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The Impact of Remittances, Financial Infrastructure, Internet Usage, and Taxation on Gross Domestic Product

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Abstract

All over the world, policymakers consider economic growth to be very important. This report examines how remittances, financial infrastructure, internet usage, and tax policies affect Gross Domestic Product differently in High-Income Countries and Upper-Middle-Income Countries. With panel regression analysis (Fixed Effects Model) and using robust standard errors, we study the data found in the World Bank's World Development Indicators covering the years 1999 to 2023. Internet usage seems to have a consistent detrimental effect on both income groups. In both High-Income Countries and Upper-Middle-Income Countries, trade openness and foreign direct investment increase Gross Domestic Product, but other factors affect them differently; remittances and internet usage lower Gross Domestic Product in Upper-Middle-Income Countries, but bring about higher Gross Domestic Product in High-Income-Countries, while education and taxes have opposite effects on these economies. It appears that the observed outcomes go against a number of classic beliefs, underlining the significance of paying attention to different elements within policymaking. To better make the results robust in future studies, it is suggested to use institutional quality controls.

Keywords: Gross Domestic Product, Remittances, Financial Infrastructure, Internet Usage, Taxation

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Introduction

An increase in economic growth raises living standards, decreases poverty, and aids the development of a more sustainable world. Because GDP growth is important, looking into its causes has become a key area of study in economics. Experts have studied how remittances, good financial infrastructure, internet usage, and taxes matter for a country's economy, yet not many systematic comparisons between upper-middle-income and high-income countries have been made (Lucas, 1988; Levine, 2004).

More money from migrants goes back to their home countries than foreign direct investment and official development aid and most of these migrants come from developing economies. Remittances can support economic security and family savings, though their impact on overall economic growth depends greatly on the local conditions and household income (Adams & Page, 2005; Meyer & Shera, 2017; Farroukh & Mazioued, 2024). Having commercial banks available is key to inclusive economic growth since it leads to saving, borrowing, and investing by the public (Levine, 2004; Beck, 2007; Demirgüç-Kunt, 2018).

Increasing financial activities is positive for improving equality and economic performance in middle-income countries, but too much expansion in high-income countries can cause inefficient and risky outcomes (Burgess & Pande, 2005; Djankov, 2007; Law & Singh, 2014).

Because of the internet, businesses now experience bigger impacts on productivity and the ease of reaching markets. Although using the Internet usually leads to better economic results, studies now show that high-income and upper-middle-income countries may see less growth in productivity because many people are wasting time online and lack key skills (Choi & Yi, 2009; Czernich, 2011; Kolko, 2012, Vu, 2019). Also, the effects of taxation in fiscal policy depend on how well taxes are managed and on the state of the country's economy. Appropriately distributing tax revenue is helpful for infrastructure and education in developed countries, though overly heavy or ineffectively managed taxes sometimes lead to less investment and slower growth in upper-middle-income countries (Gupta, 2009; Castells-Quintana & Royuela, 2014; McNabb, 2018).

To fill these gaps, the study looks into the role of remittances, the Internet, financial systems, and taxation in GDP growth between HICs and UMCs. Using thorough panel data and advanced econometrics, we find out the complications in how these things relate to the growth of the economy. We have shown that the Internet causes many problems, both remittances and banking have various consequences, and tax policies also play a unique part, showing that economic policies should be specifically designed for each situation. This paper follows the following order: Section 1 is of Introduction, Section 2 gives an extensive review of the literature, Section 3 describes the methodology, Section 4 presents the results, Section 5 discusses the findings and Section 6 wraps up with suggestions for additional research and conclusions.

Literature Review

Remittances and GDP

Many articles and reports have studied how remittances help reduce poverty and improve the economy (Giuliano & Ruiz-Arranz, 2009). Many economies praise remittances for bringing more money in and are believed to help the economy by increasing both consumption and investments of households (Adams & Page, 2005; Ratha, 2011). Yet, there are differing opinions among experts about how natural resources impact the economy, since some believe they lead to consumption-related challenges (Chami, 2008; Barajas,

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2009). However, the way countries use remittance funds often has a big effect on their impact. Meyer & Shera (2017) find that sending remittances can also have a positive effect on GDP growth, thanks to more investment and consumption by households in developing economies. At the same time, research points out certain issues like reliance and people leaving the workplace (Cazachevici, 2020). With the mixed data, this study proposes this hypothesis to test what really happens to the economy when people send remittances:

H_1: There is a significant relationship between remittances and GDP.

Financial Infrastructure and GDP

An effective commercial banking sector greatly contributes to economic growth by encouraging people to save, get credit, and invest (Levine, 2004). Access to banking plays a role in encouraging inclusive economic growth. Upper-middle-income countries have shown a positive link, as Law & Singh (2014) and Demirgüç-Kunt (2018) suggest, between having more financial inclusivity and economic growth. If financial sectors in high-income countries grow too much, it might cause inefficiency, more risks, and financial unsteadiness (Beck, 2007; Djankov, 2007). A hypothesis was suggested by the study to empirically study the topic:

H_2: There is a significant relationship between financial infrastructure and GDP.

Internet Usage and GDP

Using the internet which reflects digitalization, is believed to increase productivity and the rate of growth by improving how information is delivered to people and by better managing economic markets (Choi & Yi, 2009; Czernich, 2011). In the beginning, people think that Internet use will lead to greater productivity and better efficiencies in the market. In contrast, you have studies such as those by Kolko (2012) and Czernich, 2011 point to decreasing productivity because of low skills and too much time spent online, mostly in rich countries. This demonstrates the difficulties connected to the internet and the economy growing together. Taking into account the available evidence, the research wants to find out if the following hypothesis is true:

H_3: There is a significant relationship between Internet Usage and GDP.

Taxation and GDP

Taxes play a big part in influencing economic growth and this influence depends largely on how effectively they are collected and on the country's economy. Proper handling of taxes allows money to be spent on infrastructure and education which are key for sustained economic growth in high-income nations. With the support of fiscal policy and correct resource allocation, taxation such as tax revenue and trade taxes, can affect growth. In addition, burdensome or badly set up tax systems can negatively affect the economy and growth in upper-middle-income countries (Castells-Quintana & Royuela, 2014; Gupta, 2009). This results in forming the following hypothesis which can be tested experimentally:

H_4: There is a significant relationship between Taxation and GDP.

Literature reports important shortcomings in analyzing details of regional impacts, suggesting that more attention should be given to comparisons of impacts across income levels.

Methodology

The investigation incorporates a quantitative comparative research approach to evaluate the impact of different financial and digital inclusion indicators on GDP per capita from 1999 to 2023 between HICs and UMCs. The research calls for the utilization of quantitative panel data structures due to their data nature as well as their research objectives. The

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research needed both descriptive and inferential causal analysis because it examined the dependent variable stdgdp with independent variables stdr, stdi, stdc, stdtr, and stdt and control variables stds, stdg, stdp, stdtra, stdf, stdinf. All variables received standardization treatments to establish international comparability and minimize the impact of measurement scales. The study includes 81 countries arranged according to the World Bank income groups which are supported by a period of 25 years for longitudinal analysis.

Data and Sources

The entire analysis relies exclusively on secondary data sources by using internationally recognized datasets. The World Bank maintains the World Development Indicators (WDI) database for extracting data that includes standardized financial and macroeconomic information. All variables employed in the analysis along with their types, standardized abbreviations, official World Bank indicator codes, and data sources are shown in Table 1.

Table 1: Overview of Study Variables with Codes and Source Details

Sr.No	Variable Name	Variable Type	Variable Abbreviation	Variable Code (WDI)	Source
1	GDP per capita	Dependent	stdgdp	NY.GDP.PCAP.KD	World Bank WDI
2	Personal remittances received (% of GDP)	Independent	stdr	BX.TRF.PWKR.DT.GD.ZS	World Bank WDI
3	Commercial bank branches (per 100,000 adults)	Independent	stdc	FB.CBK.BRCH.P5	World Bank WDI
4	Individuals using the Internet (% of the population)	Independent	stdi	IT.NET.USER.ZS	World Bank WDI
5	Tax revenue (% of GDP)	Independent	stdtr	GC.TAX.TOTL.GD.ZS	World Bank WDI
6	Taxes on international trade (% of revenue)	Independent	stdt	GC.TAX.INTT.RV.ZS	World Bank WDI
7	School enrollment, secondary (% gross)	Control	stds	SE.SEC.ENRR	World Bank WDI
8	General government	Control	stdg	NE.CON.GOVT.ZS	World Bank

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	final consumption expenditure (% of GDP)				WDI
9	Population growth (annual %)	Control	stdp	SP.POP.GROW	World Bank WDI
10	Trade (% of GDP)	Control	stdtra	NE.TRD.GNFS.ZS	World Bank WDI
11	Foreign Direct Investment, net inflows (% of GDP)	Control	stdf	BX.KLT.DINV.WD.GD.ZS	World Bank WDI
12	Inflation, consumer prices (annual %)	Control	stdinf	FP.CPI.TOTL.ZG	World Bank WDI

Econometric Model

A Fixed Effects (FE) model with robust standard errors is used to adjust the analysis for hidden differences in countries and to remove bias when some variables are left out. This model consists of the following empirical expression:

$$stdgdp = \beta_0 + \beta_1 stdp_{it} + \beta_2 stdi_{it} + \beta_3 stdc_{it} + \beta_4 stdtr_{it} + \beta_5 stdt_{it} + \Sigma\beta_{controls} X_{it} + \mu_i + \mathcal{E}_{it}$$

Where,

i = country

t = time

μ_i = fixed effects

$\mathcal{E}_{it}$= error terms

This model allows for the estimation of the effects of each standardized independent variable on economic growth while controlling for unobserved heterogeneity across countries.

Theoretical Framework

An illustration of the research theory appears in Figure 1. Several key independent factors represented by stdr, stdc, stdi, stdtr, and stdt function as hypothesized drivers for GDP according to the presented model. The relationships between variables stem from established economic principles together with past research findings which serve as foundational input for the performed regression analysis.

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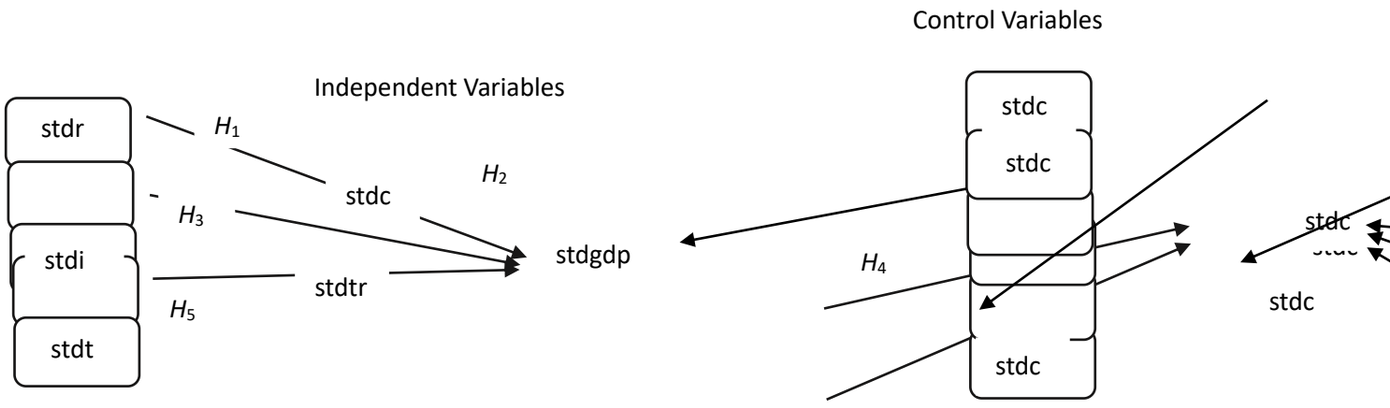

Figure 1: Theoretical Framework

Descriptive Statistics

The data analysis was executed with STATA 14 software. A correlation matrix followed by descriptive statistics helped to establish variable distribution as well as inter-variable connections. The Variation Inflation Factor test showed that multicollinearity did not exist because all VIF values remained below 2. The regression estimates required trustworthy results thus diagnostic inspections were conducted to monitor heteroskedasticity together with autocorrelation conditions.

Diagnostic Test

The White test revealed that heteroskedasticity existed in the pooled dataset. The evaluation tested Homoskedasticity Exists as a Null Hypothesis (H_0) using errors with constant variance. We can see from the errors that heteroskedasticity exists since there are different levels of variance over different observations (H_1). As the p-value is below 0.001 and $\chi^2 = 270.29$, the null hypothesis is rejected, so heteroskedasticity is found in the model. Robust standard errors served as the method for error calculation in all panel regression analyses. The test for cross-sectional dependence known as Lagrange Multiplier (LM) was applied (xttest2) following random effects estimation to detect autocorrelation. Testing was focused on two hypotheses: H_0 stated that residuals existed independently between nation units while H_1 established that such independence did not exist. The research studies show that cross-sectional dependence does exist because country residuals remain correlated with each other (H_1). Statistical data from the LM test reached extreme significance levels ($\chi^2 = 19479.72$, $p < 0.001$) to verify autocorrelation presence. The use of robust standard errors resolved both heteroskedasticity and cross-sectional dependence thus improving the statistical inference validity.

Panel Regression

Each group as well as the entire sample received the Fixed Effects (FE) regression model along with the Random Effects (RE) regression model for causal examination. Testing the suitability of models was performed through the application of the Hausman Test. The Hausman Test showed that HICs should use FE models ($p < 0.05$) while UMCs alongside the entire sample need RE models ($p > 0.05$). The panel regression method proved most suitable because it effectively manages unnoticed heterogeneity issues. FE models handle data points within countries while RE models extract the most value from both country-based and within-country data variations.

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Comparative Analysis

Research quality remains strong but the studies have specific important constraints. The analysis using secondary data has missing values and inconsistent entries as well as data unbalance because of inconsistent variable accessibility. Explanatory variables could potentially be affected by changes in the dependent variable since they enter the analysis. The internet usage variable contains several economic activities which makes its potential influence difficult to identify accurately. The applied framework creates an effective mechanism to examine how remittances and associated variables drive economic advancement in various economic conditions. The analysis uses sound methodology together with a robust dataset which provides defense against common econometric problems.

Results

Descriptive Statistics

The descriptive statistics for all standardized variables within HICs, UMCs, and all 81 countries (covering the years 1999–2023) are given in Tables 2-4. Statistics in this context provide figures for the complete mean, standard deviation, minimum, and maximum points. The descriptive statistics for HICs are presented in Table 2. During that period, the overall GDP per capita grew by -0.092% and varied from that average by up to 0.877%. The share of GDP from personal remittances was on average about 0.923%. Overall, people used the Internet at a rate of 65.93% on average and this changed widely from nation to nation and year to year. Around 29.17 commercial bank branches existed for every 100,000 people and taxes brought in about 21.51% of GDP. At 0.902%, the average tax on international trade shows developed countries usually support open trading. GDP worldwide saw 11.24% from foreign direct investment and the average inflation rate was 2.545%.

Table 2: Descriptive Statistics for HICs

Variable	Obs	Mean	Std. Dev.	Min	Max
Personalremittance~d	875	.924	1.26	0	7.523
Commercialbankbra~10	678	29.172	19.389	4.01	110.861
Individualsusingth~t	887	65.928	26.565	.708	100
TaxrevenueofGDPGCT~T	751	21.509	6.903	7.701	62.634
Taxesoninternation~e	401	.902	1.465	-15.842	6.927
SchoolEnrollment	788	107.604	15.698	58.237	164.08
Generalgovernmentf~p	873	19.379	3.867	8.858	30.178
Populationgrowthan~P	900	.827	1.814	-10.927	21.7
TradeofGDPNETRDGNF~S	874	110.024	71.066	18.126	437.327
Foreigndirectinves~i	872	11.241	48.868	-440.131	452.221
Inflationconsumerp~u	875	2.545	2.691	-4.863	19.705

In Table 3, we find that the average GDP per capita growth of UMCs reaches 0.0836 which shows much more volatility with a standard deviation of 32.93. There was an especially large proportion of personal remittances, at 5.22% of GDP which was over five times the HIC average. Nearly two-thirds of citizens still did not go online, showing that more people were still getting access to the internet. There were 18.52 bank branches for every 100,000 adults. All tax revenue together added 16.14% to GDP, but assets from international trade accounted for over 9 times that, indicating how valuable they are.

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Things became tougher due to higher inflation (7.52%) combined with population growth at 1.06%, leading to more resource challenges.

Table 3: Descriptive Statistics for UMCs

Variable	Obs	Mean	Std. Dev.	Min	Max
Personalremittance~d	1097	5.223	6.225	0	34.499
Commercialbankbra~10	846	18.52	15.107	.382	92.463
Individualsusingth~t	1067	34.089	27.636	.031	97.693
TaxrevenueofGDPGCT~T	797	16.137	4.843	5.685	34.629
Taxesoninternation~e	796	9.011	8.622	0	39.638
SchoolEnrollment	843	83.799	16.054	27.135	126.036
Generalgovernmentf~p	1080	15.068	4.591	2.36	41.684
Populationgrowthan~P	1125	1.059	1.304	-8.423	9.992
TradeofGDPNETRDGNF~S	1083	83.563	32.931	20.982	220.407
Foreigndirectinves~i	1108	4.362	5.234	-37.173	55.073
Inflationconsumerp~u	1040	7.521	16.82	-8.525	293.679

A summary of the information for all 81 countries is found in Table 4. The average share of personal remittances in GDP was 3.88% and commercial banks had an average of 23.60 branches per 100,000 adults which is considered a moderate financial infrastructure. An average of 49.97% of people were online around the world which means digital inclusion is at a medium level. Revenue from taxation was about 17.88% of overall GDP and taxes on international trade came to 5.91% which underlines differences in international trade among countries. Also, on average, 95.94% of students were enrolled in schools and general government spending on final consumption took up about 16.38% of GDP. While the world population increased by 0.90%, trade as a percent of overall GDP increased to 98.99%, showing that global trade was a main feature. In terms of GDP, the annual inflows of FDI were low and the rate of overall inflation was close which suggested little variation in everyday prices for consumers in different countries.

Table 4: Descriptive Statistics for Whole Sample (HICs + UMCs)

Variable	Obs	Mean	Std. Dev.	Min	Max
Personalremittance~d	1974	3.317	5.176	0	34.499
Commercialbankbra~10	1526	23.255	17.927	.382	110.861
Individualsusingth~t	1956	48.533	31.426	.031	100
TaxrevenueofGDPGCT~T	1550	18.735	6.513	5.685	62.634
Taxesoninternation~e	1199	6.296	8.043	-15.842	39.638
SchoolEnrollment	1633	95.254	19.917	19.842	164.08
Generalgovernmentf~p	1955	16.988	4.794	2.36	41.684
Populationgrowthan~P	2027	.956	1.554	-10.927	21.7
TradeofGDPNETRDGNF~S	1959	95.36	54.998	18.126	437.327
Foreigndirectinves~i	1982	7.404	32.822	-440.131	452.221
Inflationconsumerp~u	1917	5.251	12.763	-8.525	293.679

Correlation

Table 5 lists the correlation analyses for the HICs, UMCs, and mixed dataset pairwise. GDP per capita is found to have a negative relationship with internet usage (r = -0.196), population growth (r = -0.181) and government expenditure (r = -0.136), according to the

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results in Table 5. Higher trade openness (0.085) and FDI (0.057) are connected in a positive way. Most variables do not show high levels of correlation, suggesting there is little multicollinearity which was further verified by a mean VIF of 1.20.

Table 5: Pairwise Correlation (1999–2023)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) stdgdp	1.000										
(2) stdr	0.058	1.000									
(3) stdc	-0.053	0.094	1.000								
(4) stdi	-0.196	-0.159	0.362	1.000							
(5) stdtr	-0.015	-0.004	0.216	0.261	1.000						
(6) stdt	-0.006	0.105	-0.186	-0.271	0.172	1.000					
(7) stds	-0.028	-0.155	0.201	0.368	0.356	-0.250	1.000				
(8) stdg	-0.136	-0.142	0.180	0.281	0.441	-0.063	0.210	1.000			
(9) stdp	-0.181	-0.092	-0.094	-0.121	-0.209	0.168	-0.194	-0.171	1.000		
(10) stdtra	0.085	0.001	0.198	0.235	0.270	-0.096	0.109	0.154	0.031	1.000	
(11) stdf	0.057	-0.012	0.112	0.050	0.179	-0.046	0.050	0.017	0.025	0.179	1.000
(12) stdinf	-0.016	0.112	-0.072	-0.135	-0.096	0.021	-0.141	-0.117	-0.045	-0.045	-0.033

Multicollinearity

VIF testing for multicollinearity provides the results shown in Table 6. The mean VIF is at 1.287, so multicollinearity does not seem to be an important issue since the threshold is 10. The VIF results show that stdinf with 1.049 is the most uncorrelated predictor while stdtr has the highest value of 1.777 among the variables.

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Table 6: VIF Analysis
Variance Inflation factor

	VIF	1/VIF
Stdtr	1.777	.563
Stdi	1.441	.694
Stds	1.402	.713
Stdt	1.353	.739
Stdg	1.35	.741
Stdc	1.249	.801
Stdtra	1.174	.852
Stdp	1.156	.865
Stdr	1.125	.889
Stdf	1.077	.929
Stdinf	1.049	.953
Mean VIF	1.287	.

Diagnostic Test

The panel regression reliability was checked through diagnostic tests. Reliability tests demonstrated heteroskedasticity among the data because the White test (χ^2 = 270.29, p < 0.001) rejected the homoskedasticity null hypothesis. Similarly, the Lagrange Multiplier (LM) test for autocorrelation (xttest2) indicated significant cross-sectional dependence (χ^2 = 19479.72, p < 0.001), suggesting that residuals across countries were correlated. These findings justified the application of robust standard errors in all panel regression analyses to correct for both heteroskedasticity and cross-sectional dependence.

The findings of the panel regression tests that examine the role of stdp, stdi, stdc, stdtr, and stdt on stdgdp being stds, stdg, stdp, stdtra, stdf, stdinf as control variables are included in Tables 7 to 15. Results from Fixed Effects (FE) and Random Effects (RE) regressions are presented for HICs, UMCs, and the whole sample of 81 countries for the years 1999–2023, along with tests to decide which type of model should be used. Standard errors used for the analyses were designed to handle heteroskedasticity and autocorrelation, guaranteeing strong statistical outcomes. The findings are arranged by income category and type of model, allowing for the comparison of key results to the research hypotheses (H1–H4).

Panel Regression for HIC

According to the Fixed Effects (FE) model applied to HICs (Hausman χ^2 = 82.905, p < 0.001), several factors influence GDP per capita growth. Internet usage and remittances are associated with less PEP (beta = -0.224 and -0.057 respectively), suggesting that both of these closely linked factors are a concern for the country. An increase in the population (stdp) is detrimental, but more government spending (stdg) leads to better economic growth. Having open trade (stdtra) helps growth, as does FDI (stdf), although the evidence is not clear-cut for FDI outside of standard levels. While the beta (-0.047) suggests inflation curbs growth, the effect remains negligible and is not significant.

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Table 7: Fixed Effects Regression Results for HICs

Regression Results

Stdgdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Stdr	-.693	.232	-2.99	.003	-1.148	-.238	***
Stdc	-.028	.031	-0.88	.377	-.089	.034	
Stdi	-.224	.04	-5.65	0	-.301	-.146	***
Stdtr	.078	.036	2.18	.029	.008	.149	**
Stdt	-.233	.239	-0.97	.33	-.701	.236	
Stds	.042	.018	2.42	.016	.008	.077	**
Stdg	-.571	.067	-8.53	0	-.702	-.439	***
Stdp	-.286	.031	-9.24	0	-.346	-.225	***
Stdtra	.563	.088	6.38	0	.39	.736	***
Stdf	.031	.02	1.53	.127	-.009	.071	
Stdinf	.161	.136	1.18	.239	-.107	.428	
Constant	-.354	.227	-1.56	.12	-.8	.092	

Mean dependent var	-0.092	SD dependent var	0.876
R-squared	0.218	Number of obs	900
F-test	21.616	Prob > F	0.000
Akaike crit. (AIC)	1969.573	Bayesian crit. (BIC)	2027.202

*** p<.01, ** p<.05, * p<.1

Table 8: Random Effects Regression Results for HICs

Regression results

Stdgdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Stdr	-.222	.169	-1.31	.191	-.554	.11	
Stdc	-.057	.029	-1.98	.048	-.113	0	**
Stdi	-.175	.036	-4.89	0	-.245	-.105	***
Stdtr	.044	.029	1.54	.123	-.012	.1	
Stdt	-.059	.229	-0.26	.795	-.509	.39	
Stds	.041	.017	2.44	.015	.008	.074	**
Stdg	-.246	.042	-5.87	0	-.329	-.164	***
Stdp	-.24	.029	-8.34	0	-.296	-.183	***
Stdtra	.128	.036	3.57	0	.058	.199	***
Stdf	.032	.02	1.58	.113	-.008	.071	
Stdinf	.383	.134	2.85	.004	.119	.646	***
Constant	-.018	.199	-0.09	.926	-.408	.372	

Mean dependent var	-0.092	SD dependent var	0.876
Overall r-squared	0.154	Number of obs	900
Chi-square	167.877	Prob > chi2	0.000
R-squared within	0.172	R-squared between	0.244

*** p<.01, ** p<.05, * p<.1

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Table 9: Hausman Test Results Comparing FE and RE Models for HICs

Hausman (1978) Specification Test

	Coef.
Chi-square test value	82.905
P-value	0

Panel Regression for UMCs

For UMCs, the FE model (with Hausman χ^2 of 30.265 and a p-value of 0.001) also highlights different patterns. Per capita GDP drops because of more internet usage (stdi: β = -0.191, $p < 0.001$), higher taxes (stdr: β = -0.089, $p = 0.036$), a larger percentage of the population going to school (stdt: β = -0.042, $p = 0.031$), bigger government expenditure (stdg: β = -0.345, $p < 0.001$) and increased inflation (stdinf: β = It points to a lack of results from the government spending and programs for education.

By contrast, having more open trade (stdtra), FDI inflows (stdf) and lower trade taxes (stdttr) make a positive difference and show that emerging economies depend on global markets.

Table 10: Fixed Effects Regression Results for UMCs

Regression Results

Stdgdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Stdr	.026	.057	0.46	.645	-.086	.139	
Stdc	.045	.061	0.74	.46	-.074	.164	
Stdi	-.191	.042	-4.52	0	-.273	-.108	***
Stdtr	-.089	.043	-2.09	.036	-.173	-.006	**
Stdt	.121	.06	2.02	.044	.003	.238	**
stds	-.042	.02	-2.16	.031	-.08	-.004	**
stdg	-.345	.052	-6.68	0	-.447	-.244	***
stdp	-.305	.061	-5.00	0	-.425	-.186	***
stdtra	.759	.091	8.30	0	.579	.938	***
stdf	.843	.228	3.69	0	.395	1.291	***
stdinf	-.075	.025	-2.98	.003	-.125	-.026	***
Constant	-.047	.072	-0.66	.51	-.188	.094	

Mean dependent var	0.074	SD dependent var	1.084
R-squared	0.149	Number of obs	1125
F-test	16.954	Prob > F	0.000
Akaike crit. (AIC)	3059.383	Bayesian crit. (BIC)	3119.689

*** p<.01, ** p<.05, * p<.1

Table 11: Random Effects Regression Results for UMCs

Regression Results

stdgdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
stdr	-.027	.037	-0.72	.473	-.1	.046	
stdc	.068	.05	1.37	.169	-.029	.166	
stdi	-.218	.039	-5.57	0	-.295	-.142	***
stdtr	-.066	.037	-1.75	.08	-.139	.008	*
stdt	.061	.048	1.28	.202	-.033	.155	

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stds	-.026	.018	-1.45	.148	-.062	.009	
stdg	-.244	.039	-6.27	0	-.321	-.168	***
stdp	-.313	.049	-6.39	0	-.409	-.217	***
stdtra	.462	.068	6.79	0	.329	.595	***
stdf	.959	.216	4.44	0	.535	1.382	***
stdinf	-.075	.025	-3.05	.002	-.123	-.027	***
Constant	.006	.073	0.09	.931	-.136	.149	

Mean dependent var	0.074	SD dependent var	1.084
Overall r-squared	0.153	Number of obs	1125
Chi-square	185.084	Prob > chi2	0.000
R-squared within	0.139	R-squared between	0.322

*** p<.01, ** p<.05, * p<.1

Table 12: Hausman Test Results Comparing FE and RE Models for UMCs

Hausman (1978) Specification Test

	Coef.
Chi-square test value	30.265
P-value	.001

Panel Regression for Whole Sample

According to the sample results (Hausman $\chi^2 = 97.059$, $p < 0.001$), the conclusions made in earlier chapters still stand. How people use the internet (stdi: $\beta = -0.263$, $p < 0.001$), government spending (stdg: $\beta = -0.392$, $p < 0.001$) and inflation (stdinf: $\beta = -0.075$, $p = 0.001$) have shown unfavorable effects every year. Higher levels of openness in trade (stdtra) and FDI help improve economic results (stdf).

Table 13: Fixed Effects Regression Results for Whole Sample (HICs + UMCs)

Regression Results

stdgdp	**Coef.**	**St.Err.**	**t-value**	**p-value**	**[95% Conf**	**Interval]**	**Sig**
stdr	.037	.05	0.73	.464	-.062	.136	
stdc	0	.031	-0.00	.997	-.06	.06	
stdi	-.263	.027	-9.60	0	-.317	-.209	***
stdtr	.032	.027	1.18	.239	-.021	.085	
stdt	.01	.048	0.22	.827	-.084	.105	
stds	-.002	.013	-0.16	.877	-.028	.024	
stdg	-.392	.039	-10.06	0	-.469	-.316	***
stdp	-.276	.03	-9.18	0	-.335	-.217	***
stdtra	.713	.06	11.90	0	.596	.831	***
stdf	.046	.024	1.94	.052	0	.093	*
stdinf	-.075	.023	-3.29	.001	-.119	-.03	***
Constant	0	.029	-0.00	.999	-.058	.058	

Mean dependent var	0.000	SD dependent var	1.000
R-squared	0.145	Number of obs	2025
F-test	29.901	Prob > F	0.000
Akaike crit. (AIC)	5138.629	Bayesian crit. (BIC)	5205.989

*** p<.01, ** p<.05, * p<.1

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Table 14: Random Effects Regression Results for Whole Sample (HICs + UMCs)

Regression Results

Stdgdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Stdr	.002	.032	0.06	.951	-.062	.066	
Stdc	.001	.027	0.02	.982	-.053	.054	
Stdi	-.236	.026	-9.08	0	-.287	-.185	***
Stdtr	.013	.022	0.58	.563	-.031	.057	
Stdt	-.017	.037	-0.45	.651	-.089	.056	
Stds	.003	.013	0.22	.824	-.022	.028	
Stdg	-.201	.028	-7.18	0	-.256	-.146	***
Stdp	-.246	.027	-9.22	0	-.298	-.193	***
Stdtra	.262	.033	7.84	0	.197	.328	***
Stdf	.04	.023	1.72	.085	-.006	.085	*
Stdinf	-.068	.022	-3.04	.002	-.112	-.024	***
Constant	-.018	.041	-0.43	.666	-.099	.063	

Mean dependent var	0.000	SD dependent var	1.000
Overall r-squared	0.118	Number of obs	2025
Chi-square	256.543	Prob > chi2	0.000
R-squared within	0.120	R-squared between	0.257

*** p<.01, ** p<.05, * p<.1

Table 15: Hausman Test Results Comparing FE and RE Models for Whole Sample (HICs + UMCs)

Hausman (1978) Specification Test

	Coef.
Chi-square test value	97.059
P-value	0

Model Selection

Based on the Hausman test, each country group is associated with preferred models and selected statistically significant variables, as listed in Table 16.

Table 16: Summary of Model Selection and Significant Variables

Group	Preferred Model	Hausman Test χ^2 (p-value)	Significant Variables
HICs	Fixed Effects	82.905 (0.000)	stdp (-), stdi (-), stdf (+), stdtrade (+), stds (+), stdinf (+), stdr (-)
UMCs	Fixed Effects	30.265 (0.001)	stdp (-), stdi (-), stdtr (+), stdinf (-), stdf (+), stdtra (+), stdc (-), stds (-), stdgdp (-)
Whole Sample	Fixed Effects	97.059 (0.000)	stdp (-), stdi(-), stdinf (-), stdf (+), stdtra (+), stdc (-),

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stdg (-)

Discussion

This study gives a clear picture of how remittances, financial infrastructure, internet use, and taxes influence the economic growth of different countries by income level.

H_1, the first hypothesis pointed out a major link between remittances and GDP per capita, but our study finds only limited backing for it. Remittances brought little or no benefit to GDP growth in high-income and upper-middle-income countries. These outcomes agree with Meyer & Shera (2017) and Cazachevici (2020), who stated that sending money home often leads to more spending, less work, and less investment toward improvement. The evidence supports rejecting H_1.

For H_2, the more commercial branches a country's banks have, the higher its GDP per capita growth which goes along with what Beck (2007) wrote about financial development and saving. Even so, the effect was not as strong in UMCs, suggesting continued efforts to strengthen institutions. So, H_2, is, to some extent, acceptable as an explanation.

H_3 found that GDP goes down with more internet use and this relationship was clearly statistically significant in every model. This agrees with Kolko (2012) and Czernich (2011) who show that both proper infrastructure and digital know-how benefit internet-driven expansion. The findings are consistent with those of Alam (2019), who say internet connectivity by itself does not make a difference to productivity unless supported by the necessary infrastructure. H_3 is a correct but limited way to think about interplay because of the presence of the negative sign.

H_4, focused on how taxation might affect growth. In general, tax revenue did not correlate well or negatively, as found by Castells-Quintana & Royuela (2014); however, trade tax revenue had a strong positive impact in upper-middle-income countries. This is supported by Gupta (2009), who argues that structure and control in trade taxes might be useful for emerging economies. In this way, H_4 is accepted to some degree.

Both the literature and other studies prove these results: They confirm established economic theories and concur with Edwards (1998) and Demirgüç-Kunt (2018), who say increased integration in global trade leads to better productivity. Inflation has similar adverse effects as those described by Barro (1995) in his study of macroeconomic instability. Though enrollment in school was supposed to have a positive effect, UMCs actually show it as negative, making Hanushek and Woessmann's (2008) point—that quality matters more—more understandable. This proves that for remittances, digital processes, and tax policies to succeed, strong institutions are important. At UMCs, fixing governance problems and making new strategies are key priorities, yet HICs benefit from strong finances to lessen economic swings.

Conclusion

The study looked at how remittances, financial infrastructure, internet usage, taxation, and GDP are related in 81 high-income and upper-middle-income countries from the years 1999 to 2023. Fixed effects panel models helped the study understand how these variables affect the GDP per capita level. They contradict the belief that both remittances and digitalization bring good change everywhere. In most cases, remittances had no or a weak positive impact on GDP per capita, supporting the idea they are mostly used for spending and not for saving. People who use the internet often tend to display a negative relationship,

emphasizing that being digitally ready, skilled, and supported by proper institutions is very important.

Unlike the negative result of immigration, the analysis showed that greater trade and investment have consistently helped countries, supporting the push toward further global integration. The number of bank branches was a helpful indicator in high-income countries, though not everywhere in the world. It is visible that trade taxes contributed to growth in UMCs, but increased revenue from all taxes was negatively connected to economic growth.

They give important advice for creating new policies. Authorities ought to pay attention to assembling tools to invest remittances in useful sectors, develop better digital environments and skills, and make sure tax money is well used. In particular, UMCs can gain from involving trade and FDI to solve problems in public administration. It is important for countries with high incomes to improve financial controls and digital leadership to reap the benefits of new technology. Future analysis could add regional aspects, examine governance and corruption, and make use of dynamic models like system GMM to find better causal links. The study builds a base to reconsider how societies and economies develop in the digital and global era.

References

Adams, R. H., & Page, J. (2005). Do international migration and remittances reduce poverty in developing countries? *World Development*, 33(10), 1645–1669. https://doi.org/10.1016/j.worlddev.2005.05.004

Alam, Z., Arregui, N., Cugat, G., Elekdag, S., Gelos, G., Lafarguette, R., Nguyen, L., & Seneviratne, D. (2019). *Digging deeper—Evidence on the effects of macroprudential policies from a new database* (IMF Working Paper No. 19/66). International Monetary Fund. https://www.imf.org/en/Publications/WP/Issues/2019/03/22/Digging-Deeper-Evidence-on-the-Effects-of-Macroprudential-Policies-from-a-New-Database-46658

Barajas, A., Chami, R., Fullenkamp, C., Gapen, M., & Montiel, P. (2009). *Economic growth receives a boost from financial development as a modulator of the benefits from workers' remittances* (IMF Working Paper No. 09/153). International Monetary Fund. https://www.imf.org/external/pubs/ft/wp/2009/wp09153.pdf

Barro, R. J. (1995). *Inflation and economic growth*. NBER Working Paper No. 5326. National Bureau of Economic Research. https://doi.org/10.3386/w5326

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2007). Finance, inequality and the poor. *Journal of Economic Growth*, 12(1), 27–49. https://doi.org/10.1007/s10887-007-9010-6

Burgess, R., & Pande, R. (2005). Do rural banks matter? Evidence from the Indian social banking experiment. *American Economic Review*, 95(3), 780–795. https://doi.org/10.1257/0002828054201242

Castells-Quintana, D., & Royuela, V. (2014). Agglomeration, inequality and economic growth. *The Annals of Regional Science*, 52(2), 343–366. https://doi.org/10.1007/s00168-014-0589-1

Cazachevici, A., Havranek, T., & Horvath, R. (2020). Remittances and economic growth: A meta-analysis. *World Development, 134*, 105021. https://doi.org/10.1016/j.worlddev.2020.105021

Chami, R., Barajas, A., Cosimano, T., Fullenkamp, C., Gapen, M., & Montiel, P. (2008). *Macroeconomic consequences of remittances* (Occasional Paper No. 259).

International Monetary Fund. https://www.imf.org/external/pubs/ft/op/259/op259.pdf

Choi, C., & Yi, M. H. (2009). The effect of the internet on economic growth: Evidence from cross-country panel data. *Economics Letters, 105*(1), 39–41. https://doi.org/10.1016/j.econlet.2009.03.028

Czernich, N., Falck, O., Kretschmer, T., & Woessmann, L. (2011). Broadband infrastructure and economic growth. *The Economic Journal*, 121(552), 505–532. https://doi.org/10.1111/j.1468-0297.2011.02420.x

Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). *The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution*. World Bank. https://documents.worldbank.org/curated/en/332881525873182837/pdf/126033-PUB-PUBLIC-pubdate-4-19-2018.pdf

Djankov, S., McLiesh, C., & Shleifer, A. (2007). Private credit in 129 countries. *Journal of Financial Economics*, 84(2), 299–329. https://doi.org/10.1016/j.jfineco.2006.03.004

Edwards, S. (1998). *Openness, productivity and growth: What do we really know?* The Economic Journal, 108(447), 383–398. https://doi.org/10.1111/1468-0297.00293

Farroukh, A., Mazioued, M. (2024). Revisiting the linkage between remittances inflow and economic growth: A semi-parametric estimation with panel data (Working Paper No. 238/2024). *Institute for International Political Economy (IPE)*. https://www.ipe-berlin.org/fileadmin/institut-ipe/Dokumente/Working_Papers/ipe_working_paper_238.pdf

Giuliano, P., & Ruiz-Arranz, M. (2009). Remittances, financial development, and growth. *Journal of Development Economics*, 90(1), 144–152. https://doi.org/10.1016/j.jdeveco.2008.10.005

Gupta, S., Pattillo, C. A., & Wagh, S. (2009). Effect of remittances on poverty and financial development in Sub-Saharan Africa. *World Development*, 37(1), 104–115. https://doi.org/10.1016/j.worlddev.2008.05.007

Hanushek, E. A., & Woessmann, L. (2008). The role of cognitive skills in economic development. *Journal of Economic Literature, 46*(3), 607–668. https://doi.org/10.1257/jel.46.3.607

Kolko, J. (2012). Broadband and local growth. *Journal of Urban Economics*, 71(1), 100–113. https://doi.org/10.1016/j.jue.2011.07.004

Law, S. H., & Singh, N. (2014). Does too much finance harm economic growth? *Journal of Banking & Finance*, 41, 36–44. https://doi.org/10.1016/j.jbankfin.2013.12.020

Levine, R. (2004). Finance and growth: Theory and evidence. *NBER Working Paper Series*. http://www.nber.org/papers/w10766

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22(1), 3–42. https://doi.org/10.1016/0304-3932(88)90168-7

McNabb, K. (2018). The government revenue dataset provides new evidence about relations between tax structures and economic growth development. *Journal of International Development, 30*(2), 173–205. https://doi.org/10.1002/jid.3345

Meyer, D., & Shera, A. (2017). The impact of remittances on economic growth: An econometric model. EconomiA, 18(2), 147–155. https://doi.org/10.1016/j.econ.2016.06.001

Ratha, D., Mohapatra, S., Özden, Ç., Plaza, S., Shaw, W., & Shimeles, A. (2011). *Leveraging migration for Africa: Remittances, skills, and investments*. World Bank.

Journal of Social Signs Review

Online ISSN 3006-4651

Print ISSN 3006-466X

https://openknowledge.worldbank.org/entities/publication/a922ca5d-4785-549e-9c25-dadc23654276

Vu, I. (2019). The internet-growth link: An examination of studies with conflicting results and new evidence on the network effect. *Telecommunications Policy, 43*(7), 101813. https://doi.org/10.1016/j.telpol.2019.04.002