

ROADS TO EXPORT DIVERSIFICATION: EMPIRICAL INSIGHTS

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Contents

EXECUTIVE SUMMARY	4
CHAPTER 1: A NEW EMPIRICAL TAKE ON EXPORT DIVERSIFICATION	10
1. Introduction.....	10
2. A new approach to understand export diversification	13
<i>The dependent variable</i>	13
<i>Independent variables</i>	22
3. The analytical roadmap in this book.....	27
4. Conclusions.....	50
CHAPTER 2: EXPLAINING EAST ASIA VERSUS LATIN AMERICA.....	52
1. Introduction.....	52
2. Latam export diversification through new glasses.....	53
3. Exporting from the core vs from the periphery	55
4. The stronger East Asian horizontal policies	62
5. Latam's large space for policy strengthening	68
6. Can Latam catch up with EA?	71
7. Conclusions.....	77
CHAPTER 3: IS CHILE A ROLE MODEL OF EXPORT DIVERSIFICATION POLICIES? A REASSESSMENT.....	79
1. Introduction.....	79
2. Reassessing Chile's export performance	80
3. Hampered by remoteness.....	87
4. Chile's policy strengthening in recent decades.....	93
5. Catching up with remote role models	101
6. Conclusions.....	106
CHAPTER 4: GULF COUNTRIES TRANSITION TO A CLEAN-ENERGY WORLD.....	108
1. Introduction.....	108
2. The Gulf's export progress and challenge	109
3. Strong infrastructure, but large room for stronger education and governance	113
4. Can GCC make the needed transition?	119
5. Conclusions.....	125
CHAPTER 5: EXPORT-LED DEVELOPMENT IN AFRICA	126
1. Introduction.....	126
2. Export successes in Africa	127
3. Remoteness and weak policies but some SSA role models	132
4. A realistic leap out of a poverty/export concentration trap.....	142
5. Conclusions.....	146
CHAPTER 6: CAN SMALL STATES DIVERSIFY AWAY FROM TOURISM?	149
1. Introduction.....	149
2. The tourism dependence challenge.....	150
3. Small states' policy efforts towards diversification.....	161
4. Financially realistic non-tourism export development	163
5. Conclusions.....	169
EPILOGUE: IMPLICATIONS ON INDUSTRIAL POLICIES	171
REFERENCES	176

METHODOLOGICAL APPENDIX: ADDITIONAL METHODOLOGICAL	
DISCUSSION AND DATA DESCRIPTION	182
<i>A.1. GRAVITY EQUATION ROBUSTNESS CHECKS</i>	182
<i>A.2. DATA DESCRIPTION</i>	186
<i>A.3. EXPORT COMPLEXITY AND COMPLEX EXPORTS</i>	188
<i>A.4. SUBREGIONAL GROUPS</i>	190

ROADS TO EXPORT DIVERSIFICATION: EMPIRICAL INSIGHTS

EXECUTIVE SUMMARY

Export diversification is one of the most intense areas of debate within the most intensely debated question of how to foster economic growth. This book contributes to it by providing a clear perspective on the whole lot that policy makers can do to promote export diversification, by strengthening the orthodox fundamentals or horizontal policies of an economy within countries' financial means.

Within this intense debate, several facts that are related to basic economic concepts are commonly overseen. Most importantly, some of the most cited research overlooks the fact that export diversification is not just the result of policy choices but also of exogenous natural resource abundance. That is, some countries have export baskets concentrated in few natural resources not because they are unable to export more complex products, but because they exogenously have large amounts of natural resource assets to be exported. Similarly remarkable is the neglect of the importance of countries' distance to other countries in explaining export diversification, even though this factor is one the most significant determinants of international trade.

Neglecting these concepts leads to several erroneous inferences. Because very remote Chile is less diversified than East Asian countries like Malaysia, it is often concluded that this is explained by the fact that Chile does not use much Industrial Policies (IPs). Oil rich countries are seen as policy failures because their export baskets are still highly dependent on oil despite their heavy investments to develop more sophisticated products and, again, IPs are

proposed as the needed solution [include citation]. Small states, many of them natural resource rich or tourism paradises, are similarly seen as policy failures and even as completely unable to develop other more complex exports because of economies of scale. All these conclusions stand against the empirical evidence presented in this book that does consider natural resource exogeneity and distance to other markets.

This book, in general, aims to understand better the challenge of export diversification by using an empirical framework, proposed in Salinas (2021a), which does consider natural resource exogeneity and distance to other markets. This framework can more accurately identify the export development successes that help boost export diversification, as well as the policies that explain this success. When this policy framework is applied, a tight relation is found between some orthodox, horizontal policies (education, governance, infrastructure, trade policy openness) and the export development that is needed to diversify export baskets. This identification is key to orient policy makers in their efforts towards export diversification.

The analytical framework in this book also addresses a major limitation of the literature of export diversification promotion: endogeneity between export success and its determinant policies. Statistical exercises that find significant relations between export growth and certain horizontal policies can be questioned because, theoretically, it may be the case that omitted policies (say IPs) are the actual cause of export growth and this, in turn, boosts GDP growth and, thus, the financial resources available to strengthen horizontal policies.¹ If this was the

¹ For example, in theory, a strong statistical relation between education and exports can either reflect direct causality from the former to the latter, but it could also be the case that an export subsidy not considered in the analysis could have led to significant export takeoff that fostered GDP growth, which allowed for higher government revenues to finance higher quality education.

actual data generating process, a regression with exports as dependent variable and horizontal policies as independent variables while omitting IPs (IPs are challenging to include in a cross-country regression framework) would find a spurious relation between horizontal policies and export performance.

This book addresses such potential endogeneity by including GDP per capita as a control variable. Also importantly, its analysis of policy recommendations is constantly mindful of the relation between the strength of horizontal policies and GDP per capita (in other words, the potential space to finance horizontal policies). This allows us to propose policy reform scenarios that seem realistic considering a country's GDP per capita (a low-income country cannot attain overnight a high-income level of education).

Based on this framework, the rest of the book provides empirical insights related to export development in several key regions. Policies towards export diversification are identified based on their statistical relation to the performance of the export products that are needed to diversify an export basket. And countries' export performance is assessed controlling for their geographical remoteness and other exogenous, non-policy related factors (proximity to other markets, landlockedness, and natural resource abundance).

A first lesson is that the successful export diversification of some East Asian countries relative to most Latin American (Latam) countries is largely explained by Latam's exogenous natural resource abundance and its relative remoteness from large population and economic centers. In addition, export policy determinants are found to be relatively weak in many Latams, even controlling for their GDP per capita. An extremely high homicide rate is a particularly alarming characteristic of the region. Simulation analysis finds that realistically

strengthening them (considering their GDP per capita levels) can significantly boost their Non-Hydrocarbon/Mineral (NHM) exports, with most Latam countries in our sample matching or surpassing export development of the East Asian miracles. A country case study on Chile highlights this most successful export development case, challenging a commonly proposed hypothesis that Latams are all bound to be unsuccessful export promoters even when they implement strong horizontal policies.

Also revealing is that the oil exporters of the Gulf Cooperation Council (GCCs) are found to have significant success in promoting NHM exports, notably as much as well-known East Asian Emerging Market countries (EAEMs). However, weaknesses in their education and governance (considering their relatively high GDP per capita levels), are found to be major limitations. Simulations that assume that GCCs strengthen these determinants in line with the levels expected given their GDP per capita, result in significant diversification. And if GCCs match some role model countries in education and governance quality (controlling for their GDP per capita), they would increase NHM exports by an amount that is higher than their current amount of their Hydrocarbon/Mineral (HM) exports, thus allowing for a successful export transition out from HM exports as the world transits towards its clean energy future.

Another encouraging finding from our analysis is that, although Sub-Saharan African (SSA) countries have limited export development due to weak horizontal policies, several countries in the region have relatively strong horizontal policies and NHM export development. The relative success of these countries challenges the pessimistic view that SSA countries are doomed to remain poor because of a fully exogenous “poverty trap.” These successful countries can serve as role models for the rest of the region. Moreover, individual reform efforts to foster NHM exports could benefit from similar efforts in other SSA countries, as

this would increase the size of nearby markets and generate agglomeration effects on NHM exports. In this sense, SSA can benefit from their population size similarly to East Asian countries, more so than the remote but less populated Oceanic and South American countries. However, it is important to note that East Asian countries are more effectively interconnected by sea transportation than SSA countries, many of which are separated by difficult terrain.

Inferences on Small States (SS) export development towards diversification are similarly surprising. No statistically strong relation is found between NHM (including of manufactures) exports and country size, and the per capita level of these exports in several SS is found to be as high of those of EAEMs. Moreover, there is a statistically important and negative relation between non-tourism services exports and population size, suggesting that these products are an important route to SS diversification. However, the tourism assets in most SS are so large that even if they grow as much NHM exports per capita as East Asian countries, tourism will remain a dominant sector in their economies. Therefore, even in such scenario, S will have to strengthen their macroeconomic management to deal with potential volatility of the international tourism market.

Overall, through the proposed analytical framework, regions are found to have NHM export levels in line with their remoteness and strength of horizontal policies, thus suggesting that these factors are the backbone of export development towards diversification. Horizontal policy reforms that are realistic considering countries' GDP per capita are predicted to significantly boost export development, which in turn can significantly boost their GDP per

capita to finance further horizontal policy strengthening in a virtuous cycle that ideally could generate remarkable export take offs.

Such a policy path seems more credible, less risky, and more multilaterally consistent than policy prescriptions centered on IPs. The tendency to precipitously conclude that IPs are the required prescription citing their use in some high-performing East Asian countries, although practically all countries in the world have implemented IPs most frequently without significant success, seems rather ideologically motivated. Policy makers would thus be advised to do their admittedly challenging homework of strengthening their horizontal policies rather than seeking some so far mysterious mix of subsidies that could diversify their export baskets in the absence of strong enough horizontal policies.

1. INTRODUCTION

Following a new methodological framework proposed in Salinas (2021a), this book seeks to gain new understanding on the process of export diversification and its determinants. In the following chapters, this framework is consistently applied to several groups of countries that are commonly seen as needing a significantly more diversified export basket. These include countries in Latin America, oil-dependent Gulf Cooperation Council (GCC), Sub-Saharan Africa (SSA), and Small States (SS).

But why do many consider export diversification important in the first place? This is most commonly because a more diversified export basket is believed to be statistically associated with lower output volatility (Haddad and others, 2013), and that the latter is associated with higher long-term output growth (Ramey and Ramey, 1995; Hnatkowska and Loayza, 2004). Some also suggest that since most countries with high export concentration depend on raw HM products, they should export other products with higher local value added, especially those with higher labor demand. Some economists find a statistically positive association between certain *superior* export categories, mainly NHM exports, and higher future economic growth (for example, see Hallak (2006) on export *quality*; Hausmann and others (2006) on export *sophistication*; Hidalgo and Hausmann on export *complexity*).² As we will

² Importantly, some economists propose that a valid alternative for export diversification is the processing of raw natural resource products. For instance, an influential World Bank publication on Latin America's dependence on natural resource exports (De Ferranti and others, 2002), concludes that this region should not turn away from its comparative advantage of natural resource abundance and "play to its strengths" by bolstering complementary, policy-related endowments (education, institutions, infrastructure, among others),

see, this book somehow steers away from any controversy on the need to reduce the share of raw HM exports, by turning the question of export diversification into the more widely agreed objective of general export development.

Why is there a need for a different approach to analyzing the question of export diversification? While there is decades-long literature aiming to identify policies that lead to export diversification and the development of *superior* exports, there are important caveats in their methodological approaches, as discussed by Salinas (2021a). If the identification of export diversification determinants is framed as a regression analysis in which the dependent variable is export diversification and the independent variables include the policies that are thought to influence it, we see that:

- The dependent variables commonly used are indices of exports diversification (or export concentration) that largely depend on the value of HM exports and, therefore, are greatly affected by exogenous (non-policy related) changes in international commodity markets or by exogenous natural resource abundance.
- The explanatory variables included are limited to those associated with higher productivity (for example, education, governance), neglecting the importance of geographical remoteness (and other gravity equation-related variables) for exports development according to standard trade models.

which in turn should foster higher-value added activities (including the processing of natural resources) that provide “good jobs”. Similarly, Gonzalez and others (2020), counter the commonly made argument that Chile needs to reduce its export concentration on natural resource-based products by noting that Australia and New Zealand prospered socioeconomically while preserving their export concentration on natural resource-based products.

As suggested in Salinas (2021a), the following modifications address these caveats:

- a. *A new dependent variable.* Instead of using export diversification indices that are substantially affected by exogenous factors, the target (the dependent variable) should be the level of the export categories (non-hydrocarbon/mineral (NHM) goods, manufacturing, or services) that need to be developed to reduce export concentration on HM products as these are not significantly affected by exogenous commodity prices and HM resource abundance. Hence, it is conceptually and statistically cleaner to reframe the objective of export diversification as an objective of development of NHM goods and services exports, noting that both objectives are practically equivalent.
- b. *New independent variables.* Instead of only having independent variables that are broadly associated with GDP/productivity growth, the regression analysis framework should be that of a gravity equation specification.

And, as is discussed in Salinas (2021a), it is useful to include income per capita as an independent variable that controls for endogeneity while removing it for goodness of fit estimation.

The proposed methodological changes allow for a substantial estimation improvement relative to other studies, leading to more statistically robust coefficients and higher goodness of fit. These estimations find a strong relation between gravity related variables and NHM, manufacturing, and service exports. They also find that educational attainment, governance, infrastructure quality, and trade policy openness are robustly related to these exports, and that

adding them to an index that approximates a country's proximity to other markets explains above 80 percent of cross-country variation in the level of targeted exports. The following sections further describe this methodological framework and its specific application in this book.

2. A NEW APPROACH TO UNDERSTANT EXPORT DIVERSIFICATION

THE DEPENDENT VARIABLE

Most empirical attempts to identify the factors that foster export diversification use as dependent variable an export concentration index, such as the Herfindahl-Hirschman Index (HHI). Relatedly, studies that aim to identify the determinants of *superior* exports use several indices of exports *superiority*, such as the Exports Sophistication Index (ESI) (Hausmann and others, 2005; Weldemicael, 2012) or the Economic Complexity Index (ECI) (Hidalgo and Hausmann, 2009).

These indices are substantially affected by exogenous factors, thus weakening their statistical link to policy determinants. Take for instance the HHI of export concentration for country j including exports (x) of several sectors (s):

$$(1) HHI_j = \sum_s \left(\frac{x_{sj}}{\sum_s x_{sj}} \right)^2$$

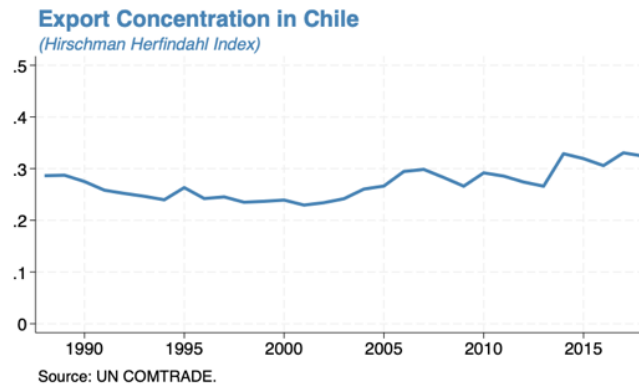
This index is higher when the nominal export value of one or few commodities is high relative to the total export basket, indicating more (less) exports concentration (diversification). In most developing countries, partly due to their weak production capacity,

a handful of hydrocarbon/mineral (HM) exports account for most of their total exports. Hence when aiming to diversify exports these countries in practice seek policies to nurture NHM products. If successful, the higher value of these products will narrow the gap with respect to the dominant HM exports and this would reduce their HHI.

But the HHI can also significantly fluctuate in response to variations in the nominal value of their HM exports, which are commonly the result of largely exogenous events such as changes in international commodity prices or findings of additional HM reserves. Such fluctuations can considerably weaken the statistical relationship between policy frameworks and the targeted development of NHM exports needed to diversify export baskets.

This is quite evident when looking at the evolution of the HHI in a commodity exporting country. For instance, Chile's HHI in the early 2000s markedly reverted its previously downward trend in the absence of any substantial reform to its policy framework (Figure 1.1). Implying an exclusive connection between Chile's HHI and its policy framework, Lebdioui (2019) argues that this end of the downward trend in export concentration is the result of the abandonment of some industrial policies applied in previous decades.

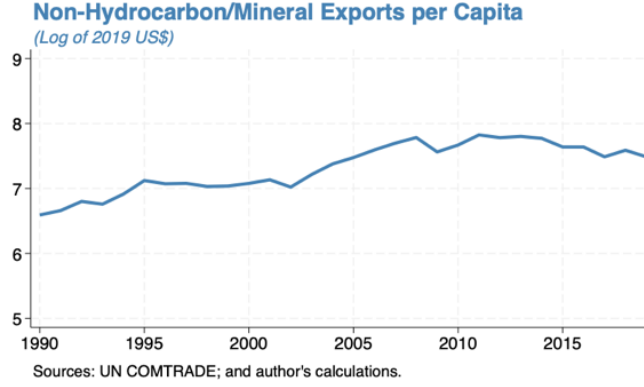
Figure 1.1



However, the evolution of per capita NHM exports suggests a completely different story (Figure 1.2). Its continued upward trend throughout the 1990s and 2000s is strong evidence that the surge in export concentration was not related to a weakening in Chile's NHM export policy determinants. The surge in concentration in the early 2000s is related to the international copper boom, which multiplied the value of Chile's copper exports from US\$ 8 billion in 2003 to a peak of US\$ 54 billion in 2011, when it accounted for half of its goods exports. Because most countries that seek export diversification are strongly dependent on HM exports, this disconnect between the HHI and policy determinants of NHM exports due to commodity fluctuations is highly consequential.³

³ In a regression analysis with the concentration index as dependent variable and a set of policy variables as covariates, heterogeneity in HM abundance and prices could bias coefficients of policy variables that are correlated to HM heterogeneity and/or inflate error terms thus lowering estimation efficiency. In general, countries with high HM abundance could be unfairly judged as failures of pro-diversification merely because of their exogenous HM abundance.

Figure 1.2



A similar complication occurs when trying to identify a statistical relation between policy variables and *superior* exports by using sophistication or complexity indices as dependent variables. These indices are broadly a product of the sophistication/complexity of each exported product times the product's share in the country's export basket. This concept is more evident in the definition of the ESI. For instance, the ESI of country j is calculated as the sum of the sophistication ($SOPH$) of each exported product weighted by its share in its total exports:

$$(2) ESI_j = \sum_s \left(\frac{x_{js}}{\sum_s x_{js}} \right) SOPH_s$$

In turn, product sophistication is calculated as the weighted average of GDP per capita (GDPpc) of the countries exporting product s , where the weight is the value-share of product s in country j 's overall export basket divided by the value-shares across all countries exporting that good:

$$(3) SOPH_s = \sum_j \frac{\left(\frac{x_{js}}{X_j} \right)}{\left(\sum_j \left(\frac{x_{js}}{X_j} \right) \right)} GDPpc_j$$

Where $X_j = \sum_s x_{js}$ is the total exports of country j . Hence, a product is estimated as more sophisticated when it is mainly produced in higher income countries. Because HM exports dominate the export baskets of lower GDP per capita countries, in general, HM exports are estimated as less sophisticated than NHM exports:

$$(4) SOPH_{HM} < SOPH_{NHM}$$

Since exports (x) are measured in nominal values, exogenous increases in international HM prices or HM discoveries lower the ESI without any change in the value of sophisticated exports. Regression specifications that aim to establish a link between policies and sophisticated exports are thus weakened by exogenous commodity related fluctuations. This caveat similarly applies to the analysis of export complexity because, although the definition of the ECI is more intricate than the ESI's, in essence it is similarly a product of the complexity of each exported product weighted by the product's share in the country's export basket.⁴

Chile during the early 2000s is also an illustrative case of how these indices can mislead the identification of policies that foster *superior* exports. Chile's ECI stayed broadly unchanged since 1995 (Figure 1.3) despite the sustained productivity growth that Chile has experienced

⁴ The ECI of a country is calculated based on the diversity of exports a country produces and their ubiquity, or the number of countries able to produce them (and those countries' complexity). This index aims to measure the knowledge in a society in terms of the products it exports (Hausmann and others, 2013), but this is questionably the case as it is substantially affected by commodity fluctuations that are not related to the knowledge or productivity of economic agents.

which, a priori, should have increased its capacity to produce complex goods for exporting. As was the case with the HHI, Chile's ECI stagnation is most evidently related to the boom of copper (a low complexity product), thus showing how commodity fluctuations erode the relation between target variable (complex exports) and policy variables.⁵

Figure 1.3

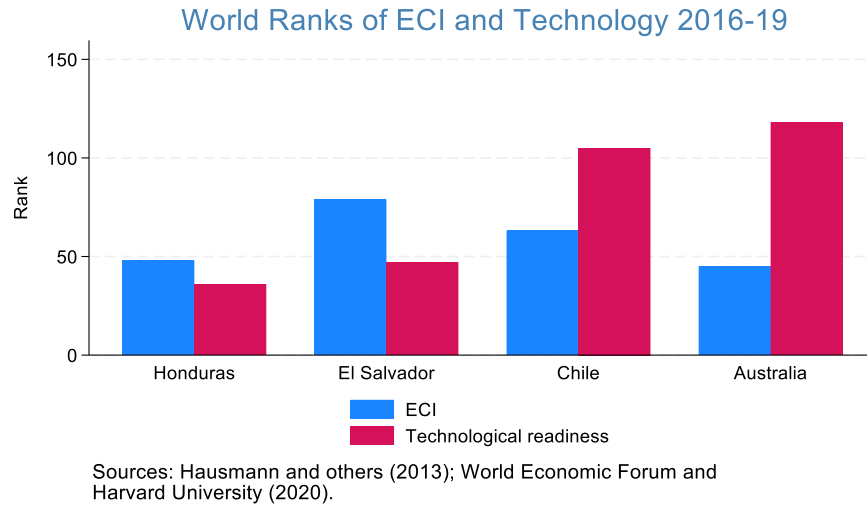


The disconnect between the ECI and a country's policy framework is similarly evident in cross-country comparisons (Figure 1.4). A priori, the advanced Australian economy, with its strong institutional and educational capacities, as well as its highly ranked technological readiness, should obviously be more capable of producing complex products than Latin American countries. Yet, for example, the ECI of Australia is below the ECIs of El Salvador and Honduras. According to its authors the ECI is a proxy for *productive capabilities* and measures the *knowledge of a society* (Hausmann and others, 2013), but it is questionable that Australia's *productive capabilities* are inferior in this illustrative cross-country comparison.

⁵ As an example of a similar disconnect in oil exporting countries, Nigeria's ECI has considerably deteriorated during oil price booms (in the early 1970s and early 2000s) and improved significantly in 2008, as a result of the oil price collapse of that year. At a regional level, as noted in Ding and Hadzi-Vaskov (2017), a growing trend in the share of *complex exports* in Latin American and Caribbean in the 1990s was reversed in the 2000s because of the commodity price boom, as the region is a major exporter of these products.

Australia's low ECI is likely related to its exogenously high mineral endowment and consequent high exports of minerals, which are low complexity products.

Figure 1.4



Another illustrative case of the limitations of the ECI as a measure of complexity due to natural resource abundance is the U.S. state of Texas. Although this state is a global technology leader, its ECI is just 0.29, on par with the Philippines. This evident inconsistency likely results from Texas superlative petroleum endowments and the extremely low (-2.57) Product Complexity Index (PCI) of Petroleum Oils in Hausmann and others (2013).

This dependency of the ECI on exogenous commodity developments is systemic across countries. Fixed effect regressions including most countries (Table 1.1) indicate that the ECI is strongly associated with resource wealth as defined in Sachs and Warner (1995). It is thus likely that the ECI's statistical relation with future GDP growth described in Hidalgo and Hausmann (2009) is related to the *resource curse* identified long before in several studies including in Sachs and Warner (1995).

Table 1.1

Dependent Variable:	ECI	
Log Complex Exports per Capita	.3108***	.3074***
Hydrocarbon and Mineral Exports-to-GDP (Sachs and Warner, 1995)		-.0023***
Constant	-1.6003***	-1.3761***
Observations	3,111	3,089
R-squared	0.66	0.75
Sources: Hausmann and others (2013), World Economic Outlook (IMF), UN Comtrade, and author's calculations.		
Notes: * p<0.1, ** p<0.05, *** p<0.01. Fixed effects regression.		

The evident disconnect between the above discussed indices and policy determinants that foster diversification and export *superiority* can be effectively addressed by focusing directly on the evolution of the export products that lead to diversification or export *superiority*.

Since export diversification is commonly sought in countries that are dependent on a handful of HM exports, the relevant dependent variable is the value of NHM exports. In other words, as HHIs (defined in equation 1) are high in commodity-dependent countries because few HM products dominate the value of NHM exports, policymakers can lower the HHI by boosting NHM exports.⁶ Regression analyses that seek to identify the policy determinants of export diversification can have these NHM export categories as dependent variables.

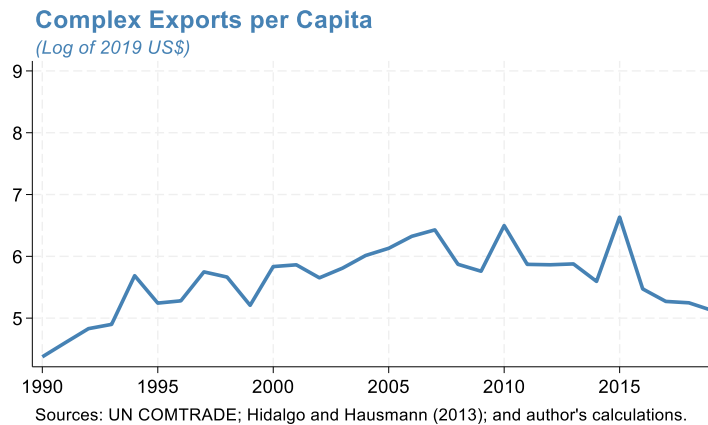
Similarly, when aiming to foster *superior* exports the dependent variable can be directly defined as the value of those *superior* exports itself. Doing this filters out the effect of low-

⁶ The HHI could also be lowered by fostering other HM exports, but the level of these HM exports depends exogenously on their existing reserves and prices. Therefore, it makes sense to think of export diversification as the promotion of NHM export categories, including in manufacturing and services.

complexity HM export values, which policy makers have little influence over.⁷ Most of the rest of this book does not analyze export superiority concepts as they are not part of mainstream international trade theory. Only the country case study on Chile in Chapter 4 does, and it measures *complexity* through the value of *complex* exports per capita, hereby defined as those products with Product Complex Index (PCI) above zero (the top half of most complex products in Hausmann and others (2013) categorization).⁸

Assessments substantially change when focusing directly on the evolution of the *complex* exports per capita. Unlike the ECI, the real value of Chile's *complex exports* per capita continued to grow during the copper boom (Figure 1.5) and, as expected, *complex exports* per capita is higher in Australia than in Honduras and El Salvador (Figure 1.6).

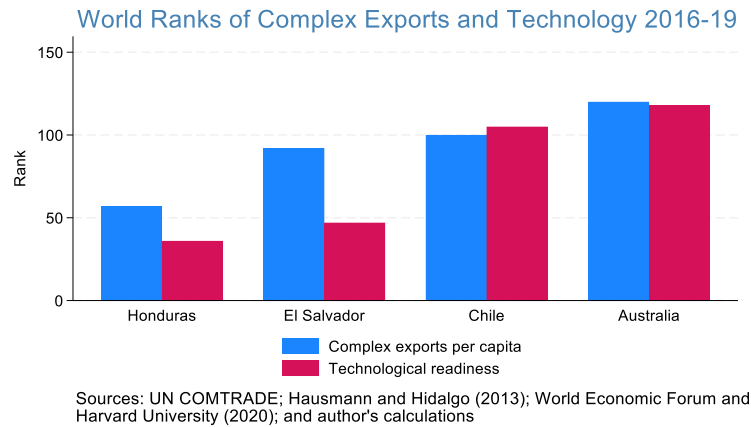
Figure 1.5



⁷ For cross-country comparability the value of superior exports can be normalized by population or labor force to control for size.

⁸ Salinas (2021a) further discusses why using ratios of exports per capita as dependent variables, is a superior solution to other alternatives to account for the spurious dependence of concentration and complexity indices on exogenous HM abundance.

Figure 1.6



INDEPENDENT VARIABLES

The second fundamental shift needed to identify and understand better the factors that foster export diversification (and *superior* exports) is basing regression specifications on standard trade theory. This second shift is partly related to the first one, as the dependent variables proposed are levels (not indices) of exports and these have been extensively modelled in the international trade literature.

While the analysis in Salinas (2021a) is not based on any specific international trade theoretical model, it does keep a relation to them by using an empirical gravity equation approach in the determination of independent variables. As Arkolakis and others (2012) have shown, a large class of international trade models generate isomorphic gravity equations, and therefore the results of gravity equation-based estimates should be broadly robust to model selection.

For a structural selection of covariates in addition to standard gravity equation variables, we glance at components of an EK02 (Eaton and Kortum, 2002) Ricardian general equilibrium model, a model that is widely accepted as a theoretical foundation to the gravity model. Specifically, we can relate the target export categories (NHM, manufacturing, complex, and services) to the manufacture sector in EK02's two-sector setting of manufactures and non-manufactures (equation 17 in EK02):

$$(5) \quad \frac{X_{ni}}{X_n} = T_i \left(\frac{\gamma d_{ni} w_i^\beta p_i^{1-\beta}}{p_n} \right)^{-\theta}$$

where the fraction of total expenditure of country n on manufacturing goods from country i (X_{ni}) divided by its total expenditure (X_n), is a function of country i 's state of technology (T_i), wages in country i (w_i), and prices in both countries i and n .⁹ Note that while distance-related variables are mostly exogenous, those related to technology and wages are largely determined by public policies of the exporting economy.

Other empirical studies on the determinants of export diversification and *superior* exports include independent variables that are related to productivity/technology (T-variables) of the exporting country (i), but do not include wage and gravity equation variables. This omission implicitly assumes that labor costs and gravity-equation variables do not have a different effect in the targeted export groups (NHM or *superior* exports) from the non-targeted exports

⁹ Parameter γ is a measure of the sensitivity of local prices to foreign cost structures and geographic barriers. θ represents product homogeneity across countries, which governs comparative advantage. A low θ implies high product variability and in that case comparative advantage exerts a bigger force for trade. β is labor's share in production, while $(1 - \beta)$ is intermediate inputs' share in production.

(homogeneous elasticities across export types). A significant exception is Weldemicael (2012), which finds that distance to markets is strongly related to the ESI, thus implying a significant difference in the impact of distance on more sophisticated exports from less sophisticated exports.¹⁰ In line with this finding, the statistical analysis in Salinas (2021) identifies heterogenous elasticity-to-distance across several export groups.

Following the previous discussion, the analysis in Salinas (2021) is based on gravity-equation regression specifications including labor costs and T-variables:¹¹

$$(6) \quad X_{ni,t} = \alpha_1 \log(\gamma) + \alpha_2 \log(X_{n,t}) + \alpha_3 \log(d_{ni}) + \alpha_4 \log T_{i,t} + \alpha_5 \log(w_{i,t}) + \alpha_7 \log(X_{i,t}) + \vartheta_{ni} + \mu_t + \varepsilon_{ni,t}$$

where year (μ_t) and country-pair fixed effects (ϑ_{ni}) are introduced. In addition to distance between countries itself, other commonly used gravity equation variables (dummies for common currency, Free Trade Agreement, common border, common language, common colonizer, and past colonial dummy) are included as they are also somehow related to the distance (d_{ni}) concept in EK02.

Regression specifications in studies of export diversification/*superiority* include T-variables such as institutional development, educational attainment, trade policy openness, and

¹⁰ While Weldemicael (2012) innovates in the export *superiority* literature by including distance to other markets, by still using ESI as dependent variable, its statistical analysis is affected by exogenous heterogeneity related to HM abundance and prices. Neither does it include other gravity-equation and labor cost variables.

¹¹ Price variables are excluded for statistical estimation simplicity but will be indirectly considered when discussing below the introduction multilateral resistance terms.

infrastructure development.¹² These four variables appear significantly (though not robustly) associated with diversification, sophistication, and complexity in several studies (for example Hausmann and others, 2006; Weldemicael, 2012; International Monetary Fund, 2014; Ding and Hadzi-Vaskov, 2017), including through Bayesian identification (Giri and others, 2019).

The analysis in this paper also identifies these four variables as the most economically and statistically significant in fostering diversification and *complexity* relative to other T-variables.

As highlighted in the gravity equation literature, exports are not only determined by policy variables of the exporting country, but also by policies of the importing country and therefore they are also included in regressions below. A labor market flexibility variable is introduced to partly capture the wage variable in EK02, assuming rigid labor markets inflate wage costs.

GDP per capita is added as an independent variable mainly to control for potential endogeneity between NHM exports per capita and T-variables. As discussed earlier, higher NHM exports can foster GDP and higher GDP can help strengthening T-variables (for example, higher output can facilitate/finance higher educational attainment). Note though that GDP per capita is not included in the calculation of goodness of fit when estimating the predictive power of policy variables.

¹² Trade policy openness and transport infrastructure can be alternatively considered proxies for effective distance between countries.

Some other components are added to equation (6) including: (i) a remoteness index variable of the importer as a reduced-form control for inward multilateral resistance (Rn,t); (ii) a remoteness index variable of the exporter as a reduced-form control for outward multilateral resistance (RI,t); and (iii) T-variables of the importing country ($T_{n,t}$):¹³

$$(7) \quad X_{ni,t} = \alpha_1 \log(\gamma) + \alpha_2 \log(X_{n,t}) + \alpha_3 \log(d_{ni}) + \alpha_4 \log T_{i,t} + \alpha_5 \log(w_{i,t}) + \\ + \alpha_6 \log\left(\left(\frac{X}{N}\right)_{i,t}\right) + \alpha_7 \log(X_{i,t}) + \alpha_8 \log(RI_{n,t}) + \alpha_9 \log(RI_{i,t}) + \alpha_{10} \log(T_{n,t}) + \vartheta_{ni} + \\ \mu_t + \varepsilon_{ni,t}$$

As in Wei (1996) and Anderson and van Wincoop (2003), the remote index of a country i is calculated as a weighted average of the distance of country i to its trading partners (n), where the weights are the incomes of trading partners (Xn):¹⁴

$$(8) \quad RI_i = \sum X_{n,t} d_{ni,t}$$

¹³ Although including log GDP per capita and log GDP of the source country can add multicollinearity to the specification (the correlation among them in the sample is 0.5) this does not directly impact the main conclusions of this paper because: (i) the estimated coefficient of log GDP, which is used to calculate the equation (9), appears stable and statistically significant across regressions; (ii) conclusions based on equation (9) do not change if the coefficient is replaced by 1 (as commonly assumed in the gravity equation literature); main conclusions of the paper are not directly based on the coefficient of log GDP per capita.

¹⁴ The use of remoteness indices to control for multilateral resistance could be considered a second-best option, as Yotov and others (2012) suggests that a first-best option would be the use of exporter-time and importer-time fixed effects. However, this potentially first-best option would wash out the identification of the hypothesized determinants of the dependent variables in this study due to multicollinearity with the proposed fixed effects.

Since country-pair fixed effects terms are fully correlated with time invariant variables, equation (7) is estimated using the Hausman and Taylor (1981) instrumental variable technique.¹⁵

3. THE ANALYTICAL ROADMAP IN THIS BOOK

The methodological framework discussed in the previous section is used in the following sections to better understand the question of export diversification in relevant country groups. The systematic implementation of the following steps proves particularly insightful.

Step 1: Assessing NHM exports per capita, not only export concentration indices.

Instead of focusing only on export concentration indices, this book assesses the value of NHM exports, finding that for many countries, high export concentration indices are not the result of unsuccessful NHM export promotion, but of exogenously abundant HM exports.

An important modification in this book relative to Salinas (2021a) is that the normalization of exports across countries is done by dividing them by working age population, not by total population. As noted in Salinas (2021a), a potential drawback of normalizing targeted exports through dividing by total population is that such ratio can be exogenously affected by the share of the population in working age. For example, countries with strong export determinants could have a relatively weak export per capita ratio because its population is

¹⁵ Because the dependent variable in equation (3) is specified in logarithmic terms, zero trade flows cannot be included and therefore the information they could provide is neglected. While regressions on goods exports have strong statistical fit despite this omission, regressions on the smaller and less comprehensive set of service exports observations may be more affected by this omission. Yotov and others (2012) indeed suggests that the omission of zero trade flows is more significant for sectoral service trade due to their highly localized consumption and highly specialized production.

relatively old and its working age population share small.¹⁶ Therefore, throughout the rest of this book, for simplicity of wording, we redefine export per capita ratios as “export per working age person ratios”.

In regional comparisons (see Figure 1.7-1.9), the level of NHM, manufacturing, and services exports per capita broadly appear higher in wealthier regions (East Asia High Income (EAHI), European Union (EU), Scandinavian (SCN) countries) and lower in the lower income regions of (South Asia (SAR), Sub-Saharan Africa (SSA), and India (IND)). These expected correlations, however, are not perfect and discrepancies between exports and GDP per capita across regions could be partly related to HM abundance (which allows countries to have a higher GDP per capita than expected given only their NHM exports).¹⁷

¹⁶ An alternative normalization to dividing exports by the working age population would be to divide it by the labor force. Nonetheless, participation in the labor force can be endogenous to economic activity and therefore to policy determinants under consideration in this study. For example, if policy determinants are effective in fostering the targeted exports partly by increasing labor force participation, the exports-to-labor force ratio would be relatively unchanged and not reflect the success of those policies. In any case, the identification of policy determinants of diversification does not require normalization of the dependent variable and while the analysis on goodness of fit does require normalization, it is largely robust to normalization by labor force instead of population.

¹⁷ This is noted in Salinas (2021a), as well as the fact that countries that participate in Global Value Chains (GVs) tend to have NHM exports of lower value added than many remote countries with significant NHM exports from processing of their natural resources.

Figure 1.7

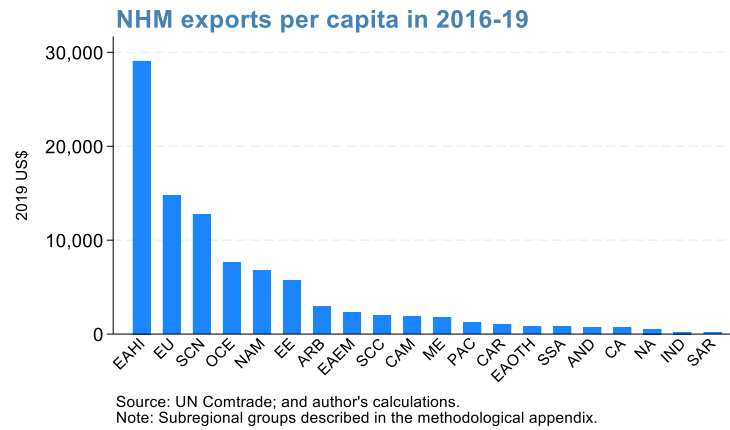


Figure 1.8

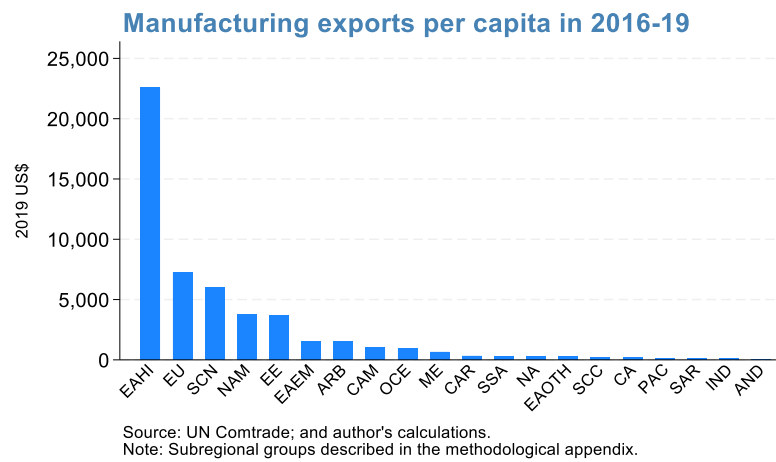
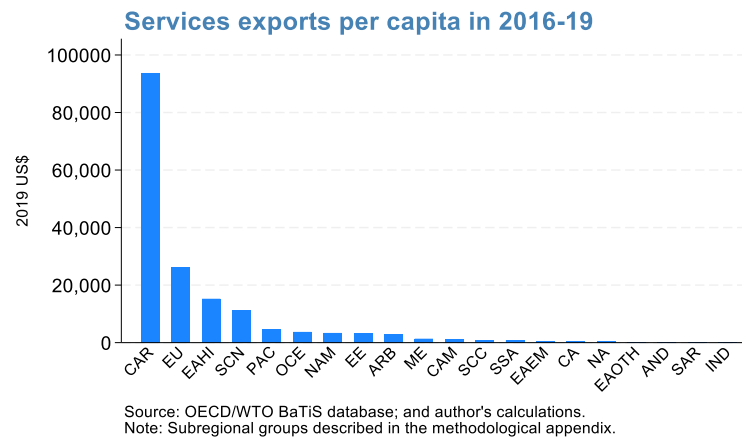


Figure 1.9



Importantly for our discussion, there are many resource-dependent countries like in Scandinavia (SCN) and Oceania (OCE, Australia and New Zealand) that have considerably high levels of NHM goods and services exports per capita. This partly may be the case because the NHM exports category includes processed HM products. But it should also reflect cases of resource-dependent countries like SCN that also have high manufacturing and services exports per capita.¹⁸

There are some apparent discrepancies between export concentration indices and NHM exports per capita that confirm the point that high export concentration does not mean failure to develop NHM goods and services exports. One example is the SCC country group, which in average has very high export concentration indices, but their level of NHM exports per capita is broadly as high as in high export performing EAEM and Central American and Mexico countries (CAM). May more of these cases will be spotted in the following chapters.

Step 2: Assessing NHM exports accounting for their proximity to other markets.

Considering the importance of geographical distance to other markets, NHM export values are also assessed controlling for Proximity to Markets (PM) indices proposed in Salinas (2021a). This is done through scatter plots that, across countries, compare the actual value of NHM exports per capita with their level predicted by the PM. This prediction is based on a simple cross-country OLS of NHM exports per capita on PM and a landlockedness dummy variable (LL).

¹⁸ Regional acronyms are described in Table A.2.

$$(6) \log\left(\frac{x_i}{N_i}\right) = \beta_0 + \log(PM_i) + LL_i$$

The period of the regression is 2016-19, the last four years prior to the Covid pandemic and its disruptive effect on international trade. The same cross-country regressions are run with manufacturing exports per capita and services exports per capita as the dependent variable.

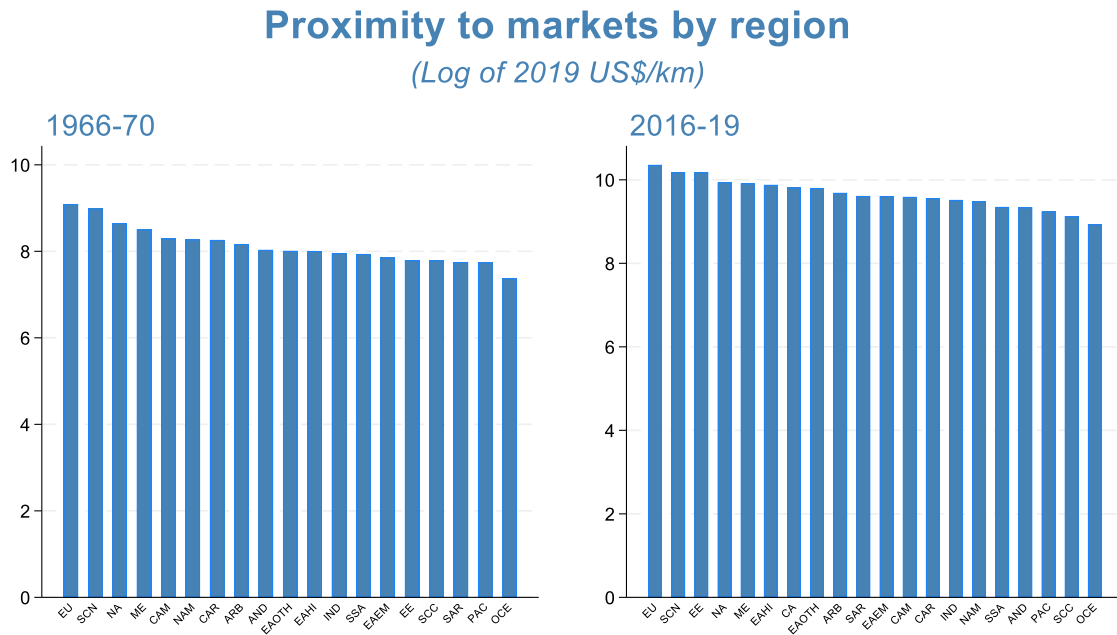
The PM index is simply calculated as the inverse concept of the commonly used Remoteness Index:

$$(7) RI_i = \sum X_n d_{ni} \quad (\text{Remoteness Index of country } i)$$

$$(8) PM_i = \sum \frac{x_n}{d_{ni}} \quad (\text{Proximity to Markets Index of country } i)$$

A glance at cross-regional comparisons of the *PM* index confirms that distance to global economic centers appears closely linked to NHM, especially to manufacturing and services export development (Figure 1.10). Manufacturing powerhouse regions (CAM, EE, EAH, and EAEM) have substantially higher *PM* than most other emerging and developing regions. Remarkably, CAM and EE had very high *PM* already in the 1960s, but as noted earlier, they did not experience a sustained acceleration in NHM exports until they liberalized their trade regimes.

Figure 1.10



Source: UN Comtrade; CEPII dataset, and author's calculations.

Already in the 1960s, East Asian countries benefitted from a significantly higher PM than many emerging economies. In fact, the PM index of South Korea in 1965 was about 70 percent higher than SCC, a factor that significantly helps explain the often-noted higher export performance of South Korea (see a discussion on this in Chapter 2). The high PM of South Korea and other East Asian countries in the 1960s significantly reflected the large population of that region and their proximity to the large and already industrialized Japanese economy, which was not only beneficial as a source of nearby demand but also of capital and technology transfer.

The largeness of the East Asian economic agglomeration and its efficient sea-based interconnection are clearly an advantage relative to the relative isolation of countries in

Oceania, Sub-Saharan Africa, and South America. The higher PM in East Asia than South America and Sub-Saharan countries is likely higher if estimated based on travel time among countries, not distance among them. East Asian countries are easily and closely connected through the sea, whereas South American and Sub-Saharan African countries are mainly separated by difficult land geographies. Furthermore, the higher PM of East Asian countries has substantially increased in recent decades, as their high PMs have fostered their economies and the growth of their economies have further increased their PMs (a virtuous cycle).

The scatter plots of actual versus predicted exports per capita are very telling. Being located close to large economic centers is a critical advantage for the development of exports conducive to export diversification (Figures 1.11-1.13). In fact, the cross-country regressions on which these regional scatter plots are based find that, together with landlockedness, PM explains about a third of the cross-country variation in NHM and services exports per capita, and two-fifths of the variation in manufacturing exports. This is clear evidence that assessing a country's export promotion policy framework without controlling for PM, as most studies do, misses a large part of the picture.

Figure 1.11

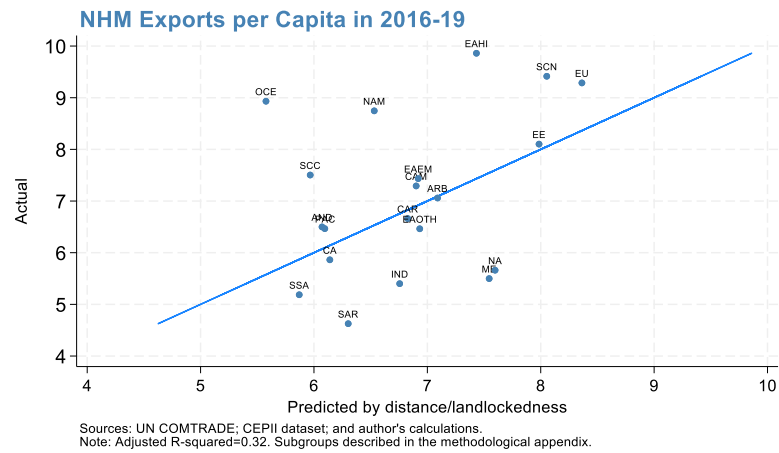


Figure 1.12

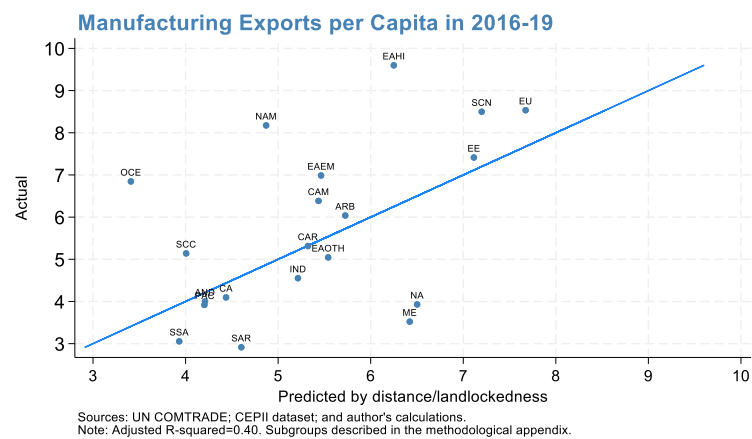
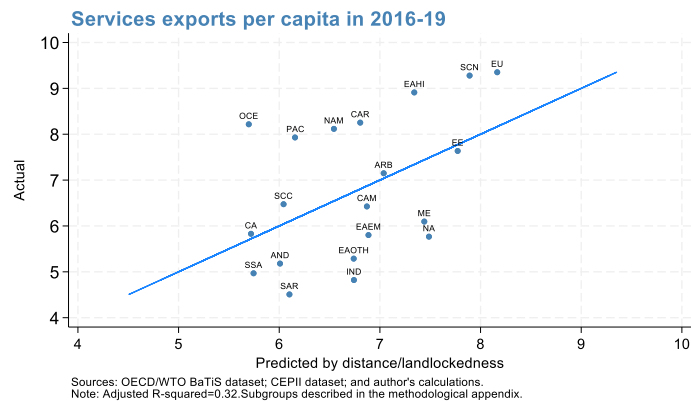


Figure 1.13



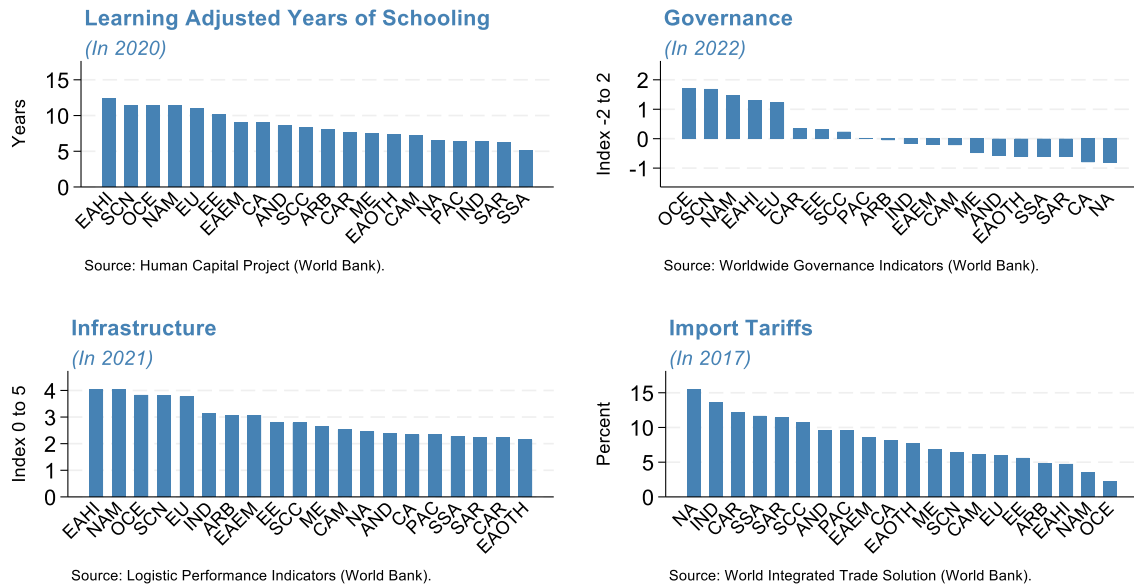
Many countries have export values way above what would be expected given their remoteness from large international markets. Such countries likely have strong export policy determinants that help them offset the hurdle caused by their geographical remoteness. For instance, some advanced countries with high technological readiness as those in OCE (Australia and New Zealand), are among the most notable positive outliers in these scatter plots. One can think of these countries as potential role models of export diversification policies, more so than other countries that may have even higher NHM exports but much less than expected given their PM.

Step 3: Assessment of the quality of horizontal policies

A next step in our assessment is to look directly at the strength of the main horizontal policies commonly associated with export development: education, governance, infrastructure, and trade policy openness. A cross-regional comparison of these variables indicates that the Oceanic (OCE) region, which exports much more than predicted by its PM, ranks among the top three subregions in the world in all these four export determinants (Figure 1.14). Indeed, similar assessments of horizontal policies in the following chapters generally confirm that positive outliers in the scatter plots of step 2 also are the ones that have relatively strong horizontal policies.

Figure 1.14

Exports Determinants across subregions



Note: Subregion groups are described in the methodological appendix.

Step 4: Assessment of the financial space for horizontal policy strengthening

While the strength of horizontal policies is positively associated with export development, a common criticism to experts that recommend the strengthening of horizontal policies to promote export diversification, is that lower income countries are not able to significantly bolster these policies because they do not have the financial resources needed to do it.

Although most industrial policies, such as tax incentives, subsidies, and state-owned enterprises also require significant resources, they are commonly considered less costly than the strengthening of horizontal policies.

Therefore, another important module of the analytical framework in this book is the assessment of the financial space for the strengthening of export policy determinants through

cross-country scatter charts showing the relation between GDP per capita and these policies.

It is obviously a valid critique, for example, that experts should not recommend SSA countries to rapidly develop the infrastructure of advanced countries to exit a potential poverty trap, without consideration for its existing financial resources.

Nevertheless, as seen in these scatter charts (Figures 1.15-1.17), the relation between some horizontal policies (education, governance, and infrastructure) and GDP per capita (in other words, available financial resources) is strong (with an R-squared above 0.6) but not too tight, so that there are many countries that have horizontal policies much stronger than predicted by their GDP per capita (they appear above the fitted line). These countries are thus proposed in this book as role models in the development of these policies. The relation between import tariffs and GDP per capita is extremely weak (with an R-squared of 0.13), indicating that lower income countries can substantially reduce their average import tariff within their current financial resources (Figure 1.18).

Figure 1.15

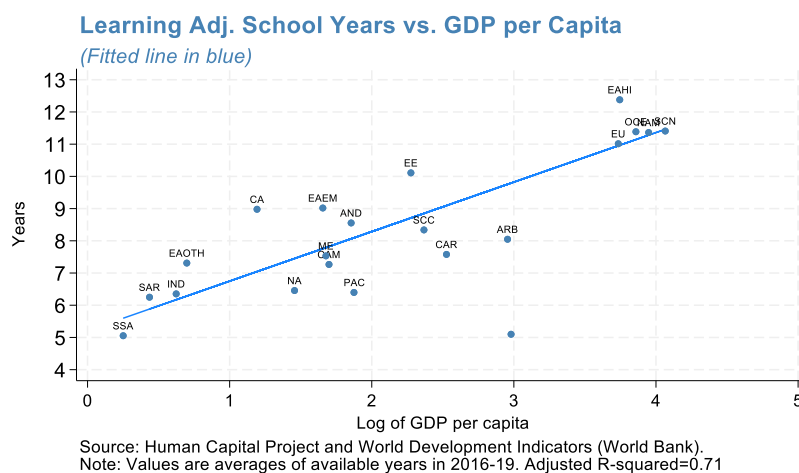


Figure 1.16

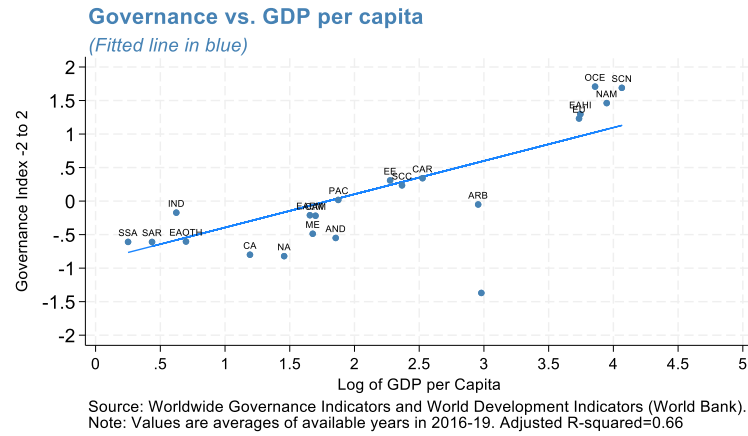


Figure 1.17

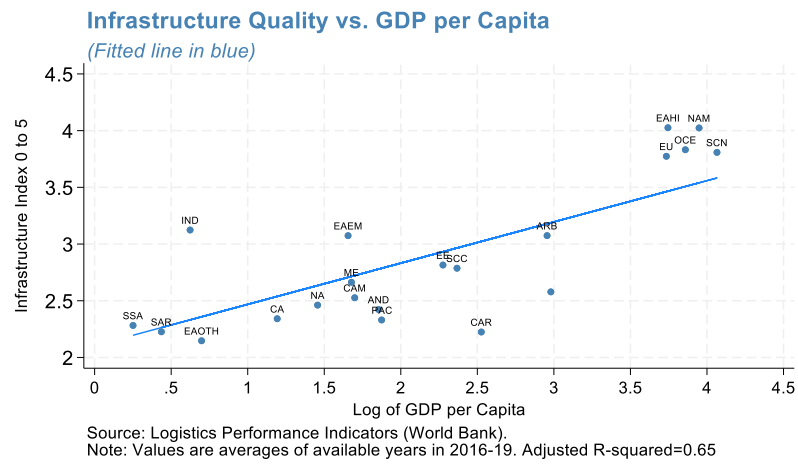
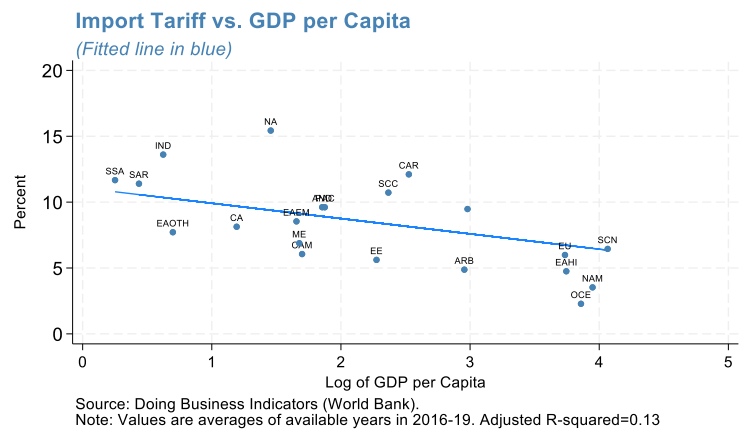


Figure 1.18



EAHI and EE countries have education levels notably above the level expected from their GDP per capita. In fact, EE countries like Lithuania, Poland, and Ukraine have education levels broadly like those of the much wealthier Western European countries. Similarly, the governance in relatively poor India is slightly stronger than the governance in upper-middle income countries in the AND and EAEM regions. And the infrastructure quality of EAEM countries is in average way above in wealthier countries in Latin America.

This wide “positive divergence” between the strength of horizontal policies and their level predicted by their GDP per capita, is an encouraging indication that countries can launch financially “realistic” strengthening of these policies with existing resources, which can result in significant export takeoffs. Some examples are very telling:

- Education: with current GDP per capita, if the average SSA country attains the same positive divergence in scatter plots of education and GDP per capita as EE countries, this region can reach the level of education of CAM: a significant quantum leap. Or if the average Caribbean country reaches the positive divergence of EE countries, it can surpass EE’s education level itself.
- Governance: if the average Arab (ARB) country reaches the same positive divergence in governance as OCE, it can attain the governance of the EU. This could significantly help these countries on their current efforts to diversify away from hydrocarbon exports.

- Infrastructure: if the average AND country attains the positive divergence in infrastructure of EAEM they could surpass the latter region. This would be highly beneficial to AND countries considering the challenging geography that they face.

Step 5: Simulation of the impact of “realistic” reforms.

After Step 4 has given us some indications of the financial space for the strengthening of horizontal policies, Step 5 simulates these reforms to assess how much export development they can trigger. This is done within the linear gravity equation framework in Salinas (2021a), updating the estimates in that paper, including by using the more recently produced measurements of the main horizontal policies that were presented in Step 3.^{19 20} In addition, in each of the following chapters, regressions are modified to reflect the idiosyncratic realities

¹⁹ To the non-economist reader, some words of caution are needed before interpreting simulation results in this step. The first ones are regarding the validity of regression coefficients point estimates as even if we have some statistical evidence that they are different from zero (an assertion that itself is subject to all the common caveats behind any regression analysis), the statistical confidence of the accuracy of the precise estimated coefficient is lower than its difference from zero.

Secondly, indicators of export determinants are clearly subject to measurement error. This is true, of course, for indicators based on subjective surveys (governance, infrastructure, and ease of doing business), but even for more objective measures that may not exactly reflect the concept that we are trying to capture (average tariffs is not a precise measure of the trade policy restrictiveness concept that we want to measure, nor the expected learning adjustment years of schooling or the years of education of the existing population precisely represent the human capital of the existing labor force that we would ideally like to represent). In fact, indicators of export determinants from different sources are closely correlated but far from perfectly so so that, for many countries, the discrepancy among alternative sources is notorious.

Moreover, the largely empirical approach in this paper (not fully rooted on international trade or growth models) require us to make projections based on rather simplistic assumptions of linear correlation. All this should be kept in mind in throughout this paper, but especially when interpreting these simulations, which should be taken as suggestive more than conclusive.

²⁰ To estimate the impact of these more recently produced variables on education and infrastructure in the absence of a long time series that can be used to include them in the gravity equations estimated in Salinas (2021a), these “newer” variables are “transformed” to the “older” variables through a univariate regression with the “older” variable as the dependent variable and the “newer” variable as the independent variable.

of each country group (for example, the homicide rate is included to study Latin American countries and conflict casualties is incorporated to study Sub-Saharan African countries).

We revise the regression estimate in Salinas (2021a), based on equation (7) in this chapter.

Results are broadly very similar. The coefficient of distance to partner country in the second regression including both gravity-equation variables (see Table 1.2, column 2) and horizontal policy variables, indicates that reducing distance by half is associated with a 171 percent increase in NHM exports. The coefficients of most other gravity equation variables are statistically significant and have the expected signs.

Table 1.2
Determinants of NHM exports

Dependent Variable: Log NHM exports	(1)	(2)	(3)
Log GDP reporter	1.106***	0.584***	0.604***
Log GDP partner	0.414***	0.410**	0.298***
Log distance	-1.177***	-1.328***	-1.257***
Common currency dummy	0.414***	0.410**	0.298***
Common border dummy	1.646***	1.813***	1.734***
Common language dummy	0.708***	0.605***	0.626***
Common colonizer dummy	0.526***	0.655***	0.620***
Past colonial link dummy	1.425***	1.302***	1.552***
Free trade agreement dummy	0.439***	0.273***	0.277***
Landlockedness dummy (1 is landlocked)		-1.690***	-1.241***
Log of hydrocarbon/mineral assets	0.0412***	0.0780***	0.0659***
Log GDP per capita	-0.113**	-0.10	0.354***
Governance (WB Index)		0.297***	
Education (UN Index)		5.868***	
Infrastructure (GCR Index)		0.212***	
Average Tariff		-0.0281***	
Labor market flexibility (GCR Index)		-0.049	
Political stability (Polity IV)			-0.0254***
Education (Barro Lee)			0.0956***
Infrastructure (WDI)			0.0172***
Trade liberalization (Wacziarg and Welch, 2003)			0.628***
Constant	-14.57***	5.249*	4.276***
Observations	93,093	37,866	73,069
Rho	0.82	0.92	0.85

Notes: * p<0.1, ** p<0.05, *** p<0.01. Panel regressions based on Hausman and Taylor (1981) technique with groups consisting of all combinations of reporter and partner countries in UN Comtrade database. Observations are non-overlapping 5-year averages within the 1962-2019 period, depending on data availability. Regression specification based on equation (7). Multilateral resistance terms and partner country's policy variables included (coefficients not reported). Dependent variable is the logarithm of the value of exports excluding hydrocarbon and mineral products. Definitions of dependent and independent variables are found in the data section of the methodological appendix. Trade liberalization dummy is based on identification of trade liberalization episodes in Wacziarg and Welch (2008), with a value of 1 if the country has liberalized.

Landlockedness, another geographic exogenous regressor (not included in Salinas, 2021), has a massive impact on NHM exports too, as being landlocked is associated with an 80 percent lower level of NHM exports. And the relatively exogenous HM assets is positively associated with NHM exports, likely because many NHM products are derived from raw HM products.

The statistical and economic significance of T- variables in the second column regression is also remarkable, particularly of education. A one standard deviation increase in educational attainment is associated with a 170 percent increase in NHM exports, while the same increases in governance and infrastructure quality increase them by a significant but much lower 30 percent. Reducing the average import tariff from 15 to 5 percent is associated with an similarly significant 30 percent increase in NHM exports. Remarkably, the coefficients of gravity equation and these four horizontal policy variables are clearly more robust than the coefficient of GDP per capita.

Labor market flexibility is not significant when measured by the Global Competitiveness Report subindex, but a one standard deviation increase in the IMF labor subindex does appear statistically associated with a 45 percent increase in NHM exports in the third column regression.²¹ Because of this lack of robustness we do not significantly rely on this variable for the rest of the analysis in this book.

²¹ Table A.3 shows that coefficients of policy variables the regression in column 2 remain economically and statistically significant to several regression specifications.

The third regression in Table 1.2 substantially extends the sample back to the 1980s by using the Barro-Lee years of education attainment, the Polity IV political stability index as a proxy for governance; an index of railroad, phone lines, and electricity coverage as a proxy for infrastructure; and, as a proxy for trade policy, a binary variable with value of one if the trade policy regime has been liberalized according to Wacziarg and Welch (2008). As in Salinas (2021a), the estimated coefficients confirm the importance of education, infrastructure, and trade policy openness and suggest a negative impact of political stability (which is not a perfect indicator of the broader concept of governance).

The independent variables in equation (7) appear also very significant when regressing them on manufacturing exports as the dependent variable (Table 1.3). Notably, the impact of distance to partner country, infrastructure, and trade policy openness appears higher than NHM exports. Regression results of alternative specifications in Salinas (2021a) that test the robustness of these estimates are shown in the methodological appendix.

Table 1.3

Determinants of exports by export type

Dependent Variable: Log of exports of:	Non-	
	hydrocarbon/ mineral	Manuf.
Log GDP reporter	0.592***	0.550***
Log GDP partner	0.900***	0.762***
Log distance	-1.335***	-1.532***
Common currency dummy	0.381**	0.472***
Common border dummy	1.751***	1.694***
Common language dummy	0.764***	0.570***
Common colonizer dummy	0.586***	0.363**
Past colonial link dummy	1.213***	1.507***
Log of hydrocarbon/mineral assets	0.0770***	0.0922***
Landlockedness dummy (1 is landlocked)	-1.711***	-1.619***
Log GDP per capita	-0.11	-0.09
Governance (WB Index)	0.300***	0.326***
Education (UN Index)	5.887***	5.324***
Infrastructure (GCR Index)	0.212***	0.336***
Average Tariff	-0.0281***	-0.0570***
Labor market flexibility (GCR Index)	-0.05	-0.03
Constant	5.423*	10.23***
Observations	37,866	35,903
Rho	0.92	0.92

Notes: * p<0.1, ** p<0.05, *** p<0.01. Panel regressions based on Hausman and Taylor (1981) technique with groups consisting of all combinations of reporter and partner countries in UN Comtrade database. Observations are non-overlapping 5-year averages within the 1962-2019 period, depending on data availability. Regression specification based on equation (7). Multilateral resistance terms and partner country's policy variables included (coefficients not reported). Dependent variable is the logarithm of the value of exports excluding hydrocarbon and mineral products. Definitions of dependent and independent variables are found in the data section of the methodological appendix.

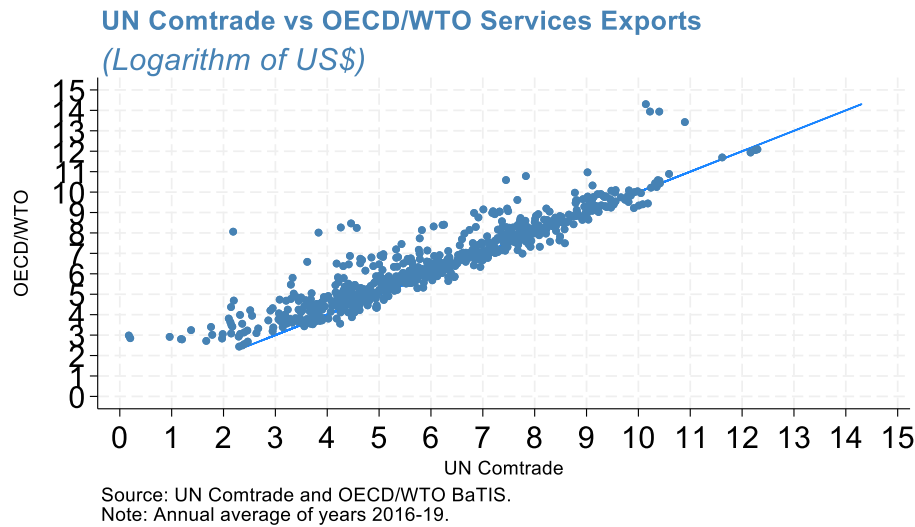
Considering that gravity equation regressions with services exports do not obtain significant results, the simulations in Step 5 are based on country level regressions that circumvent the problems of gravity equation estimations and do find significant coefficients. One potential reason behind weak gravity regression estimates is that bilateral services exports data has a higher prevalence of zeroes (in other words, there is no trade between countries in many service sectors). OLS regressions, including the Hausman and Taylor estimator that is used in Salinas (2021a), cannot incorporate the information contained in the zero trade flows, because these observations are simply dropped from the estimation sample when the value of

trade is transformed into logarithmic form. This happens although the observed zeros might contain important information about the countries (such as why they are not trading) which should be exploited for efficient estimation (Helpman, Melitz and Rubinstein, 2008).

A commonly recommended strategy in the presence of zero trade flows is to estimate the gravity model through the Poisson Pseudo Maximum Likelihood (PPML) estimator which has a multiplicative form and therefore preserves the zero observations (Santos Silva and Tenreyro, 2006). However, PPML estimates similarly weak and non-intuitive coefficients.

An important problem with bilateral services exports data is seen in Figure 1.19, which shows that bilateral data aggregated for each country across all its trading partners is most often lower than country level data published in Balance of Payments data sources such as the OECD/WTO Balanced Trade in Services (BaTis) dataset (OECD-WTO, 2025). Thus, bilateral data not only has too many zero observations but apparently has measurement error at the aggregated country level.

Figure 1.19



We therefore attempt regression estimation of the determinants of services exports at the country level, including the PM index as an independent variable to approximate the concept of distance in gravity equation variables. The main potential limitation in doing this is the much fewer observations, which can result in weak statistical significance. Nevertheless, the results are statistically and intuitively satisfactory (Table 1.4). Either with OLS, Between Effects (BE), or Random Effects (RE) estimators, education, governance infrastructure, import tariffs, are statistically significant and with coefficients not too different from those in bilateral gravity equation regressions with goods exports (Table 1.3), except the education coefficient which is much lower in these regressions.²² Landlockedness does not appear statistically significant, which is not surprising because most services are not exported through maritime route (for example, there is relatively small sea-based tourism).

²² Fixed Effects estimates are not included because they practically drop the highly time invariant PM Index and the fully time invariant landlockedness variable.

Table 1.4

Determinants of services exports

Dependent Variable: Log of exports of services per capita	OLS	Between estimator	Random effects	OLS (2016-19)
Log of proximity to markets	0.851***	0.867***	0.506***	0.911***
Landlockedness	0.14	0.14	-0.01	0.123
Log of natural resource assets	0.01	0.00	-0.03	-0.0224
Education Attainment	1.704***	1.901*	1.748**	1.873*
Governance	0.600***	0.607**	0.341***	0.499**
Infrastructure	0.08	0.11	0.154**	-0.0643
Import tariff	-0.0326**	-0.04	-0.0205*	-0.0506**
Labor flexibility	0.297***	0.25	0.361***	0.453**
Log of GDP per capita	178.00	178.00	178.00	58
Constant	0.00	0.00	0.00	0
Observations	336	336	336	111
Adjusted R-squared	0.86	0.86		0.84
Rho			0.97	

Notes: * p<0.1, ** p<0.05, *** p<0.01. Observations are non-overlapping 5-year averages within the 2005-2019 period, depending on data availability.

The rest of the analysis on exports of services in this book uses the RE estimation coefficients. With the RE estimator, the impact of distance appears significant, with a one standard deviation reduction in the PM index been associated with 35 percent higher exports of services. Except for the coefficient of education, the RE coefficients of the main horizontal policies in Table 1.4 are about the same as for NHM exports in Table 1.3.

As in Salinas (2021a), scatter plots that add the estimated impact of the four most significant horizontal policy variables (education, governance, infrastructure, and trade policy openness), show a very strong goodness of fit, with an R-squared close to 0.8 for NHM and manufacturing exports, and close to 0.7 for services exports (Figures 1.20-1.22). Graphically,

we see that, within this framework, no regions with the *PM*, landlockedness, and horizontal policy variables of SSA or Latin American regions has the level of NHM exports per capita of EAH1.

Figure 1.20

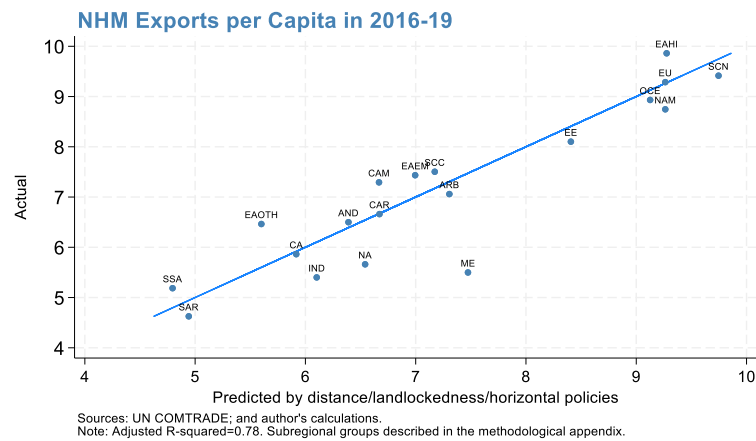


Figure 1.21

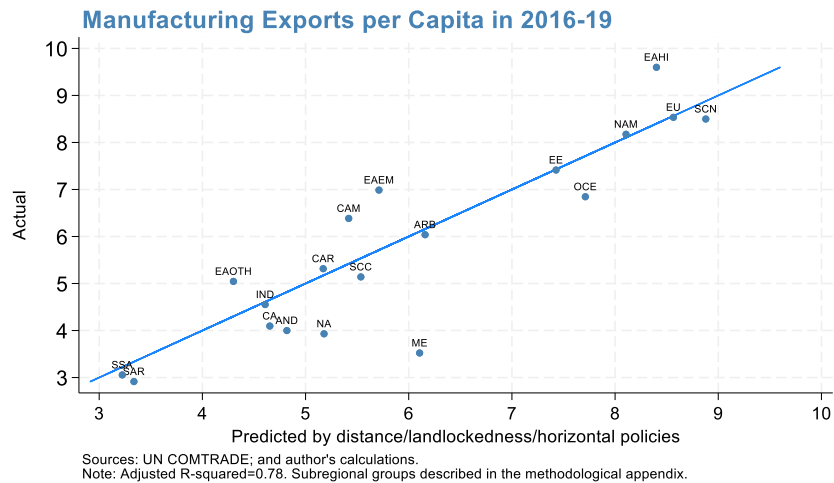
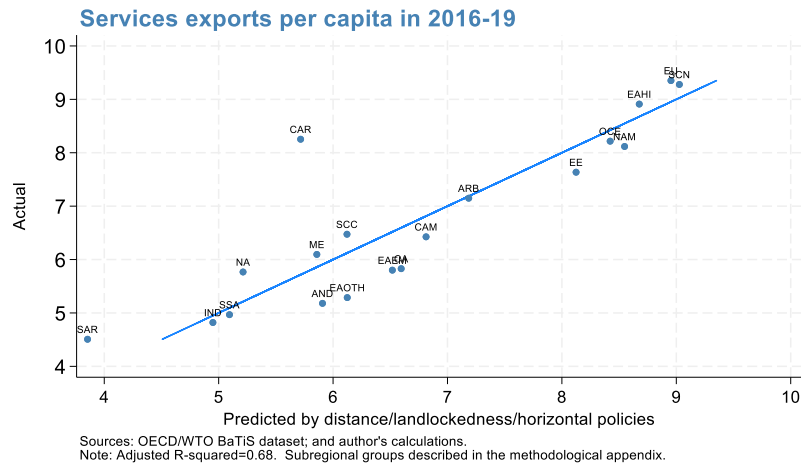


Figure 1.22



It seems, therefore, that countries cannot simply bypass the need to strengthen their horizontal institutional, educational, infrastructure, and trade policy framework. The remarkable improvements in fit for some regions when adding predictive policy variables (for example, OCE) is another corroboration that their success is largely associated with their strong horizontal policies.

As suggested in Salinas (2021a), remaining outliers in scatter plots that incorporate horizontal policies may reflect omitted variables or measurement errors that can be further explored. For instance, positive outliers include countries that participate in GVCs (CAM, East Asia, EE) with a high share of imported components and therefore low domestic value added. Some small outliers are major trading points—including Hong Kong, Panama, and Singapore—with export data that includes reexports with negligible domestic value added. And many outliers are HM exporting countries that can process some of their raw hydrocarbon production advantageously because of their HM abundance itself.

4. CONCLUSIONS

As seen in following chapters, several new insights on export diversification come out when following methodological suggestions in Salinas (2021a), that is, when evaluating directly export categories that help diversify away from HM products, instead of focusing on commonly used diversification indices, as well as from formulating the analysis within a gravity equation framework. The high goodness of fit under this framework strongly rejects the null hypothesis of a disconnect between the quality of a horizontal policy framework and export diversification, which has led many to neglect the importance of orthodox, horizontal policies in attaining export diversification.

The centrality of *PM* underscores the need to effectively shorten “distance” to other economies by enhancing connectedness at all levels, reducing trade policy barriers, enhancing trade facilitation, strengthening transport infrastructure, investing in top-notch communication technology (particularly on internet connectivity to support the digital economy), and fostering technological diffusion. Enhancing connectedness is crucial for the most remote economies, thus allowing their production agents to more significantly tap from backward and forward linkages to large global economic centers.

Horizontal policy variables also appear strongly associated with the level of NHM goods, manufacturing, and services exports. Strengthening horizontal policy areas such as education, governance, and infrastructure may seem a daunting task that mainly requires financial resources that are lacking in developing countries, but scatter plots of these horizontal policies versus GDP per capita shows that strengthening these policies with existing resources can

launch substantial export development booms. There are several countries in which the quality of these policies is way above what is expected from their level of income, and they can thus serve as role models.

Moreover, significant payoff can be obtained from evidently “cheaper” reforms that reduce trade policy barriers and remove excessively restrictive regulations, including of the labor market. Also note that within the wide objective of governance strengthening, more focused reforms to improve government effectiveness and control corruption seem particularly productive (Salinas 2021a). And concentrating on strengthening port and electricity infrastructure seems most important among all infrastructure areas.

The methodology presented in this chapter can surely be improved, most evidently by moving from an empirically based framework to others based on specific international trade, macroeconomic, and economic growth models. The empirical approach in this book is mainly meant to illustrate hopefully insightful concepts that can guide the discussion on export diversification more than to provide ultimate quantitative estimates on this issue.

CHAPTER 2: EXPLAINING EAST ASIA VERSUS LATIN AMERICA

1. INTRODUCTION

One of the most relevant dichotomies on export diversification and on overall economic development is the divergence between East Asian (EA) and Latin American (Latam) countries. Whereas many EA countries have excelled in developing a sophisticated global value chain, Latam export baskets remain concentrated in extractive industries (hydrocarbon and minerals, HM). A very common and insightful observation is that although in the 1950s South Korea and several Latam countries had a similar income per capita, now South Korea is a major industrial exporter that has doubled the income per capita of even the wealthiest Latin American countries (Chile, Uruguay, Mexico).²³

The remarkable export and economic takeoff of South Korea and of many East Asian (EA) countries has motivated a vast empirical literature aiming to determine the policies behind their success so that other countries can replicate them. Studies can be broadly grouped in two camps. One that highlights the importance of EA's improving orthodox horizontal policies (education, infrastructure, governance, and so on). And another one focuses on the importance of some heterodox Industrial Policies (IPs), such as direct government transfers to specific sectors/firms through tax exonerations, subsidies, direct government credit, or State-Owned Enterprises (as opposed to more orthodox IPs, like state-funded export marketing or R&D).

²³ Puerto Rico is the only Spanish speaking territory in the Western Hemisphere that has a similar GDP per capita as South Korea.

Despite its vastness, this literature is far from conclusive. Heterodox IPs were indeed widespread in EA, but many of them were unsuccessful, and the case studies of apparently successful heterodox IPs in East Asia do not estimate if their identified export payoff is higher than the payoff of an alternative investment in strengthening horizontal policies. Moreover, heterodox IPs have also been attempted in Latin America and most other developing countries without significant success. This is why there are no cross-country studies that find a statistically significant payoff from heterodox IPs.

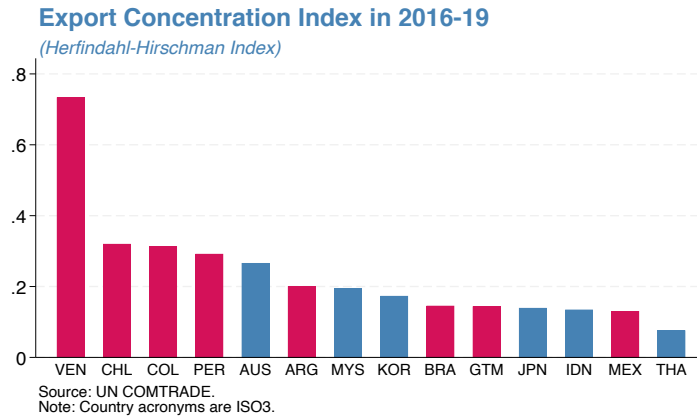
On the other hand, empirical cross-country studies that attempt to explain the East Asian export miracle through statistical association with its horizontal policies so far do not show clear cut results, especially when considering the potential endogeneity between exports development and the strength of horizontal policies. Amidst this inconclusiveness this chapter aims to explain the puzzling divergence in export development between EA and Latam.

2. LATAM EXPORT DIVERSIFICATION THROUGH NEW GLASSES

The common comparative analysis between EA and Latam is simply based on comparing their export diversification indices (Figure 2.1). A conventional Herfindahl-Hirschman Index (HHI) of export concentration confirms that EA exports are much more diversified (less concentrated) than those of most Latin American countries (except Mexico, Guatemala and Brazil). It is indeed the case that Latam remains a mainly commodity exporter region, whereas East Asia has developed a much more diversified export basket. Interestingly, the high-income

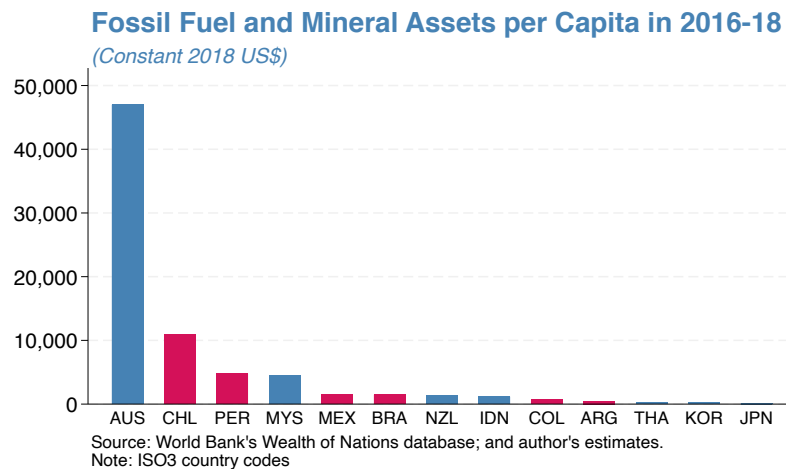
Australian economy is also broadly as export concentrated and dependent on commodity exports as many Latams.

Figure 2.1



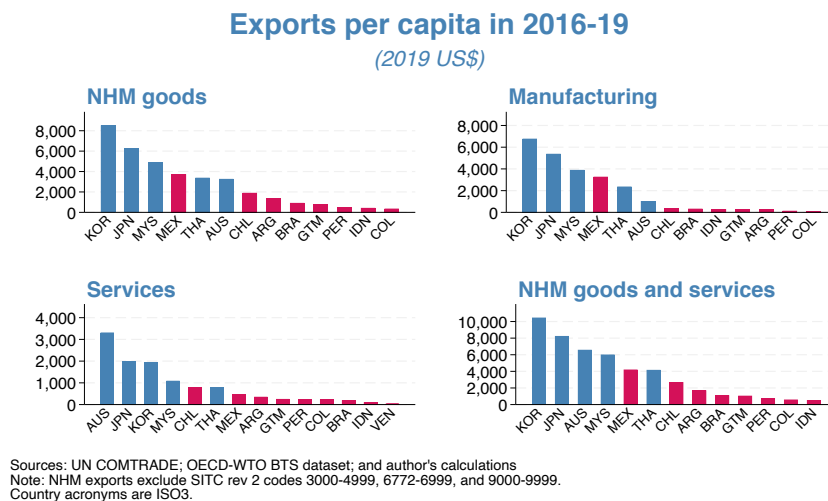
As is commonly seen in this book, high export concentration can reflect low exports of NHM goods and services (NHMGs) and/or high natural resource abundance. As seen in Figure 2.2, many Latams (and AUS) indeed have very high hydrocarbon and mineral assets, which must then be an important factor explaining their high export concentration.

Figure 2.2



But relatively low NHMGS exports are also part of the story (Figure 2.3). Mexico stands as a significant exception within Latams underperformance, as it broadly matches the NHMGS and manufacturing export capita level of Malaysia and Thailand.

Figure 2.3



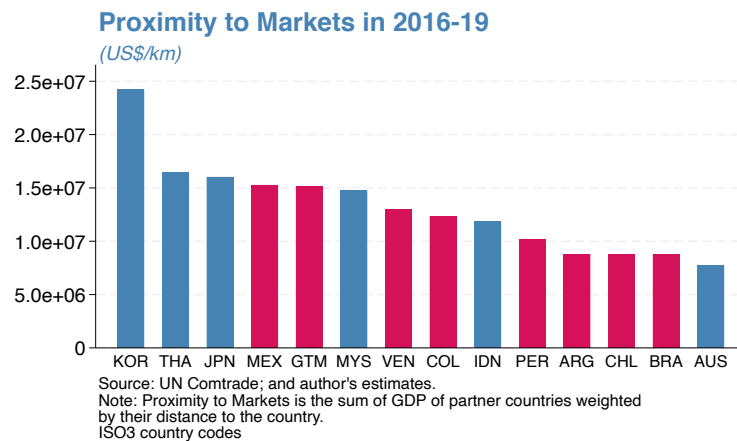
Interestingly though, CHL is among the best export performers in Latam even though its export concentration is among the highest. In fact, Chile's services exports per capita are higher than those of tourism-powerhouse. The relative success in exporting the NHMGS products that can help reduce Latam's concentration on raw HM exports looks then quite different when looking directly at the level of these exports than when looking at the HHI.

3. EXPORTING FROM THE CORE VS FROM THE PERIPHERY

But why does EA have much higher NHMGS exports than Latam, especially more than South America? From a gravity equation perspective, it is very likely that South American remoteness from the large global economic centers is a major factor behind its export underperformance. As reflected in a cross-country comparison of PMs (Figure 2.)⁴, South American countries (and AUS) are very far from the large global markets, much further than

EA countries. This may explain why a remote country with strong horizontal policies like CHL exports much less NHM goods exports than EAs but performs well in services exports (which are less affected by distance than goods exports).

Figure 2.4



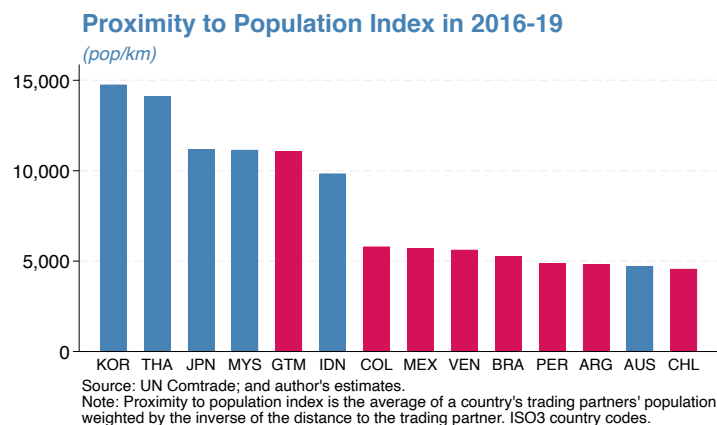
But while remoteness is a major limiting factor to export development, it is very hopeful to see that Australia has NHMGS exports per capita match the best EA performers. As suggested in chapter 1, this good performance despite remoteness suggests Australia has very strong export policy determinants, so that this country can serve as a role model to remote CHL and other remote South American countries.

Another fact that is key to our assessment is that EA's favorable PM appears to be a largely exogenous factor, reflecting its very large population. A priori, one could think that EA's high PM is mainly the endogenous result of strong policy frameworks that are conducive to high GDP per capita and consequently high GDPs (thus increasing the numerator of EA's PM index). The high GDP per capita of Japan and Korea should indeed significantly boost

EA's PM, but most other EA countries do not have GDPs per capita significantly higher than Latams.

In fact, a comparison between EAs' and Latams' Proximity to Population (PP) indices (Figure 2.5), an index equivalent to a PM index with GDP per capita equal to one for all countries, shows that EA's PM advantage over Latams would be much higher without differences in GDP per capita. The higher PP of the EA region is an important and largely exogenous advantage over Latam. It mainly reflects the proximity to China and, to a lower but important degree, to India. Moreover, the fact that both these mega-countries have significant room to catch up to the GDP per capita of advanced economies implies that EA's PM advantage over Latam is most likely to increase in coming decades.

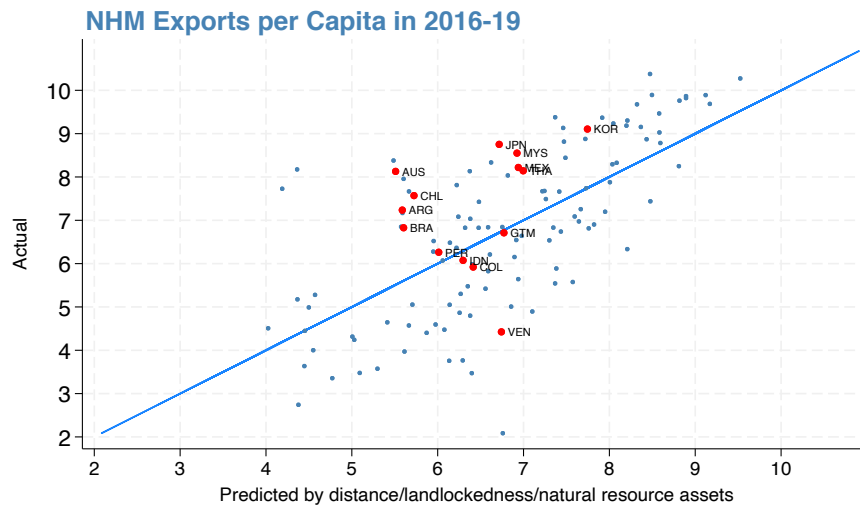
Figure 2.5



Factoring in this exogenous PM advantage of EA over Latam, makes their export comparisons remarkably different, as seen in a scatter plot in which we compare countries' actual NHM exports per capita with the level predicted by PM, landlockedness, and natural

resource assets (Figure 2.6). The predictive power of these factors is important as implied by the 0.37 R-squared of the base regression line. As expected, they predict that the NHM exports of Asian countries and Mexico is much higher than of South America countries.

Figure 2.6



The key point is that, judging by how much their actual NHM exports per capita are above their PM-predicted level, Chile, Argentina, and Brazil perform as well as East Asian countries. The story of the East Asian miracle exporters vs the South American laggards seems to have a significant exogenous root.

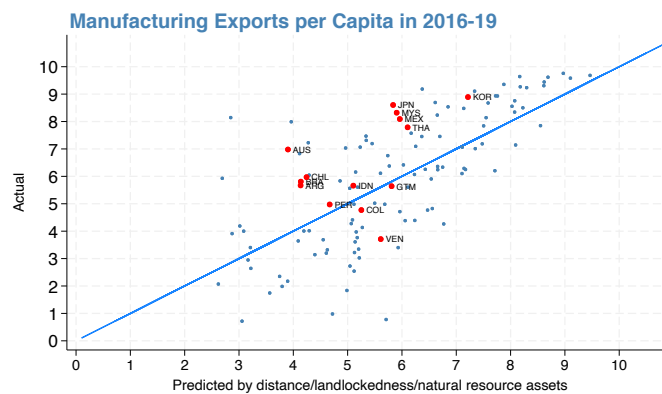
The South American picture is rather heterogenous though. While there are countries like ARG, CHL, and BRA that have NHM exports that are broadly as higher than predicted as East Asian countries, others such as COL, GTM, PER do not have superlative performances controlling for their distance, and Venezuela performs much worse. Therefore, while exogenous factors may largely explain the superiority of EAs over ARG, CHL, and BRA,

other factors (likely policy related) could be important in explaining EAs superiority over COL, GTM, PER, and VEN.

The superlative export performance of CHL controlling for exogenous factors is particularly noteworthy, as its positive deviation from the fitted line is only surpassed by the advanced economies of AUS and JPN. This is a strong indication of Chile’s solid export policy determinants and that CHL’s weaker-than-EA export performance is largely explained by its remoteness to other large economies. We hence dedicate a separate chapter (chapter 3) to understand Chile’s export performance better.

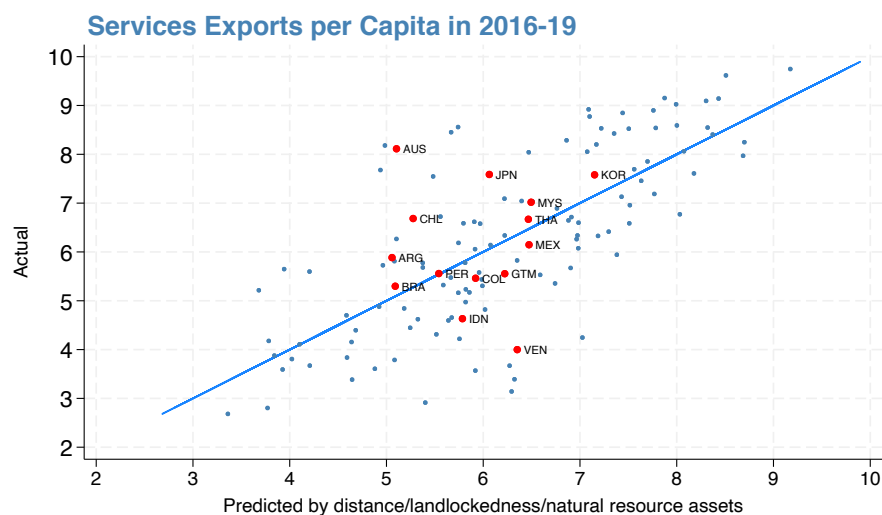
A broadly similar picture is seen when we compare the actual level of manufacturing exports per capita versus the level predicted by exogenous factors (Figure 2.7). As was the case with NHM exports, EAs are predicted to have higher manufacturing exports than South American countries and the deviation from 45-degree line among South American countries shows the same heterogeneity pattern as for NHM. The main difference for this type of exports is that ARG, CHL, BRA “positively-deviate” slightly less than EAs.

Figure 2.7



The scatter plot for services exports (Figure 2.8), interestingly shows that ARG and CHL deviate more positively from the 45-degree line than all EAs except Japan. Remarkably Chile's over performance controlled by PM surpasses that of the advanced economy of South Korea, and in absolute value is around as high as in Malaysia and Thailand. Bottom line of these three charts? Exogenous factors largely explain EAs superior exports per capita relative to CHL, ARG, BRA, while there seem to be other factors explaining COL, PER, VEN underperformance.

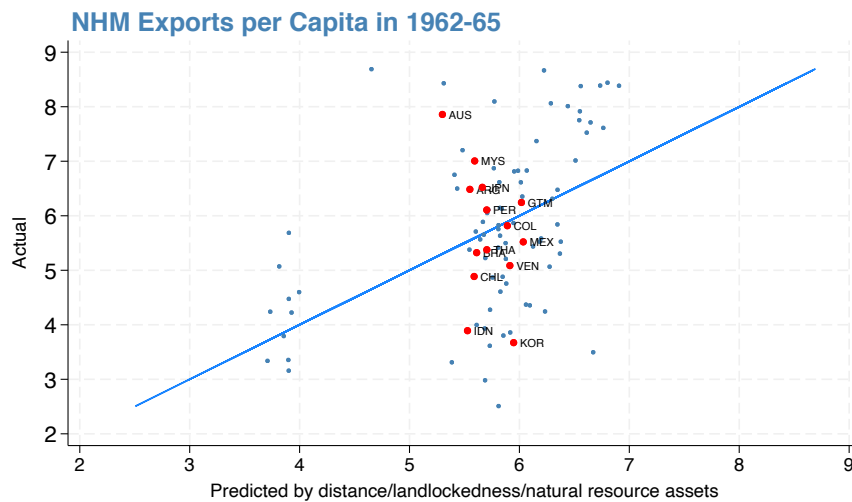
Figure 2.8



This type of scatter plots also give us an insight that helps explain the strong surge of KOR's exports relative to those in Latam countries that we mentioned earlier. Comparing 1962-65 to 1976-80 (Figures 2.8 and 2.9), we can see that this surge corresponded to a move-to-potential more than a move-to-superlative exports levels, considering that in 1962-65 KOR's NHM exports were extremely lower than their predicted level given the country's PM (near the big Japanese economy and the large East Asian population agglomerations). Such

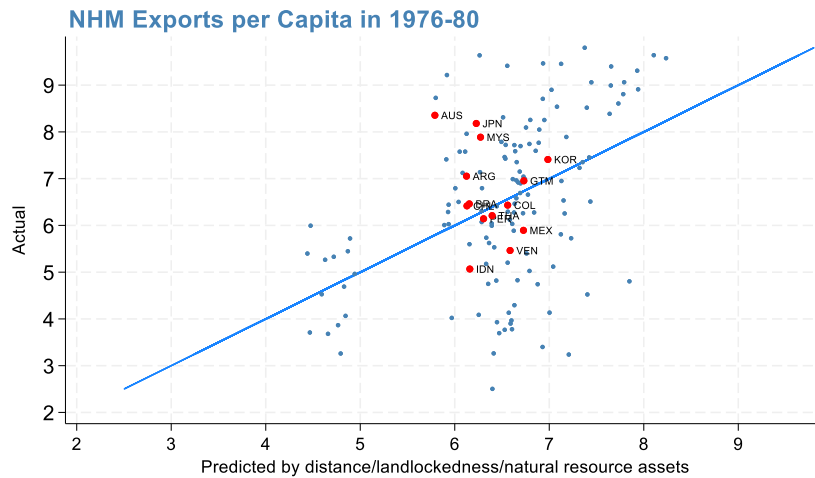
underperformance by the early 1960s may be related to KOR's severe ISI regime in the post-war years, an overvalued currency, and restricted relations with the large and nearby Japanese economy.

Figure 2.9



Exports rapidly moved to potential after the 1960s dismantling of ISI, currency devaluation, and normalization of trade relations with Japan. In about 15-20 years of peacetime development and a significant opening of its economy, KOR exports managed to surpass their predicted-by-PM level although not by much more than other Latams, and actually below ARG (Figure 2.10).

Figure 2.10



Although the export growth rates of KOR in the 1960s and 1970s were impressive, it is hard to coin them as a miracle when PM is brought into account. And as seen in previous charts, KOR's upward deviation in 2015-19 scatter plots is lower than CHL's for NHM goods exports, and below CHL and ARG for services exports.

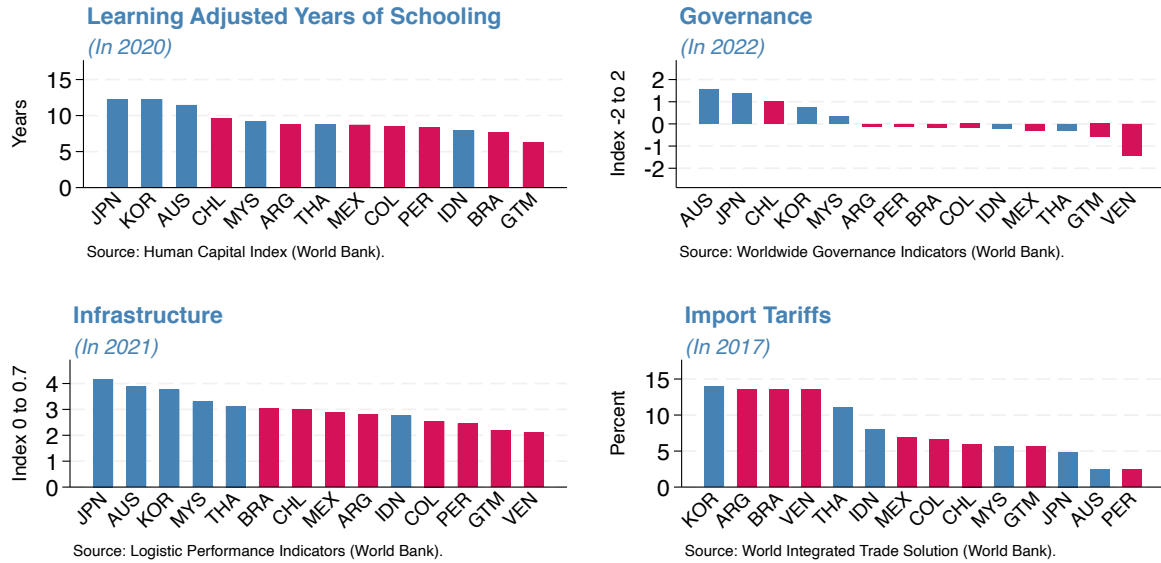
4. THE STRONGER EAST ASIAN HORIZONTAL POLICIES

EA's export overperformance compared to Latam does not appear that mysterious either when evaluating the strength of its export determinants (Figure 2.11). The top EA exporters (KOR, JPN and MYS) have very strong education, governance, and infrastructure. CHL is the Latam country that most closely matches EA's export determinants, and indeed CHL is the best Latam export performer when controlling for PM. Not surprisingly AUS, the best export performer controlling for PM, has all superlative export determinants and VEN, the weakest export performer, has the worst governance and infrastructure among comparators.

Figure 2.11

Exports Determinants in EA and Latam

(Latest year available)

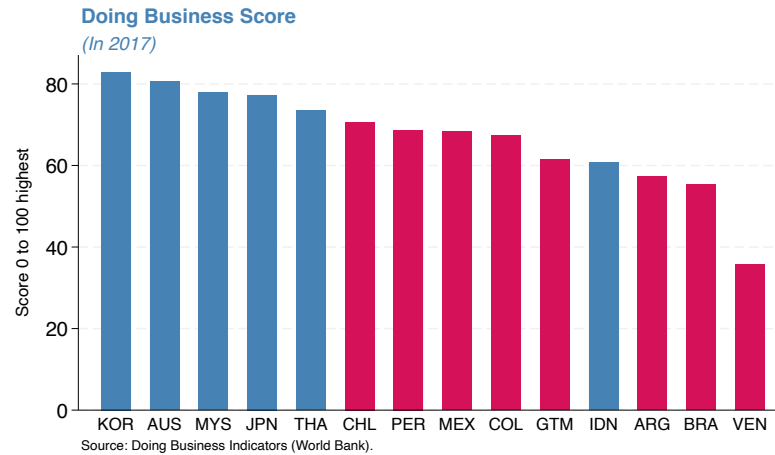


Note: Country acronyms are ISO3.

EA (and AUS) also has performed much better on other export determinants, particularly on the Ease of Doing Business, a variable that appears significant in regressions in Salinas (2021a) and in the methodological appendix of this book (Figure 2.12).²⁴ Except weak exporter IDN, all EA's in our sample had an easier doing business environment in recent years. Again here Chile, the best export performer in Latam, had the easier environment to do business among Latams.

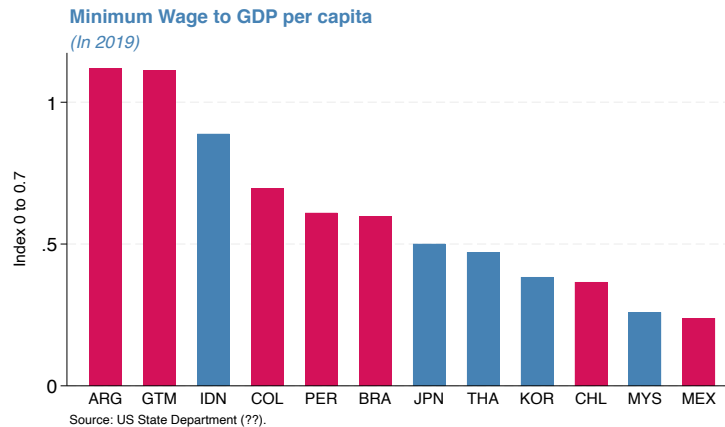
²⁴ Although the World Bank's Doing Business database has been severely questioned and phased out due to measurement errors in specific cases, in general, it provides valuable and irreplaceable information from worldwide surveys that has been widely accepted, at least in broad terms.

Figure 2.12



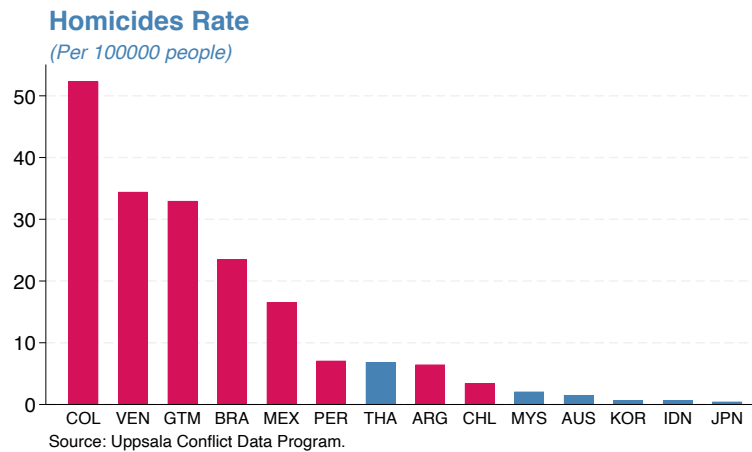
Another factor likely weakening Latam's competitiveness is its more rigid labor market legislation. One way in which this can be appreciated is in a comparison of unit labor costs as approximated by comparisons of minimum wage to GDP per capita ratios (Figure 2.13). In 2019, JPN, THA, KOR, and especially MYS had ratios that are around and below the international average of 0.5. In contrast, in Latam, this ratio was only similar or lower than in EA in the stronger exports performing CHL and MEX. Other Latam countries in our sample had ratios above the international average, particularly ARG and GTM, with ratios more than twice the international average.

Figure 2.13



One aspect of Latam's weak governance is particularly alarming...its extremely high level of violence (Figure 2.14). Latam has the highest homicide rates in the world, while EA has among the lowest. Among Latams, Chile appears again as the best performer, but still with a much higher rate than all EA comparators except THA.

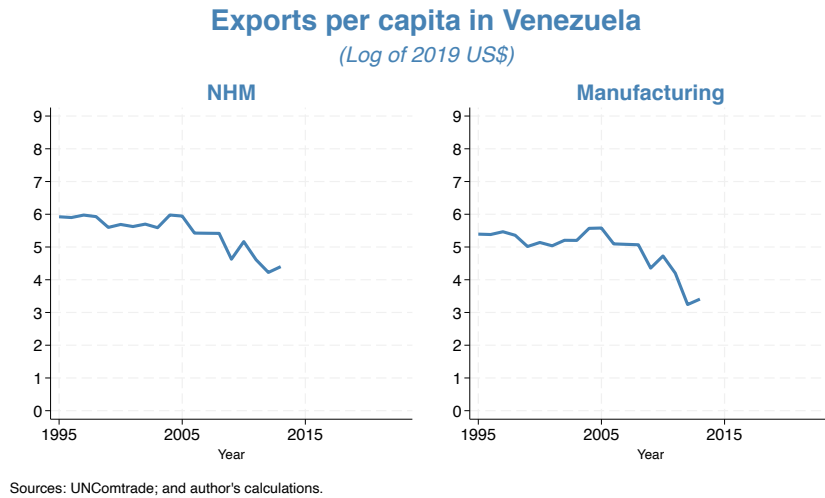
Figure 2.14



Just like PM appears to explain the Korean miracle export growth in the 60s and 70s, horizontal policies very likely explain the Venezuelan catastrophic NHM export collapse of this century. Figure 2.15 shows the collapse of Venezuela's NHM and manufacturing exports, which dates way back before the imposition of widespread economic sanctions to

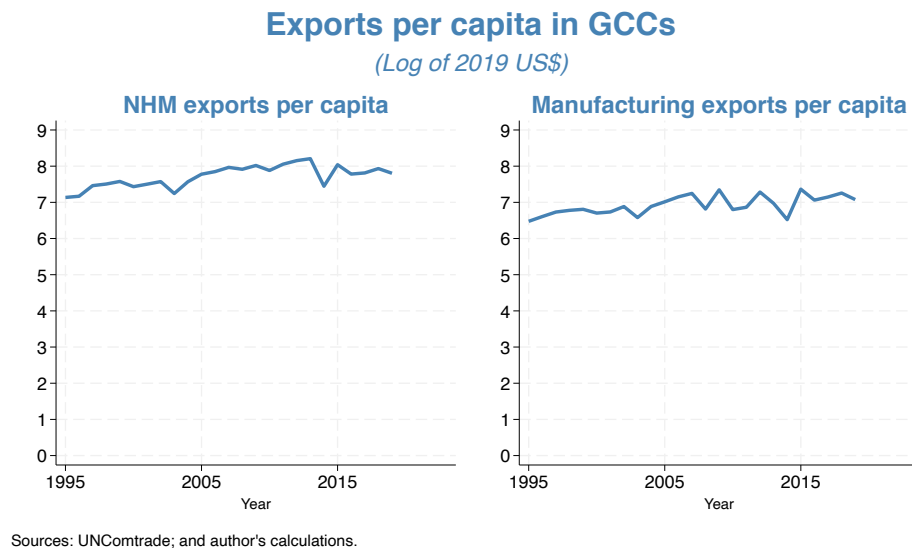
their government by the United States in the late 2010s. Surely the region's average export story would have been better if this formerly wealthy economy would not have collapsed.

Figure 2.15



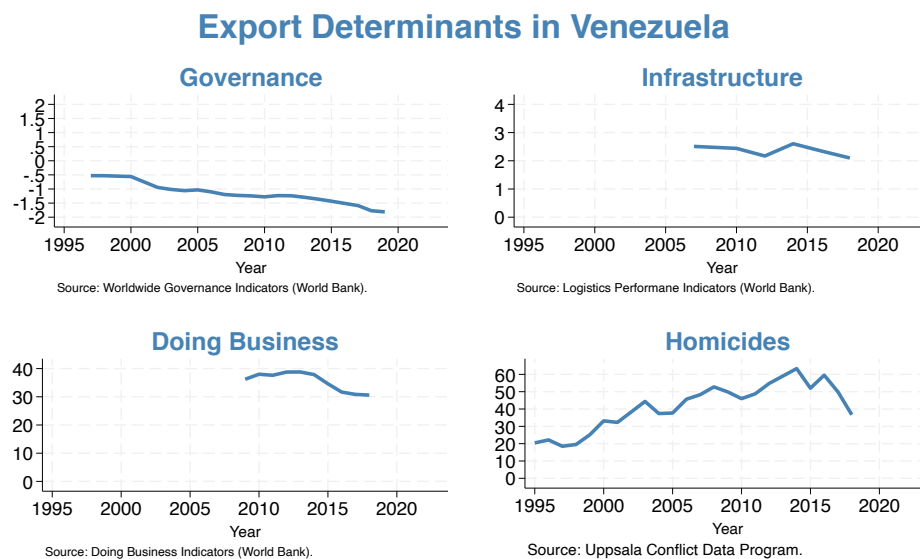
Venezuela's NHM and manufacturing export collapse is not likely consequence of a Dutch disease from its booming hydrocarbon exports as other hydrocarbon exporters have not experienced such NHM export collapse. In fact, NHM exports in GCC countries grew significantly during the oil boom in recent decades (Figure 2.16).

Figure 2.16



Venezuela's export collapse is widely considered a result of government mismanagement, as reflected in the dramatic erosion of many important indicators (Figure 2.17). In fact, since the Chavista government assume power in the late 1990s, Venezuela's WGI declined by one point, which is more than one standard deviation across all world countries. Similarly severe deteriorations took place in its infrastructure and business climate. From the start of the LPI and Ease of Doing Business recording, Venezuela recorded close to one cross-country standard deviation declines in these indicators. The deterioration in its security situation is most remarkable, with its homicide rate moving from an already high level in the late 1990s, to be one of the highest in the world in the years after.

Figure 2.17



Latam's underperformance relative to EA cannot be fully understood without considering Latam's frequent export collapses that are brought along by gross government mismanagement by radical regimes, in contrast to the largely well managed East Asian

governments. While the once prosperous Cuba and Venezuela are the extreme cases of economic collapse due to self-inflicted damage, practically all Latam countries have had periods of catastrophic economic mismanagement mainly through extreme trade protectionism and macroeconomic imbalances that have led to very high inflation and even several hyperinflation cases. It would be an extremely extraordinary and counterintuitive claim to argue that such macroeconomic disarrays in the region would have had no impact on its export development.

5. LATAM'S LARGE SPACE FOR POLICY STRENGTHENING

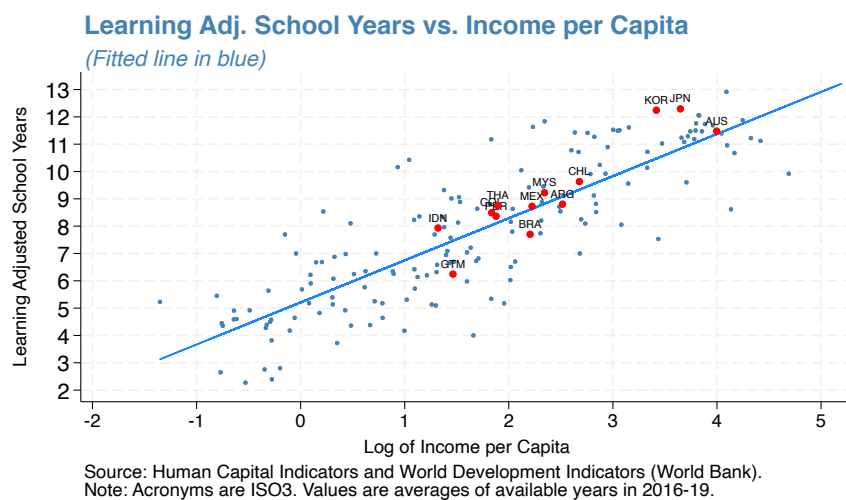
If Latam's export underperformance is largely related to its weaker export determinants, an important question is whether it is financially realistic for the region to significantly improve its export determinants? In other words, can Latam countries make significant strides in strengthening them given their GDP per capita?

The answer appears to be largely positive, considering that the financial constrain to the strengthening of horizontal policies is apparently not too strict. As suggested in chapter 1, this can be implied from the scattered plots between export determinants and GDP per capita, which show that there are significant positive (and negative) outliers in this relation. Positive outliers in those scatter plots can serve as role models for the strengthening of horizontal policies.

A scatter plot of the education index on the log of GDP per capita shows that KOR and JPN have much stronger education than is expected from their GDP per capita (Figure 2.18). All

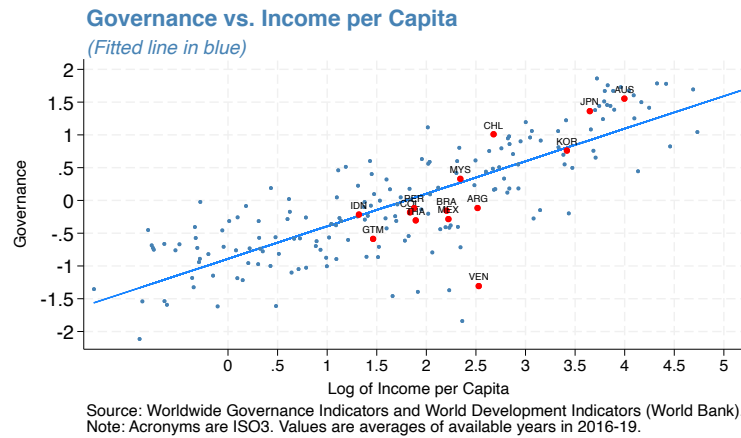
Latam countries can significantly strengthen their education outcomes by aiming to match the positive outlying of JPN and KOR. Furthermore, ARG, BRA, and GTM, have a considerably weaker education than expected from their GDP per capita, thus suggesting they have significant room for educational improvement given their existing resources.

Figure 2.18



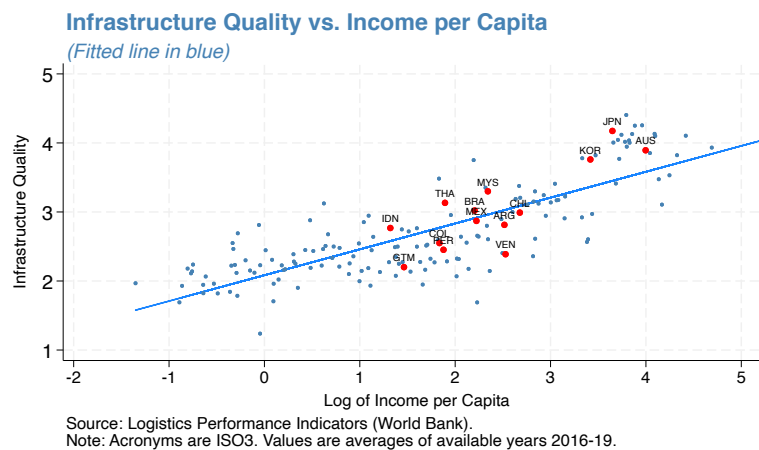
Most Latam countries have very poor governance even for their GDP per capita, with Venezuela being among the world's worst performers (Figure 2.19). Except for Chile, which is one of the best performers, it seems all Latam can significantly improve their governance by just reaching the level expected given their GDP per capita. Of course, even larger improvements can be made with their existing resources if they become positive outliers as notable as CHL, JPN, or KOR.

Figure 2.19



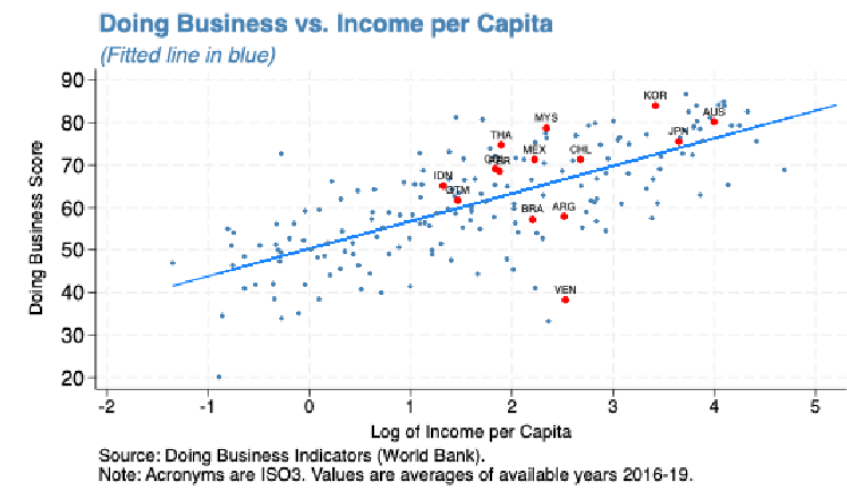
Latam's infrastructure underperformance given GDP per capita is also notable, whereas EA comparators are very strong performers in this area (Figure 2.20). In fact, all EA comparators are much bigger positive outliers than all Latam countries (including CHL). Latam can thus make substantial infrastructure improvements if it manages to establish an infrastructure development system as effective as in EA.

Figure 2.20



Many Latam countries are positive outliers in the relation between GDP per capita and the Ease of Doing Business, but none is as notably positive as EA's KOR, MYS and THA (Figure 2.21). While Latam's Ease of Doing Business is not as underperforming as its governance and infrastructure, significant improvements can be made if their countries match the EA's role models.

Figure 2.21



6. CAN LATAM CATCH UP WITH EA?

There is some statistical basis to expect that if Latam countries manage to match the performance of EA comparators in the scatter plots above, many of them could match EA's remarkable export performance. This can be inferred from simulations of the impact of "realistic" (within financial constraints) improvements in export determinants based on the regression point estimates of the coefficients of horizontal policies' variables in the gravity equation regressions presented in Chapter 1.

For this purpose, in this chapter we make slight modifications in these regressions, adding the Doing Business score and the Log of the Homicide rate, considering the important difference in these variables between EA and Latam.

The regression results presented in Table 2.1, confirm the important negative effect of the homicide rate on NHM and manufacturing exports. An increase in the log of the homicide rate by one-standard deviation lowers NHM exports by 15 percent and manufacturing exports by 24 percent. The homicide rate is not included in the cross-country regression of Table 2.2 because it reduces too much the number of observations (this makes many variables statistically insignificant). The Doing Business score is included in Table 2.1 and 2.2, implying that a one-standard deviation increase in it increases NHM exports by 13 percent, manufacturing exports by 40 percent, and services exports by 10 percent.

Table 2.1.

Determinants of exports by export type		
Dependent Variable: Log of exports of:	Non-hydrocarbon/mineral	Manuf.
Log GDP reporter	1.008***	0.925***
Log GDP partner	0.894***	0.799***
Log distance	-1.348***	-1.407***
Common currency dummy	0.264*	0.366**
Common border dummy	1.560***	1.751***
Common language dummy	0.677***	0.703***
Common colonizer dummy	0.672***	0.556***
Past colonial link dummy	0.921***	1.107***
Log of hydrocarbon/mineral assets	-0.01	0.0337*
Landlockedness	-1.900***	-1.722***
Log GDP per capita	-0.374***	-0.334***
Governance (WB Index)	0.248***	0.201**
Education (UN Index)	3.900***	3.929***
Infrastructure (GCR Index)	0.143***	0.186***
Average Tariff (Percent)	-0.0257***	-0.0497***
Labor market flexibility (GCR Index)	-0.05	-0.01
Doing Business (World Bank Index)	0.00912***	0.0274***
Log homicides per 100k people	-0.172***	-0.277***
Constant	-0.20	-2.01
Observations	32,706	31,454
Rho	0.93	0.93

Notes: * p<0.1, ** p<0.05, *** p<0.01. Panel regressions based on Hausman and Taylor (1981) technique with groups consisting of all combinations of reporter and partner countries in UN Comtrade database. Observations are non-overlapping 5-year averages within the 1962-2019 period, depending on data availability. Regression specification based on equation (7) of chapter 1. Multilateral resistance terms and partner country's policy variables included (coefficients not reported).

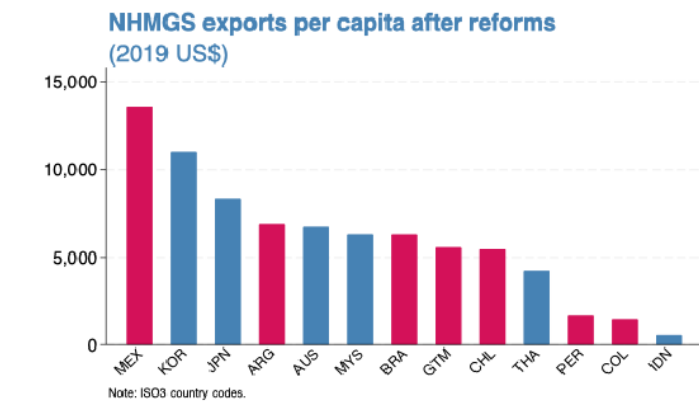
Table 2.2

Dependent Variable: Log of exports of services per capita	OLS	Between estimator	Random effects	OLS (2016-19)
Log of proximity to markets	0.845***	0.848***	0.364*	0.897***
Landlockedness	-0.335**	-0.33	-0.662**	-0.344
Log of natural resource assets	-0.01	-0.01	-0.02	-0.00478
Education Attainment	0.32	0.48	0.717*	0.684
Governance	0.495***	0.476**	0.337***	0.549**
Infrastructure	0.10	0.17	0.124**	0.121
Import tariff	-0.0490***	-0.0534*	-0.01	-0.0605**
Labor flexibility	0.145*	0.14	0.115*	0.077
Doing Business	-0.01	-0.01	0.00666*	-0.01
Log of GDP per capita	0.495***	0.442**	0.421***	0.447*
Constant	-8.679***	-10.14**	-1.82	-9.313**
Observations	336	336	336	111
Adjusted R-squared	0.86	0.86		0.84
Rho			0.97	

Notes: * p<0.1, ** p<0.05, *** p<0.01.

Based on these estimates we simulate a scenario in which all Latams become as positive outliers in the scatter plots of section 5 as KOR in education, governance, infrastructure, and ease of doing business, while lowering their average tariffs to 2 percent and their homicide rate to the world average (5 homicides per 100,000 people). Under this ambitious but financially realistic scenario their NHM goods and services (NHMGS) exports would expand substantially (Figure 2.22).

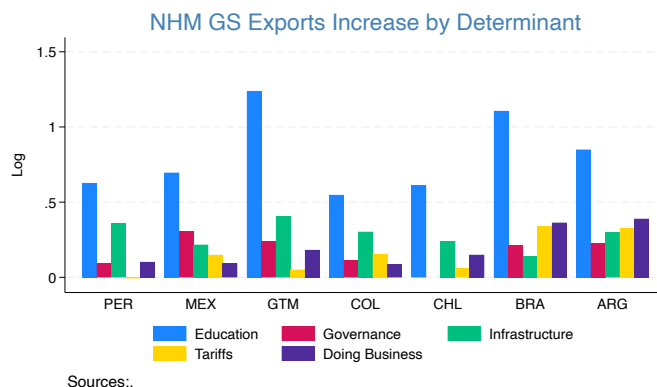
Figure 2.22



With an already high level of NHMGS exports per capita given their proximity to the large US market, Mexico would even surpass exporting stars KOR and JPN. Despite their remoteness, SCCs would broadly match the good export performance of MYS, even without the PM of MYS. Andean countries would not attain such levels though as their relatively low GDP per capita constraints the strengthening of their fundamentals. Nevertheless, the significant boost to their exports from the strengthening of their export determinants should boost their GDP per capita, which in turn could allow them to further boost their export determinants in a virtuous cycle.

We can estimate which improvements in export determinants most importantly contribute to the projected expansion of exports in this scenario, by multiplying the estimated improvement in exports determinants for each country by the regression coefficient of each horizontal policy determinant. This exercise suggests that improvements in education are the most significant contributor, with GTM, BRA, ARG and MEX benefiting the most (Figure 2.23). Improvements in infrastructure are generally the second most significant contributors to projected exports expansions, being most significant for GTM, PER, COL.

Figure 2.23



Improvements in infrastructure are generally the second most significant contributors to projected exports expansions, being most significant for GTM, PER, COL. There is no observation of Venezuela's education quality so we do not know how much this factor could contribute to fostering its exports, but we observe that this country benefits the most and by far from the projected improvements in governance, infrastructure and Ease of Doing Business.

Importantly, as suggested earlier, strengthening exports determinants is likely to lead to virtuous cycles of exports expansions leading to GDP per capita expansions and this to further strengthening of export determinants. Therefore, Latam countries can aspire to boost their NHMGS exports beyond the assumed strengthening of this scenario, so that the ceiling of exports strengthening for this region can be significantly higher than under our simulated scenario.

We can further simulate what would be the impact of this simulated boost to Latam countries' horizontal policies and consequent increase in their GDPs on the PM. Such a chain of events would result in a second-round effect on Latam's exports given the empirical importance of PM on exports. We can do this empirically, although admittedly very speculatively, by calculating the resulting increase in GDP from the simulated increase in all Latam's NHM exports, multiplying the latter by an estimated elasticity of GDP on NHMGS exports from a simple scatter plot of those two variables. With this calculated increase in GDP in Latam's countries we can recalculate each countries' PM.

Figures 2.24 show the PMs that result from such exercise, and these can be compared to the PMs before the reforms in Figure 2.25. The projected PM increases in Latam range between 11 percent for VEN to 45 percent for GTM.

Figure 2.24

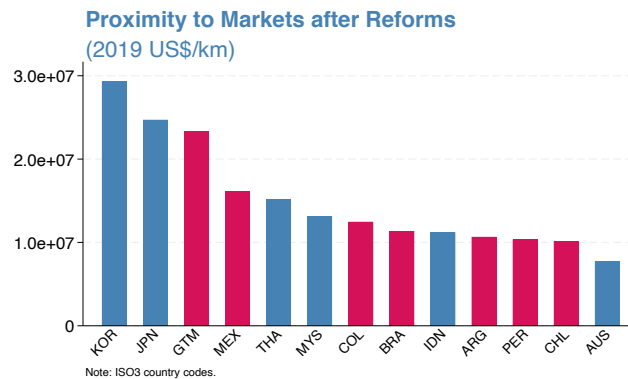


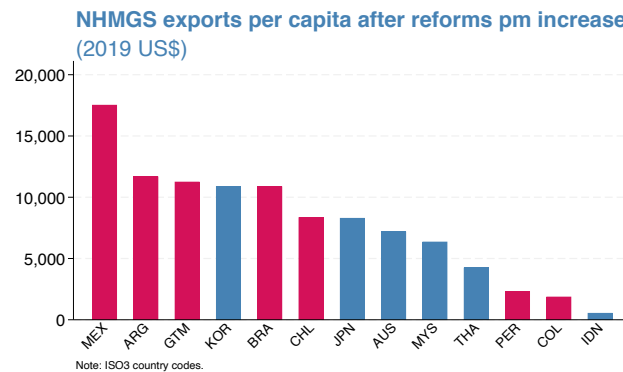
Figure 2.25



The impact on Latam's NHMGS exports of this simulated region-wide increase in PM indices is substantial (Figure 2.26). With their already high PM from their nearness to the US market, MEX and GTM would have higher NHMGS exports per capita than EAs. And the simultaneous boosting of GDP per capita in South America would allow those countries with the highest starting GDP per capita (ARG, BRA, and CHL) to offset their remoteness from the large Asian, European and US markets and surpass the NHMGS exports per capita of most

EAs. Note that an even bigger impact would take place if not only these sample Latam countries, but the rest of Latam would similarly strengthen their export determinants.

Figure 2.26



Thus, substantial and simultaneous improvements in export determinants across Latam countries can generate important agglomeration effects, reflected in the higher PM indices, and which can ideally help Latam match the agglomeration effects that benefit EA countries. Note though that Latam's agglomeration effects would result from having high GDP per capita across the region more than by population size, which is much smaller than EA's. Nonetheless, caution against drawing strong conclusions from these simulations considering the very simplistic methodology.

7. CONCLUSIONS

This chapter shows statistical evidence that EAs export more NHMGs than most Latam largely because of larger population/economic agglomeration, as well as because stronger horizontal policy determinants (stronger even when controlling for GDP per capita). Considering this evidence, we can at the very least assert that it is very hard to reject a null hypothesis that PM and horizontal policies explain Latams export underperformance, as some economists do.

Moreover, note that both regions have made intensive use of IPs, including subsidies to exports and EPZs, so it is unlikely that IPs are the differentiating factor.

One can think of several ways in which Latam can boost the horizontal policies in which it underperforms the most. Most evidently, governance can be significantly improved by avoiding ideologically rooted governance catastrophes (most notably Cuba and Venezuela), easing business regulations, and lowering world-record violence.

Ideally, Latam should assemble infrastructure development systems that attain EAs effectiveness. Trans-Amazonian and Trans-Andean transport infrastructure is key to strengthen the South American agglomeration. Ongoing megaport projects in the South American pacific that serve to link it to Asia are also key.

Beyond the issues discussed in this chapter, one can think of two other country-specific issues that are very worth wondering upon in the future. One is that, given its population size (half of South America's), the export takeoff of Brazil is key to boost the South American agglomeration (in other words, to increase the PM indices of the South American subregion). Another is that it is puzzling why Mexico's NHMGS exports takeoff has not been accompanied by fast GDP growth. Mexico's ECI increased from about 0.5 in the 1980s to 1 in 2000s, but growth was low. This latter fact deserves careful attention, as it leaves us seriously wondering...does what you export really matter?

CHAPTER 3: IS CHILE A ROLE MODEL OF EXPORT DIVERSIFICATION POLICIES? A REASSESSMENT

1. INTRODUCTION

Although strong economic fundamentals have allowed Chile to experience economic growth and poverty reduction on par with East Asian countries, its continued dependence on copper exports nurtures a perception that the country has underperformed in promoting export diversification and structural transformation.²⁵ This hypothetical failure is considered of particular importance by many economists who argue that developing other more labor-intensive export sectors (such as manufacturing and services) may have more direct social benefits than copper exports and that export diversification, by lowering output volatility, could further enhance Chile's long term economic growth (see for example Haddad and others, 2010). Nonetheless, Gonzalez and others (2020) counter this argument by noting that Australia and New Zealand prospered socioeconomically while preserving their export concentration on traditional products.

While the need to diversify Chile's exports is still under debate, and after noting in the previous chapter that Chile appears to be a good export performer when controlling for its PM, this chapter reassesses its success in promoting export diversification. Considering Chile's aspirations to excel not just among Latam countries but among OECD countries, we raise the bar in the analysis with respect to Chapter 2, by focusing not only on NHM exports

²⁵ Based on Salinas (2021b) and Salinas (2024)

and services but also on exports of high complexity (as defined in Hidalgo and Hausmann, 2009, and Salinas, 2021).²⁶

In this chapter we find that, though it is factually correct that Chile has an export basket highly concentrated in copper products, it is also true that it has significantly developed complex exports, which is an ambitious goal of export diversification policy strategies.²⁷ Chile's traditional indicators of export diversification and complexity are not favorable because of its exogenous abundance of copper and high international copper prices, not because of a weak capacity of the country to develop non-copper exports. The chapter further shows that Chile's positive performance in developing complex exports is in line with its significant strength in often cited horizontal policy determinants of export diversification and complexity. In fact, its policy strength is such that, controlling for the negative effect of its remoteness to other markets, Chile's per capita exports of NHM and complex exports are among the highest in the world.

2. REASSESSING CHILE'S EXPORT PERFORMANCE

As will be clear in this chapter, Chile's success or failure in promoting non-copper exports can be evaluated only after filtering out its exogenous copper abundance and the volatility of copper prices (in this section) and controlling for its remoteness (in the following section).

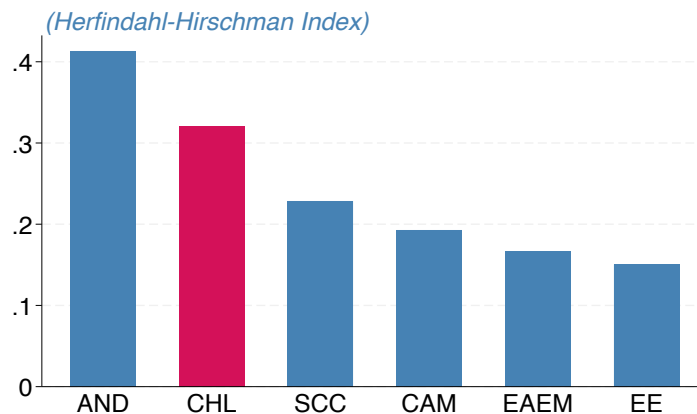
Indeed, traditional quantitative measures of export concentration are high for Chile relative to

²⁶ See Section A.3. of the methodological appendix for a description of export complexity and complex exports.

²⁷ Although the concept of complexity is not part of mainstream economic growth or international trade theory, it is used in this paper given its wide influence on the empirical public policy literature, and because its related Product Complexity Index is broadly related to an intuitive understanding of the complexity or sophistication of products.

the average in other emerging market regions (Figure 3.1). With a Herfindahl-Hirschman Index (HHI) of exports concentration above 0.3 in 2015, Chile's export basket appears much less diversified than those of the manufacturing powerhouse countries of Central America and Mexico (CAM), and East Asian Emerging Markets (EAEM).

FIGURE 3.1
EXPORT CONCENTRATION INDEX IN 2016-19

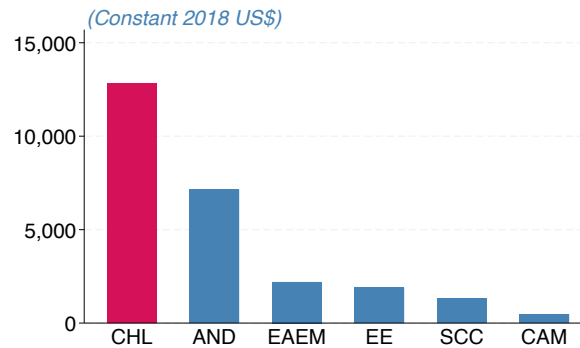


Source: UN COMTRADE

Note: AND=Andean countries; CAM=Central America and Mexico; EAEM=East Asia Emerging Markets; EE=Eastern European; SCC=Southern Cone Countries. Subregional grouping described in Table A.1.

However, this seems largely a result of Chile's strong dependence on copper exports, as copper represents about half of Chile's goods exports. This, in turn, is a natural consequence of Chile's superlative copper wealth, which results in Chile having hydrocarbon/mineral (HM) assets per capita among the top 20 countries worldwide, and much above its comparators (Figure 3.2).

FIGURE 3.2
FOSSILE FUEL AND MINERAL ASSETS PER CAPITA IN 2016-18

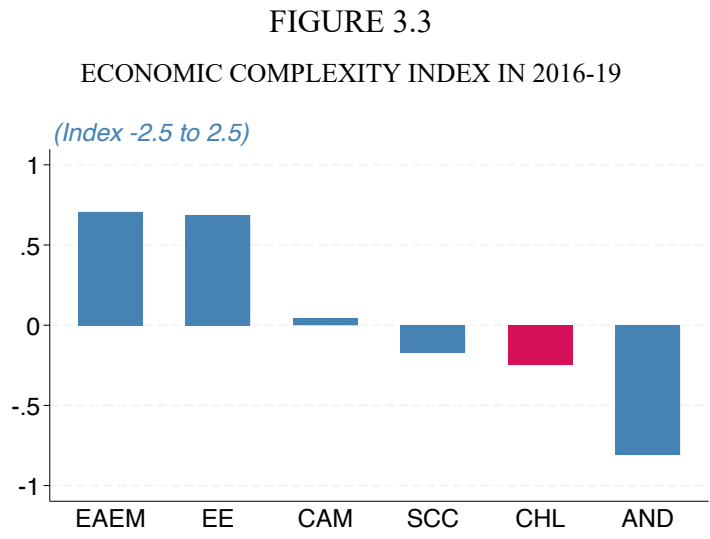


Source: World Bank's Wealth of Nations database; and author's estimates

Note: AND=Andean countries; CAM=Central America and Mexico; EAEM=East Asia Emerging Markets; EE=Eastern European; SCC=Southern Cone Countries. Subregional grouping described in Table A.1.

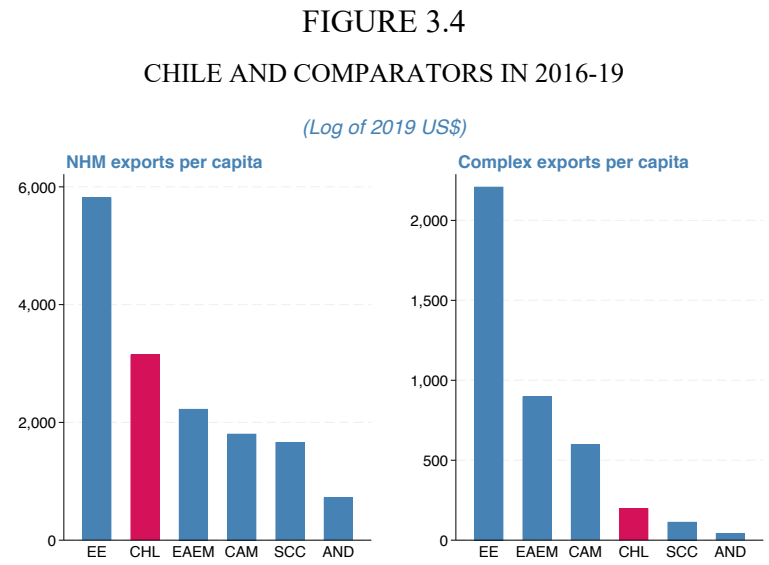
Also, partly because of copper dominance, Chile ranks low in the Economic Complexity Index (ECI).²⁸ Since copper appears in the bottom 5 percent of the Product Complexity Index (PCI developed in Hausmann and others, 2013), Chile's ECI is lower than in most other emerging market regions (Figure 3.3). This is the case although Chile performs strongly in factors that are statistically related to exports diversification and complexity identified in Giri and others, (2019), Ding and Hadzi-Vaskov (2017), and Salinas (2021a) such as educational attainment, institutional strength, and infrastructure development.

²⁸ The ECI of a country is calculated in Hidalgo and Hausmann (2009) based on the diversity of exports a country produces and their ubiquity, or the number of the countries able to produce them (and those countries' complexity). According to its authors, this index aims to measure the *productive capabilities* and *knowledge in a society* as expressed in the products it exports.



Source: Hausmann and others (2013)
 Note: AND=Andean countries; CAM=Central America and Mexico; EAEM=East Asia Emerging Markets; EE=Eastern European; SCC=Southern Cone Countries. Subregional grouping described in Table A.1.

Switching the unit of analysis from concentration indices to values of the export categories needed to diversify exports and increase their complexity considerably improves Chile’s relative standing (Figure 3.4). Following its success in developing non-copper export products in recent decades, Chile’s NHM exports per capita now compares favorably to those of the manufacturing powerhouse regions of CAM and EAEM.



Source: UN COMTRADE; Hausmann and others (2013); and author's calculations.

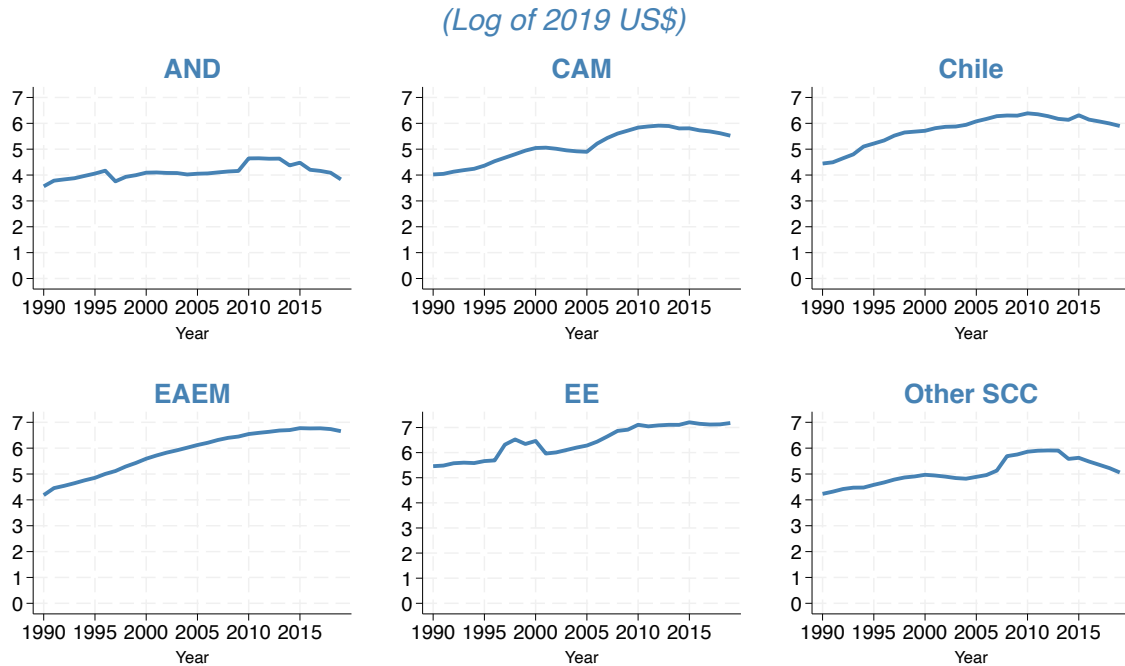
Note: NHM exports exclude SITC rev 2 codes 3000-4999; 6772-6999, and 9000-9999. Complex exports are goods with Product Complexity Index (Hausmann and others, 2013) above Zero.

AND=Andean countries; CAM=Central America and Mexico; EAEM=East Asia Emerging Markets; EE=Eastern European; SCC=Southern Cone Countries. Subregional grouping described in Table A.1.

Because some of Chile's NHM exports are of natural resource-based products with low complexity, the country does lag CAM and EAEM in terms of complex exports per capita. But it is also noteworthy that the growth rate of Chile's complex exports per capita is not too different from the average in emerging market regions with successful manufacturing export sectors (Figure 3.5). Growing by a factor of eight in the last three decades since the mid-1980s, Chile's complex exports per capita performance has been more similar to the average in CAM and EAEM countries, than to nearby Andean (Bolivia, Colombia, Peru, and Venezuela) and Southern Cone (Argentina, Brazil, Paraguay and Uruguay) subregions, which increased exports complexity by factors of two and three, respectively.²⁹ Thus, by 2014-16 Chile's complex exports per capita were six times higher than in Andean countries (AND) and three times higher than in the average in other Southern Cone countries (SCC).

²⁹ Besides Central American countries (Costa Rica, Guatemala, Honduras, Nicaragua, and El Salvador) CAM includes Mexico. EAEM includes China, Indonesia, Malaysia, Thailand, and Vietnam.

FIGURE 3.5
COMPLEX EXPORTS GROWTH IN CHILE AND COMPARATORS
(Log of 2019 US\$)



Source: UN COMTRADE; Hausmann and others (2013); and author's calculations.

Note: Complex exports are goods with Product Complexity Index (Hausmann and others, 2013) above zero. AND=Andean countries; CAM=Central America and Mexico; EAEM=East Asia Emerging Markets; EE=Eastern European; SCC=Southern Cone Countries. Subregional grouping described in Table A.1.

At least one methodological reason and two conceptual reasons help explain CAM's and EAEM's higher complex exports per capita. The methodological issue is that CAM and EAEM countries participate more intensively in GVCs than Chile, so that their gross NHM exports overstate their domestic value added. According to the OECD Trade in Value Added (TIVA) database (OECD, 2019), in 2018 the domestic value added of NHM exports of Mexico, Malaysia and Thailand, the CAM and EAEM economies with highest complex

exports per capita, was around 60 percent.³⁰ In comparison, the domestic value added of NHM exports of distant Australia and Chile was 81 and 88 percent of their gross exports, respectively. Thus, the difference in the value added of complex level per capita between EAEM and Chile is likely much lower (about 2 to 1) than the difference in gross complex exports per capita shown in the chart above (about 3 to 1).

One of the conceptual reasons is that even though the production of copper is not particularly labor-intensive, the share of labor it demands directly and indirectly is not negligible. With less labor force available to non-copper sectors, the per capita level of complex exports is expected to be lower than in the absence of such large copper production. CAM countries do not have significant HM exports and although EAEM countries also have significant HM exports per capita, in 2017, Chile had a ratio about four times higher.

Before exploring the second conceptual reason (remoteness) in the next section, we note that while some of Chile's complex exports are linked to its abundant natural resources, many others are not. Looking at a list of Chile's top ten complex exports we see that only few (Processed Copper and Converted Paper), are products that industrialize natural resources (Table 3.6). Most are manufacturing products, such as telecommunications products, vehicles, machinery and medicaments, that are not linked to natural resource abundance. This is a positive sign that Chile's comparative advantage is not solely related to its natural resources but also to its strength in policies that nurture export complexity (which we discuss

³⁰ Data on exports value added is not available for most countries, therefore the rest of the analysis centers on gross exports. Note that all indices of diversification and export *superiority* are subject to this caveat.

below). Noteworthy also, Chile produces many highly complex products, with PCIs above two, such as medical equipment, electrical instruments, and metal working machine tools.

TABLE 3.1
LIST OF TOP 10 COMPLEX EXPORTS FROM CHILE, 2016-19

Product	US\$ m (annual average)
Rubber tyres & tubes for vehicles and aircraft	312.1
Paper and paperboard in rolls or sheets nes	311.7
Copper and alloys of copper, worked	258.3
Bodies & parts motor vehicles ex motorcycles	166.2
Alcohols, phenols, phenol alcohols, glycerine	162.1
Medicaments	153.2
Other artificial resins and plastic materials	121.8
Construction and mining machinery, nes	119.7
Iron and steel forgings in the rough state	97.7
Rail. & tram. freight cars, not mechanically propd.	90.1

Source: UN Comtrade.

Note: Complex exports are goods with Product Complexity Index (Hausmann and others, 2013) above zero.

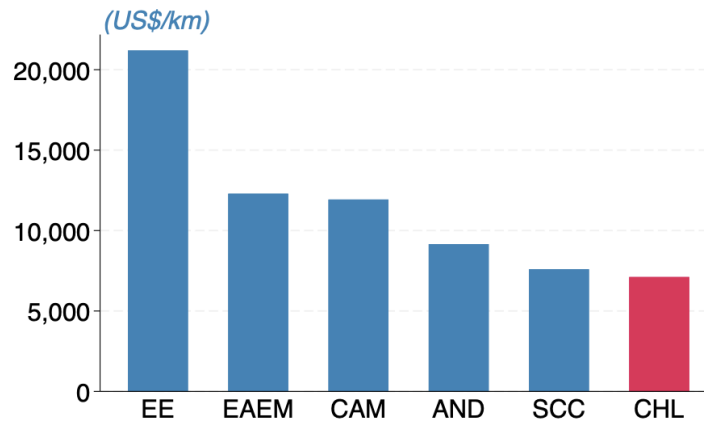
3. HAMPERED BY REMOTENESS

Chile's main limitation in developing complex and non-mineral exports in general is most likely its remoteness from the main centers of global economic activity or its low Proximity to other Markets (PM) as defined in Salinas (2021a) (Figure 3.6).³¹ Far from the large Asian, European, and North American markets, the costs of transporting Chile's exports are considerably higher than for countries that are located within or in the close periphery of these regions. This limits its potential to join GVCs and therefore it is not surprising that its level of complex exports per capita is considerably lower than in CAM, EAEM, and Eastern

³¹ In that study, GDP per capita is added as an independent variable acknowledging that it can also approximate wage costs, but mainly to control for potential endogeneity between NHM exports per capita and T-variables. Higher NHM exports can foster GDP and higher GDP can help strengthening T-variables (for example, higher output can facilitate/finance higher educational attainment). Note though that GDP per capita is not included in the calculation of goodness of fit when estimating the predictive power of policy variables.

Europe (EE).

FIGURE 3.6
PROXIMITY TO MARKETS IN 2016-19

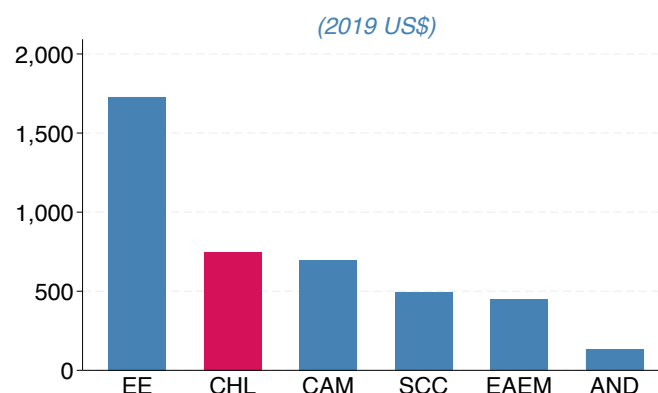


Source: UN COMTRADE; and author's estimates.

Note: Proximity to Markets is the sum of GDP of partner countries weighted by their distance to the country. AND=Andean countries; CAM=Central America and Mexico; EAEM=East Asia Emerging Markets; EE=Eastern European; SCC=Southern Cone Countries. Subregional grouping described in Table A.1.

A fact that is likely evidence of the limitation imposed by Chile's remoteness is that, because non-tourism services are less sensitive to the distance factor, Chile's per capita exports of services compare favorably to other regions including EAEM (Figure 3.7). Chile's service exports include those of its largest airline (the largest in Latin America), as well as Business, Information Technology, and Financial Services (Table 3.2). These are skill-intensive products which show that the Chilean economy has the capabilities to produce high value-added exports especially when distance is not a major limiting factor.

FIGURE 3.7
SERVICE EXPORTS PER CAPITA IN 2016-19



Source: EBOPS; Hausmann and others (2013); and author's calculations.

Note: Complex exports are goods with Product Complexity Index (Hausmann and others, 2013) above zero. AND=Andean countries; CAM=Central America and Mexico; EAEM=East Asia Emerging Markets; EE=Eastern European; SCC=Southern Cone Countries. Subregional grouping described in Table A.1.

TABLE 3.2

SERVICE EXPORTS FROM CHILE, 2016-19

Product	US\$ m (annual average)
Transportation	3152
Travel	2853
Other business services	2545
Computer and information services	357
Insurance services	301
Financial services	298
Royalties and license fees	56
Personal, cultural, and recreational services	43

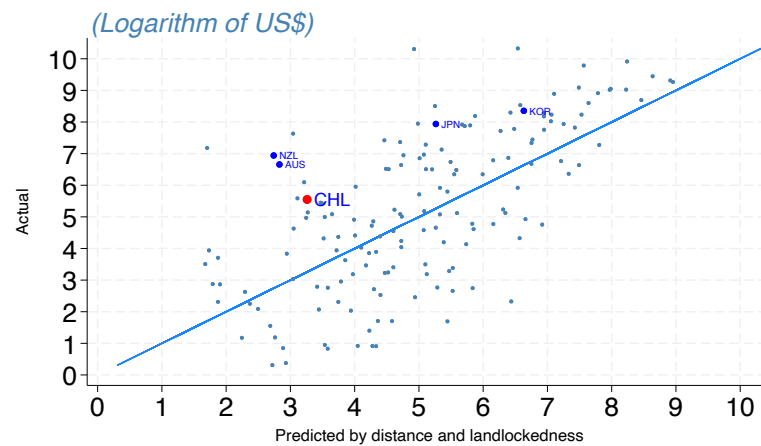
Source: EBOPS Database in UN Comtrade.

Statistical estimates of the impact of geographic remoteness on export development in Salinas (2021a) also suggest that this factor is a major limitation for Chile. They predict that because Chile's PM index is about half of the average of EAEM countries, its complex exports per capita should be about a third of the latter region only due to distance.

Likely because of its relatively solid horizontal policy framework, Chile's complex exports per capita are in fact much higher than predicted only by the PM index (distance) and

landlockedness (Figure 3.8a) or by the PM index, landlockedness, and HM assets (Figure 3.8b). As suggested in chapter 1, all countries that are significantly above the fitted line very likely have strong export diversification policy frameworks that allow them to surpass expectations anchored in geographic determinants and therefore hint at “role models” of export development policies.

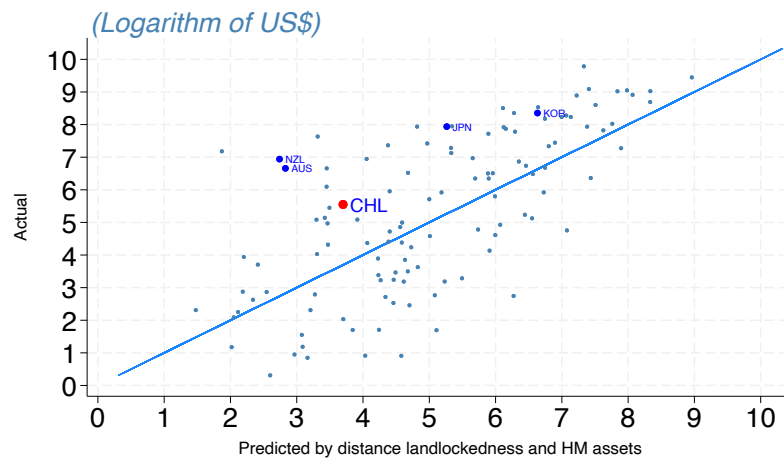
FIGURE 3.8
COMPLEX EXPORTS PER CAPITA - ACTUAL VS PREDICTED
a) Predicted by distance and landlockedness



Source: UN Comtrade database; and author's calculations.

Note: Adjusted R-squared 0.35. Acronyms are ISO3. Annual average of years 2016-19.

b) Predicted by distance, landlockedness, and hydrocarbon/mineral assets



Source: UN Comtrade database; and author's calculations.

Note: Adjusted R-Squared 0.38. Acronyms are ISO3. Annual average of years 2016-19.

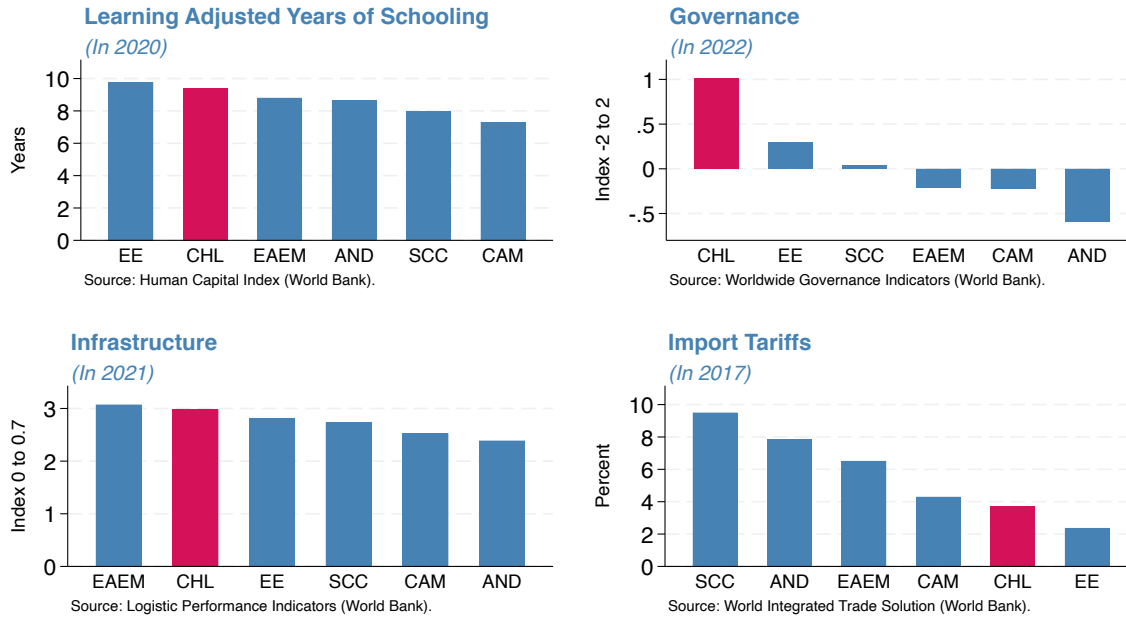
Chile seems to be one such model. Superlative countries in these scatter plots include well known models of export development in East Asia, such as Japan, Malaysia, South Korea, and Thailand. Remarkably, the upward deviation of Chile's complex exports per capita with respect to the level predicted by distance is similarly among the highest in the world, as is the case of also remote Australia (AUS) and New Zealand (NZL).

Comparing Chile's horizontal policies to those of comparator regions corroborates that strong policies most likely play a role in boosting its complex exports way above the value predicted by its PM (Figure 3.9). Chile's governance is considerably stronger than all its comparators, while it is only surpassed by EE on education and trade policy openness and by EAEM on infrastructure development. As expected then, a scatter plot comparing the level of complex export per capita predicted not only by distance but also by policy variables (governance, education, infrastructure, and import tariffs) does a much better job at predicting Chile's complex exports (Figure 3.10).

FIGURE 3.9

DETERMINANTS OF COMPLEX EXPORTS IN CHILE AND COMPARATORS IN 2016-19

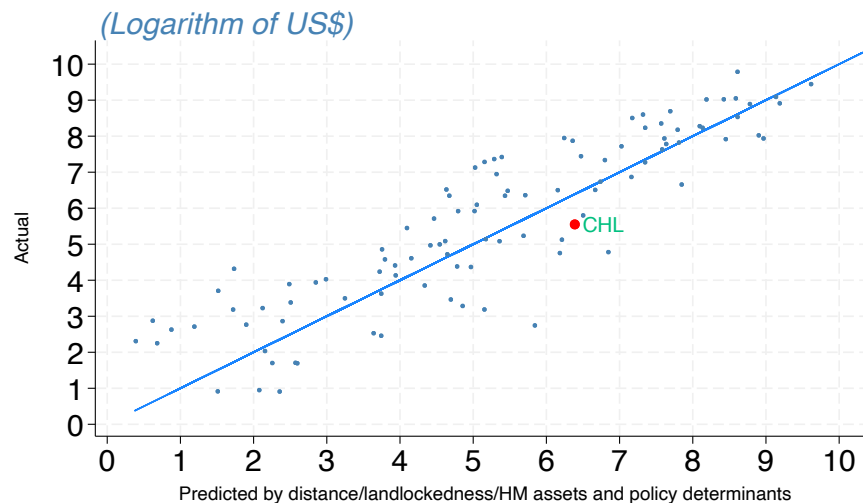
(Latest year available)



Note: Country acronyms are ISO3. AND=Andean countries; CAM=Central America and Mexico; EAEM=East Asia Emerging Markets; EE=Eastern Europe; SCC=Southern cone countries. Regional subgroupings described in Table A.1.

FIGURE 3.10

COMPLEX EXPORTS PER CAPITA - ACTUAL VS. PREDICTED

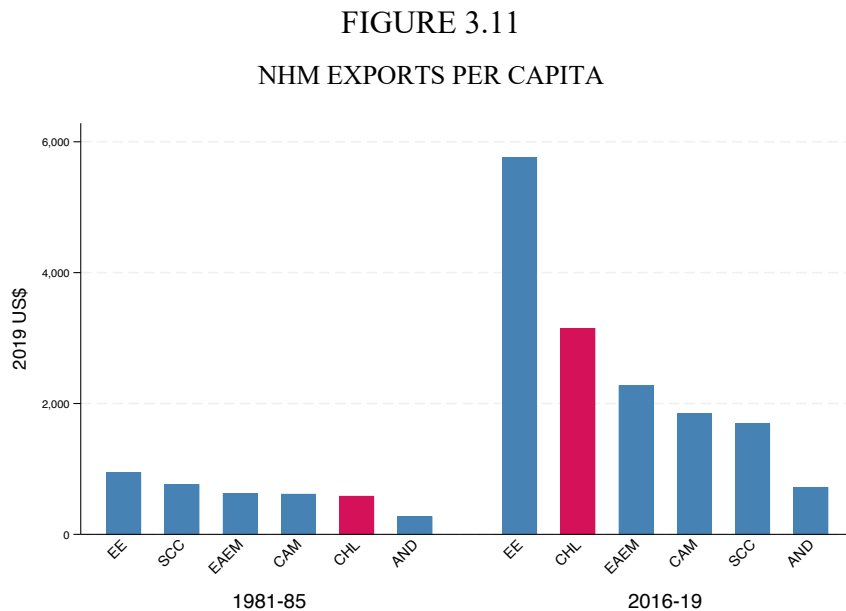


Source: UN Comtrade database; and author's calculations.

Note: Acronyms are ISO3. Annual average of years 2016-19.

4. CHILE'S POLICY STRENGTHENING IN RECENT DECADES

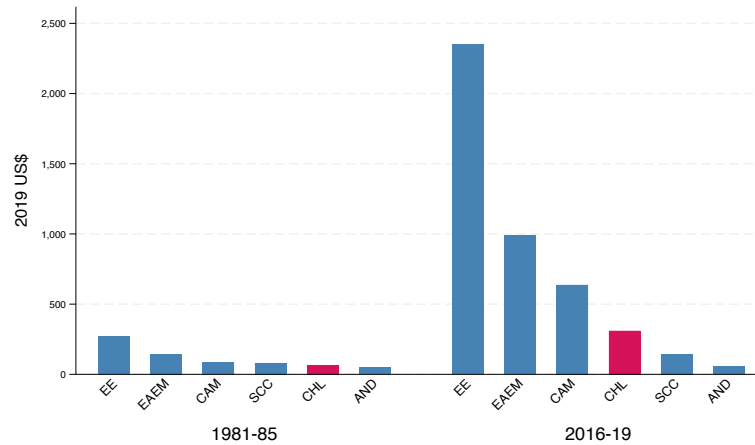
Chile's NHM exports per capita were within the average range of emerging market regional groups back in 1980 (Figure 3.11). Since then, it has gradually surpassed the average level in most other EM regions, including the high performing EAEM region, despite its remoteness to the large economic centers. But its progress in fostering complex export development has not been as impressive, only surpassing SCC countries and lagging the EAEM average (Figure 3.12).



Source: UN Contrade; and author's calculations.

Note: AND=Andean countries; CAM=Central America and Mexico; EAEM=East Asia Emerging Markets; EE=Eastern European; SCC=Southern Cone Countries. Subregional grouping described in Table A.1.

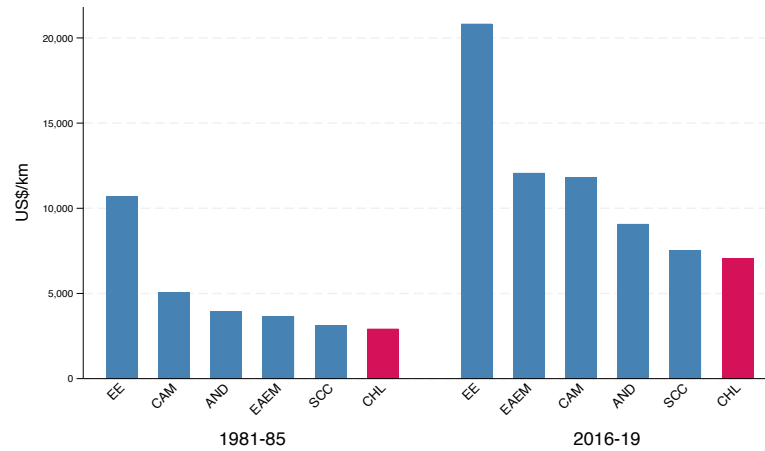
FIGURE 3.12
COMPLEX EXPORTS PER CAPITA



Note: AND=Andean countries; CAM=Central America and Mexico; EAEM=East Asia Emerging Markets; EE=Eastern European; SCC=Southern Cone Countries. Subregional grouping described in Table A.1.

Chile's less impressive development of complex exports relative to EAEM is likely related to its remoteness, as these exports commonly develop within GVCs, which are strongly dependent on proximity to large economies. Importantly, Chile's distance disadvantage relative to EAEM's has increased, as its PM index relative to this region decreased from two thirds in 1980 to one half in 2017 (Figure 3.13). This is likely because the large East Asian economic agglomeration (efficiently linked through sea-based transportation) benefits from a virtuous circle through which the high initial PM of these countries fosters their intraregional exports and economic activity, and this in turn increases the regions PM. As many of these countries still have significant room to converge on the income per capita of advanced countries this virtuous circle will surely continue in coming decades.

FIGURE 3.13
PROXIMITY TO MARKETS



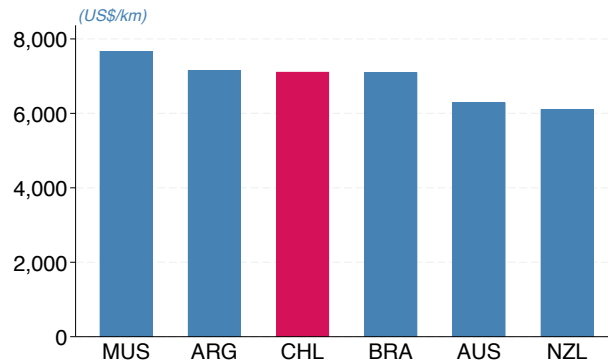
Note: Proximity to Markets is the sum of GDP of partner countries weighted by their distance to the country. . Regional acronyms described in Table A.1.

In contrast, Chile's relatively isolated South American neighbors have low PMs and this limits their potential for intraregional export development and economic growth. Without the impulse from a nearby and fast-growing economic agglomeration, Chile's development of non-copper exports has hinged on the strength of its policy determinants of export diversification and complexity.

Acknowledging thus once more how Chile's remoteness affects the assessment of its export performance, the rest of this chapter compares it with other remote countries with similar PM (Figure 3.14). In such comparison, Chile has the highest level of per capita complex exports among emerging market regions and only trails high-income Australia and New Zealand

(Figure 3.15).³²

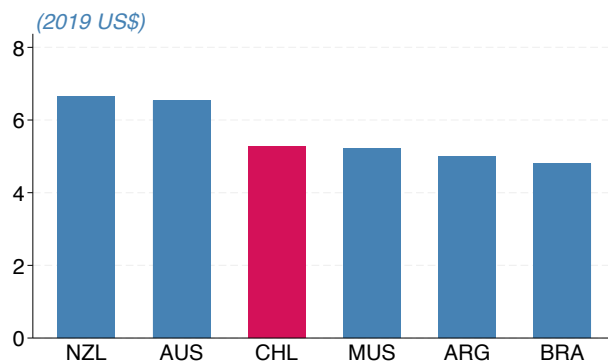
FIGURE 3.14
PROXIMITY TO MARKETS IN 2016-19



Source: UN Comtrade; and author's estimates.

Note: Proximity to Markets is the sum of GDP of partner countries weighted by their distance to the country. Country acronyms are ISO3.

FIGURE 3.15
COMPLEX EXPORTS PER CAPITA IN 2016-19



Source: UN Comtrade; and author's estimates.

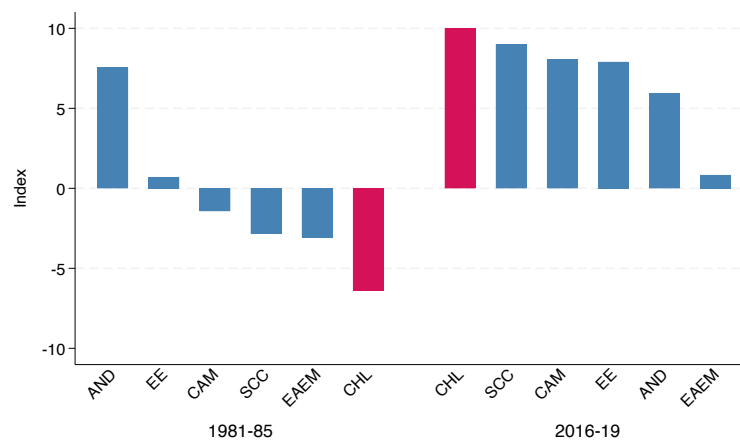
Note: Country acronyms are ISO3.

Relative to these remote comparators, Chile has considerably strengthened its horizontal policies, particularly in the areas of governance and trade policy openness. After a politically unstable period that included an almost two-decade long military government, Chile returned

³² The comparator remote countries include those with an income per capita above 8,000 US dollars per capita, population above 1 million, and located at a southern latitude similar to Chile's.

to a democratic system and experienced a long period of uninterrupted development of political and economic institutions. This is reflected in an improvement in its Polity IV index from a negative to the maximum score, reaching the same score as for Australia and New Zealand (Figure 3.16). And by 2016-19, the World Bank's overall governance index indicates that Chile is considerably ahead of the average in comparator emerging market regions, as seen in the previous section.

FIGURE 3.16
POLITICAL STABILITY INDEX

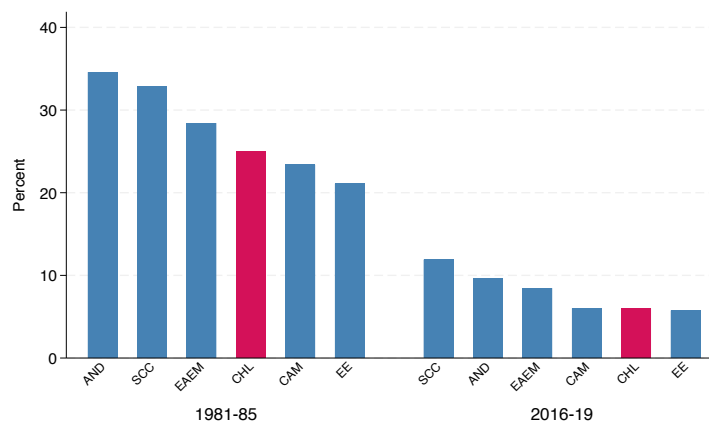


Note: Polity IV Governance Index. AND=Andean countries; CAM=Central America and Mexico; EAEM=East Asia Emerging Markets; EE=Eastern European; SCC=Southern Cone Countries. Regional grouping described in Table A.1.

Chile's progress in liberalizing its trade policies has been particularly outstanding too. Its average Most-Favored-Nation (MFN) tariff has been reduced from about 100 percent in the 1970s to about 25 percent in 1980, and to low single-digit in 2017 (Figure 3.17). This 95-percentage point reduction in Chile's average tariff on its own is statistically associated to a twenty-fold expansion in complex exports per capita according to estimates in Salinas (2021a). Chile is also one of few countries that wiped out non-tariff barriers, and did it ahead

of most developing countries, in the 1970s. Moreover, Chile has been notably active in signing Free-Trade Agreements, especially with its largest trading partners, including the United States, East Asian countries, the European Union, Oceanic countries, and other South American countries. Hence, most of Chile's exports and imports are subject to the open trade conditions established in these agreements.

FIGURE 3.17
AVERAGE IMPORTS TARIFF

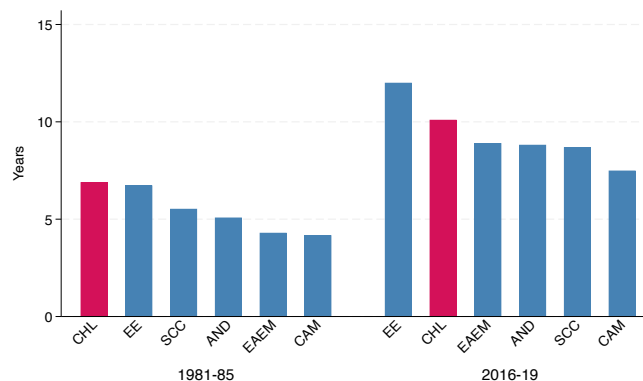


Source: World Development indicators (World Bank)

Note: Simple average imports tariff. AND=Andean countries; CAM=Central America and Mexico; EAEM=East Asia Emerging Markets; EE=Eastern European; SCC=Southern Cone Countries. Regional grouping described in Table A.1.

Chile's educational attainment has been comparatively high for several decades and, while it has not relatively improved in recently, it is most likely a major pillar of its export strength. Although its educational attainment has been recently surpassed by the EE region, it remains above that of other emerging market regions, including EAEM (Figure 3.18). Noteworthy, Chile appears above other emerging market regions except EE in the measure of quality of learning in the World Bank's School Years Adjusted by Learning Indicator.

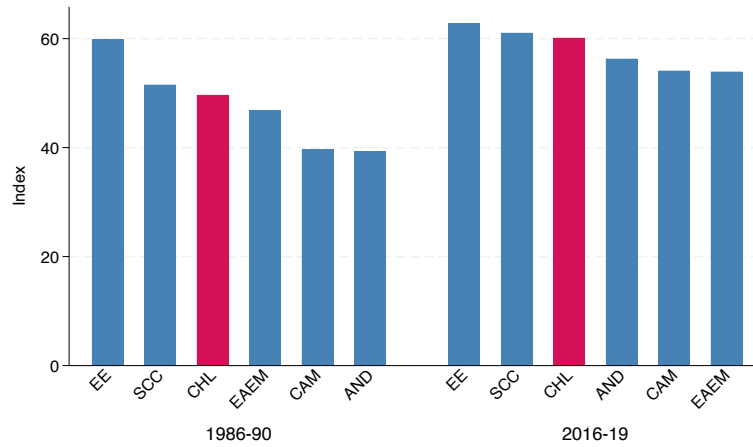
FIGURE 3.18
EDUCATION ATTAINMENT



Note: Barro-Lee average years of education attainment. AND=Andean countries; CAM=Central America and Mexico; EAEM=East Asia Emerging Markets; EE=Eastern European; SCC=Southern Cone Countries. Regional grouping described in Table A.1.

Infrastructure coverage in Chile has rapidly expanded in recent decades and its quality is superlative in some areas (Figure 3.19). An index of infrastructure coverage that factors in electricity and phone line infrastructure going back to 1985, shows that Chile's coverage has remained about average among emerging market regions but has closed the gap with respect to Eastern Europe. In addition, the Infrastructure Pillar of the Global Competitiveness Index (World Economic Forum), which factors in quality for a wider set of infrastructure areas, indicates that Chile infrastructure excels in most areas (Figure 3.20). This is particularly the case of ports and electricity quality, identified in Salinas (2021a) as the areas of infrastructure most strongly associated with export development.

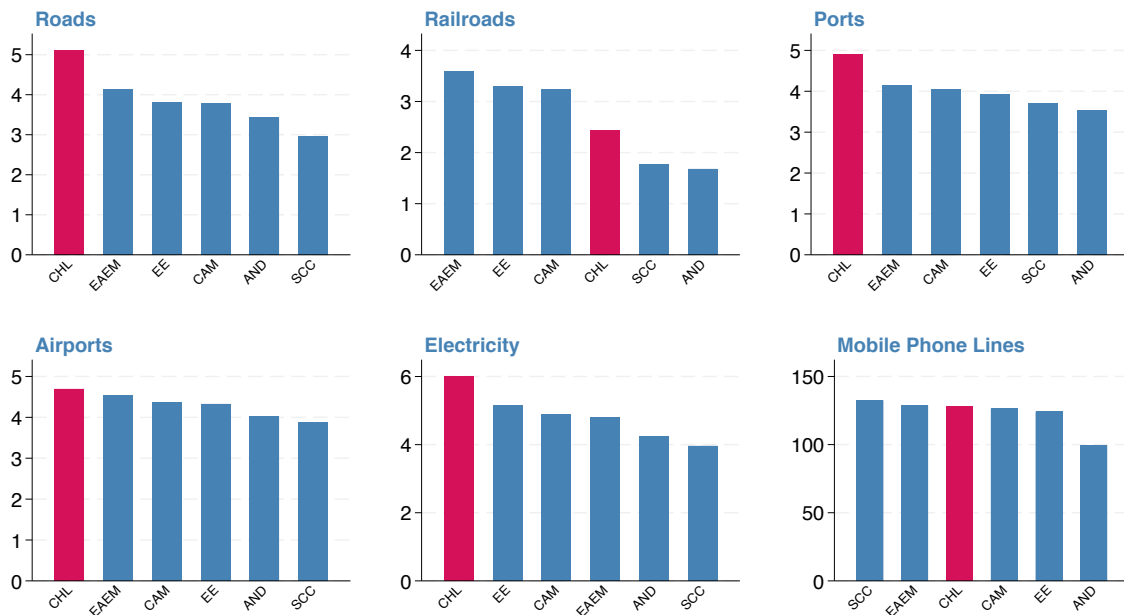
FIGURE 3.19
INFRASTRUCTURE



Note: Infrastructure index based on electricity and fixed phone line coverage from World Development indicators (World Bank). AND=Andean countries; CAM=Central America and Mexico; EAEM=East Asia Emerging Markets; EE=Eastern European; SCC=Southern Cone Countries. Regional grouping described in Table A.1.

FIGURE 3.20
INFRASTRUCTURE SUBCOMPONENTS

(Index 0 to 7)



Source: Global Competitiveness Report (World Economic Forum).

Note: Country acronyms are ISO3. AND=Andean countries; CAM=Central America and Mexico; EAEM=East Asia Emerging Markets; EE=Eastern Europe; SCC=Southern cone countries. Regional subgroupings described in Table A.1.

5. CATCHING UP WITH REMOTE ROLE MODELS

In light of its geographic disadvantage Chile could aim to foster its exports diversification and complexity by strengthening its policy framework to match Australia and New Zealand, remote countries that have successfully developed NHM and complex exports way above EE and EAEM countries. Except for trade policy openness, Chile has significant room to catch up with these two advance countries in all the other three factors associated with export development.

To simulate a scenario in which Chile strengthens its horizontal policies to the level of Australia and New Zealand, we first run the gravity equation regressions of chapter 1 using the log of Complex Exports as the dependent variable. An implementation of those regression specifications with updated data (Table 3.4) confirms that distance is also very relevant to the development of complex exports, in fact more relevant than for NHM exports. Landlockedness, another geographic exogenous regressor, has broadly an also big impact on complex exports as on NHM exports. And, as was similarly the case with manufacturing exports in chapter 1, the impact of education, governance, infrastructure, and the average import tariff is more important for complex exports than for NHM exports.

TABLE 3.3
DETERMINANTS OF EXPORTS BY EXPORT TYPE

Dependent Variable: Log of exports of:	Non-hydrocarbon/mineral	Complex
Log GDP reporter	0.584***	0.644***
Log GDP partner	0.899***	0.766***
Log distance	-1.328***	-1.687***
Common currency dummy	0.410**	0.570***
Common border dummy	1.813***	1.417***
Common language dummy	0.605***	0.521***
Common colonizer dummy	0.655***	0.363**
Past colonial link dummy	1.302***	1.446***
Log of hydrocarbon/mineral assets	0.0780***	0.119***
Landlockedness	-1.690***	-1.749***
Log GDP per capita	-0.10	-0.427***
Governance (WB Index)	0.297***	0.426***
Education (UN Index)	5.868***	6.788***
Infrastructure (GCR Index)	0.212***	0.344***
Average Tariff	-0.0281***	-0.0445***
Labor market flexibility (GCR Index)	-0.05	-0.0825*
Constant	5.249*	9.535***
Observations	37,866	35,649
Rho	0.92	0.91

Source: Author's elaboration.

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Panel regressions based on Hausman and Taylor (1981) technique with groups consisting of all combinations of reporter and partner countries in UN Comtrade database. Observations are non-overlapping 5-year averages within the 1962-2019 period, depending on data availability. Regression specification based on equation (7) in chapter 1. Multilateral resistance terms and partner country's policy variables included (coefficients not reported). Definitions of dependent and independent variables are found in the data section of the methodological appendix.

From these estimates it is inferred that eliminating the significant gap in the education attainment gap with respect to, for example, New Zealand is associated with 113 percent increase in complex exports (Table 3.4). Eliminating the gap in governance and infrastructure relative to New Zealand could increase complex exports by 27 and 26 percent, respectively. And lowering average tariffs to New Zealand's level could increase complex exports by 11

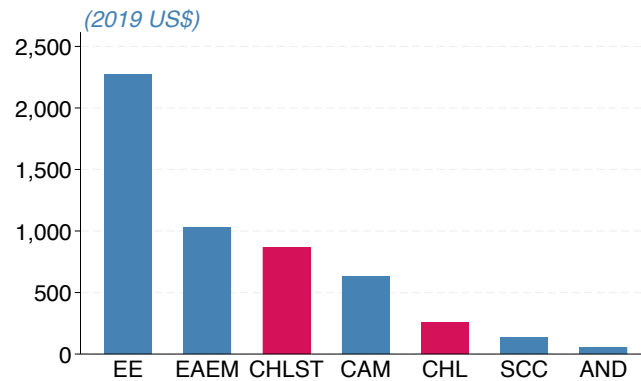
percent. Attaining all these improvements would quadruple Chile's complex exports, considerably nearing the average in EAEM although not attaining EE's average largely because of remoteness (Figure 3.21).

TABLE 3.4
CHILE COMPLEX EXPORTS PER CAPITA IN 2016-19 WITH NEW ZEALAND POLICIES

	US\$
Actual	215
Predicted with New Zealand Policies	
Educational attainment	480
Governance	275
Infrastructure quality	273
Average import tariff	239
Combined policies	867

Source: EBOPS; Hausmann and others (2013); and author's calculations.

FIGURE 3.21
COMPLEX EXPORTS PER CAPITA IN 2016-19



Source: Hausmann and others (2013).

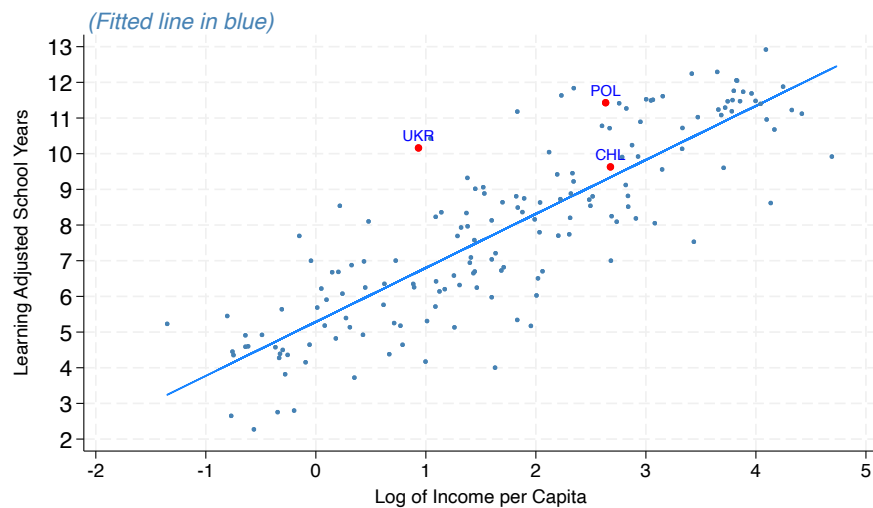
Note: CHLST stand for Chile Strengthened, the predicted level of Chile with the level of education, governance, and infrastructure of New Zealand.

AND=Andean countries; CAM=Central America and Mexico; EAEM=East Asia Emerging Markets; EE=Eastern European; SCC=Southern Cone Countries. Regional grouping described in Table A.1.

Scatter plots between the log of GDP per capita and horizontal policy determinants suggest that despite its strong performance in export diversification determinants, Chile can still substantially further strengthen most of them with existing resources (Figure 3.22). Chile's governance is way above what would be predicted from its GDP per capita, so it is harder to expect more significant improvements in the short run. On education, Chile appears to have as strong education as expected given its GDP per capita, but Eastern European countries like Poland or Ukraine have education levels significantly above the best fitted line and broadly like those of much wealthier Western European countries. Chile's infrastructure quality is also about what is expected from its GDP per capita, but those of East Asian countries like China, Malaysia, or Thailand are substantially above the best fitted line, and considerably above those in similarly wealthy countries in Latin America. Eastern Europe and East Asian countries can be thought of as role models of education and infrastructure development, respectively.

FIGURE 3.22

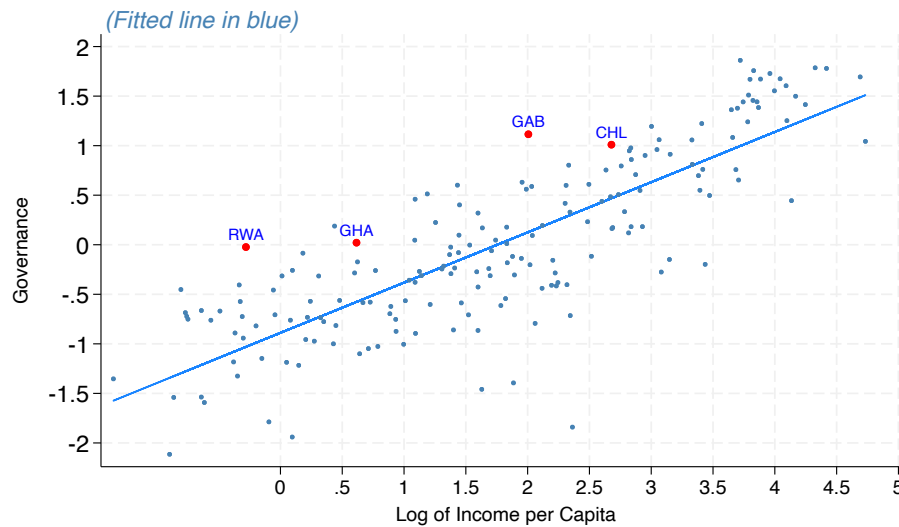
LEARNING ADJUSTED SCHOOL YEARS VS. INCOME PER CAPITA



Source: Human Capital Indicators and World Development Indicators (World Bank).

Note: Acronyms are ISO3. Values are averages of available years in 2016-19.

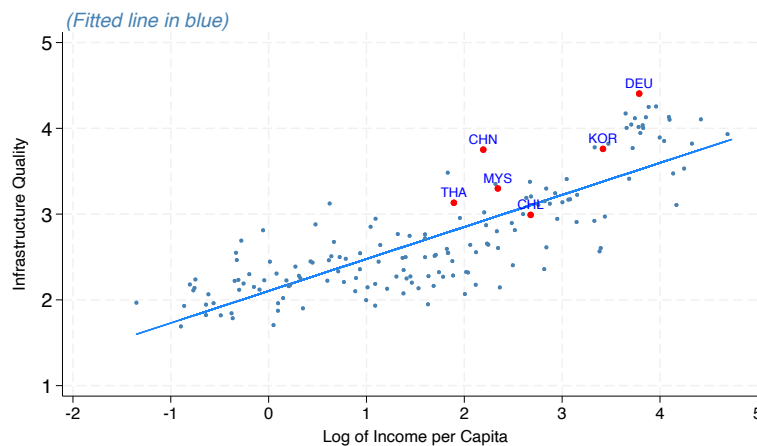
a) GOVERNANCE VS. INCOME PER CAPITA



Source: Worldwide Governance Indicators and World Development Indicators (World Bank).

Note: Acronyms are ISO3. Values are averages of available years in 2016-19.

b) INFRASTRUCTURE VS. INCOME PER CAPITA



Source: Logistics Performance Indicators (World Bank).

Note: Acronyms are ISO3. Values are averages of years 2016-19.

6. CONCLUSIONS

Chile's development of non-copper and complex exports has been more successful than implied by commonly used diversification and complexity indices. When observing the level and long term growth of NHM and complex export categories, Chile's performance appears as strong as its overall economic performance and more similar to the average in the high performing East Asian region than to other South American countries. This has been the case despite Chile's remoteness from the large global economic centers and likely mainly a result of its well-recognized efforts to strengthen its institutional development and trade policy openness, and physical infrastructure. The analysis in this chapter make us infer that if Chile has low diversification and ranks low in terms of the ECI it is because of exogenous copper abundance and distance to large international markets, not because of an ineffective policy framework.

For sure, as described in Lebdioui (2019), Chile has also relied on vertical policies for export promotion, but it did so decades ago and avoiding the now controversial industrial policies that generated major macroeconomic imbalances in many developing countries, such as SOEs or trade protectionism. In contrast, it relied on now widely recommended policies, such as technology transfer and diffusion, R&D support, and export marketing, which are unlikely to lead to macroeconomic disarray. In the 1970s and 1980s, it relied on more controversial credit subsidies, but less so in later decades without apparent impact on its development of NHM and complex exports. Nowadays, with a much larger global capital pool and its very low sovereign spread, it's hard to argue that financing is a bottleneck to Chile's exports development.

Going forward, this analysis underscores the need to preserve Chile's leadership in strengthening its economic fundamentals and redouble its efforts to overcome the hurdles imposed by distance to large markets. Strengthening connectivity to other markets is crucial for Chile's efforts to increase export diversification and complexity. Although geographic distance is a fixed variable, "effective" distance can be lowered through investments in transports and communications infrastructure that lower the cost of goods and knowledge exchange.³³

Australia and New Zealand are role models of high complexity development despite long distance from large international markets. With these countries and other advanced economies as benchmark, Chile should continue to strengthen governance, education, and infrastructure to reach higher degrees of complexity.

Sectorally, Chile can focus on the development of exports of services and of high value-to-weight products, which are less affected by transportation costs. Improving telecommunications and electricity infrastructure towards the quality level of advanced countries would be key to foster exports of services. In general, technology will clearly be Chile's best ally in overcoming its distance hurdle.

³³ Proximity to markets can also increase with higher GDP of nearby trading partners, but this is of course largely out of control of local policy makers.

1. INTRODUCTION

Export diversification is particularly urgent for the many countries in which hydrocarbons dominate their export baskets, as the world moves out from fossil fuels towards cleaner energy sources.³⁴ Notably among them are the countries that constitute the Gulf Cooperation Council (GCC) – Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates.

GCCs are well known for their hydrocarbon wealth, but also for their visible efforts to develop other sectors. Despite investing vast resources in export diversification, including investments in world class infrastructure, these countries remain highly dependent on oil exports. Are all these resources being invested in vain? Are GCCs implementing the right policies to promote export diversification? More fundamentally, given the superlative value of their hydrocarbon exports, is it realistic to expect these countries to fully replace them with other exports?

Economists cannot answer these questions by studying only indices of export diversification (significantly determined by exogenous resource abundance and international prices) or by prescribing IPs without statistical evidence to back their effectiveness. In this chapter we suggest that understanding these issues is better done by applying the methodology in Salinas (2021a) and that doing so envisions some hope but also challenges GCCs.

³⁴ Based on Belkhir and others (forthcoming).

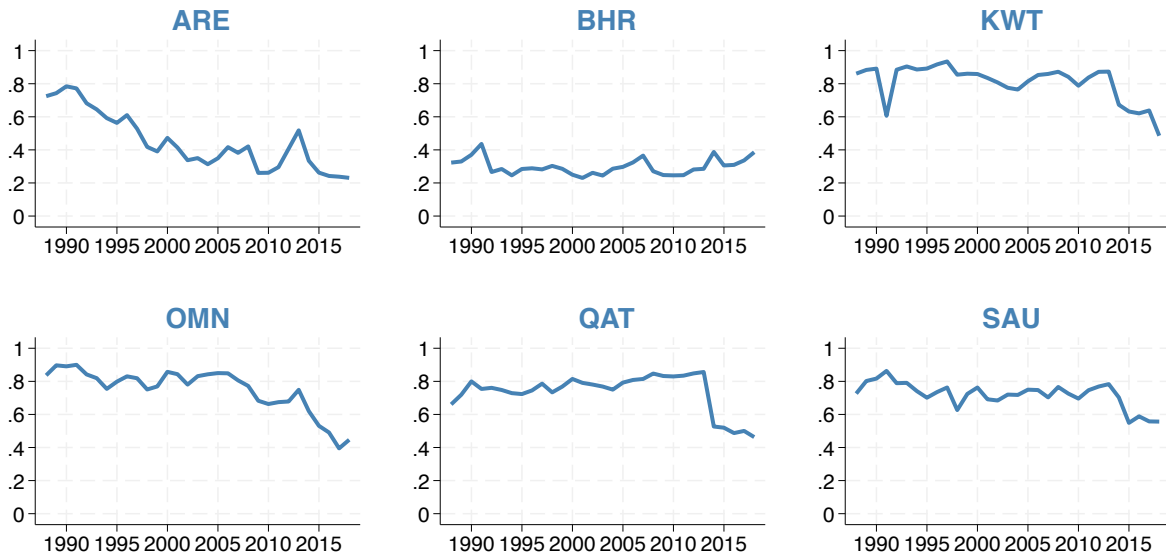
2. THE GULF'S EXPORT PROGRESS AND CHALLENGE

To assess GCC's success in promoting non-hydrocarbon exports we should not analyze export concentration indices but look directly at the evolution of non-hydrocarbon exports. This is mainly because export concentration indices must have been affected by the large swings in the international hydrocarbon markets in recent decades. Hydrocarbon international prices are much higher than three decades ago and the value of those exports have consequently increased (exogenously), thus affecting positively (negatively) export concentration (diversification) indices.

As discussed in chapter 1, the commonly used Herfindahl-Hirschman Index (HHI) is based on the nominal value of the products in an export basket and, in GCC countries, can significantly change in response to fluctuations in the nominal value of its large hydrocarbon exports. This makes it hard to deduce if changes in the HHI are related to policy measures to promote non-oil exports or to exogenous changes in oil prices and production. Figure 4.1 describes the evolution of the HHI of GCCs over the last three decades. During this period there were major fluctuations in international oil and gas prices that make it hard to judge the success of the prominent GCC government policies to foster non-hydrocarbon exports.

FIGURE 4.1

Export Concentration in GCCs (Hirschman Herfindahl Index)



Source: UN COMTRADE.

Similarly, it is hard to gauge the success of export diversification efforts in cross-country comparisons of the HHI (Figure 4.2). GCCs have export concentration indices clearly higher than those of East Asian countries, but it is not evident that this is related to a weak export capacity or to their exogenously much higher hydrocarbon assets (Figure 4.3).

FIGURE 4.2

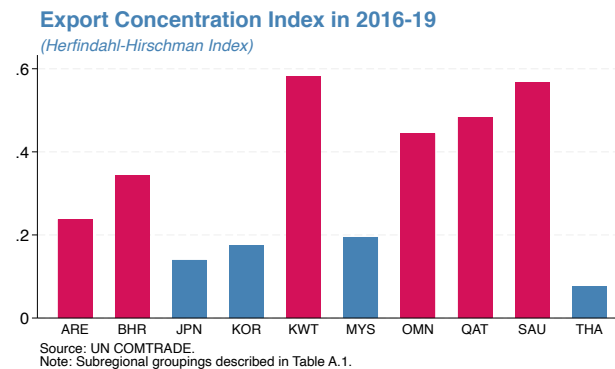
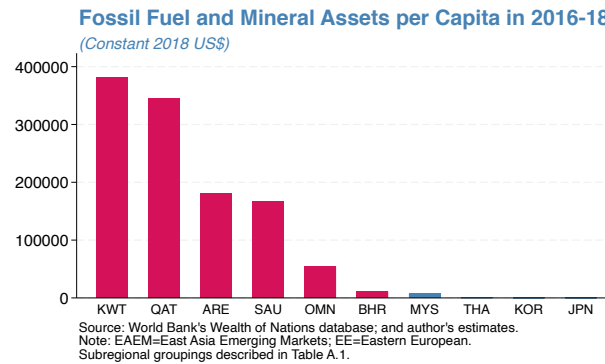


FIGURE 4.3



Focusing not on the HHI but directly on the export categories that are needed to promote export diversification, namely NHM goods and services, cleans up the picture. For instance, while East Asian countries are much more diversified than GCCs, ARE has higher NHM goods exports per capita, higher than even Korea and Japan (Figure 4.6). ARE, BHR and QAT have higher services exports per capita than all East Asian comparators (Figure 4.7), while KWT, OMN and SAU perform roughly like Malaysia and Thailand. East Asian countries then may be more diversified than GCCs, but this is mainly related to GCCs exogenous hydrocarbon abundance, not to a failure of NHM export development in GCCs.

Figure 4.3

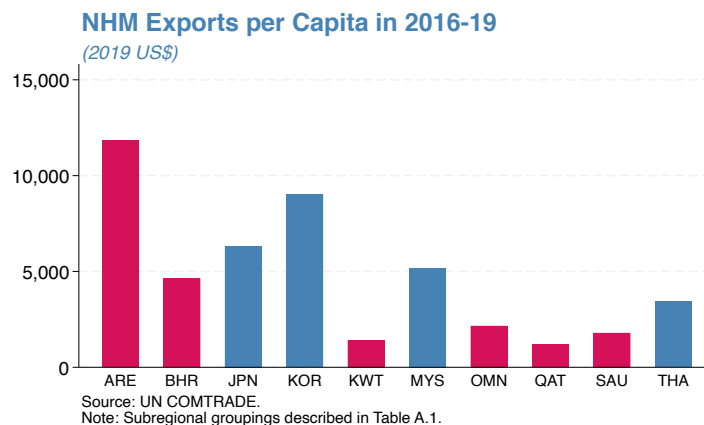
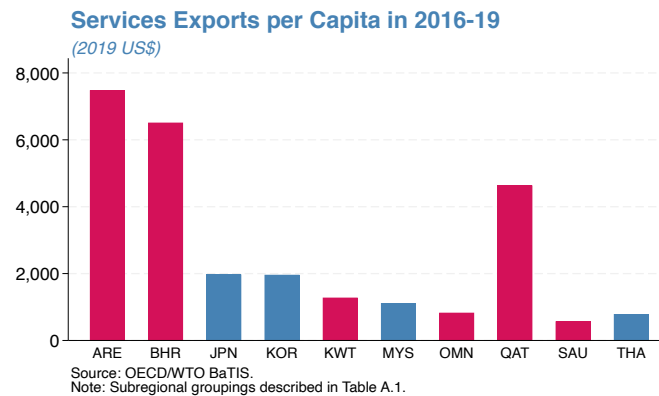


Figure 4.4

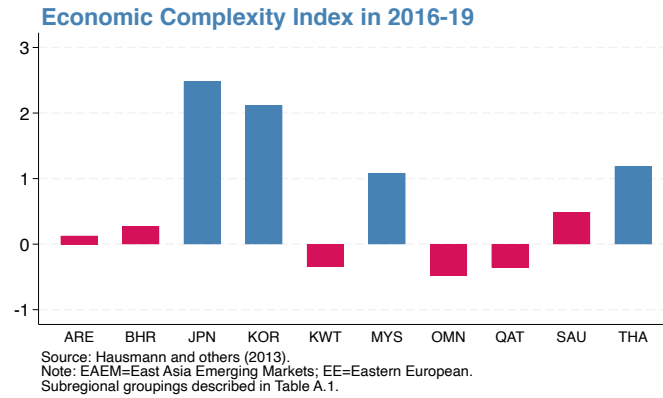


A similar change in GCC's assessment arises when studying export complexity. Because hydrocarbon products have low Product Complexity Indices (PCIs), exogenous increases in international hydrocarbon prices or hydrocarbon discoveries lower the Economic Complexity Index (ECI) without any change in the value of exports of higher complexity. Regression specifications that aim to identify a link between policies and the value of complex exports using the ECI as dependent variable are thus weakened by exogenous commodity related fluctuations.

Cross-country analysis of the ECI is particularly deceiving. GCC countries have much lower ECIs than East Asian comparators (Figure 4.5), but this likely owes a lot to GCCs higher hydrocarbon wealth. In fact, a comparison of complex exports per capita (Figure 4.6) suggests ARE, BHR, and QAT have as good or better capacity to export complex products as East Asian comparators.

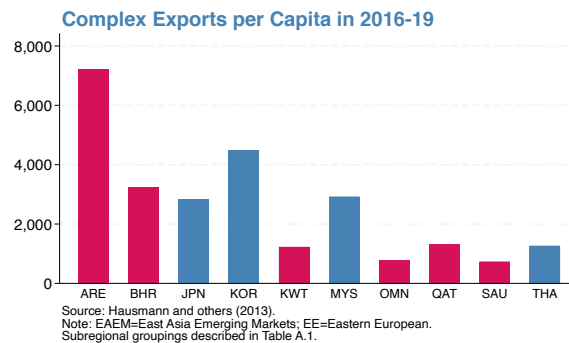
FIGURE 4.5

World Ranks of ECI and Technology 2016-2019



Source: Hausmann and Hidalgo (2013), World Economic Forum and Harvard University (2020)

FIGURE 4.6



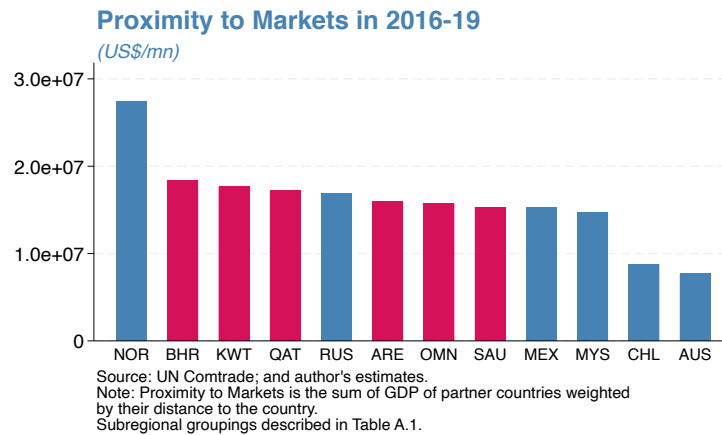
Source: UN Comtrade; World Economic Forum and Harvard University (2020); and author's calculations.

3. STRONG INFRASTRUCTURE, BUT LARGE ROOM FOR STRONGER EDUCATION AND GOVERNANCE

After defining the new “dependent variable” that reflects better GCCs success in promoting non-oil exports, we analyze GCC’s factors that can explain its non-oil export development. To

do so, we compare GCCs to other emerging markets, oil exporting countries. First, we look at the exogenous “gravity pulls” on these countries, as measure by their PMs, and see that they are not as strong as that of Norway, which is part of the large European market, but neither as weak as those of remote resource-rich countries like Australia or Chile (Figure 10). GCCs are relatively close to the European market and are also not far from large East and South Asian economies. This results in PM indices that are as high as those of manufacturing powerhouses like MEX and MYS. As we discuss later, the growth potential of the relatively nearby Asian regions presents a major potential for GCCs’ NHM export development.

Figure 4.7



How well are GCCs policies taking advantage of their favorable geographic location? Scatter plots (Figure 4.8 and 4.9) comparing the actual level of NHM goods and services exports versus their predicted level given their exogenous PMs (and HM assets), show that ARE and BHR are taking the most advantage of their “gravity pull” for NHM exports (they are above the 45-degree line), while ARE and QAT are doing so for services export. As suggested in Salinas (2021) the better-than-expected performance may be related to stronger policy determinants.

Most other GCCs are performing broadly in line with what would be expected considering their PM, except for the significantly underperforming SAU on services exports.

Figure 4.8

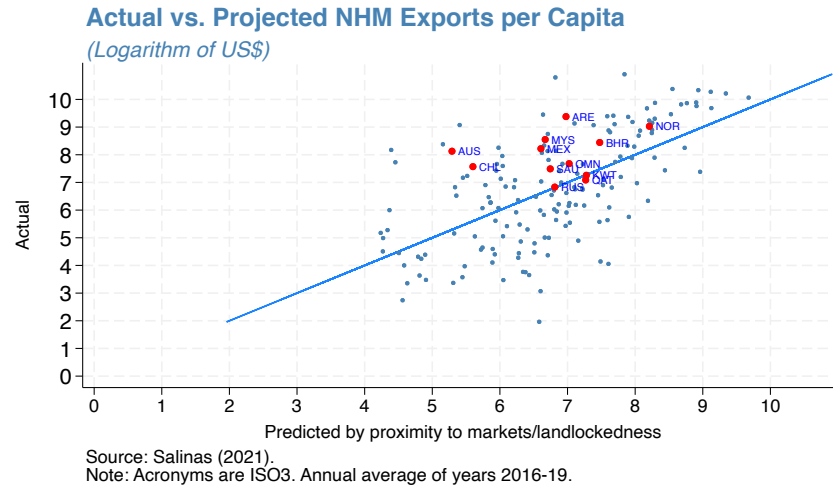
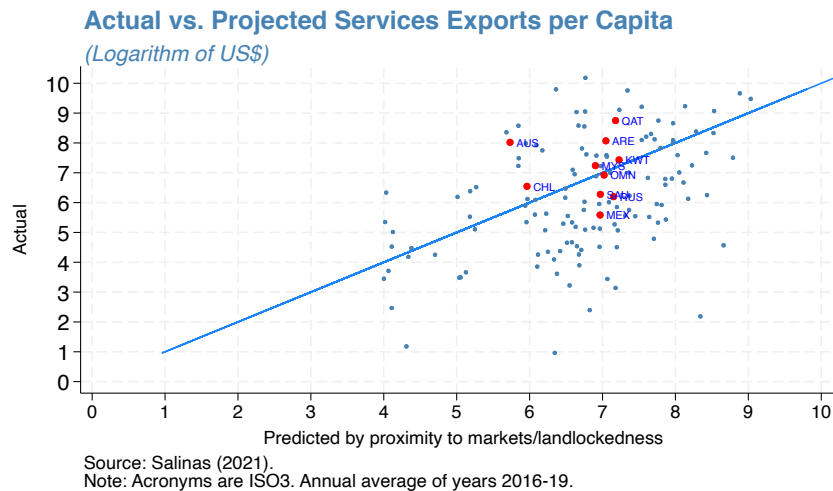


Figure 4.9



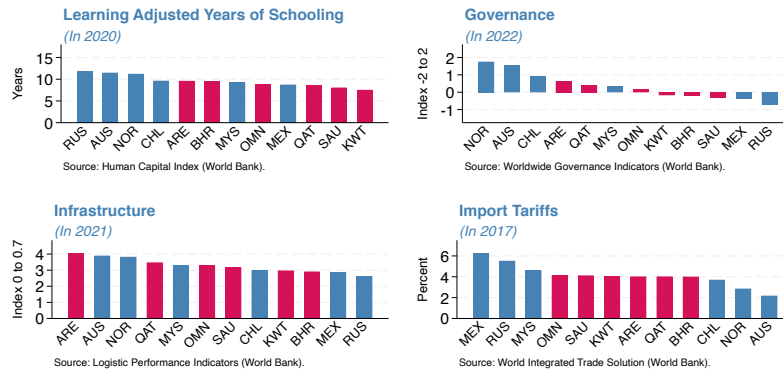
Because the scatter plots are not detecting an underperformance of GCCs on NHM goods and services (NHMGs) exports relative to comparator countries, one would expect that GCC's export policy determinants are at least broadly in line with its comparators. Indeed, this is the

case as seen in Figure 4.10 charts, with GCC countries only performing slightly worse on education, but slightly better on infrastructure.

Figure 4.10

Exports Determinants in GCCs and Comparators

(Latest year available)

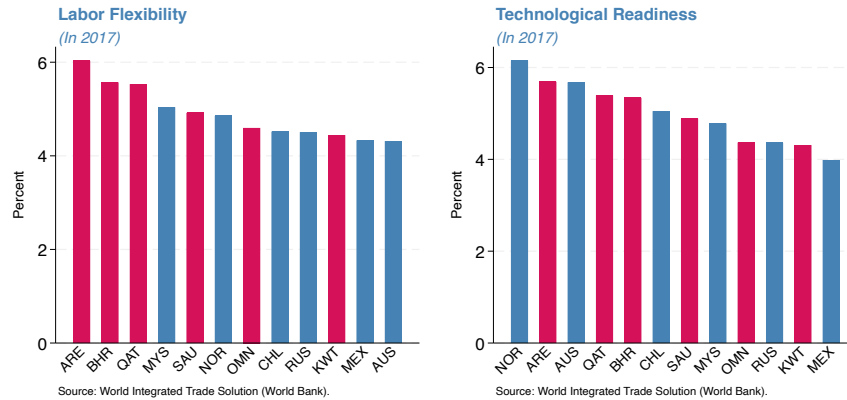


Note: Country acronyms are ISO3.
Regional subgroupings described in Table A.1.

Intra-regionally, ARE, BHR, and QAT broadly have stronger policy determinants than other GCCs. ARE and BHR have relatively strong education, while ARE and QAT have significantly stronger infrastructure. These three countries also have more flexible labor markets, hinting that they have more competitive unit labor costs, and have stronger technological readiness (Figure 4.11).

Figure 4.11

Exports Determinants in GCCs and Comparators
(Latest year available)



Note: Country acronyms are ISO3.
Regional subgroupings described in Table A.1.

But GCC's policy efforts look highly unsatisfactory when they are assessed relative to their income per capita, as seen in cross-country scatter plots of these policy variables and GDP per capita (Figures 4.12-4.15). While there are some GCC countries, particularly ARE, that have stronger infrastructure than expected from their income per capita, all GCC countries have unexpectedly low education and governance. Moreover, most GCC countries have a weaker than expected Doing Business. This strongly suggests that GCC countries can comfortably strengthen most export determinants using their existing economic resources. This may be the most important conclusion for policy makers of those countries....much more can be done with existing resources.

Figure 4.12

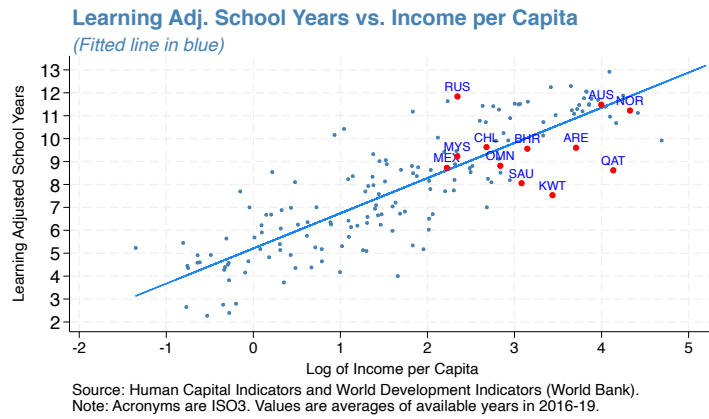


Figure 4.13

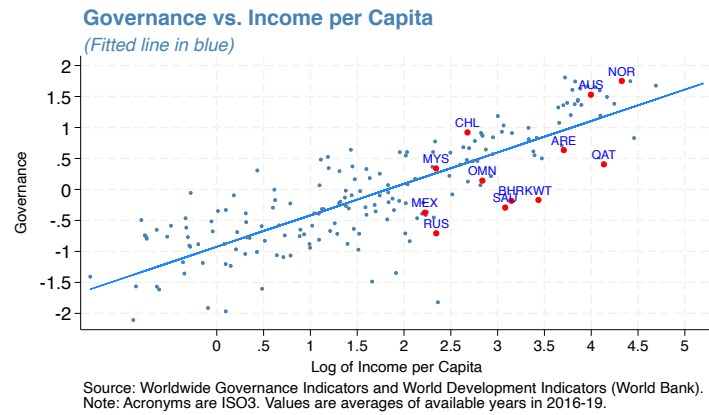


Figure 4.14

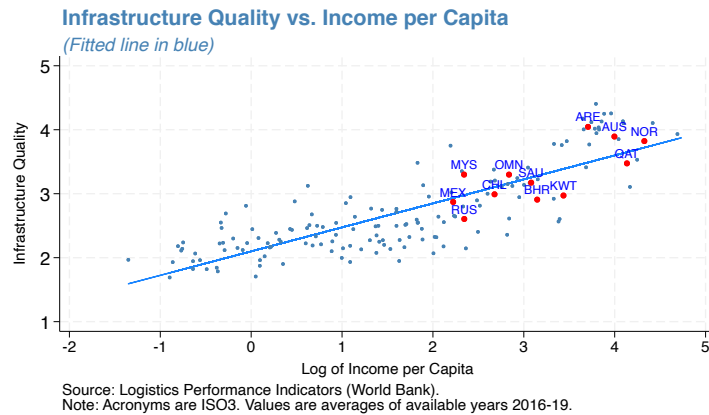
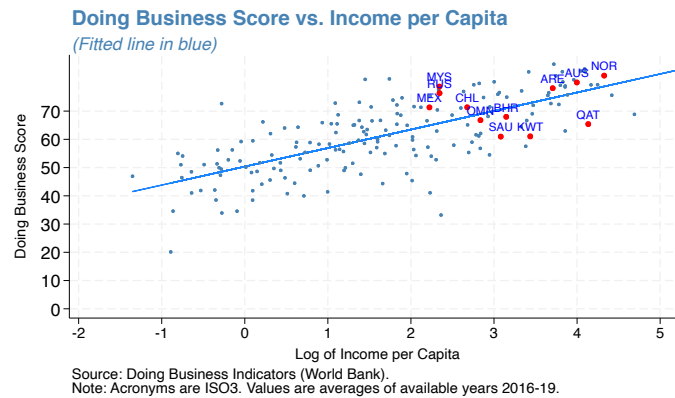


Figure 4.15



4. CAN GCC MAKE THE NEEDED TRANSITION?

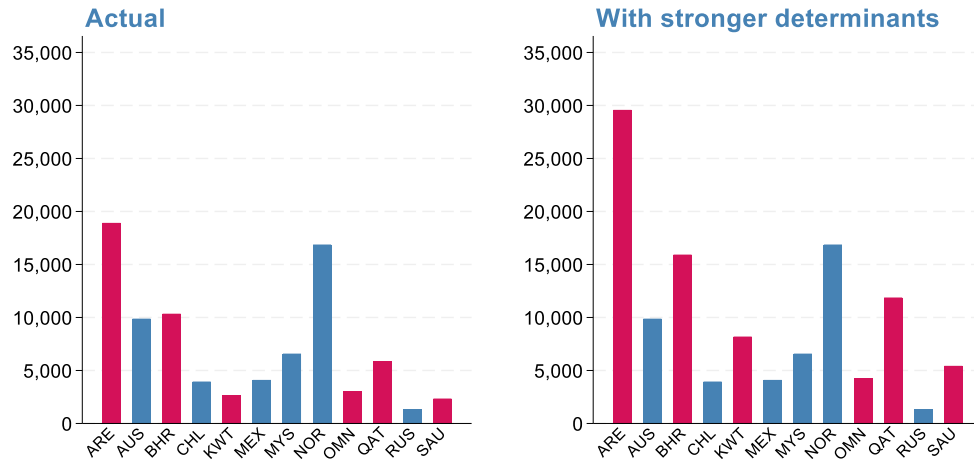
GCCs underperformance in export promotion horizontal policies (except in infrastructure) given their GDP per capita has a positive spin. It means that they have the financial resources to significantly strengthen them with the substantial major impact that this could have on their non-hydrocarbon exports.

The payoff of doing so is estimated to be quite significant, as suggested by applying the simulations proposed in Step 5 of chapter 1. If in 2016-19 all GCC countries would have had their education, governance, and infrastructure at the level expected given their GDP per capita, and their average tariffs at 2 percent, they would have had significantly higher NHMGS exports per capita (Figure 4.16). The boost to their NHMGS exports ranges from 40 percent for OMN to 205 percent for KWT, as this latter country has the highest gap between its horizontal policy strength and their level predicted by its very high GDP per capita. With such increases, most GCC countries would end up with NHMGS exports per capita above MYS, and all GCCs would surpass Mexico.

Figure 4.16

NHM GS Exports per Capita in 2016-19

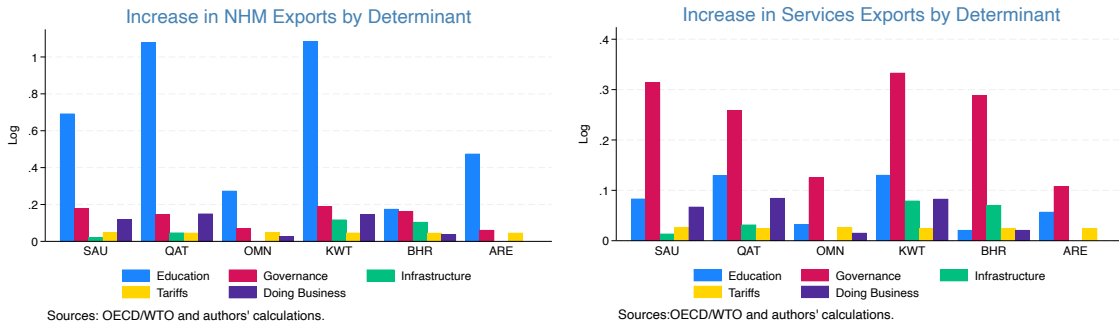
(2019 US\$)



Sources: UN COMTRADE; OECD/WTO BaTiS; and author's calculations

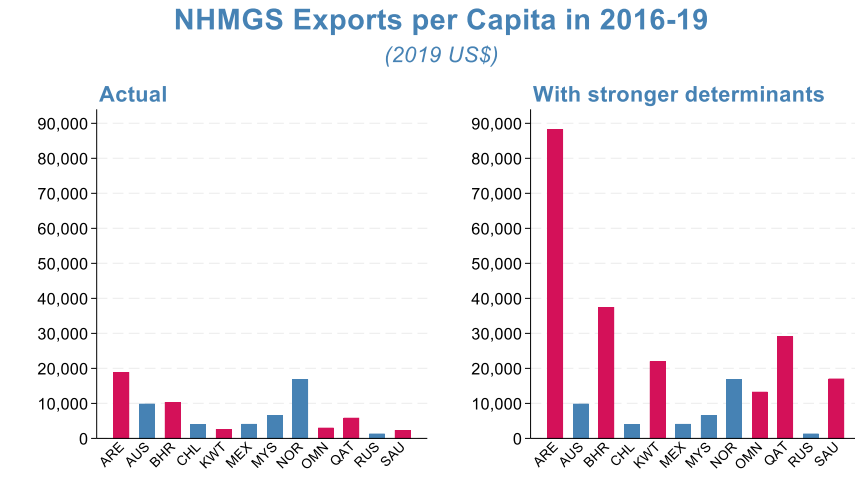
As expected, most of these very important gains would be achieved from the improvements in education and governance, are that are notably weak in GCC countries considering their income per capita (Figure 4.17). The payoff from the strengthening of education is particularly high for NHM goods exports except for Oman, whose education level is already broadly in line with its GDP per capita. Services exports are most benefited by stronger governance, more than by stronger education because of education's lower regression coefficient (see chapter 1).

Figure 4.17



This kind of simulations also suggest that a much more ambitious though not unrealistic realistic reform program could allow GCC countries to fully offset a full fading of their oil and gas exports. Given that there are many countries that have education, governance, and infrastructure considerably above the level predicted by their GDP per capita, GCC countries could aim to follow these role models. Specifically, these countries could aim to be such positive outliers in education as Russia (or many Central Asian and Eastern European countries), in governance as Chile, in infrastructure as ARE, and in Ease of Doing Business are Malaysia. The related boost to their NHMGS would be dramatic (Figure 4.18). With such superlative fundamentals in 2016-19, all GCC countries including SAU would have surpassed Malaysia's exports per capita and ARE, BHR, KWT, QAT would have been among the top NHMGS exporters in the world.

Figure 4.18

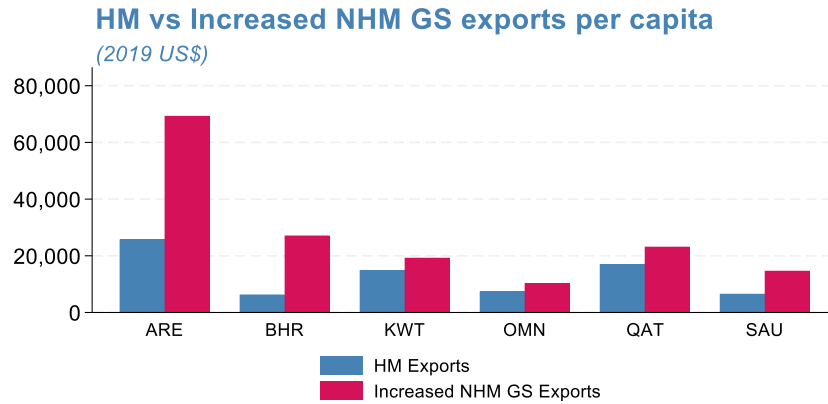


Sources: UN COMTRADE; OECD/WTO BaTiS; and author's calculations

Very importantly, strengthening GCCs' education, governance, and infrastructure to match positive outliers in these areas, can be expected to increase their NHMGS exports by amounts higher than their current HM exports per capita in all GCC countries, thus allowing these countries to largely survive the expected phasing out of hydrocarbon fuels (!). Moreover, a more speculative approach of using correlations between NHMGS exports and GDP and between HM exports and GDP to respectively deduct the GDP impact of the simulated increase in NHMGS exports and the total phase out HM exports, concludes that their combined effect on GDP would be positive in all GCCs (Table 4.1).³⁵

³⁵ Projecting this way the impact of higher NHMGS export on GDP per capita is of course admittedly very simplistic, as mentioned for Latam simulations in chapter 3.

Figure 4.19



Source: UN COMTRADE; OECD/WTO BaTiS; and author's calculations.
Note: GCCs assumed to have upward deviation of education, governance, and infrastructure similar to outliers Russia, Chile, UAE, and Malaysia respectively. ISO3 country codes

Table 4.1

Country	Net GDP change
Bahrain	25.4
Kuwait	11.6
Oman	10.0
Qatar	12.1
Saudi Arabia	14.2
United Arab Emirates	23.7

Source: UN Comtrade data and author's calculations

The analytical framework in this section further suggests that GCCs will likely benefit more than many other countries from the projected rise of the relatively nearby Chinese and Indian economies as this is expected to significantly strengthen their PM indices. Several GDP projections for the following decades indicate that the GDPs of China and India will eventually surpass the United States'. One such forecasts, Goldman Sachs (2022), concludes that by 2050 China's economy will be 13 percent higher than the United States' and India's will be 60 percent of the United States'.

A thought experiment that illustrates the implications of Goldman Sachs (2022) projections on the relative export development of GCCs and comparator countries is to calculate their PM indices in 2016-19 if China's and India's GDP would have been 113 and 60 percent of US GDP in those years (Figures 4.21 and 4.22). In such scenario, both the PM indices of GCCs, AUS, and MYS would have been considerably higher, while those of countries further from China and India (Chile, Mexico) would not be significantly different. These projected changes in PM indices would significantly boost the NHMGS exports of GCC countries relative to those of countries further from China and India (Figure 4.22)

Figure 4.21

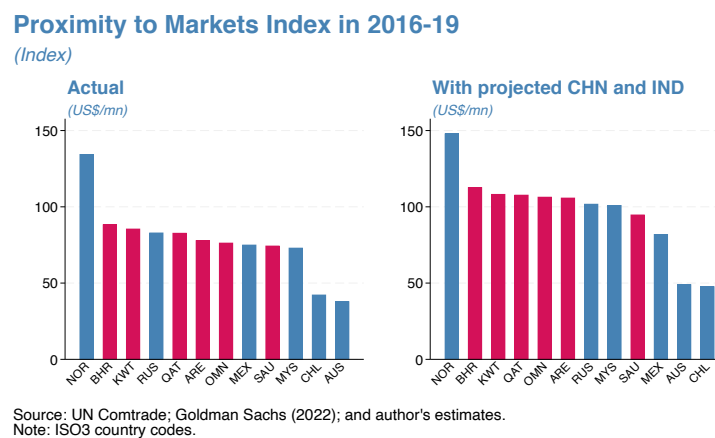
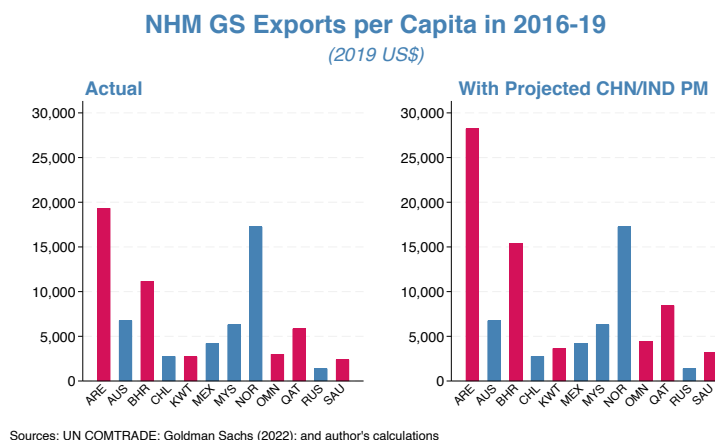


Figure 4.22



5. CONCLUSIONS

GCC countries have been successful in attaining NHMGS exports per capita that even compete with those of widely acclaimed East Asian countries. Also, good news is that, considering their significant financial resources (partly sourced from existing hydrocarbon revenues), they can substantially strengthen their education, governance, and investment climate, which in turn could significantly reduce its current export concentration in hydrocarbon exports.

Empirical exercises in this book suggest that “realistic” efforts to strengthen their horizontal policies can result in a gulf region that sees its non-hydrocarbon exports fully replacing its potentially vanishing hydrocarbon exports. A word of caution though. While the simulated boosting of NHMGS exports is as large as to match current hydrocarbon exports, the latter will remain macroeconomically important as long as the world demand for these products is significant. Therefore, responsible macroeconomic management to smooth out hydrocarbon related fluctuations will remain critical until then.

1. INTRODUCTION

Sub-Saharan African (SSA) countries have export baskets that are among the least diversified in the world. The typical country in this region exports predominantly raw hydrocarbon or mineral products and has only a very small share of exports of manufactures and services. Without significant growth in NHM goods and services (NHMGS) exports, the value added and related income per capita in the region is unlikely to take off. Moreover, SSA's high concentration in hydrocarbon (HM) products makes their economies subject to the vagaries of international commodities' markets and this complicates their macroeconomic management.

Reducing their export concentration surely requires developing other exports, preferably more sophisticated and with higher value added and social impact. To do so, several policy prescriptions have been given and applied including industrial policies (SOEs, trade policy protection, tax subsidies, and so on) which have been already used in the region without success and have often contributed to the large fiscal deficits, macroeconomic crises, and low economic growth that have prevailed in the region. And while it is widely agreed that an orthodox prescription including policies that strengthen education, governance and infrastructure can significantly contribute to export diversification (and overall economic development) in SSA, it can be validly argued a priori that the low income per capita of the region can be an unsurmountable constrain, a poverty trap that impedes the strengthening of these horizontal policies to start with.

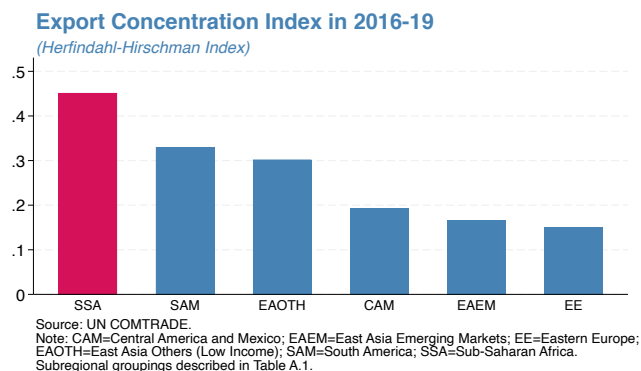
So, is there a path to export diversification in Sub-Saharan Africa? Are there feasible (financeable) policies that can effectively develop NHMGS exports in this region? Again, the analytical approach in this book provides some insights.

2. EXPORT SUCCESSES IN AFRICA

SSA is notably dependent on the export of very few commodities, mainly HM products. Given its weak productive capacity, SSA is mainly able to export HM products that are naturally abundant and do not require a complex economywide production platform, in contrast to other more complex exports such as manufacturing and services products.

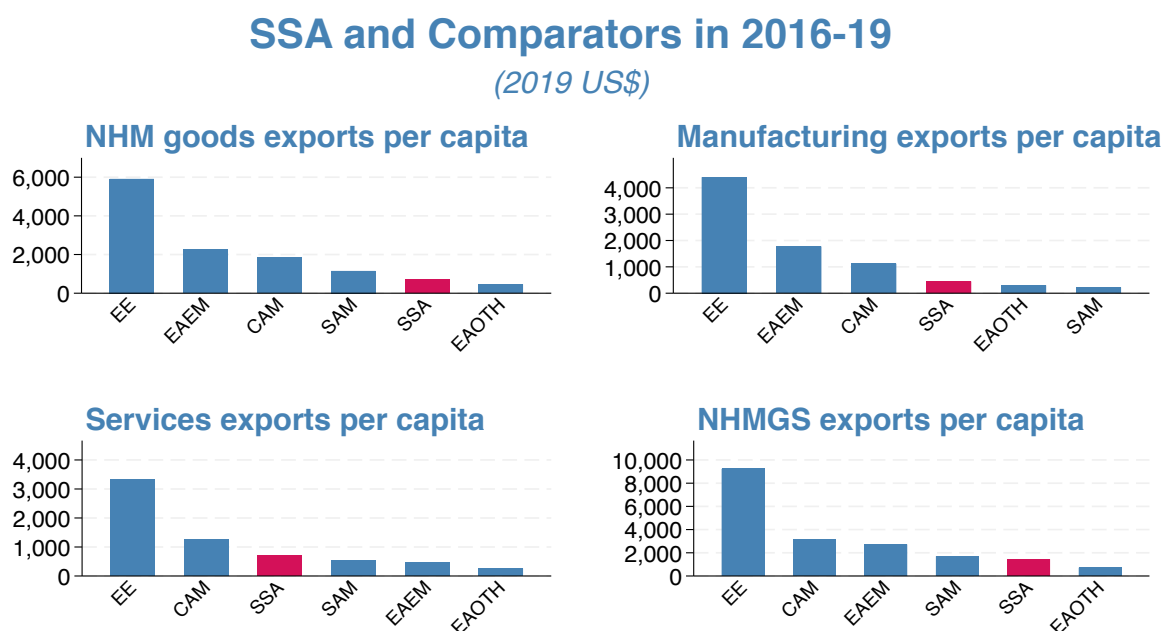
Comparing SSA's export concentration to emerging market subregions provides a clear picture of its commodity dependence (Figure 5.1). The commonly used HH index of export concentration shows that, in average, SSA has a very high export concentration (low export diversification), well above the levels of EE, CAM and EAEM, and even above the levels of the resource abundant South American countries and of East Asian low-income (EAOTH) countries.

Figure 5.1



Following the methodological approach of the first chapter we investigate whether the high export concentration in SSA countries reflects only resource abundance or also an underdevelopment in NHM goods and services exports (Figure 5.2). As opposed to the case in some other countries/regions analyzed in previous chapters (Chile and GCC countries) in which high export concentration masks high development of NHM exports, the high concentration of SSA export baskets reflects a very low level of NHM exports per capita beyond those of HM products. In average, Sub-Saharan African countries have NHMGS exports per capita only superior to East Asia Low Income (EAOTH) countries. Surprisingly though, SSA has a higher average level of manufacturing than South American countries, and its average level of services exports per capita surpasses even EAEM countries.

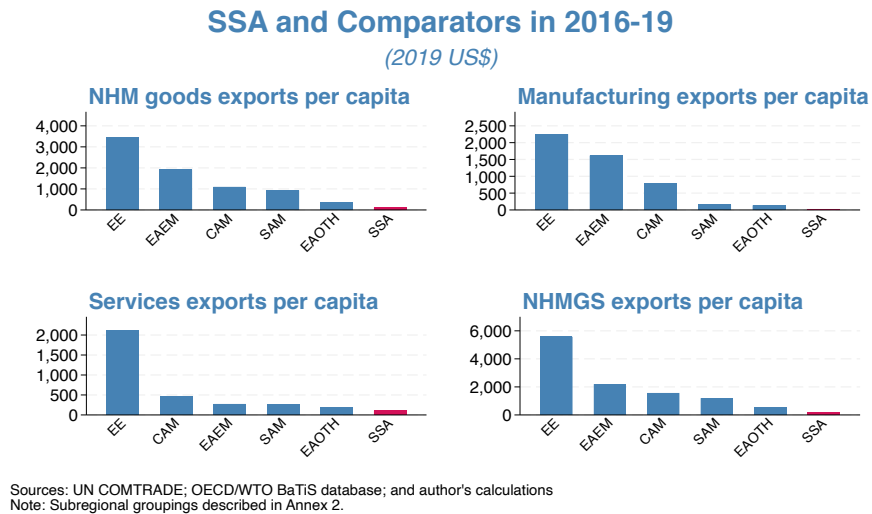
Figure 5.3



Sources: UN COMTRADE; OECD/WTO BaTiS database; and author's calculations
Note: Subregional groupings described in Annex 2.

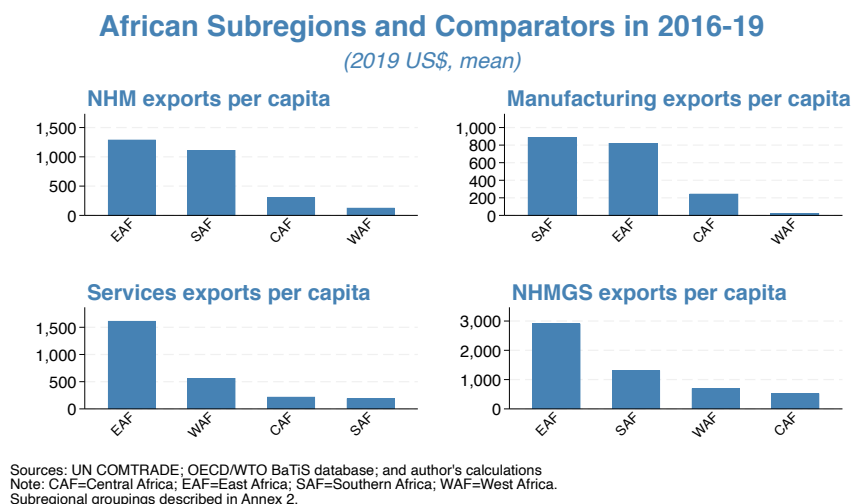
This surprisingly good relative performance in manufacturing and services, however, appears to reflect some superlative SSA performers and not the common performance among most countries in the region. Looking not at the mean but the median exports per capita provide a very different picture, with SSA's median exports per capita of all four export categories being the lowest among all comparator regions (Figure 5.3). The different picture between the mean and the median thus requires us to look at the distribution of export performance across the region.

Figure 5.3



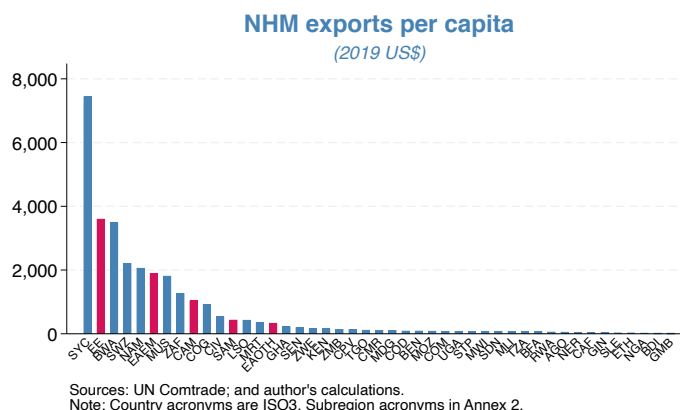
A second level of aggregation already shows some distributional detail that help us understand SSA heterogeneity in its exports. In NHM goods exports per capita, including in manufacturing, Eastern African (EAF) and Southern African (SAF) countries significantly surpass the level of Central (CAF) and Western African (WAF) countries. In fact, the NHM and manufacturing exports per capita of EAF and SAF surpass the average of the wealthier South American region. In services exports, EAF surpasses all other SSA subregions and remarkably surpass the average in CAM and EAEM countries, even though the latter regions are much closer to very large economies (in other words, have much higher PMs).

Figure 5.4



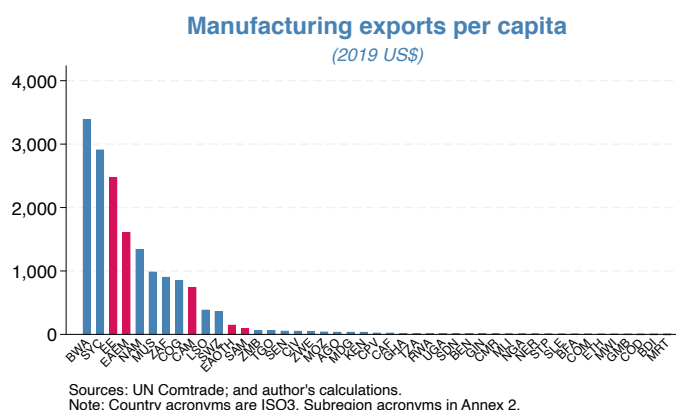
The country-level picture of exports per capita shows us the very large difference in export performance across SSA countries (Figure 5.5). A handful of SSA countries in EAF and SAF have NHM exports per capita way above the rest of the region. Seychelles, Botswana, Namibia, Swaziland, Mauritius and South Africa match or even surpass the average NHM exports per capita of successful export performing CAM, EAEM, and EE regions. In contrast, the vast majority of SSA countries have NHM exports per capita that are below the average of all comparator regions.

Figure 5.5



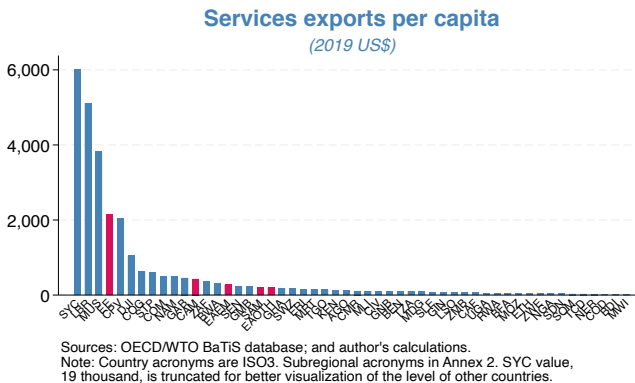
We also observe a cross-SSA-countries distribution of manufacturing exports per capita that similarly includes a handful of internationally competitive countries, mainly in EAF and SAF, with values above high performing regions of EE, EAEM, and CAM, while the vast majority of SSA countries have extremely low levels (Figure 5.6). This small group of manufacturing superlatives in SSA mainly sell textiles, machinery and equipment, maritime vehicles, and processed minerals.

Figure 5.6



For services exports per capita, again there are few mainly EF and SAF countries that outperform the rest of the region (Figure 5.7). And relative to comparator regions, there are many more SSA countries that surpass CAM and EAEM. The small islands of Mauritius and Seychelles excel on services exports per capita, largely because of their very high tourism. Other tourism hot spots such as Cape Verde and Sao Tome and Principe, also perform quite well on services exports. The port country of Djibouti, expectedly, also has high services exports per capita.

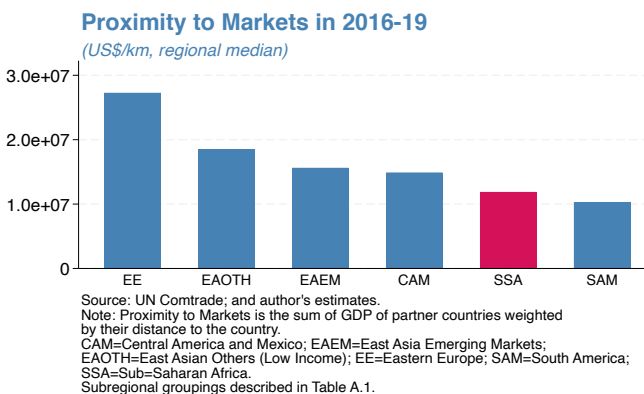
Figure 5.7



3. REMOTENESS AND WEAK POLICIES BUT SOME SSA ROLE MODELS

Any evaluation of SSA weak export development needs to acknowledge the negative impact of its exogenous geographical remoteness. As seen in Figure 5.8, comparing the PM of SSA to those of comparator regions, we see that SSA is furthest from the large international markets together with South America. Both regions do not have the PM advantage of well-known successful exporters in CAM, EE, EAEM.

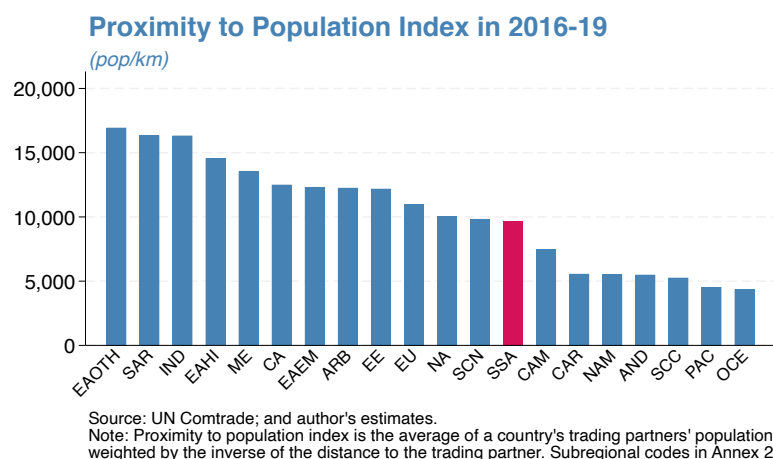
Figure 5.8



It is also very important to note that SSA's effective remoteness should be larger than indicated by the PM, as the latter index does not consider the cost of bridging distance. It is significantly less costly to interconnect, for example, East Asian countries that are linked by the lower-cost maritime transportation than to interconnect SSA countries given the difficult terrain (including deserts and rainforests) among them.

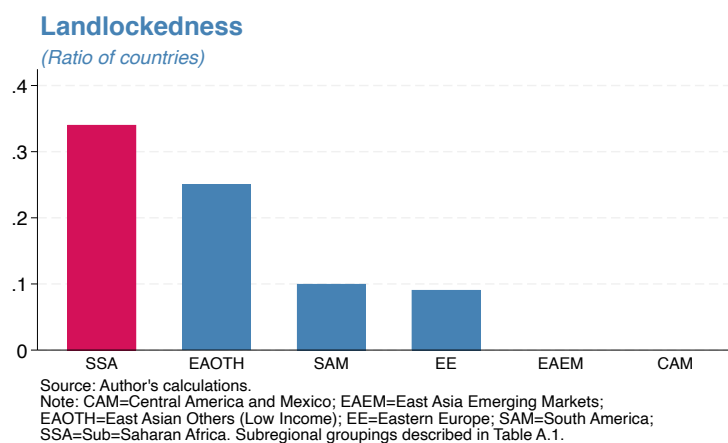
For sure, SSA low PM indices are partly explained by the low GDP per capita in the region itself but, as is the case of Latin American countries (see chapter 2), the low PM indices are also more exogenously related to its low Proximity to Population (PP, see Figure 5.10). This in turn is partly a result of its lower population density, lower than in high export performing East Asia and Europe. Although SSA's population is very large and soon to reach 1.3 billion, its also very large land area results in its population density being about 50 people per square kilometer, about a third of Western Europe's population density. And although SSA's population is projected to increase faster than in other world region, this growth will take several decades and therefore its effect on boosting the PM index will take long.

Figure 5.10



Another substantial geographic hurdle faced by many SSA exporters is landlockedness. As seen in Figure 5.11, about 35 percent of SSA countries are landlocked, a much higher percent than for comparator regions. And, as we saw earlier, having no access to maritime transportation is a major constraint to exporting. Regressions in the first chapter suggest that landlockedness is associated with an 80 percent lower NHM goods exports. Put in another way, a bit more than a third of SSA countries export about a fifth of what they would if they would have access to the sea. That so many of its countries are landlocked is clearly a huge, exogenous constraint to SSA overall export development.

Figure 5.11



In fact, once landlockedness and remoteness are considered (together with the also exogenous natural resource abundance), SSA low level of exports per capita are very well predicted. A scatter plot comparing the actual level of NHM exports per capita with the level expected from these variables (Figure 5.12), shows that the SSA level is almost perfectly predicted by these largely exogenous factors. These factors also well predict SSA's average levels of manufacturing and services exports per capita, although moderately overestimating its average manufacturing exports per capita and moderately underestimating its average services exports per capita (Figure 5.13 and 5.14).

Figure 5.12

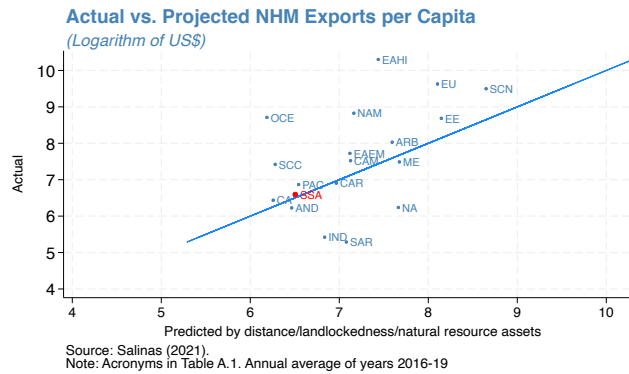


Figure 5.13

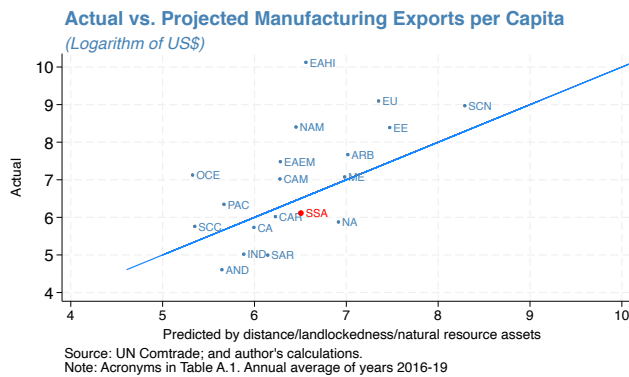
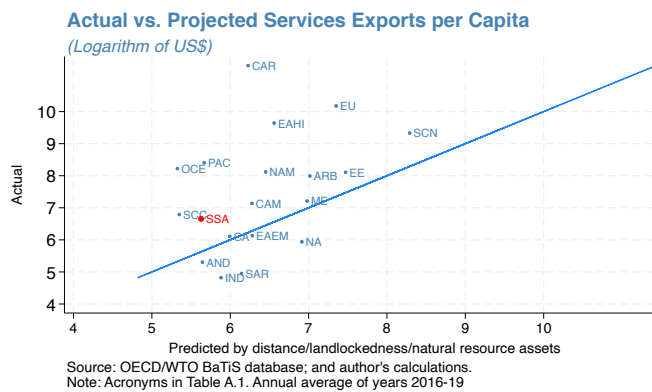


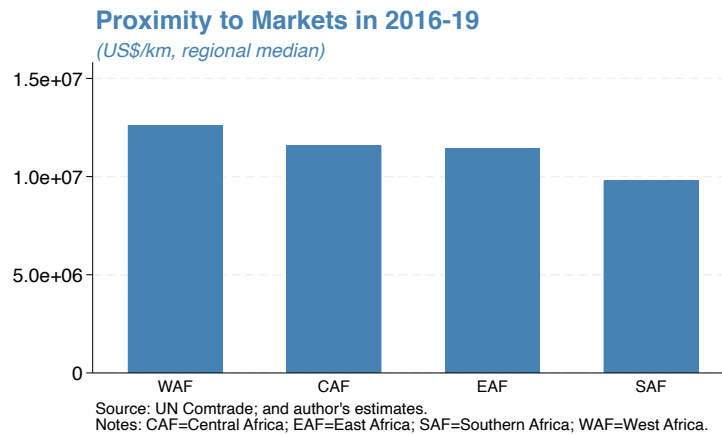
Figure 5.14



While remoteness and landlockedness go a long way in explaining SSA's export underdevelopment, weak export determinants in SSA are most likely another key factor. One

fact that makes this clear is that the higher export performing EAF and SAF regions have lower PM than the worse performing CAF and WAF countries (Figure 5.15). Then these remote successful exporters must also have strong policy-related export determinants that help them offset their remoteness.

Figure 5.15

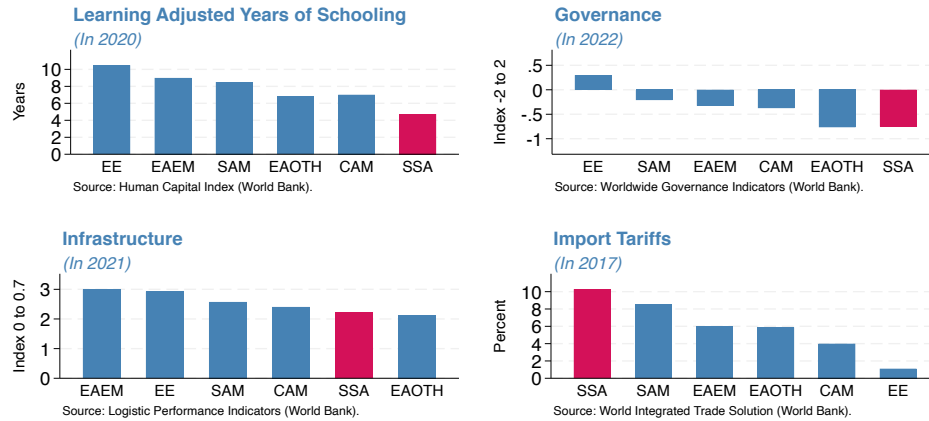


Besides facing severe exogenous factors, the SSA median country has very weak horizontal policy determinants (Figure 5.16). The biggest regional deficiency is its education level, but its also weak infrastructure is alarming too, especially considering its challenging geography and remoteness to large markets. The relatively high tariffs significantly compound this connectivity constraint. The weak governance despite significant aid-financed public sector reforms in recent decades is similarly of concern.

Figure 5.16

Exports Determinants in SSA Countries and Comparators

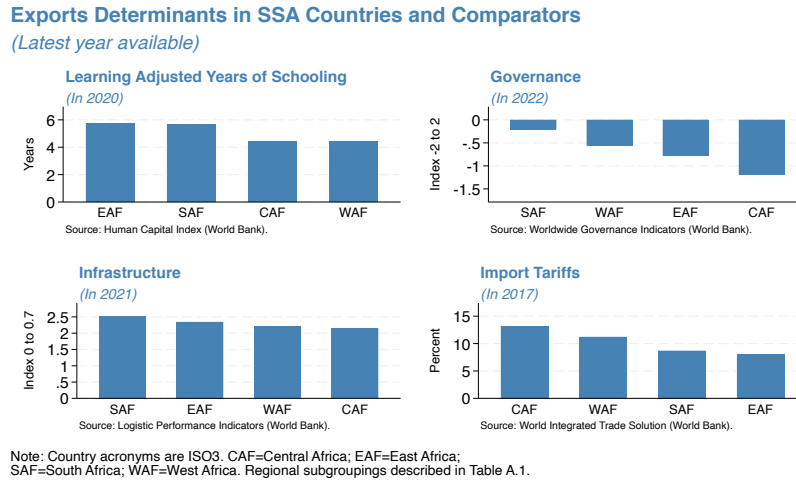
(Latest year available, regional median)



Note: CAM=Central America and Mexico; EAEM=East Asia Emerging Markets; EAOTH=East Asian Others (Low Income); EE=Eastern Europe; SAM=South America; SSA=Sub-Saharan Africa. Regional subgroupings described in Table A.1.

As expected, the more remote EAF and SAF countries have the stronger orthodox policy determinants among all SSA subregions (see Figure 5.17), which is most likely an important explanation for their better export performance. EAF, the best performer in SSA in terms of NHMGS exports per capita, has the best education quality, as well as the lower import tariffs. Their average infrastructure quality is also relatively high. SAF, with the highest manufacturing exports per capita, also has relatively high education quality and low import tariffs, and ranks top regionally on infrastructure quality and governance, with the latter being about the world median.

Figure 5.18



A particularly notorious factor behind SSA's weak governance is its high incidence of conflict. As seen in the next section, gravity equation regressions that add conflict homicides identify its very significant and harmful effect, even when controlling for GDP per capita. At more than 1 death per 100,000 people, the average conflict death rate is way above other regions (Figure 5.18). These rates are highest in worst export performing regions of CAF and WAF (Central African Republic, Democratic Republic of Congo, Mali, Nigeria, among others). A weak business-related regulatory framework (Figure 5.20), as measured by the Doing Business score, is most likely another factor explaining SSA's export underdevelopment.

Figure 5.19

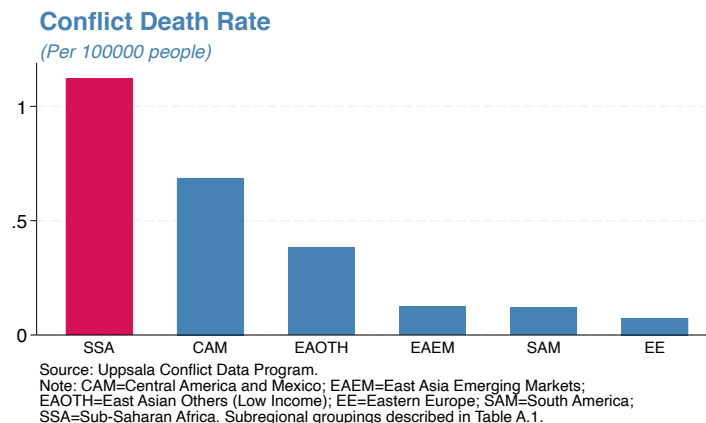
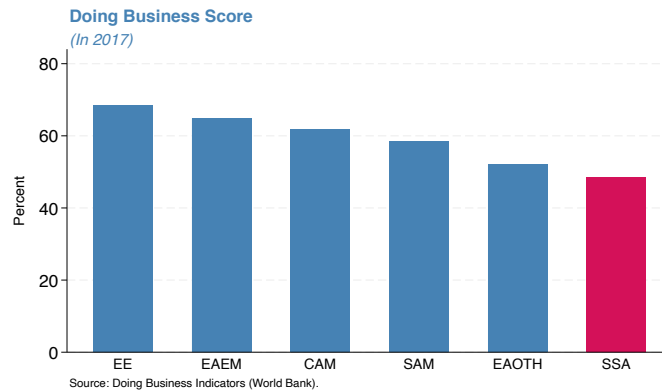
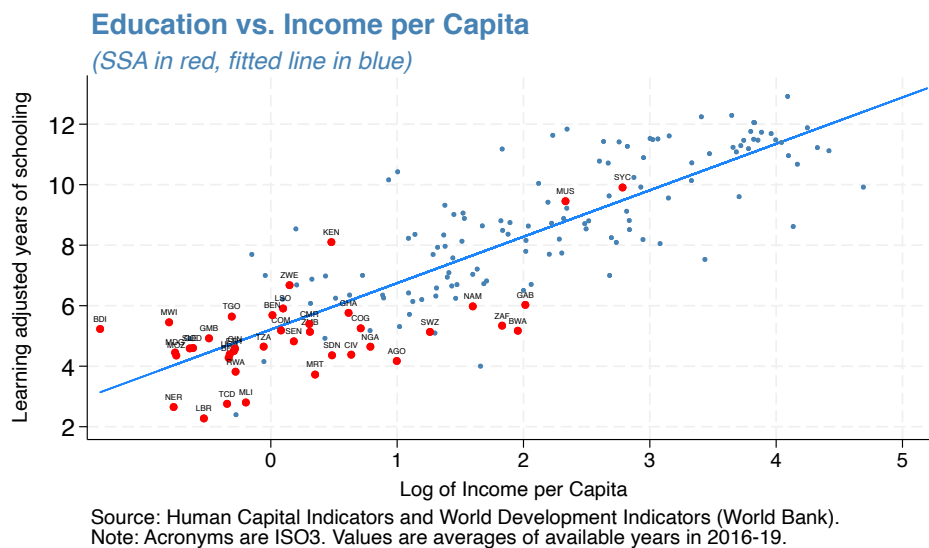


Figure 5.20



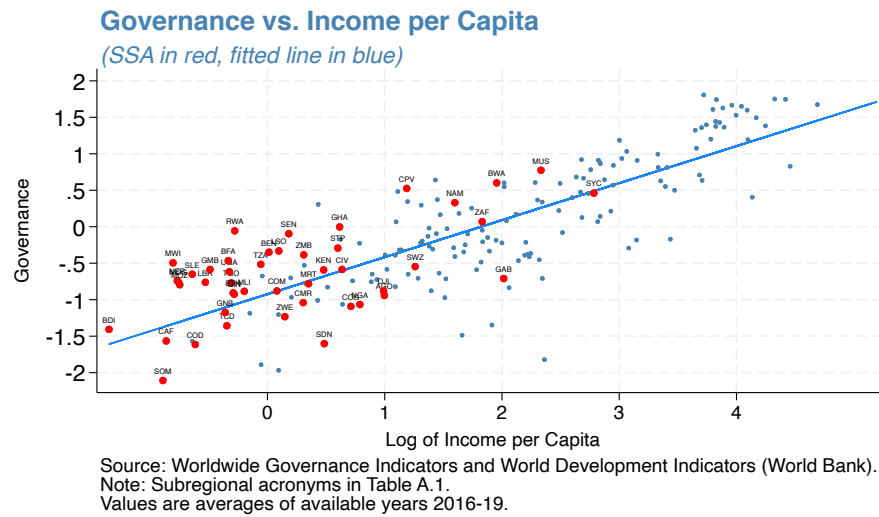
As discussed in previous chapters, strengthening many export policy determinants is constrained to some extent by their own low income. Yet, cross-country scatter plots between export determinants and GDP per capita show that there are several SSA countries that have determinants way stronger than expected from their income per capita. On Learning adjusted years of schooling, for example, Kenya has more than 2 years above its GDP-predicted level (Figure 5.21). This country is as positive outlier on this indicator as well-known international role models in Central Asia, East Asia, and Eastern Europe.

Figure 5.21



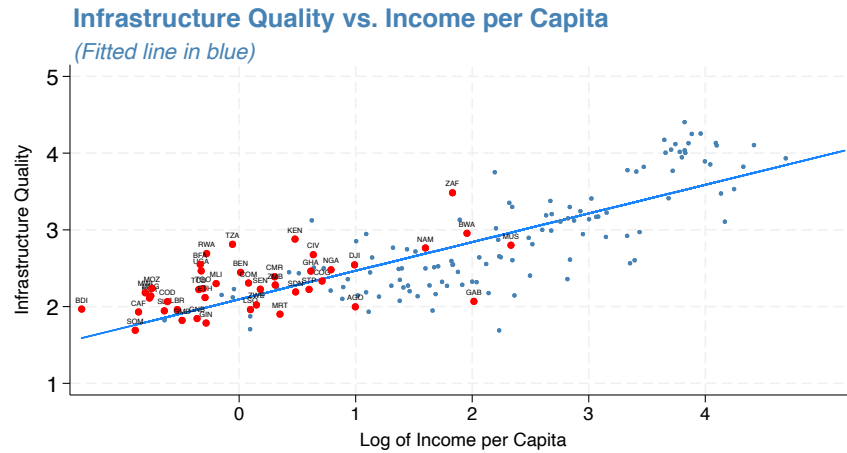
On governance, SSA has its own role models. Many SSAs have a governance quality way above predicted by their GDP per capita (Figure 5.22). Most impressively Rwanda, but also Cape Verde, Malawi, and Senegal can serve as role models for aspiring governance reformers in the region. The SSA countries with the best governance in absolute terms, Mauritius and Botswana can also be an important example for SSA countries.

Figure 5.22



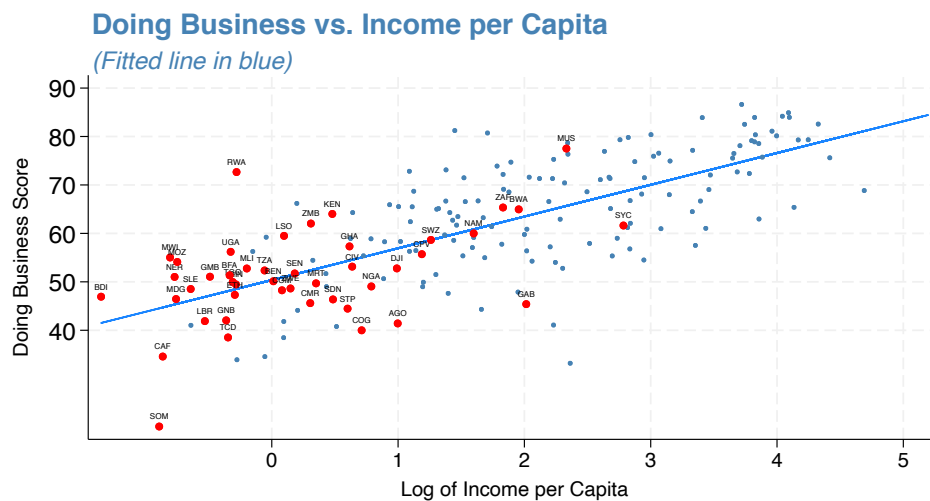
Infrastructure is most clearly dependent on financial resources, but Kenya, Rwanda, South Africa, and Tanzania have infrastructure quality much higher than expected by their GDP per capita (Figure 5.23). Internationally, East Asian countries and India are similar cases.

Figure 5.23



The region can also substantially improve its business climate despite its low income. Most impressively, Rwanda in 2017 had Doing Business ranking 25 points above the level predicted by its GDP per capita (Figure 5.24). Mauritius and Kenya were also impressive outliers. These three countries had the best Doing Business score in the region. Central and East Asian countries also are notable for their business climates given their GDP per capita.

Figure 5.24



4. A REALISTIC LEAP OUT OF A POVERTY/EXPORT CONCENTRATION TRAP

For sure, the low financial resources available to most SSA countries are an important constraint to the strengthening of their horizontal export policy determinants. A priori, one could think that this constraint is so strong that they constitute a trap to export diversification. Yet, as seen in the previous section, there is significant room to strengthen horizontal policies with available financial resources. In this section we make linear projections of how much SSA exports can be boosted with such a financially “realistic” strengthening of its horizontal policies.

As mentioned earlier, conflict is a commonly cited factor restraining economic activity in SSA, so export projections can be more meaningful to SSA’s context if they include this variable. To do so, we run gravity equation regressions that include the log of conflict casualties per capita. This addition does not substantially modify the rest of the regression and identifies the expected significant negative impact of conflict on exports (Table 5.1). The estimated coefficient implies that a one standard deviation increase in the conflict death rate is associated with a quarter lower NHM exports and a fifth lower manufacturing exports. The high and statistically significant negative coefficient of conflict casualties is even more impressive when we note that this variable included together with the related governance variable (which includes a component of Political Stability and Violence).

Table 5.1

Dependent Variable: Log of exports of:	Non-hydrocarbon/mineral	Manuf.
Log GDP reporter	0.713***	0.720***
Log GDP partner	0.901***	0.774***
Log distance	-1.265***	-1.470***
Common currency dummy	0.485***	0.549***
Common border dummy	1.837***	1.766***
Common language dummy	0.679***	0.549***
Common colonizer dummy	0.613***	0.482***
Past colonial link dummy	1.234***	1.412***
Log of hydrocarbon/mineral assets	0.0609***	0.0658***
Landlockedness	-1.815***	-1.611***
Log GDP per capita	-0.246***	-0.265***
Governance (WB Index)	0.02	0.145*
Education (UN Index)	5.416***	4.934***
Infrastructure (GCR Index)	0.180***	0.258***
Average Tariff (Percent)	-0.0284***	-0.0579***
Labor market flexibility (GCR Index)	-0.05	-0.04
Doing Business (World Bank Index)	-0.0284***	-0.0579***
Conflict death rate (Uppsala database)	-0.0302***	-0.0199***
Constant	-2.31	1.74
Observations	37,325	35,483
Rho	0.92	0.91

Notes: * p<0.1, ** p<0.05, *** p<0.01. Panel regressions based on Hausman and Taylor (1981) technique with groups consisting of all combinations of reporter and partner countries in UN Comtrade database. Observations are non-overlapping 5-year averages within the 1962-2019 period, depending on data availability. Regression specification based on equation (7) of chapter 1. Multilateral resistance terms and partner country's policy variables included (coefficients not reported). Dependent variable is the logarithm of the value of exports excluding hydrocarbon and mineral products. Definitions of dependent and independent variables are found in the data section of the methodological appendix.

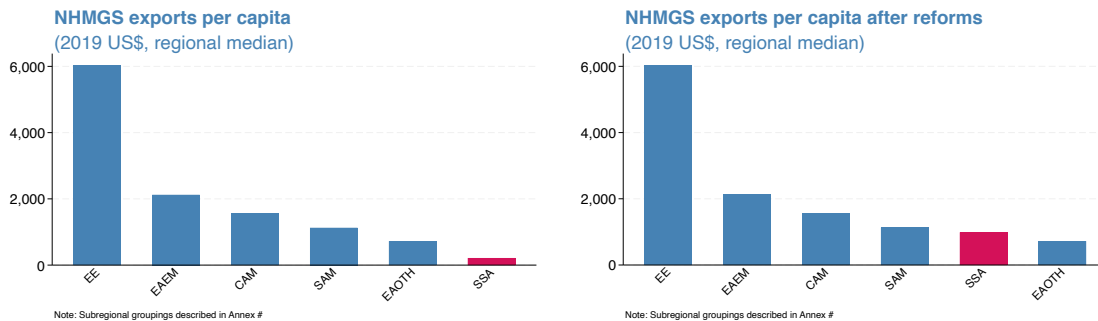
A similar modification to services regressions in Salinas (2021) is not similarly successful, as conflict appears with a negative sign coefficient but not statistically significant. We hence refrain from using this variable in upcoming simulations of the impact of strengthening export determinants on services exports. This will make our simulations more conservative than otherwise regarding the impact of conflict reduction on NHMGS exports.

An ambitious, but financially realistic scenario would be that SSA countries follow their own regional role models that have horizontal export policy determinants way stronger than predicted by their GDP per capita: Kenya on education, Cape Verde on governance, and Kenya

on infrastructure. Hence, in this simulation we assume that all countries have a “positive outlying” as high as these three countries. In addition, we assume that import tariffs are lowered to 2 percent and that the conflict death rate is lowered to the level of East Asian lower income countries (EAOTH).

The simulated impact of these reforms is a significant 270 percent increase in the median NHMGS, surpassing the average level of EAOTH (Figure 5.25). The magnitude of the assumed reforms is important and would require major political efforts in these countries. For sure, the biggest efforts (but also biggest rewards from their efforts) would need to be made in CAF and WAF, which currently have the weakest political fabric.

Figure 5.25



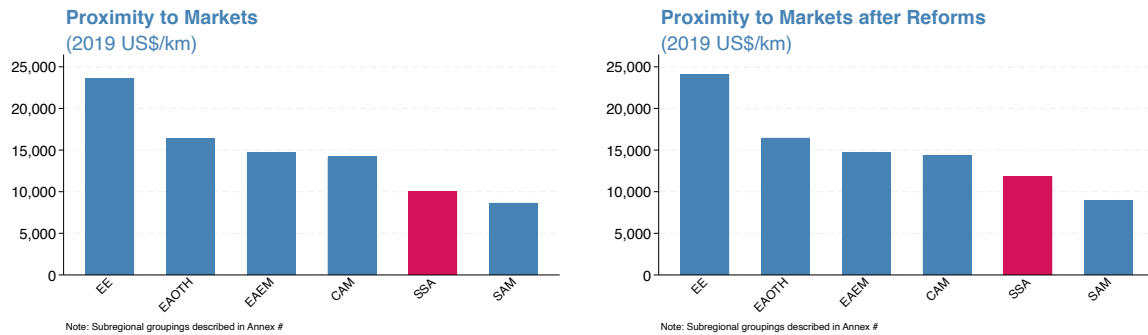
The NHMGS export boost from the strengthening of export policy determinants should be significantly larger if a large part of SSA countries simultaneously undertake these reforms because the consequently simultaneous increase in NHM exports would result in a more general increase in GDP per capita, which would increase PM of other SSA countries. This in turn would further boost their NHMGS exports. In such an SSA wide simultaneous strengthening of horizontal policies, the NHMGS exports of, for example, Niger, would not

only grow from the strengthening of its own horizontal policies but should also further grow from the expected boost to GDP in other SSA countries, especially from the nearby WAF countries. This should increase Niger's PM index and this in turn should further boost its NHMGS exports.

This benefit of increased PM from the development of nearby countries has been seen for decades in the export development of East Asian countries. Thus, the initial export development of Japan is widely known to have boosted the export development of Singapore, South Korea and Taiwan, and this eventually reached down to other East Asian countries with weaker fundamentals such as Malaysia, Thailand, and Vietnam. The liberalization and opening of the Chinese economy are leading to further and substantial increases in PMs across the East Asian region.

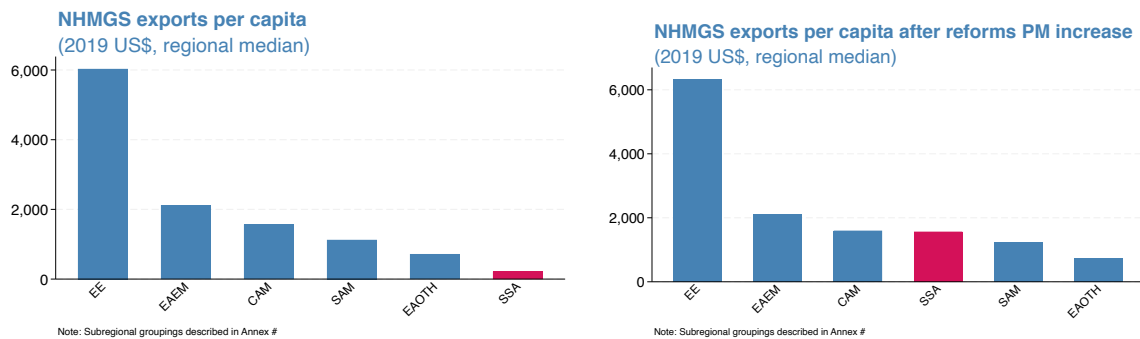
For a very raw sense of the potential impact of the previously simulated increases in NHMGS exports across SSA on their GDP we use the very simplistic empirical methodology used for a similar simulation for Latam countries in chapter 2, assuming from a correlation coefficient that an increase of one percent in NHMGS exports is related to a 0.69 percent increase in GDP. The estimated GDP increases related to all estimated increases in NHM exports are used to calculate new PM indices. This way we calculate that the previously simulated increase in NHMGS exports across SSA would lead to an increase of average in their PM index of 19 percent (Figure 5.26).

Figure 5.26



And based on previously estimated regressions of NHMGS per capita on PM, landlockedness and natural resource assets we can again deduct that the 19 percent increase in SSA's PM index would lead to a substantial 60 percent increase in NHM exports (Figure 5.27). This gets up the median SSA NHM exports to surpass the middle-income SAM region and even match CAM, a region substantially benefited by their proximity to the large North American economy.

Figure 5.27



5. CONCLUSIONS

While the SSA region has indeed extremely low export development, we need to realize that this poor performance is partly a result of their largely exogenous long distance to the large economic and population centers and the landlockedness of a third of its countries. But the statistical analysis in this chapter provides space for optimism. Several remote SSA countries

have export per capita levels that even match those of high performing export regions. These successful SSA countries tend to have relatively strong export policy determinants (strong even controlling for their GDP per capita) that help them offset the significant geographic hurdles.

SSA's geographic limitations highlight the need to invest in strengthening transport infrastructure and communications. The latter is particularly important to boost services exports, some of which are less dependent on distance to markets and more dependent on telecommunications to the rest of the world.

A context of low government effectiveness and corruption are always an obstacle to infrastructure development. In this regard, recent public/private schemes in Latin American countries (*Obras por Impuestos* (Works for Taxes), Government-to-Government (GtoG), and PPPs), can help build infrastructure in this context. And being education the export policy determinant where SSA performs remarkably poorly, major efforts that tap on technology to massify and improve education can have large payoffs.

Simulations results provide a very positive outlook. Not asking SSA countries to match high-income countries' export policy determinants but those of their own regional best performers could result in a massive boost to their exports per capita. This could thus launch a virtuous cycle of stronger policy determinants, leading to higher GDP per capita, that increases both their PM indices and their economic resources to finance further strengthening of policy determinants. Arguably, more than an economic challenge, the effective export diversification

of SSA is a political challenge needed to strengthen its orthodox, horizontal policy determinants more than stubbornly and failingly insisting on rent-seeking prone hard IPs.

1. INTRODUCTION

Another group of countries (and territories) that find it difficult to diversify their exports are those with low population.³⁶ Commonly referred to as Small States (SS), a few of them have significant HM resources (for example, Seychelles, and Trinidad and Tobago), but most are islands that mainly export tourism services. Somewhat like the case of HM exporters, tourism in these small states is mainly the result of their natural resource abundance, in this case, abundance of attractive beaches and overall natural landscape. And while some of these SS have developed significant overall competitiveness that can foster other exports (for example, Iceland or Mauritius), one could think that their small population can limit the economies of scale that could help the development of manufacturing.

Although these SS can further boost their income per capita by strengthening their tourism sectors, they could face scale constraints like, for example, many European cities that are already experiencing overtourism. Moreover, the Covid pandemic that hit hard world tourism, has highlighted the importance of not depending too much on this sector. Responsible macroeconomic management surely can go a long way in helping these countries smooth out exogenous shocks to tourism but nurturing other sectors would considerably facilitate dealing with this major challenge.

³⁶ Chapter co-authored with Carolina Castellanos (IMF).

Is diversification a reasonable policy prescription for SS? Can these countries significantly diversify their export baskets through strengthening their export policy determinants (partly using the revenue provided by tourism)? Or is their small size itself an unsurmountable obstacle to diversification?

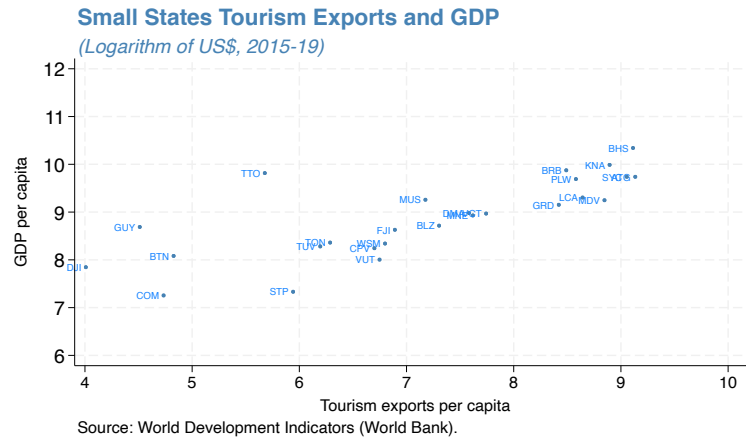
This chapter explores these questions based on the analytical framework proposed in chapter 1. The first stylized facts show that SS have different degrees of tourism export dependence, showing that many of them have significant non-tourism export development. Statistical analysis further suggests that lower population size is not a significant constraint to the development of NHM goods exports and, in fact, smallness is statistically associated with higher non-tourism services (NTS). While our simulations show that the strengthening of horizontal policy determinants can result in the significant development of non-tourism exports, it is also clear from this chapter's analysis that the size of the tourism sectors in many small states is so large, that even if SS surpass the export development of the East Asian region, they will remain significantly dependent on tourism exports. This highlights the need for a solid macroeconomic management of SS.

2. THE TOURISM DEPENDENCE CHALLENGE

Most SS are economically blessed by natural landscapes that make them hotspots of international tourism. The relevance of tourism to their economic activity is evident in a scatter

plot showing a strong positive relation between their tourism exports and their GDP (Figure 6.1).^{37 38}

Figure 6.1



Nonetheless, this blessing also implies a major challenge, as their large tourism exports are so dominant that fluctuations in this sector can dramatically shake their economies. This was most notably the case when the Covid-19 pandemic practically halted global tourism. While almost no country was spared from the pandemic tourism shock, in SS its economic impact was catastrophic, with most of these economies experiencing a contraction above 10 percent of GDP in 2020 (Figures 6.2 and 6.3). This is way above the three percent contraction of the global economy that year. The size of the GDP hit on SS was correlated with the relative size of tourism in their total exports and GDP. The massive balance of payments impact of the pandemic on these countries required international support, including through IMF lending that was historically high relative to those countries' quotas.

³⁷ Trinidad and Tobago (TTO) is a clear outlier in this relation because of its high hydrocarbon exports.

³⁸ For this chart and the rest of the chapter, we define Small States based on the UN list of Small Island Development States.

Figure 6.2

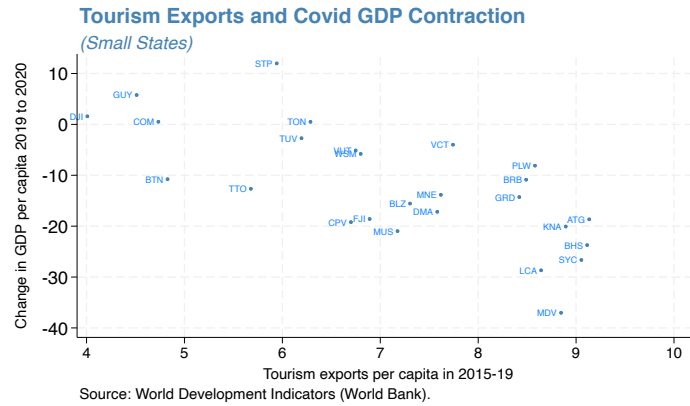
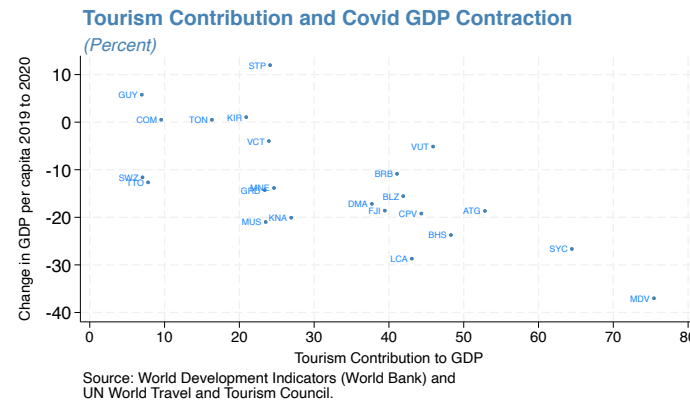


Figure 6.3

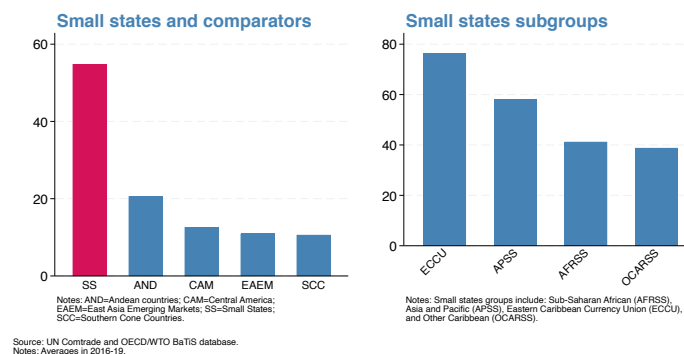


Further complicating this issue, numerous small states face constrained fiscal positions that limit their ability to absorb such shocks, largely due to the ongoing fiscal challenges associated with managing their unusually frequent natural disasters. Most SS are islands that are located within the path of hurricanes and cyclones, natural events that are becoming more frequent with the ongoing warming of the planet. Very often, they bring about such destruction that they significantly compromise the fiscal sustainability of these countries. Add to this the frequent volatility of their dominant tourism exports and macroeconomic management becomes a superlative challenge.

Whereas the importance of reducing SS tourism dependence by boosting other exports is clear, the feasibility of doing this is not. A major challenge is the magnitude of tourism dominance, which requires substantial development of other exports to meaningfully reduce tourism dominance. The median SS has tourism exports that account for more than 60 percent of their NHM goods and services exports (Figure 6.4)³⁹. This is way above the percentage share for the selected emerging market regions that we will use as comparators for the rest of the chapter. This tourism dominance is very large across SS subgroups in several world locations, with the Eastern Caribbean Currency Union (ECCU) group having a median tourism share of 80 percent, while the least dependent African Small States (AFRSS) and other, non-ECCU Caribbean countries (OCARSS) have a still substantial median tourism share of about 40 percent.

Figure 6.4

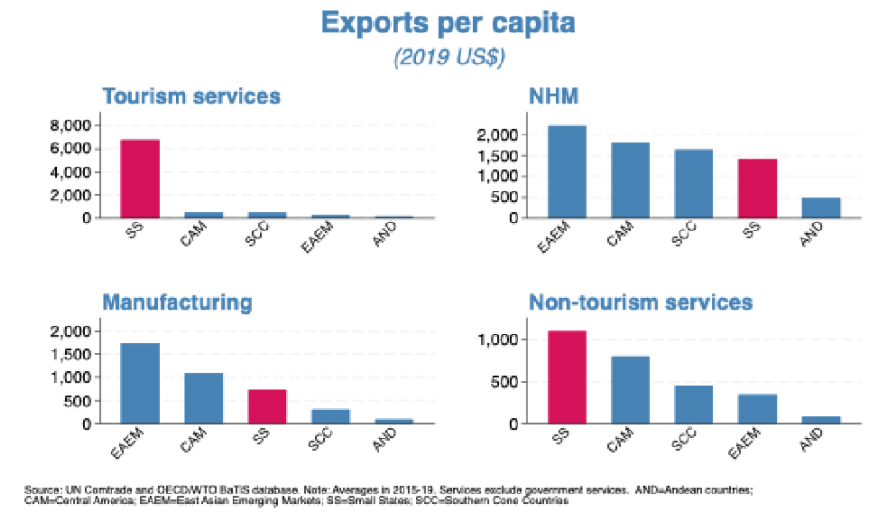
Tourism share of NHM goods and services exports in 2016-19
(2019 US\$, median)



³⁹ This chapter does not include HM exports in the analysis, as it focuses on the development of exports that can be developed mainly through appropriate policies, while HM exports are largely determined by largely exogenous resource abundance.

The per capita size of tourism exports in SS is so high that is hard to see tourism not remaining the dominant export, even if these countries can effectively boost other exports. With SS tourism being in average about US\$ 6,000 per capita, not even if these countries would export NHM goods and non-tourism services (NHMGNTS) as the average EAEM (less than US\$2500) could NHMGNTS match the size of their own tourism exports (Figure 6.5).

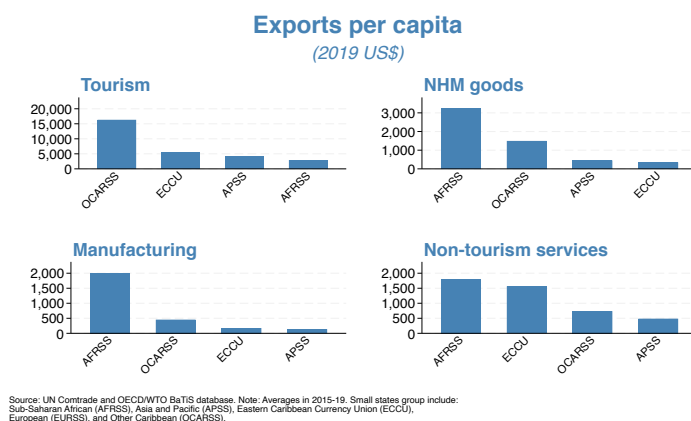
Figure 6.5



In addition to the large size of SS tourism exports, another challenge to SS significant diversification, a priori, could be their population size because economies scale is an important determinant of industrial development. Despite their low population though, SS do have a significant development of non-tourism exports, in average surpassing South American countries in NHM goods and manufacturing exports per capita. And SS average NTS exports per capita are in fact higher than in all comparators. Considering that other export determinants besides population size may explain SS significant NHMGNTS development, later we analyze the impact of population size on export performance controlling for other variables through regression analysis.

Worth noting too, the export performance among SS is very diverse (Figure 6.6). Across SS subgroups, in average it's the African Small States (AFRSS) subgroup that has the best export performance in all non-tourism exports. Other (non-ECCU) Caribbean Small States (OCARSS) also have relatively high NHMs goods and manufacturing exports, although considerably below AFRSS, while ECCU has NTS exports per capita that are broadly as high as AFRSS.

Figure 6.6



AFRSS superior export performance among SS largely reflects the high performance of Mauritius and Seychelles (Table 6.1). Their non-tourism exports per capita match and surpass the average level of EAEMs. While these countries have tourism exports that are among the largest within the SS group, they are also among the very few SS that have non-tourism exports that surpass their tourism exports. Their non-tourism exports include textiles, medicaments, fisheries, business services, telecommunications services, among others.

Table 6.1

Exports per capita in 2016-19 (2019 US\$)						
Country	ISO 3 Code	Tourism	NHM goods	Manufactures	Non-tourism services	Tourism share (%) 1/
Africa (Sub-Saharan, AFRSS)						
Cabo Verde	CPV	1,029	143	26	472	62.6
Comoros	COM	128	81	10	60	47.5
Mauritius	MUS	1,705	1,860	1,045	1,646	32.7
Sao Tome and Principe	STP	485	79	12	96	73.5
Seychelles	SYC	10,031	14,917	10,535	8,429	30.1
Asia Pacific (APSS)						
Bhutan	BTN	176			101	2/
Fiji	FJI	1,378	972	320	872	42.8
Kiribati	KIR	40	85	14	163	14.0
Maldives	MDV	7,095	415	1	687	86.6
Palau	PLW	7,018	485	262	832	84.2
Samoa	WSM	1,315	259	57	525	62.6
Tonga	TON	737	n.a.	n.a.	510	2/
Tuvalu	TUV	752	n.a.	n.a.	321	2/
Vanuatu	VUT	1,293	n.a.	n.a.	328	2/
Eastern Caribbean Currency Union (ECCU)						
Antigua and Barbuda	ATG	10,707	19	6	3,099	77.4
Dominica	DMA	2,612	171	2	744	74.1
Grenada	GRD	5,438	231	31	574	87.1
Saint Kitts and Nevis	KNA	9,125	797	749	4,006	65.5
Saint Lucia	LCA	6,308	429	161	439	87.9
Saint Vincent and the Grenadines	VCT	2,825	378	72	489	76.5
Other Caribbean (OCARSS)						
Bahamas	BHS	10,717	1,217	557	1,018	82.7
Barbados	BRB	5,001	n.a.	n.a.	1,988	2/
Belize	BLZ	1,617	720	76	511	56.8
Guyana	GUY	117	1,157	316	265	7.6
Trinidad and Tobago	TTO	373	3,963	1,261	372	7.9

Source: Comtrade (UN), BaTiS database (OECD/WTO), and author's calculations.

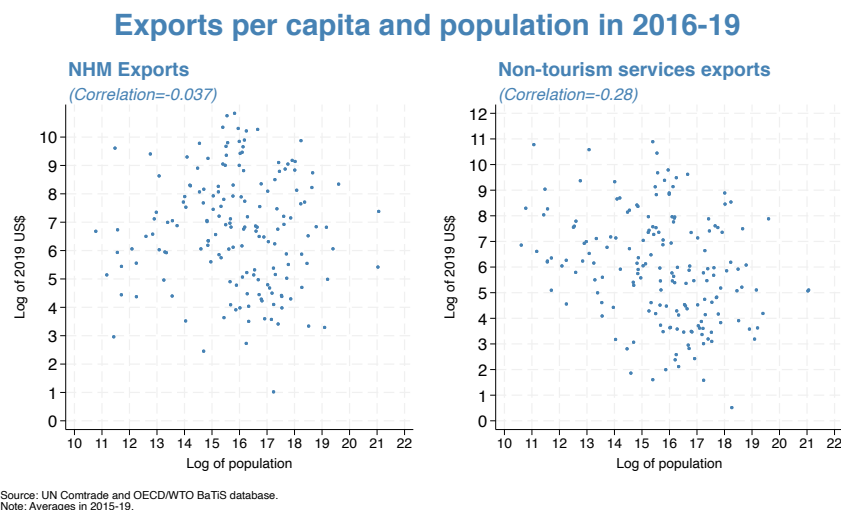
1/ Share of Non-hydrocarbon/mineral (NHM) goods and services exports.

2/ Not available due to missing NHM goods exports data in Comtrade.

Some of the other SS with good non-tourism export performance include countries with high NHM goods exports that are processed products from their raw HM resources and therefore benefit from this exogenous factor (for example, Guyana and Trinidad and Tobago). Others though (most notably Barbados, Bahamas, Fiji, St. Kitts and Nevis) have developed a more diverse export basket including electronics, medicaments, passport sales, ships/vessels, among other products.

Despite the potentially limiting lack of economies of scale, the fact that several SS do have a significant development of non-tourism exports shows that size is not a complete impediment to SS export diversification. Moreover, scatter plots between the log of population and the log of non-tourism exports per capita do not show a positive relation between both (Figure 6.7). While they show no clear relation between population and NHM goods exports, they in fact show a negative (although not strong) relation between population and NTS exports.

Figure 6.7



Neither do random effect regressions find a significant relation between population size and NHM/manufacturing exports, plus they confirm the apparently negative relation between population size and NTS exports per capita (Table 6.2).⁴⁰ There is, hence, no statistical evidence that a small population size negatively affects the development of non-tourism exports.

⁴⁰ Similar results are obtained in OLS cross-country regressions for the period 2016-19.

Table 6.2

Regressions of population size on exports

Dependent Variable: Log of exports per capita	NHM	Manuf.	NT services
Log of proximity to markets	0.258	0.793***	0.685***
Landlockedness	-1.405***	-1.651***	-0.50
Log of natural resource assets	-0.05	-0.04	-0.06
Education Attainment	1.922**	2.538**	2.568***
Governance	-0.09	-0.12	0.23
Infrastructure	0.259***	0.244**	0.281***
Import tariff	-0.0257*	-0.0482**	0.00
Log of GDP per capita	0.576***	0.524***	0.370***
Log of population	-0.06	0.09	-0.141**
Constant	1.30	-10.86**	-5.957*
Observations	176	176	172
Rho	0.94	0.92	0.82
Notes: * p<0.1, ** p<0.05, *** p<0.01.			

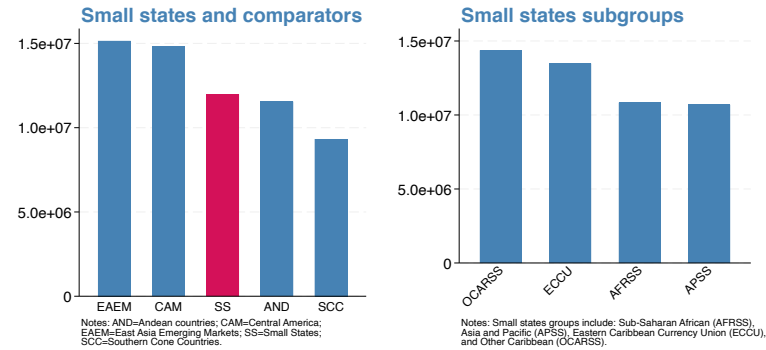
Source: UN Comtrade, OECD/WTO BaTiS; and author's calculations.

Another potential exogenous limitation to SS export diversification could be remoteness from the main international markets, a major constraint to joining Global Value Chains and to overall export development, as discussed throughout this book. The average Proximity to other Markets (PM) of SS is not as high as the average of CAM and EAEM, but neither as low as of South America countries (Figure 6.8). PM varies significantly across SS subgroup, with Caribbean SS having broadly the same proximity to markets as CAM and EAEM (due to their proximity to the large North American market), while AFRSS and APSS being significantly more remote and, thus, challenged by distance.

Figure 6.8

Proximity to Markets in 2016-19

(US\$/km)



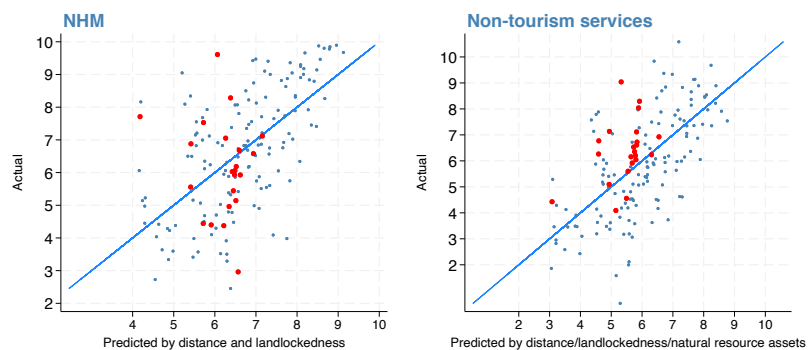
Source: UN Comtrade and OECD-WTO BaTIS database.
Notes: Averages in 2016-19.

But while distance is an important challenge to export development, there are several SS that export way more NHMGNTS than expected from their remoteness (Figure 6.9). This suggests that SSs, like many countries with strong export policy determinants, can offset the limitation imposed by distance.

Figure 6.9

Actual vs Exports per Capita in 2016-19

(Logarithm of 2019 US\$)



Sources: UN COMTRADE; OECD-WTO BTS dataset; and author's calculations
Note: Small states in red. NHM exports exclude SITC rev 2 codes 3000-4999, 6772-6999, and 9000-9999.
Country acronyms are ISO3.

In the case of NHMs goods exports, it's only a few SSs that export more NHM goods than predicted by their proximity and the majority export less than predicted by proximity. In contrast, almost all SSs export more NTS than predicted by proximity. Interestingly, Mauritius and Seychelles, the most notable export performers among small states are also among the most remote. This good performance controlling for proximity to other markets, hints that both countries have strong export policy determinants.

MUS and SYC, as well as Fiji (FJI), Guyana (GUY), and Trinidad and Tobago (TTO) are the few SSs that export significantly more NHM goods than predicted by their proximity (Figure 6.10). MUS and SYC also lead the large number of SS that export more NTS than predicted by their PM (Figure 6.11). While some SS overperform in NTS exports partly through their Citizen-by-Investment programs (for example, ATG and KNA), this overperformance is also related to other services exports (for example, business services), which are likely fostered by strong export policy determinants. This is particularly the case of MUS and SYC, as we see in the next section.

Figure 6.10

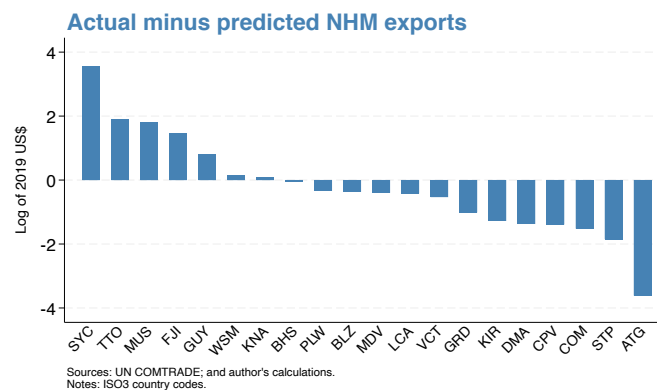
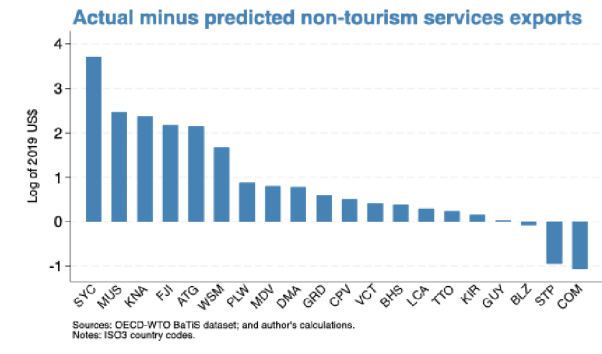


Figure 6.11

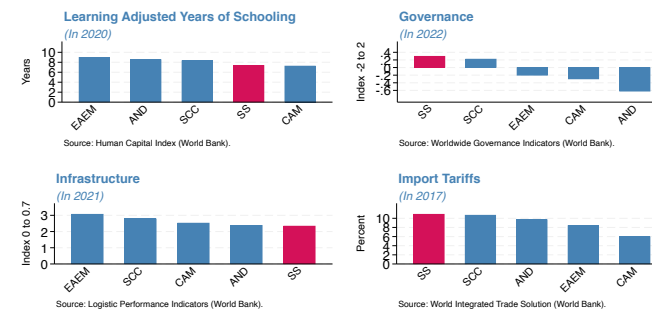


3. SMALL STATES' POLICY EFFORTS TOWARDS DIVERSIFICATION

Most SS are not particularly strong export policy performers. In fact, in average, SS have weak export policy determinants relative to comparator emerging market countries, and therefore significant room to improve them (Figure 6.12). SS education quality only matches that of CAM and its average infrastructure quality is even below that of the not very affluent AND and CAM regions. Further limiting the competitiveness of their exports, SS have an average import tariff as high as the relatively protectionist SCC countries. SS governance is comparatively strong, but being only around the world median, here there is also significant space for strengthening.

Figure 6.12

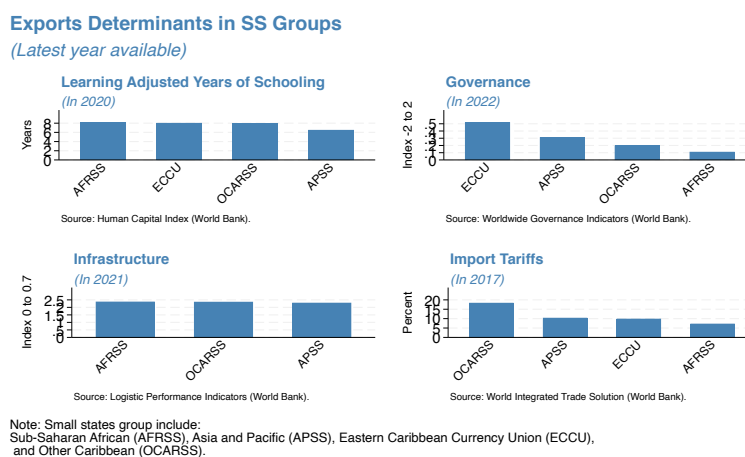
Exports Determinants in SS and Comparators
(Latest year available)



Note: AND=Andean countries; CAM=Central America; EAEM=East Asia Emerging Markets; SS=Small States; SCC=Southern Cone Countries.

The better export policy performance of several SSs suggests that these countries can have stronger horizontal policies, irrespective of their small size (Figure 6.13). AFRSS have LAYS like the average of EAEM and a single digit average import tariff. They also have an average infrastructure index that is not very different from those of all comparators. And ECCU countries have an average governance index that matches that of Costa Rica, a country well-known by its good governance among emerging market countries.

Figure 6.13

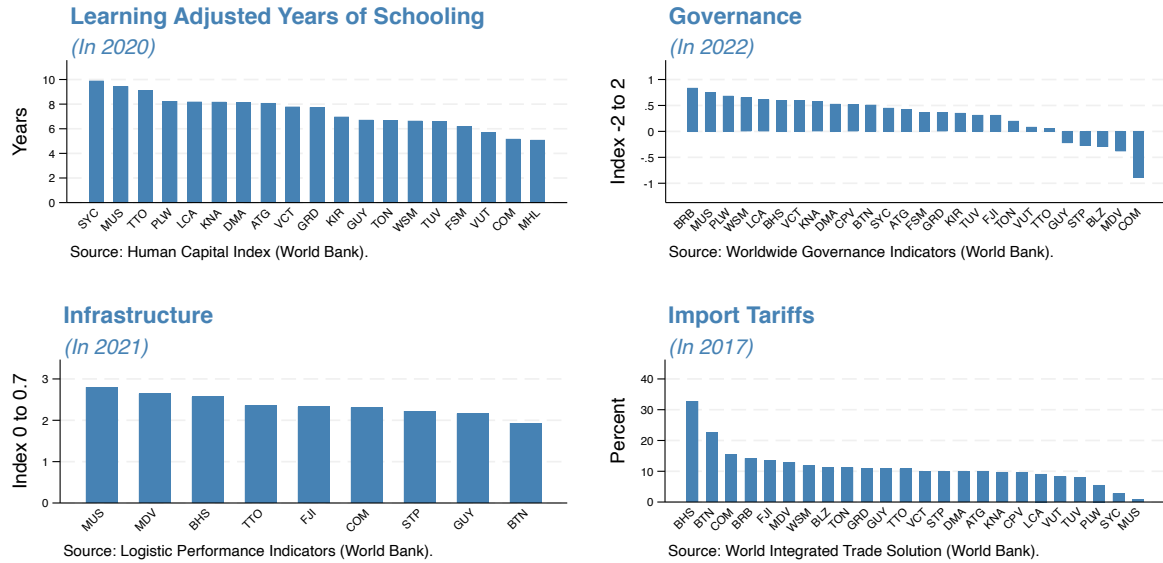


The strong export policy determinants of AFRSS reflect the sound performance of SYC and MUS, the countries that have significantly more non-tourism exports than predicted by PM (Figure 6.14). They remarkably have among the strongest education, governance, and infrastructure quality, as well as low-single digit import tariffs. And, generally, we see that SSs that are good export performers in both NHM goods and NTS exports controlling for PM, also have strong export policy determinants. KNA for instance has educational and governance quality above the median SS, while TTO has a remarkably good quality of education. On the other hand, weak export performers like COM, KIR, and STP also show weak export policy determinants.

Figure 6.14

Exports Determinants in SS Countries

(Latest year available)



Note: ISO3 country codes

4. FINANCIALLY REALISTIC NON-TOURISM EXPORT DEVELOPMENT

That SS have significant room to strengthen many of their export policy determinants is more evident when comparing their determinants to the level predicted by their income per capita.

The education quality of most of them is below their income-predicted level, evidence that they could improve this indicator with existing financial resources (Figures 6.15 and 6.16). Even the relatively sound policy performers, MUS and SYC are far from the world's most prominent positive outliers, which have around 3-4 years LAYS above the level predicted by their GDP per capita.

Figure 6.15

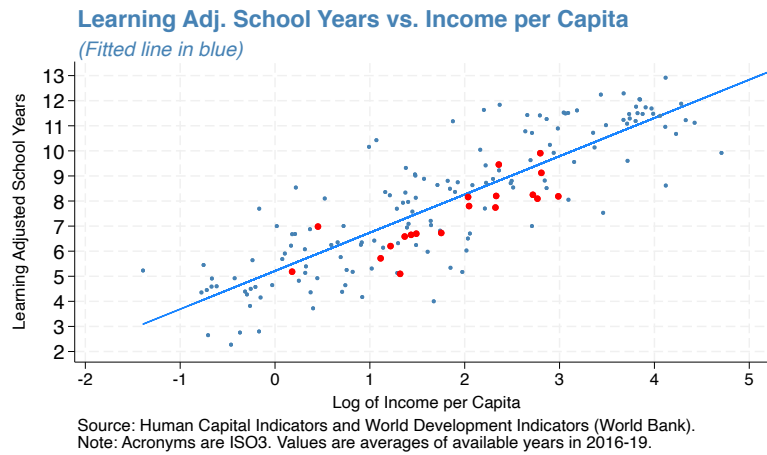
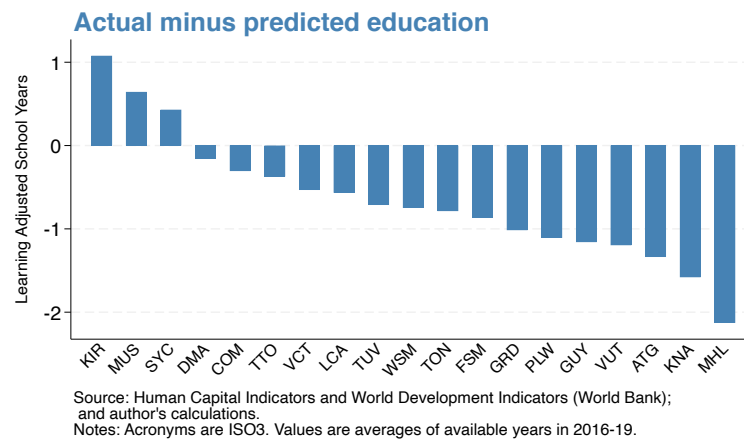


Figure 6.16



This is similarly the case of infrastructure quality, with only one out of nine countries having an infrastructure index above the level expected from their income, and slightly so (Figure 6.17 and 6.18). SS countries could substantially boost their exports by matching international role models (many in East Asia) that have infrastructure indices around one point above the prediction from their GDP per capita. SS can also substantially open their trade regimes, with MUS and SYS being proof that countries with very low population have no impediment to bring down their average tariffs to very low, competitive levels.

Figure 6.17

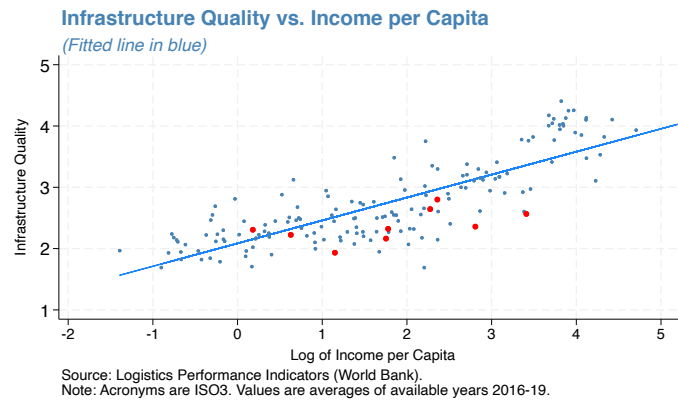
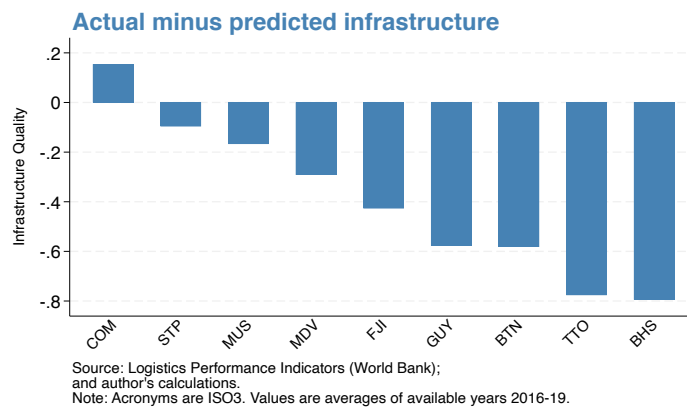


Figure 6.18



It is only governance quality, that SS have been able to strengthen it above what would be expected from their financial resources (Figures 6.19 and 6.20). In fact, some of them are the most significant positive outliers in governance. Still, there are several SSs with governance below the income-predicted level and therefore could improve it significantly with existing resources.

Figure 6.19

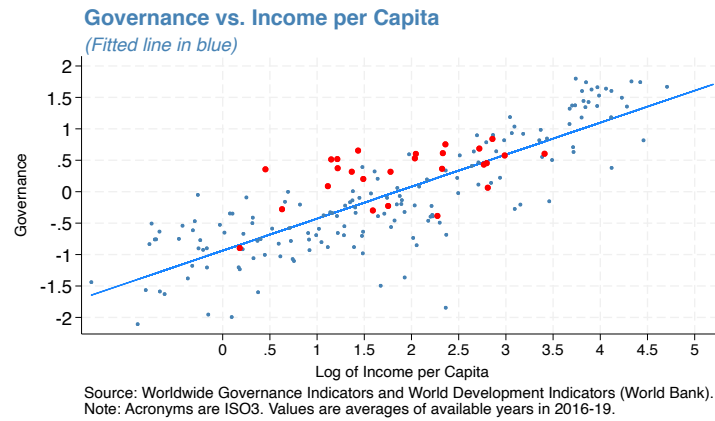
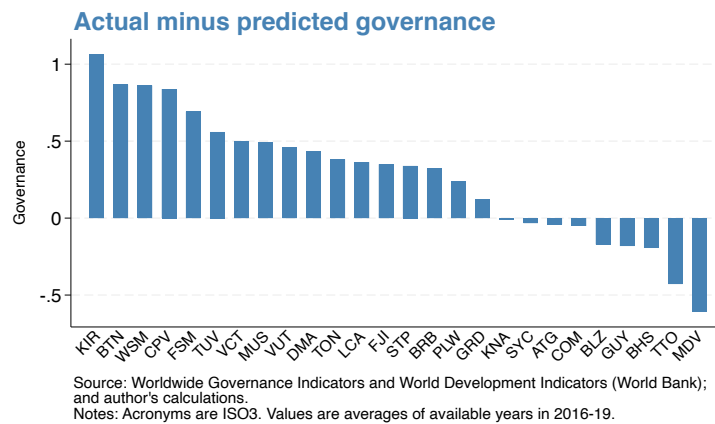
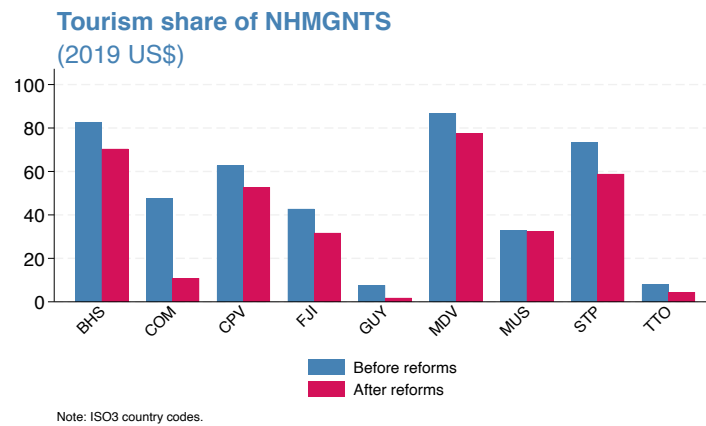


Figure 6.20



Based on chapter one's point estimates of policy determinants' coefficients we calculate the potential effects on NHMGNTS exports of strengthening education, governance, infrastructure, and import tariffs to the level of MUS, for all countries that have data for these four variables (Figure 6.21). GUY and TTO have relatively weak governance indices and high average tariffs, so they benefit significantly from these reforms. Bahamas has the highest average tariff among SS and, therefore, considerably boosts its exports by lowering its average tariff to 2 percent. Comoros, Fiji, and Maldives also benefit significantly from matching MUS.

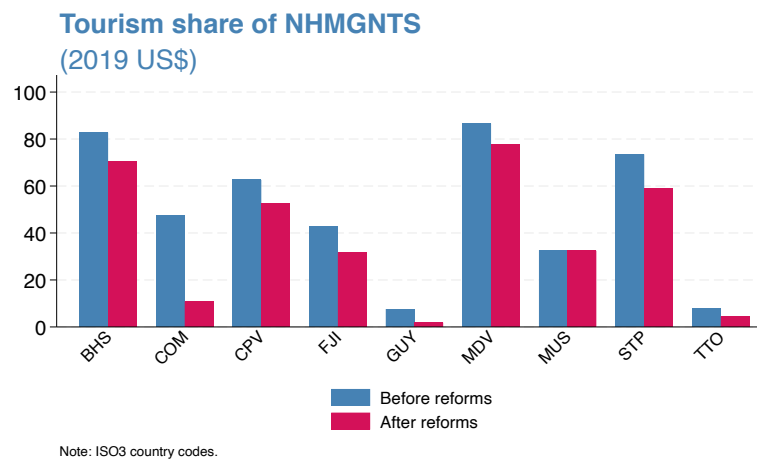
Figure 6.21



A key point though is that, although stronger horizontal policies can substantially boost NHMGNTS, they can also boost tourism. A better educated labor force, stronger governance, and higher infrastructure quality will surely benefit the tourism industry. This is an essential difference of diversification away from tourism with the diversification away from HM exports discussed in previous chapters. HM exports are less sensitive to the complexity of the local economic system and, therefore, to the strength of the horizontal policy determinants considered in this book.

An even if tourism would oddly not increase from a strengthening of SS horizontal policies, their tourism is so large that it will remain a dominant export sector. Simulation results in Figure 6.22 show this by assuming that only NHMGNTS, not tourism exports, are boosted by the simulated reforms. While the simulated increase in NHMGNTS allows SS to make significant headways in reducing their tourism dependence (most notably Comoros), most SS would remain considerably dependent on tourism.

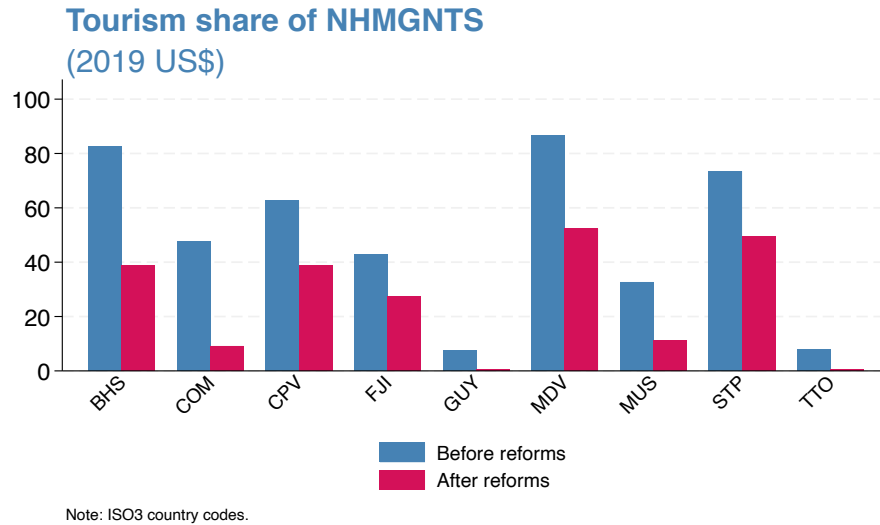
Figure 6.22



A more ambitious reform target would be for SSs to strengthen their education, governance, and infrastructure to match the most superlative global positive outliers in these areas. Thus, SSs would reform these horizontal policies so that their LAYS would be three points above the level predicted by GDP per capita, their governance 1.5 points above the GDP per capita prediction, and infrastructure one point above GDP per capita prediction.

With such a strong reform effort, simulated SS would dramatically reduce tourism dependence (Figure 6.23). But even with such policy strengthening and assuming tourism would not respond to it, most SS will remain considerably dependent on tourism. For sure though, the impact of these reforms on income per capita, be it by boosting tourism or non-tourism exports, would be significant.

Figure 6.23



5. CONCLUSIONS

This chapter suggests that significant development of non-tourism exports in SS is feasible and can include NHM goods exports (including of manufactures), as its low population may not be a significant impediment to export these products.

However, tourism exports are so large that these are likely to account for high share of total SS exports even if these countries make the significant horizontal policy reforms to reach and surpass non-tourism exports per capita of EAEM. This will further be the case because these reforms will surely also boost tourism to a significant extent.

Therefore, SS will most likely need to cope with tourism export volatility and its macroeconomic implications for a while. In principle, they could do this by:

- Maintaining a countercyclical fiscal stance, including through automatic stabilizers.

- Developing financial instruments that allow hedging for global economic growth, a major driver of tourism and commodities.
- Maintaining a flexible labor market while protecting people from labor market fluctuations.

These recommendations are particularly important for fixed exchange rate regime countries as they must deal with these fluctuations without the flexible exchange rate cushion. Tourism revenue volatility itself could be reduced by geographically diversifying tourism sources and fostering a large variety of tourism options (cultural, rainforest, beaches, musical festivals and so on) that may not be necessarily correlated among each other.

EPILOGUE: IMPLICATIONS ON INDUSTRIAL POLICIES

The statistical importance of horizontal policies in promoting export diversification identified in Salinas (2021a) and corroborated throughout this book, does not necessarily imply that sector-specific policies or IPs cannot contribute to export diversification. In fact, from a statistical point of view, the contribution of IPs policies could be partly correlated to and reflected in the statistical contribution of some horizontal policy covariates in Salinas (2021a). In other words, it is quite possible that IPs are more successfully implemented in countries with higher government effectiveness, better control of corruption, and overall education, and therefore their contribution is partly reflected in the statistical importance of these horizontal policy variables.

But, more fundamentally, the strong contribution of orthodox, horizontal policies is not a rejection of the importance of IPs because the distinction between both is essentially blurred. That is, horizontal policies and the variables that measure them are importantly an aggregation of several sectoral/vertical policies. Most evidently, government's educational/training, business regulations, or infrastructure (roads, railroads, ports) are frequently specifically directed to support some sectors and therefore cannot be considered fully horizontal. This is partly why, even orthodox economists accept vertical policies/IPs like government-led development of railroads to connect agricultural fields, roads to reach specific tourist locations, subsidizing job training or tertiary education in leading economic sectors, and so on. The economic orthodoxy goes beyond that, and commonly supports so-called "soft" IPs such as government institutions that promote foreign investment and exports in specific sectors or sector-specific R&D. The wide

support for these government schemes reflects their apparently important contribution to successful export diversification cases (see some notable cases described in Delechat and others, 2024).

Either leading or following the private sector, orthodox thinkers agree that the state should have a supply of public goods and services organically integrated and coordinated with the private sector. Thus, it has been a widespread practice for countless governments of most ideological stances to hire consultant firms to design strategies to support the development of export competitiveness, such as for the implementation of Michael Porter's approach to generate competitive advantage.

There is even some widespread support to the benefits of Export Processing Zones (EPZs) in terms of them providing infrastructure that supports manufacturing in some specific sectors. One such case happened in Mauritius in the 1970s. With high imports restrictions (average tariffs at around 100 percent) and rigid labor market legislation, this country fostered export diversification and complexity by setting up SEZs without import restrictions and with a flexible labor legislation, including one of the lowest minimum wage-to-GDP ratios in the world. These schemes most likely played an important role in Mauritius' notable export development, together with its relatively high overall institutional strength and educational quality.

There is less support in using EPZs to establish a circumscribed environment of low import tariffs and flexible labor market regulation in countries where it is politically challenging to liberalize imports and labor for the entire economy. But where there is a major dispute is on whether

substantial tax breaks in EPZs are an efficient export promotion measure or whether they constitute a substantial fiscal and macroeconomic risk and promote a “race to the bottom” on international taxation of manufacturing.

In general, the dispute on IPs refers to those that could potentially generate macroeconomic disarray. To start with, there is wide disagreement about their effectiveness. Argumentations claiming IPs effectiveness in promoting export diversification (for example in Rodrik, 2004; Rodrik, 2008; or Cherif and Hasanov, 2019) have mainly pointed at their extensive use in East Asian countries, including through firm-level studies. There are several reasons to demand further evidence before claiming that IPs should be an important component in export development strategies:

- As Harrison and Rodriguez-Claire (2012) reflects, while it is clear that East Asian countries pursued industrial policies it is not clear that those policies should be credited for their successful industrialization, especially considering that these countries simultaneously excelled on strengthening their horizontal policies. And, as argued in Salinas (2021a), East Asian export development also exogenously benefits from the economies of scale of being an enormous population agglomeration, efficiently interlinked through relatively cheap sea-based transportation.
- Several studies have negatively assessed specific IP aspects and cases in East Asian countries, notably since Caves and Uekesa (1976), which suggested that Japan’s MITI created recession cartels and entry barriers that resulted in allocative inefficiency.
- Firm-level and sector-level studies that suggest a positive impact of IPs on export promotion in some East Asian countries or in advanced economies cannot be generalized

as a cookie-cutter policy recommendation to export development, especially considering that modelling studies such as Garcia-Macia and Sollaci (2024) conclude that sector-specific fiscal support is only preferable to sector-neutral support under restrictive necessary conditions—when externalities are well measured (for example, greenhouse gas emissions), domestic knowledge spillovers of targeted sectors are high (typically in larger economies), and administrative capacity is strong (including to avoid misallocation to politically connected sectors). This study finds that if any of these conditions are not met, welfare impacts of IPs quickly become negative.

- The apparently optimal cases of implementation of IPs also need to be more strictly assessed, by comparing the identified benefits of the government financing of these IPs to the counterfactual benefits of government financing of horizontal policies with high return to export development (education, governance, infrastructure). Baquie and others (2025) conclude that structural reforms generally offer greater benefits and strengthen the link between IPs and economic performance.
- From a statistical cross-country perspective, it is hard to claim IPs are a general recipe for export development considering that these policies have been used in practically all developing countries, the vast majority of which have not experienced any significant export takeoffs.
- And even if a large body of statistical evidence behind IPs were developed, this does not mean that they can generate export “miracle” takeoffs. In fact, Bartelme and others (2021) find that the gains from even optimally designed industrial policies are small and hardly transformative, even among the most open economies.

Given the insufficient evidence behind their effectiveness and the long and vast history of sector-specific and industrial policy failures, it sounds wise to avoid using those “hard” IPs that could lead to fiscal erosion, facilitate rent seeking, contribute to a “race to the bottom” in international taxation, or weaken multilateralism. Tax incentives, subsidized credit, exchange rate manipulation, sector-specific trade protection, are among the “riskier” options. A lazy argument that is commonly made is highlighting the contribution of some relatively mainstream IPs to argue that IPs in general are key to export diversification. IPs come in all sorts of colors and their effectiveness cannot be bunch in one category. Carefulness and solid analysis are needed when planning and implementing IPs as suggested in Cherif and others (2022).

It is also commonly argued that IPs are needed because it is too hard to launch horizontal policy-based export miracles in developing countries considering their low financial resources. But, as shown in this book, horizontal policies can be strengthened substantially with existing financial resources. This can launch a virtuous cycle of stronger horizontal policies, leading to higher exports and GDP per capita, and this in turn provides more resources for further strengthening of horizontal policies.

Arguably, more than higher financial resources, the strengthening of horizontal policies requires the political will to undertake them. However, this political will itself can be weakened by promises of an arguably cheaper and easier, but less corroborated route to export diversification through IPs. Policy makers would do well to acknowledge that horizontal policies are not only less risky and less controversial than IPs, but as suggested by the analysis in Salinas (2021a), they seem to constitute the effective backbone of export diversification.

REFERENCES

- Albeaik, Saleh, Mary Kaltenberg, Mansour Alsaleh, Cesar Hidalgo, 2017, "Improving the Economic Complexity Index," Papers 1707.05826, arXiv.org, revised Jul 2017.
- Allen, Treb, Costas Arkolakis, Yuta Takahashi, 2020, "Universal Gravity," *Journal of Political Economy*, University of Chicago Press, vol. 128(2), pages 393-433.
- Anderson James and Eric van Wincoop, 2003, "Gravity with Gravitas: A Solution to the Border Puzzle," *American Economic Review*, American Economic Association, vol. 93(1), pages 170-192.
- Arkolakis, Costa, Arnaud Costinot and Andrés Rodríguez-Clare, 2012, "New Trade Models, Same Old Gains?," *American Economic Review*, American Economic Association, vol. 102(1), pages 94-130.
- Bakker, Bas, Manuk Ghazanchyan, Alex Ho, and Vibha Nanda, 2020, "The Lack of Convergence of Latin America compared with CESEE and East and South-east Asia: Is Low Investment to Blame?," IMF Working Papers 20/98, International Monetary Fund.
- Baquie, Sandra, Yueling Huang, Florence Jaumotte, Jaden Kim, Rafael Machado Parente, And Samuel Pienknagura, 2025, "Industrial Policies: Handle with Care," IMF Staff Discussions Notes SDN/2025/002, International Monetary Fund, Washington, DC.
- Barro, Robert J. and Jong Wha Lee, 2013. "A new data set of educational attainment in the world, 1950–2010," *Journal of Development Economics*, Elsevier, vol. 104(C), pages 184-198, retrieved from: < <http://www.barrolee.com/>>.
- Bartelme, Dominick, Arnaud Costinot, Dave Donaldson, and Andres Rodriguez-Clare, 2021, "The Textbook Case for Industrial Policy: Theory Meets Data," University of California, Berkeley, working paper.
- Belkhir, Mohamed, Salem Nechi, and Gonzalo Salinas, forthcoming, "Enhancing Economic Resilience in the GCC Countries: The Imperative of Export Diversification," forthcoming as IMF Working Paper, Washington DC.
- Busse, Matthias and Steffen Gröning, 2011, "The resource curse revisited: governance and natural resources," *Public Choice*, Vol. 154, No. 1/2 (January 2013), pp. 1-20 (20 pages)
- Cadestin, Charles, Julien Gourdon and Przemyslaw Kowalski, 2016, "Participation in Global Value Chains in Latin America: Implications for Trade and Trade-Related Policy," OECD Trade Policy Papers 192, OECD Publishing.
- Caves, Richard E. and Uekusa Masu, 1976, *Industrial Organization in Japan*, The Brookings Institution, 1976. Pp. xi, 169, Washington, D.C.

Cherif, Reda and Hasanov Fuad, 2014, “Soaring of the Gulf Falcons: Diversification in the GCC Oil Exporters in Seven Propositions,” IMF Working Paper WP/14/177, Washington DC.

Cherif, Reda, and Fuad Hasanov, 2019, "Principles of True Industrial Policy," *Journal of Globalization and Development*, De Gruyter, vol. 10(1), pages 1-22, June.

Cherif, Reda, Fuad Hasanov, Nikola Spatafora, Rahul Giri, Dimitre Milkov, Saad N Quayyum, Gonzalo Salinas, and Andrew M. Warner, 2022, “Industrial Policy for Growth and Diversification: A Conceptual Framework,” IMF Departmental Paper No 2022/017, International Monetary Fund, Washington, DC.

De Ferranti, David, Guillermo E. Perry, Daniel Lederman and William E. Maloney, 2002. "From Natural Resources to the Knowledge Economy: Trade and Job Quality," World Bank Publications - Books, The World Bank Group, No. 14040, August.

Delechât, Corinne, Giovanni Melina, Monique Newiak, Chris Papageorgiou, Nikola Spatafora, 2024, “Economic Diversification in Developing Countries: Lessons from Country Experiences with Broad-Based and Industrial Policies,” IMF Departmental Paper No 2024/006, International Monetary Fund, Washington, DC.

Ding, Xiaodan and Metodij Hadzi-Vaskov, 2017, "Composition of Trade in Latin America and the Caribbean," IMF Working Papers 2017/042, International Monetary Fund.

Eaton, Jonatahan and Samuel Kortum, 2002, "Technology, Geography, and Trade," *Econometrica*, Econometric Society, vol. 70(5), pages 1741-1779.

Escobari, Marcel, Ian Seyal, Jose Morales-Arilla, and Chad Shearer, 2019, “Growing Cities that Work for All: A Capability-Based Approach to Regional Economic Competitiveness,” Workforce of the Future Initiative, Brookings Institution, available at: <https://www.brookings.edu/wp-content/uploads/2019/05/GrowingCitiesThatWorkforAll-FINALforWeb.pdf>

Garcia-Macia, Daniel and Alexandre Sollaci, 2024, “Industrial Policies for Innovation: A Cost-Benefit Framework,” IMF Working papers WP/24/176, International Monetary Fund.

Giri, Rahul, Saad N Quayyum, Rujun Yin, 2019, "Understanding Export Diversification: Key Drivers and Policy Implications," IMF Working Papers 19/105, International Monetary Fund.

Gonzalez, Hermann, Felipe Larraín, and Oscar Perelló, 2020, “Diversificación de exportaciones: ¿Es Chile diferente a Australia y Nueva Zelanda?,” *Estudios Públicos* 159 (2020), 73-110. Available at: <https://doi.org/10.38178/07183089/1324200512>

Haddad, Mona, Jamus Jerome Lim, Cosimo Pancaro and Christian Saborowski, 2012, "Trade openness reduces growth volatility when countries are well diversified", ECB Working Paper No. 1491.

Hallak, Juan Carlos, 2006, "Product Quality And The Direction Of Trade," *Journal of International Economics*, Vol 68 pp. 238-265.

Harrison, Ann and Andrés Rodríguez-Clare, 2010, "Trade, Foreign Investment, and Industrial Policy for Developing Countries," in Dani Rodrik and Mark Rosenzweig, editors: *Handbook of Development Economics*, Vol. 5, The Netherlands: North-Holland, 2010, pp. 4039-4214. ISBN: 978-0-444-52944-2

Hausman, Jerry A. and William E. Taylor, 1981, "Panel Data and Unobservable Individual Effects," *Econometrica*, Econometric Society, vol. 49(6), pages 1377-1398.

Hausmann, Ricardo, Jason Hwang and Dani Rodrik, 2006, "What You Export Matters," CEPR Discussion Papers 5444, C.E.P.R. Discussion Papers.

Hausmann, Ricardo, César A. Hidalgo, Sebastián Bustos, Michele Coscia, Alexander Simoes, Muhammed A. Yildirim, 2013, "The Atlas of Economic Complexity: Mapping Paths to Prosperity", The MIT Press.

Hidalgo, Cesar and Ricardo Hausmann, 2009, "The Building Blocks of Economic Complexity," *Proceedings of the National Academy of Sciences of the United States of America*, 106 (26), pp. 10570-10575.

Hidalgo, Cesar, 2021, "Economic complexity theory and applications," *Nature Reviews Physics*, 2, pp. 92-113.

Head, Keith, Thierry Mayer, and Jhon Ries, 2010, The erosion of colonial trade linkages after independence, *Journal of International Economics*, 81(1):1–14, 2010.

Hnatkovska, Viktoria V. and Norman Loayza, 2004, "Volatility and growth," Policy Research Working Paper Series 3184, The World Bank.

International Monetary Fund, 1980, *World economic outlook*, Washington, D.C: International Monetary Fund.

International Monetary Fund, 2014, "Sustaining long-run growth and macroeconomic stability in low-income countries: the role of structural transformation and diversification," *IMF Policy Papers*, March 2014, Washington, DC.

International Monetary Fund, 2015, "Northern Spring, Southern Chills," *Regional Economic Outlook*, Chapter 5, April., Washington DC.

International Monetary Fund, 2019, “Reigniting growth in low-income and emerging market economies: what role can structural reforms play,” *World Economic Outlook*, Chapter 3, October, Washington, DC.

Irwin, Douglas, 2023, “The Return of Industrial Policy,” in *Finance and Development*, June 2023, pp. 13-14, International Monetary Fund.

Lebdioui, Amir, 2019, "Chile's export diversification since 1960: A free market miracle or mirage?," *Development and Change*, Volume 50, Issue 6, Pages 1483-1746. Available at: <https://onlinelibrary.wiley.com/doi/full/10.1111/dech.12545>

OECD, 2018, Trade in Value added. Available at <http://www.oecd.org/sti/ind/measuring-trade-in-value-added.htm>

OECD-WTO, 2025, *Balanced Trade in Services (BaTiS) Database*, Organisation for Economic Co-operation and Development and World Trade Organization. Available at: https://www.oecd.org/en/publications/the-oecd-wto-balanced-trade-in-services-database-batis_c321a7a7-en.htm

Polity IV, 2014, *Polity IV Project*, Severn, Maryland: Center for Systematic Peace. Retrieved from: <http://www.systemicpeace.org/polity/polity4.htm>.

Raei, Faezeh, Anna Ignatenko, Borislava Mircheva, 2019, "Global Value Chains: What are the Benefits and Why Do Countries Participate?," IMF Working Papers 2019/018, International Monetary Fund.

Ramey, Garey and Valerie A. Ramey, 1995, “Cross-Country Evidence on the Link Between Volatility and Growth,” *The American Economic Review*, Vol. 85, No. 5 (Dec., 1995), pp. 1138-1151.

Rodrik, Dani, 2004, "Industrial Policy for the Twenty-First Century," CEPR Discussion Papers 4767, C.E.P.R. Discussion Papers.

Rodrik, Dani, 2008, "Normalizing Industrial Policy," World Bank Publications, The World Bank, number 28009, November.

Rose, Andrew K, 2004, Do We Really Know That the WTO Increases Trade? *American Economic Review*, 94(1):98–114, 2004.

Sachs, Jeffrey and Andrew M. Warner 1995, “Economic reform and the process of global integration”, *Brookings Papers on Economic Activity*, 1–118.

Salinas, Gonzalo, 2021a, "Proximity and Horizontal Policies: The Backbone of Exports Diversification and Complexity," IMF Working Papers 2021/64, International Monetary Fund.

Salinas, Gonzalo, 2021b. "Chile: A Role Model of Export Diversification Policies?," IMF Working Papers 2021/148, International Monetary Fund.

Salinas, Gonzalo, 2024. "Chile: A Role Model of Export Diversification Policies? A Reassessment," in *Estudios de Economia*, Vol. 51 No. 2 (2024): December, Universidad de Chile.

United Nations, 2020, *UN Comtrade*. Available at <<http://comtrade.un.org>>.

United Nations Development Program, 2020, *Human Development Reports*, Various editions, retrieved from: <http://hdr.undp.org/en/content/education-index>.

Wei, Shang-Jin, 1996, "Intra-national versus International Trade: How Stubborn Are Nation States in Globalization?," NBER working paper no. 5331.

Wacziarg, Romain and Karen Horn Welch, 2008, "Trade Liberalization and Growth: New Evidence," *World Bank Economic Review*, World Bank Group, vol. 22(2), pages 187-231.

Weldemicael, Ermias O., 2012, "Determinants of Export Sophistication," The University of Melbourne, available at <https://www.business.unsw.edu.au/About-Site/Schools-Site/Economics-Site/Documents/E.Weldemicael%20-%20Determinants%20of%20Export%20Sophistication.pdf>

World Bank, 2019, "Heightened Tensions, Subdued Investment," *Global Economic Prospects, June 2019*: Washington, DC, available at <https://thedocs.worldbank.org/en/doc/308981560187921635-0050022019/original/211398Ch01.pdf>

World Bank, 2020a, *Worldwide Governance Indicators*, various editions, World Bank Publications, World Bank, Washington DC, retrieved from: <<https://info.worldbank.org/governance/wgi/>>.

World Bank, 2020b, *World Integrated Trade Solution*, various editions, World Bank, Washington DC, retrieved from: <https://wits.worldbank.org/>.

World Bank, 2020c, *Doing Business*, various editions, World Bank Publications, The World Bank, Washington DC, retrieved from: <https://www.doingbusiness.org/en/doingbusiness>.

World Economic Forum, and Harvard University, 2020, *The global competitiveness report*, various editions, Geneva: World Economic Forum, retrieved from: <https://www.weforum.org/reports/the-global-competitiveness-report-2020>.

Yotov, Yoto, Roberta Piermartini, Jose Antonio Monteiro, and Mario. Larch, 2016, "An advanced guide to trade policy analysis: the structural gravity model," World Trade Organization.

METHODOLOGICAL APPENDIX: ADDITIONAL METHODOLOGICAL DISCUSSION AND DATA DESCRIPTION

A.1. GRAVITY EQUATION ROBUSTNESS CHECKS

In addition to the regression analysis shown in Table 3 and 4 in Chapter 1, Salinas (2021a) regress other gravity equation specifications mainly as robustness checks with additional horizontal policy variables, using regression methodologies other than Hausman and Taylor (2021), and with lagged independent variables. The following tables replicate those regressions with latest data, similarly finding strong robustness in the economic and statistical significance of gravity-related and horizontal policies variables.

The significance of these policy determinants remains robust to the inclusion of other T-variables from the Doing Business and Global Competitiveness reports (Appendix Table 1). Some Doing Business variables are statistically significant, as well as the aggregated index of the Doing Business scores. Among variables in the Global Competitiveness Index, only Business Sophistication is a statistically significant and positive impact on NHM exports.

Appendix Table 1

Other determinants of NHM exports

Dependent Variable: Log non-hydrocarbon/mineral exports	(1)	(2)	(3)	(4)
Log distance	-1.328***	-1.196***	-1.198***	-1.153***
Governance (WB Index)	0.297***	0.253***	0.221**	0.187**
Education (UN Index)	5.868***	5.473***	5.091***	5.961***
Infrastructure (GCR Index)	0.212***	0.163***	0.122***	0.184***
Average tariff	-0.0281***	-0.0250***	-0.0238***	-0.0228***
Labor market flexibility (GCR Index)	-0.05	-0.0373	-0.0573	-0.0571
Construction permits (Doing Business)		0.00225*	0.00	
Getting credit (Doing Business)		0.00	0.00	
Investment protection (Doing Business)		0.00	0.00	
Paying taxes (Doing Business)		0.00236*	0.00236*	
Contract enforcement (Doing Business)		0.0112***	0.0113***	
Resolving insolvency (Doing Business)		0.00	0.00	
Macroeconomic environment (GCR Index)			-0.0545**	
Technological readiness (GCR Index)			0.04	
Business sophistication (GCR Index)			0.176*	
Innovation (GCR Index)			0.01	
Doing Business Score				0.0123***
Constant	5.249*	0.46	1.81	-1.48
Observations	37866	37866	37866	37325
Rho	0.92	0.92	0.93	0.93

Notes: * p<0.1, ** p<0.05, *** p<0.01. Panel regressions based on Hausman and Taylor (1981) technique with groups consisting of all combinations of reporter and partner countries in UN Comtrade database. Observations are non-overlapping 5-year averages within the 1962-2019 period, depending on data availability. Regression specification based on equation (7). Multilateral resistance terms and partner country's policy variables included (coefficients not reported). Dependent variable is the logarithm of the value of exports excluding hydrocarbon and mineral products. Definitions of dependent and independent variables are found in the data section of the methodological appendix.

Within the broad policy areas of governance, education, and infrastructure there are some specific components that are most strongly associated with NHM exports development (Appendix Table 2). As is the case in Salinas (2021a), the most impactful subcomponents within governance are government effectiveness and control of corruption, secondary and tertiary education within education, and ports and electricity within infrastructure.

Appendix Table 2

Sub-determinants of NHM exports

Dependent Variable: Log non-hydrocarbon/mineral exports	(1)	(2)	(3)
Log distance	-1.314***	-1.570***	-1.286***
Governance (WB Index)		0.416***	0.141*
Education (UN Index)	5.457***		5.757***
Infrastructure (GCR Index)	0.137***	0.223***	
Average tariff	-0.0241***	-0.0345***	-0.0348***
Labor market flexibility (GCR Index)	-0.06	-0.03	-0.149***
Government effectiveness (WB Index)	0.420***		
Control of corruption (WB Index)	0.490***		
Primary education (GCR Index)		0.003	
Secondary education (GCR Index)		0.00662***	
Tertiary education (GCR Index)		0.00793***	
Port infrastructure (GCR Index)			0.0519*
Electricity infrastructure (GCR Index)			0.0511*
Constant	5.132*	5.832**	-4.10
	-2.26	-2.69	(-1.71)
Observations	37866	37866	37670
Rho	0.92	0.91	0.91

Notes: * p<0.1, ** p<0.05, *** p<0.01. Panel regressions based on Hausman and Taylor (1981) technique with groups consisting of all combinations of reporter and partner countries in UN Comtrade database. Observations are non-overlapping 5-year averages within the 1962-2019 period, depending on data availability. Regression specification based on equation (7). Multilateral resistance terms and partner country's policy variables included (coefficients not reported). Dependent variable is the logarithm of the value of exports excluding hydrocarbon and mineral products. Definitions of dependent and independent variables are found in the data section of the methodological appendix.

Appendix Table 3 shows that regression results of column 2 in Table 1.2 remain economically and statistically significant across several regression estimators.

Appendix Table 3

Determinants of export by regression estimator

Dependent Variable: Log of NHM exports	Hausman-Taylor	Hausman-Taylor	Hausman-Taylor	Pooled OLS	Between Effects	Random Effects	Fixed Effects
Log GDP reporter	0.771***	0.703***	0.584***	1.352***	1.346***	1.357***	-0.606***
Log GDP partner	0.894***	0.887***	0.899***	0.952***	0.926***	0.964***	0.504***
Log distance	-1.441***	-1.159***	-1.328***	-1.414***	-1.355***	-1.545***	
Common currency dummy	0.453***	0.494***	0.410**	-0.09	-0.21	0.16	
Common border dummy	1.556***	1.997***	1.813***	1.313***	1.288***	1.307***	
Common language dummy	0.552***	0.797***	0.605***	0.510***	0.568***	0.496***	
Common colonizer dummy	0.485***	0.549***	0.655***	0.785***	0.754***	0.568***	
Past colonial link dummy	1.318***	1.188***	1.302***	0.513***	0.432**	0.718***	
Log of hydrocarbon/mineral assets	0.0572***	0.0900***	0.0780***	-0.0338***	-0.0413***	-0.0272***	0.104***
Landlockedness dummy (1 is landlocked)	-1.934***	-1.855***	-1.690***	-1.426***	-1.343***	-1.532***	0.00
Log GDP per capita	-0.374***	-0.370***	-0.10	-0.977***	-1.067***	-0.721***	0.950***
Governance (WB Index)	0.229***	0.210**	0.297***	0.575***	0.449***	0.718***	-0.12
Education (UN Index)	5.108***	4.632***	5.868***	1.475***	1.632***	0.819***	1.451***
Infrastructure (GCR Index)	0.217***	0.222***	0.212***	0.733***	0.972***	0.346***	0.158***
Average Tariff	-0.0199***	-0.0239***	-0.0281***	-0.0373***	-0.0394***	-0.0275***	-0.0204***
Labor market flexibility (GCR Index)	-0.0650*	-0.03	-0.05	-0.381***	-0.380***	-0.0984***	0.04
Constant	3.61	-8.899***	5.249*	-6.604***	-8.130***	-3.632***	6.769***
Partner country policy variables	No	Yes	Yes	Yes	Yes	Yes	Yes
Multilateral resistance proxies	No	No	Yes	Yes	Yes	Yes	Yes
Observations	37,866	37,866	37,866	37,866	37,866	37,866	38,265
Rho	0.92	0.92	0.92	0.00	0.00	0.78	0.94

Notes: * p<0.1, ** p<0.05, *** p<0.01. Panel regressions based on Hausman and Taylor (1981) technique with groups consisting of all combinations of reporter and partner countries in UN Comtrade database. Observations are non-overlapping 5-year averages within the 1962-2019 period, depending on data availability. Regression specification based on equation (7). Multilateral resistance terms and partner country's policy variables included (coefficients not reported). Dependent variable is the logarithm of the value of exports excluding hydrocarbon and mineral products. Definitions of dependent and independent variables are found in the data section of the methodological appendix.

This evident association between NHM exports per capita and gravity/policy variables does not demonstrate causality from the latter to the former, but regressions with lagged covariates do provide some evidence of causality. The regression in the second column of Appendix Table 4, lags policy independent variables in column 2 of Table 1.2 by one period and finds that the coefficients of these variables are not considerably different from those in the contemporaneous specification in the first column. Regressions in the fourth and fifth column lag the policy variables in column 3 of Table 1.2 (the longer-spanned policy variables) by one and two

periods, respectively. The coefficients of the education, infrastructure, and trade liberalization variables remain significant under both lags.

Appendix Table 4
Determinants of exports at different periods

Dependent Variable: Log of NHM exports	Hausman-Taylor	Hausman-Taylor	Hausman-Taylor	Pooled OLS	Between Effects	Random Effects	Fixed Effects
Log GDP reporter	0.771***	0.703***	0.584***	1.352***	1.346***	1.357***	-0.606***
Log GDP partner	0.894***	0.887***	0.899***	0.952***	0.926***	0.964***	0.504***
Log distance	-1.441***	-1.159***	-1.328***	-1.414***	-1.355***	-1.545***	
Common currency dummy	0.453***	0.494***	0.410**	-0.09	-0.21	0.16	
Common border dummy	1.556***	1.997***	1.813***	1.313***	1.288***	1.307***	
Common language dummy	0.552***	0.797***	0.605***	0.510***	0.568***	0.496***	
Common colonizer dummy	0.485***	0.549***	0.655***	0.785***	0.754***	0.568***	
Past colonial link dummy	1.318***	1.188***	1.302***	0.513***	0.432**	0.718***	
Log of hydrocarbon/mineral assets	0.0572***	0.0900***	0.0780***	-0.0338***	-0.0413***	-0.0272***	0.104***
Landlockedness dummy (1 is landlocked)	-1.934***	-1.855***	-1.690***	-1.426***	-1.343***	-1.532***	0.00
Log GDP per capita	-0.374***	-0.370***	-0.10	-0.977***	-1.067***	-0.721***	0.950***
Governance (WB Index)	0.229***	0.210**	0.297***	0.575***	0.449***	0.718***	-0.12
Education (UN Index)	5.108***	4.632***	5.868***	1.475***	1.632***	0.819***	1.451***
Infrastructure (GCR Index)	0.217***	0.222***	0.212***	0.733***	0.972***	0.346***	0.158***
Average Tariff	-0.0199***	-0.0239***	-0.0281***	-0.0373***	-0.0394***	-0.0275***	-0.0204***
Labor market flexibility (GCR Index)	-0.0650*	-0.03	-0.05	-0.381***	-0.380***	-0.0984***	0.04
Constant	3.61	-8.899***	5.249*	-6.604***	-8.130***	-3.632***	6.769***
Partner country policy variables	No	Yes	Yes	Yes	Yes	Yes	Yes
Multilateral resistance proxies	No	No	Yes	Yes	Yes	Yes	Yes
Observations	37,866	37,866	37,866	37,866	37,866	37,866	38,265
Rho	0.92	0.92	0.92	0.00	0.00	0.78	0.94

Notes: * p<0.1, ** p<0.05, *** p<0.01. Panel regressions based on Hausman and Taylor (1981) technique with groups consisting of all combinations of reporter and partner countries in UN Comtrade database. Observations are non-overlapping 5-year averages within the 1962-2019 period, depending on data availability. Regression specification based on equation (7). Multilateral resistance terms and partner country's policy variables included (coefficients not reported). Dependent variable is the logarithm of the value of exports excluding hydrocarbon and mineral products. Definitions of dependent and independent variables are found in the data section of the methodological appendix.

A.2. DATA DESCRIPTION

NHM and manufacturing exports are calculated based on UN Comtrade data, based on SITC Revision 2 classification. The NHM group includes codes 0-2699, 2900-2999, and 5000 and higher, excluding 6821, 6831, 6841, 6851, 6861, 6871, 6879-6895, 9310, and 9610.

Manufactures include codes 6000 and higher, excluding 6821, 6831, 6841, 6851, 6861, 6871, 6879-6895, 9310, and 9610. Services exports come from the OECD/WTO Balanced Trade in Services (BaTiS) dataset.

For the case study on Chile, following Salinas (2021a), complex products include goods that in Hausmann and others (2013) have a PCI above zero (approximately the top half of the PCI ranking).⁴¹ Data for goods goes back to 1962 for most countries and for services it starts in 2005 for practically all countries. The sample period ends in 2019, prior to the Covid-19 shock, to reduce the noise related to the pandemic disruption to international trade.

The main independent variables are obtained from the following sources:

- Gravity equation variables are extracted from the CEPII gravity database constructed by Head and others (2010) and Rose (2004)., available at http://www.cepii.fr/cepii/en/bdd_modele/bdd.asp.
- Educational attainment data was retrieved from the United Nations Education index (UNDP, 2020), Barro-Lee (Barro and Lee, 2013), and from the World Bank's Human Capital Portal, available at: <https://humancapital.worldbank.org/en/home>
- Governance is obtained from World Bank (2020a) and political stability from Polity IV (2014). Infrastructure quality comes from the Global Competitiveness Report (World Economic Forum and Harvard University, 2020) and the Logistics Performance Indicators, available at: <https://lpi.worldbank.org/>
- Tariff data comes from the World Integrated Trade Solution (World Bank, 2020b).
- Labor market flexibility is based on the labor flexibility sub-index of the Global Competitiveness Report (GCR).

⁴¹ The Product Complexity Index is available at < <https://atlas.cid.harvard.edu/rankings/product> >.

- Other T-variables used in robustness checks in this methodological appendix come from the same sources as in Salinas (2021a).

A.3. EXPORT COMPLEXITY AND COMPLEX EXPORTS

Although not part of mainstream economic growth or international trade theory, the concept of Economic Complexity presented in Hidalgo and Hausmann (2009) has attained a significant impact in the empirical public policy literature, with this paper having over four thousand citations to date (according to J-STOR). More importantly, the concept of Economic Complexity is now widely acknowledged and used in policy analyses in think tanks (for example, Escobari and others, 2019; Mealy and Colyle, 2021), flagship publications of international organizations (for example, World Bank, 2019; International Monetary Fund, 2015), and in governmental analytical units some of which, as mentioned in Hidalgo (2021), have created complexity data observatories in ministries of economy or production, and national innovation or statistics agencies. Economic Complexity data observatories have been set up in Harvard University and MIT.

The Economic Complexity Indicator (ECI) that is produced under this conceptual framework aims to measure the complexity of an economy through the composition of its export basket, using an algorithm that produces an ECI that is higher for export baskets that are more diverse and have higher exports of goods that are produced by fewer countries. See Hidalgo (2021) for a recent technical description of the ECI. Also under this framework, a Product Complexity Index (PCI) is elaborated, which assigns higher scores to goods that are produced by fewer countries.

Although not directly rooted in conventional economic theory, this indicator is broadly related to the well-established empirical facts that (i) advanced economies tend to produce a large variety of products, and (ii) more complex products (for example, iPhones or airplanes) are produced by a small number of countries.

As, indeed, more complex goods are produced in only a few countries, the PCI does rank higher those products that are widely considered more complex (for example, machinery for specialized industries), and ranks lower those products like raw hydrocarbon and mineral commodities that are widely considered less complex. However, as is explained in the main text of this paper, the ECI is determined exogenously by stocks and prices of hydrocarbon and mineral products, factors that are not related to a country's capabilities to produce and export complex products that the ECI's creators intend to measure.

A.4. SUBREGIONAL GROUPS

Region	Region Code	Country	Region	Region Code	Country	Region	Region Code	Country
Andean	AND	Bolivia Colombia Ecuador Peru Venezuela	Eastern Europe	EE	Albania Bosnia Herz. Bulgaria Croatia Cyprus Czechia Estonia Georgia Hungary Latvia Lithuania Montenegro N. Macedonia	Pacific Isl.	PAC	Tonga Tuvalu Vanuatu
Arab	ARB	Bahrain Brunei Kuwait Oman Qatar Saudi Arabia UAE Yemen				South Asia	SAR	Afghanistan Bangladesh Bhutan Nepal Pakistan Sri Lanka Timor-Leste
Central Asia	CA	Armenia Azerbaijan Belarus Kazakhstan Kyrgyzstan Tajikistan Turkmenistan Uzbekistan				Southern Cone	SCC	Argentina Brazil Chile Paraguay Uruguay
Central Am. & Mexico	CAM	Costa Rica El Salvador Guatemala Honduras Mexico Nicaragua Panama	European Union	EU	Romania Russia Serbia Serb. and Mont. Slovakia Slovenia Turkey Ukraine Andorra Austria Belgium France Germany Greece Greenland Ireland Italy Luxembourg Malta Netherlands Portugal Spain Switzerland U.K.	Scandinavia	SCN	Denmark Finland Iceland Norway Sweden
Caribbean	CAR	Anguilla Antig. & Barb. Aruba Bahamas Barbados Belize Bermuda Cayman Isds Cuba Dominica Dominican Rep. French Guiana Grenada Guadeloupe Guyana Haiti Jamaica Martinique Montserrat St. Kitts & Nevis Saint Lucia St. Vct. & Gren. Suriname Trinidad & Tob.				Sub-Saharan Africa	SSA	Angola Benin Botswana Burkina Faso Burundi Cabo Verde Cameroon Central African Rep. Chad Comoros Congo Cote d'Ivoire D.R. Congo Djibouti Eritrea Ethiopia Gabon Gambia Ghana Guinea Guinea-Bissau Kenya Lesotho Liberia Madagascar Malawi Mali Mauritania Mauritius Mayotte Mozambique Namibia Niger Nigeria Rwanda Sao Tome & Princ. Senegal Seychelles Sierra Leone Somalia South Africa Sudan Togo Uganda Tanzania Zambia Zimbabwe
East Asia Emerging	EAEM	China China, Macao SAR Indonesia Malaysia Philippines Thailand Viet Nam	India Middle East	IND ME	India Iran Iraq Israel Jordan Lebanon Syria Algeria Egypt Libya Morocco Tunisia Canada USA Australia New Zealand Cook Isds FS Micronesia Faeroe Isds Fiji French Polynesia Kiribati Maldives New Caledonia Palau Pap. New Gn. Samoa Solomon Isds			
East Asia High Income	EAHI	China, Hong Kong Japan Singapore South Korea	North America	NAM				
East Asia Others	EAOTH	Cambodia Lao PDR Mongolia Myanmar	North Africa	NA				