Education, Labor Markets, and Economic Growth: A Descriptive Analysis of Smaller Economies and Their Trade Superpowers by Russell Qian

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Abstract

Historically, developing countries like the Dominican Republic (DR) and the Democratic Republic of Congo (DRC) have maintained extensive trade relationships with global superpowers, but they continue to face persistent economic challenges. In this paper, I explore whether disparities in GDP between the DR and DRC, with respect to their superpower trade partners, affect the economic relationships and growth trajectories of these countries. I leverage longitudinal GDP data from 2000–2023, and compare the United States and China's trade, labor market, and educational attainment variables against their trade counterparts, DR and DRC's respective variables. My descriptive analysis revealed that high-income nations with universal secondary education translate trade into sustained wage increases and GDP growth. In contrast, developing exporters show rising exports but declining secondary-school completion, which in turn limits wage growth and constrains long-term economic potential. These findings suggest that trade alone does not create equitable economic growth in developing economies; rather, this paper points to the importance of investing in education and human capital.

Keywords: Developing countries, Superpower trade partners, Global Domestic Product (GDP), Education, Wages.

1 Introduction

1.1 Historical Context

Historically, the United States has displayed an interventionist approach to resolving foreign conflicts, meaning it is actively involved in other countries' affairs, usually through militaristic means, to promote its own goals or fulfill its agenda. This is evident from their military involvement during the Dominican Civil War, assisting in the elimination of dictator Rafael Trujillo, reflecting an imperialist "act first, then think" policy. This intervention extended U.S. economic influence, most notably in Dominican sugar production, which was dominated by American interests and marked by the exploitation of Black and Haitian labor.

Despite decades of trade relationships with their respective superpower trade partners, the Dominican Republic and the Democratic Republic of the Congo continue to face development challenges similar to those of a developing country. For example, between 2000 and 2023, the DRC's GDP per capita increased from approximately $300 to $600. In contrast, their major trading partner, China, increased their GDP per capita tenfold, from around $953 to $12,000 (World Bank, 2024). Theoretically, the DRC holds more promising potential GDP growth than China, with over $2 trillion worth of key natural resources yet to be mined. Yet how does such a paradox–immense natural wealth coupled with persistent poverty–exist?

This paper explores whether differences in GDP between developing and developed nations are a key factor in economic relations, influencing the degree of independence,

bargaining power, and general interactions. I built a time series dataset for pairs of countries, where each pair consists of a developing and a developed country, tracking how trade, investment, and aid ties with global superpowers have changed over the past two decades. Additionally, I plotted those shifts alongside their annual GDP growth. Finally, I created an integrated graph with the target developing and developed countries to determine whether their growth is inversely or directly related, helping me answer the question: do links to a superpower mean faster expansion, slower growth, or no obvious change?

There are numerous subtle economic interdependencies between developing and developed nations that shape their respective growth trajectories. However, sometimes, these interdependencies are particularly evident, for example, in the relationship between economic superpowers like the United States and China and developing countries like the Dominican Republic (DR) and the Democratic Republic of the Congo (DRC).

Since the US intervention in 1965, the DR has remained heavily reliant on the U.S., with exports to the U.S. valued at approximately $7.5 billion and imports at $10.4 billion. These export commodities include gold, silver, nickel, and cacao beans (OEC 2024). Furthermore, U.S. tourism constitutes around 31% of the Dominican tourism market, indicating a complex economic integration and dependency. The short-term implications of severing ties could mean considerable economic losses. However, long-term social and economic improvements could include potential reductions in racial discrimination and labor exploitation. This raises a central question: if the DR trades so extensively with the U.S., where are the economic benefits going? Why hasn't this translated into more sustainable development or self-sufficiency?

On the other side, China's involvement with developing nations exemplifies modern-day colonialism, prominently through its Belt and Road Initiative, a program that funds the construction of infrastructure to expand economic influence globally, particularly in Africa. China's investment in the DRC's mining sector, specifically in copper and cobalt extraction, comprises 41% of the DRC's exports to China. This has led to economic reliance similar to that of the DR's relationship with the U.S.

In both the DRC and DR, much of the revenue from exports fails to benefit the general population. In the DRC, profits from exported copper and cobalt are mostly absorbed by private mining companies or lost to government corruption. Similarly, in the DR, export income is absorbed by private firms with little to no tax from the government. Both cases result in funds never reaching their respective national treasuries, preventing proper reinvestment in public goods and infrastructure (Khoury, 2024).

It is imperative to understand the context of these four countries, as they will be the main cases analyzed in this paper. Their rich yet convoluted economic and political histories will serve as the foundation to discover who benefits from these relationships, how the resources and profits are distributed, and why economic growth in these nations has lagged. This paper seeks to explain and quantify how these countries are economically growing and the direction of their trade relations, but also why they are growing the way they are.

1.2 Literature Review

Oliver E. Williamson's paper on transaction-cost economics (1979) provides foundational insights into the structural dynamics of economic interactions, a core foundation that is notably relevant to this research on the economic interdependence between developed and developing nations. Williamson argues that transaction costs—the expenses of enforcing contracts and ensuring exchanges—shape whether markets or hierarchical structures, such as firms, prevail. Given the facts about the DR and the DRC, it is crucial to understand these costs because they explain how multinational corporations and superpowers like the United States and China choose to organize their economic relations with developing countries. For example, the transactional cost framework can clarify why the U.S. maintains tight control over industries such as sugar in the DR, implementing a hierarchical control structure to minimize uncertainty and ensure profitability despite the social and economic costs. Williamson's theories provide essential context for analyzing how transaction structures contribute to sustained economic influence and interdependence between developed and developing economies.

Charles I. Jones's work on resource misallocation (2011) further supplements my analysis by highlighting how micro-level inefficiencies create a ripple effect through economies to generate macro-level disparities in wealth and productivity. This concept directly enriches my study of GDP variations between developed and developing countries. Jones utilizes an input-output economic framework to show that distortions in intermediate goods allocation significantly impede aggregate productivity and economic growth. Applied to my research, Jones's insights help illustrate how misallocations, such as exploitative labor practices in the DR's sugar industry or inefficient resource management in the DRC's mining sector, contribute to persistent economic disparities and dependence on economic superpowers. This theoretical perspective aids in providing reasoning for the detailed mechanisms behind GDP differences.

Acemoglu, Johnson, and Robinson's study on the rise of Europe (2005) argues that institutional quality, driven by decentralized control and distribution of trade profits, is necessary for sustained, continued economic growth. This finding aligns closely with my analysis of the DR and DRC's dependence on economic superpowers. In nations where institutional power remains centralized or controlled externally, such as through U.S. economic dominance in the DR or China's infrastructure and mining hold in the DRC, economic benefits are often unevenly distributed. However, institutional frameworks that encourage decentralized distribution and reinvestment can foster sustained growth and greater economic autonomy. My paper integrates these findings by exploring the institutional frameworks used to facilitate such change and the implications of economic dependence on superpowers. Specifically examining the degree to which centralized economic influence perpetuates wealth and social inequality.

Barry Eichengreen's analysis of the decline in U.S. basic industries (1988) identifies both domestic mismanagement and global economic pressures as critical factors that influence industrial performance. The DR's and DRC's economic vulnerabilities become clearer once this perspective is applied to my research—both nations face intense pressures due to their reliance on exports to powerful trading partners. In addition, Eichengreen's conclusion that innovation

and strategic adaptation, rather than protectionism, are critical for industrial sustainability creates a framework for my investigation into potential policy pathways for the DR and DRC. Specifically, his findings suggest potential strategies for these countries to mitigate the adverse impacts of economic dependency. One potential solution is embracing technological advancement and diversifying economic engagements. This framework is important for assessing the feasibility and outcomes of reducing dependency on their economic superpower partners. This, in turn, creates a more balanced and equitable economic relationship.

2 Methodology

2.1 Empirical Analysis

To map the relationships among wages, schooling, and trade, I followed a straightforward empirical workflow in Google Sheets. Annual data for 2000-2023 were first gathered from public sources (then deflated any monetary value to constant 2025 USD). Urban-wage averages serve as the best published substitute for middle-class earnings in China and the DRC, while national averages were available for the United States and the DR.

With the data cleaned and aligned by year, I built three sets of charts using Google Sheets' built-in graphing tools. Single-axis line charts (Figures 1- 5) trace wage growth within each country pair (US vs DR and China vs DRC). A second pair of line charts (Figure 6) tracks each nation's share of residents who finish secondary school, highlighting divergent human-capital paths. Finally, dual-axis charts (Figures 7-8) place trade flows on the left y-axis (billions of dollars) and education shares on the right y-axis (percent of population) to show whether growing imports in the United States and China, or expanding exports in the DR and DRC, move in step with changes in schooling. Conclusively, reading the figures together supplies the answer for my thesis: high-income importers with nearly universal secondary education translate trade into higher wages and consumption, while lower-income exporters grow by pulling teenagers out of school, limiting wage gains, which reinforces the global human-capital divide.

2.2 Data Collection

I would use data spanning 2000–2003, collected from reputable international and national sources. GDP figures were obtained from the International Monetary Fund (IMF), World Bank, Statista, and official government databases, with the values then converted to U.S dollars. Education data, specifically enrollment in primary and secondary schools, was collected from Statista and UNESCO. Lastly, the average wage rate of a middle-class worker and an urban class worker in the case of China came from CEIC data and respective national labor and statistical agencies. All monetary values were converted to USD using the most recent (2025) exchange rates and adjusted for inflation to ensure consistency and comparability across countries. I use a single regression with interaction terms so we can directly see how education and wages correlate with GDP in both developed and developing countries. Wages stand in for consumer spending–when people earn more, they tend to spend more, boosting output–while

education captures the long-term gains through improving skills and productivity, a factor in investments. I utilize the average salary of a middle-class worker and leave out minimum-wage effects because they do not have excess wealth to spend on excess consumption, and because GDP measurements do not fully reflect income inequality.

3 Results

For Figures 1–4, Real GDP represents GDP adjusted for inflation. C denotes household consumption expenditures on goods and services, while I captures gross private domestic investment in physical or capital assets such as factories, machinery, inventories, and residential construction, explicitly excluding financial-market purchases like stocks and bonds. G reflects government purchases of goods and services, but it does not include transfer payments such as Social Security benefits or other stipends. The US has had a steady and consistent increase in GDP over the past 23 years. Consumption was the largest component throughout, while investments, government spending, and exports grew moderately. However, US imports were significantly higher than its exports, leading to negative net exports. This trend did not change throughout the entire 23 years, highlighting the high reliance on foreign goods. In addition, note the 2008-2009 dip in overall GDP, which aligns with the global financial crisis during that time.

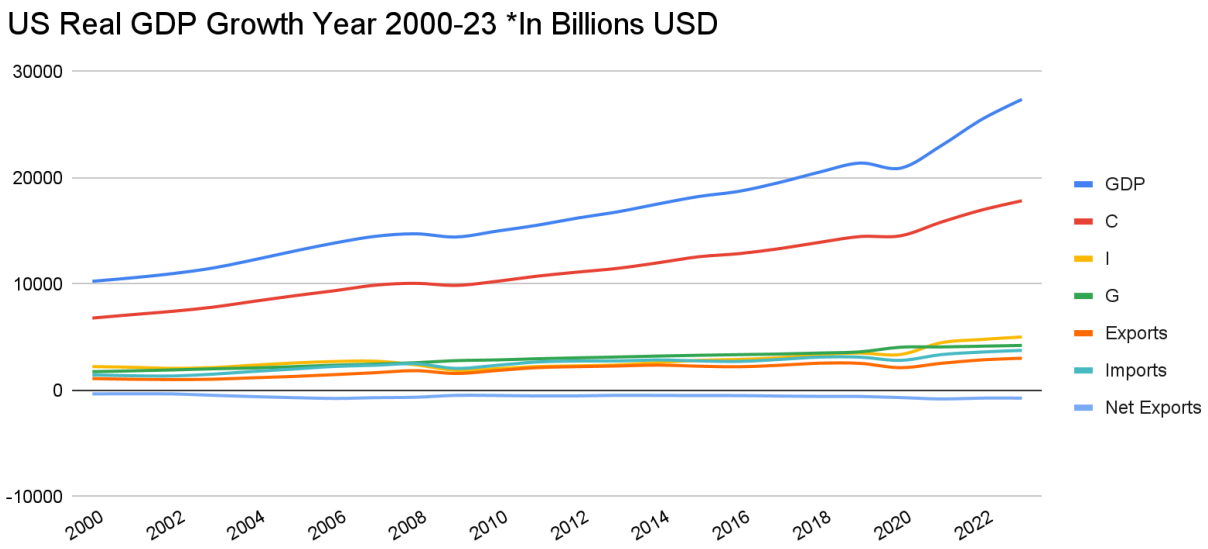


Figure 1. US Real GDP Growth Year 2000-2023. (World Bank World Development Indicators (WDI) and U.S. Bureau of Economic Analysis (BEA)) Annual real GDP and its expenditure components—household consumption (C), gross private domestic investment (I), general-government consumption (G), exports, and imports—are expressed in billions of constant 2025 U.S. dollars and deflated with the U.S. GDP-deflator series. Negative net exports (NX = exports − imports) appear as the gap between the export and import lines.

Figure 2 illustrates the gradual GDP growth of the DR, particularly accelerating after 2015. Consumption rises steadily, but investments and government spending generally remain low and inconsistent. This pattern potentially signals underlying governmental inefficiencies and limited economic diversification, though other factors may also be at play. Note the sharp increase in consumption, but a dip in overall GDP, which is due to the pandemic, as COVID-19 disrupted international trade and increased consumer demand for living necessities.

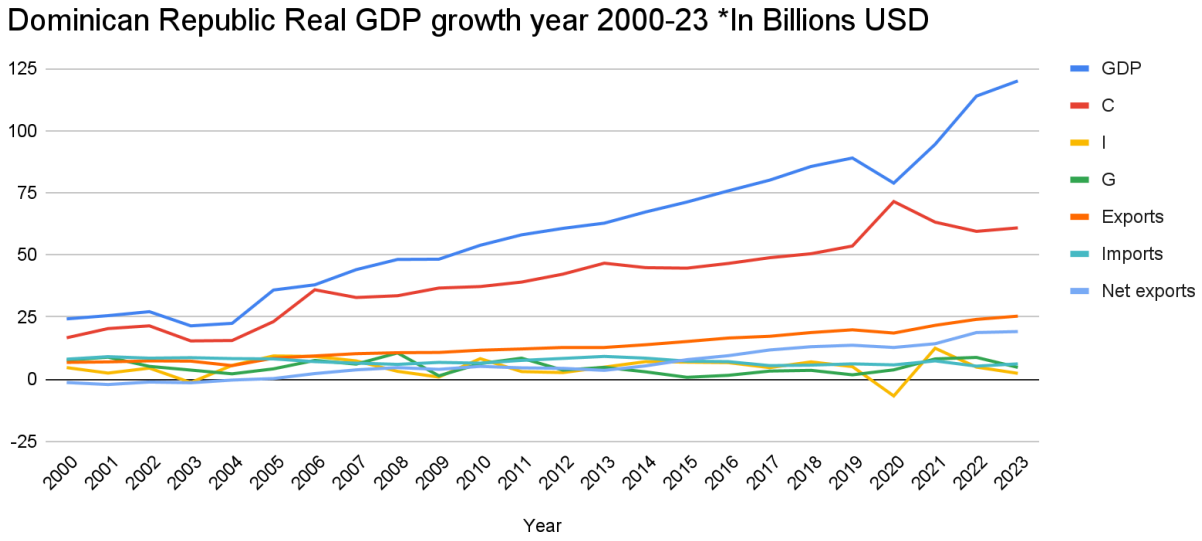


Figure 2. Dominican Republic Real GDP Growth Year 2000-2023. (International Monetary Fund (IMF) World Economic Outlook and Banco Central de la República Dominicana) Series definitions match Figure 1; values converted to constant 2025 U.S. dollars using the Dominican GDP deflator. Large year-to-year volatility in I and G reflects hurricane-related recovery and reconstruction spending and regular fiscal tightening.

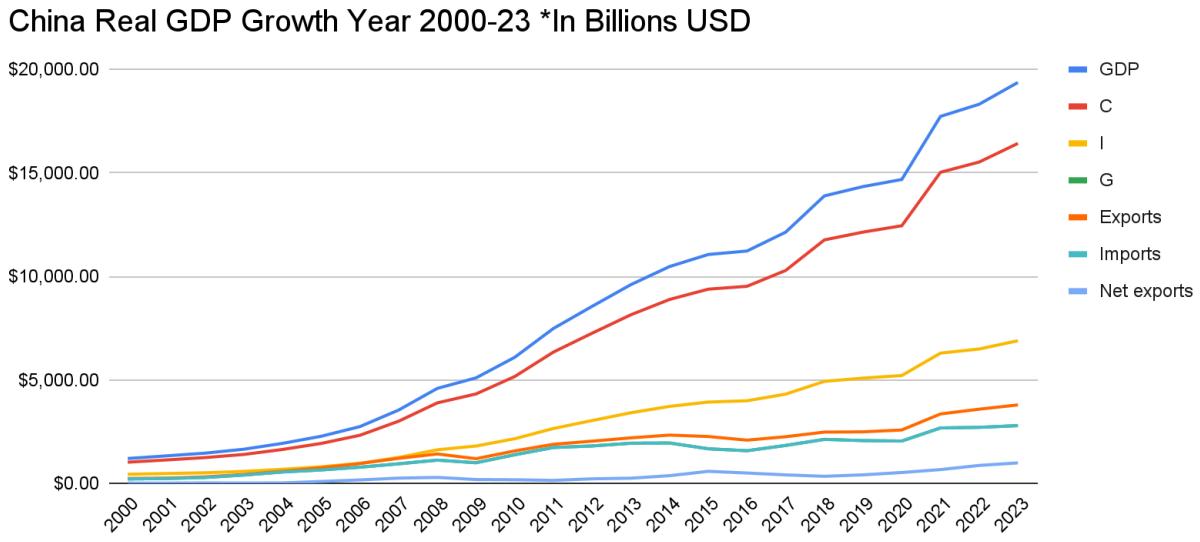


Figure 3. China Real GDP Growth Year 2000-2023. (National Bureau of Statistics of China and IMF WEO) Real series expressed in constant 2025 U.S. dollars via the Chinese GDP deflator and annual average exchange rates. Consumption includes household and nonprofit sectors.

Figure 3 illustrates the GDP growth of China. Overall, throughout the period 2000-2023, China's GDP rose relatively sharply compared to the U.S, with consumption being China's major contribution, in addition to its positive net export balance, which is due to the high demand for its workforce and its goods. The sudden increase in slope of the consumption graph is likely indicative of the population boom in the early 2010s due to the removal of the one-child policy. A stagnation in overall growth around 2020 indicates the impact of the COVID-19 pandemic. However, China's GDP growth quickly picks up momentum again, with investment growing to the steepest increase, signaling increased infrastructure and industrial expansion.

Figure 4 illustrates the GDP growth of the Democratic Republic of Congo. The DRC's GDP is on an increasing trend, but at a much lower scale compared to China. The sudden drop in GDP and investment in 2014 reflects the depreciation of the currency and its commodities as a result of increased government debt and internal government inefficiencies. Net exports remain positive, but the benefit is not reflected in domestic growth. This hints at potential foreign corporate dominance and corruption, which often leads to revenue leakage and embezzlement.

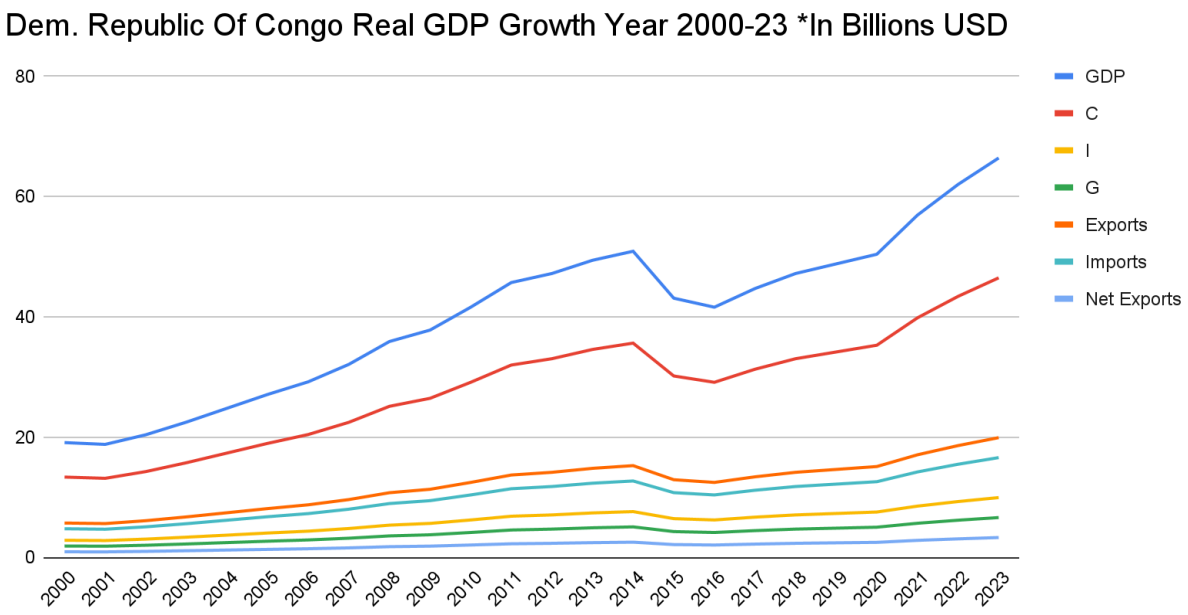
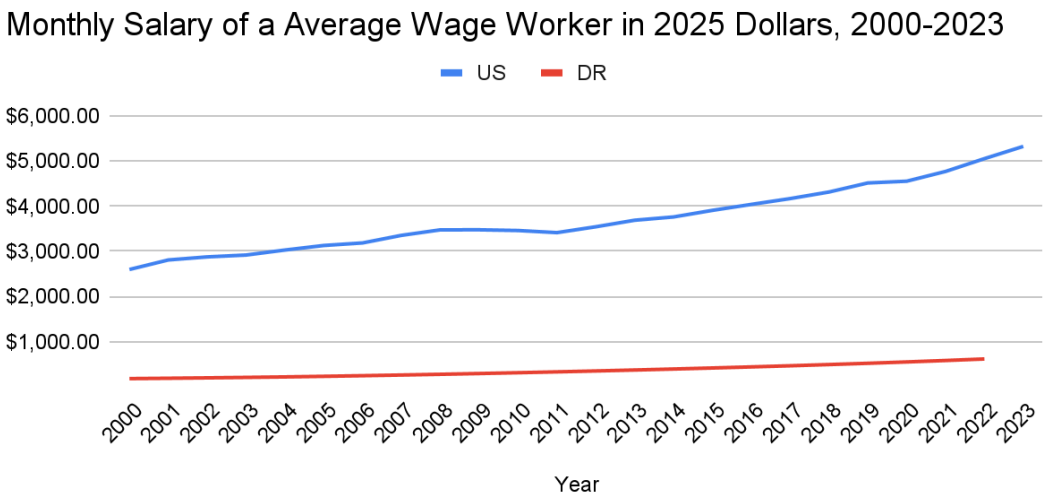


Figure 4. Dem. Republic Of Congo Real GDP Growth Year 2000-2023. (World Bank WDI and Banque Centrale du Congo) Constant-dollar conversion follows the DRC GDP deflator. Sharp declines in 2014–2015 mirror the 2014 franc depreciation and commodity-price shock.

Figure 5 depicts the average monthly wages from 2000-2023 across all four countries. Figure 5 illustrates that the average monthly salary for a U.S. middle-class worker starts at just under $3,000 in 2000 and grows steadily until a minor dip during the late-2000s recession, then rises to nearly $5,000 by 2023. Meanwhile, the monthly average wages of an urban Dominican worker increase from $200 to $700 across the same timeframe. Although growth does occur in both countries, there is a wide gap in the difference in the average wages. Figure 5(b) depicts a similar story for China and the DRC: Chinese average monthly wages of an urban worker rose after 2005 from $250 and topping $1,500 by 2023. On the other hand, the DRC trend line, which is upward sloping but with growth that is minute compared to that of China's, hugs the bottom axis below $100. For this comparison, I chart urban workers rather than the most optimal "middle-class" category because consistent, reliable data on middle-class workers is not currently available to the public in China or the DRC due to government-imposed restrictions on the publication of such data. Given that the great majority of working-class jobs are concentrated in the cities, urban pay is thus the best substitute for middle-class income.



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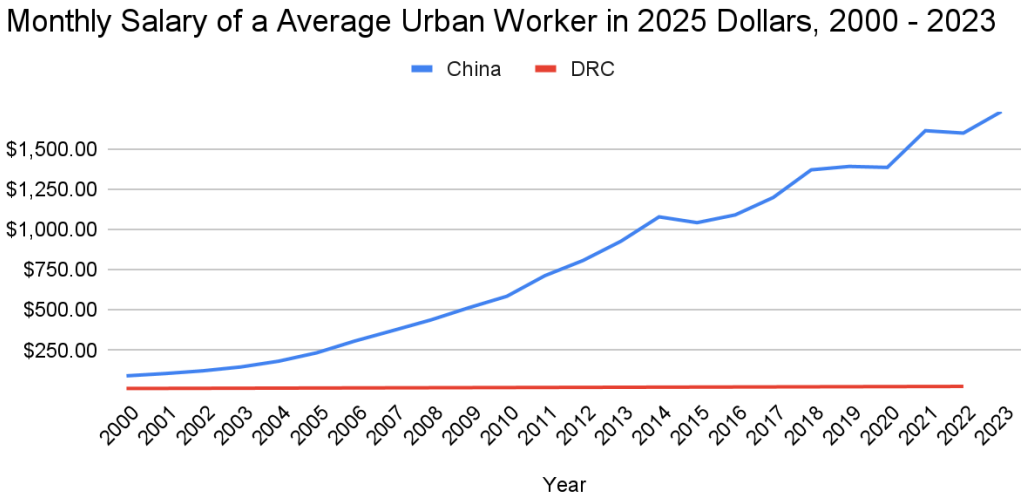

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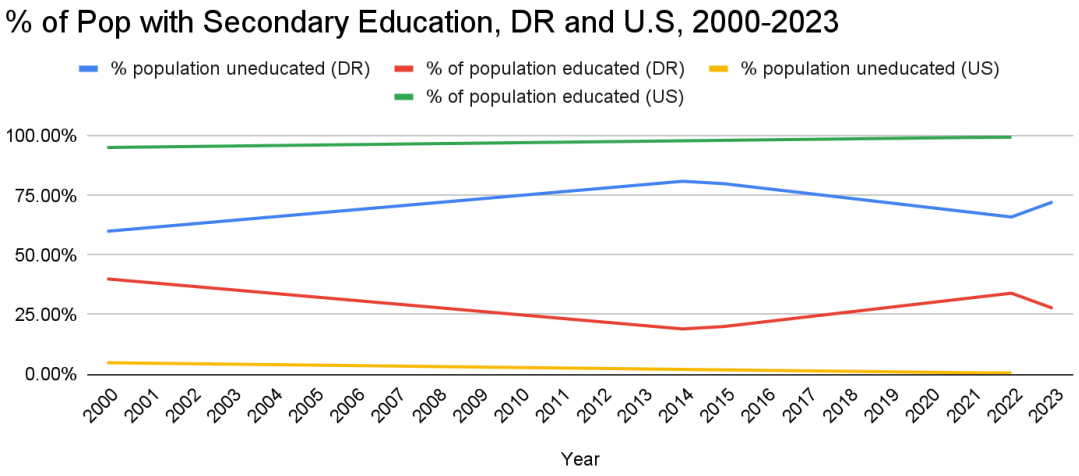
Figure 5. (a) Monthly Average Wage Worker in 2025 Dollars. (b) Monthly Salary of an Average Urban Worker in 2025 Dollars. (U.S. wages: Social Security Administration National Average Wage Index. Dominican wages: Ministerio de Trabajo; Statista. Chinese urban wages: CEIC Data/National Bureau of Statistics. DRC wages: ILOSTAT and national labour bulletins) All series are pretax averages for full-time employees; Chinese and DRC data cover urban workers (the best proxy for middle-class earnings because national coverage is unavailable due to middle-class earnings not being available for public view). Values are expressed in constant 2025 U.S. dollars using their respective country-specific CPI deflators.



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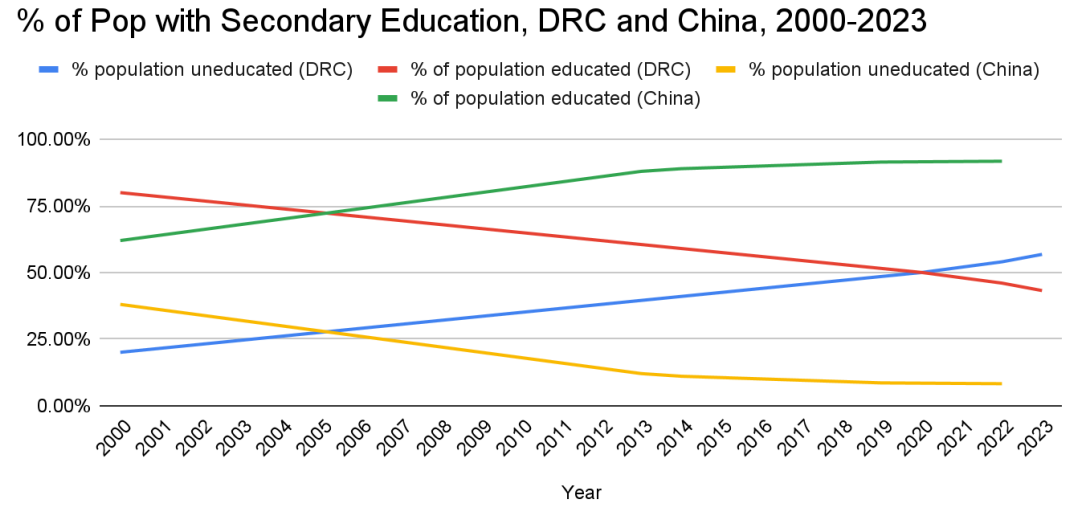


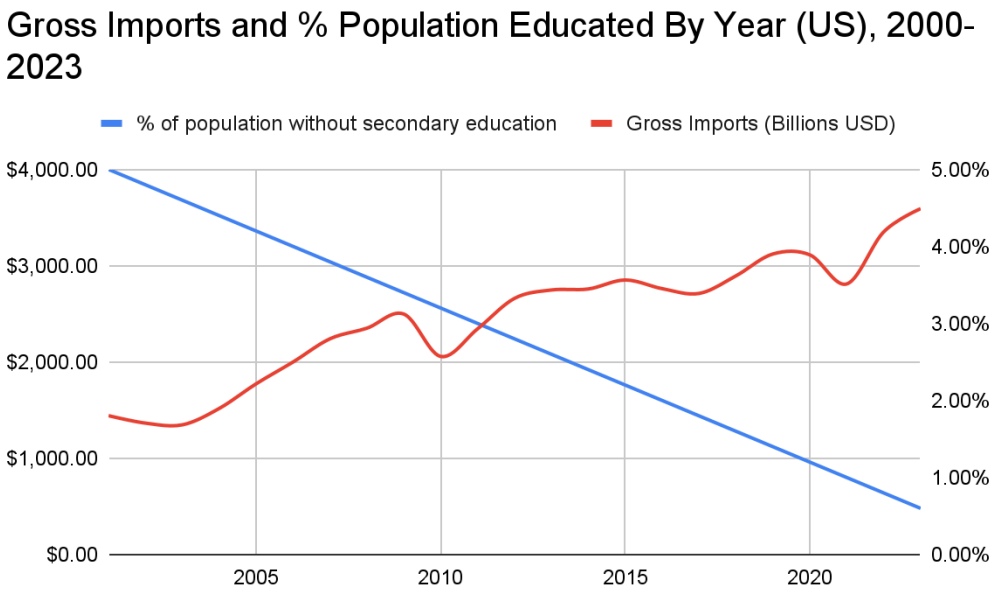
(b)

Figure 6. (a) Percent of population with secondary education, DR and U.S. (b) Percent of population with secondary education, DRC and China. (United States: IPUMS CPS; Statista. Dominican Republic: UNESCO UIS; Ministerio de Educación. China: UIS; National Bureau of Statistics yearbooks. DRC: UIS; national education surveys) The indicator measures the percentage of the population who have completed upper-secondary schooling.

Figure 6(a) shows secondary-school attainment during the period 2000-2023, with data extracted from Statista, IPUMS, and each country's respective governmental websites. There is a focus on secondary schooling because primary education is compulsory in all four countries, but secondary education is not. Figure 6(b) shows that the share of Dominicans who complete secondary education falls from roughly 40 percent in 2000 to about 20 percent by 2014, then climbs back towards 30 percent by 2023. In stark contrast, the U.S. line holds nearly

consistently in the mid-90 percent range. This is mostly a result of secondary school being mandatory with a few religious exemptions, while secondary school is not mandatory in the DR. Figure 6(b) yields similar patterns for China and the DRC: China's educated percentage soared from 60 percent in 2000 to nearly 91 percent by 2023, while the DRC trends downward, from roughly 70 percent to below 40 percent. This means that many teenagers leave school at that juncture to enter the labor force to meet the increased demand for labor in the production of labor-intensive products, such as natural resources, notably cobalt in the DRC. This distinction matters because the age at which young people leave school and enter the workforce directly relates to how much human capital investment a country is willing or able to make. Education is a major component of domestic capital and a direct driver of GDP. When students opt out of secondary schooling, there can be a loss of potential skills and productivity, which negatively impacts the economy and therefore GDP (UNESCO, 2024). In the sections that follow, I unpack the factors that drive certain teens to skip secondary education in the four targeted countries.

Figures 7 compare gross imports and exports with the percentage of the population without secondary education during the period 2000-2023. Imports are plotted for the United States because both countries are on the demand side of the trade relationship. Figure 7(b) shows that during the period 2000-2023, U.S. gross imports rose from roughly $1 trillion to over $3 trillion as the uneducated population decreased from about 4 percent to below 1 percent. It is the country purchasing goods from the Dominican Republic. Tracking U.S. import volumes allows me to ask whether a richer nation's growing demand for those exports has any quantifiable connection to education trends at home or its trading partners. Figure 7(b) pairs the DR across exports with the share of its population that completes secondary school. Exports surged from around $5 billion to more than $30 billion over the period 2000-2023. The education percentage faces a 20 percent initial decline, followed by a steady rally, then finally dipping over 5 percent. Here, I graph exports because the Dominican Republic is on the supply side of the equation. My goal is to find out whether rising export demand pulls teenagers out of school to meet labor needs, which negatively impacts the education rate.



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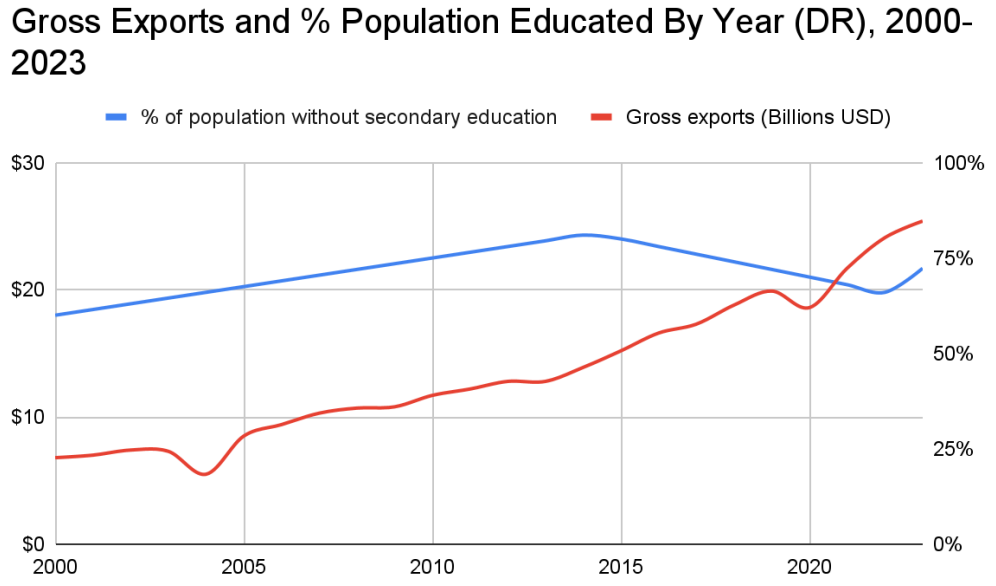
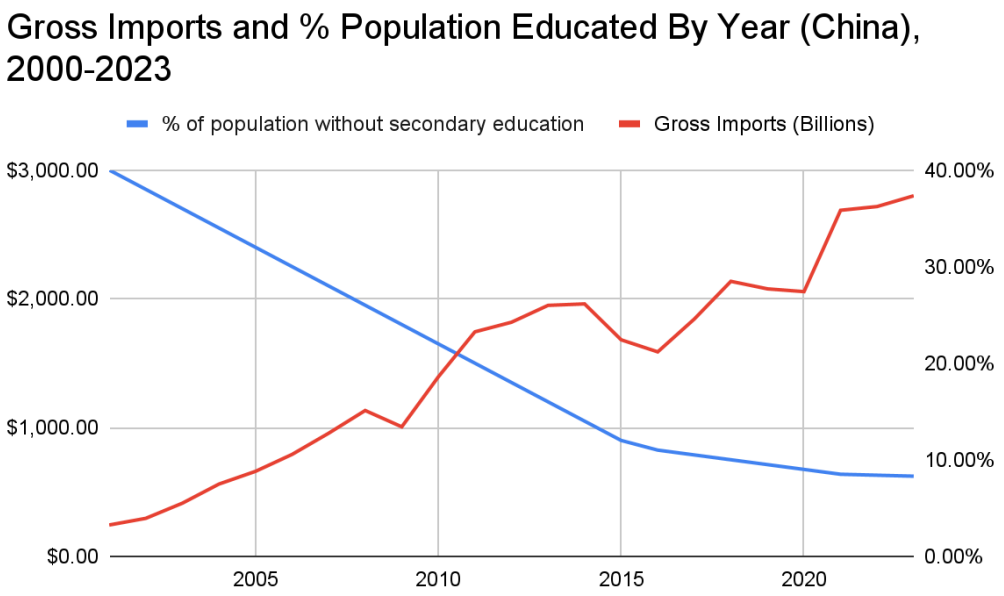


(b)

Figure 7. (a) Gross exports and percent population educated by year (U.S). (b) Gross exports and percent population educated by year (DR). *(*Trade values from IMF Direction of Trade Statistics (imports) and World Bank WITS/OEC (exports); education series from Figure 6.) Monetary values are in billions of constant 2025 U.S. dollars. “Without secondary schooling” denotes the percentage of the population without a high school diploma.



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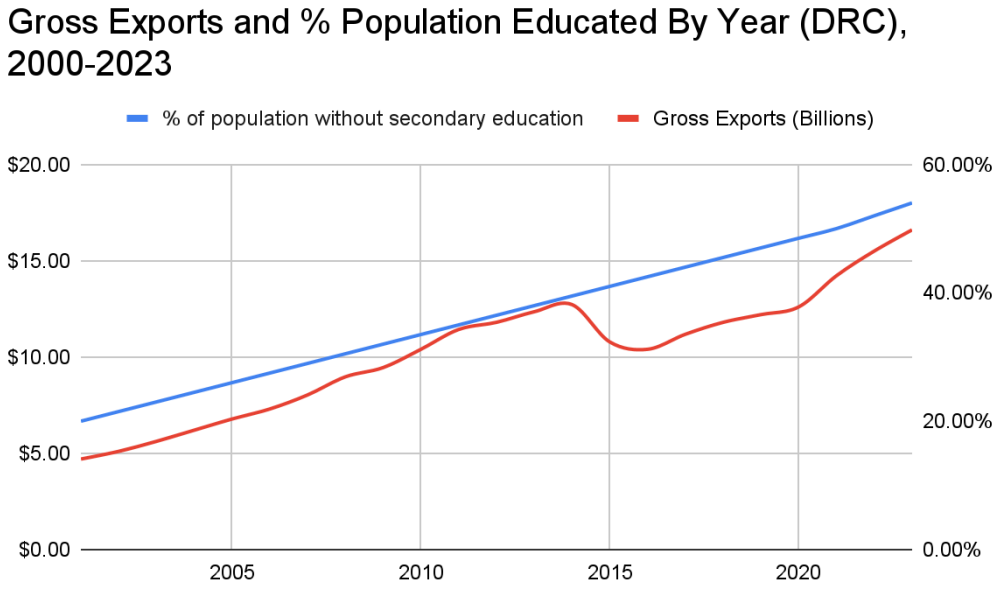

(b)

Figure 8. (a) Gross exports and percent population educated by year (China). (b) Gross exports and percent population educated by year (DRC). (Chinese import data: IMF DOTS. DRC export data: World Bank WITS; Banque Centrale du Congo. Education series from Figure 5.) Constant 2025 U.S. dollar conversion and education-gap definitions match Figure 6.

Lastly, Figure 8 extends the comparison to China and the DRC. Figure 8(a) shows China's imports rocketing from near zero in 2000 to roughly $2.5 trillion by 2023, while the fraction without secondary schooling collapses from about 35 percent to roughly 7 percent. Figure 8(b) flips that script for the DRC: exports climb almost tenfold, peaking above $15 billion, while the share of educated citizens falls by roughly 12 percent. To reiterate, concentrating on secondary education helps isolate the decision point where students either acquire additional skills or head straight into low-skill, resource-heavy sectors. Ultimately, this clarifies why soaring trade revenues in the DRC have not translated into growth in the share of the population acquiring post-secondary education.

4 Discussion

4.1 Analysis

Figure 5 confirms that real monthly wages rose in both the United States and the Dominican Republic (DR) between 2000 and 2023, yet the amount of growth diverged sharply: U.S. earnings climbed from roughly USD 3,000 to almost USD 5,000, while Dominican wages inch from about $200 to only $700. Figure 6(a) helps explain this gap. In the United States, secondary schooling is nearly universal—hovering around 99 percent throughout the period—so the country benefits from a consistently skilled labour force. Higher human-capital levels translate into greater worker productivity and higher average pay. Because household consumption is the largest component of U.S. GDP, rising wages mean increased domestic demand. Figure 7(a) captures this effect: gross U.S. imports swell from about $1 trillion to more than $3 trillion as disposable incomes expand. The inverse relationship between the import curve and the tiny "uneducated" share of the population provides sufficient evidence that as education spreads, purchasing power and import demand grow in tandem.

The Dominican Republic presents the opposite dynamic. Figure 6(a) shows its secondary education rate going downward over much of the period, even as Figure 7(b) records an export boom from roughly $5 billion to more than $30 billion. The data suggest that export growth is being fuelled by labor-intensive, low-skill sectors (specifically raw-material extraction), which draw teenagers out of school to meet the foreign demand. Although export earnings rise, forgone schooling limits long-run productivity, and the gains are not reinvested in human capital. This pattern is consistent with concerns about weak fiscal governance in the sense that export revenues are generated, but they do not translate into broader educational attainment, which, by extension, means higher domestic consumption.

Figure 5b compares wage trajectories in China and the DRC. Chinese average monthly urban earnings increased from roughly $250 a month in 2000 to about $1,500 by 2023, whereas DRC wages remain below $100 despite modest growth. We can find an explanation in Figure 6(b): China's share of residents who complete secondary school rises by roughly twenty percentage points from 2000-2023, while the DRC's educated share slips towards a 50-50 balance with the uneducated population. Similar to the U.S, China's educational expansion means both wage growth and stronger domestic demand. Figure 8(a) shows imports surging

from near zero to approximately $2.5 trillion, mirroring the pattern in Figure 7(a) for the United States.

The DRC again follows the Dominican Republic's path. Figure 8(b) indicates that exports expand almost tenfold, yet the proportion of educated citizens falls from about 20 percent to roughly 12 percent. Rising demand from industrial powers, notably China, appears to be met by drawing low-skill labor into resource extraction rather than by boosting educational investment. The result is a classic "resource-pull" effect: export revenues grow, but the domestic skill base stagnates, limiting the country's capacity to climb the value chain and bottlenecking future wage growth.

Scoping out, the figures hint at an inherent institutional failure: sudden bursts in export revenue in the DR and the DRC are not being funneled into classrooms or laboratories. Even as export earnings surge, there is a flattening of wages and a decline in secondary-school completion, which suggests that current leaders let most profits stay in a few hands instead of investing them in education and skills for everyone. One way a regime, whether democratic or technocratic, can change this trajectory is by explicitly prioritizing the working and emerging middle classes by designating a fixed share of mining and manufacturing royalties for school construction and teacher pay, making upper-secondary education compulsory or genuinely free, and offering transparent tax credits for domestic research and development. These steps could turn unstable resource income into lasting skills, more innovation, and stronger economic growth. While my graphs document the symptom—chronic underinvestment in education—I now see that a fuller explanation may lie in the architecture of governance itself. Therefore, future work and research on this topic could pair these trade and schooling trends with data on regime type, corruption scores, or major education-finance reforms to identify whether shifts in political institutions are the decisive lever for inclusive growth.

4.2 Future Work

Originally, this paper set out to tackle this question with a full ordinary least-squares regression that linked school enrollment rates and middle-class wages to GDP for each group of countries; however, the prerequisite coding and data demands were outside my current reach. I now turn to describe how I would empirically test my hypothesis via an econometric approach. I will describe the data I would use, the regression analysis I would implement, and will describe the key parameters in my regression analysis. This econometric approach would utilize a quantitative, time series regression analysis to examine the relationship between the economic engagement and influence by a global superpower (e.g, China and the United States) and the GDP growth of both a developed and a developing country. The objective is to determine if there is a correlation between economic interaction with a global superpower and changes in a nation's GDP.

The dependent variable in all regressions is the country's annual GDP. The first independent variable is the population enrolled in primary and secondary education. This represents human capital investment and access to foundational education. The second

independent variable is the average annual wage rate, which reflects labor market conditions, income levels, and the likelihood of workers leaving the country for work. Together, these variables are used to estimate how workforce education and compensation contribute to the GDP variations across the developed and developing countries. Additionally, a dummy variable is included to distinguish between a developed country (coded as 0) and a developing country (coded as 1). This model allows for a direct comparison of how education and compensation influence GDP across the different developmental contexts.

A multiple linear regression model with interaction terms will be used to articulate the relationship between the independent and dependent variables across both countries. The model is specified as follows:

$$GDP_t = \beta_0 + \beta_1(Education_t) + \beta_2(Wage_t) + \beta_3(CountryDummy_t) + \beta_4(Education_t \times CountryDummy_t) + \beta_5(Wage_t \times CountryDummy_t) + \varepsilon_t$$

In this equation, GDP_t represents the gross domestic product in a certain year *t*. $Education_t$ denotes the percentage of individuals enrolled in secondary education. $Wage_T$ corresponds to the average annual wage of a middle-class worker. $CountryDummy_t$ is a binary variable that indicates whether the country is developing (1 for the Dominican Republic and the Democratic Republic of the Congo) or developed (0 for the United States and China). The interaction terms ($Education_t \times CountryDummy_t$) and ($Wage_t \times CountryDummy_t$) allow for the comparison between two countries. The coefficients β_1 and β_2 estimate the marginal effects of educational attainment and wage level in developed countries, while β_3, β_4, and β_5 estimate the marginal effects in comparison to the developing countries. Lastly, β_0 is the intercept, and ε_T is the error term.

The estimated coefficients were interpreted to determine the strength and direction of the relationships. A positive and statistically significant coefficient for educational attainment would indicate that broader access and attendance in primary and secondary education are associated with increased GDP. Similarly, a positive coefficient for wage rate would suggest that rising wages contribute to greater economic output. The interactions between coefficients β_4 and β_5 measure how the effects of education and wages differ in developing countries compared to developed countries. If these differences are statistically significant, it means that the influence of human capital (e.g, education) and compensation on GDP is fundamentally different in the developing country. Further evidence and reasoning beyond statistical data would be needed to provide support for the results. The dummy coefficient β_3 represents the baseline GDP gap between the two countries in comparison. I am most interested in the education parameters (β_1 and β_4) because education is a key factor for human capital growth (investments) and GDP growth. In developed countries (CountryDummy = 0), every one-percentage point increase in secondary-school completion equates to a β_1-unit rise in GDP, with the assumption that wages stay the same. The interaction term β_4 shows how that effect changes in developing nations (CountryDummy = 1): a positive β_4 means each additional percentage point of educated adults

delivers an even bigger GDP boost there. At its core, focusing on β_1 and β_4 is about recognizing that education builds the skills and knowledge that power economic growth and increase the potential possibilities curve (GDP). As more people finish secondary school, they learn to use new technologies, solve problems creatively, and work more efficiently, which ultimately raises output per worker.

5 Conclusion

This paper set out to test a simple yet profound hypothesis: the size of a nation's GDP will determine, at large, who can capture the most gains from trade. This is because richer importers are better positioned to translate global commerce into higher wages and increased domestic investments (human and physical capital), whereas poorer exporters often cannot. The evidence points to a clear answer: education is the decisive factor. In the United States and China, near-universal secondary schooling supports productivity, lifts wages, and creates a positive feedback loop of rising consumption and import demand. In stark contrast, in the Dominican Republic and the DRC, low and oftentimes falling secondary completion rates leave workers in low-skill jobs, even when export revenue increases. Combined with other factors in play, such as weak governmental institutions, leakage of funds due to internal corruption, and "brain drain" as the best-qualified workers emigrate, these market failures stall GDP growth even in the presence of a positive net export.

These findings then open several avenues for extension. A larger cross-country panel would test whether the trade–education relationship holds more broadly, improving external validity. Future work could ask: *to what extent does trade itself depress schooling in exporter economies? How does education reshape the sectoral mix of labor markets in importing versus exporting countries?* These questions can be addressed through a macroeconomics lens, such as Lorenz-curve decompositions to track shifts in income inequality, Phillips-curve analysis to link wage dynamics with unemployment, and mapping trade shocks onto movements of the long-run aggregate supply (LRAS) curve to gauge potential output.

In addition, it is also clear that there exist limitations within this study. It covers only four countries and relies on urban wages as a proxy for middle-class income in two of them. Also, it is descriptive rather than causal, on top of the fact that secondary-completion rates do not capture education quality. Nonetheless, the core takeaway is present: trade by itself won't deliver lasting, broad-based growth unless part of the export profits is channeled into education. Developing countries should reassess whether current trade relationships truly serve their long-term interests. In some cases, reducing or even severing these ties could be beneficial. While such a move would cause short-term negative effects to its economy, it could free up resources to reinvest at home and prioritize education rather than simply meeting the demands of foreign markets.

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