The Half-Full and Half-Empty Glass of Economic and Export Diversification in Chile

Pablo García S. - Member of the Board

Banco Central de Chile

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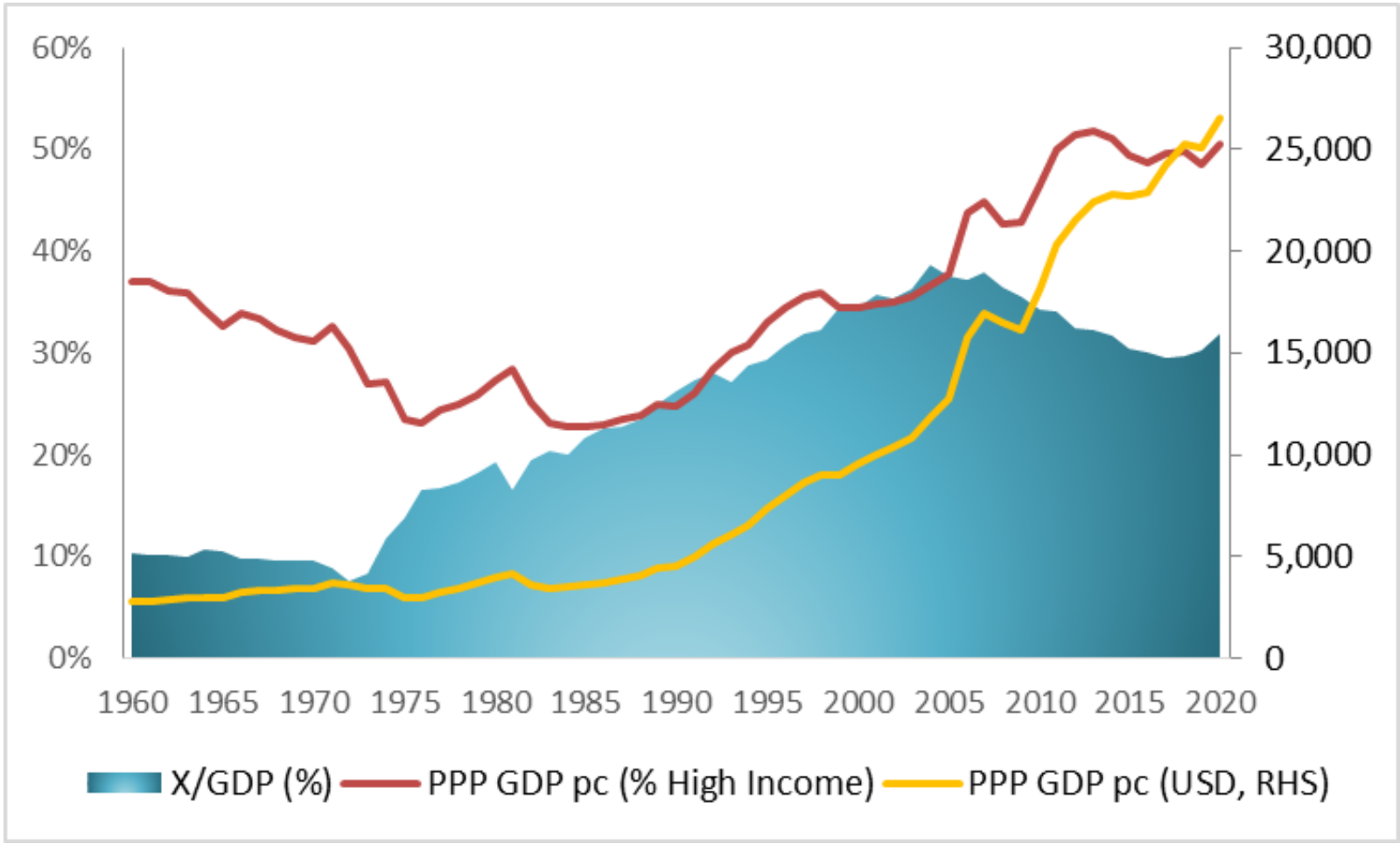
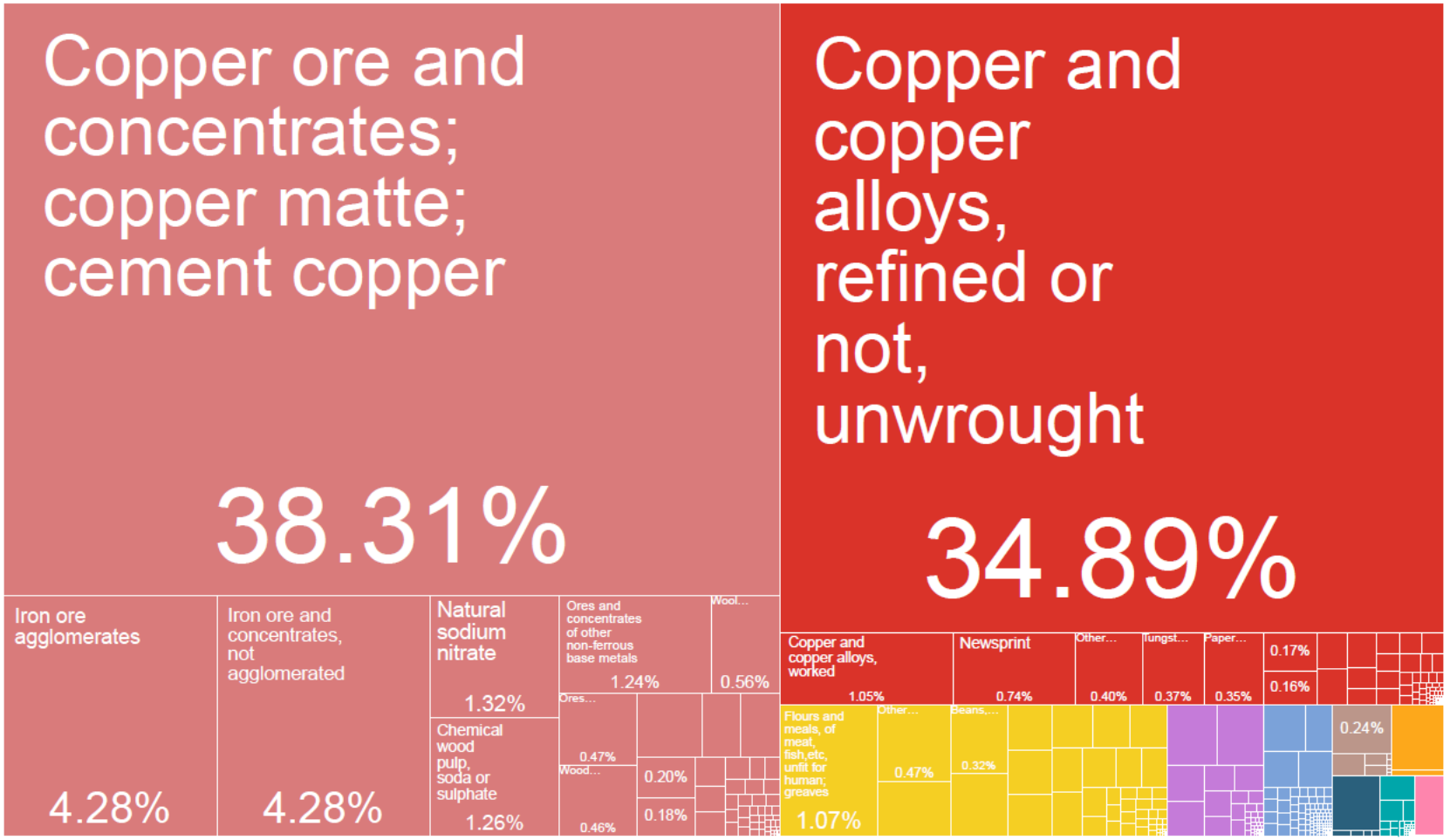
1 An overview

After being a very closed economy before the mid-1970s, export orientation has been a significant driver of economic growth and convergence in Chile.



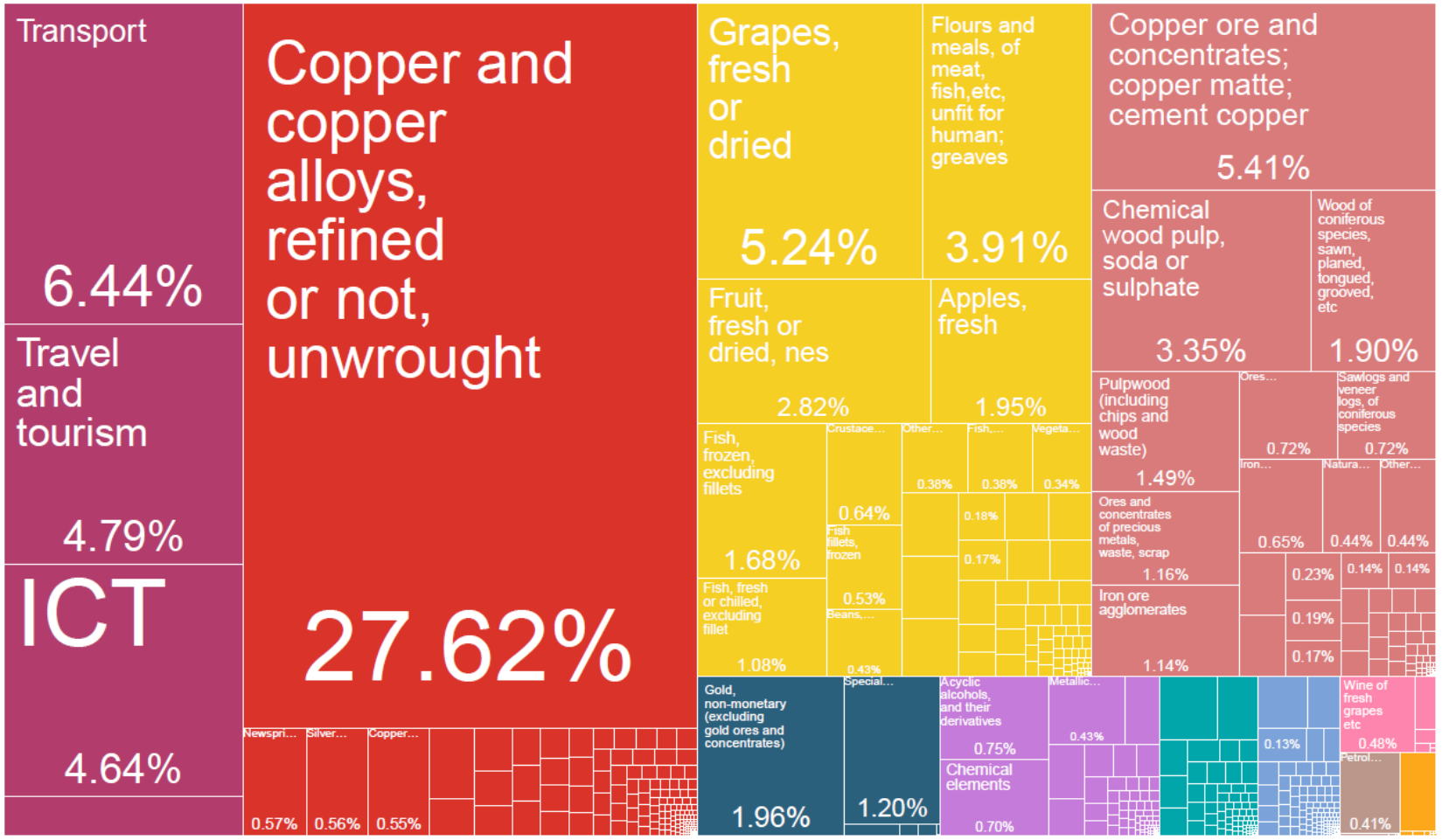
Source: IMF and Central Bank of Chile

In 1970, Chilean exports were heavily concentrated (about 90%) in copper and copper products.



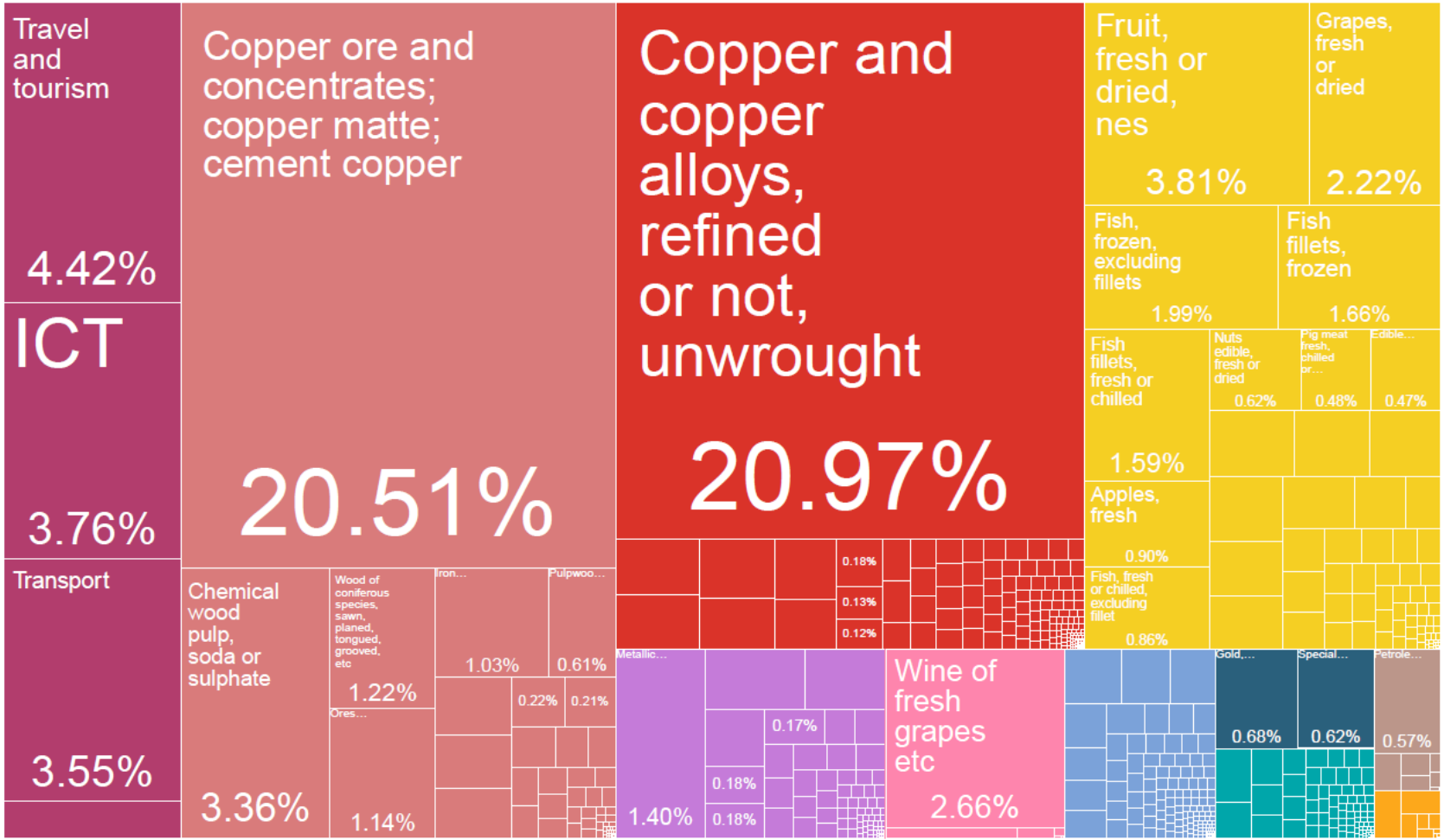
Source: Atlas of Economic Complexity

By 1990, concentration in copper and copper products had significantly shrunk but remained sizeable.



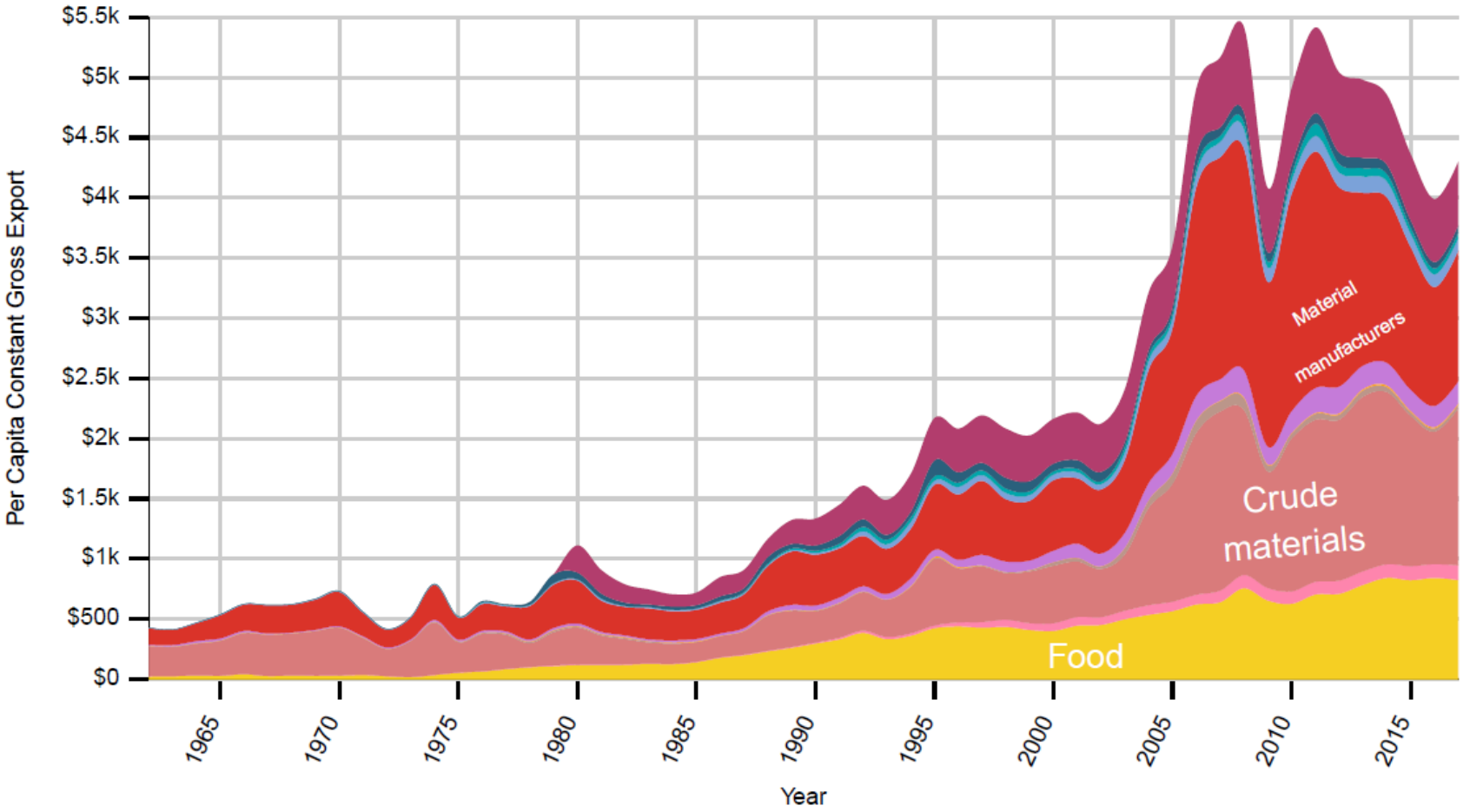
Source: Atlas of Economic Complexity

As of 2017, copper and copper products repersent around 50% of total exports, and there are now sizeable non-copper export sectors (fresh fruits, wines, woodpulp, fish products) sizeable.



Source: Atlas of Economic Complexity

The aggregate amount of exports (both copper and non copper), experienced a staggering increase since 1970, but since 2005 or so the trend seems to have slowed down.



Source: Atlas of Economic Complexity

Issues for discussion

- What have been the forces behind the large increase in Chile´s export sector since the 1960's?
- What has driven the shift away from copper, and why copper still retains a significant export share?
- Has economic/export diversification ran its course? Can it be pushed further? How?
- These are difficult and hotly debated questions in Chile. This presentation will attempt to present different (often contrasting) views on the matter.

2 The Glass Half-Full

Patterns of trade are well represented by standard gravity equations.

China´s size has also more than trumped distance.

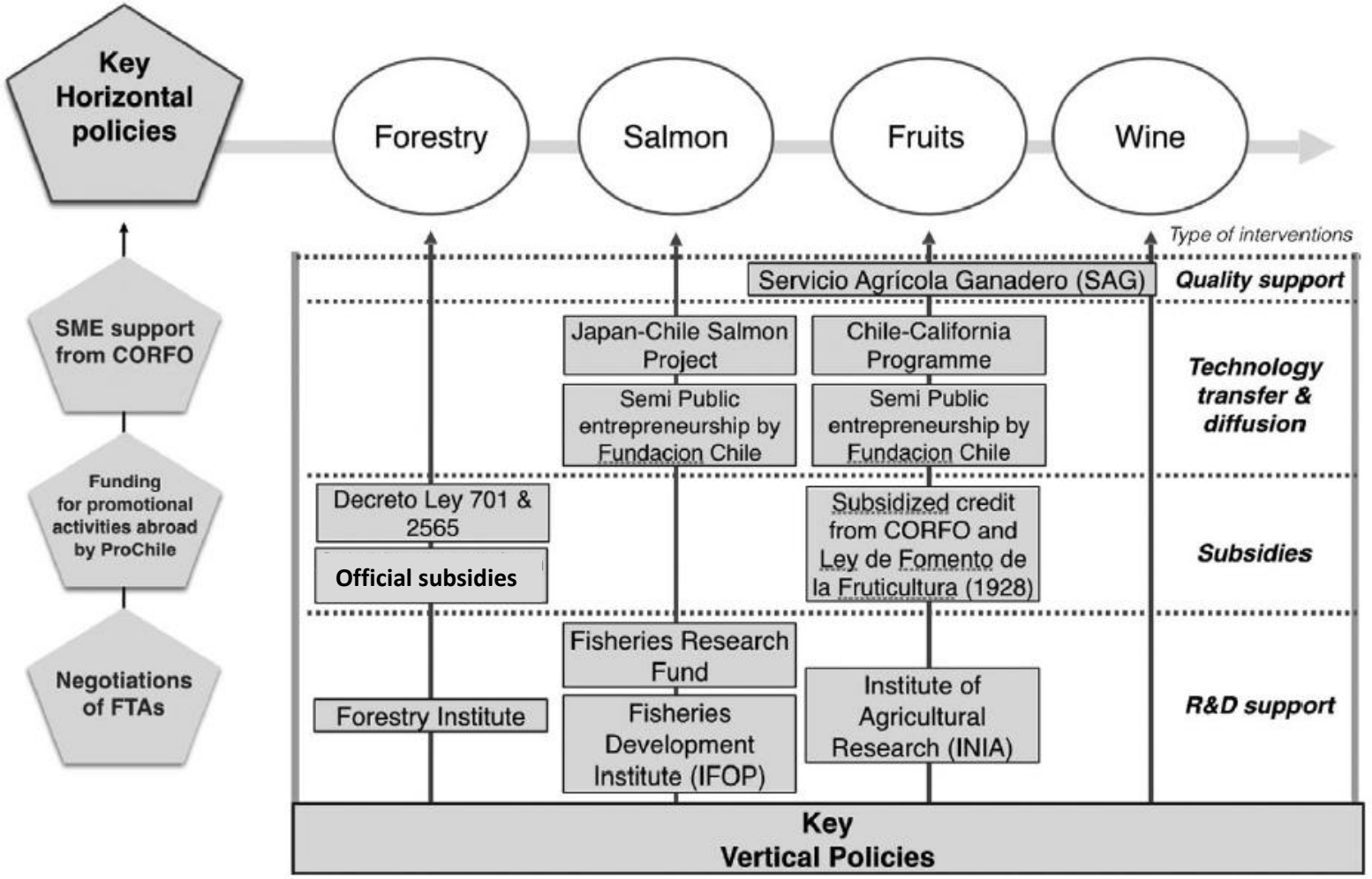
Variable ind.	*(1)* $\log(FOB^X_{ct})$	*(2)* $\log(HS4s_{ct})$	*(3)* $\log\left(\frac{FOB^X}{HS4s}\right)_{ct}$	*(4)* $\log(empresas_{ct})$	*(5)* $\log\left(\frac{FOB^X}{empresas}\right)_{ct}$
$\log(PIB_{ct})$	0,99**	0,58**	0,41**	0,62**	0,37**
	(0,02)	(0,01)	(0,02)	(0,01)	(0,01)
$\log\left(\frac{PIB}{N}\right)_{ct}$	0,35**	0,16**	0,19**	0,27**	0,08**
	(0,03)	(0,01)	(0,02)	(0,01)	(0,02)
$\log(Distancia_c)$	-1,92**	-1,85**	-0,07	-1,75**	-0,17**
	(0,06)	(0,04)	(0,04)	(0,04)	(0,03)
N	2.821	2.821	2.821	2.814	2.814
R^2-ajustado	0,69	0,76	0,41	0,76	0,41
E.F.	Año	Año	Año	Año	Año

Notas: ** denota significancia estadística al nivel 0,01. Errores estándares robustos a la heteroscedacidad y auto-correlación en paréntesis.

Source: Carriere and Claro, in Meller (2013)

Both “Vertical” and “Horizontal” policies have played a role in the diversification away from copper...

Figure 2. Key Policy Interventions behind the Emergence of Chile's Non-mining Sectors

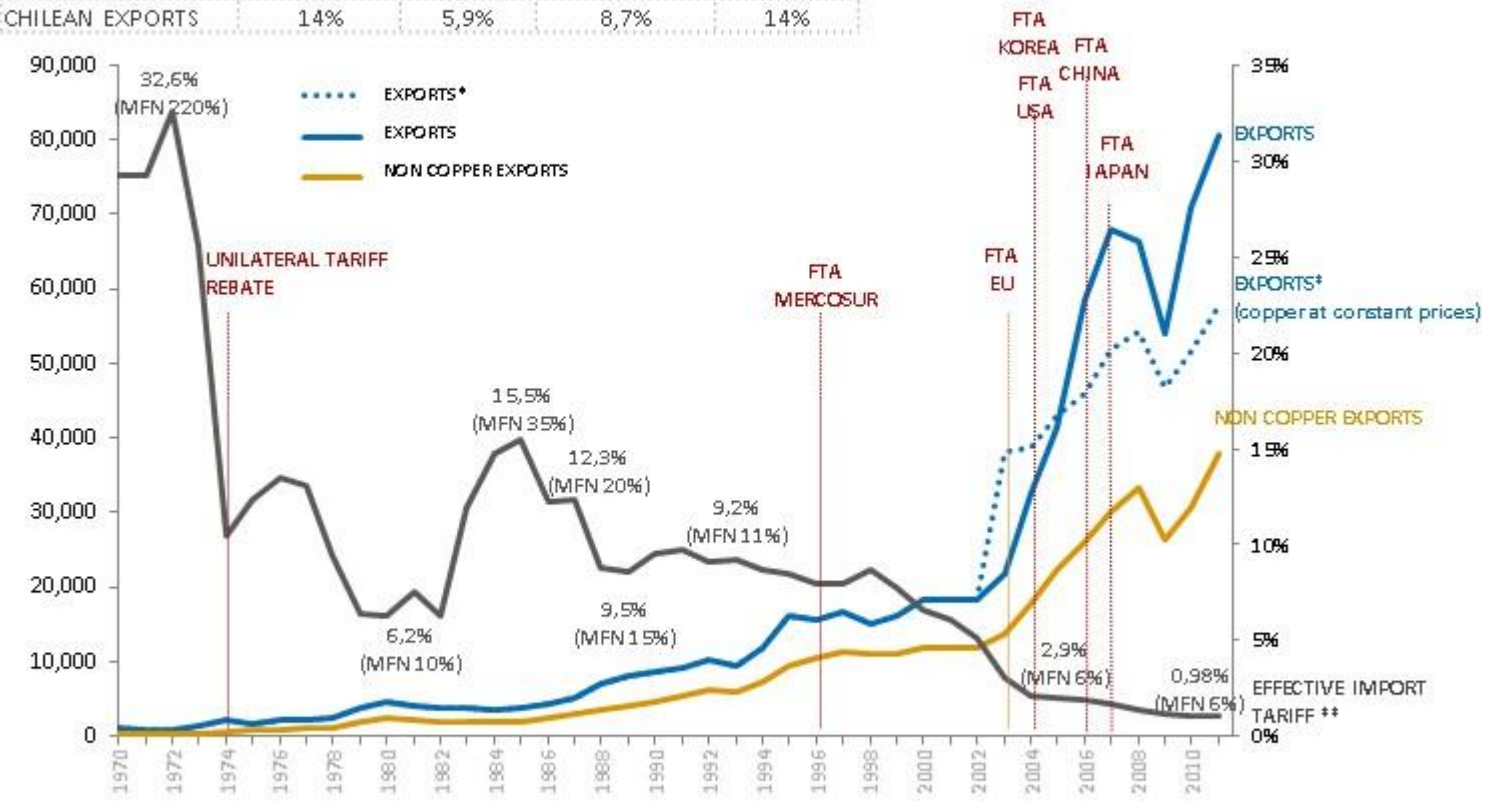


Source: Lebdioui (2019)

Key “Horizontal” policy has been a sustained reduction in tariffs on imports, through unilateral reductions and FTAs.

ECONOMY AND FOREIGN TRADE

	ANNUAL GROWTH			
	1970-1980	1980-1990	1990-2000	2000-2010
WORLD EXPORTS	20%	5,5%	6,4%	9%
CHILEAN EXPORTS	14%	5,9%	8,7%	14%



(*) Exports from 2003 to 2010 were calculated with the average copper price from 1987 – 2003 = 0,965 US$/Lb
(**) Import Tariff (Weighted Average).

Source: DIRECON, Central Bank, National Customs Service, UNCTAD & Santiago Chamber of Commerce.

Source: PROCHILE

Key “Horizontal” policy has been a sustained reduction in tariffs on imports, through unilateral reductions and FTAs.

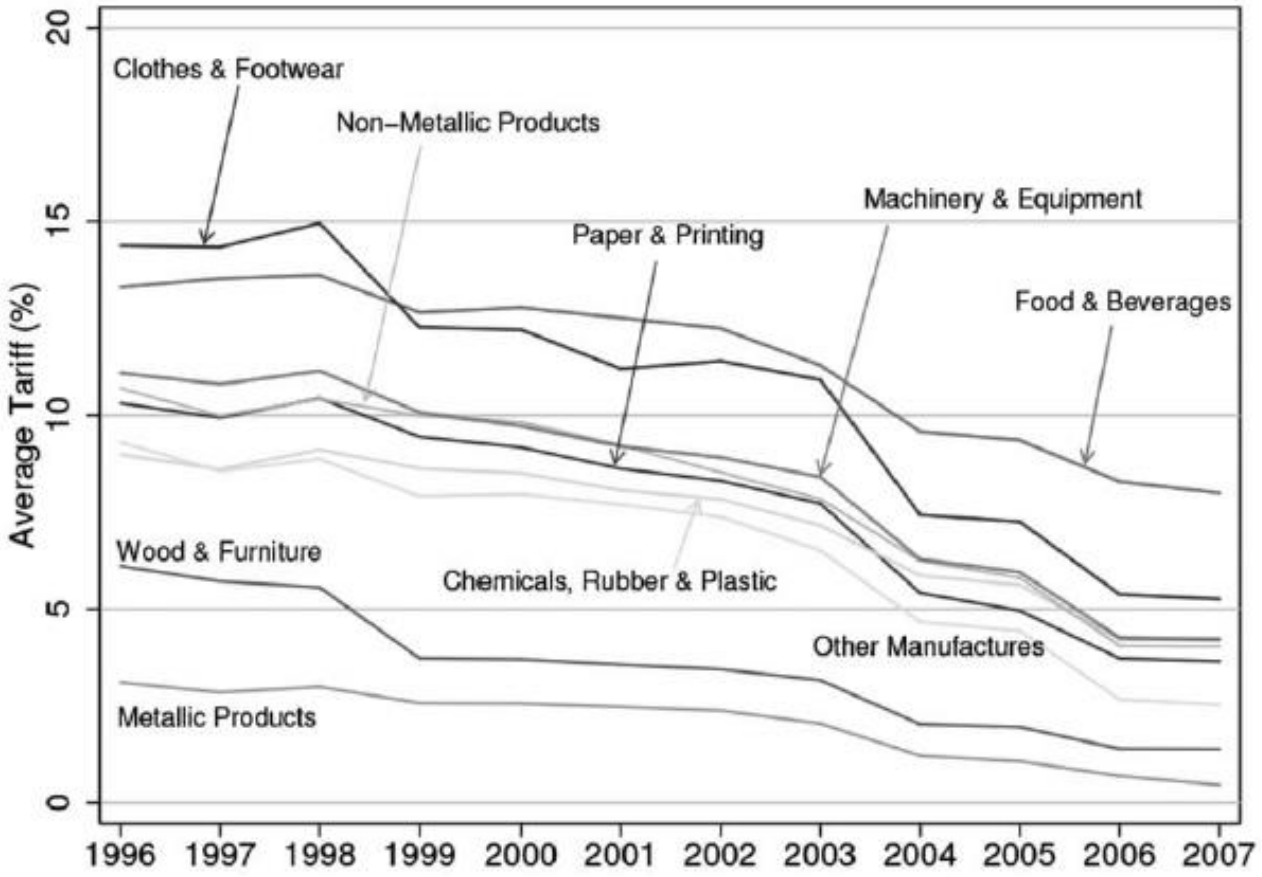


FIG. 5.—Average Chilean export tariffs (two-digit industries). The figure plots the average export tariff for all two-digit ISIC industries. We first compute average tariffs at the six-digit Harmonized System product level across all destinations of Chilean exports, using destination-specific aggregate export shares as weights. We then derive average tariffs at the more aggregate two-digit ISIC level. Color version available as an online enhancement.

Source: García-Marín and Voigtlander (2019)

The opening-up of the economy led to relevant productivity gains in the manufacturing sector, which were passed on to domestic consumers.

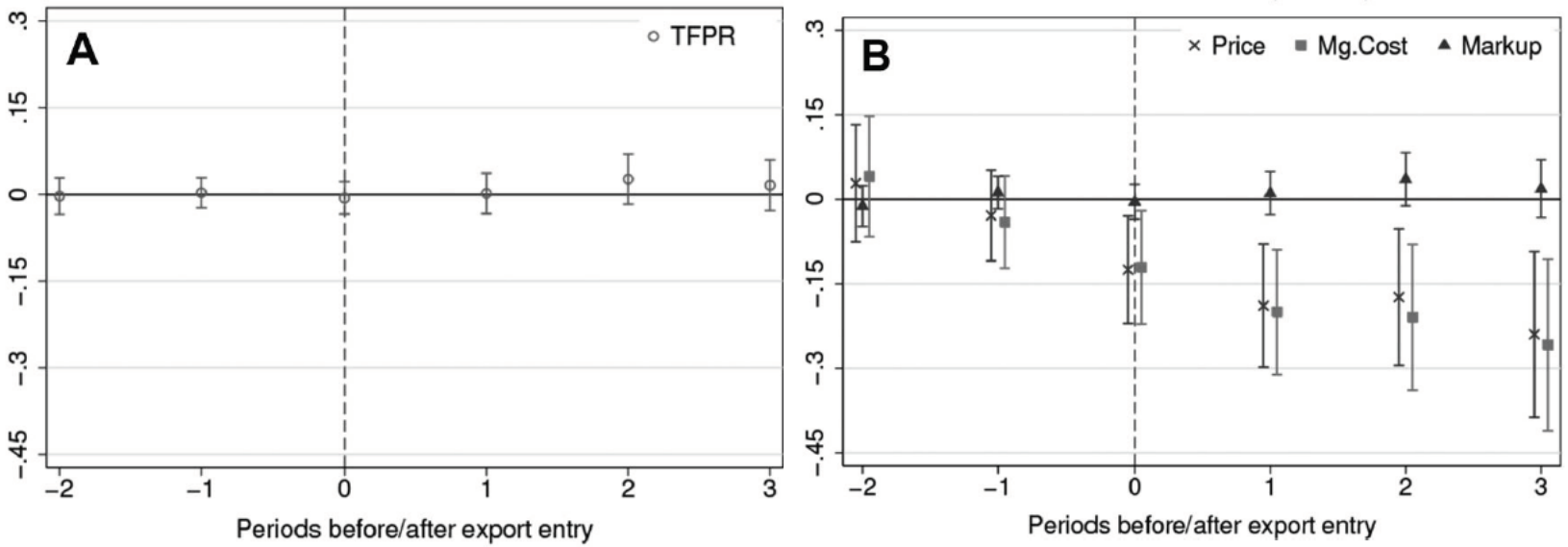
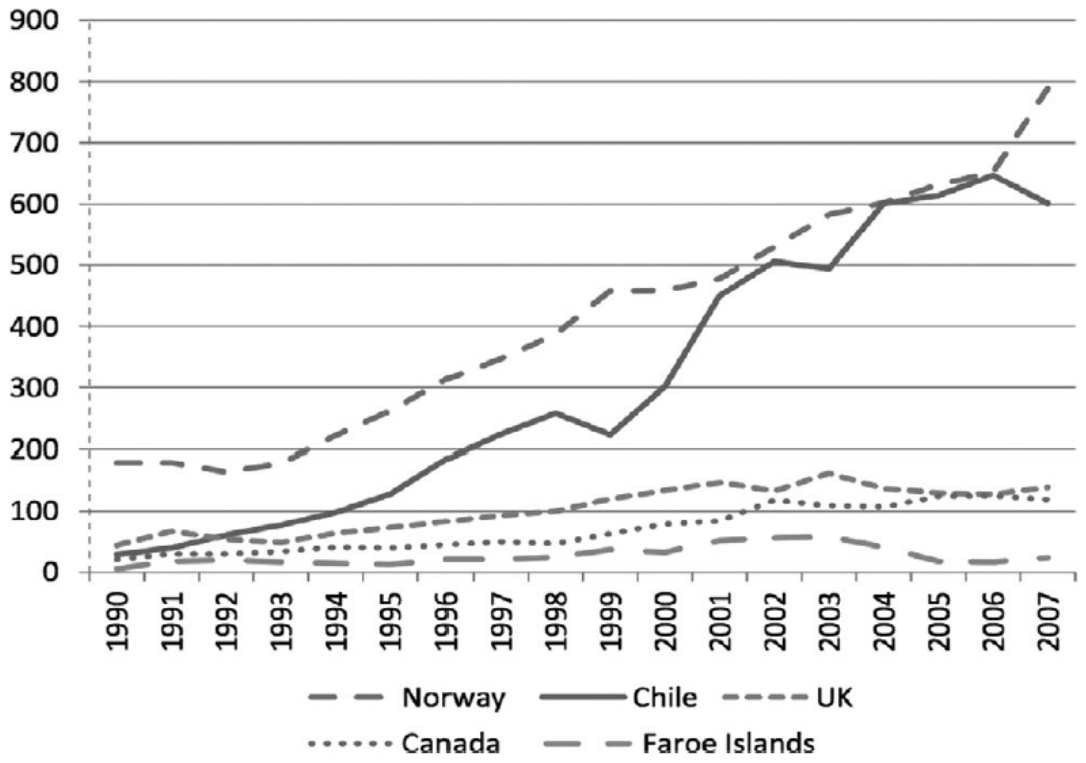


FIG. 1.—Trajectories for export entrants in Chile. Data are from the Chilean Annual Industrial Survey (ENIA) for the period 1996–2007. The figure shows the trajectories for our main outcome variables before and after export entry; period $t = 0$ corresponds to the export entry year. Panel A shows the trajectory for revenue productivity (TFPR); panel B, for marginal cost, price, and markups. All results are at the plant-product level. A plant-product is defined as an entrant if it is the first product exported by a plant and is sold domestically for at least one period before entry into the export market (see Sec. III.B). Coefficient estimates are reported in table 1. The lines and whiskers represent 90 percent confidence intervals. Color version available as an online enhancement.

Source: García-Marín and Voigtlander (2019)

(Atlantic) Salmon production experienced a significant expansion. It is cited as a good example of public-private cooperation.

Figure 3. Export Volume of Salmon Industries by Country ('000 Tonnes)



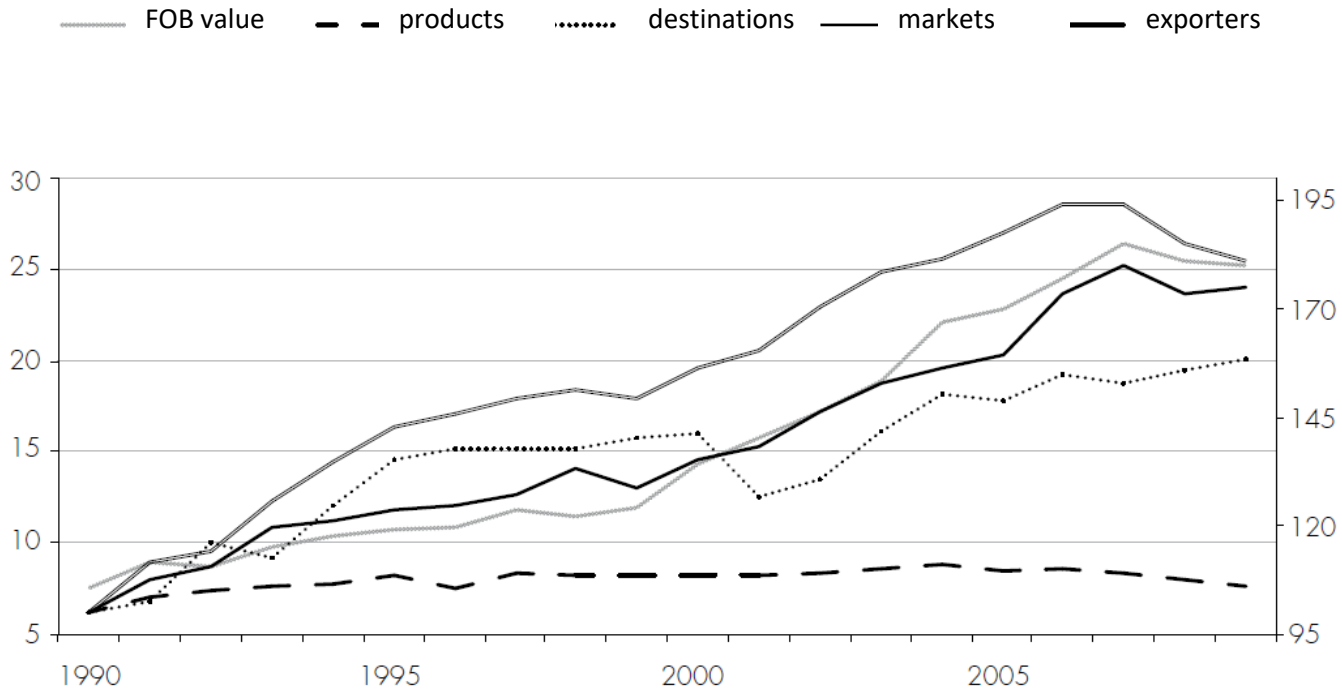
Source: Lebdioui (2019)

Figure 4. Contributions to the Development of Technologies for Processing, Fish Disease Control and Feed Production

		Contribution by the Japan-Chile Salmon Project	Contribution by Salmones Antártica / Fundación Chile	Contribution by the private sector
Processing technology			Salmones Antártica constructed the most advanced processing plants and introduced pioneering technology in 1989–1990	
Fish disease control		R&D on bacteria kidney disease control with the most advanced laboratory equipment, and pioneering contributions in the mid-1980s		
Food production	**General**	Conducted pioneering research on feed production using fish meal produced in Chile	Salmones Antártica/ Fundación Chile boosted food production towards commercial sea-cage farming of salmon in the mid-1980s	
	Crumbles	Conducted research on the production of feed suitable for young juveniles that have absorbed their yolk sacs; built production equipment and ensured a stable supply		
	Expansion pellets			Norwegian firms introduced expansion pellets into Chile through investments and the sale of equipment in the 1990s

Most indicators of Non-copper export activity increased significantly since 1990. Most noteworthy is the lack-luster increase in product diversity.

NON COPPER EXPORT INDICATORS



Source: Carriere and Claro, in Meller (2013)

Lower role of diversity and the increased relevance of China is apparent in the last periods.

EXPORT GROWTH DECOMPOSITION ACROSS DESTINATIONS, PERIODS AND ACROSS OLD AND NEW FIRMS AND PRODUCTS

A. En el periodo 1991-2001

		OLD FIRMS		NEW FIRMS		
		OLD PRODUCTS	NEW PRODUCTS	OLD PRODUCTS	NEW PRODUCTS	TOTAL
1	EE.UU.	1,70	0,10	6,49	0,20	8,48
2	Japón	-1,75	0,55	4,29	0,30	3,40
3	México	2,06	2,67	10,90	13,70	29,33
4	Argentina	-1,24	0,22	7,66	1,22	7,87
5	Brasil	-4,00	0,16	6,90	3,07	6,14

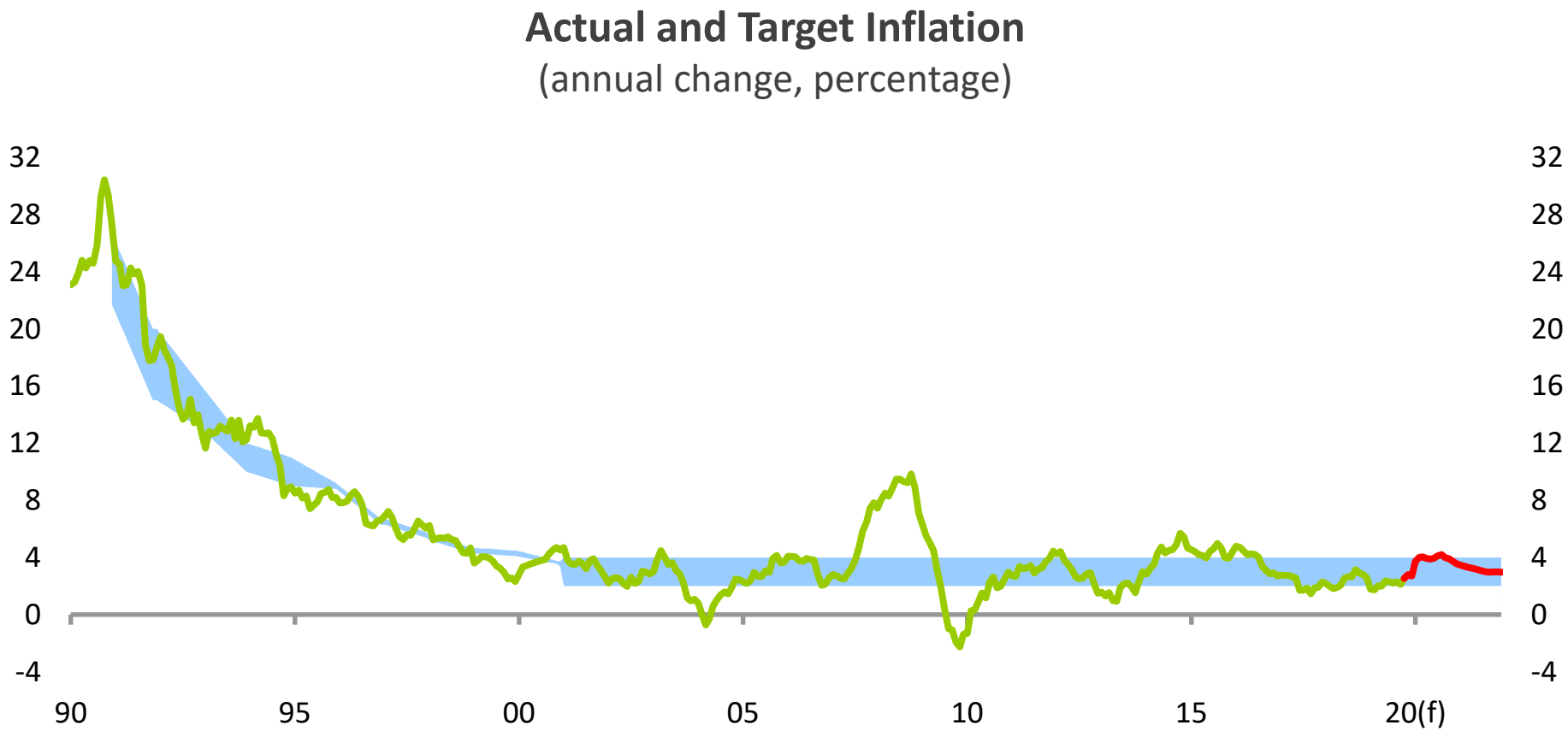
B. En el periodo 2000-2010

		OLD FIRMS		NEW FIRMS		
		OLD PRODUCTS	NEW PRODUCTS	OLD PRODUCTS	NEW PRODUCTS	TOTAL
1	EE.UU.	0,79	0,01	3,91	0,00	4,72
2	Japón	0,07	0,02	3,16	0,03	3,28
3	China	11,77	0,22	5,04	1,13	18,16
4	Brasil	3,67	0,04	6,21	0,02	9,94
5	Perú	5,13	0,03	4,49	0,01	9,66

Source: Carriere and Claro, in Meller (2013)

3 The Macroeconomic Framework

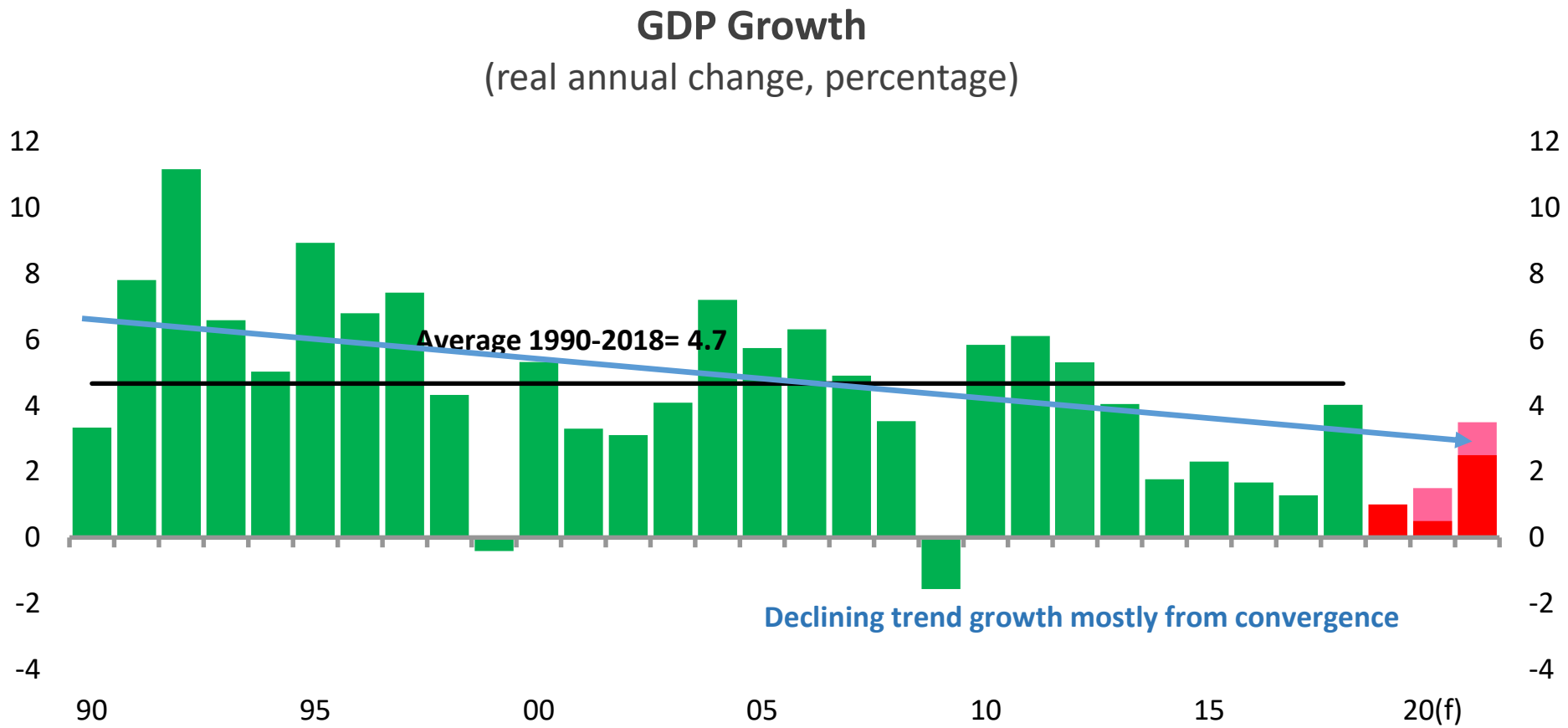
A key “horizontal” policy has been a sustained strengthening of the macro framework and an environment of macroeconomic stability. *Inflation close to targets, autonomous CB since 1990.*



(f) Red line represents the forecast included in the Monetary Policy Report, December 2019. Forecast considers a monthly frequency calculated based on a quarterly projection.

Sources: Central Bank of Chile and National Bureau of Statistics.

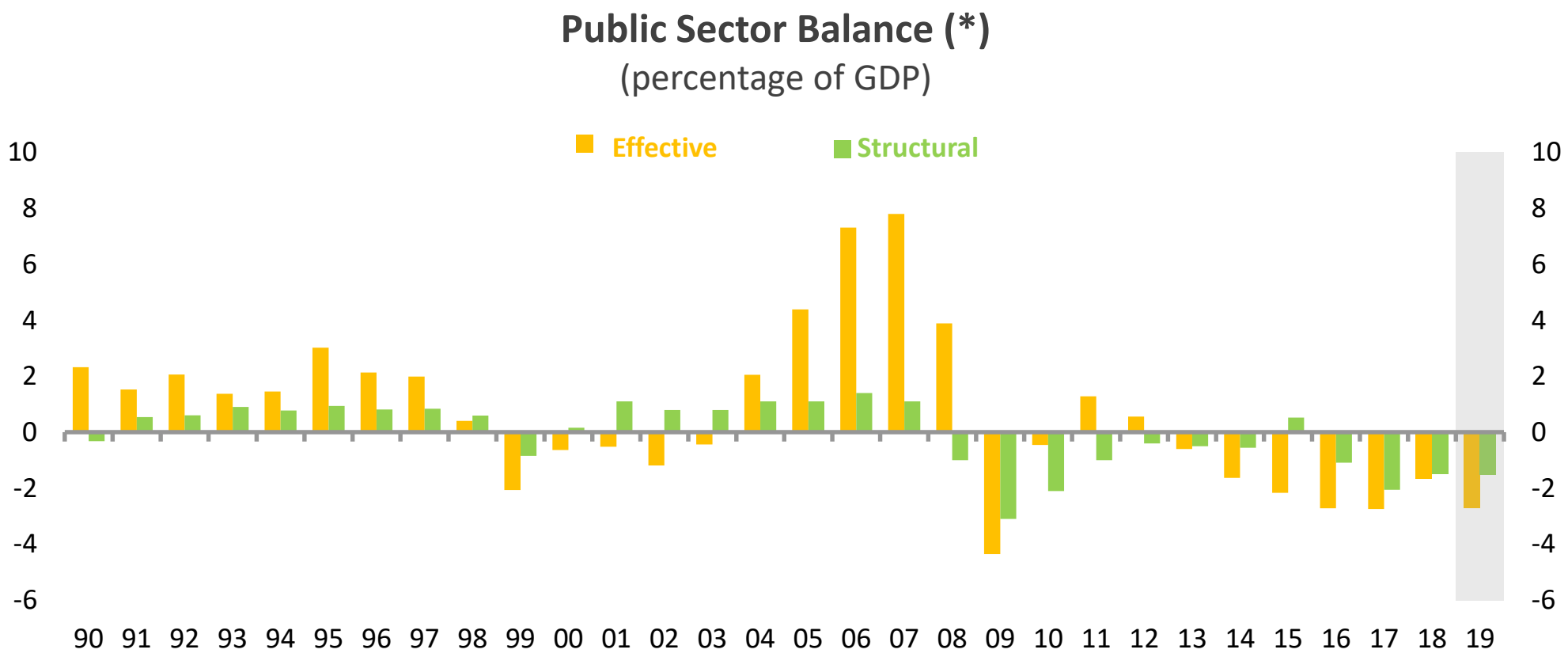
A key "horizontal" policy has been a sustained strengthening of the macro framework and an environment of macroeconomic stability. *Moderate business cycle around trend.*



(f) Forecast included in the Monetary Policy Report of December 2019. The estimates indicate that GDP will have an annual change of 1% in 2019, 0.5 – 1.5% in 2020 and 2.5 – 3.5% in 2021.

Source: Central Bank of Chile.

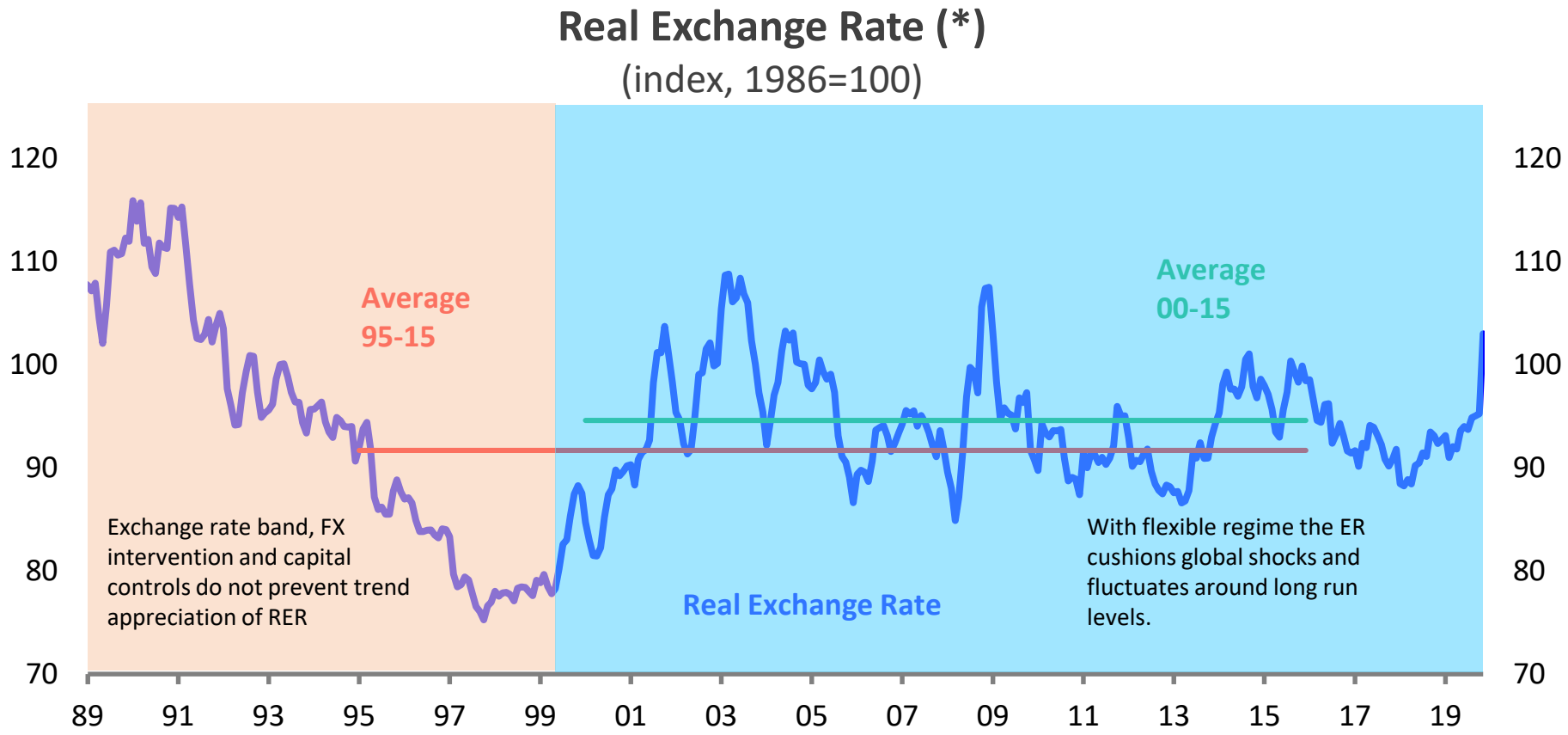
A key “horizontal” policy has been a sustained strengthening of the macro framework and an environment of macroeconomic stability. *Sound fiscal policy based on structural targets.*



(*) Forecasts inside grey area. Data obtained from Ministry of Finance’s estimates from November 5th, in the presentation: “Fiscal outlook revision 2019-2020”.

Source: National Budget Department, Ministry of Finance of Chile.

A key "horizontal" policy has been a sustained strengthening of the macro framework and an environment of macroeconomic stability. *Flexible exchange rate regime cushions global shocks.*



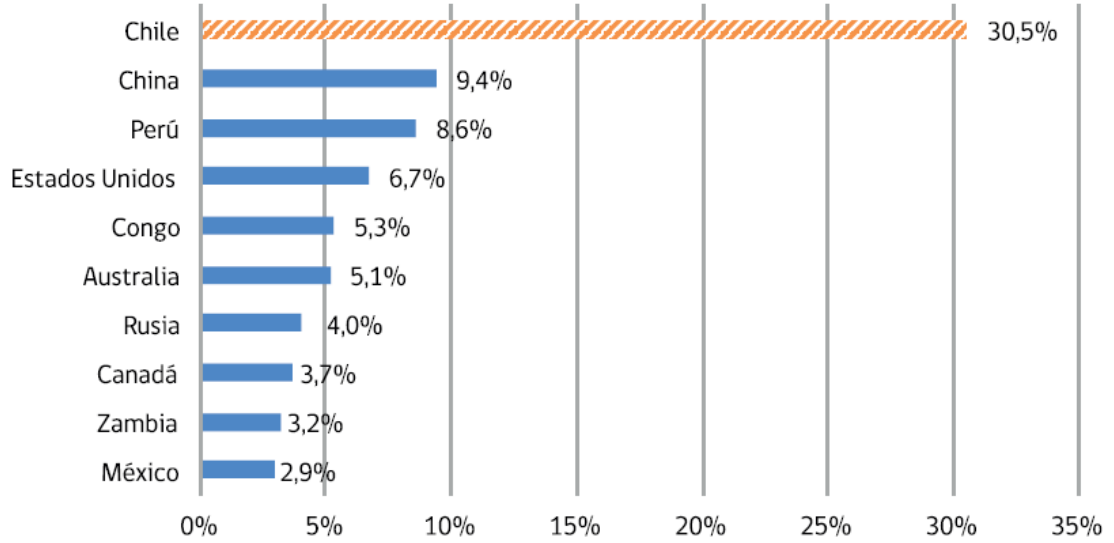
(*) Figures available until November 2019.

Source: Central Bank of Chile.

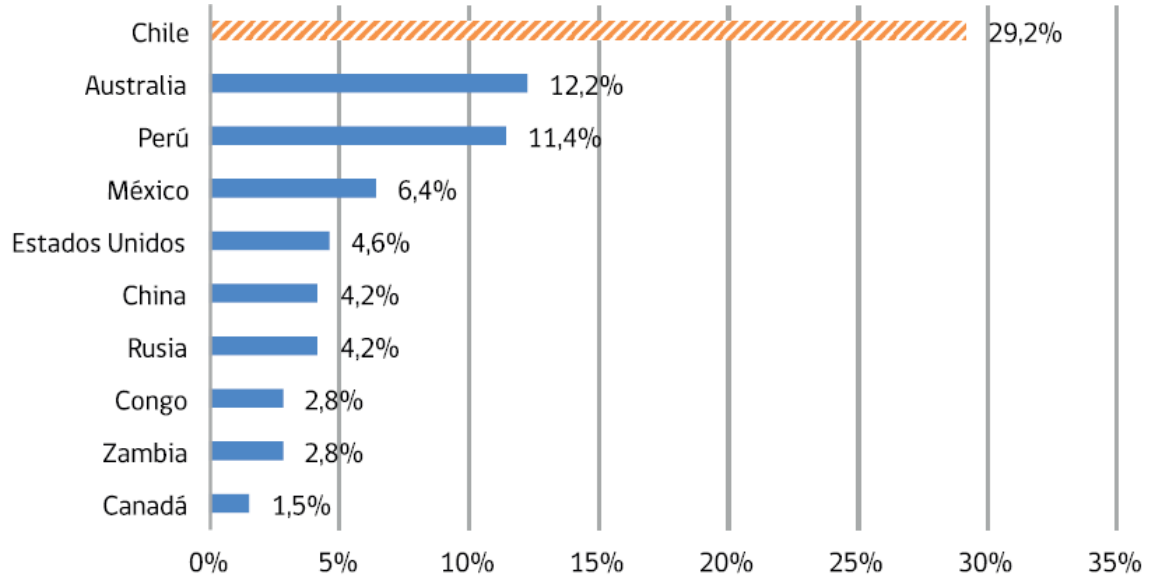
4 The Glass Half-Empty

Chile´s comparative advantage in copper remains very large…

Share of production

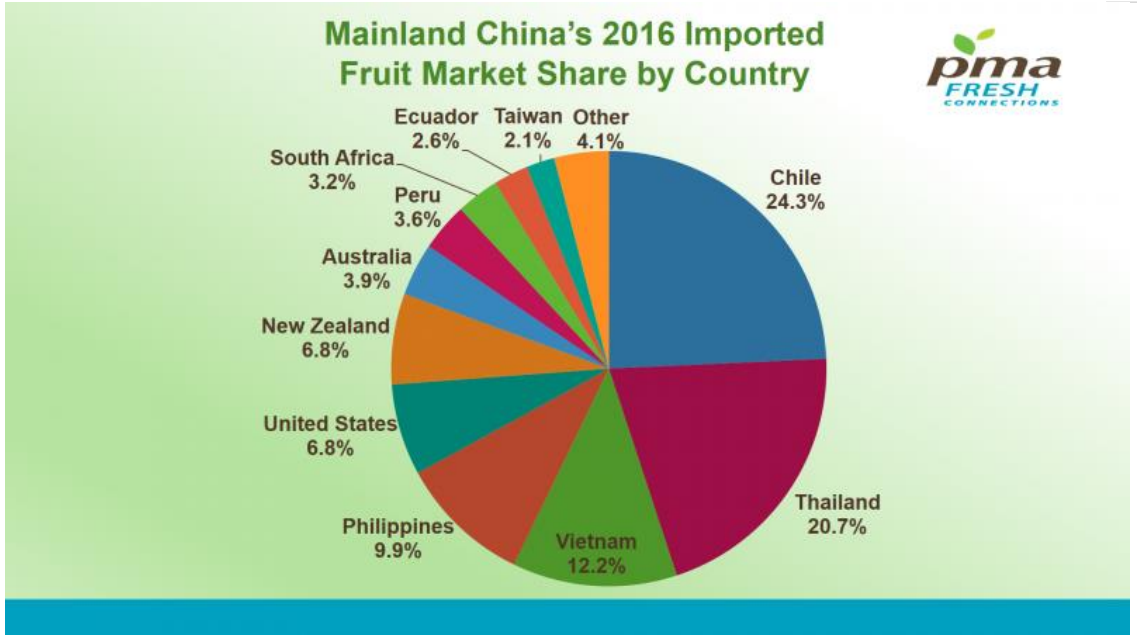


Share of reserves

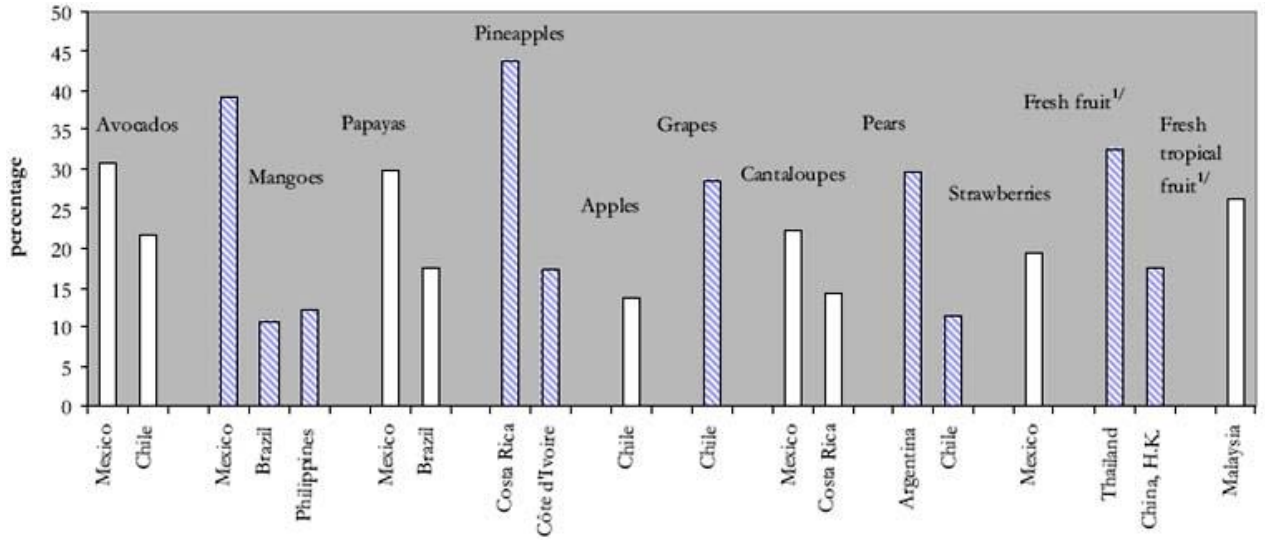


Source: Comisión Nacional de Productividad (2017)

As well as in other export sectors based on natural resources.

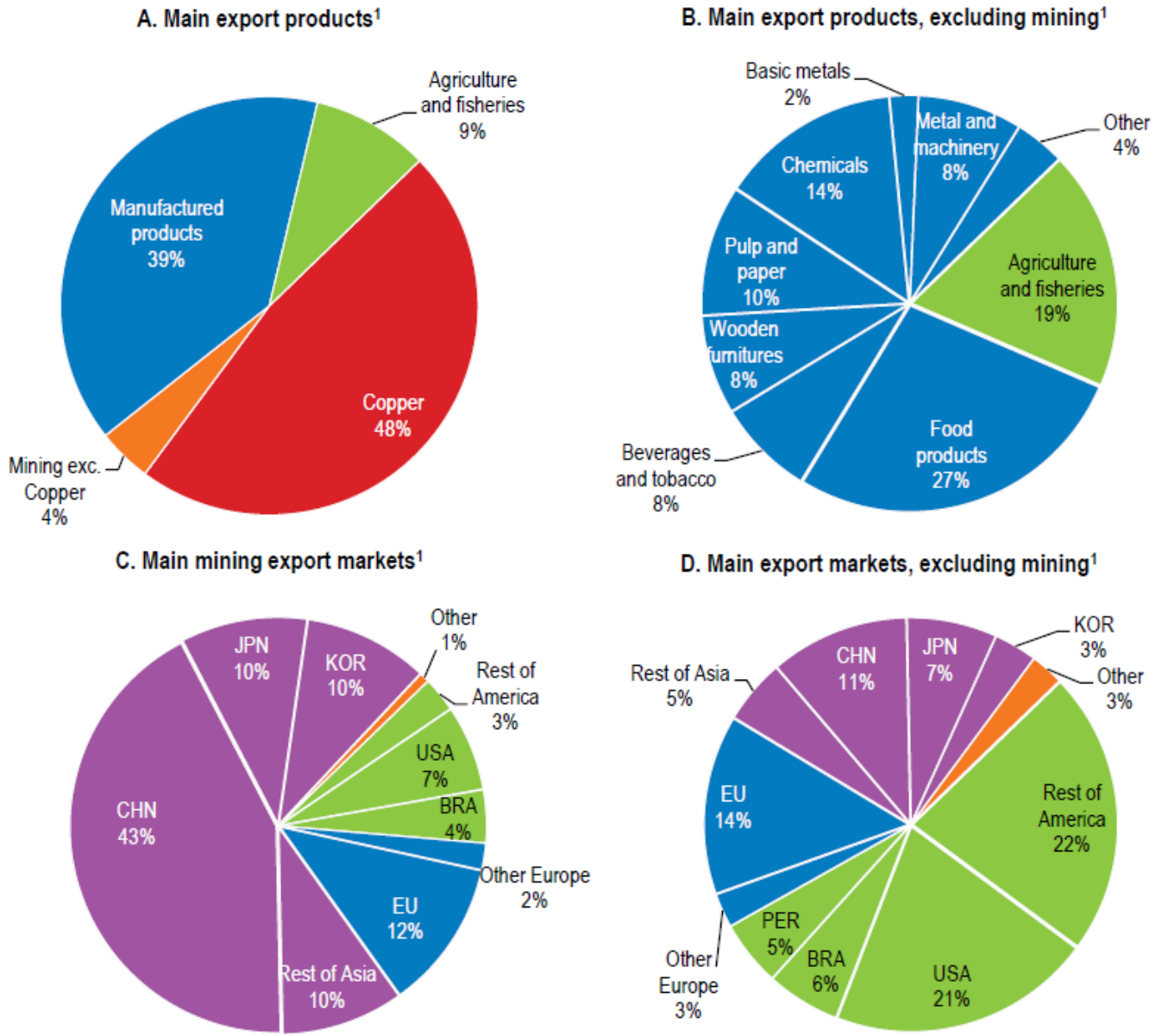


Leading developing country exporters of fresh fruits average share 1997–2001 (%)



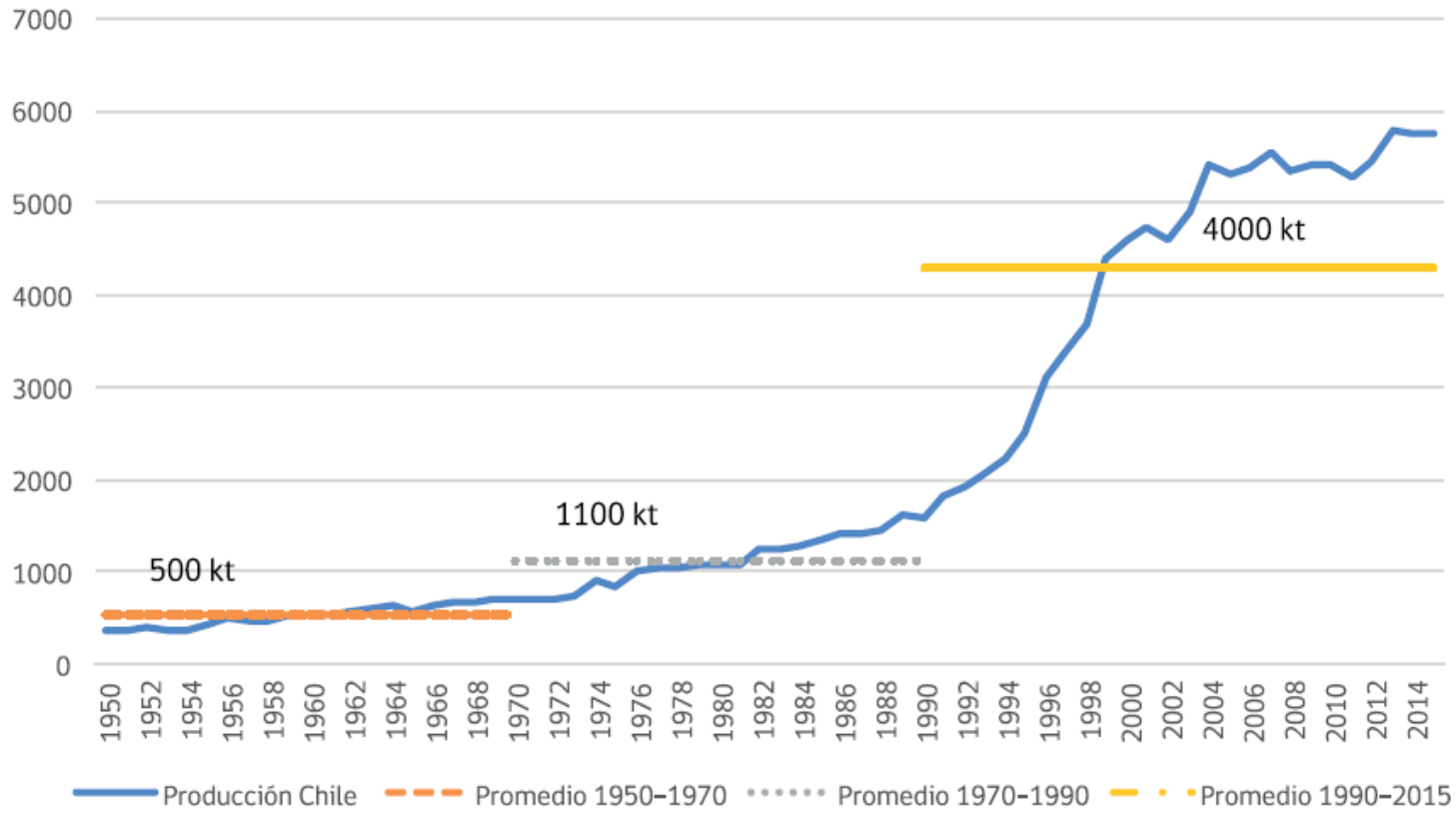
Source: FAO

Exports remain highly specialized.



Source: OECD (2018)

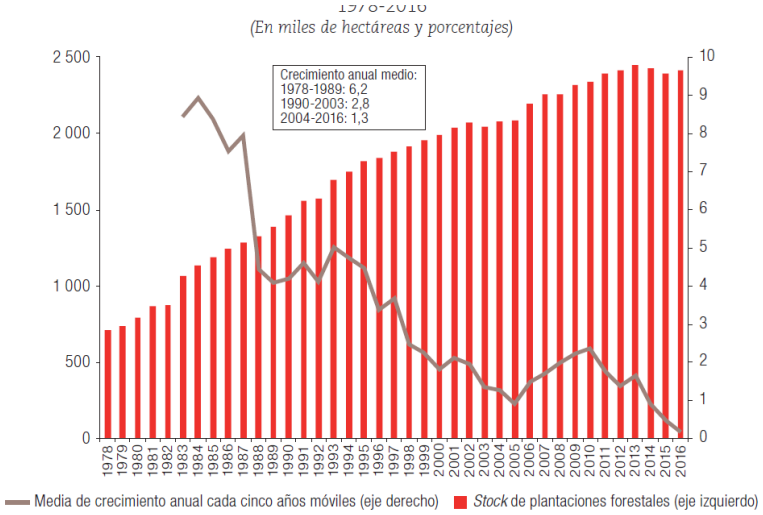
The aggregate amount of exports (both copper and non copper), experienced a staggering increase since 1970, but since 2005 or so the trend seems to have slowed down.



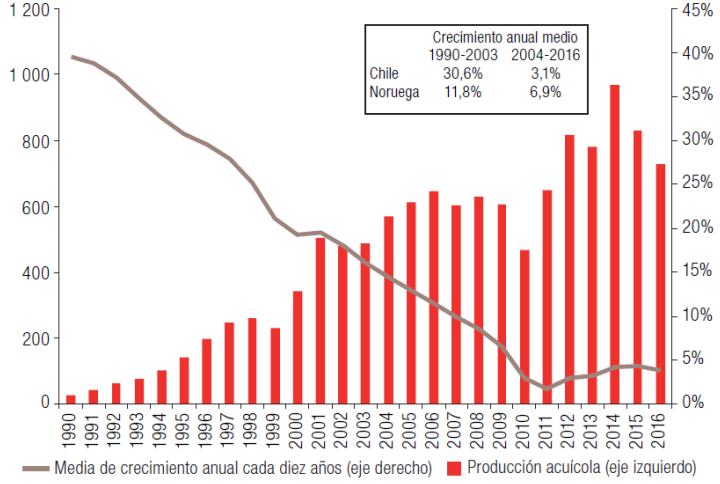
Source: Comisión Nacional de Productividad (2017)

A slowdown in the expansion of other exports based on natural resources is readily apparent from the data.

Forested area for exploitation

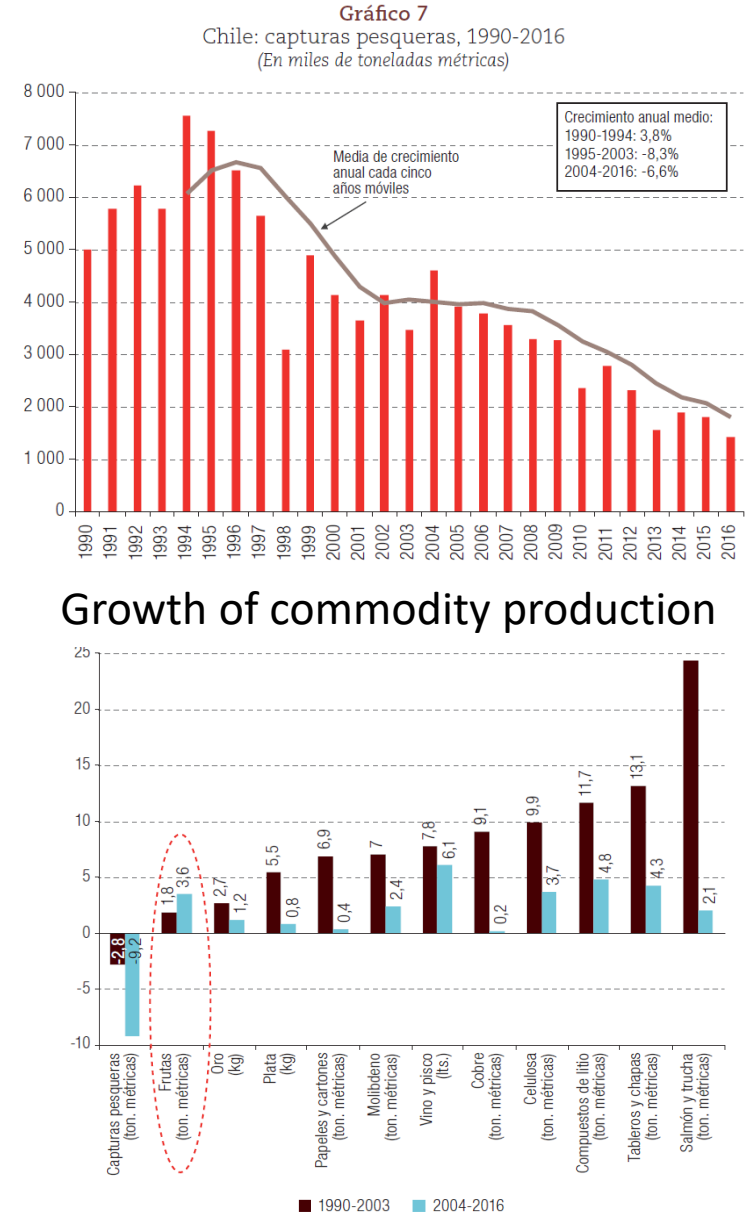


Fisheries production



Source: Diaz and Ffrench-Davis (2019)

Growth of commodity production



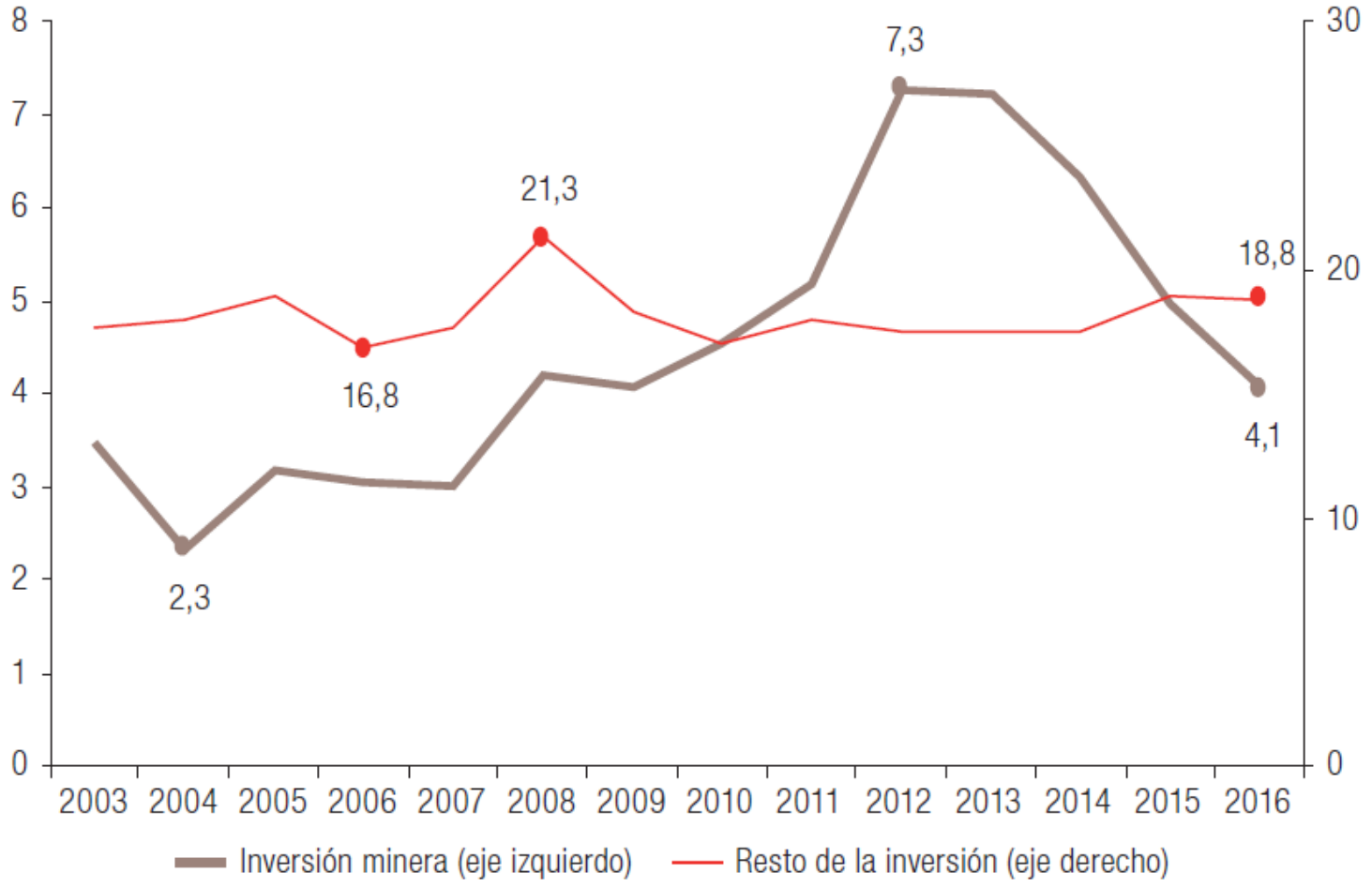
A mature copper sector still depends on large investment projects so as to preserve production levels and profitability of extraction.

The copper investment cycles have had relevant macroeconomic spillovers.

Gráfico 2

Chile: inversión en el sector minero y en sectores no mineros, 2003-2016

(En porcentajes del PIB)

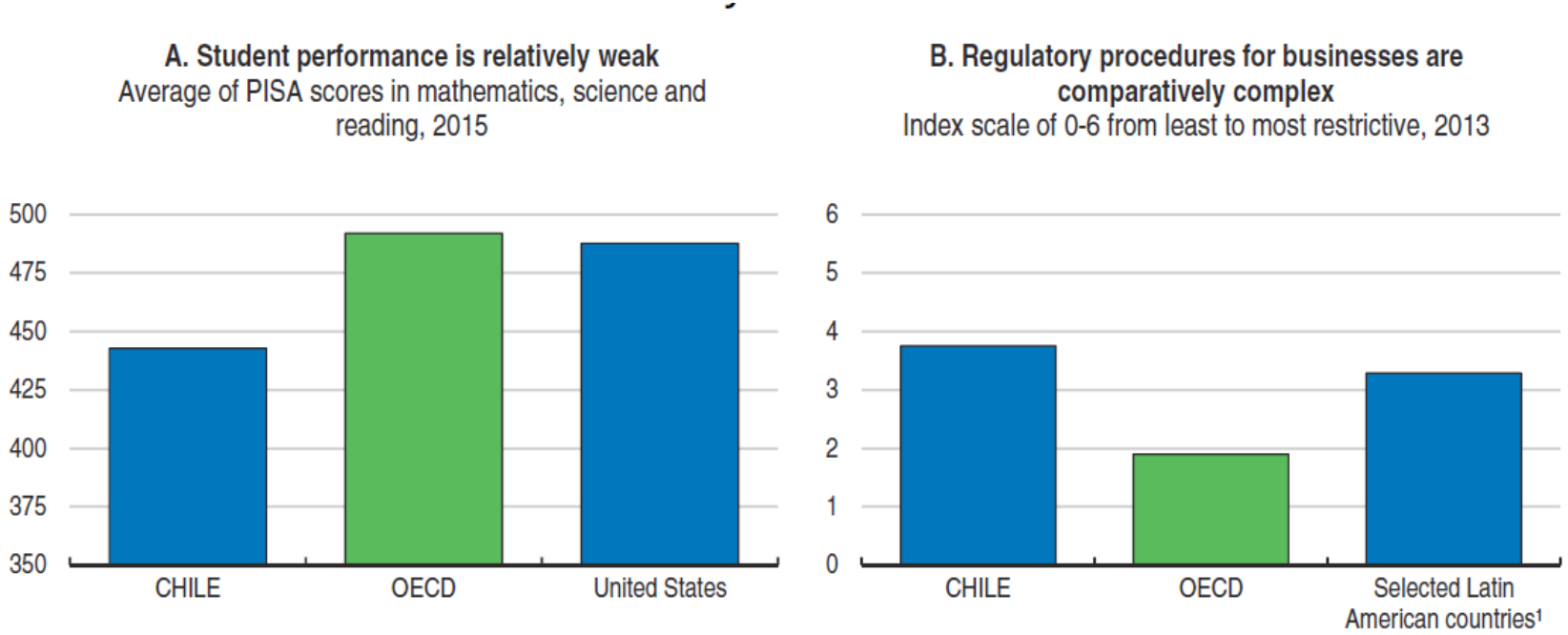


R&D efforts lag behind other economies, both in terms of levels as well as in composition.

Indicador	Australia	Chile
R&D expenditure (% GDP)	2.2%	0.3%
Private R&D expenditure (% total)	61.1%	29.6%
University-level R&D expenditure (% total)	24.2%	38.5%
Public R&D expenditure (% total)	12.1%	3.7%
Private non-profit R&D exp. (% total)	2.6%	28.2%
Private R&D exp. per worker (USD PPP)	1.039	39
Researchers	92.649	5.440
Researchers in private sector	36.309	1.298
Researchers in public sector	8.283	292
Researchers in universities	53.588	3.274

Source: Comisión Nacional de Productividad (2017)

A low overall educational achievement and red-tape can be impediments to further diversification and growth.



Source: OECD (2017)

5 A Challenging Path Forward

Structural reforms

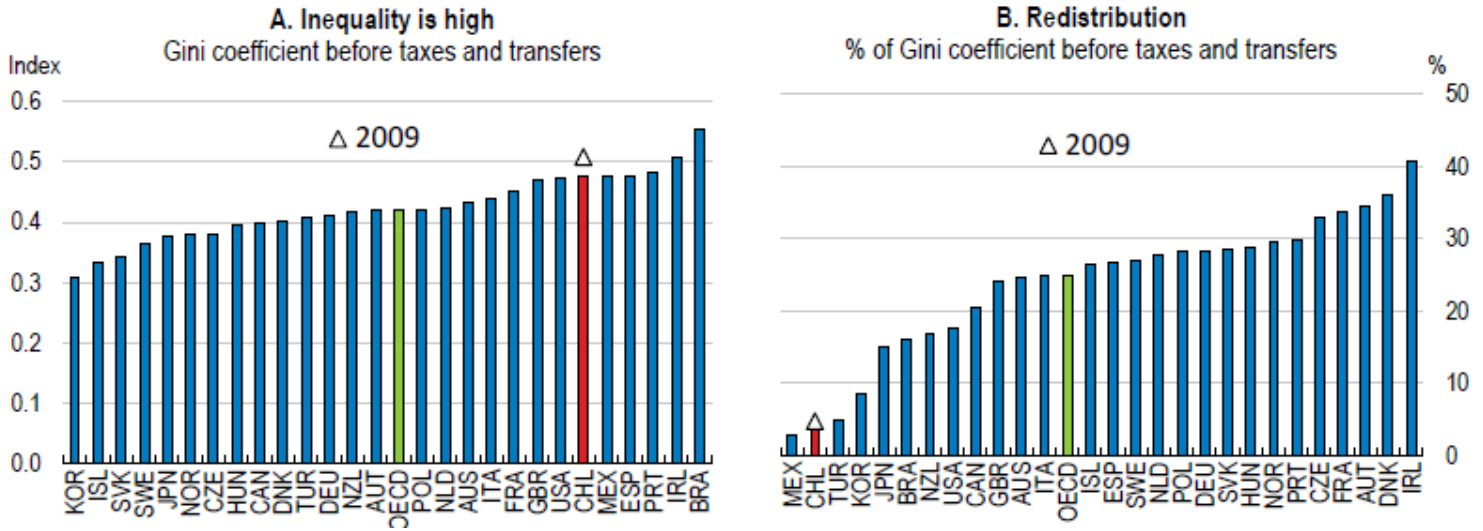
Table 5. Potential impact of structural reforms on GDP per capita after 10 years

Structural policy	Policy change		Total effect on GDP per capita	Impact on supply side components		
	2016	After reform		MFP	K / Y	L / N
			in percent	in percent		in pp[2]
Product market regulation[1]						
Improve regulation in network sectors (Rail, telecoms and post)	2.0	1.5	1.4	1.0	0.2	0.2
Streamline business licensing and regulations	1.5	1.2	1.4	0.7	0.2	0.5
Investment specific policies[1]						
Increase business R&D expenditures	0.1	0.3	0.5	0.5		
Labour market policies[1]						
Improve labour market regulations	2.6	2.3	0.6		0.5	0.2
Increase spending on activation	3.3	7.0	0.3	0.1		0.1
Increase family benefits in kind	0.8	1.0	0.4			0.2
Increase the legal retirement age	62.5	65.0	0.6			0.4
Total			5.2			

1. Table 6 presents the detailed measures.
2. Percentage points.
Source: OECD calculations based on Balázs Égert and Peter Gal (2017), "The quantification of structural reforms in OECD countries: A new framework", OECD Journal: Economic Studies, Vol. 2016/1 and Balázs Égert (2017), "The quantification of structural reforms: taking stock of the results for OECD and non-OECD countries", OECD Economics Department Working Papers, forthcoming.

Source: OECD (2018)

Tackling inequality



Source: OECD (2018)

Some useful recent references:

- Blum, B, S. Claro and I.J. Horstmann (2013), *Occasional and perennial exporters,* Journal of International Economics 90 (2013) 65–74.
- Comisión Nacional de Productividad (2016), *Revisión de las agendas de productividad*.
- Comisión Nacional de Productividad (2017), *Productividad en la gran minería del cobre*.
- Comisión Nacional de Productividad (2018), *Informe anual*.
- Díaz, A. and R. Ffrench-Davis (2019), *La inversión productiva en el desarrollo económico de Chile: evolución y desafíos.* Revista de la CEPAL N° 127. ECLAC.
- García-Marín, A. and N. Voigtlander (2019), *Exporting and Plant-Level Efficiency Gains: It's in the Measure. Journal of Political Economy, 2019, vol. 127, no.4.* Chicago.
- Lebdioui, A. (2019), *Chile's Export Diversification since 1960: A Free Market Miracle or Mirage?*. Development and Change, International Institute of Social Studies.
- Meller, P. (editor) (2013), *Recursos Naturales y Diversificación Exportadora: Una Mirada de Futuro para América Latina*. CIEPLAN.
- Marfán, M. and P. Meller (2019), *Estrategia Industria 4.0: Diseñando el Chile Futuro*. ASIMET, Consejo Minero.
- Marshall, J. (2018), *Crecimiento de América Latina: lecciones y desafíos,* draft. CPI.
- OECD (2017), *Going for growth.*
- OECD (2018), *Economic Survey for Chile*.


Thank you!