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# Explaining Income Divergence in the Western Indian Ocean: Evidence from Mauritius, Seychelles, Madagascar, and Comoros

Andrew Esparon, Aissatou Diallo and Mahamoud Islam

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# Explaining Income Divergence in the Western Indian Ocean: Evidence from Mauritius, Seychelles, Madagascar, and Comoros

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August 2026

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**ABSTRACT:** This paper examines the divergent economic development paths of Mauritius, Seychelles, Madagascar, and Comoros since 1980. Despite operating in broadly similar regional and geographic settings, Mauritius and Seychelles achieved significantly higher levels of real GDP per capita, while Madagascar and Comoros saw more limited progress. Combining qualitative analysis with panel econometric methods (FMOLS and DOLS), the paper finds that institutional quality, human capital development, trade openness, and macroeconomic policies are associated with higher levels of real GDP per capita. The results suggest that stronger governance frameworks and investment in human capital are associated with higher income levels in Mauritius and Seychelles, while more persistent institutional and structural challenges are associated with lower income levels in Madagascar and Comoros. Overall, the findings suggest the importance of institutions, human capital, and external integration in economic performance across the four Indian Ocean island economies.

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# Introduction

Mauritius, Seychelles, Madagascar, and Comoros —four island nations situated in the Indian Ocean—share notable similarities in geography, natural endowments, and historical institutions. Each of these countries experiences a tropical climate characterized by warm temperatures and seasonal rainfall, which supports rich biodiversity and underpins their tourism potential. Historically, all four nations were colonies or protectorates of either Britain or France, and their economies were traditionally anchored in agriculture, despite limited arable land—particularly in Mauritius, Comoros, and Seychelles.

Despite these commonalities, the economic trajectories of these island states have diverged markedly since 1980. Mauritius and Seychelles have significantly outperformed their regional peers, with real GDP per capita increasing by 354 percent and 138 percent, respectively, over the past four decades. In contrast, Madagascar experienced a contraction of 35 percent in real GDP per capita, while Comoros recorded a relatively modest increase of 17 percent. These outcomes place Mauritius and Seychelles among the top performers in Sub-Saharan Africa (SSA), with average annual real GDP growth rates of approximately 3 percent, while Comoros and Madagascar have experienced more limited growth.

This paper investigates the key correlates of differences in growth trajectories of real GDP per capita across the four island nations. The analysis adopts a two-pronged approach. First, it offers a qualitative assessment of growth divergence, drawing on national accounts data and a literature-based review of structural, macroeconomic, and institutional factors. Second, it conducts a quantitative evaluation using Fully Modified Ordinary Least Squares (FMOLS) and Dynamic Ordinary Least Squares (DOLS) models. These econometric techniques are well-suited to the small sample size and partially heterogeneous panel data available, enabling an assessment of long-run associations with growth.

While the qualitative assessment spans the post-independence period, the quantitative analysis begins in 1980 due to the absence of reliable and comparable data prior to that year—particularly for Comoros. The findings indicate that post-independence growth trajectories diverged in association with differences in institutional quality and macroeconomic and structural policies, especially those related to education and trade. Mauritius and Seychelles benefited from stronger governance, policies that fostered productive investment, expanded educational access, and promoted trade openness.

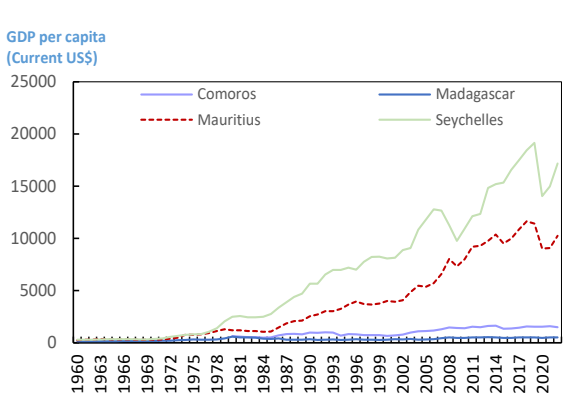
Although initial conditions at independence varied across the four countries, the evidence points to the importance of differences in policy frameworks and institutional evolution, which appear to have been associated with divergent development outcomes. In the core model, early advantages are captured through levels and trends in independent variables such as education equality, health outcomes, and corruption indices. The role of initial conditions is also tested explicitly as a separate variable in robustness checks.

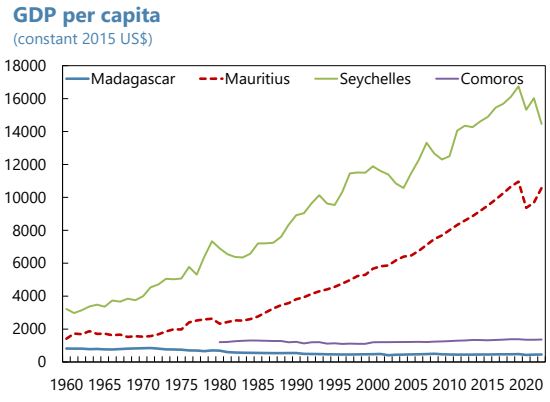
Drawing on these insights, the paper highlights key patterns for economic development in similarly situated economies. It suggests the important role of institutional quality, human capital development, trade openness, and macroeconomic policies in supporting inclusive and sustained growth. These insights are particularly relevant for Sub-Saharan African countries seeking to learn from the experience of high-performing peers.

The paper is structured as follows: Section I reviews the relevant literature on economic growth in the four island nations. Section II presents a qualitative analysis of the factors associated with growth. Section III

provides an empirical analysis of long-run growth correlates using FMOLS and DOLS estimations. The final section concludes with a summary of the findings and their implications.

**Figure 1. GDP per capita (nominal and real trajectories)**




# Section I. Literature Review

Two schools of thought are widely cited in the theory of economic development: the Solow-Swan model and endogenous growth theories. The Solow-Swan model posits that income rises with the accumulation of physical and human capital. However, due to diminishing returns, increases in capital alone cannot sustain long-term growth. Instead, technological innovation—considered exogenous (i.e., determined outside the model)—drives long-run economic growth. In this framework, savings influence the level of GDP, but not the long-term growth rate. As a result, policymakers have limited direct influence over the long-run growth path. The model also predicts convergence: poorer countries should grow faster than richer ones, eventually catching up in per capita income, provided they have similar savings rates, population growth, and access to technology.

In contrast, endogenous growth theory assigns a central role to economic policy and incentives in shaping growth outcomes. It treats technological progress as an endogenous process, influenced by decisions within the economy, such as investment in innovation and human capital. Unlike the Solow-Swan model, it does not assume diminishing returns to capital, allowing for the possibility of sustained growth driven by continuous capital accumulation and innovation. Here, factors like savings, investment, education, and government policy play a direct role in determining the growth rate.

Based on these theoretical insights, the drivers of economic growth can be grouped into four broad categories: macroeconomic policies, structural factors, institutional quality, and the external environment. Macroeconomic policies encompass fiscal and monetary policies. While loose policies can stimulate short-term demand, their long-term impact depends on their quality and sustainability. For example, excessive fiscal loosening may lead to high debt levels and increased default risk, which can deter investment and slow growth.

Structural factors/policies include efforts to enhance long-run growth through better education, health, and trade policy. Although their impact is often delayed, these policies can significantly boost productivity and

economic potential. Investments in human capital and trade liberalization both promote efficiency and expand market opportunities.

Quality of Institutions —sound institutions that ensure political stability, uphold the rule of law, and promote good governance— create a favorable environment for investment and economic activity. They reduce uncertainty and encourage private sector development.

The external environment – particularly important for small island states – relates to external conditions that can heavily influence growth. These conditions include demand for exports (via the current account) and access to capital (via the capital account), in particular. While domestic factors —such as macroeconomic stability, an open capital account, a sound financial system, and a business-friendly legal framework— can help create the conditions for attracting capital, the actual realization of these opportunities is largely driven by external agents and global dynamics.

Empirical research has extensively examined the role of these growth drivers across countries. For instance, De Long and Summers (1991), working with a large sample that includes advanced, emerging, and developing economies from 1960 to 1985, found that investment in equipment strongly correlates with growth: an additional percentage point of GDP invested in equipment could lead to a GDP increase of approximately one-third of a percentage point. Barro (1996) analyzed a panel of around 100 countries spanning the period from 1960 to 1990, revealing that higher initial levels of schooling and life expectancy, lower fertility rates, reduced government consumption, stronger adherence to the rule of law, lower inflation, and improved terms of trade were correlated with higher economic growth rates, given an initial level of real per capita GDP.

Subsequent studies expanded this empirical base, testing additional variables, and exploring developing countries' contexts. Sala-i-Martin et al. (2004), studying 88 countries, examined the robustness of explanatory variables in determining long-term growth trends. Out of 67 variables, they identified 18 that were significantly correlated with economic growth, with the most influential factors being the relative price of investment, primary school enrollment rates, and the initial level of real GDP per capita. Dao (2011), using data from the World Bank and focusing on 62 developing economies, found that per capita GDP growth was linearly dependent on several factors, including urban sanitation and water access, rural water access, gross capital formation as a percentage of GDP, adult literacy rates, bank liquid reserves relative to assets, globalization indices, and measures of social and political globalization.

More recent reviews have highlighted that the relevance of these drivers varies significantly by development level. In a comprehensive literature review on the macroeconomic determinants of economic growth, Chirwa and Odhiambo (2016) emphasized differences between developing and developed economies. They noted that in developing countries, key determinants of economic growth include foreign aid, foreign direct investment, fiscal policy, investment levels, trade openness, human capital development, demographic factors, monetary policy, natural resources, and various geographic, regional, political, and financial influences. In contrast, in developed countries, the key determinants associated with economic growth include physical capital accumulation, fiscal policies, human capital investment, trade dynamics, demographic trends, monetary policies, and advancements in financial and technological sectors.

Turning to regional evidence, several studies have focused on growth dynamics in African economies. Tsangarides (2012) conducted a comparative analysis of growth spells between African and non-African countries, revealing distinct differences. The study highlights that the impact of openness and droughts is unique to African countries. Conversely, factors such as terms of trade, exchange rate undervaluation, and

inflation predominantly influence non-African countries. Furthermore, while investment, total years of education, and changes in U.S. interest rates affect both African and non-African countries, the marginal impact of these variables differs significantly between the two groups. In a study of 42 African countries over 1999–2011, Ghazanchyan and Stotsky (2013) demonstrated that higher levels of private and public investment correlate positively with economic growth, contingent on the econometric specification used. The study further suggests that government consumption may hinder growth, while more flexible exchange rate regimes are conducive to growth. However, variables related to the real exchange rate and liberalization did not have significant impacts. Anyanwu (2014), analyzing data from 53 African countries between 1960 and 2010, identifies domestic investment, net ODA inflows, education, government effectiveness, urbanization, and metal prices as significant drivers of Africa's economic growth.

Beyond continental patterns, several studies have examined the specific challenges of small states, including those in the Caribbean. Easterly and Kraay (2000) argue against treating small states as a distinct category, suggesting that they should receive similar policy advice as larger states. This view is partially supported by Aiyar (2008), who finds no consistent evidence that small size is a disadvantage for economic growth. Conversely, Briguglio (2022) contends that while some small states perform well economically, they face significant constraints, such as limited economies of scale and high vulnerability to external shocks. Jayaraman (2006) emphasizes the importance of sound macroeconomic policies for building resilience in small states, particularly in mitigating the impacts of exogenous shocks such as natural disasters. Jaramillo and Sancak (2007) analyzed why the Dominican Republic and Haiti, two countries that share similar initial characteristics (geography and historical institutions), have had different growth trajectories. They found that rather than initial conditions, policy decisions played a central role in the growth trends of the two countries. Mamingi and Borda (2015) studied the determinants of economic growth for the Organisation of the Eastern Caribbean States. They found that, in general, external debt, the natural increase rate—defined as the birth rate minus the death rate—and private consumption are the main drags on economic growth in the region in the short and long run, while trade openness positively affects economic growth. Natural disasters have a negative impact, but only in specific countries. In the specific context of small island economies, the literature further highlights the role of sectoral specialization—particularly tourism—and external demand as drivers of growth. While tourism has supported diversification, employment, and income generation in several small island states, it has also exposed these economies to external shocks and demand volatility (Armstrong & Read, 2006; Scheyvens & Momsen, 2008). At the same time, institutional quality remains critical in shaping the extent to which such sectors translate into sustained growth (Acemoglu et al., 2001; Briguglio, 2022).

Studies focused specifically on the four Indian Ocean islands analyzed in this paper remain limited, primarily due to data constraints. Hamori and Razafimahefa (2003) investigated the impact of trade on GDP growth among the four islands using a bivariate VAR specification. They found that the size of the economy and the importance of trade relative to GDP markedly determine the effects of trade on growth. Mauritius has been the subject of many analyses intended to explain its "growth miracle." As part of this exercise, authors have sometimes used the other three countries as benchmarks. Subramanian and Roy (2001) and Subramanian (2009) highlights the role of a heterodox export strategy, strong institutions—including an inclusive political system that mitigates conflict—and a favorable trading environment as key drivers of economic growth. Frankel (2010) and Svirydzenka and Petri (2014) point to the importance of pro-growth policies, including the creation of a well-managed Export Processing Zone, trade diplomacy regarding preferences, spending on education, avoidance of currency overvaluation, and business facilitation.

A body of empirical research has explored the role of legal origins in shaping economic outcomes, suggesting that the historical foundations of a country's legal system—whether rooted in common law or civil law

traditions—have long-term implications for institutional development and, by extension, economic performance. In this paper, legal origins are discussed as part of the historical context shaping institutional development, but are not explicitly operationalized in the empirical analysis. La Porta et al. (1998, 2008) argue that legal traditions influence the design of financial regulations, property rights, and the enforcement of contracts, which in turn affect investment climates and growth trajectories. This perspective has been particularly influential in comparative development studies, where legal origin is treated as a foundational determinant of institutional quality. In the context of small island developing states, such as those in the Indian Ocean, this framework provides a compelling lens through which to examine divergent growth paths, as initial legal and institutional conditions continue to shape policy effectiveness and economic resilience. The literature on the legal origins of development argues that the historical origin of a country's laws is highly correlated with a broad range of its legal rules and regulations, as well as with economic outcomes. La Porta et al. (2008) claim that first, legal rules and regulations differ systematically across countries. Second, these differences in legal rules and regulations are accounted for to a significant extent by legal origins. Third, the basic historical divergence in the styles of legal traditions - the policy implementing focus of civil law (French style) versus the market-supporting focus of common law (English style) - has been used to explain differences in legal rules across countries. Fourth, the measured differences in legal rules matter for economic and social outcomes.

# Section II: Qualitative Analysis

## A. Geography, Political and Economic Background

This section examines structural factors that the growth literature highlights as likely to influence long-term growth performance, namely geography, political background, and economic structure. The narrative shows that the four island nations share similar geographic features and broadly similar colonial legacies, although their political histories and post-independence trajectories differ. At independence, the four economies were largely shaped by plantation-based and agricultural activities. However, Mauritius and Seychelles experienced relatively greater political stability and developed more diversified industries in tourism, finance, information and business services, while Comoros and Madagascar experienced prolonged periods of political instability that weighed on institutional quality and economic development prospects.

### a. Geographical settings and risks of natural disasters

**Comoros is a small island state located in the Mozambique Channel between the east coast of Africa and Madagascar.** With a population of nearly one million residents living across approximately 2,000 square kilometers, it experiences a tropical marine climate. From November to April, the climate is hot and humid with northeastern monsoons and potential cyclones; the rest of the year is cooler and drier. According to the World Bank, Comoros faces substantial annual losses from natural disasters—primarily tropical cyclones (64 percent of average losses), followed by floods (35 percent).

**By far the largest of the four economies in terms of land area (with nearly 600,000 square kilometers), Madagascar is situated in the Indian Ocean off the southeast coast of Africa.** Its diverse geography includes lowlands and steep bluffs along the east coast, volcanic mountains in the northern Tsaratanana Massif, protected harbors and broad plains on the west coast, and a plateau and semi-arid region in the southwest. With a population of approximately 30 million, Madagascar is the most populous of the four economies analyzed in this paper. The climate features two distinct seasons: hot and rainy from November to April, and cooler and drier conditions from May to October. Due to its location, terrain, and socioeconomic conditions, Madagascar is highly vulnerable to climate change, facing significant risks from cyclones, floods, and droughts across different regions.

**Mauritius is an archipelago in the Indian Ocean east of Madagascar.** Covering 2,040 km² with a coastline of 177 km, the Republic includes the main island of Mauritius, Rodrigues, and the smaller atolls of Agalega and Saint Brandon. Mauritius and Rodrigues are part of the volcanic Mascarene Islands and are home to numerous rivers and streams. With a population of over one million, Mauritius is the second most populous economy in the sample. The climate is humid and subtropical, with hot and rainy conditions from November to April, cyclones peaking from December to March, and cooler and drier conditions from May to October. While direct cyclone hits are rare, Mauritius experiences their effects almost annually, with wind, rain, and storm surges contributing to significant losses (World Bank).

**Seychelles, an island state in the western Indian Ocean, is one of the smallest countries in the world in terms of both its population (about 120,000) and its land surface area (about 500 km2).** Seychelles comprises 115 islands, including around 40 granitic islands clustered near Mahé and coralline islands stretching over 1,200 kilometers. The main inhabited islands—Mahé, Praslin, and La Digue—host nearly the entire population, with Mahé alone accounting for 86 percent. Granitic islands feature hills up to 940 meters, narrow coastal plains, and coral reefs, while coralline islands are flat and lack fresh water. Land is extremely scarce. Mahé houses the capital, Victoria. The climate is tropical and humid, moderated by monsoons—cooler southeast winds from May to September and warmer northwest winds from March to May. Flooding, often triggered by intense rainfall, leads to landslides, fatalities, and infrastructure damage.

**b. Political background and governance**

**Comoros experienced recurrent episodes of political instability following independence.** Since gaining independence from France in 1975, Comoros has faced recurring political instability, including attempted or successful coups and repeated secession efforts by individual islands. Recurring political instability—including the 1989 assassination of President Abdallah—together with destructive cyclones in the 1980s hindered institutional development. Formal governance structures remain relatively constrained. In the absence of strong state institutions, communities often rely on traditional governance and diaspora-funded initiatives. Arabic and French are the official languages.

**Madagascar's post-independence history is marked by several political crises.** Strategically located off the southeast coast of Africa, Madagascar was historically contested by British and French powers, ultimately becoming a French colony in the late 19th century. It gained independence on June 26, 1960. Since then, the country has experienced recurring political instability, most notably between 2009 and 2012. This uncertainty has likely discouraged private investment and hindered economic growth. Structural challenges—including centralized governance, weak accountability, limited institutional capacity, and vulnerability to vested interests—have further constrained development. Even where reforms were introduced, implementation has at times been uneven. Public engagement in policy reform processes has at times remained limited. Malagasy and French are the official languages, and Madagascar is a member of the ''Organisation Internationale de la Francophonie''.

**Mauritius is a stable democracy with relatively strong institutions.** Mauritius was colonized successively by the Dutch, French, and British, gaining independence on March 12, 1968, through the Mauritius Independence Act. The path to independence was marked by intercommunal tensions, particularly between Creole and Indian communities, which often flared during elections. Despite these divisions, successive governments have worked—albeit imperfectly—toward inclusive governance and economic progress (Federal Research Division, 1994). Successive governments have broadly maintained a commitment to economic development, contributing to relatively strong governance outcomes. English is the official language used in administration, courts, and business, while both English and French dominate in education and professional settings.

**The same ruling party (under successive names) remained in power in Seychelles from 1977 to 2020.** Seychelles gained independence from Britain on June 29, 1976, following a history of colonial rule. As a goodwill gesture, Britain returned the Desroches, Aldabra, and Farquhar Islands and provided grants to support the transition to independence. From 1977 to 2020, the same political party dominated the country's politics, pursuing a state-led development model. A new constitution in 1993 reintroduced multiparty democracy, and in 2016, an opposition coalition won control of the legislature. The state has played a central role in development, providing free public services, maintaining a large public enterprise sector, and funding social programs through revenues from strategic sectors like tourism and fishing. The country has three national languages: Seychelles Creole, English, and French. English, a legacy of British rule, remains the primary language of government and business.

**c. Economic performance**

**The structure of the Comoros' economy at the time of independence in the 1970s was predominantly agricultural, with a focus on cash crops such as vanilla, cloves, and ylang-ylang.** At independence in the 1970s, Comoros had an economy dominated by agriculture, particularly cash crops like vanilla, cloves, and ylang-ylang, which were key export earners. Subsistence farming was widespread, and fishing supported coastal livelihoods. The industrial sector was minimal, with limited manufacturing capacity and heavy reliance on imports. In 1997, the primary sector (agriculture, forestry, and fishing) contributed 1.4 percentage points to growth, while the secondary sector (industry) added just 0.4. By 2022, these contributions had declined to 0.7 and 0.1 respectively, with the tertiary sector (services) contributing 0.5—reflecting a gradual but modest shift in the economic structure.

**At the time of Madagascar's independence in 1960, agriculture accounted for 34 percent of GDP and employed most of the population.** Key crops included rice, cassava, sweet potatoes, maize, and coffee, alongside export-oriented cash crops such as vanilla, cloves, and sugar. Livestock, especially cattle, and coastal fishing, also played important roles.

However, persistent institutional challenges and recurring political instability have been associated with weaker economic performance. Madagascar's long-term growth performance has been relatively weak compared with many peer countries, resulting in lower living standards than would have been expected from its resource endowment and demographic potential. These prolonged downturns and inconsistent recoveries have kept poverty levels high. The country's stop-go growth pattern and more limited institutional effectiveness remain major barriers to inclusive development.

**At the time of independence Mauritius was a remote monocrop producer.** At independence in 1968, Mauritius was a remote, agriculture-based economy heavily reliant on sugarcane, with tea, vegetables, and cut flowers also contributing. The sector employed a large share of the labor force, both directly and through related activities like processing and transport. Agriculture accounted for over 22 percent of GDP, and per capita income stood at just US$260. Since then, Mauritius has transformed into a diversified economy driven by manufacturing, tourism, and financial services, overcoming early challenges of high unemployment, low wages, and economic volatility.

**At independence in 1976, Seychelles' economy was primarily agricultural, centered on the production of copra, cinnamon, vanilla, and other spices—key export commodities that employed a significant share of the labor force.** However, agriculture was constrained by limited arable land and poor soil quality. Fishing also played a vital role, both for domestic consumption and export, supported by the islands' rich marine resources. The manufacturing sector was minimal, and tourism—now a major economic driver—was still in its infancy, with limited infrastructure. By 1999, the primary sector (agriculture, forestry, and fishing) contributed just 0.4 percentage points to growth, while the secondary sector (industry) detracted by -1.4.

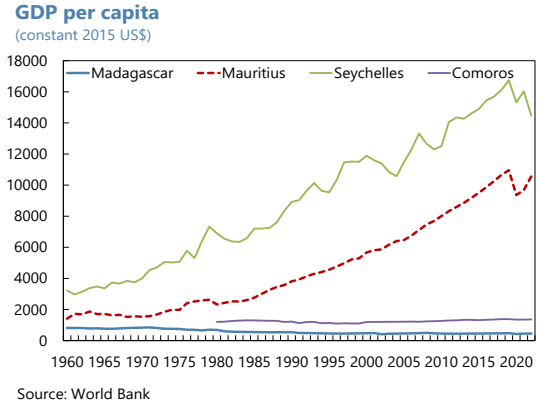
In contrast, by 2022, the primary, secondary, and tertiary sectors contributed 0.5, 1.1, and 10.8 percentage points respectively, reflecting the country's shift toward a service-based economy.

## B. Divergent Growth Trajectories: Exploring Associated Factors

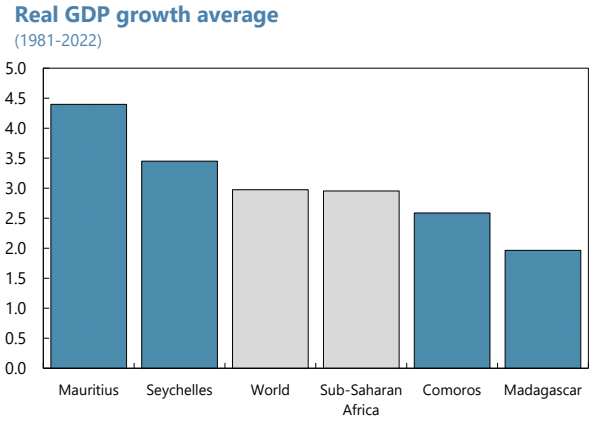
In this section, we analyze what drove economic activity in the four countries from two angles. First, from a national accounts perspective, we show that investment and trade have shaped different trajectories. Second, we approach the analysis using the literature-based determinants identified above: macroeconomic policies, structural factors, institutional quality, and the external environment. To guide the analysis, we expect that:
(i) improvements in institutional quality should be associated with higher income levels, (ii) expansions in education and health should support income convergence, and (iii) trade openness should coincide with structural transformation and export growth.

Mauritius and Seychelles have significantly outperformed Madagascar and Comoros in terms of per capita income growth over the last four decades. While income levels varied at independence, the gaps were relatively modest. However, as shown in Panel 1, Mauritius and especially Seychelles have experienced sustained and robust growth in real GDP per capita, leading to a substantial divergence in income levels over time. In contrast, Madagascar and Comoros have seen relatively flat trajectories, with limited improvement in living standards, resulting in a widening development gap within the group.

**Panel 1. GDP per Capita and Real GDP Growth**




Source: World Bank




Sources: World Bank, IMF staff calculations

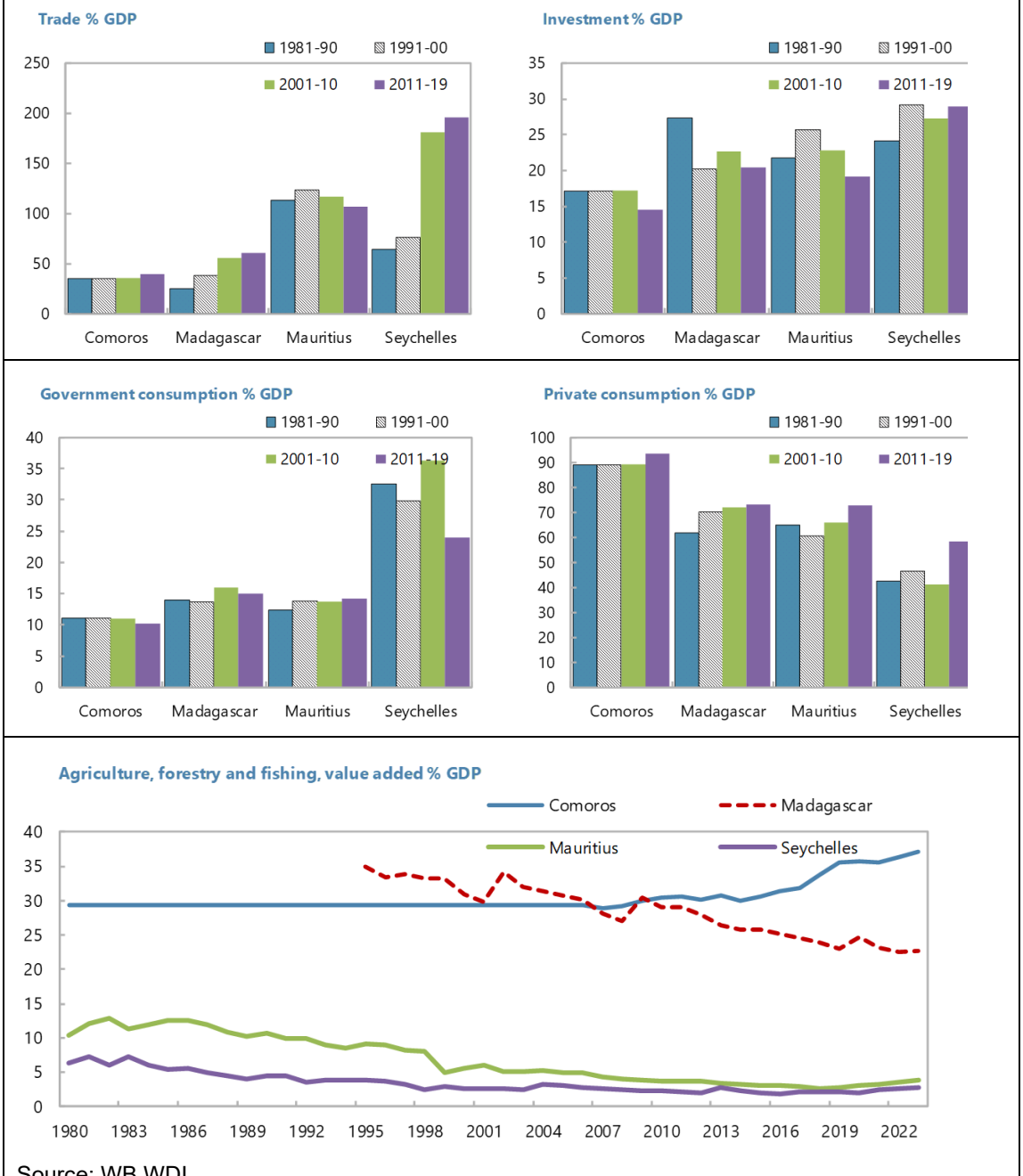
### a. National accounts perspective

Looking at the composition of GDP in nominal terms (Panel 2), two factors clearly stand out:

- Trade (measured as exports plus imports of goods and services as a percentage of GDP) and investment (gross fixed capital formation) have been key engines of growth in Mauritius and Seychelles. These countries have consistently maintained high levels of trade openness and capital formation. Investment levels have also been relatively strong in Madagascar but more volatile and lower overall in Comoros.
- Sectoral diversification and structural transformation further underpin the performance gap. From the late 1970s onward, Mauritius transitioned from an agriculture-based economy, notably sugar, toward manufacturing, especially textiles, and later services, including tourism, finance, and ICT. Similarly, during the 1990s and 2000s, Seychelles leveraged its tourism industry and expanded fish processing. These developments were supported by investment and sustained trade integration. This pattern is consistent with the expectation that trade openness and investment support structural transformation and export growth.

- Government consumption also played a role, particularly in Mauritius and Seychelles, where spending in social sectors such as education contributed to long-term growth. In contrast, public spending was limited in Madagascar and Comoros, reflecting both fiscal constraints and weaker state capacity.
- Private consumption (as a share of GDP) has been comparatively higher in Madagascar and Comoros, reflecting lower levels of investment and government spending.

**Panel 2. Analyzing GDP Components**




Source: WB WDI.

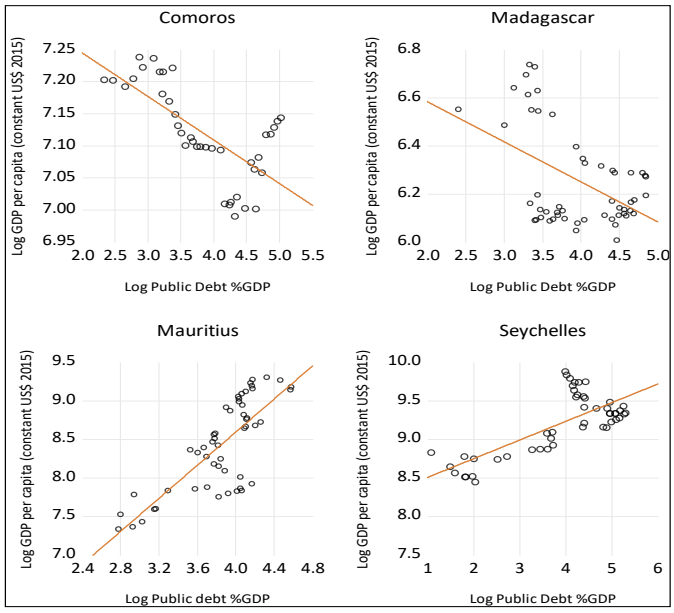
**b. Macroeconomic policies, structural factors, institutional quality, and external environment**

Macroeconomic policies have been more closely associated with stronger growth outcomes in Mauritius and Seychelles.

- Figures 1–3 illustrate that, over the post-1980 period, macroeconomic stability was generally stronger in Mauritius and Seychelles, while Madagascar and Comoros experienced greater volatility, which is associated with weaker investment and growth outcomes. This suggests a positive association between macroeconomic stability and income growth, later tested quantitatively in Section III.

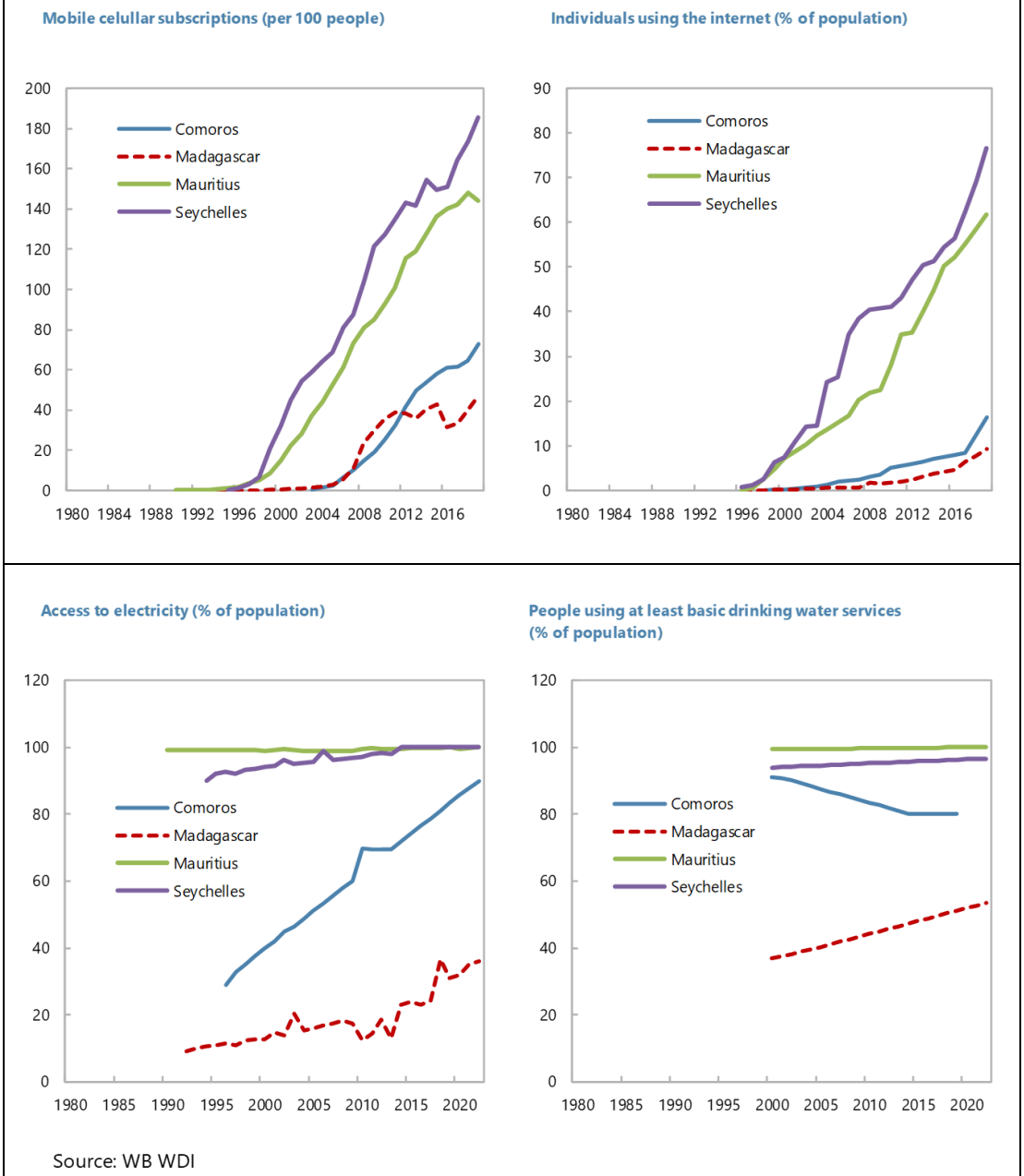
- While public debt has increased in both Mauritius and Seychelles, this rise has been accompanied by sustained gains in income per capita, as shown in Figure 1. This suggests an association between public borrowing and productive investments, including infrastructure, rather than a causal interpretation. Panel 3 shows infrastructure-related indicators with stronger performance in Mauritius and Seychelles. For instance, mobile and internet access indicators show a strong increase in both countries from the 1990s onward. In Mauritius, public funds supported a diversification strategy that shifted the economy from a sugar-dependent base toward textiles, tourism, and financial services. Similarly, Seychelles invested significantly in education and healthcare, resulting in universal health coverage and high literacy rates. The country also attracted substantial foreign direct investment to develop a strong tourism sector, supported by improvements in infrastructure and service quality. These strategic investments have been associated with robust economic performance and improved living standards. In contrast, in Comoros and Madagascar, public debt increased rapidly but without a corresponding improvement in income per capita. This may reflect differences in how effectively borrowing supported productive investment or the role of external factors—such as political instability or constrained governance—that limited the association between borrowing and growth outcomes. Both countries have experienced governance challenges that may have constrained their ability to fully leverage public borrowing.

**Figure xx. Public Debt and Real GDP per Capita (in log)**




Sources: WB WDI, IMF staff calculations

**Panel 3. Infrastructure-related Indicators**




Source: WB WDI

- Both Madagascar and Comoros went through the Heavily Indebted Poor Countries (HIPC) Initiative, with Madagascar reaching the completion point in 2004 and Comoros in 2012. The initiative aimed to reduce their debt burdens to sustainable levels, thereby creating fiscal space for poverty reduction and development spending. However, despite this debt relief, both countries experienced more limited and volatile economic growth relative to Mauritius and Seychelles.

- Regarding price stability, inflation has generally remained contained in the four economies, except in Madagascar, which has experienced quite volatile inflation alongside periods of sharp depreciation (see

Figure 2). In Comoros, modest demand growth and a relatively stable exchange rate (see Figure 3)—maintained through a peg to the euro—have helped keep inflationary pressures in check. This peg has been supported by relatively comfortable foreign exchange reserves, with remittance inflows from France playing an important supporting role. Mauritius, Seychelles, and Madagascar have moved from fixed exchange rate arrangements to more flexible ones, reducing pressures to accumulate reserves.

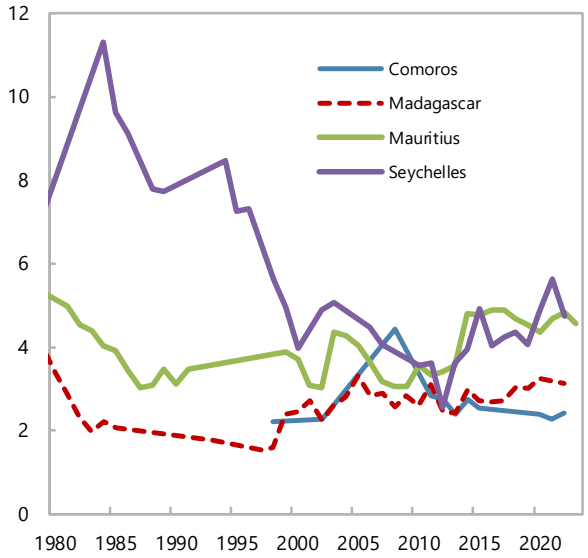
Social policies have been closely associated with growth in Mauritius and Seychelles.

- Social policies have been more active in enhancing education and health outcomes in Seychelles and Mauritius. In both countries, significant investments in social policies have been key to economic growth.
    - Education: Both Seychelles and Mauritius have prioritized education – including through comparatively higher government spending (see Panel 4, first chart) - leading to high literacy rates and a well-educated workforce. In Mauritius, the government has implemented free primary, secondary, and tertiary education, which has led to high enrollment rates and better educational outcomes1. Similarly, Seychelles has one of the highest literacy rates in Africa, thanks to its comprehensive and inclusive educational policies. These policies contribute to a more skilled and adaptable workforce, supporting innovation and productivity. Alternative indicators—such as the education equality index from the V-Dem database, which is more qualitative but widely available—also point to similar outcomes, with both Seychelles and Mauritius performing strongly.
    - Health: Health outcomes have been stronger in Mauritius and Seychelles thanks to proactive social policies including higher government spending in healthcare (see panel 5). Mauritius has developed a robust healthcare system that offers free public healthcare services, resulting in high life expectancy and low infant mortality rates. Seychelles has similarly invested heavily in healthcare, achieving universal healthcare coverage and significant improvements in public health indicators.

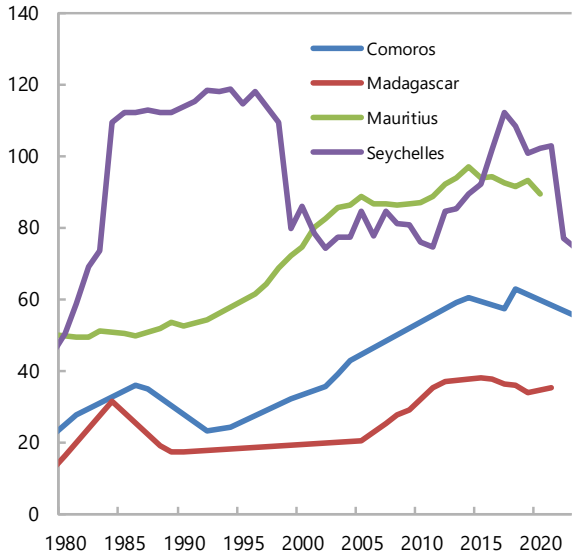
[1] Prior to independence, primary education was free in Mauritius. Secondary education became free in 1977. Tertiary education was free from 1965 to 2000 became fee paying from 2000 to 2019, when it became totally free. Source: Chronology of Free Public Tertiary Education | Le Mauricien

## Panel 4. Education-related Indicators

**Government spending in education (% GDP)***

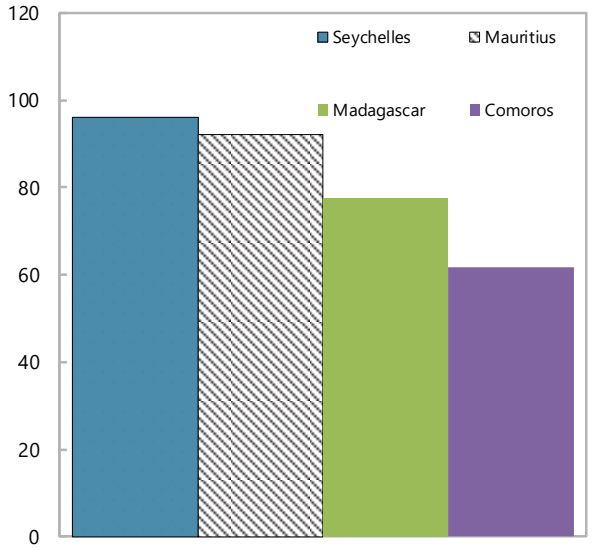



**School enrollment, secondary (% gross)***

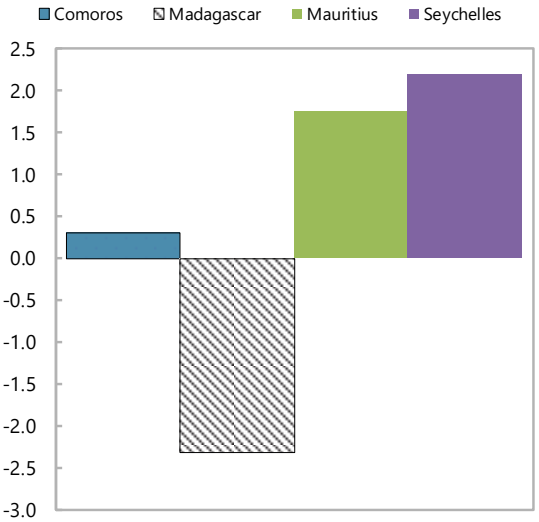



* Missing data points interpolated for continuity.

**Literacy rate, adult total (% of people ages 15 and above)**
(Most recent available data)




**Educational equality index (V-DEM, average 2020-22)***

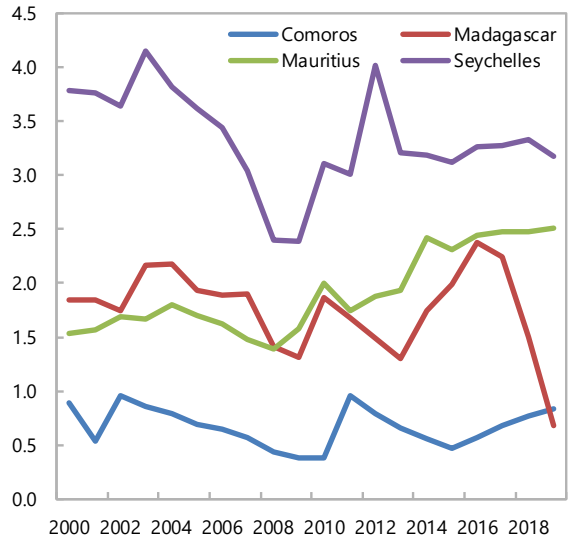



* The educational equality index from the Varieties of Democracy (V-Dem) project captures the extent to which access to high-quality basic education is distributed equally across social groups, based on expert assessments. Higher values indicate greater educational equality.

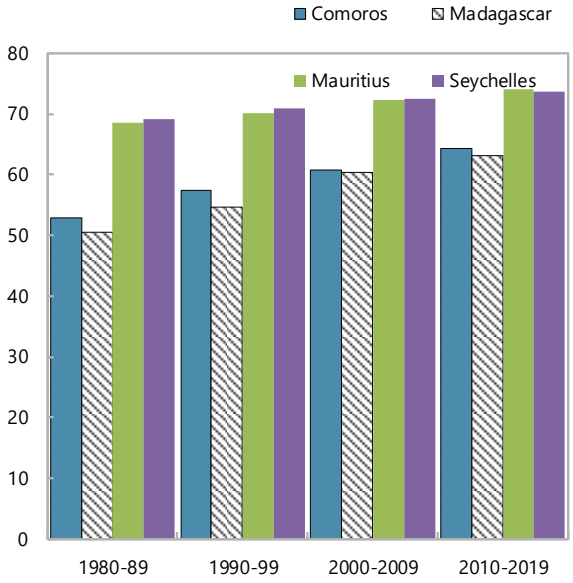
Sources: WB WDI, V-Dem dataset

## Panel 5. Health-related Indicators

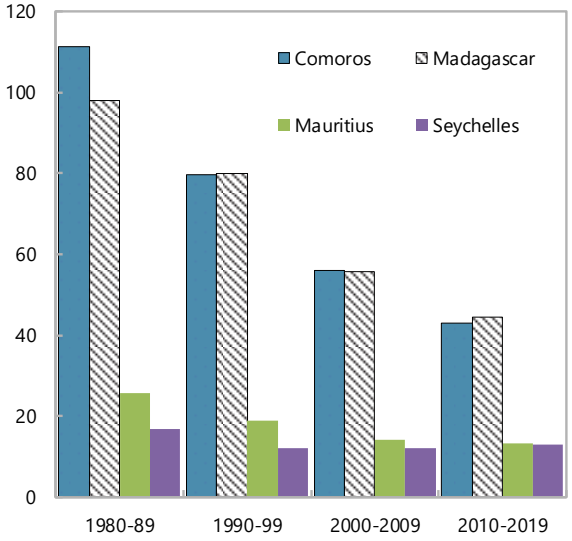
**Domestic general government health expenditure (% of GDP)**



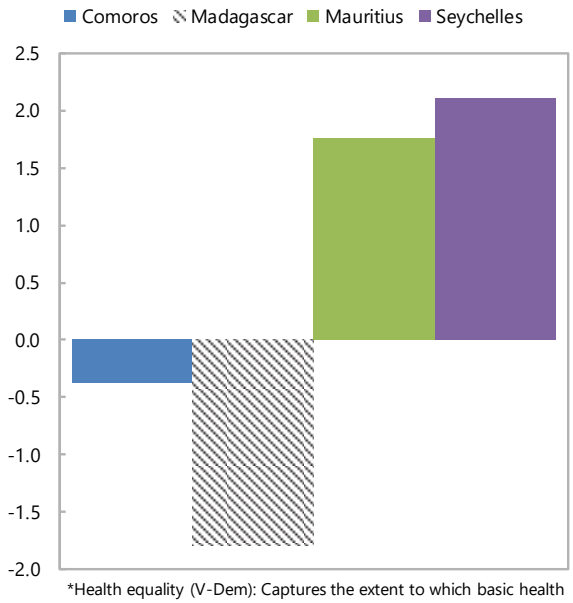

**Life expectancy at birth, total (years)**




**Mortality rate**




**Health equality index (V-DEM, average 2020-22)***




*Health equality (V-Dem): Captures the extent to which basic health services (e.g., vaccinations and prenatal care) are equally accessible across social groups, based on expert assessments. Higher scores indicate more equitable access to essential healthcare

Sources: WB WDI, V-Dem v14 Dataset (2024)

**The political environment and the quality of institutions have generally been stronger and more stable in Mauritius and Seychelles.**

- *Political Stability*: Both countries have benefited from relatively stable political environments, which have supported consistent policy implementation and strengthened investor confidence. In Mauritius, stable governance has facilitated a predictable policy framework, while Seychelles has also maintained a stable political climate conducive to sustained economic development. In contrast, the political context in Madagascar and Comoros has been more volatile.

- *Institutional Strengthening:* Mauritius and Seychelles have made sustained efforts to strengthen institutions, including improving transparency, accountability, and the efficiency of public administration. In Mauritius, reforms have included anti-corruption measures and improvements in regulatory frameworks to support business activity. Seychelles has similarly implemented public sector reforms and governance improvements, contributing to a more supportive business environment.

- **Trade policies have been more conducive for business development.** Mauritius and Seychelles have adopted trade policies that have significantly contributed to their economic growth.

  - ***Trade agreements.*** Trade integration has contributed to the development of Mauritius. The country is a long-standing member of the WTO and has benefited from preferential access to major markets, particularly the European Union and the United States (including through AGOA)[2]. These arrangements supported the development of export sectors such as sugar, textiles, and clothing. Seychelles has also benefited from trade linkages with the European Union and had access to the U.S. market under AGOA until its graduation in 2017.

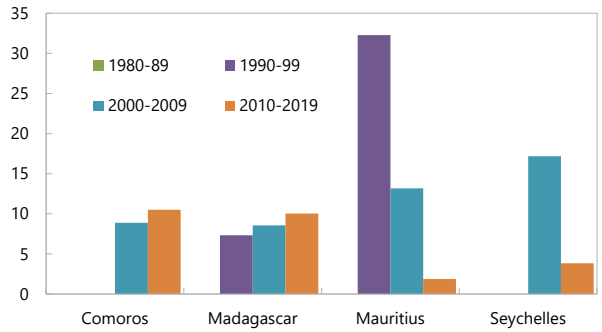
    - ***Export promotion and diversification****.* Both Mauritius and Seychelles have been active in supporting export diversification. Seychelles has focused on diversifying its economy by promoting sectors such as tourism, fisheries, and offshore financial services. This diversification has reduced the country's dependence on a single economic sector and made its economy more resilient to external shocks. For Mauritius, the focus has been on the development of tourism, textiles, and financial services. Investment incentives have reinforced these export-promotion efforts. Seychelles has created an attractive environment for FDI—through improved public infrastructure, an open foreign exchange policy that supports business operations, and tax incentives—focusing on sectors such as tourism and fisheries, which are crucial for its economy. These policies have helped facilitate much-needed capital, technology, and expertise, further supporting economic growth. Figure 4 shows that foreign direct investment inflows have been significantly higher and more sustained in Mauritius and Seychelles compared with Madagascar and Comoros, supporting this divergence.

    - ***Trade facilitation:*** Mauritius and Seychelles have made efforts to improve trade facilitation, such as reducing tariffs (see figure 5), improving customs procedures and port infrastructure, and enhancing logistics services**.**

[2] Mauritius has leveraged preferential access to key markets, particularly the European Union, to support its export sectors in sugar, textiles, and clothing. It also benefits from preferential trade schemes such as AGOA, which provides duty- and quota-free access to the U.S. market for a large number of tariff lines.

- **In contrast, Madagascar and Comoros have faced challenges in expanding investment in social sectors, strengthening institutional effectiveness, and creating a conducive environment for trade.** Education and health outcomes remain more limited in both countries, with persistently high child mortality rates, low life expectancy, and limited literacy rates. Frequent periods of political instability, lower institutional capacity, and less developed regulatory frameworks reduce investment attractiveness. Implementation of pro-growth trade policies has also been more limited compared with Mauritius and Seychelles, particularly in areas such as trade facilitation—where constraints related to infrastructure and customs procedures persist—and in the promotion of investment and exports.

**Figure xx. Tariff Rate, Applied, Simple Mean, All Products (%)**




Source: WB WDI
*Averages were computed using all available observations during the period.

Over time, the four countries experienced markedly different episodes of policy reform and structural change, which align with their divergent growth outcomes. In Mauritius, the establishment of the Export Processing Zone during the 1970s and 1980s marked a pivotal trade reform that supported export diversification and was associated with sustained growth. Similarly, in Seychelles, the expansion of the tourism sector during the 1990s facilitated a structural transformation toward a service-based economy, contributing to stronger income performance. In contrast, Madagascar experienced a major political crisis during 2009–12, which disrupted economic activity and was associated with weaker growth outcomes. Comoros, meanwhile, experienced recurrent episodes of instability from independence through the 2000s, which constrained policy continuity and dampened economic performance. These contrasting episodes illustrate how the timing and nature of reforms and shocks are closely associated with the observed divergence in growth trajectories across the four countries.

# Section II. Quantitative Analysis

The quantitative analysis does not seek to provide an exhaustive explanation of income divergence, but rather tests a small number of key correlates identified in the qualitative analysis.

## A. Data

Data availability presents a major constraint, particularly for Comoros. Standard indicators on education, health, and institutional quality (e.g., from the World Governance Indicators) are unavailable for much of the sample period (1970–2022). As a result, we rely on alternative proxies from the Varieties of Democracy (V-Dem) project (see Annex I, for more details), which offers longer historical coverage and broader cross-country comparability. The empirical analysis is restricted to the period starting in 1980—the earliest year for which a consistent and comparable dataset could be constructed across all four countries. Earlier data are either missing, fragmented, or not harmonized across countries. While the narrative analysis draws on historical developments beginning in the 1960s and 1970s, our econometric analysis necessarily focuses on the post-1980 period.

While trade openness is used as the primary proxy for external integration, other external factors—such as foreign direct investment, reserve accumulation, and exchange rate dynamics—are considered in robustness checks. Data limitations and uneven coverage across countries, especially for Comoros, prevent the inclusion of more granular external indicators in the baseline specification.

Data quality and comparability should therefore be interpreted with caution. National accounts revisions and differences in the treatment of informal and subsistence activities may affect measured output levels, particularly in Comoros and Madagascar. The results are therefore best interpreted as reflecting broad long-run relationships rather than precise cross-country comparisons of levels.

The main variables[3] used in the empirical analysis are summarized in the variable dictionary below. The dictionary clarifies definitions, transformations, and sources to ensure consistency between the narrative, tables, and estimation results.

| Variable | Definition and transformation | Source |
|---|---|---|
| Real GDP per capita | Outcome variable; real GDP per capita in constant 2015 USD expressed in natural logarithms. | World Bank World Development Indicators. |
| Public debt | General government public debt as a percent of GDP; used in natural logarithms. The squared logarithm of public debt is included in nonlinear specifications. | IMF World Economic Outlook and related IMF databases, subject to country coverage. |
| Political Corruption Index | Institutional-quality indicator measuring the extent of political corruption, used in levels. | Varieties of Democracy database. |
| Education Equality | Indicator measuring the extent to which access to high-quality basic education is distributed equally across the population, used in levels.[4] | Varieties of Democracy database. |
| Trade openness | Exports plus imports of goods and services as a percent of GDP; used in natural logarithms. | World Bank World Development Indicators. |
| Additional controls | Initial GDP per capita, investment or capital-stock measures, credit-to-investment ratio, real exchange rate, reserves, FDI, health equality, and governance indicators. transformations follow the table labels. | World Bank, IMF databases, and V-Dem, depending on variable coverage. |

A detailed explanation of the variables and data sources is provided in Annex I. Variables are grouped into four categories, which are discussed below.

**Macroeconomic Policies**

- **Public Debt (percent of GDP):** such variable captures the fiscal stance. Moderate debt may support growth by financing productive investment, while excessive debt can hinder growth due to crowding out and debt overhang (Reinhart & Rogoff, 2010).

**Quality of Institutions**

- **Political Corruption Index (V-Dem):** measures the extent of political corruption across branches of government. High corruption is expected to negatively impact growth by deterring investment and weakening institutional efficiency (Mauro, 1995).

[3] A more detailed table is provided in Annex I.

[4] See V-Dem, for more details on variable definitions and the methodology used to construct the indicators. All V-Dem indicators are based on expert assessments and should be interpreted as perception-based measures rather than direct objective indicators.

**Structural Policies**

Due to limited data on conventional human capital indicators, we rely on **proxies** based on the V-Dem database for education and equity outcomes. Structural factors are grouped into two subcategories:

- **Social Policies: Education Equality** (V-Dem): reflects the extent to which high-quality basic education is equitably available. Greater educational equality is expected to enhance human capital, reduce inequality, and support long-term growth (Barro, 2001).

- **Trade Policies: Trade Openness** is defined as the sum of exports and imports as a percentage of GDP. While greater openness may improve efficiency and access to markets, its growth effects depend on the country's structure and competitiveness. It may also expose small, undiversified economies to external shocks (Rodríguez & Rodrik, 2000).

## B. Empirical Strategy/Methodology

Our objective is to investigate the factors associated with the economic development of the four islands, using real GDP per capita (in USD) as the outcome variable. To do so, we use panel Fully Modified Ordinary Least Squares (FMOLS) and Dynamic Ordinary Least Squares (DOLS). These methods are appropriate for addressing endogeneity and serial correlation in the presence of non-stationary panel data (Pedroni, 2000; Kao & Chiang, 2000). Moreover, this method is particularly effective in small samples and partially heterogeneous panels, such as the dataset used here. DOLS, as developed by Kao and Chiang (2000), incorporates leads and lags of the first differences of regressors to mitigate endogeneity and omitted dynamics. Compared with FMOLS, DOLS often achieves higher efficiency in finite samples, making it a complementary approach for this study (Mark & Sul, 2003). Both FMOLS and DOLS are chosen because of their robustness in handling non-stationary panel data with cointegration, small sample sizes, and endogeneity. FMOLS ensures unbiased estimates by correcting for long-run covariance, while DOLS dynamically adjusts for endogenous feedback effects, making both methods well suited for macroeconomic studies (Phillips & Hansen, 1990).

**The empirical strategy will be as follows**:

1. We start by providing background on the different estimators that will be used: FMOLS and DOLS, both pooled and weighted.
2. Then, we provide a baseline estimator that includes the four most consistent and widely available explanatory variables, yielding robust and significant results across all estimation techniques, using the estimator that is more consistent with our sample: weighted FMOLS.
3. We test the robustness of our results using alternative estimators: pooled FMOLS, pooled DOLS, and weighted pooled DOLS.
4. We test the robustness of our results by including several additional macroeconomic, institutional, and social variables.

## C. Estimator Specifications

1. There are four main estimator specifications used in this study. While all estimators produce consistent estimates and the results are used for robustness checks, we selected the weighted pooled FMOLS estimator as the main estimator because of its efficiency and stability in a small-N, large-T panel setting. It also handles cross-sectional dependence without overfitting, making it well suited to the sample of four partially heterogeneous island economies. They are partially heterogeneous because

the countries differ in openness and political and institutional conditions, while also sharing common structural traits such as small island status, import dependence, and vulnerability to the external environment. Moreover, the variables reflecting shared differences operate through similar mechanisms in shaping development outcomes. Therefore, the weighted pooled estimator acknowledges heterogeneity in the error term while still pooling the slope coefficients. The other specifications presented include pooled FMOLS, pooled DOLS, and weighted pooled DOLS.

2. Although FMOLS-MG is theoretically valid for small-N, large-T panels, it proved unreliable in our case. With only four countries, some unit-level estimates were unstable, and the mean-group average became sensitive to individual outliers. The mean-group approach assumes sufficient cross-sectional units to capture slope variation; four is simply too few to trust the mean as a general pattern. Additionally, inference is weak when the distribution of coefficients across such a small N cannot be meaningfully assessed.
3. The four specifications are as follows:
4. FMOLS Pooled Specification

The Pooled FMOLS estimators assume a common long-run relationship across all cross-sections. The specification is:

$$\log GDPPC_{(it)} = \alpha + \beta_1.(EducEqual_{it}) + \beta_2.log\left(\frac{Public_{Debt}}{GDP}\right)_{it} + \beta_3.(Corruption_{it}) + \beta_4.\log(\frac{Trade}{GDP}_{it}) + \varepsilon_{it}$$

Where $GDPpc_{it}$ denotes the GDP per capita (in log terms) of country *i,* at time *t.* The list of variables is divided into four groups relating to (i) macroeconomic policies, (ii) structural policies,(iii) institutional quality, and (iv) external factors. $\epsilon_{it}$ is the idiosyncratic error term. Equation (1) is estimated using annual data from 1980 to 2022, reflecting data availability constraints across countries. The coefficients $\alpha$, β are constant across all cross-sections.

*a. FMOLS Weighted Pooled Specification (Baseline Estimator)*

The weighted pooled FMOLS estimator modifies pooled FMOLS by applying weights to account for differences in cross-sectional sample sizes or variance contributions. The specification remains the same as pooled FMOLS but incorporates weights. These weights adjust the estimation process, giving greater importance to cross-sections with higher reliability or data quality.

*b. DOLS Pooled Specification*

The Pooled DOLS estimator assumes homogeneity in the long-run coefficients across cross-sections, similar to pooled FMOLS, but introduces dynamic leads and lags of the independent variables to address endogeneity. The specification is:

$$\log GDPPC_{\{it\}} = \alpha + \beta_1.\left(EducEqual_{it}\right) + \beta_2.log\left(\frac{Public_{Debt}}{GDP}\right)_{it} + \beta_3.(Corruption_{it}) + \beta_4.\log(\frac{Trade}{GDP})_{it} + \sum_{\{k=-q\}}^{q}\delta_k\Delta X_{it-k} + \epsilon_{it}$$

Where, ΔXit-k denotes the first differences of the independent variables, with k representing leads and lags. The coefficients $\alpha$, β are constant across all cross-sections. The dynamic adjustment with leads and lags ensures the robustness of the long-run parameter estimates.

*c. DOLS Weighted Pooled Specification*

The Weighted Pooled DOLS estimator builds upon the pooled DOLS by incorporating weights to address differences in data quality or contribution across cross-sections. The specification is identical to pooled DOLS but includes a weighting mechanism. Weights ensure that the estimation reflects the relative reliability or variance contribution of each cross-section.

Coefficients $\beta_1$ through $\beta_4$ represent the common long-run coefficients, and $\delta_k$ denotes the coefficients on the leads and lags of the differenced regressors.

## D. Baseline Results

**Table 2a** reports the core estimation results from a series of weighted pooled FMOLS regressions examining the long-run correlates of GDP per capita across the four island economies.

The analysis introduces explanatory variables sequentially to assess coefficient stability and their statistical significance.

Table 2a. Baseline Regression Results

| | FMOLS Weighted | | | |
|---|---|---|---|---|
| | **I** | **II** | **III** | **IV** |
| *Education Equality* | 0.574*** | 0.550*** | 0.492*** | 0.582*** |
| | (0.017) | (0.030) | (0.031) | (0.048) |
| *Log Public Debt (% GDP)* | | 0.053** | 0.061*** | 0.166*** |
| | | (0.022) | (0.022) | (0.041) |
| *Political Corruption Index* | | | -1.933*** | -2.032*** |
| | | | (0.026) | (0.039) |
| *Log Trade Openness* | | | | 0.201*** |
| | | | | (0.054) |
| Observations | 229 | 189 | 189 | 179 |
| Cross-sections | 4 | 4 | 4 | 4 |
| **$R^2$** | **0.62** | **0.54** | **0.67** | **0.69** |

*Robust standard errors are reported in parentheses.*
**** p<0.01, ** p<0.05, * p<0.1.*

*All weighted pooled estimates employ Bartlett kernel and Newey-West fixed bandwidth to correct for serial correlation and heteroskedasticity in residuals. Trade enters the equation as a deterministic regressor.*

***Education equality enters first and remains consistently positive and highly significant across all estimation specifications***, with coefficients ranging from 0.49 to 0.58. This suggests that improvements in equitable access to education are strongly associated with higher income per capita, reinforcing the central role of human capital in long-run development. These findings are consistent with the literature on human capital and growth. In the context of small island economies, more equitable access to education likely strengthens the skill base of the workforce and supports long-run productivity and resilience.

***The inclusion of public debt in Estimation II yields a positive and statistically significant coefficient***, indicating that public debt is positively associated with income at moderate levels, likely where borrowing finances productive investment and is effectively managed. This relationship should be interpreted as associative rather than causal, and it should be balanced against the nonlinear results reported below, which show that the marginal association weakens at higher debt levels.

[5]In Estimator III, when the Political Corruption Index (V-Dem) is introduced, the coefficient is negative and highly significant at -1.9. This result highlights the importance of institutional quality in shaping long-run income levels, consistent with both the qualitative analysis and the broader literature. As with the other estimates, the relationship should be interpreted as associative rather than causal.

Estimator IV incorporates trade openness, which enters with a positive and statistically significant coefficient (0.20). Trade is included as a structural driver of external integration for these economies, and its positive and significant coefficient reinforces its central role in shaping long-run income levels.

The results underscore the complementary roles of education, institutional quality, fiscal capacity, and trade integration in shaping long-run economic performance in structurally diverse island states.

## E. Robustness Checks

### a. Estimator sensitivity to alternative specifications

**Table 2b** presents a robustness check of the core results using three alternative specifications: , pooled FMOLS, weighted pooled DOLS, and pooled DOLS estimators. Across all estimators, the direction, magnitude, and statistical significance of the coefficients remain broadly consistent, reinforcing the validity of the core findings.

**Table 2b: Robustness Check Across Specifications**

| | FMOLS | DOLS | DOLS |
|---|---|---|---|
| | **Pooled** | **W. Pooled** | **Pooled** |
| *Education Equality* | 0.639*** | 0.376*** | 0.536*** |
| | (0.088) | (0.096) | (0.089) |
| *Log Public Debt (% GDP)* | 0.122*** | 0.068** | 0.086* |
| | (0.042) | (0.027) | (0.047) |
| *Political Corruption Index* | -2.387*** | -1.617*** | -1.988*** |
| | (0.425) | (0.288) | (0.450) |
| *Log Trade Openness (% GDP)* | 0.201*** | 0.189*** | 0.210*** |
| | (0.055) | (0.051) | (0.050) |
| Observations | 179 | 181 | 181 |
| Cross-sections | 4 | 4 | 4 |
| **$R^2$** | **0.68** | **0.72** | **0.74** |

*Robust standard errors are reported in parentheses.*

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

*All weighted pooled and pooled estimates employ Bartlett kernel and Newey-West fixed bandwidth to correct for serial correlation and heteroskedasticity in residuals. DOLS estimates apply automatic leads and lags specification based on the SIC criterion. Trade enters the equation as a deterministic regressor.*

[5] To test whether this relationship holds across different debt levels—and whether excessive debt may instead constrain growth—we introduced a squared term for public debt in our robustness checks (Table 2e). The results confirm a non-linear relationship, whereby the marginal growth impact of debt declines at higher levels, consistent with the debt overhang hypothesis (Reinhart & Rogoff, 2010). This suggests that while moderate borrowing can be growth-enhancing, excessive debt accumulation may crowd out private investment and reduce fiscal space for essential services.

Education equality remains strongly and significantly associated with GDP per capita across specifications. The coefficient ranges from 0.38 under weighted pooled DOLS to 0.64 under pooled FMOLS, confirming the robustness of the relationship across specifications. Public debt also remains positive and significant across estimations, although the coefficient is somewhat lower under DOLS specifications.

The negative relationship between corruption and GDP per capita persists across all estimators, with coefficients ranging from –1.6 to –2.4. This consistency underscores the critical role of institutional quality in shaping long-run income levels. Similarly, the coefficient on trade openness is positive and statistically significant across specifications reinforcing its contribution to income growth.

The robustness checks confirm that the core results are not driven by estimator-specific assumptions. The consistency of sign, size, and statistical significance across FMOLS and DOLS variants, and under pooled and weighted pooled structures, supports the view that education equality, trade openness, institutional quality, and fiscal structure are associated with variation in GDP per capita in small island developing states.

### b. Sensitivity to additional variables

**Table 2c** presents a robustness check of the core results, including several additional macroeconomic, institutional, and social variables. It uses weighted pooled FMOLS estimators. Across all estimators, the direction, magnitude, and statistical significance of the coefficients remain broadly consistent, reinforcing the validity of the core findings.

**Table 2c. Robustness Check: Additional Variables**

| | FMOLS Weighted | | | |
|---|---|---|---|---|
| | **i** | **ii** | **iii** | **iv** |
| *Education Equality* | 0.636*** | 0.536*** | 0.466*** | 0.558*** |
| | (0.049) | (0.051) | (0.053) | (0.054) |
| *Log Public Debt (% GDP)* | 0.314*** | 0.188*** | 0.139*** | 0.154*** |
| | (0.063) | (0.048) | (0.042) | (0.044) |
| *Political Corruption Index* | -1.212*** | -2.422*** | -1.190*** | -2.098*** |
| | (0.059) | (0.046) | (0.041) | (0.042) |
| *Log Trade Openness* | 0.327*** | 0.102* | 0.105** | 0.093* |
| | (0.082) | (0.053) | (0.046) | (0.051) |
| *Log Initial GDPPC* | 0.263*** | | | |
| | (0.099) | | | |
| *Log Investment/Capital Stock* | | 0.331*** | | |
| | | (0.063) | | |
| *Log Credit/Investment* | | | 0.280*** | |
| | | | (0.036) | |
| *Log Real Exchange Rate* | | | | -0.063** |
| | | | | (0.027) |
| **Cross-sections** | **4** | **4** | **4** | **4** |
| **Observations** | **164** | **167** | **179** | **179** |

*Robust standard errors are reported in parentheses.*
*** p<0.01, ** p<0.05, * p<0.1.*
*Custom table built from selected model columns.*

**Table 2d. Robustness Check: Additional Variables (continued)**

| | FMOLS Weighted | | | | | | |
|---|---|---|---|---|---|---|---|
| | **v** | **vi** | **vii** | **viii** | **ix** | **x** | **xi** |
| *Education Equality* | 0.549*** | 0.342*** | 0.451*** | 1.025*** | 0.942*** | 0.968*** | 0.445*** |
| | (0.050) | (0.069) | (0.049) | (0.048) | (0.046) | (0.049) | (0.048) |
| *Log Public Debt (% GDP)* | 0.148*** | 0.130** | 0.105*** | 0.087** | 0.211*** | 0.096** | 0.147*** |
| | (0.044) | (0.052) | (0.039) | (0.041) | (0.032) | (0.041) | (0.044) |
| *Political Corruption Index* | -1.753*** | -2.046*** | -2.331*** | -2.232*** | -2.262*** | -2.643*** | -1.803*** |
| | (0.041) | (0.048) | (0.039) | (0.039) | (0.029) | (0.039) | (0.039) |
| *Log Trade Openness* | -0.041 | -0.077 | 0.155*** | 0.280*** | 0.278*** | 0.300*** | 0.171** |
| | (0.047) | (0.054) | (0.050) | (0.076) | (0.101) | (0.073) | (0.048) |
| *Log International Reserves* | 0.180*** | | | | | | |
| | (0.056) | | | | | | |
| *Log FDI % GDP (inflows)* | | 0.113*** | | | | | |
| | | (0.015) | | | | | |
| *Health Equality* | | | 0.261** | | | | |
| | | | (0.103) | | | | |
| *Law Equality* | | | | 0.701*** | | | |
| | | | | (0.048) | | | |
| *Performance Legitimation* | | | | | 0.410*** | | |
| | | | | | (0.043) | | |
| *Executive Respect for Constitution* | | | | | | 0.087*** | |
| | | | | | | (0.033) | |
| *Head of State Appointment* | | | | | | | 0.052*** |
| | | | | | | | (0.010) |
| **Cross-sections** | **4** | **4** | **4** | **4** | **4** | **4** | **4** |
| **Observations** | **179** | **163** | **179** | **179** | **179** | **179** | **179** |

*Robust standard errors are reported in parentheses.*
**** p<0.01, ** p<0.05, * p<0.1.*
*Custom table built from selected model columns.*

**Macroeconomic and Structural Dimensions**. Public debt is positively associated with growth at moderate levels but exhibits diminishing returns at higher levels. The negative and significant squared debt term indicates that the marginal association between debt and income weakens as debt rises, consistent with potential debt-overhang or fiscal-space constraints. Additional controls such as the real exchange rate and private credit-to-investment ratio also enter significantly, suggesting that external competitiveness and financial intermediation relative to productive investment are associated with higher income levels. The investment-to-capital stock ratio further affirms the importance of physical capital accumulation.

The observed positive coefficient on initial GDP per capita, contrary to the conditional convergence hypothesis, suggests a pattern of divergence among the four island economies. This result likely reflects structural

asymmetries not accounted for in the standard Solow model, particularly in institutional capacity and governance.

**Trade and External Environment**. While trade openness remains generally positive and significant, its coefficient exhibits some variation once key external sector variables are introduced (Table 2c, equation IV; Table 2d, V and VI). When the exchange rate, foreign reserves, or FDI inflows are included, the magnitude and statistical significance of the trade variable fluctuate. This suggests a degree of interaction or shared explanatory power between trade and other external accounts. Nonetheless, international reserves and FDI net inflows themselves are consistently positive and significant, confirming that external buffers and capital inflows play critical roles in supporting long-run growth.

**Institutional and Social Dimensions**. The inclusion of structural equity and governance variables in estimations VII to XI strengthens the interpretation that institutional effectiveness and social inclusion are associated with the growth process, consistent with the arguments of Acemoglu, Johnson, and Robinson (2005). Health equality and law and liberty protections are significantly positive, while governance measures such as executive respect for constitutional constraints, merit-based appointment of heads of state, and legitimacy of effective governance show strong and consistent positive associations with income levels. Notably, the coefficient on law and liberty protection is the largest in this set (0.7), reinforcing the argument that safety and freedom are important correlates of long-run development in political systems.

In sum, the robustness checks confirm the core findings while highlighting the broader relevance of macro-fiscal stability, structural inclusiveness, external integration, and institutional legitimacy as correlates of long-run GDP per capita across the four island economies.

### c. Extensions: Focus on Public Debt

This section extends the baseline specification to further examine the role of public debt by focusing on two policy extensions. First, we test whether the relationship between public debt and economic growth is nonlinear by introducing a squared debt term. Second, we assess whether the association between public debt and long-run income depends on human capital conditions by interacting public debt with education equality.
The results point to a nonlinear relationship between public debt and GDP per capita. Public debt is positively associated with growth at moderate levels, but the squared term enters with a negative and significant coefficient, indicating diminishing marginal returns at higher debt levels. This suggests that debt may support income when used productively, but its growth association weakens as debt rises. These estimates should be read as associations rather than evidence of causality.

In addition, the interaction between public debt and education equality is positive and statistically significant. This suggests that the positive association between public debt and income is stronger in economies with higher levels of education equality.

Taken together, these results reinforce the paper’s central conclusion that public debt can be associated with higher income outcomes in small island economies, but that this association depends on both the level of debt and the broader structural environment—particularly human capital conditions.

| Table 2e. Extensions: Public Debt | | | |
|---|---|---|---|
| | FMOLS Weighted | | |
| | i | ii | iii |
| *Education Equality* | 0.481*** | 0.533*** | 0.388*** |
| | (0.049) | (0.048) | (0.051) |
| *Log Public Debt (% GDP)* | 0.300*** | 0.102** | 0.165*** |
| | (0.046) | (0.041) | (0.043) |
| *Political Corruption Index* | -1.936*** | -2.109*** | -2.047*** |
| | (0.039) | (0.040) | (0.040) |
| *Log Trade Openness* | 0.406** | 0.147*** | 0.106* |
| | (0.160) | (0.054) | (0.054) |
| *Education x Log Debt* | | 0.233*** | |
| | | (0.053) | |
| *Log Public Debt (% GDP)²* | -0.158*** | | |
| | (0.049) | | |
| **Cross-sections** | **4** | **4** | **4** |
| **Observations** | **179** | **179** | **179** |

*Robust standard errors are reported in parentheses.*
**** p<0.01, ** p<0.05, * p<0.1.*
*Custom table built from selected model columns.*

### d. Results from Quantitative Analysis

The quantitative results reveal the following key findings for small island developing states.

- **Institutional quality** emerges as a central correlate of growth. The persistent negative coefficient on perceived corruption, alongside the positive associations with law and liberty protection, executive respect for constitutional rules, and performance-based legitimation, highlights the importance of accountable governance and equality before the law in shaping economic outcomes.
- **Human capital development**, measured primarily through education equality in the core model and complemented by health equality in robustness specifications, shows strong and stable associations with GDP per capita. The inclusion of health equality further improves model fit, suggesting additional gains from broader social investment.
- **Trade openness** is associated with stronger growth outcomes, especially in models that account for external balances and macro-financial buffers, highlighting the importance of external integration for small, outward-oriented economies.
- **Public debt** plays a conditional role in growth (Table 2e), with positive associations at moderate levels and diminishing returns at higher levels.
- Finally, **initial GDP per capita** is positively associated with subsequent income outcomes. Economies with a stronger initial capital base, such as Seychelles and Mauritius, have experienced faster income growth. This highlights the importance of capital accumulation and the need to scale up investment in capital and infrastructure in lagging economies.

# Conclusion

This study explores the divergence in economic growth trajectories among Mauritius, Seychelles, Madagascar, and Comoros since 1980. Using qualitative evidence and FMOLS/DOLS estimations, the analysis suggests that institutional quality, human capital, trade openness and fiscal conditions are important correlates of long-run growth. Mauritius and Seychelles have generally benefited from stronger institutions and more stable policy frameworks, while Madagascar and Comoros have experienced more persistent political and institutional challenges.

Below are the key findings:

- Geography and historical legacies influenced early development paths, but differences in policy frameworks and institutional evolution are associated with the divergence in income outcomes among the four island economies.
- Stronger governance, greater respect for the rule of law, and higher levels of performance-based legitimacy are positively associated with higher levels of real GDP per capita.
- More equitable access to education (and, to a lesser extent, better health outcomes) is associated with higher income levels, underscoring the importance of investment in human capital.
- Greater trade openness is positively associated with income levels, while moderate public debt is associated with higher GDP per capita, although the relationship weakens at higher debt levels.

The analysis is subject to several limitations. Data constraints required the use of proxy variables for a number of institutional and structural factors, and the small sample of countries limits the generalizability of the findings. Future research could extend the analysis by incorporating a broader sample of small island developing states, examining the role of external shocks and climate vulnerability, and using more granular measures of institutional quality and policy implementation.

Finally, while this study focuses on real GDP per capita as the primary measure of economic performance, future research could examine how institutional quality and structural policies influence broader development outcomes, including poverty reduction, inequality, resilience to external shocks, human development, and overall economic well-being.

# Annex I. Variables and Data Sources

| Variable | Description | Expected Sign | Data Source |
|---|---|---|---|
| Natural logarithm of Real GDP per capita | Natural logarithm of GDP per capita (Constant US$ 2015) | | World Development Indicator |
| | ***Structural Factors*** | | |
| Education Equality | Investigate the extent to which high-quality basic education, typically for ages 6 to 16, is guaranteed to all, enabling them to exercise basic rights as adult citizens. Responses range from extreme inequality, where at least 75 percent of children receive low-quality education, to equality, where less than 5 percent of children receive such education. | + | VDEM |
| Health Equality | The extent to which high-quality basic healthcare is guaranteed to all, sufficient to exercise basic political rights as adult citizens. Poor-quality healthcare can prevent citizens from participating fully in society. Responses range from extreme inequality, where at least 75 percent of citizens' ability to exercise political rights is undermined, to equality, where less than 5 percent are affected. | + | VDEM |
| | ***Macroeconomic Factors*** | | |
| Private sector Credit-to-Investment | Natural logarithm of Domestic Credit to private sector/ investment | + | WDI |
| Public Debt /GDP | Natural logarithm of Total public debt percent of GDP | +/- | IMF |
| Real Exchange Rate | Natural logarithm Real Exchange Rate (LCU/US$) | - | WDI |
| Initial GDP Per Capita | Natural logarithm of initial GDP per capita (1980) held constant across time for each cross section to capture initial economic condition | +/- | WDI |
| Investment to capital stock ratio | Natural logarithm of Investment to capital stock ratio (both in current prices) | + | IMF |
| | ***Institutional Factors*** | | |
| Political Corruption Index | Institutional-quality indicator measuring the extent of political corruption, used in levels. | - | VDEM |
| Head of state appointment | Investigates how heads of state reach office, considering the most influential body involved in the appointment. The response categories range from appointments through force or hereditary succession to direct elections and legislative appointments. Aims to understand the diverse mechanisms of head of state appointments across different countries and time periods. | + | VDEM |
| Performance Legitimation | To what extent the government refer to performance (such as providing economic growth, poverty reduction, effective and non-corrupt governance, and/or providing security) in their regime justification. | + | VDEM |
| Equality before the law and individual liberty index | The extent to which laws are transparent, rigorously enforced and impartial public administration. Also, the extent to which citizens enjoy access to justice, secure property rights, freedom from forced labor, freedom of movement, physical integrity rights, and freedom of religion. | + | VDEM |
| Executives respect of constitution | Extent to which members of the executive (the head of state, the head of government, and cabinet ministers) respect the constitution 0-4 ordinal scale | + | VDEM |
| | **External Factors** | | |
| International Reserves to GDP | Natural logarithm of International reserves (current US$) as a ratio of nominal GDP (current US$) | + | IMF |
| Trade /GDP | Natural logarithm of Trade percent GDP | + | WDI |

# Annex II. Steps for the Estimations and Diagnostic Tests

i. Test for cross-sectional dependence (CSD) (test the original data series individually).

ii. Cross-sectionally demean the panel series to remove the fixed effects.

iii. Based on the test result, run the unit root test using CIPS if cross-section dependence is present; otherwise, run regular panel unit root tests e.g. ADF, PP, KPSS, ERS.

iv. Run the cointegrating regression (weighted pool) if unit root exists; otherwise, run panel linear regression (in this case, no need to demean the data since fixed effects are accounted for in the regression model).

v. Extract the residual.

vi. Run CSD on residuals.

vii. Run unit root test on the residuals. If residuals have CSD run CIPS, if not run regular panel unit root test.

Tested each variable for Cross sectional dependence- All variables are cross sectionally dependent. Demeaned the data to remove the fixed effects. Demeaning extracts the within-country variations, removing time-invariant effects that could distort the FMOLS and DOLS estimates.

| Variables | Test | Breusch-Pagan LM | Pesaran scaled LM | Bias-corrected scaled LM | Pesaran CD |
|---|---|---|---|---|---|
| *Log (Public Debt percentGDP)* | Statistic | 71.01 | 18.77 | 18.73 | 3.77 |
| | Prob. | 0.000 | 0.000 | 0.000 | 0.000 |
| *Education Equality* | Statistic | 170.96 | 47.62 | 47.59 | 6.64 |
| | Prob. | 0.000 | 0.000 | 0.000 | 0.000 |
| *Political Corruption index* | Statistic | 82.5 | 22.1 | 22.1 | 8.3 |
| | Prob. | 0.000 | 0.000 | 0.000 | 0.000 |
| *GDP per capita (constant)* | Statistic | 199.05 | 55.73 | 55.70 | -0.30 |
| | Prob. | 0.000 | 0.000 | 0.000 | 0.765 |
| *Trade( percentGDP) d.f. 6* | Statistic | 55.79 | 14.37 | 14.34 | 3.75 |
| | Prob. | 0.000 | 0.000 | 0.000 | 0.000 |

Unit root tests performed on all variables found that all are I(1), except for trade, which tested I(0) when tested with a deterministic constant. When the constant is removed for trade, the order changes to I(1). As a result, trade is treated as a deterministic regressor instead of a main regressor. The reasoning for treating trade as a deterministic regressor in the FMOLS and DOLS estimations likely stems from the fundamental structure of these island economies. They rely heavily on the external sector. For example, there is heavy reliance on imports of essential goods, including food, energy, and capital. Their export base is relatively narrow, with key sectors relying on global demand. This means trade reflects underlying structural characteristics of the economy. They also rely on foreign direct investment and external financing, which are often tied to trade. Often, they cannot generate enough domestic savings to finance investment, or they simply lack adequate factors of production. Therefore, trade openness plays a role in capital accumulation, reinforcing its deterministic nature.

| CIPS unit root test | α | Statistic | CIPS | Truncated CIPS |
|---|---|---|---|---|
| *Log of GDP per Capita* | x | t-stat | -1.81 | -1.81 |
| | | p-value | >=0.10 | >=0.10 |
| *Education Equality* | x | t-stat | -2.18 | -2.18 |
| | | p-value | >=0.10 | >=0.10 |
| *Political Corruption Index* | x | t-stat | -0.98 | -0.98 |
| | | p-value | >=0.10 | >=0.10 |
| *Log (Public Debt percentGDP)* | x | t-stat | -1.69 | -1.69 |
| | | p-value | >=0.10 | >=0.10 |
| *Trade( percentGDP)* | x | t-stat | -2.85 | -2.85 |
| | | p-value | <0.01 | <0.01 |
| | | t-stat | -1.30 | -1.30 |
| | | p-value | >=0.10 | >=0.10 |

*Post estimation cross section dependence test results – on residual*

| Estimation | Test | Breusch-Pagan LM | Pesaran scaled LM | Bias-corrected scaled LM | Pesaran CD |
|---|---|---|---|---|---|
| FMOLS Pool.W | Statistic | 19.97 | 4.03 | 3.99 | 4.14 |
| | Prob. | 0.00 | 0.00 | 0.00 | 0.00 |
| DOLS Pool.W | Statistic | 19.14 | 3.79 | 3.76 | 3.58 |
| | Prob. | 0.00 | 0.00 | 0.00 | 0.00 |
| FMOLS Pooled | Statistic | 11.00 | 1.44 | 1.40 | 2.80 |
| | Prob. | 0.09 | 0.15 | 0.16 | 0.01 |
| DOLS Pooled | Statistic | 17.33 | 3.27 | 3.23 | 3.65 |
| | Prob. | 0.01 | 0.00 | 0.00 | 0.00 |

*Null hypothesis: No cross-section dependence (correlation)*

*Post estimation unit root test on residual.*

| Estimation | Test | Im, Pesaran and Shin W-stat | ADF - Fisher -$X^2$ | PP - Fisher $X^2$ | Levin, Lin & Chu t* | CIPS | Truncated CIPS |
|---|---|---|---|---|---|---|---|
| FMOLS Pool.W | Statistic | | | | | -3.09 | <0.01 |
| | Prob. | | | | | -3.09 | <0.01 |
| DOLS Pool.W | Statistic | | | | | -2.91 | <0.01 |
| | Prob. | | | | | -2.91 | <0.01 |
| FMOLS Pooled | Statistic | -2.40 | 22.28 | 22.41 | -0.26 | | |
| | Prob. | 0.008 | 0.004 | 0.004 | 0.399 | | |
| DOLS Pooled | Statistic | | | | | -2.73 | <0.01 |
| | Prob. | | | | | -2.73 | <0.01 |

*Null hypothesis: Unit root*

# Annex III. Stepwise Explanatory Variable Addition

Note all post estimation residual tests are stationary

| | FMOLS Pool | | | |
|---|---|---|---|---|
| | I | II | III | IV |
| *Education Equality* | 0.61*** | 0.60*** | 0.50*** | 0.64*** |
| | 0.05 | 0.08 | 0.07 | 0.09 |
| *Log-Public Debt (percent GDP)* | | 0.06 | 0.08** | 0.12*** |
| | | 0.05 | 0.04 | 0.04 |
| *Political Corruption Index* | | | -2.05*** | -2.39*** |
| | | | 0.37 | 0.42 |
| *Log-Trade (percent GDP)* | | | | 0.201*** |
| | | | | 0.09 |
| *Observation* | 229 | 189 | 189 | 179 |
| *Cross sections* | 4 | 4 | 4 | 4 |
| ***R²*** | **0.63** | **0.53** | **0.67** | **0.68** |

*** p<0.01, ** p<0.05, * p<0.1

| | DOLS Pool | | | |
|---|---|---|---|---|
| | I | II | III | IV |
| *Education Equality* | 0.58*** | 0.58*** | 0.47*** | 0.54*** |
| | 0.05 | 0.08 | 0.07 | 0.09 |
| *Log- Public Debt (percent GDP)* | | 0.02 | 0.07 | 0.09* |
| | | 0.06 | 0.05 | 0.05 |
| *Political Corruption Index* | | | -1.87*** | -1.99*** |
| | | | 0.41 | 0.45 |
| *Log- Trade (percent GDP)* | | | | 0.21*** |
| | | | | 0.05 |
| *Observation* | 228 | 185 | 189 | 181 |
| *Cross sections* | 4 | 4 | 4 | 4 |
| ***R²*** | **0.66** | **0.62** | **0.72** | **0.74** |

*** p<0.01, ** p<0.05, * p<0.1

| | DOLS Weighted Pool | | | |
|---|---|---|---|---|
| | I | II | III | IV |
| *Education Equality* | 0.52*** | 0.40*** | 0.44*** | 0.38*** |
| | 0.06 | 0.09 | 0.06 | 0.10 |
| *Log- Public Debt (percent GDP)* | | -0.01 | 0.08*** | 0.07** |
| | | 0.03 | 0.03 | 0.03 |
| *Political Corruption Index* | | | -1.89*** | -1.62*** |
| | | | 0.24 | 0.29 |
| *Log- Trade (percent GDP)* | | | | 0.19*** |
| | | | | 0.05 |
| *Observation* | 228 | 185 | 189 | 181 |
| *Cross sections* | 4 | 4 | 4 | 4 |
| ***R²*** | **0.66** | **0.62** | **0.72** | **0.74** |

*** p<0.01, ** p<0.05, * p<0.1

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