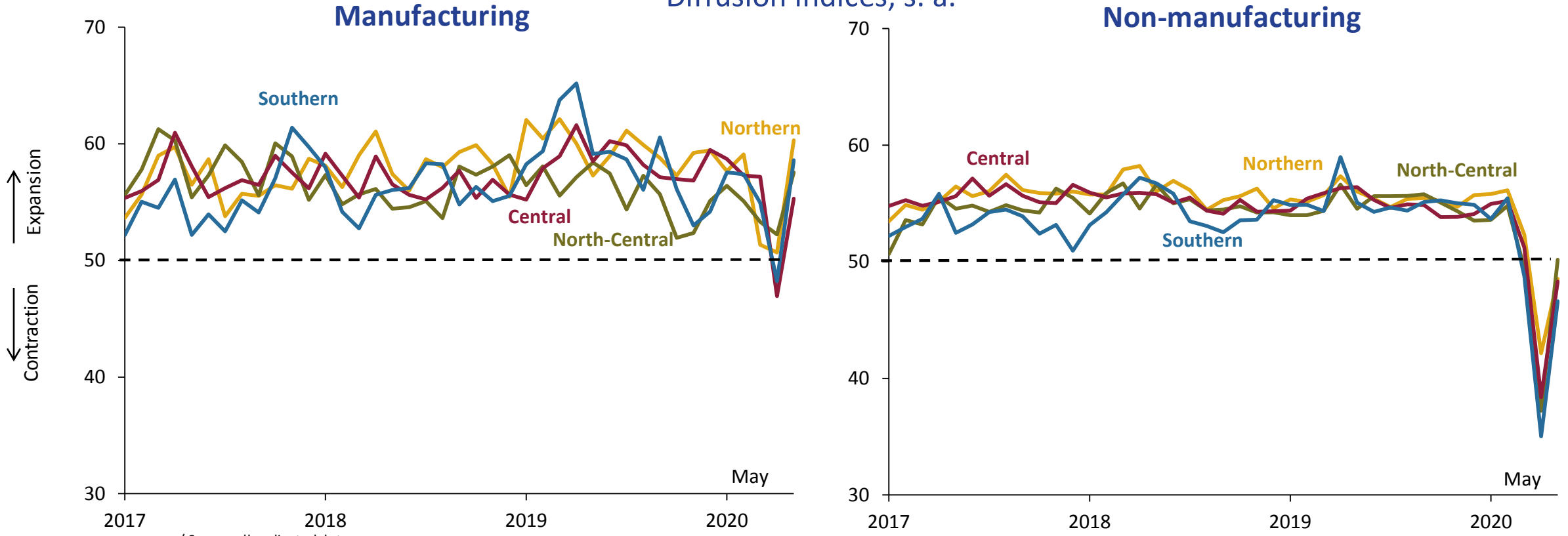
(based on data collected between March 23 and April 23, 2020)

III. Final remarks

Regional indices for March and April point to a deterioration in business sector expectations for manufacturing and non-manufacturing activity for the following 3 months. Although data collected in May registered an improvement in said expectations, the indicator of the non-manufacturing sector remained below 50 points in all regions of Mexico, except for the North-Central one.

Regional Index of Manufacturing and Non-manufacturing Orders: Activity Outlook, Next 3 Months

Diffusion indices, s. a.

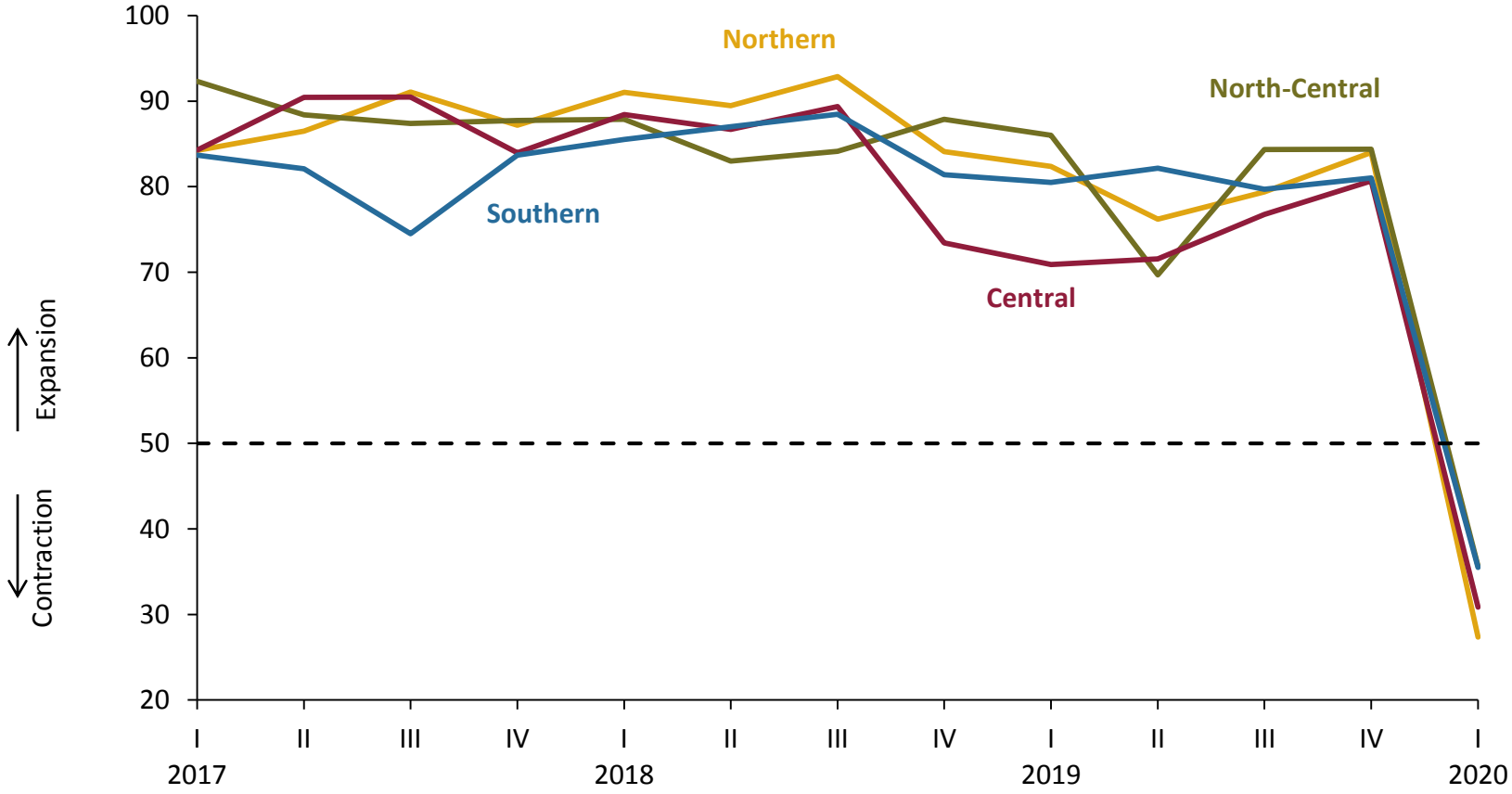


s. a. / Seasonally adjusted data.
Source: Banco de México.

Regarding demand for own goods and services, the diffusion index in all regions decreased considerably and is below 50 points.

Business Agents' Expectations: Demand over Next 12 Months 1/

Diffusion indices

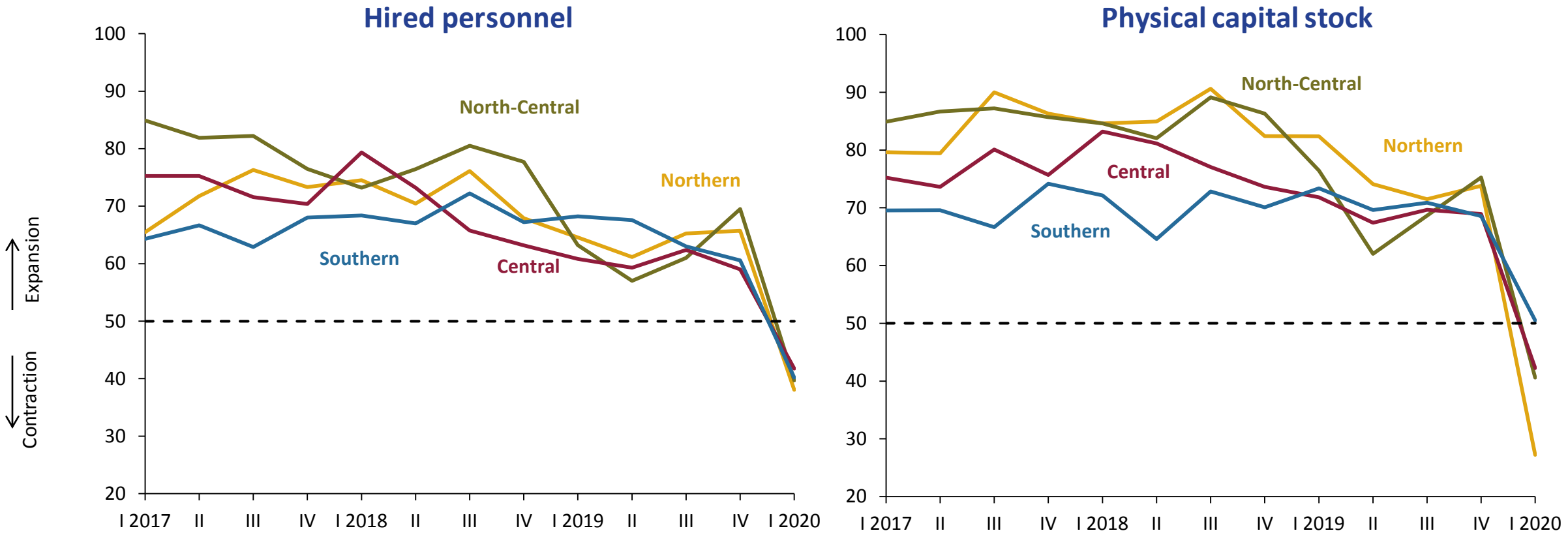


1/ Results obtained from responses to the question: "With respect to the volume of sales of your goods and services in the previous 12 months, how do you expect your sales volume to change in the next 12 months?", from interviews conducted by Banco de México. Data corresponding to Q1 2020 were obtained from data collected between March 23 and April 23, 2020.

Consistent with the anticipated contraction in demand, the diffusion indices corresponding to hired personnel and physical capital stock also decreased sharply, and located below 50 points in all regions, except in the Southern region in the case of firms' physical capital.

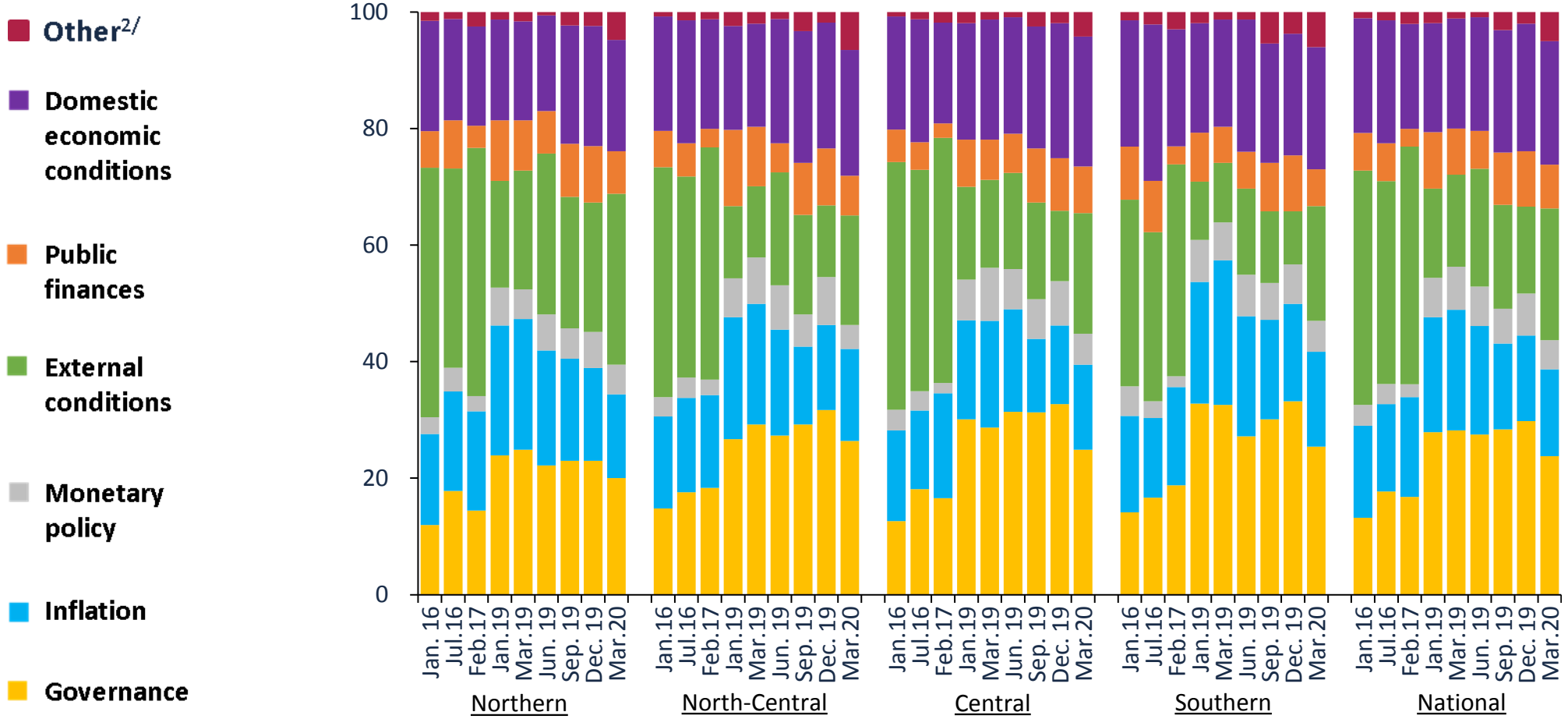
Business Agents' Expectations: Hired Personnel and Physical Capital Stock, Next 12 Months [1/]

Percentage of responses



1/ Results obtained from responses to the questions: "With respect to the previous 12 months, how do you expect the total number of workers in your firm to change in the next 12 months?", and "With respect to your firm's investment in fixed assets during the previous 12 months, how do you expect investment levels to change in the following 12 months?, from interviews conducted by Banco de México. Figures for Q1 2020 were obtained from data collected between March 23 and April 23, 2020.

Percentage Distribution of Business Agents' Responses when Interviewed about the Main Three Factors that Could Hinder Growth of Economic Activity in their States, in the Next 6 Months (based on data collected between March 2 and 31, 2020) 1/



1/ Question: Which do you consider to be the main three limiting factors for growth of economic activity in your state during the next 6 months? This question is similar to that included in the questionnaire of the Survey among Private Sector Forecasters. Figures for March 2020 were obtained based on data collected between March 2 and 31, 2020.

2/ The question includes different specific factors, as well as an open option "other", in which business contacts can indicate other factors they consider relevant. In the case of data collected in March 2020 in this item it is noteworthy that practically all responses make a reference of the COVID-19 pandemic.

Source: Banco de México.

Business Agents' Opinion on Risks to Regional Economic Activity (based on data collected between March 23 and April 23, 2020) 1/

Upward risks

- That employment protection and business support programs are implemented effectively.
- That a more effective and faster-than-anticipated containment of the COVID-19 pandemic is achieved.
- That public investment in infrastructure reactivates.

Downward risks

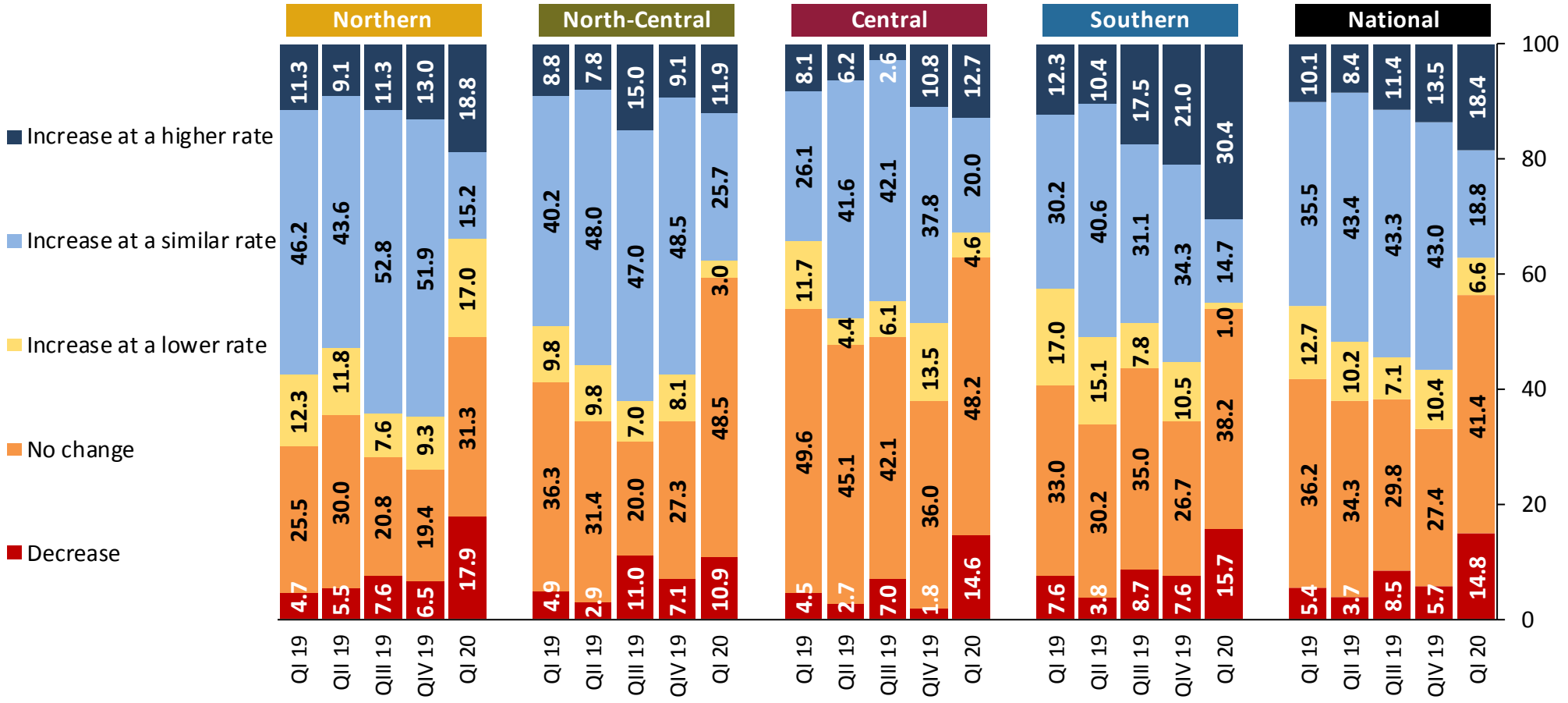
- That the negative impact of the COVID-19 pandemic on regional economic activity extends more than expected.
- That public insecurity increases.
- That, regardless of the health emergency, private investment and employment remain weak.

1/ Results obtained from responses to the questions: "Which are the main 2 events/situation/facts that, if they occur, would boost economic performance in your state in the next 12 months?" and "Which are the main 2 events/situations/facts that, if they occur, would hinder economic growth in your state in the next 12 months?", from interviews conducted by Banco de México between March 23 and April 23, 2020.

Regarding sales prices of own goods and services, in all regions, business agents mentioned more frequently that they expect sales prices to remain at the same level during the next 12 months as compared to the previous 12 months.

Business Agents' Expectations: Annual Change of Sales Prices, Next 12 Months [1/]

Percentage of responses

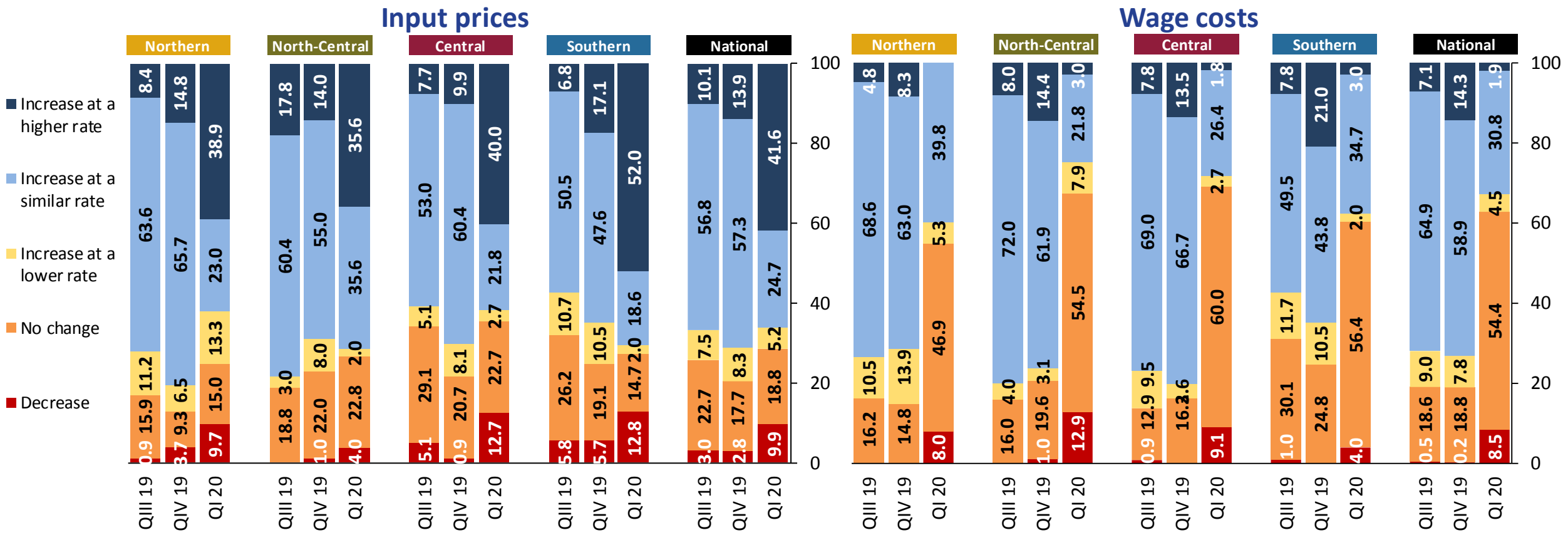


1/ Results obtained from responses to the question: "With respect to the previous 12 months, how do you expect sales prices in your sector to change in the next 12 months?", from interviews conducted by Banco de México. Figures for Q1 2020 were obtained from data collected between march 23 and April 23, 2020.

The share of business agents in different regions who expect input prices to grow at a higher rate than that recorded during the previous 12 months increased considerably. Meanwhile, most consulted business contacts expect their wage costs to remain unchanged.

Business Agents' Expectations: Annual Change of Input Prices and Wage Costs, Next 12 Months [1/]

Percentage of responses



1/ Results obtained from responses to the questions: "With respect to the previous 12 months, how do you anticipate the change in input prices (goods and services) used in your sector to be for the next 12 months?", and "With respect to the previous 12 months, how do you anticipate the changes in wages of workers in your sector to be in the next 12 months?", from interviews conducted by Banco de México. Figures for Q1 2020 were obtained from data collected between march 23 and April 23, 2020.

Outline

I. Regional Economic Report

II. Results January – March 2020

A. Economic activity

B. Inflation

C. Economic outlook

(based on data collected between March 23 and April 23, 2020)

III. Final remarks

Final remarks

1. Although economic activity in all regions was already weak prior to the **COVID-19 pandemic**, as a result of the actions adopted to contain the spread, **productive activity began to contract significantly**.

2. The supply, demand and financial shocks caused by the COVID-19 pandemic affected the inflation process, both at the national and regional levels, generating both upward and downward pressures. Indeed, at the beginning of the health crisis clear downward pressures started to be observed, derived from lower energy prices and, subsequently, both upward and downward pressures on different goods and services have been registered.

3. Consulted business agents listed the following risks :

   - ✓ *Upward: i) that employment protection and business support programs are implemented effectively; ii) that a more effective and faster-than-anticipated containment of the COVID-19 pandemic is achieved, and iii) that public investment in infrastructure recovers.*

   - ✓ *Downward: i) that the negative impact of the COVID-19 pandemic on regional economic activity extends more than expected; ii) that public safety levels deteriorate, and iii) that, regardless of the health emergency, private investment and employment remain weak.*

4. The COVID-19 pandemic has had major negative effects in all regions in Mexico, although the channels through which the health crisis has affected them have varied depending on each region's productive structures. In any case, the pandemic possibly entails the realignment of supply and demand structures, which implies that to recover faster, regions should double efforts in order to generate an environment conducive to investment and to allow the reallocation of factors to their most productive uses. This will result in a faster recovery of employment and the welfare of the population.



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