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October 31, 2025

Approved By
European Department

Prepared By Carlos de Resende and Jenny Lee (EUR)

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ASSESSING ECONOMIC DIVERSIFICATION IN SAN MARINO[1]

This paper evaluates the state of economic and export diversification in San Marino, a high-income small state with a manufacturing-heavy economy. Using sectoral Gross Value Added (GVA) data and export diversification metrics—Herfindahl-Hirschman Index (HHI), Entropy Index (EI), and Export Concentration Ratio (CR)—derived from mirror trade data, the study benchmarks San Marino against peer economies. While San Marino's economy seems concentrated in manufacturing and wholesale trade at the aggregate sector level, more disaggregated product level data shows that its export structure is well diversified given the country's size and development level, despite more recent trends suggest a slight decreasing in diversification. The analysis confirms a U-shaped relationship between diversification and income, indicating that high-income economies like San Marino may not further benefit from more diversification. These results suggest that horizontal structural policies—rather than sector-specific industrial policy—to supporting high-value-added products within currently competitive sectors, as well as to high-productivity growth sectors with economy-wide synergies, like ICT, are the most relevant to sustain productivity growth while maintaining resilience through diversification.

A. Introduction

1. This paper assesses economic and export diversification in San Marino.

- *Economic diversification*—broadening the range of economic activities within a country—is critical for sustainable economic growth and higher living standards (IMF 2014). It reduces vulnerability to sector-specific shocks by reducing over-reliance on a limited number of commodities or sectors (UNCTAD, 2017) and enhancing income stability (World Bank, 2008). Diversification also fosters innovation and competitiveness—by encouraging the development of new sectors and industries (Rodrik, 2006; McMillan and Rodrik, 2011)—and is closely linked to structural transformation and productivity gains from resource reallocation (Herreford, Rogerson and Valentinyi, 2014).

- *Export diversification*—narrowly referred to as the diversification in export products[2]—often drives output diversification and reduces vulnerability to terms-of-trade shocks, stabilizing export revenues (Ghosh and Ostry, 1994; Bleaney and Greenaway, 2001; Cavallo *et al*., 2008; Haddad *et al*., 2013; McMillan, Rodrik and Verduzco-Gallo, 2014; World Bank, 2017). It is associated with higher growth, increased per capita income (Al-Marhubi, 2000; Gutierrez de Pineres and Ferrantino, 2000; and Lerderman and Maloney, 2007; Papageorgiou *et al*, 2015; McIntyre *et al*., 2018; Henn *et al*, 2020) and productivity growth (Feestra and Kee, 2004).

[1] Prepared by Carlos de Resende and Jenny Lee (EUR)

[2] The term "export diversification" can also be associated with the diversification in export partners or markets.

2. Small economies and microstates like San Marino, face constraints to diversification due to limited resources and small domestic markets. These factors restrict efficient production of a broad range of products (IMF 2014). While limited regarding small states, existing studies confirm the general findings for other economies. Both McIntyre et al (2018) and Lee and Zhang (2022) show that export diversification in products or industries promote economic growth and reduce economic volatility in these economies; Sannassee, Seetanah and Lamport (2014) document a positive relationship between export diversification and growth in Mauritius.

3. The literature offers nuanced stylized facts relevant for San Marino, a microstate with high-income status that continues to primarily rely on manufacturing. While economic and export diversification are critical components of sustainable growth, especially at lower levels of development, the relationship between growth and specialization, in the form of sectoral concentration, is U-shaped. At higher developmental stages, further growth is often associated with specialization rather than diversification (Rodrik, 2006; Klinger and Lederman, 2004; and Imbs and Wacziarg, 2003). Markakkaran and Sridharan (2022) confirm that low- and lower-middle-income countries benefit more from diversification, while high-income countries perform better with specialization—using system GMM estimation of a non-linear dynamic panel model of the relationship between HHI-based export diversification and GDP per capita growth across 101 countries from 1995 to 2019. Larger shares of manufacturing exports and employment play an important role in the typical economy's transition away from low-income status through "fast growth" episodes (Johnson, Ostry, and Subramanian, 2006; Jones and Olken, 2005).

4. San Marino is a highly open economy, dependent on trade, especially with Italy and other European economies. Haddad et *al*. (2013) indicates that trade openness lowers output volatility in sufficiently diversified economies but increases volatility in those with concentrated export baskets.

5. Drawing lessons from similar small economies and microstates, and considering the literature, this paper assesses the current state of economic diversification in San Marino and provides answers to the following questions: How does San Marino's diversification compare with peers? Should San Marino further diversify, perhaps away from manufacturing, or focus on specializing in high-value-added manufacturing?

6. The paper is structured as follows: the first section presents stylized facts about San Marino's recent economic development, highlighting key trends and challenges. The second section analyzes export diversification indicators as proxies for economic diversification. The third section concludes with policy implications and recommendations.

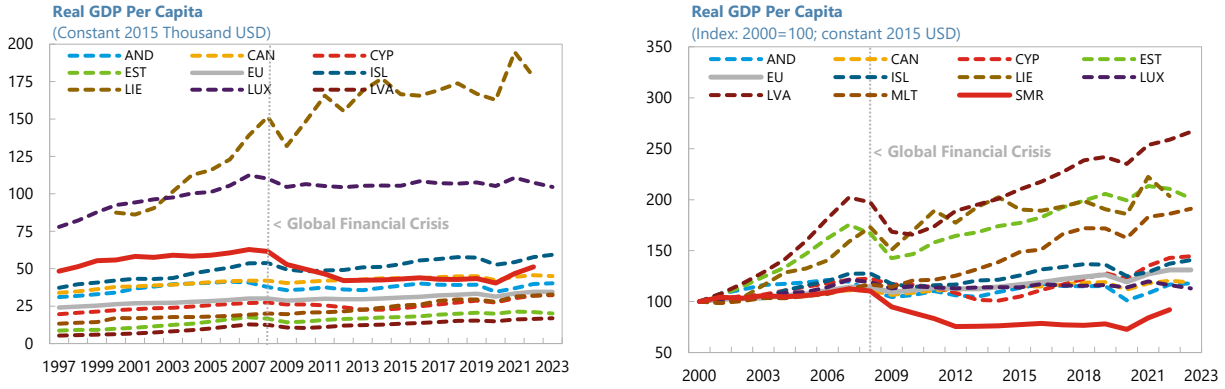
B. Stylized Facts

7. San Marino is a microstate[3] with a high level of per capita income when compared to both the EU and other European microstates. Except for Luxembourg and Liechtenstein, San

[3] San Marino's population is 34 thousand, while its economy accounts for 0.0016 percent of World GDP as of 2024.

Marino's per capita GDP surpasses that of other small European economies and microstates, including Andorra, Cyprus, Iceland, Malta, and the Baltics, and is well above that of the European Union (EU), and other developed economies like Canada during most of the 1997-2023 period (Figure 1, left chart). However, since the Global Financial Crisis (GFC), largely because of its deleterious effect on San Marino's then oversized financial sector, it has decline relative to the peers (Figure 1, right chart).

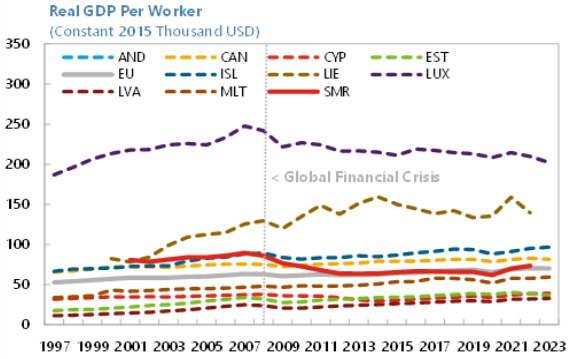
Figure 1. San Marino: Per Capita GDP Compared with Other European Small Economies and Microstates



Source: World Bank

8. The same broad picture holds for GDP per worker metrics—a better indicator of aggregate productivity and living standards, given San Marino's large reliance on daily-commuting foreign workers (mainly from neighboring Italian regions). The economic decline following the GFC, brought the country's GDP per capita down to the average EU level and below Canada's more recently, (Figure 2).

Figure 2. San Marino: GDP per Worker Compared with Other European Small Economies and Microstates



Source: World Bank and IMF staff calculations

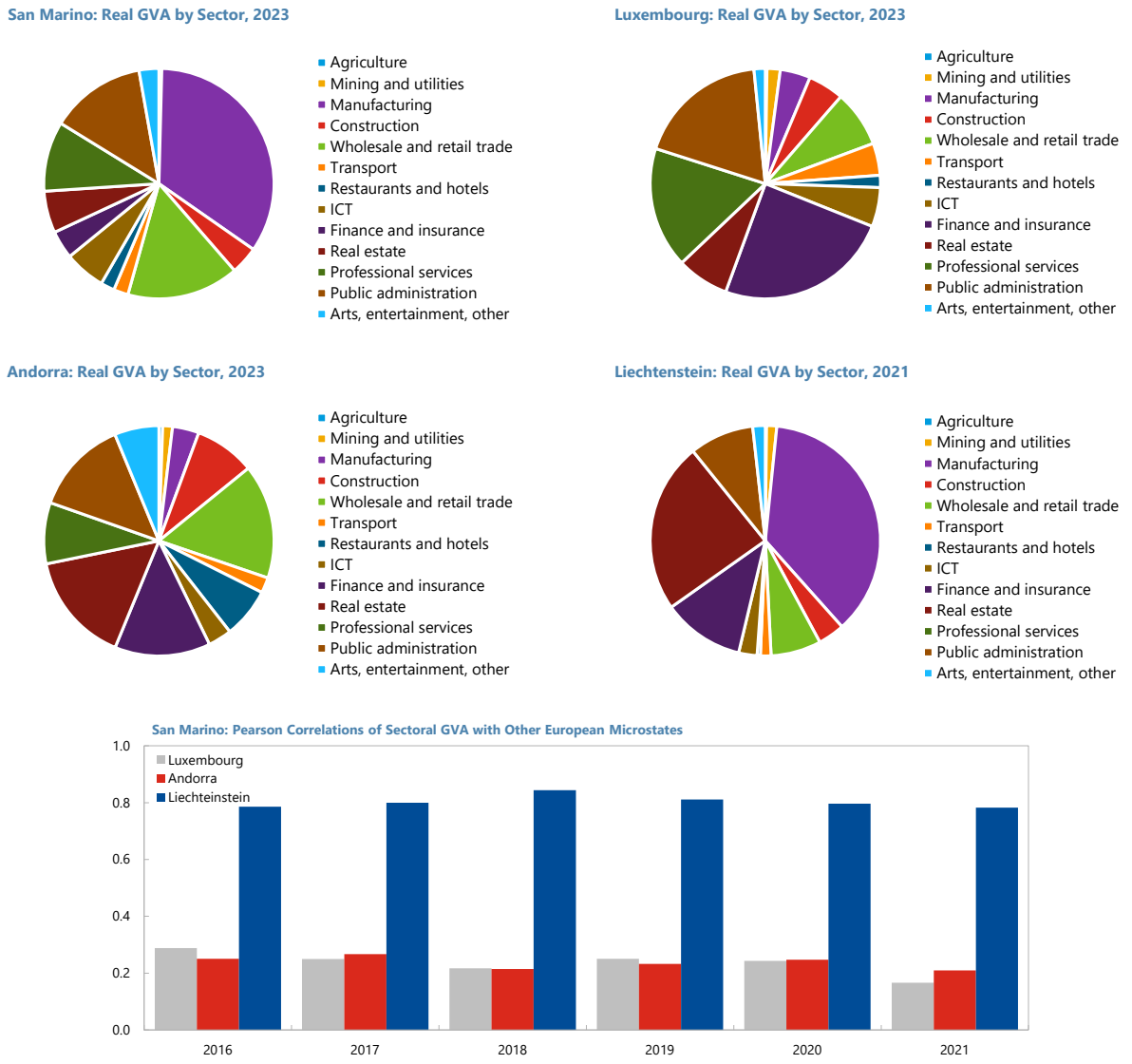
9. San Marino's economic structure—represented by the shares of different sectors in total Gross Value Added (GVA)—is characterized by a large manufacturing sector (34.2 percent), followed by wholesale and retail trade (15.7 percent) and public administration (13.4 percent), while all other sectoral sectors' shares are below 10 percent (Figure 3).

10. As in other European small states—e.g., Andorra, Liechtenstein, and Luxembourg—the total GVA shares of both agriculture and mining are very small in San Marino (about 0.02 and 0.4 percent, respectively), a feature related to both its high development stage and its limited land

surface. Country size is also likely the reason why the transport sector's share in is low—only about 2 percent in San Marino, Andorra, and Liechtenstein, and 4.2 percent in Luxembourg (Figure 3).

11. Despite other similarities in economic structure with Andorra and Luxembourg, with several similar-sized sectoral GVA shares as in San Marino, key differences exist in the manufacturing and financial sectors. Both countries have significantly lower shares of manufacturing (only 4 percent, relative to 34 percent in San Marino) and larger shares of finance and insurance (13 and 25 percent, respectively, compared with only 4 percent in San Marino). Andorra also has a larger share of real estate activities than San Marino (16 and 6 percent, respectively), while Luxembourg shows a much lower share of wholesale and retail trade (8 percent, half of San Marino's). These differences are reflected in the low Pearson Product Moment Correlation (PPMC) with sectoral GVA distribution in San Marino (Figure 3).

Figure 3. San Marino: Sectoral Distribution of Output Compared with Other European Microstates



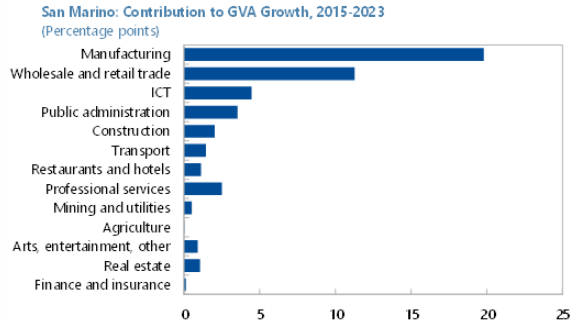
Source: Authorities and IMF staff calculations

12. A source of innovation and productivity growth, the ICT sector, remains relatively small in San Marino. It only represents 6 percent of total GVA—similar to Luxembourg, but twice the share observed in Andorra and Liechtenstein.

13. San Marino's sectoral output composition has remained broadly stable, but manufacturing continues to gradually expand its share of GVA. By 2023 (the latest available data point), the share of manufacturing had increased by more than 3 percentage points (ppt) relative to 2015. Other sectors also saw gains, such as wholesale and retail trade (+3.6 ppt), and ICT (+1.6 ppt). These three sectors combined account for about ¾ of the cumulative GVA growth during that period. Finance and insurance and real estate (both -1.8 ppt), professional services (-2.3 ppt) and public administration (-3 ppt) all reduced their shares of GVA, while arts, entertainment, and other sectors lost 0.5 ppt.

14. Manufacturing, wholesale and retail, and ICT account for the bulk of total GVA growth in San Marino since 2015. The contributions to GVA growth by sector during 2015-2023 are shown in Figure 4. The prominent roles of the manufacturing, wholesale and retail, and ICT sectors on cumulative GVA growth is evident. These three sectors combined account for almost ¾ of total GVA growth in San Marino since 2015.

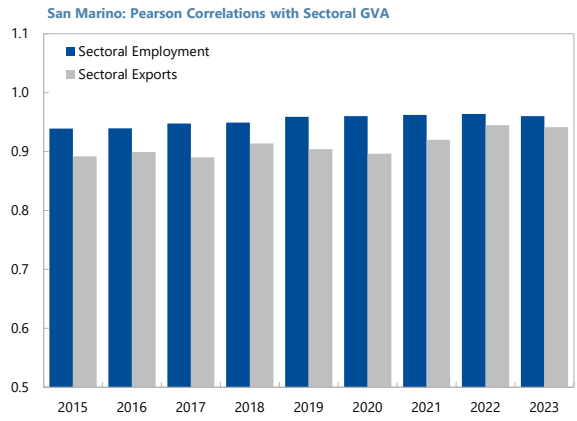
Figure 4. San Marino: Sectoral GVA Growth



Source: IMF staff calculations

15. The employment and export sectoral compositions broadly match that of output, also featuring the prominent role of the manufacturing and wholesale and retail sectors. The PPMC between sectoral GVA and sectoral employment has been about 0.95, since 2015, reaching 0.96 in 2022-2023. For the exports of goods, the PPMC with sectoral GVA has also been very high, close to 0.9 during the same period, reaching 0.94 in 2022-2023 (Figure 5). Similarly to GVA, the manufacturing sector is both the largest employer and exporting sector. It accounts for about 1/3 of total employment and about 55 percent of goods exports (Figure 6). Wholesale and retail trade, the second largest exporting sector, constitutes about 15 and 22 percent, respectively. Public administration is the second largest employer (19.1 percent share). Together, these three sectors employ about 2/3

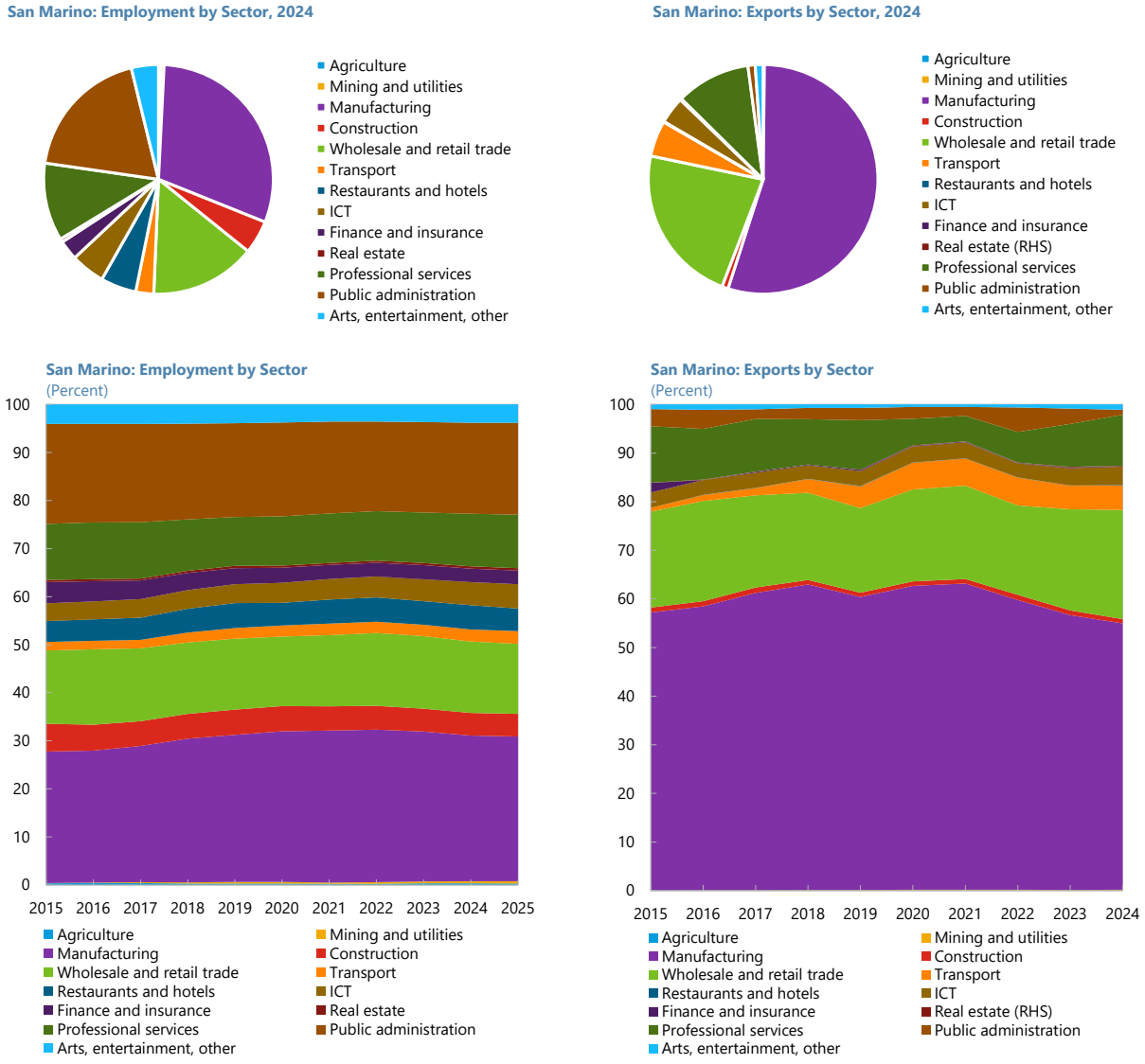
Figure 5. San Marino: Pearson Correlation between Sectoral Output, Employment, and Exports



Source: IMF staff calculations

of workers, while manufacturing and wholesale and trade account for more than ¾ of exports (Figure 6).

Figure 6. San Marino: Sectoral Distribution of Output, Employment, and Exports

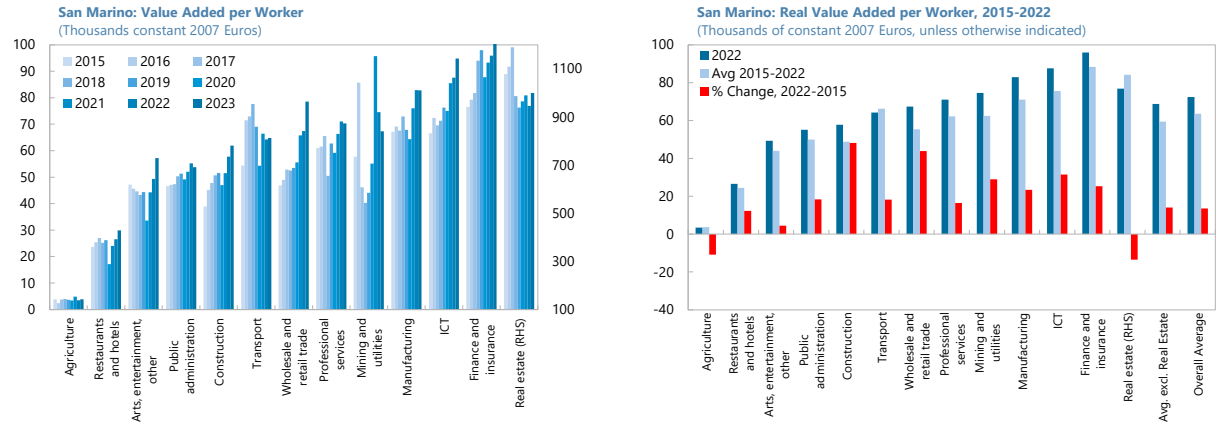


Source: UITDS and IMF staff calculations

16. While employment sectoral distribution matches that of output, labor productivity is uneven across sectors and, more recently, is growing faster in sectors that are expanding. Between 2015 and 2022, labor productivity has been growing steadily in all but two sectors (agriculture and real estate), including in the three sectors that are gaining most GVA share—ICT, manufacturing, wholesale and retail trade. Labor productivity level is the highest in real estate,

followed by finance and insurance, but is declining in both sectors (Figure 7). On average, the most productive sectors tend to show the largest labor productivity gains.[4]

Figure 7. San Marino: Sectoral Labor Productivity



Source: UITDS and IMF staff calculations

C. Export Diversification in San Marino

17. The aggregate sectoral distribution of GVA, employment and exports—very concentrated in manufacturing and the wholesale and retail sector—can be misleading as indicator of San Marino's economic diversification. In the absence of disaggregated data at the product level (as, for example, following the Standard International Trade Classification, or SITC system), analyses of economic diversification at the sectoral level, as that discussed in the previous section, will miss intra-sector diversity of products.

18. Export diversification indicators constructed from granular product data can be a reliable proxy for economic diversification in San Marino. There is a strong correlation between aggregate sectoral distributions of GVA and exports in San Marino. Moreover, the ratios of total exports to gross production (54 percent by 2022) and GVA (200 percent by 2023) are very large, given the very small size of San Marino's domestic markets which implies that some sectors almost exclusively produce to export. Manufacturing, the largest economic sector by GVA, employment, and exports, exports 87 percent of its output.

19. This section discuses export diversification, as a proxy for economic diversification in San Marino. We rely on common indicators used in the literature[5] to help assess how dependent countries are on specific products. We focus on the *Herfindahl-Hirschman Index* (HHI), the *Entropy Index* (EI), and the *Export Concentration Ratio* (CR) to compare San Marino with other small

[4] Excluding real estate (which is distorted by the minuscule domestic market in San Marino, the correlation between the average sectoral productivity level in 2023 and the sectoral cumulative productivity growth since 2015 is 0.6.

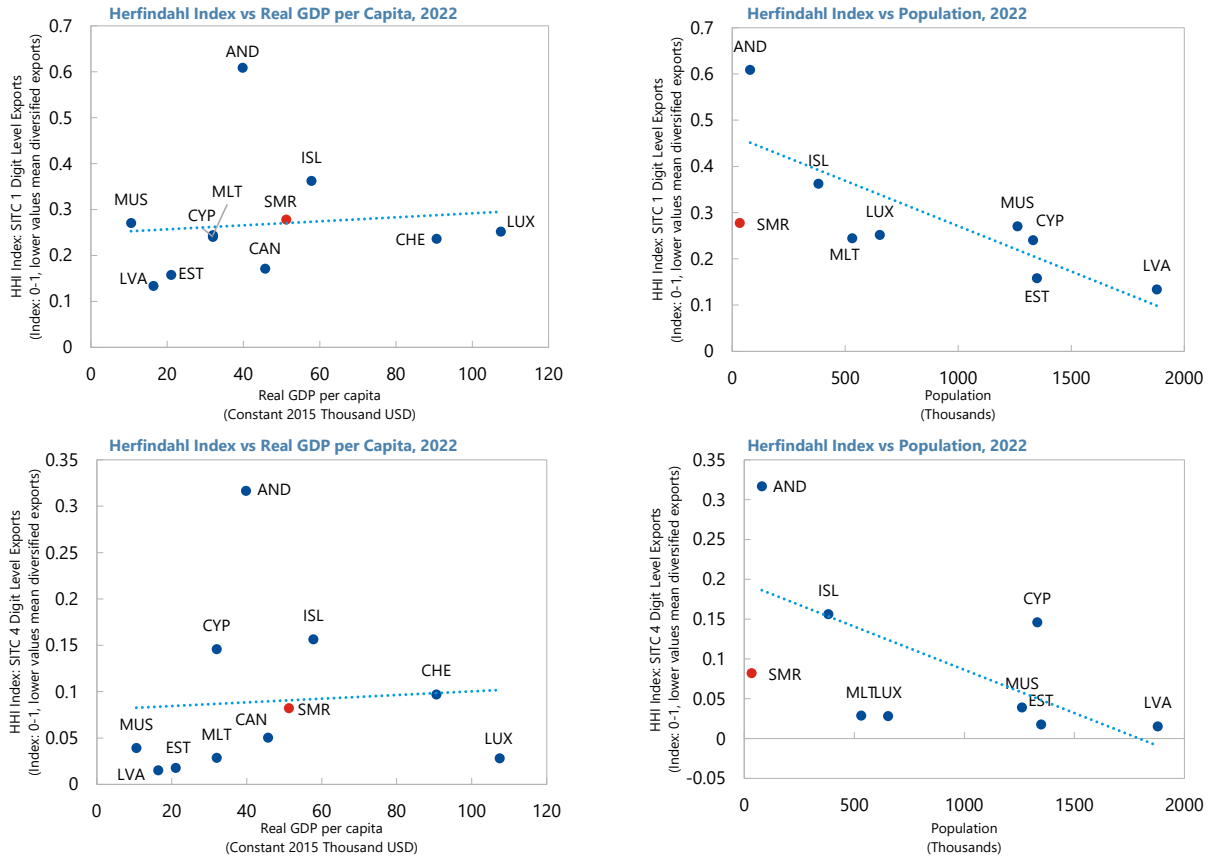
[5] For the HHI, see Brenton and Isik (2012) and Cadot *et al* (2011). Hidalgo *et al* (2007) and Imbs and Wacziarg (2003) use the Entropy Index, while Lederman and Maloney (2007) and Klinger and Lederman (2006) use the Export Concentration Ratio.

economies. Technical Annex I discusses the calculation of these indicators. While disaggregated SITC data are not available for both gross production and exports in San Marino, it is possible to backout the SITC data for San Marino's exports of goods by looking at *mirror data* from the imports of its trading partners. For cross-country comparisons, we focus on a group of small European economies and microstates, augmented by two larger small open economies (Canada and Switzerland) and one small developing, middle-income economy in Africa (Mauritius). In the next subsection, we discuss the measures of export diversification.

The Herfindahl-Hirschman Index (HHI)

20. The HHI sums the squares of the market shares of all exported products or sectors. It weighs larger shares more heavily but considers the entire distribution of export shares. The lower the index, the less concentrated exports are. See Annex I for more details on the construction of the HHI.

Figure 8. Small and Microstates: Herfindahl-Hirschman Index (HHI) *vs* Country Size and Per Capita GDP

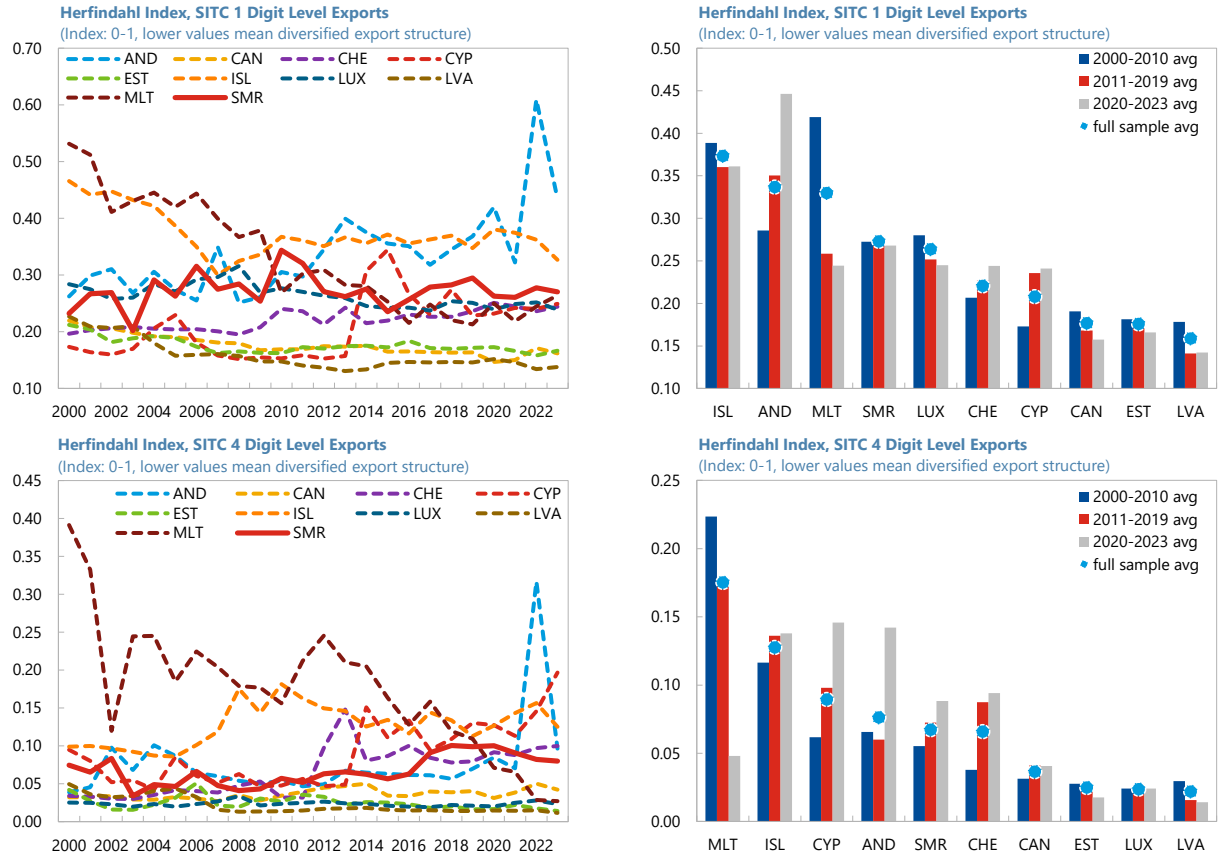


Sources: UN Comtrade, World Bank, and IMF staff calculations.
Note: San Marino values are calculated using mirror import data from trading partners.

21. Compared with other micro and small states, San Marino's export diversification measured by the HHI is typical for its level of development and relatively high for its size. Within that country group, by 2022, there is a slightly positive association between the HHI and per

capita GDP—i.e., richer small economies and microstates become less diversified—and a clear negative relationship with population size, suggesting that small population size poses a limit to diversification. These results are observed regardless of the level of SITC product disaggregation (either 1 or 4 digits).[6] San Marino is at the regression line regarding per capita GDP and below it when considering population size (Figure 8), implying that the country's export diversification level is consistent with what is expected from its development stage and above what would have been predicted by its small population size.

Figure 9. Selected, Small and Microstates: Herfindahl-Hirschman Index, 2000-2023



Sources: UN Comtrade, World Bank, and IMF staff calculations.
Note: San Marino values are calculated using mirror import data from trading partners

22. In direct HHI comparisons, both at SITC 1- and 4-digit level exports of goods, San Marino seems currently more diversified than Iceland and Andorra, but less than Malta, Luxembourg, Estonia, and Latvia. It is also as diversified as Mauritius at the SITC 1-digit level, and more diversified than Cyprus and Switzerland at the SITC 4-digit level (Figure 9). While at the 1-digit level San Marino's HHI indicates a slight decline in diversification since the year 2000, at the 4-digit level this decline is more pronounced, especially since 2016. This result is in line with the literature

[6] The highest the SITC digit level, the more granular is the product disaggregation.

that suggests that after a certain threshold, further increases in per capita GDP come from specialization rather than higher diversification.

23. A more formal panel analysis, using data from a larger sample of countries, confirms the results obtained with small countries and microstates. First, using annual data from 56 OECD and European countries during the period 1988–2023, we estimate a panel regression with country-fixed effects of the HHI on (i) per capita GDP (as proxy for the stage of development), (ii) its square (to capture the non-linearity cited in the literature), and (iii) population size. All variables enter the regression in (natural) logs. Results are displayed in Table 1.

Table 1. San Marino: Panel Regression: HHI *vs* Country Size and Per Capita GDP, 2000-2022

Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Ln (HHI)	SITC_1digit	SITC_1digit	SITC_2digit	SITC_2digit	SITC_3digit	SITC_3digit	SITC_4digit	SITC_4digit	SITC_5digit	SITC_5digit
Ln (GDP per capita)	-0.73***	-0.84***	-1.84***	-1.64***	-2.33***	-2.04***	-1.94***	-1.93***	-3.32***	-2.45***
	(0.18)	(0.21)	(0.28)	(0.31)	(0.36)	(0.41)	(0.48)	(0.54)	(0.61)	(0.69)
Ln (GDP per capita^2)	0.04***	0.04***	0.10***	0.08***	0.13***	0.11***	0.13***	0.13***	0.18***	0.13***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.04)
Ln (Population)		-0.06		0.12		0.17		0.00		0.50***
		(0.06)		(0.08)		(0.11)		(0.14)		(0.18)
Constant	2.13**	3.58**	6.23***	3.47	7.18***	3.25	3.33	3.31	10.59***	-1.11
	(0.86)	(1.55)	(1.30)	(2.34)	(1.70)	(3.05)	(2.23)	(4.02)	(2.87)	(5.17)
Observations	1788	1788	1788	1788	1788	1788	1788	1788	1788	1788
# Countries	56	56	56	56	56	56	56	56	56	56

Note: * p-value < 0.1; ** p-value < 0.05; and *** p-value < 0.01.

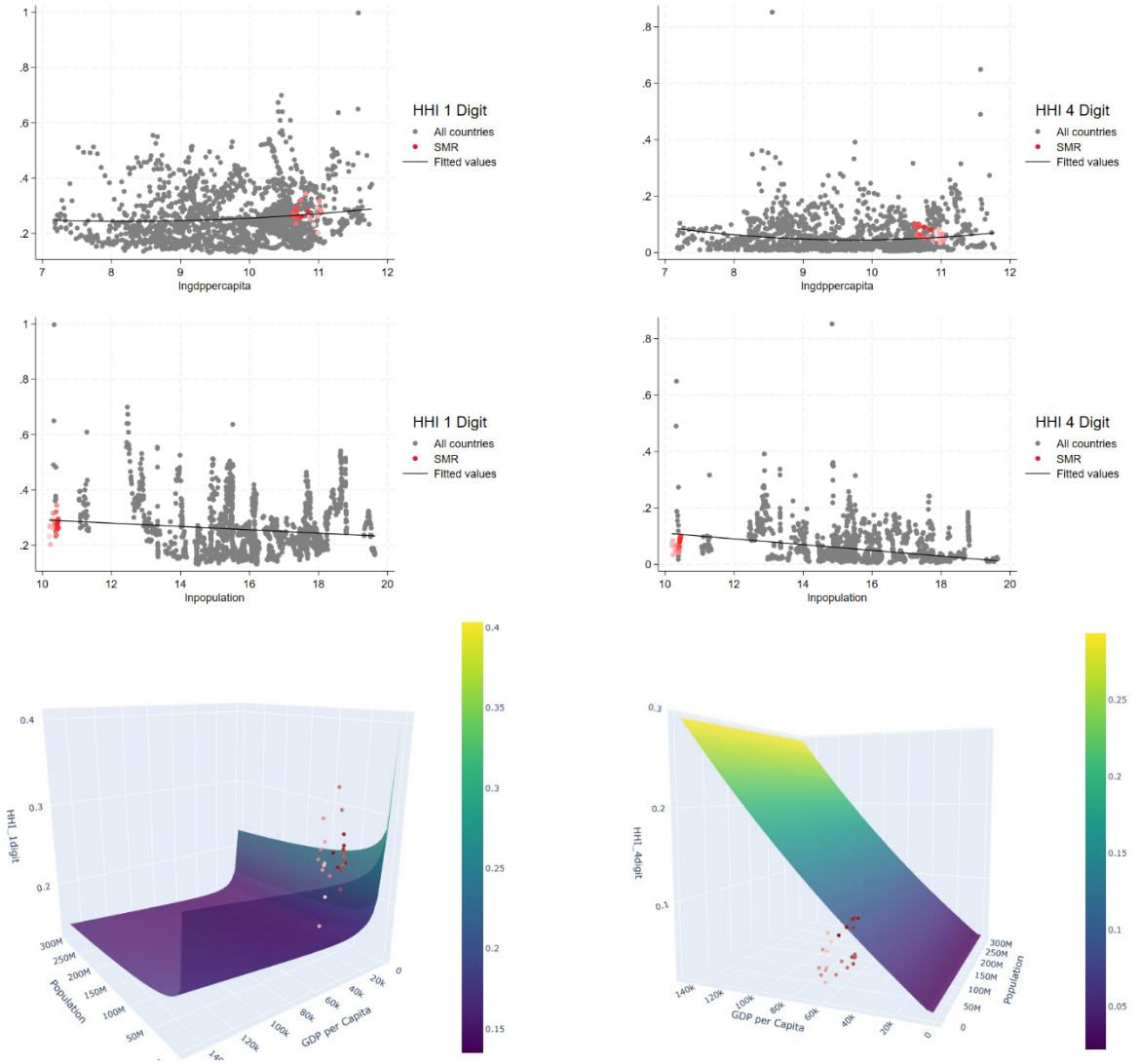
Sources: IMF staff calculations.

24. Results from the panel regression confirm the U-shaped relationship between the HHI and per capita GDP described in the literature. Regardless of SITC disaggregation level, from 1 to 5 digits, the coefficient of GDP per capita is always negative and highly statistically significant, indicating that, at least initially, lower HHI (i.e., higher export diversification) is associated with larger GDP per capita. Depending on the SITC disaggregation, results suggest a reduction of 1 percent in HHI for increases in per capita GDP ranging from 0.7 percent (SITC 1-digit) to 3.3 percent (SITC 5-digit). Moreover, the coefficient of per capita GDP squared is always positive (also highly statistically significant), indicating that the relationship between HHI and GDP per capita is non-linear and convex, and suggesting an inflection that switches the relationship between HHI and GDP per capita from negative to positive at higher levels of per capita GDP. That suggests that after a threshold in the level of GDP per capita, further increases come with *less* diversification (i.e., more specialization). The partial regression between HHI and GDP per capita, represented in the top two charts of Figure 10, shows the convex relationship between the two variables and confirms that the data from San Marino is broadly clustered around the fitted regression curve both at the SITC 1- and 4-digit levels, in a portion of the curve that surpassed the threshold level of GDP per capita for which the relationship becomes positive, confirming the results from Figure 8.

25. Findings confirm that San Marino's economy is more diversified than its size would predict. The evidence for a statistically significant *negative* relationship between the HHI and population size—clear for small economies and microstates—disappears when considering a wider sample of countries. While for small economies and microstates the strong negative correlation between HHI and population size suggests that the latter constitutes a serious limitation to further diversification (Figure 8), results in Table 1 broadly show no correlation—in all but one specification,

the coefficient of population is not statistically significant.[7] Considering 1- and 4-digit product disaggregation levels, San Marino's data is clustered at or below the partial regression curve of HHI on population size, indicating that the country is more diversified than expected given its size.

Figure 10. San Marino: Panel Regression: HHI *vs* Country Size and Per Capita GDP, 2000-2022



Note: The red dots on the 3D Surface plots represent San Marino's datapoints. Darkness corresponds to more recent years.
Sources: IMF staff calculations.

26. Taken together the results from the panel regression confirm that San Marino is a well-diversified economy considering both its size and income level. The two charts at the bottom of Figure 10 show that the San Marino data cluster around or below the fitted regression

[7] The statistically significant positive HHI-population association at the SITC 5-digit level suggests that, for sufficiently granular disaggregation, bigger domestic markers can lead to product specialization rather than diversification. However, for similar regressions using other export diversification indices (Annex II), such as the Entropy Index and the Export Concentration Ratio, population size is positively related to diversification, especially at more disaggregated product levels.

surface in the three-dimensional HHI-GDP per capita-population space, especially at the SITC 4-digit level of disaggregation. As indicated by the relatively low HHI given San Marino's population and GDP per capita, San Marino looks well diversified as many export products have moderately sized shares. Because the HHI considers the entire distribution of export products, it is sensitive to the overall spread but less sensitive to the dominance of the very top few products compared to, say, the entropy Index and Concentration Ratios. Even if there are some dominant products, the presence of multiple other products with meaningful shares means lower HHI and signals more diversification.

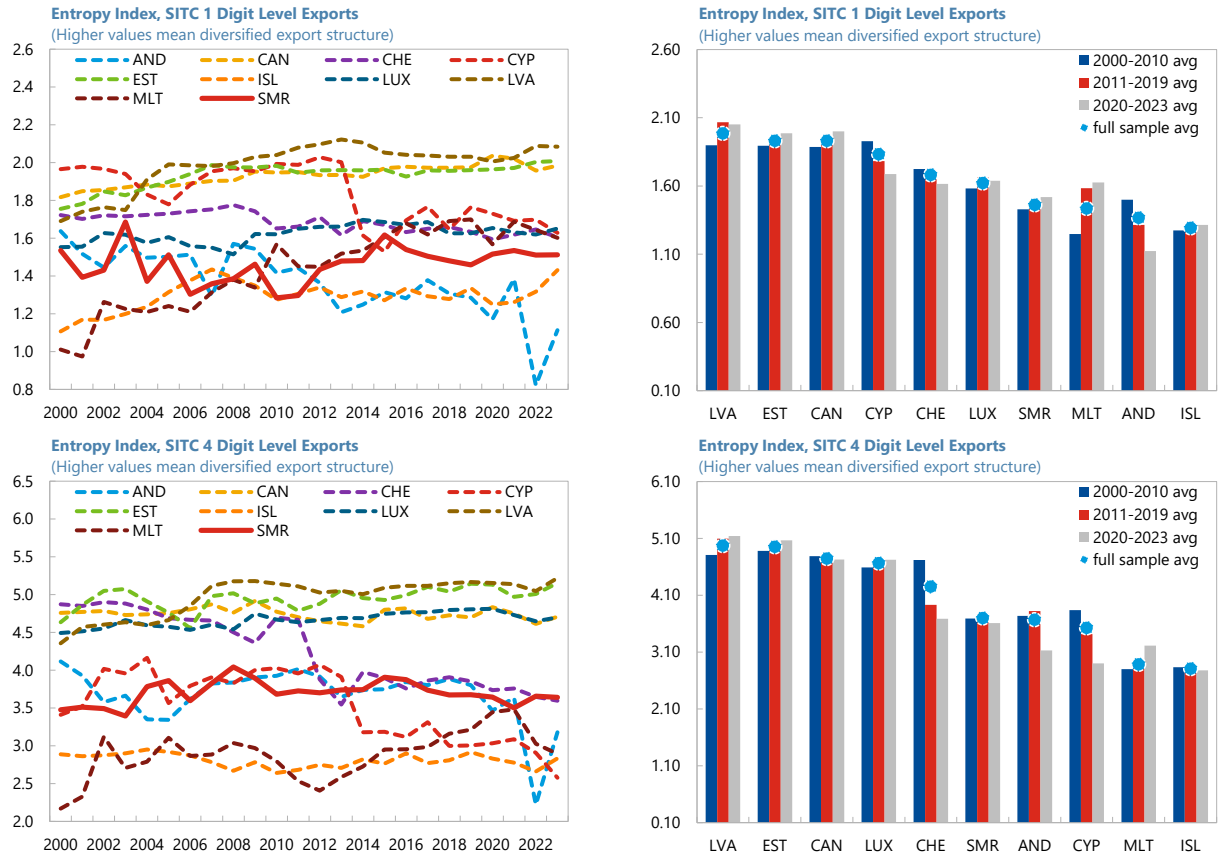
The Entropy Index (EI)

27. The Entropy Index (EI) captures the "dispersion" or "spread" in the distribution of export products, treating all product shares more equally and emphasizing evenness across products. Figure 11 displays the EI for some selected economies, mostly small and microstates. While, like the HHI, it also considers the entire distribution of export products, it is calculated by summing the market shares of each export product multiplied by its natural log (instead of itself, as in the HHI). This introduces different weights to small shares. If a few products dominate exports but many others have small shares, the Entropy index will show lower diversification compared with the HHI because it is more sensitive to the presence of very small shares—it penalizes uneven distributions more than the HHI. It is typically presented with a minus signs, so higher EI means a more diversified economy.

28. Overall, the results from HHI-based cross-country comparisons hold when the Entropy Index is used. Similarly to HHI-based cross- country comparisons, both at SITC 1- and 4-digit level exports of goods, San Marino seems more diversified than Iceland and Andorra, but more concentrated than Luxembourg, Estonia, and Latvia. At the SITC 4-digit level, the microstate is also more diversified than Cyprus and Malta, and at par with Switzerland (Figure 11). As in the case of the HHI, we also observe the decline in diversification since the mid-2010's. Historically, and similarly to the case using the HHI (see charts on the right, in Figure 9), San Marino has been in the middle of the distribution when considering this peer group, typically more diversified than Andorra, Iceland, and Malta in general, and relative to Cyprus at the SITC 4-digit level.

29. The similar overall picture from both the HHI- and EI-based cross-country comparisons of export diversification is consistent with an evenly distributed export structure in San Marino. It means that San Marino's export structure, even if dominated by some products, does not display a very long tail of minor exports compared with peers.

Figure 11. Selected, Small Economies, and Microstates: Entropy Index (EI), 2000-2023



Sources: UN Comtrade, World Bank, and IMF staff calculations.
Note: San Marino values are calculated using mirror import data from trading partners

Export Concentration Ratio (CR)

30. The *N*-goods Concentration Ratio (CR-*N*) sums the shares of the top *N* export products (at a given product SITC classification level). Unlike the HHI and EI, this indicator does not consider the entire distribution of export products. Instead, it directly measures export concentration only at the very top of the distribution. This is a very direct and focused measure of concentration and is often stricter than the HHI or EI. We will consider the CR-*4* indicator, which focuses on the top 4 export products at both the SITC 1-digit and 4-digit levels (Figure 12).

31. The CR-*4* metric leads a more nuanced assessment of San Marino's export diversification. This largely results from the interplay between its direct calculation method and different SITC levels of product disaggregation. If the top 4 export products account for a large share of exports, this index will show high concentration regardless of the remainder of the export basket. However, at different SITC disaggregation levels, the very top of the export products distribution can change more dramatically compared with the entire distribution.

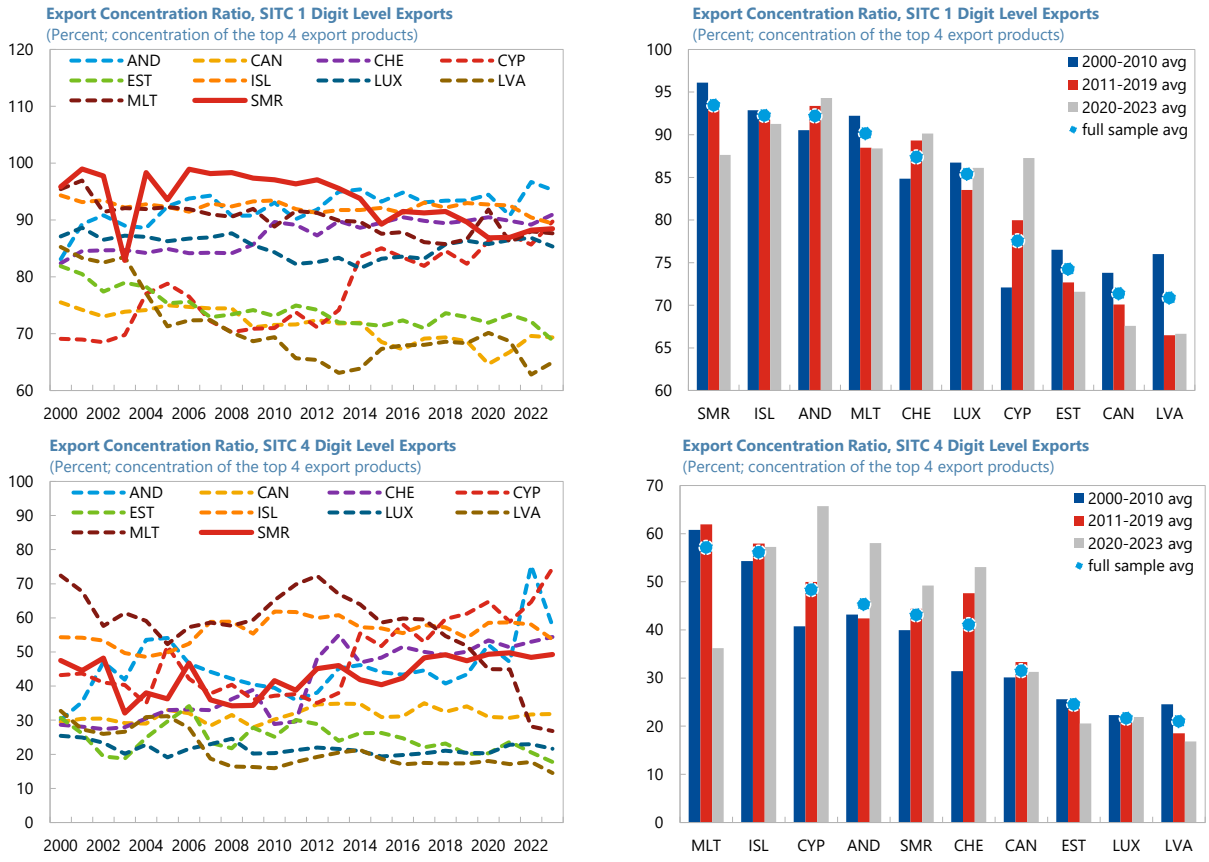
32. At the SITC 1-digit level of disaggregation, San Marino's CR-*4* indicator relative to that in the comparator group departures from the comparisons based on the HHI and EI metrics.

San Marino is currently *less* CR-diversified than other peers, except Andorra and, by a small margin, Iceland and Switzerland. This is also the case when we look at averages from the pre-Covid period (Top-right chart, Figure 12), although San Marino's CR-*4* indicator has been displaying a secular decline since the early 2000's at this level of SITC disaggregation.

33. At the SITC 4-digit, however, broadly the same relative ranking observed in both HHI-based and EI-based cross-country comparisons emerges. Not only is San Marino *currently* more diversified than Iceland, Andorra, Cyprus, and Switzerland based on the CR-*4* indicator but, also in line with the HHI and EI, it is becoming *less* diversified more recently.

34. Therefore, results indicate that the top 4 export products are more concentrated at a more aggregated level in San Marino. Intuitively, they highlight that reliance on a small number of key products reduces with more product disaggregation.

Figure 12. Selected, Small Economies, and Microstates: 4-Goods Concentration Ratio (CR-4), 2000-2023



Sources: UN Comtrade, World Bank, and IMF staff calculations.
Note: San Marino values are calculated using mirror import data from trading partners

D. Concluding Remarks and Policy Implications

35. This paper assesses the state of San Marino's economic diversification based on aggregate sectoral Gross Value Added (GVA) data from 13 economic sectors and three

standard export diversification metrics. Although data on the distribution of goods *produced* in San Marino are not available at sufficiently disaggregated levels, we rely on a very strong Pearson Product Moment Correlation (PPMC) between the aggregate sectoral GVA and export distributions to use export diversification indicators—computed from disaggregated data on Sammarinese export products obtained with mirror import data from San Marino's trading partners—as proxy for economic diversification. Results are somewhat nuanced, to some extent depending on the index used but strongly contingent on the level of disaggregation of sectoral or product data.

36. Aggregate sectoral GVA data points to an economy concentrated in manufacturing and wholesale and retail. Those broad sectors are also responsible for large shares of output and exports. Combined with public administration, these sectors also account for a sizeable share of total employment. At this level of product disaggregation, San Marino's economic structure closely resembles that of Liechtenstein (also concentrated in manufacturing), and bears some size-related similarities with other small European states, like Andorra and Luxembourg (i.e., very low GVA shares of agriculture and mining). The shares of the manufacturing sector and wholesale and retail trade on GVA are not only elevated, but increasing, along with sectors like ICT, which could suggest an increase in economic concentration.

37. However, at more disaggregated product classification levels San Marino emerges as a well-diversified economy. The Herfindahl-Hirschman Index (HHI), which accounts for the entire distribution of export product shares with emphasis on larger players, indicates a relatively diversified export structure compared to peer microstates. Similarly, the Entropy Index (EI), which is more sensitive to the unevenness of export shares than the HHI, also suggests a more balanced distribution relative to peers. The EI-based cross-country comparisons *do not* indicate a particular dominance of a few export products alongside a long tail of minor exports in San Marino, relative to peers. This concentration on fewer products is somewhat visible with the Concentration Ratio index for the top 4 goods at the detailed 1-digit SITC level of product classification, but not at the more disaggregated 4-digit level. This result confirms that while a few key products may constitute a larger share of exports in San Marino aggregated data is used, the concentration disappears with more disaggregated classification.

38. The well-diversified economic structure of San Marino is consistent with the resilience of its economy amidst global trade, geopolitical, and commodity price shocks. San Marino's economy, relying on a new growth model that diversified away from financial services after the Global Financial Crisis, has maintained positive growth following the post-pandemic successive shocks, with the manufacturing sector retaining the market share gained through nearshoring, the tourism sector flourishing on post-Covid regional demand boom, and total employment reaching record highs.

39. San Marino's export and economic diversification are broadly in line with what would be predicted by both its size and level of development. Export diversification indicators for San Marino suggest that the country is more diversified than its size predicts. The paper confirms the inverted U-shaped relationship between development level and diversification found in earlier studies: for poor countries, per capita GDP increases with more diversification, but after a certain

threshold this relationship inverts and higher per capita GDP becomes associated with *less* diversification. We show that San Marino's per capita GDP has surpassed this inflection point, suggesting that it may not benefit from further increases of GDP per capita associated with more diversification and that the recent slight decline in diversification observed since the mid-should not be a concern.

40. As a well-diversified economy, with a competitive manufacturing sector and emerging dynamic sectors like ICT, San Marino could benefit from horizontal rather that sector-specific structural policies. Focusing on higher value-added products within existing sectors that are already competitive seems like a more promising development strategy than resorting to industrial policies to develop new sectors. These existing sectors—such as manufacturing, ICT, and professional services—are also among those with highest and fast-growing labor productivity. In that context, horizontal reforms—such as investing in both physical and digital infrastructure, increasing labor market flexibility, streamlining and modernizing the tax system, resolving banking-real estate distortions to facilitate real estate market functioning, and enhancing public administration efficiency—would strengthen existing productive sectors by boosting economy-wide productivity.[8]

[8] Salinas (2021) emphasizes the importance of horizontal policies and proximity to markets in explaining export diversification.

Annex I. Export Diversification Indices

Export diversification indices measure the variety and distribution of a country's exports. They help assess how reliant a country is on specific products or markets. Some common indices used in the literature are described below.

1. Herfindahl-Hirschman Index (HHI):

It measures the concentration of exports by summing the squares of the market shares of each export product. A lower HHI indicates a more diversified export base, while a higher HHI indicates a concentration on fewer products.

$$HHI_x = \sum_{i=1}^{N} s_i^2,$$

where s_i is the share of product i in total exports and N is the total number of products.

2. Entropy Index:

This index quantifies the diversity of a country's exports based on the distribution of export volumes across products. A higher entropy value indicates a more diversified export structure.

$$Entropi = -\sum_{i=1}^{N} s_i \,.\ln\, s_i,$$

where s_i is the share of product i in total exports and N is the total number of products.

3. Export Concentration Ratio (CR):

This measure corresponds to the share of the top few products in total exports. For instance, CR-N measures the concentration of the top N export products. A lower ratio indicates a more diversified export sector.

Annex II. Additional Results

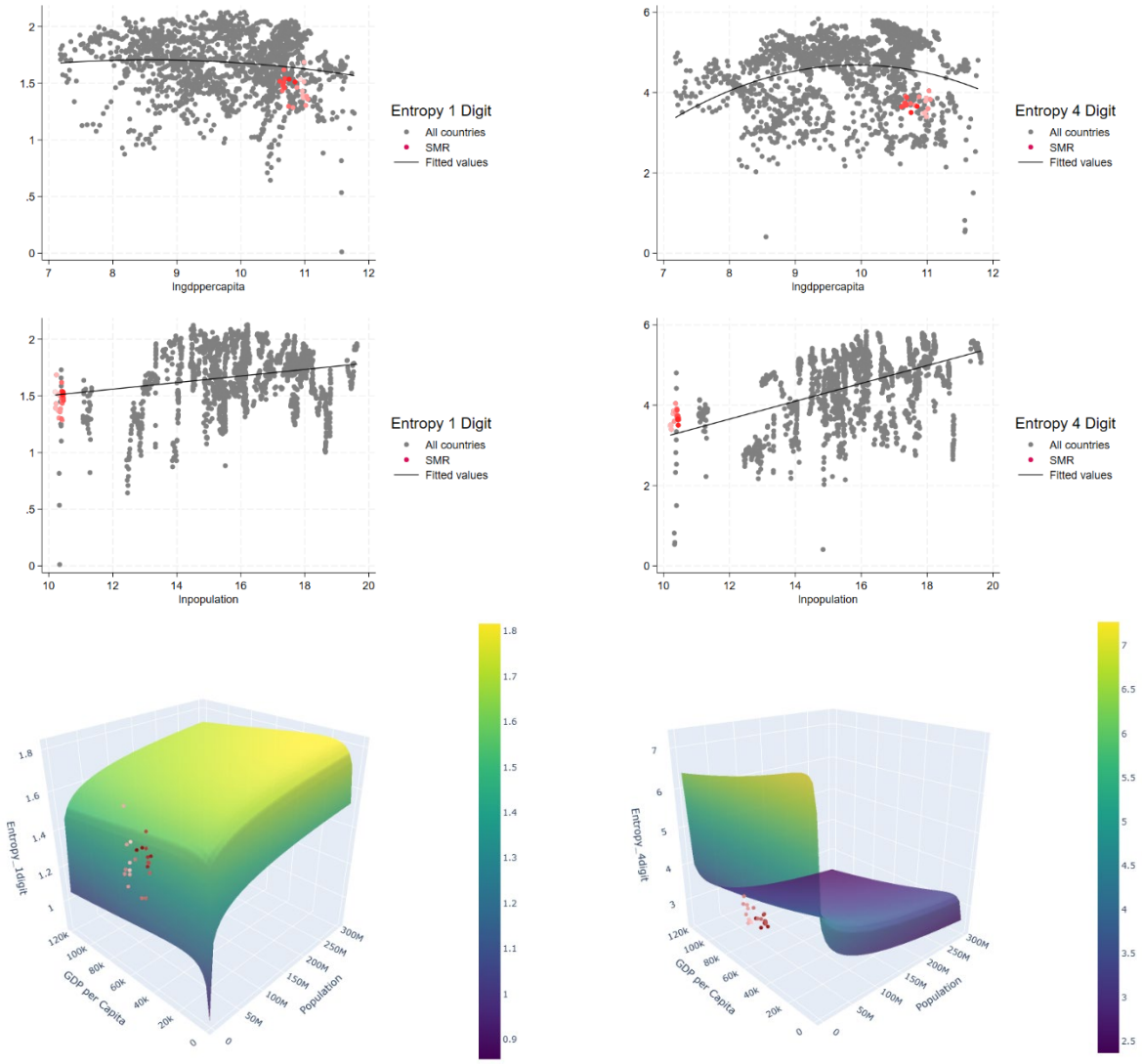
Table 1a. San Marino: Panel Regression: Entropy vs Country Size and Per Capita GDP, 2000-2022

Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Entropy Index	SITC_1digit	SITC_1digit	SITC_2digit	SITC_2digit	SITC_3digit	SITC_3digit	SITC_4digit	SITC_4digit	SITC_5digit	SITC_5digit
Ln (GDP per capita)	0.47***	0.60***	1.41***	1.25***	1.99***	1.53***	3.11***	2.37***	3.27***	3.40***
	(0.14)	(0.16)	(0.21)	(0.23)	(0.27)	(0.30)	(0.34)	(0.38)	(0.39)	(0.44)
Ln (GDP per capita^2)	-0.02***	-0.03***	-0.07***	-0.06***	-0.11***	-0.08***	-0.17***	-0.13***	-0.18***	-0.19***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Ln (Population)		0.07*		-0.09		-0.26***		-0.42***		0.07
		(0.04)		(0.06)		(0.08)		(0.10)		(0.12)
Constant	-0.89	-2.55**	-3.68***	-1.49	-4.94***	1.19	-9.25***	0.63	-10.56***	-12.31***
	(0.64)	(1.16)	(0.97)	(1.75)	(1.25)	(2.25)	(1.59)	(2.85)	(1.83)	(3.30)
Observations	1788	1788	1788	1788	1788	1788	1788	1788	1788	1788
# Countries	56	56	56	56	56	56	56	56	56	56

Note: * p-value < 0.1; ** p-value < 0.05; and *** p-value < 0.01.

Sources: IMF staff calculations.

Figure 1a. San Marino: Panel Regression: Entropy vs Country Size and Per Capita GDP, 2000-2022



Note: The red dots on the 3D Surface plots represent San Marino's datapoints. Darkness corresponds to more recent years.

Sources: IMF staff calculations.

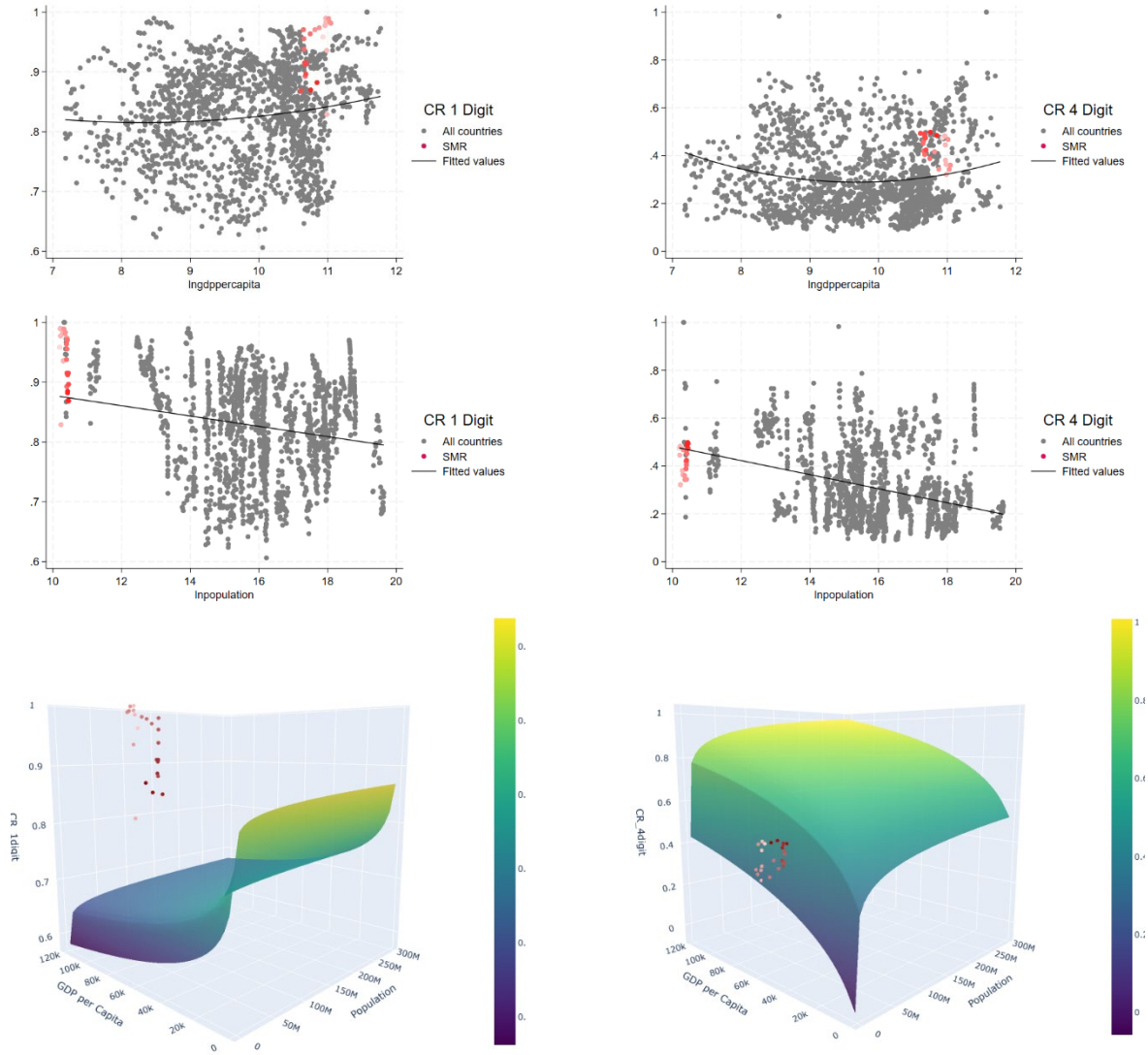
Table 1b. San Marino: Panel Regression: Export Concentration Ratio *vs* Country Size and Per Capita GDP, 2000-2022

Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Ln (CR)	SITC_1digit	SITC_1digit	SITC_2digit	SITC_2digit	SITC_3digit	SITC_3digit	SITC_4digit	SITC_4digit	SITC_5digit	SITC_5digit
Ln (GDP per capita)	-0.08*	-0.04	-1.23***	-0.95***	-1.70***	-1.38***	-1.46***	-1.32***	-1.31***	-0.48
	(0.05)	(0.06)	(0.14)	(0.16)	(0.19)	(0.22)	(0.25)	(0.28)	(0.32)	(0.36)
Ln (GDP per capita^2)	0.00	0.00	0.07***	0.05***	0.10***	0.08***	0.09***	0.09***	0.07***	0.03
	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Ln (Population)		0.02*		0.16***		0.19***		0.08		0.47***
		(0.02)		(0.04)		(0.06)		(0.07)		(0.10)
Constant	0.36	-0.21	4.84***	1.06	6.23***	1.90	3.91***	2.04	3.72**	-7.27***
	(0.23)	(0.42)	(0.65)	(1.17)	(0.90)	(1.62)	(1.15)	(2.07)	(1.52)	(2.72)
Observations	1788	1788	1788	1788	1788	1788	1788	1788	1788	1788
# Countries	56	56	56	56	56	56	56	56	56	56

Note: * p-value < 0.1; ** p-value < 0.05; and *** p-value < 0.01.

Sources: IMF staff calculations.

Figure 1b. San Marino: Panel Regression: Export Concentration Ratio *vs* Country Size and Per Capita GDP, 2000-2022



Note: The red dots on the 3D Surface plots represent San Marino's datapoints. Darkness corresponds to more recent years.

Sources: IMF staff calculations.

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