Global trade patterns in 2050 and its drivers

Eddy Bekkers[*], Erwin Corong[†], Jeanne Métivier[‡], and Daniil Orlov[§]

24th Annual Conference on Global Economic Analysis

June 2021

[*]World Trade Organization. eddy.bekkers@wto.org

[†]Center for Global Trade Analysis (GTAP), Purdue University.

[‡]World Trade Organization.

[§]World Trade Organization.

Introduction

- In this paper, we analyse the drivers of changes in global trade patterns until 2050
- We first show how trade patterns are projected to change by 2050 due to geographical and sectoral shifts.
- Our projections incorporate many trends based on external sources and own estimations:
  - employment, population and technology growth;
  - changes in the skill composition of the labour force;
  - savings rates; structural change driven by differences in productivity growth and changes in consumer preferences;
  - changes in both policy-driven and technology-driven trade costs.
- Then we identify the main drivers influencing changes in geographical and sectoral patterns of trade and production, sequentially adding each of the drivers to the model.
- We find that both demographic and technological change play the most important role in the rising share of developing economies in global trade, whereas the shift from manufacturing to services is driven by changes in differential productivity growth, shifting consumer preferences, and new technologies.

Model and Data

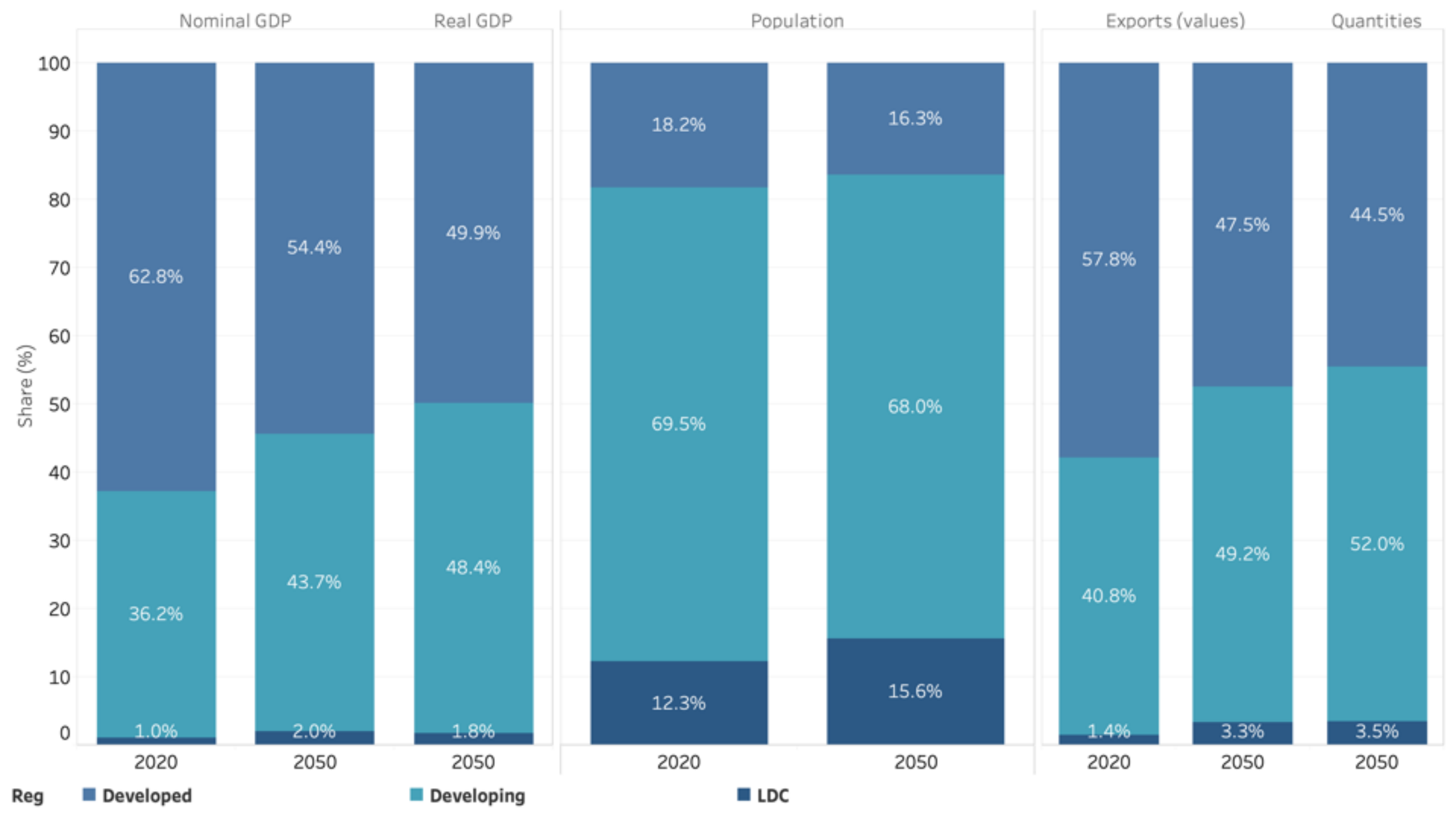
- WTO Global Trade Model—a recursive dynamic CGE model (Aguiar et al., 2019b)
  Key features
  - Capital accumulation
  - Intermediate linkages
  - Private demand, government demand, investment demand, and intermediate demand by firms
  - Non-homothetic preferences for private households
  - A host of taxes
  - Global transport sector
  - Armington preferences
- GTAP Data Base version 10A data with 2014 reference year (Aguiar et al., 2019a)
  - Time horizon: 2020-2050
- 25reg x 25sec x 5factor

№	Region	Region description	Sector	Sector description
1	asl	Asia LDC	cro	Crops
2	aus	Australia	lvs	Livestock
3	bra	Brazil	oil	Oil
4	can	Canada	onr	Other extraction
5	chn	China	prf	Processed Food
6	e27	European Union 27	p_c	Petroleum, coal products
7	gbr	United Kingdom	chm	Chemicals
8	eft	EFTA	prp	pharma, rubber, and plastics
9	idn	Indonesia	twl	Textiles, apparel, leather
10	ind	India	otg	Other Goods
11	jpn	Japan	met	Metals
12	kor	Korea	eeq	Computer, electronic and optic
13	lac	Latin America	ele	Electrical Equipment
14	mex	Mexico	ome	Machinery and equipment
15	min	Middle East and North Africa	mvh	Motor vehicles
16	oas	Other Asian countries	otn	Transport equipment nec
17	row	Rest of World	utc	Utilities and Construction
18	rus	Russia	trd	Trade
19	sau	Saudi Arabia	ars	Accommodation and recreation
20	sea	Southeast Asia	tra	Transport
21	ssl	Sub-Saharan Africa LDC	com	Communication
22	sso	Sub-Saharan Africa other	rsa	Real estate activities
23	tur	Turkey	obs	Business Services
24	usa	United States	fin	Finance and Insurance
25	zaf	South Africa	ots	Other Services

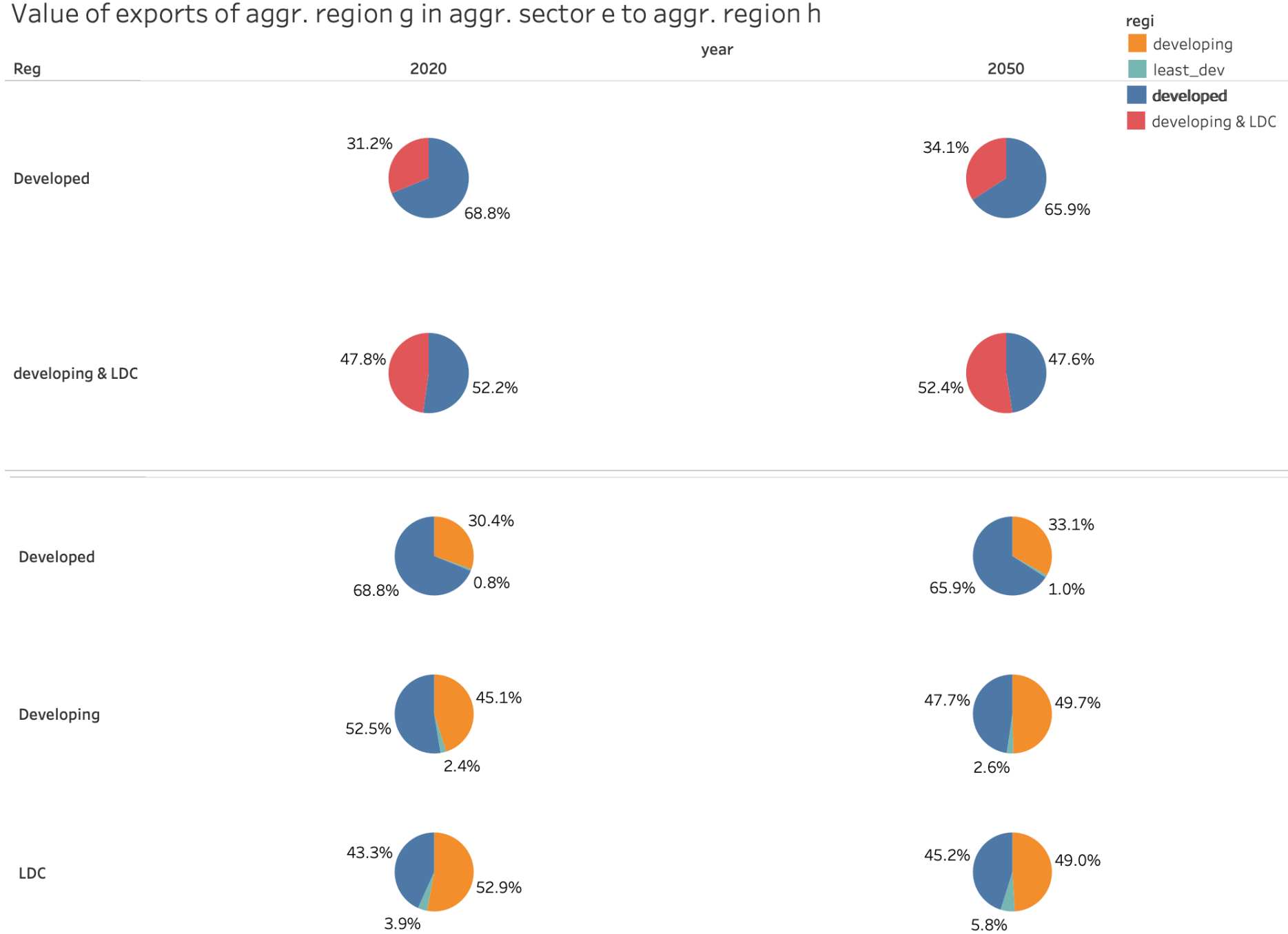
Components of our simulations

№	Colour	Legend	Scenario description
1		Baseline	Basic baseline with external growth projections on population and labour force, assuming equal total TFP across regions
2		Skill composition	Changes in the skill composition based on regional labour force participation rates
3		TFP growth	Variation in total factor productivity growth targeting external projections on GDP per capita growth
4		Differential productivity growth	Differences in productivity growth between sectors based on empirical estimates
5		CDE preferences	Changes in non-homothetic preferences leading to changing spending shares as economies grow richer
6		Non-homothetic preferences	Shifts in preferences to target empirically estimated changes in income elasticities
7		Natural resource prices	Changes in oil, gas and coal prices based on external projections
8		Savings rates	Changes in savings rates based on empirical estimation
9		Trade costs	Changes in trade costs (both tariffs and NTMs) as a result of free trade agreements and the trade facilitation agreement
10		New technology	Changes in trade costs driven by new technologies

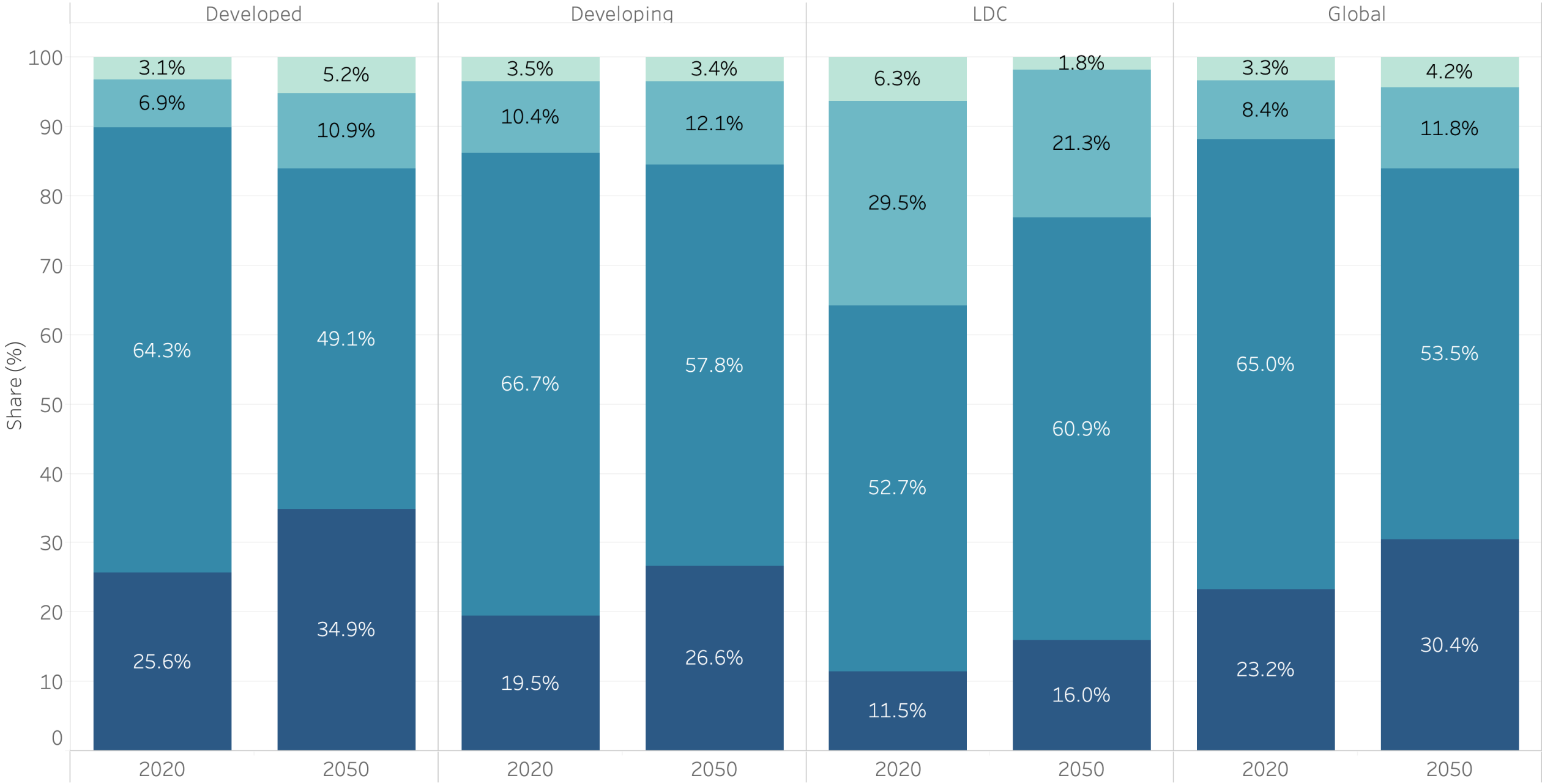
Baseline Results


Nominal GDP
Real GDP
Population
Exports (values)
Quantities
Share (%)
100
90
80
70
60
50
40
30
20
10
0
62.8%
36.2%
1.0%
54.4%
43.7%
2.0%
49.9%
48.4%
1.8%
18.2%
69.5%
12.3%
16.3%
68.0%
15.6%
57.8%
40.8%
1.4%
47.5%
49.2%
3.3%
44.5%
52.0%
3.5%
2020
2050
2050
2020
2050
2020
2050
2050
Reg
Developed
Developing
LDC

Value of exports of aggr. region g in aggr. sector e to aggr. region h

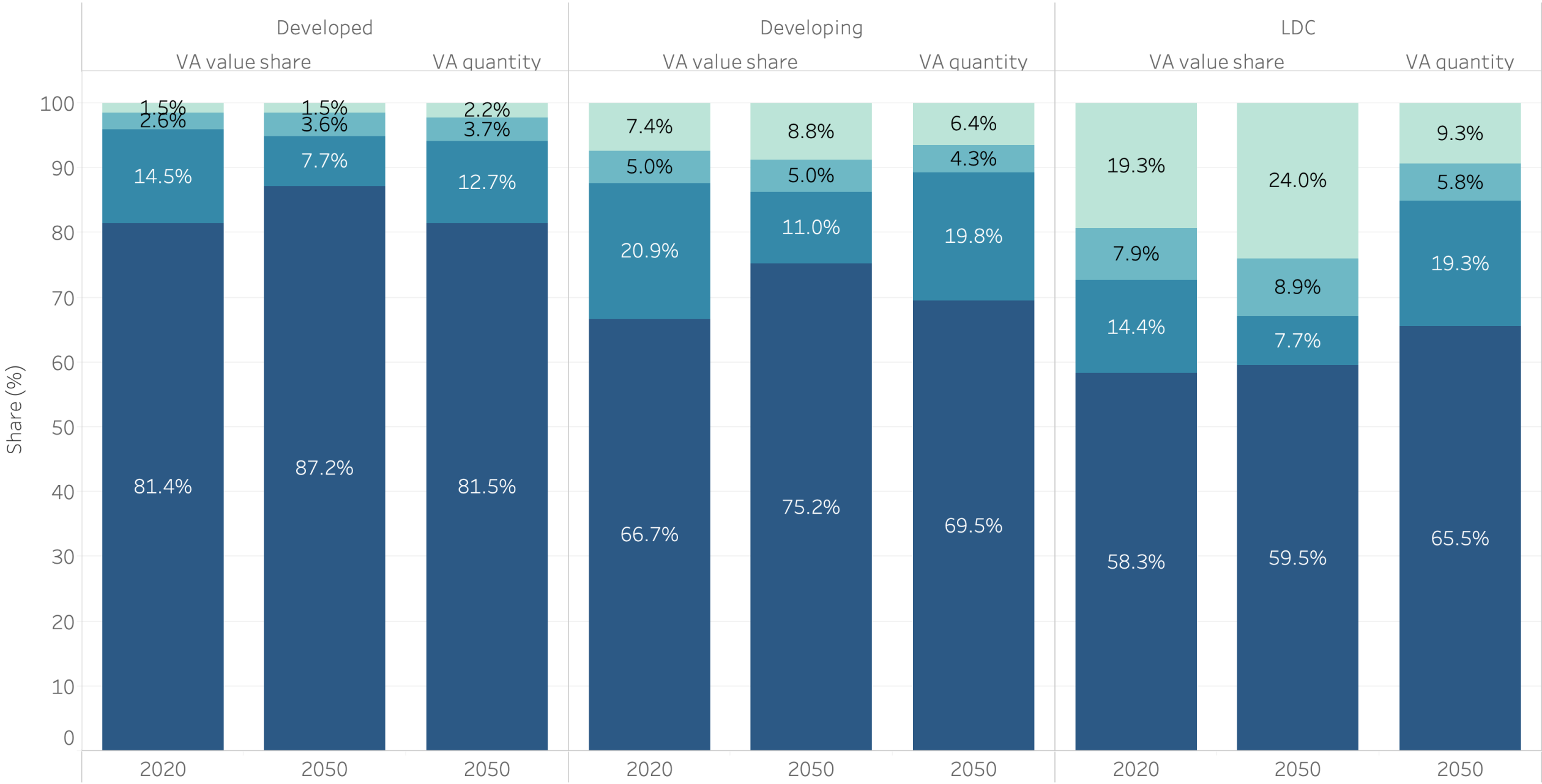


Share of exports of aggregate sectors in aggregate regions and globally (2020-2050)

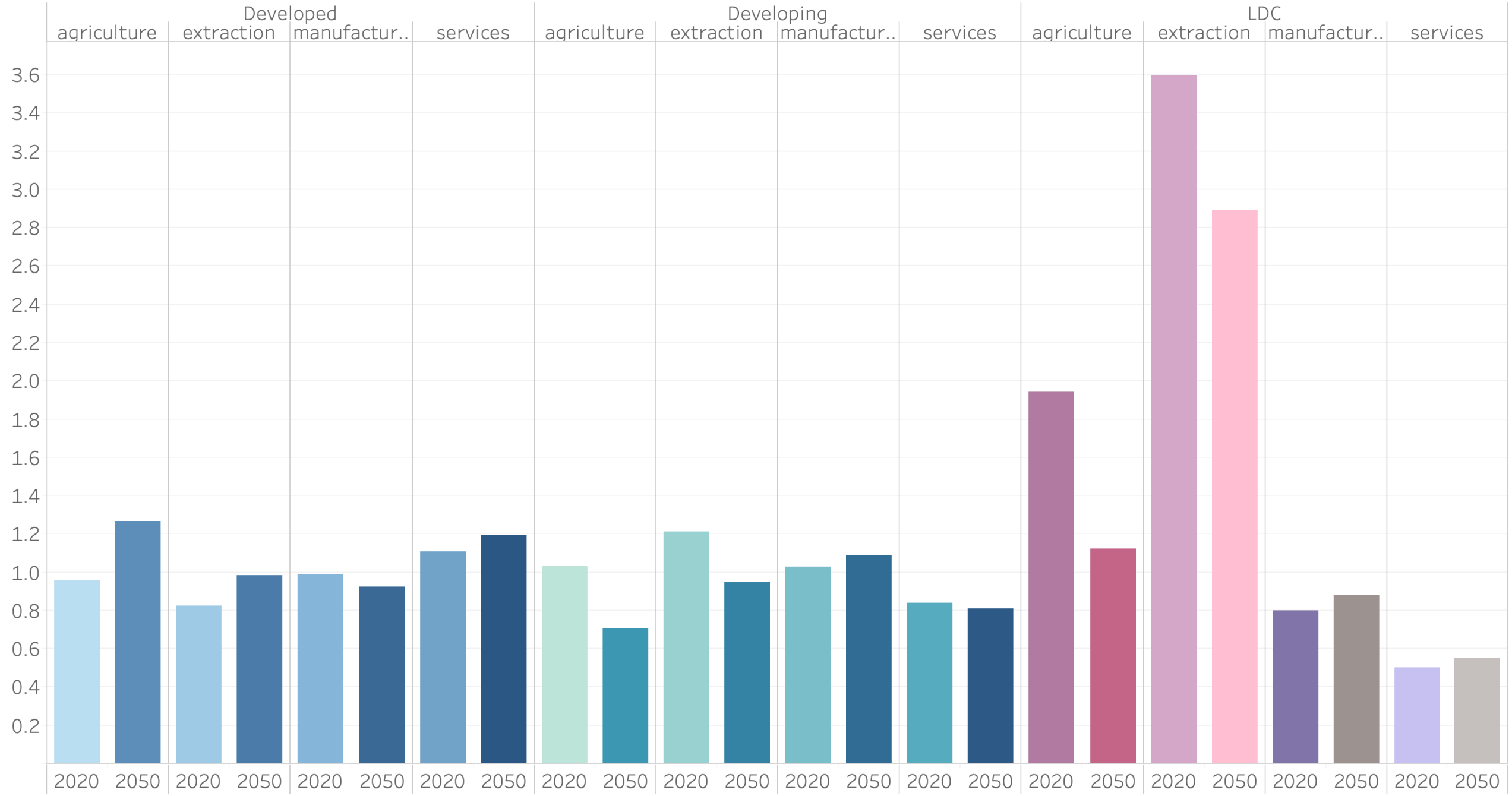


Seca agriculture extraction manufacturing services

Share of aggregate sectors in total value added in aggregate regions (2020-2050)



Revealed comparative advantage in aggregate sectors by aggregate regions (2020-2050)

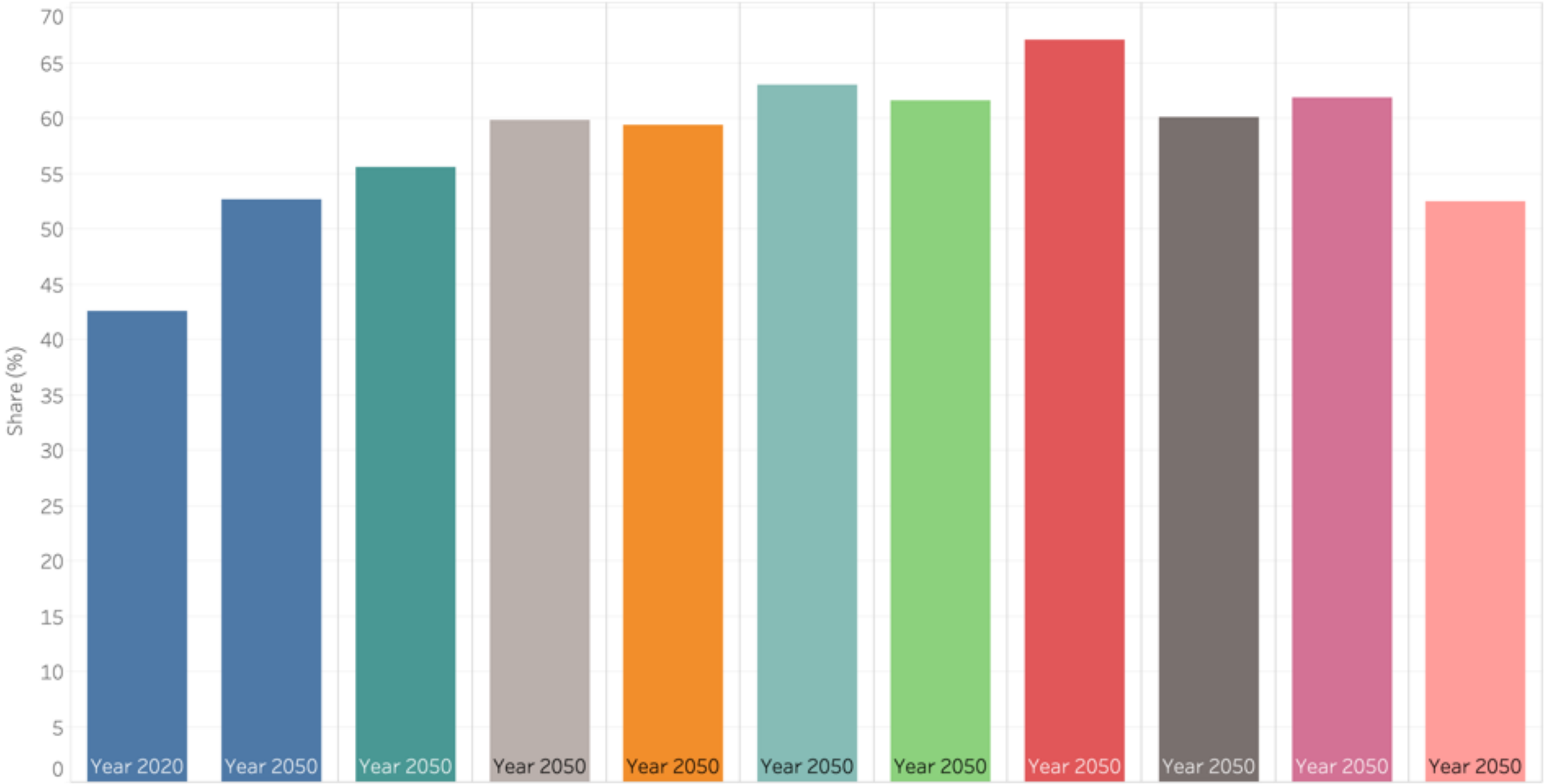


Analysis of the drivers

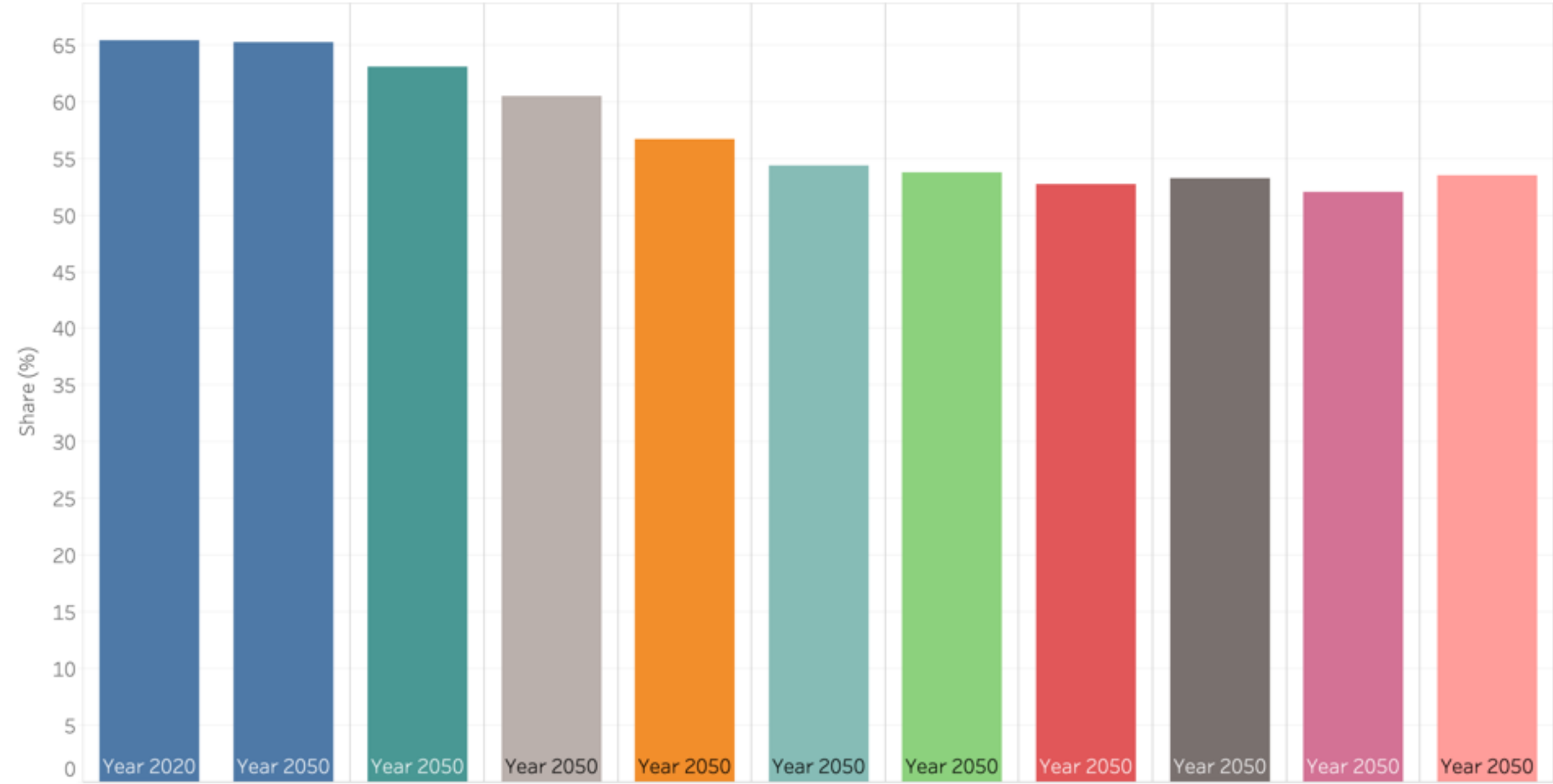
Scenarios

№	Colour	Legend	Scenario description
1		Baseline	Basic baseline with external growth projections on population and labour force, assuming equal total TFP across regions
2		Skill composition	Changes in the skill composition based on regional labour force participation rates
3		TFP growth	Variation in total factor productivity growth targeting external projections on GDP per capita growth
4		Differential productivity growth	Differences in productivity growth between sectors based on empirical estimates
5		CDE preferences	Changes in non-homothetic preferences leading to changing spending shares as economies grow richer
6		Non-homothetic preferences	Shifts in preferences to target empirically estimated changes in income elasticities
7		Natural resource prices	Changes in oil, gas and coal prices based on external projections
8		Savings rates	Changes in savings rates based on empirical estimation
9		Trade costs	Changes in trade costs (both tariffs and NTMs) as a result of free trade agreements and the trade facilitation agreement
10		New technology	Changes in trade costs driven by new technologies

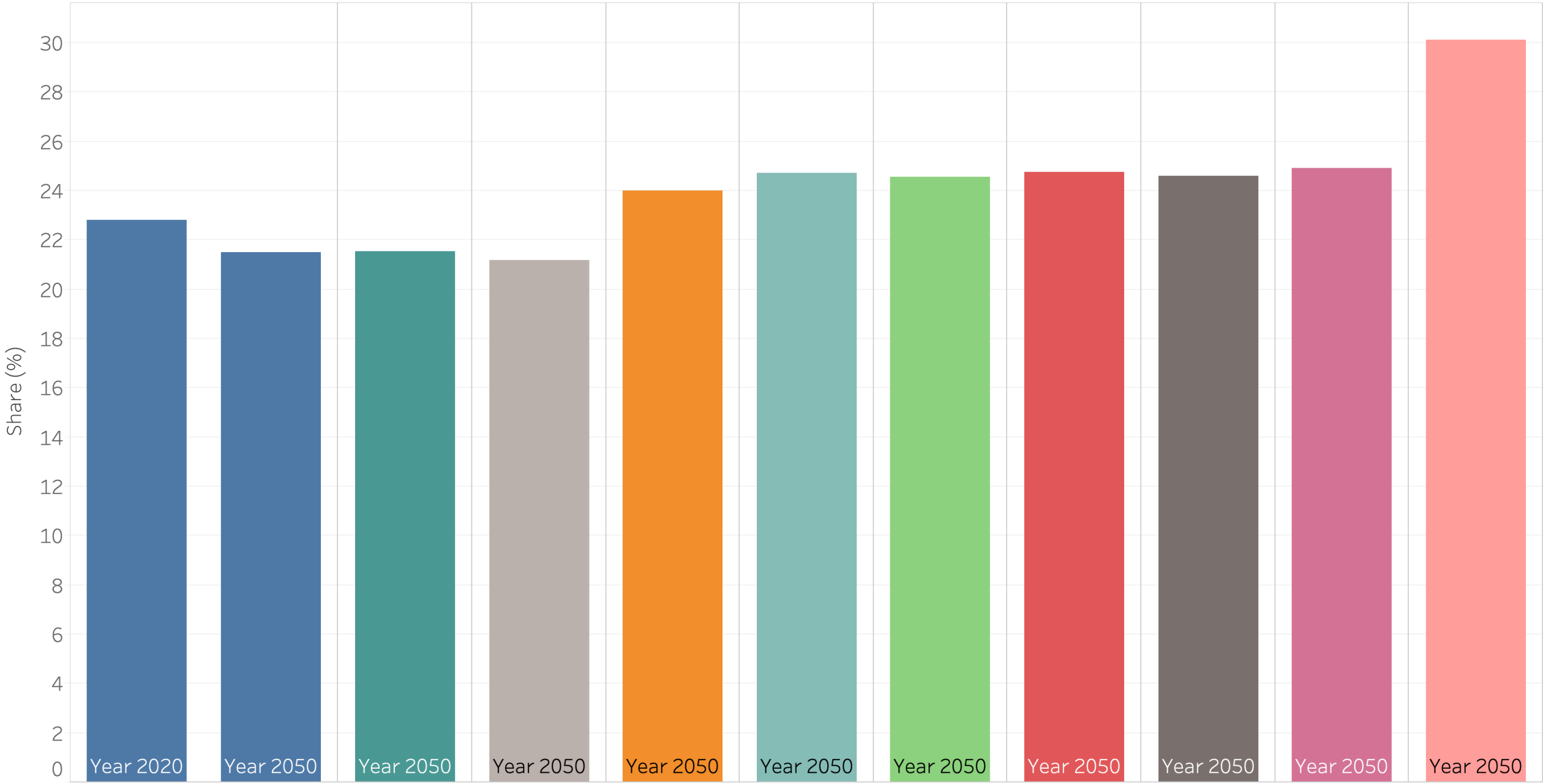
Share of exports by developing & LDC countries at FOB prices (exc. intra-region) (2020-2050)



Share of global manufacturing exports (2020-2050)



Share of global services exports (2020-2050)



Conclusions

- Demographic and technological change play the most important role in the rising share of developing economies in global trade
- The shift from manufacturing to services is driven by
  - Differential productivity growth
  - Shifting consumer preferences
  - New technologies
- Researchers should be cautious incorporating external projections in the model as some of the shocks could cause too much distortion.

Bibliography

- Aguiar, A., M. Chepeliev, E. Corong, R. McDougall, and D. van der Mensbrugghe. 2019a. “The GTAP Data Base: Version 10.”Journal of Global Economic Analysis, 4(1): 1–27.doi:10.21642/JGEA.040101AF.
- Aguiar, A., E.L. Corong, D. van der Mensbrugghe, E. Bekkers, R.B. Koopman, and R. Teh. 2019b. “The WTO Global Trade Model: Technical documentation.” Geneva, WTO Staff Working PaperNo. ERSD-2019-10. doi:10.30875/337f4736-en. http://hdl.handle.net/10419/207086.
- Bekkers, E., B. Avdiu, M. Bacchetta, G. Cariola, O. Fernandez-Amador, C. Goes, R. Koopman,J. Métivier, C. Lemos, D. Oberdabernig, D. Orlov, G. Sabbadini, and R. Teh. Forthcoming. “Documentation of external projections for the WTO Global Trade Model Baselines.” WTO,Geneva, Switzerland, Report.