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Evaluation of the Long-Term Stability and Impact of Remittances and Development Aid on Sustainable Economic Growth in Developing Countries

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Abstract: In our paper, we analyse the long-term stability and impact of remittances and development aid on sustainable economic growth in developing countries. We use two data samples from countries that were recipients of both aid and remittances in the corresponding period. First, unbalanced data from the years 1970 to 2017; that is, how countries appear in the data. Second, balanced data, where we selected the largest possible set of countries for which data exists without gaps from the years 1970–2017. This dataset consists of 57 countries for the period from 1991 to 2017. Using linear regression models, we conclude that up until the end of the 1980s, the size of aid as a share of gross domestic product (GDP) was larger than the share of remittances. After that, the situation changed and the shares of both inflows were broadly similar. The inflow of remittances was more stable than the inflow of aid and development aid did not (on the contrary to remittances) contribute positively to sustainable economic growth if we consider the entire period between 1970 and 2017. Our results suggest that a statistically significant relationship between development aid and economic growth (per capita) may be observed only in the period from 1990 to 1999. Economic growth in developing countries is negatively influenced by the uncertainty related to the flows of official development assistance (ODA) and aid in all investigated decades. In the case of the remittance flows, the increased volatility tends to contribute negatively to sustainable economic growth only when the remittance flows represent a relatively higher share of GDP.

Keywords: remittances; development aid; developing countries; sustainable economic growth; social inequality; migration

1. Introduction

Over the past few decades, workers' remittances have grown to become one of the largest sources of financial flows to developing countries (defined as low income and middle-income economies), often dwarfing other widely studied sources such as private capital and official aid flows [1]. Links between migration and development have been researched with increasing intensity since the 1990s and a new paradigmatic approach—the 'migration and development nexus'—has appeared. Various reasons lead to the increasing interest in migration and development. Namely, among other things, the absolute growth of international migrants to industrialised countries [2,3], an increasing amount of remittances in the last two decades [4,5] and their impacts on growth [6–10]. Many authors focused on questions dealing with the contribution of development aid to economic growth, poverty reduction and

migration from developing countries [11–14]. Some authors focus on the impact of sustainable social and economic development in less-developed migrant-sending countries on migrant flows from those countries to developed countries [15] and the problems related to the ageing population in Europe and other developed countries. Disillusion from the small effectiveness of traditional development tools such as development aid for more than the last six decades and other financial flows such as foreign direct investments are also factors, among others.

According to Reference [16], scientists are facing serious difficulties in understanding the complex relationships between migration and sustainable economic development. These problems include the inconclusive nature of the empirical evidence that is too narrowly defined based on case studies. For this reason, they recommend focusing on the assessment of existing research evidence and prioritising studies with a larger scale, especially in comparative studies. These studies should also attempt to focus on comparing the importance of individual development interventions and other financial flows that have an impact on economic development such as development aid and remittances.

The main objective of this paper is to analyse the long-term stability of development aid and remittances (personal remittances and personal transfers received) and their impact on sustainable economic growth in developing countries. The primary research questions are:

1. Which of these two financial flows was larger relative to the size of gross domestic product (GDP)?
2. Which of these two financial flows was more stable in terms of flows into developing economies?
3. What is the impact of development aid and remittances on sustainable economic growth in developing countries?
4. What role plays the stability of development aid and remittances flows in sustainable economic growth in developing countries?

To achieve our objectives, we use linear regression model methods to investigate the relationship between sustainable (long-term) economic growth and financial flows and to evaluate the overall stability of these flows. We use two data sets based on the World Development Indicators database [17]. The first data set is an unbalanced data set of 159 countries (for years 1970 through 2017) with corresponding indicators of remittances and development aid. The second dataset is a balanced dataset of 57 countries (for years 1991 to 2017, which is the most recent year in this database). The selected countries see no gaps in received development aid, official development assistance (ODA) and remittances in the given period. Our econometric approach and dealing with the data differ from other papers focused on this topic. We try to study the overall stability and tendencies in the development aid and remittance inflow and the possible structural changes in their impact on economic growth. Most of the studies aim at one or more countries or smaller subsamples and the corresponding results are thus not general. Moreover, the problem of stability (or volatility) is rarely mentioned and we try to fill this existing gap in the literature. Using the relatively big sample of countries allows us to prove the overall importance of remittances and development aid in sustainable economic growth and to check the robustness of these results concerning the investigated time period. Our results and proposed methodology may thus contribute significantly to the extant literature.

2. The Concept of Development Aid and Remittances

For our paper, we use the term development aid as the sum of the net official development assistance and official aid (OA) received. Development aid has been one of the fundamental tools for development interventions over the last six decades. According to the World Bank definition [18]: "net official development assistance (ODA) consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions and by non-DAC countries to promote economic development and welfare in countries and territories in the DAC list of ODA

recipients. It includes loans with a grant element of at least 25 per cent (calculated at a rate of discount of 10 per cent)." Net official aid flowed from official donors to countries and territories in part II of the DAC list of recipients. Part II of the DAC List was abolished in 2005. The collection of data on official aid and other resource flows to Part II countries thus ended with the data from 2004. Part II was a selection of more advanced countries in Central and Eastern Europe, countries of the former Soviet Union and certain advanced developing countries and territories; and official aid was provided under terms and conditions like those for ODA [18].

For measuring and classifying ODA and other resource flows originating from DAC members of the Organisation for Economic Co-operation and Development (OECD) member countries, 'the DAC list of ODA recipients' is usually reviewed every three years. Figure 1 depicts the long-term development of aid flow. It shows a rising trend in the amount of ODA received by the countries, although the relative share of the net ODA seems to be stable overall from the 1990s onward.

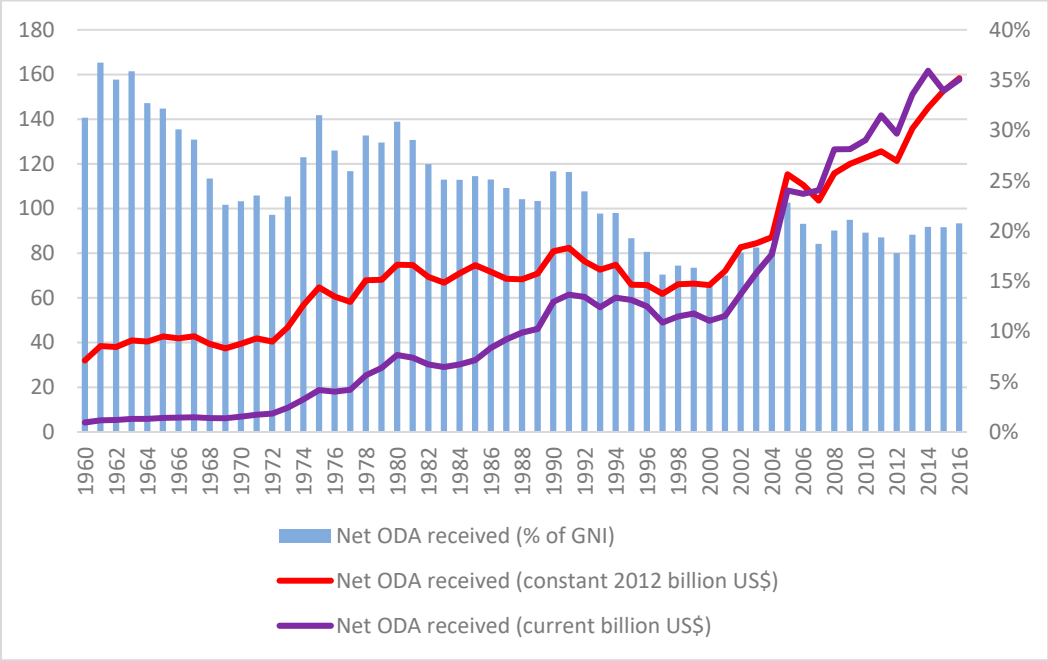

Figure 1. Development of official development assistance (ODA) flow (1960–2016), source [17].

In this paper, we understand the term remittance flows as the sum of personal remittances received. Personal remittances comprise several different transaction formats—personal transfers, compensation of employees and capital transfers between households. Data are made up to the sum of two items defined in the sixth edition of the IMF's Balance of Payments Manual: personal transfers and compensation of employees [17]. Personal transfers consist of all current transfers in cash or in kind made or received by resident households to or from non-resident households. Personal transfers thus include all current transfers between resident and non-resident individuals. Compensation of employees refers to the income of border, seasonal and other short-term workers who are employed in an economy where they are not residents and of residents employed by non-resident entities [19]. In the list of standard components of the balance of payments accounts, "workers' remittances" have been replaced by "personal transfers" (for more details, see Reference [20]). Figure 2 shows the rising trend of remittances flows.

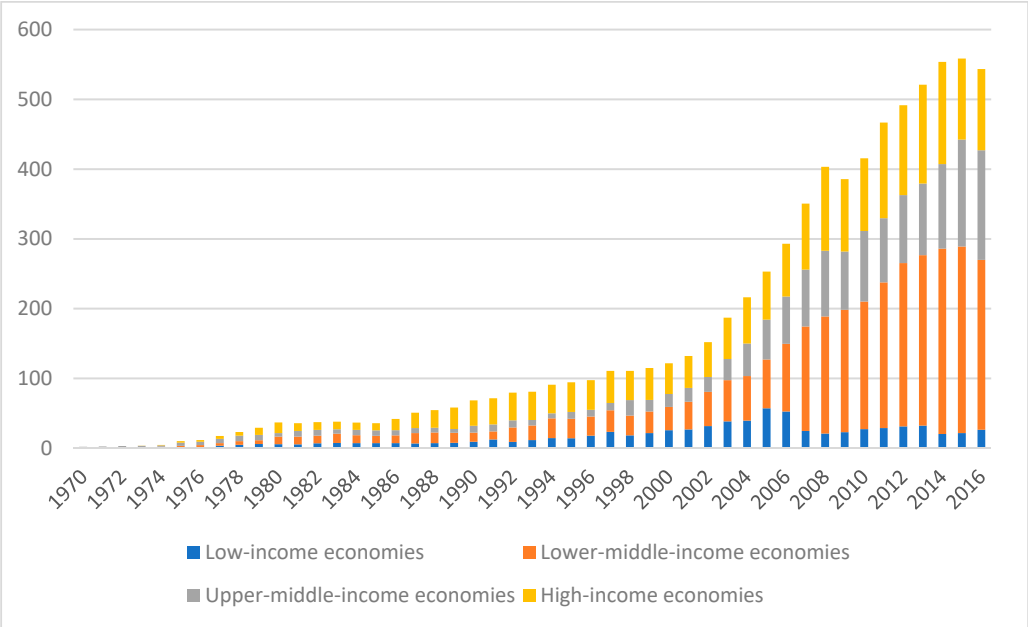

Figure 2. Development of the flow of remittances (1970–2016), current billion US$, source [17].

The remittances flows are mostly directed into the low middle-income and upper-middle-income countries. Comparing the low volumes of the remittances in the 1970s with the corresponding volumes in the 2000s forces us to investigate their impact on economic growth separately for all decades. On the other hand, the unbalanced development of the remittances flows in the low-income economies requires a focus on the stability of these flows. These issues are fully considered within our approach.

3. Literature Review

Views on the stability (including the long-term stability) of remittances diverge. For example, Reference [21] highlights the general stability of remittances. Similarly, other authors [22] write that remittances are more stable than aid and other forms of foreign capital. This conclusion can be true on a country level as well, as [23] found that remittances were a less volatile source of external finance than foreign direct investment (FDI) and ODA in their case study of Pakistan. On the contrary, Reference [24] conclude, on a large sample of developing countries, that aid was more stable than remittances, which were, in turn, more stable than FDI in the 1980–2007 period. Reference [25] writes that the "unpredictability" of aid has a negative impact on aid wasting—in a typical case, one-fifth of aid was wasted. In this way, Reference [26] argue that aid has stronger growth effects if recipients receive more aid from donors who allow for (temporary) worker mobility and (more permanent) migration where higher remittances paid by donor countries strengthen the growth effects of foreign aid. Reference [7] investigated the different regional effect of remittances, aid and FDI on growth based on the methods used.

The main purpose of development aid is to help economically disadvantaged regions in their efforts to raise the living standards of their population [27] and to support the sustainable knowledge-based [28], environmental [29], social and economic development. Over the years, the debate about the effectiveness of aid has been characterised by controversy, with aid optimists at one extreme and aid sceptics at the other (see References [30–32], for example). Aid optimists believe that aid is supposed to fill the investment-savings gap (and other gaps). The increase in investment should then lead to higher and more sustainable economic growth and an increase in per capita income (for example Reference [33]) or have a negative impact on migration flows [14]. Among others, for example, Reference [34] conclude that aid has a significant impact on economic growth. Similarly, Reference [35] finds a positive impact of aid in Asian countries and [13], using a panel of

142 countries over the time period of 1973–2012, suppose that aid helps dampen the negative effects of macroeconomic volatility on the distribution of income, while remittances do not. Reference [36] presents evidence of a positive impact of aid on growth, although this impact is rather promoted by structural changes, improved social indicators and reduced poverty which may be affected by the development aid. On the other hand, several authors conclude the opposite—for example, References [37–39] point out that there is very little evidence that decades of official aid transfers have notably contributed to the long-term economic growth in developing economies. The impact of wealth transfers as remittances and foreign aid was studied and quantified by Reference [40]. They used a simulated dynamic stochastic general equilibrium model calibrated on data from 85 recipient countries. The positive effect of foreign aid (and remittances) may be thus caused by the theoretical model framework.

In this way, results by Reference [41] indicate that developmental aid can promote long-run growth in case, when the development aid finances investments into physical infrastructure, organisational development and human capabilities. In other cases, the development aid is inherently inefficient, according to Reference [41]. According to the models of Reference [42], it is beneficial for the donor country to increase development aid as the co-financing rate by the recipient country increases. It results from the fact that development aid may help decrease the immigration cost and support economic development. Furthermore, Reference [14] obtain evidence of a negative relationship between the total aid a country receives and the emigration rates. This relationship holds for the poorer part of recipient countries, which suggests that the budgetary constraint channel does not play a significant role in shaping migration decisions. The most plausible explanation for these contrasting results is that, unlike in previous studies, authors [14] use the flows of migrant rather than the stocks of migrants as dependent variable.

A negative effect of the aid in the long run was confirmed by Reference [43] which studied the short- and long-run effects of remittances, aid and financial deepening on growth in Guyana (using cointegration techniques). The effectiveness of the foreign aid was deeply analysed by Reference [44]. This paper examined the effectiveness of foreign aid for economic growth in the six poorest and highly aid-dependent African countries and showed that the long run effect of aid on growth might be found to be negative for most of these countries.

Views on the impact of remittances on sustainable economic growth are varied as well, regardless of sample size or the geography of the studied countries. For example, using panel vector autoregression, Reference [45] discovers that remittances have a positive, albeit small, impact on economic growth. Similarly, Reference [46] find that all sources of foreign capital have a positive and statistically significant impact on sustainable economic growth when controlling the effect of the institutions. And on the regional level, for example, Reference [10] in the case of Central and East European Countries, Reference [9] in the case of the Balkan states, Reference [8] in the case of South Asia and Reference [7] in the case of Latin America and the Caribbean, suggest that remittances have a positive impact on growth.

It is possible to find comparable results when individual countries are studied. For example, Reference [47] writes about the positive impact of remittances on Tonga's economic growth. Using dynamic data panel estimates, Reference [48] finds that remittances exert a weakly positive impact on long-term macroeconomic growth. On the contrary, Reference [1] concludes that at best, workers' remittances have no impact on economic growth. Reference [49] discovered that in Bangladesh, the growth effect of remittances was firstly negative but became positive at a later stage of development in the 1974–2006 period. In this way, Reference [12] shows in his analysis that remittances accentuate, not ameliorate poverty in countries with a low level of financial development. The multi-country analysis was carried out by Reference [50]. This paper examined the relationship between remittances and economic growth for a sample of 62 developing countries over the period 1990–2014. Reference [50] emphasised the role of openness because the remittances seem to promote growth only in more opened countries. More important growth factors are the quality of domestic institutions and the overall

macroeconomic environment in the receiving country. Positive short and long-run effect of remittances in Guyana was proved by Reference [43] where the Granger-causality test reveals the influence of capital stock, development aid and financial deepening on remittances inflow. Reference [51] examined the impact of remittances on the economic growth in Kyrgyzstan and Macedonia. Their results proved a long-run positive impact of remittances on the economic growth of these countries. Causality tests showed that remittances support economic growth for Kyrgyzstan, whereas economic growth appears to support remittances inflow for Macedonia. A causal link between remittances and economic growth in Bangladesh, India and Sri Lanka was studied by Reference [52]. Using vector autoregressive models, this paper that growth in remittances does lead to economic growth in Bangladesh. No causal relationship between growth in remittances and economic growth was estimated in India but in Sri Lanka, a two-way directional causality has been found.

The economic growth in developing countries may be influenced by other relevant factors that might be related to remittances and development aid. In our analysis, we have checked the robustness of our results by controlling the effect of foreign direct investments (FDI), gross fixed capital formation, government spending and exports of goods and services. All variables are expressed as the share of GDP. FDI especially is considered by many authors in their papers. The impact of FDI on economic growth in the Central and Eastern European countries is analysed by many authors. Reference [53] provides evidence of the positive effect of FDI on the region. Similarly, Reference [54] shows a unidirectional causality between FDI and GDP growth in all CEE countries, except Hungary. The positive impact of FDI on the CEE region was proved by Reference [55], which compared the effect on EU accession countries and MENA countries. In their findings, FDI inflows stimulate economic growth only in the EU accession countries of the CEE region, while the effect of FDI on growth in MENA and in non-EU accession countries is either non-existent or negative. Candidacy to EU membership appears in their view as an important driving force for broader and more effective reforms that may have contributed to the positive effect of FDI inflows on growth. A large positive impact of FDI stock on output growth was proved by Reference [56] as well. Reference [57] concludes that FDI has clearly supported the economic transition process, promoted growth and has greatly contributed to raising overall labour productivity in the CEE economies, due to fixed capital investments but also due to the transfer of intangible assets. And in Reference [58], inward FDI played a privileged role in the re-integration of the 11 CEE countries into the international economy. It generally seems that the authors find a positive effect of FDI on growth in the CEE region. On the contrary, on the level of developing countries, the results are more diverse. For example, Reference [59], found out that their outcomes for a sample of developing economies during the period 1976–2005 show differences associated to both the method of estimation (the system GMM vs OLS method) as well as the level of economic development. They also reveal the importance of controlling local capacities related to the macroeconomic and institutional environment.

4. Materials and Methods

In this section, we first describe the data and then present our model. Data are sourced from the World Development Indicators database [17]. We perform the estimation on two data samples. First, the unbalanced data; that is, how countries appear in the data. The panel is unbalanced for several reasons. Countries drop in and out of the ODA recipients list, as determined by the DAC committee [60]. For example, the Czech Republic, Poland and Hungary were removed from the list in 2004 when they joined the European Union. Former Soviet republics Ukraine and Belarus have been on the list since 1991. Remittance data exist for countries with large enough numbers of migrants worldwide who send remittances, as not all migrants send remittances (see Reference [61], among others). To address our research questions, we can only compare countries that, in the corresponding year, were recipients of aid and remittances. Second is the balanced data, where we select a set of the highest possible number of countries for which data exist for 1970–2017 without gaps. This dataset consists of 55 countries in the period from 1991 to 2017 (no newer data are currently available in

this database). Our analysis will be based on the following list of available variables (including the corresponding codes and descriptions):

- BX.TRF.PWKR.CD.DT—Personal remittances received (current US$)
- BX.TRF.PWKR.DT.GD.ZS—Personal remittances received (% of GDP)
- NY.GDP.MKTP.CD—GDP (current US$)
- NY.GDP.PCAP.CD—GDP per capita (current US$)
- NY.GNP.MKTP.CD—GNI (current US$)
- NY.GDP.MKTP.KD.ZG—GDP growth (annual %)
- NY.GDP.PCAP.KD.ZG—GDP per capita growth (annual %)
- DT.ODA.OATL.CD—Net official aid received (current US$)
- DT.ODA.ALLD.CD—Net official development assistance and official aid received (current US$)
- DT.ODA.ODAT.CD—Net official development assistance received (current US$)
- DT.ODA.ODAT.GN.ZS—Net ODA received (% of GNI)
- DT.ODA.OATL.KD—Net official aid received (constant 2012 US$)
- DT.ODA.ALLD.KD—Net official development assistance and official aid received (constant 2012 US$)
- DT.ODA.ODAT.KD—Net official development assistance received (constant 2012 US$)
- BX.KLT.DINV.WD.GD.ZS—Foreign direct investment, net inflows (% of GDP)
- NE.GDI.FTOT.ZS—Gross fixed capital formation (% of GDP)
- GC.XPN.TOTL.GD.ZS—Government spending (% of GDP)
- NE.EXP.GNFS.ZS—Exports of goods and services (% of GDP)

The data present a diverse story. For countries like Ethiopia, Mali or Papua New Guinea, the volume of ODA and OA exceeds remittances in the period from 1991 to 2016 defined by our balanced data set. For countries like the Philippines or the Dominican Republic, the flow of remittances is high enough and it exceeds the volume of ODA and OA. For most countries, the picture is mixed. Country distribution of ODA and OA depends on the economic situation in those countries, disasters and conflicts. The volume of aid sometimes increases when a country experiences a pressing need for it.

The volume of remittances depends on the number of migrants worldwide. Since the number of migrants tends to grow, remittances grow over time. This trend is visible for Jamaica, the Philippines, Guatemala and Armenia. For many countries, the aid and remittance curves cross. Before a certain date (specific to each country), total aid ranks first, and, after this date, total remittances exceed received aid. This trend may be explained by aid helping countries grow but once they start growing, they need less aid. This trend might also be explained by aid not being adequate in assisting people in need, so migration and remittances increase to fill the gaps that aid cannot.

The stability and impact of remittances and development aid on sustainable (long-term) economic growth are analysed using standard linear regression models. Working with the long-run averages (the means over decades) allows us to control the influence of business cycles (i.e., the short-run factors). First, we test whether the difference in means is statistically significant. Since the variables of interest are roughly continuous variables, we run the following two basic regression specifications according to Equations (1) and (2):

$$y_i = \beta_0 + \beta_1 D_i + \varepsilon_i \quad (1)$$

$$z_i = \gamma_1 LI_i + \gamma_2 LMI_i + \gamma_3 UMI_i + \upsilon_i \quad (2)$$

where y_i and z_i are shares of aid or remittances in GDP (data are stacked) for country i, β_0 is the intercept, D_i is a dummy variable that equals one if y_i represents the mean of remittances and zero if y_i represents the mean of aid. We then run the same regressions while replacing y_i and z_i with the values of standard deviations of the corresponding statistics. Variables LI_i, LMI_i and UMI_i are

dummy variables for low, lower middle and upper middle-income countries, respectively, as defined by the World Bank Analytical Classifications for the respective years. We use them to control the possible individual effects for these countries. This approach allows us to take into account the possible variance of both the shares of aid and remittances in GDP, thus not omitting the differences in the economic levels of these countries. The classification is in accordance with the list of ODA recipients. Since the income status of the countries might have changed during the analysed decades, we have decided to take the most frequent income level (in the corresponding period) as the representative one. This analysis is based on the balanced sample and on the full sample divided into the selected decades.

We reveal the role of aid and remittances flows and their volatility within a linear regression model based on the full unbalanced sample as well as the unbalanced sample divided into the decades. The parameters of all models are estimated using ordinary least squares estimator. To deal with the possible problem of heteroskedasticity, we use heteroskedasticity-consistent standard errors estimates. We investigate the relationships between long-term (sustainable) economic growth and the set of the core controlling variables consisting of the average shares of remittances and ODA, the indicators of volatility (measured using the logarithm of standard deviations to facilitate the interpretation of estimated coefficients) and the corresponding interactions terms. Dealing with the interaction terms allows us to reveal the role of stability of the aid and remittances flows conditioned by their importance in the economy (measured by the average shares to GDP). The above-defined income groups dummies serve as the controls of income effects.

Statistically significant variables are selected using the stepwise regression (a 20% level of significance variable is considered for addition to or subtraction from the set of explanatory variables). Our evaluation of the impact on economic growth is thus based on the statistical significance or insignificance of the model variables and the sign of the corresponding model parameters. As a robustness check, we have added FDI as another control variable (as suggested by many other papers), as well as other possible growth factors such as average gross fixed capital formation, government spending and exports (a measure of openness). But this improvement does not change the statistical significance and insignificance of our core regressors mentioned when considering the periods of the 2000s and the 2010s (i.e., the periods where most of the observations are available and the results are thus comparable). The reason is that these variables are only weakly correlated with the original set of regressor, probably as a consequence of working with country averages within the investigated periods.

5. Results and Discussion

Using the balanced sample, we test the differences in average shares of aid and remittances as well as their long-term stability measured by the standard deviations of the underlying empirical distributions. The results are presented in Table 1.

Table 1. Comparison of means and standard deviations for ODA and remittance distributions.

Variable, Parameter	Mean of Distribution	SE	Standard Deviation of Distribution	SE
Intercept, β_0	0.069 ***	0.010	0.036 ***	0.006
Remittance dummy, β_1	−0.018	0.014	−0.011	0.009
Number of observations	114		114	

Notes: ***, **, * denote parameter significance at the 10%, 5% and 1% level of significance, respectively. SE represents the robust standard errors of parameters estimates (heteroskedasticity-consistent standard errors).

The estimates in Table 1 suggest that there is no statistically significant difference between the average shares of aid and remittances. Regarding our balanced sample of 57 countries, we can conclude that the average share of remittances and ODA and OA in GDP is 6.9%. This conclusion, after looking at aggregated data, does not concur with our previous claims about the prevailing relative share of remittances in GDP. The explanation for that is very simple. There may be several countries with big volumes of remittances relative to their GDP in each regional or income category and a relatively lower

ratio of ODA. In that case, the aggregate statistics hide the fact that ODA, or official aid flows, play a very important role in the development of many smaller countries.

Estimates of the regression (1) with average standard deviations as a dependent variable suggest that the variability of both flows does not differ (the coefficient of the dummy variable is statistically insignificant at the 10% level of significance). Remittance flows are thus not relatively more stable (on average) when considering the balanced sample from 1990s. In the descriptive statistics section, we mentioned that the factors behind the volume of aid and remittances differ. Sometimes, aid is distributed to the poorest countries, the countries most ravaged by disaster or conflict or the countries whose disasters and conflicts are most prominent in the donor country's media. The distribution of aid may also be a political decision, supporting political leaders who are in the donor country government's favour or who have adequate lobbying power. Meanwhile, the volume of remittances depends on the number of migrants and their characteristics. Other factors that influence aid and remittance flows are the specific time period considered, the overall wealth of the specific countries, their tax system and their welfare system.

Consequently, we estimate regressions (1) and (2) separately for each decade using the full sample data set to assess the robustness of our results and to control for possible structural changes in the development of the investigated countries. As Table 2 suggests, the estimates for all of the decades put together (pooled decades) using the full available sample of countries do not confirm our previous conclusion about the differences between the shares of remittances and aid. The average share of remittances in GDP is lower by 2.1–3.7% (as suggested by the estimated parameter) compared to the share of ODA and official aid in GDP. On the other hand, in recent years (since 2010), these differences have vanished (the parameter of the dummy variable is statistically insignificant using the 10% level of significance). The estimates in Table 2 suggest that between 1970 and 1999, aid received exceeded remittances received. During the 1970–1979 period, a typical country received, on average, 6.5% of its GDP in aid, whereas the average share of remittances was only 3.6%. During the 1980–1989 period, ODA and OA accounted for 8.5% of GDP on average, whereas remittances were only half that amount: 5.2% but in this case, the difference is rather statistically insignificant. One should note the increase in both aid and remittances when comparing to the previous decade: aid grew by around 2% and remittances grew by 3.6%.

Table 2. Comparison of average shares of ODA and remittances.

		Regression (1)				Regression (2)					
						LI		LMI		UMI	
Dependent Variable	**N**	β_0	**SE**	β_1	**SE**	γ_1	**SE**	γ_2	**SE**	γ_3	**SE**
					1970–2016						
Mean of distribution	1146	0.073 ***	0.004	−0.023 ***	0.006						
Average O/G	546					0.125 ***	0.009	0.070 ***	0.006	0.028 ***	0.008
Average R/G	546					0.048 ***	0.009	0.066 ***	0.009	0.028 ***	0.004
					1970–1979						
Mean of distribution	130	0.065 ***	0.009	−0.029 *	0.015						
Average O/G	65					0.101 ***	0.016	0.053 ***	0.011	0.015 **	0.006
Average R/G	65					0.060 *	0.035	0.027 ***	0.006	0.006 **	0.003
					1980–1989						
Mean of distribution	176	0.085 ***	0.011	−0.033	0.024						
Average O/G	87					0.125 ***	0.023	0.090 ***	0.016	0.021 ***	0.006
Average R/G	87					0.016 ***	0.004	0.091 **	0.044	0.018 ***	0.005
					1990–1999						
Mean of distribution	266	0.078 ***	0.008	−0.037 ***	0.012						
Average O/G	127					0.127 ***	0.014	0.075 ***	0.012	0.011 ***	0.002
Average R/G	127					0.046 **	0.023	0.054 ***	0.011	0.013 ***	0.003

Table 2. *Cont.*

		Regression (1)				Regression (2)					
						LI		LMI		UMI	
Dependent Variable	**N**	β_0	**SE**	β_1	**SE**	γ_1	**SE**	γ_2	**SE**	γ_3	**SE**
					2000–2009						
Mean of distribution	308	0.072 ***	0.009	−0.021 *	0.011						
Average O/G	141					0.135 ***	0.022	0.069 ***	0.012	0.030 **	0.014
Average R/G	141					0.050 ***	0.009	0.072 ***	0.011	0.034 ***	0.009
					2010–2017						
Mean of distribution	266	0.065 ***	0.009	−0.003	0.011						
Average O/G	126					0.128 ***	0.018	0.061 ***	0.011	0.041 **	0.020
Average R/G	126					0.076 ***	0.015	0.080 ***	0.011	0.041 ***	0.008

Notes: ***, **, * denote parameter significance at the 10%, 5% and 1% level of significance, respectively. N represents the number of observations in regressions. SE are the robust standard errors of parameter estimates (heteroskedasticity-consistent standard errors). O/G = ODA to GNI ratio (%), R/G = remittances to GDP ratio (%). N denotes the number of available observations. LI = lower income dummy, LMI = lower middle-income dummy, UMI = upper middle-income dummy. β_0, β_0 = parameters of regression (1); γ_1, γ_2, γ_3 = parameters of regression (2).

In the following two decades, 1990–2017, total aid did not grow on a systematic basis relative to the GDP of recipient countries. Total aid dropped to 7.8%, 7.2% and 6.5% respectively. Remittances show a different picture. In the 1990–1999 period, remittance flow remained at 4.1% of the GDP. In the period from 2000 to 2010, remittances grew in volume and, on average, accounted for 5.1% of the recipient country's GDP and in the last seven years, we can observe an increase to 6.5% of the recipient country's GDP. Our next conclusion is that the volume of aid and remittances depends on the income level of the recipient country. The general trend is that low and lower-middle-income countries receive more of both aid and remittances than upper-middle-income countries but the magnitude differs across time. Between 1970 and 1979, a low-income country received 4.8% more aid and 3.3% more remittances than a lower middle-income country. The gap in aid of around 3–6% between a low and lower-middle-income country persisted in the remaining four decades. In the meantime, the picture for remittances changed. In the 1980–1989 period, remittances played a predominant role only for lower middle-income countries (more than 9% of GDP on average). In the 1990s, the share of remittances on GDP was almost the same for low and low middle-income countries. In the last two decades, remittances to low middle-income countries exceeded remittances to low income countries by 0.4–2.2%, most likely because migration heavily depends on income in that the poorest of the poor often do not have opportunities to migrate for income, so remittances tend to come from those who are poor but not the poorest. That is, lower-middle-income countries have more migrants than low-income countries. Within this period, we can observe the importance of remittances for upper-middle-income countries (with a share of 3.4–4.1% of the GDP that contributes to sustainable economic development).

Our second question was related to the long-term stability of remittances and ODA flows into analysed countries. Although the results for the balanced sample (related to the period 1990–2017, as shown in Table 1) did not provide evidence for any differences in stability, when considering all the investigated countries and the corresponding decades, we get a different picture (see Table 3). With the exception of the 1980s, remittances (expressed as the share to GDP) were less volatile and thus more stable than development aid in the analysed countries. From this point of view, we can conclude that remittance flow may contribute to the long-term economic stability of developing economies that supports sustainable economic development. Of course, we can observe some differences in the stability of both flows among the groups of countries. ODA (as a ratio to GNI) seems to be more volatile in lower-income countries in comparison to lower middle-income countries and upper-middle-income countries. On the other hand, the stability of remittances is very similar for lower and lower-middle-income countries (except for the 1980s, where remittance flows were more volatile in the case of lower-middle-income countries).

Table 3. Comparison of standard deviations for ODA and remittances.

		Regression (1)				Regression (2)					
						LI		LMI		UMI	
Dependent Variable	**N**	β_0	**SE**	β_1	**SE**	γ_1	**SE**	γ_2	**SE**	γ_3	**SE**
					1970–2016						
Std. dev. of distribution	1146	0.023 ***	0.002	−0.010 ***	0.002						
Std. dev. O/G	546					0.039 ***	0.005	0.022 ***	0.002	0.011 ***	0.003
Std. dev. R/G	546					0.015 ***	0.003	0.017 ***	0.003	0.006 ***	0.001
					1970–1979						
Std. dev. of distribution	130	0.020 ***	0.004	−0.010 **	0.005						
Std. dev. O/G	65					0.029 ***	0.008	0.015 ***	0.004	0.010 **	0.005
Std. dev. R/G	65					0.012 **	0.005	0.010 ***	0.003	0.001 *	0.001
					1980–1989						
Std. dev. of distribution	176	0.023 ***	0.003	−0.006	0.008						
Std. dev. O/G	87					0.032 ***	0.005	0.023 ***	0.003	0.009 ***	0.003
Std. dev. R/G	87					0.004 ***	0.001	0.030 *	0.016	0.006 ***	0.002
					1990–1999						
Std. dev. of distribution	266	0.027 ***	0.003	−0.015 ***	0.004						
Std. dev. O/G	127					0.043 ***	0.007	0.028 ***	0.005	0.006 ***	0.001
Std. dev. R/G	127					0.016 **	0.008	0.014 ***	0.002	0.004 ***	0.001
					2000–2009						
Std. dev. of distribution	308	0.022 ***	0.004	−0.008 *	0.005						
Std. dev. O/G	141					0.040 ***	0.013	0.021 ***	0.004	0.010 **	0.004
Std. dev. R/G	141					0.020 ***	0.005	0.017 ***	0.003	0.009 ***	0.002
					2010–2017						
Std. dev. of distribution	266	0.023 ***	0.004	−0.012 ***	0.004						
Std. dev. O/G	126					0.045 ***	0.009	0.020 ***	0.006	0.015 **	0.007
Std. dev. R/G	126					0.019 ***	0.004	0.012 ***	0.003	0.005 ***	0.002

Notes: ***, **, * denote parameter significance at the 10%, 5% and 1% level of significance, respectively. N represents the number of observations in regressions. SE are robust standard errors of parameter estimates (heteroskedasticity-consistent standard errors). O/G = ODA to GNI ratio (%), R/G = remittances to GDP ratio (%). N denotes the number of available observations. LI = lower income dummy, LMI = lower middle-income dummy, UMI = upper middle-income dummy. β_0, β_0 = parameters of regression (1); γ_1, γ_2, γ_3 = parameters of regression (2).

These results suggest that the remittances flow may help the receiving country to smooth its economic development more importantly compared to the flows of ODA and aid. The third question stated in the introduction of this paper was: "What is the impact of development aid and remittances on sustainable economic growth?" To answer it, we have performed a linear regression of financial flows on average year on year GDP growth or growth of GDP per capita (for the period from 1970 to 2017 and the corresponding decades) that may be considered as an indicator of long-term and sustainable economic growth. We control the potential income level effect using corresponding dummies. Of course, many factors may influence economic growth. But, proving statistical insignificance of the investigated variables (remittances and aid) would support the conclusion that these factors do not contribute to the economic growth at all. Without controlling the effect of stability of investigated flows (see Table 4), the statistically significant positive impact of development aid may be observed in the period from 1990 to 1999. In this case, development aid in the amount of 1% of the GDP of a receiving country would correspond to approximately a 7.8% (nominal) increase of GDP per capita growth in this period. Significant contributions to sustainable economic growth per capita could be related to remittance flow as well. An increase in remittance flows of 1% of GDP could have led to significant economic growth per capita in the 1990s. These results may be connected with the role of openness as noted by Reference [50] highlighting the link between the openness and better institutions. The negative influence after 2000 was possibly caused by the overall economic slowdown that started in 2008 and resulted into the lower remittance flows to the developing countries.

Table 4. Estimation results for factors influencing GDP growth (basic model).

	1970–2017		1970–1979		1980–1989		1990–1999		2000–2009		2010–2017	
Control Variable	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**
Model for average year-on-year GDP growth												
Average R/G									−6.92 **	3.27	−9.66 ***	3.18
Average O/G	−2.19	1.50					7.22 *	3.96	-3.35	2.12		
LI	4.77 ***	0.32	4.76 ***	1.04	3.43 ***	0.63	2.98 ***	0.72	6.31 ***	0.51	5.54 ***	0.54
LMI	4.47 ***	0.24	5.52 ***	0.79	3.40 ***	0.52	2.87 ***	0.58	5.74 ***	0.43	5.08 ***	0.44
UMI	3.64 ***	0.29			3.99 ***	0.75	4.03 ***	0.69	3.84 ***	0.44	3.8 ***	0.40
N	546		65		87		127		141		126	
R2	0.61		0.53		0.55		0.54		0.78		0.79	
Average year-on-year GDP growth per capita												
Average R/G							5.05 *	2.84			−6.38 **	3.21
Average O/G	−2.16	1.52					7.88 ***	2.91	−5.33 **	2.27		
LI	2.18 ***	0.32	2.10 **	1.03					3.66 ***	0.54	2.57 ***	0.54
LMI	2.80 ***	0.24	3.05 ***	0.79	1.10 **	0.52	1.36 **	0.54	4.18 ***	0.41	3.18 ***	0.44
UMI	2.45 ***	0.29			2.54 ***	0.75	2.71 ***	0.68	2.78 ***	0.47	2.51 ***	0.40
N	546		65		87		127		141		126	
R^2	0.33		0.24		0.16		0.29		0.58		0.24	

Notes: ***, **, * denote parameter significance at the 10%, 5% and 1% level of significance, respectively. No asterisk indicates significance at the 20% level of significance. LI = lower income dummy, LMI = lower middle-income dummy, UMI = upper middle-income dummy. SE are robust standard errors of parameters estimates (heteroskedasticity-consistent standard errors). O/G = ODA to GNI ratio (%), R/G = remittances to GDP ratio (%). N denotes the number of available observations, R^2 is the uncentered coefficient of determination (due to the absence of the intercept).

Using the proxy variables for the volatility of the ODA and remittances flows allows us to reveal their influence on economic growth, as stated in our fourth research question. This control variable seems to be a crucial factor for investigating the role of remittances and ODA flows in sustainable economic growth. The results in Table 5 shows that ODA and aid do not contribute to the economic growth at all (at the 10% significance level). Some exceptions may be found in the 1990s (at 20% significance level). The remittances flows contributed to the economic growth in the 2000s only. This period was characterised by the rising trends in the shares of remittances in GDP (as suggested by the statistically significant coefficient at the interaction term of volatility and the share of remittances). Similar patterns in remittances may be found in all the investigated periods (see the positive sign at the volatility proxies for the remittances). This result is in accordance with Figure 2 even though the increasing flows of remittances are connected with the increasing volatility (in this case). Comparing the estimated effects of the stability in remittances flows in the 1970s, 1980s and 2010s allows us to better understand the role of remittances in developing countries. In the 1970s and 1980s, when the remittance flows represented a relatively small share in GDP, the shocks affecting the remittances flow (as measured by their increased volatility) contributed significantly to the economic growth. Through the next decades, the share of remittances grew and the countries became more dependent on these contributions. Remittances are thus an integral part of the developing economies now and their volatile dynamics contributes negatively to economic growth. These results are in accordance with [8] focusing on the effect of workers' remittances and its volatility on economic growth of five South Asian countries. Although they generally found a positive effect of remittances in most of the studied countries, the volatility of workers' remittances had a negative and significant effect on economic growth in the majority of the studied countries.

Table 5. Estimation results for factors influencing GDP growth (extended model).

	1970–2017		1970–1979		1980–1989		1990–1999		2000–2009		2010–2017	
Control Variable	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**
Model for average year-on-year GDP growth												
Average R/G									17.53 *	9.84		
Average O/G							6.34	4.09				
Volatility R/G	0.24 ***	0.09	0.55 **	0.28	0.59 ***	0.18					−0.47 ***	0.17
Volatility O/G	−0.33 ***	0.10			−0.72 **	0.29			−0.21	0.14	−0.25 *	0.15
Interaction R/G							−3.04 *	1.61	8.93 ***	3.27		
Interaction O/G												
LI	4.45 ***	0.54	8.35 ***	1.88	4.38 ***	1.36	2.32 ***	0.71	5.39 ***	0.74	1.65 *	0.90
LMI	4.03 ***	0.56	8.98 ***	1.85	3.32 **	1.31	2.36 ***	0.59	5.16 ***	0.87		
UMI	2.95 ***	0.71	5.51 **	2.80	3.45 **	1.71	3.84 ***	0.69	2.84 ***	1.00		
N	546		65		87		127		141		126	
R2	0.64		0.64		0.61		0.56		0.81		0.75	
Average year-on-year GDP growth per capita												
Average R/G									17.12	11.00		
Average O/G							5.41	4.01				
Volatility R/G	0.38 ***	0.09	0.58 **	0.28	0.72 ***	0.17					−0.29 *	0.17
Volatility O/G	−0.4 ***	0.10			−0.69 **	0.28			−0.34 **	0.16	−0.26 *	0.15
Interaction R/G							−3.82 **	1.58	7.69 **	3.66		
Interaction O/G												
LI	2.36 ***	0.55	5.83 **	1.91	2.62 **	1.30			2.10 **	0.82		
LMI	2.77 ***	0.57	6.69 ***	1.88	1.85	1.25	1.13 *	0.60	2.98 ***	0.97		
UMI	2.20 ***	0.71			3.02 *	1.64	2.54 ***	0.66	0.99	1.11	−1.39	1.17
N	546		65		87		127		141		126	
R^2	0.38		0.36		0.30		0.34		0.63		0.51	

Notes: ***, **, * denote parameter significance at the 10%, 5% and 1% level of significance, respectively. No asterisk indicates significance at the 20% level of significance. LI = lower income dummy, LMI = lower middle-income dummy, UMI = upper middle-income dummy. SE are robust standard errors of parameters estimates (heteroskedasticity-consistent standard errors). O/G = ODA to GNI ratio (%), R/G = remittances to GDP ratio (%). N denotes the number of available observations, R^2 is the uncentered coefficient of determination (due to the absence of the intercept).

Our results suggest that the economic growth in the developing countries is strongly influenced by the uncertainty related to the flows of ODA and aid. Our results prove the negative effects of lowered stability in ODA and aid flows on economic growth. The ODA and aid can stabilise the economy of developing the country in the short-run. But, the recipients of the ODA and aid tend to be more dependent on these flows. Increasing uncertainty in these flows (i.e., lower stability) thus results in lower growth rates of the economies regardless of the level of these flows. This specific pattern is distinct from the effects of remittances. Of course, one needs further research aimed at identifying the growth effects of distinct categories of aid, as pointed out by Reference [41].

To check the robustness of our results, we have performed a regression analysis (see Table 6) using other control variables that reflect the positive role of foreign direct investments and gross fixed capital formation, the negative influence of the government spending and insignificant effect of the openness (expressed as the share of exports to GDP). Due to missing observations in the original dataset,

using these variables led to the loss of more than half of observations in the investigated decades (especially when considering the 1970s, 1980s and 1990s). Statistical significance and insignificance of our core regressors (related to the remittances and development aid) do not change when considering the periods of the 2000s and the 2010s (i.e., the periods where most of the observations are available). No positive effect of the development aid on sustainable economic growth (per capita) was proved. The negative influence of the volatility of the development aid prevailed as well (mostly in interaction with the levels of development aid). The positive effect of remittances flow may be observed in the 2000s as discussed previously.

Table 6. Estimation results for factors influencing GDP growth (robustness check).

	1970–2017		**1970–1979**		**1980–1989**		**1990–1999**		**2000–2009**		**2010–2017**	
Control Variable	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**
Model for average year-on-year GDP growth												
Average R/G									18.76 *	9.84		
Average O/G									−6.87 **	3.41		
Volatility R/G												
Volatility O/G									−0.51 ***	0.18		
Interaction R/G							−6.69 ***	2.40	8.56 **	3.61	1.49 **	0.05
Interaction O/G	−1.13	0.82			11.04 ***	3.70	−2.95	2.08	−4.21 ***	1.35		
LI	3.29 ***	0.66	5.34 ***	1.14	−2.96 *	1.42					6.41 ***	0.86
LMI	2.97 ***	0.66	6.43 ***	1.01	−3.26 **	1.26					5.82 ***	0.91
UMI	2.54 ***	0.75	4.63 *	2.15	−4.4 ***	1.33					4.62 ***	1.00
FDI/G			1.11 **	0.39					0.36 ***	0.07		
INV/G	0.11 ***	0.02			0.39 ***	0.05	0.16 ***	0.05	0.10 ***	0.04	0.04	0.02
GOV/G	−0.06 ***	0.02					-0.06 **	0.03	−0.05 *	0.03	−0.07 ***	0.02
EXP/G												
N	273		13		17		61		94		88	
R2	0.79		0.95		0.97		0.78		0.81		0.88	
Average year-on-year GDP growth per capita												
Average R/G												
Average O/G												
Volatility R/G							−0.79 ***	0.21				
Volatility O/G	−0.17 **	0.08	−0.59 ***	0.16	0.62 ***	0.20			−0.35 **	0.14	−0.29 ***	0.09
Interaction R/G							−12.7 ***	2.58	3.24 **	1.25		
Interaction O/G					−75.4 ***	15.7						
LI							−9.27 ***	1.91				
LMI							−7.85 ***	1.82				
UMI	−0.60 *	0.36					−6.74 ***	1.99	−2.07 ***	0.63	−1.38 ***	0.48
FDI/G	0.04	0.02	1.82 ***	0.37			0.11	0.08	0.30 ***	0.08		
INV/G	0.11 ***	0.02			0.31 ***	0.05	0.20 ***	0.04	0.12 ***	0.04	0.06 ***	0.02
GOV/G	−0.02	0.01					−0.03 **	0.01	−0.026 *	0.01		
EXP/G												
N	273		13		17		61		94		88	
R^2	0.61		0.88		0.87		0.75		0.73		0.68	

Notes: ***, **, * denote parameter significance at the 10%, 5% and 1% level of significance, respectively. No asterisk indicates significance at the 20% level of significance. LI = lower income dummy, LMI = lower middle-income dummy, UMI = upper middle-income dummy. SE are robust standard errors of parameters estimates (heteroskedasticity-consistent standard errors). O/G = ODA to GNI ratio (%), R/G = remittances to GDP ratio (%), FDI/G = foreign direct investments to GDP ratio (%), INV/G = gross fixed capital formation to GDP ratio (%), GOV/G = government spending to GDP ratio (%), EXP/G = exports of goods and services to GDP ratio (%). N denotes the number of available observations, R^2 is the uncentered coefficient of determination (due to the absence of the intercept).

There are several papers that studied the impact of remittances on economic growth. The analyses concentrate on different regions (they mostly consider developing countries or emerging markets) and different periods. The authors deal with the different size of the sample of the studied countries. Regardless of these differences, most of the studies found a positive impact of remittances on economic growth at least for the majority of studied countries [6–10]. However, some of the studies found mixed results considering some sub-samples of countries (or regions) or the conclusions were limited to the combination of using other sources of economic growth (FDI). Our results remained robust in

incorporating the possible effect of FDI (probably because of using larger dataset and country-specific averages of all variables). This pattern is relatively specific when compared with the results of Reference [7] investigating how foreign direct investment (FDI), foreign aid and remittances impact the economic growth of 53 African and 34 Latin American and Caribbean countries. According to Reference [7], separate estimation shows foreign aid and FDI affects economic growth in Africa but when they control for all three factors, only FDI affects African economic growth. For Latin America and the Caribbean, foreign aid and remittances affect growth when estimated separately, while remittances affect growth when they are estimated simultaneously.

6. Conclusions

This paper sets out to compare the size, long-term stability and impact of remittances and development aid on the sustainable economic growth in developing countries. We conclude that in the observed period, the size of aid as a share of GDP was larger than the size of remittances as a share of GDP until the end of the 1980s, then the trend reversed. Overall, the trends in remittances tend to be more stable than trends in development aid and may be thus considered as a more important factor that contributes to sustainable economic development. This result is in accordance with References [45,48,51], although this effect might contribute more likely to longer-term growth in countries with higher quality political and economic policies and institutions, as pointed out by References [45] or [47]. Because changes in development aid showed little correlation with changes in GDP, it appears that development aid does little to influence long-term (sustainable) economic growth based on the data studied here as pointed out by References [39–41]. Our results suggest that a statistically significant relationship between development aid and economic growth (per capita) may be observed only in the period from 1990 to 1999. The economic growth in the developing countries is negatively influenced by the uncertainty related to the flows of ODA and aid in all investigated decades. Our results prove that the higher volatility (i.e., lower stability) of ODA and aid flows contribute negatively to the long-term economic growth. This conclusion extends the conclusion of the case studies of References [43] and [44] by incorporating the factors of stability. In this way, policy implications of our findings suggest that if development aid does not have a positive impact on economic growth, it cannot significantly hinder migration from developing countries to developed economies. This argumentation is supported, for instance, by Reference [62]. According to Reference [62], the data for the last half-century suggest that in developing countries, more development means more migration, not less. Policies to foster development may thus be most effective when paired with policies to accommodate mobility.

Remittances provided a slightly different picture, growing in accord with the growth of GDP. Our estimates revealed that an increase in development aid and remittance flows led to significant long-term economic growth per capita only in the 1990s. These results may be connected with the role of openness as noted by Reference [50] highlighting the link between the openness and better institutions. A two-way effect may be present. Increased remittances might support economic growth since the remittances are spent on consumption. Simultaneously, economic growth increases a country's affluence, leading to more migration and more remittances. A negative influence (on overall economic growth) after the year 2000 was more likely caused by the global economic slowdown that started in 2008. This pattern supports the conclusion that remittances do not entirely dampen the negative effects of macroeconomic volatility but they may help to smooth the impact of adverse economic shocks. Remittances flows are overall more stable than the inflows of developing aid and are also positively related to the sustainable social and economic development of developing countries. This result extends the conclusions presented by Reference [51] or [52] aimed at few developing countries (such as Macedonia, Kyrgyzstan or Bangladesh) only. Except for the 1980s, remittances (expressed as the share to GDP) were less volatile and thus more stable than development aid in the analysed countries. From this point of view, we can conclude that remittance flow may contribute to the long-term economic stability of developing economies that supports sustainable economic

development, as suggested by Reference [6] (considering only a small subsample if developing countries) or [9] (aiming at six high remittances receiving European countries in the 2000s). But, the role of stability of remittances flows is more difficult when comparing the estimated effects of the stability in remittances flows in the 1970s, 1980s and 2010s. When the remittance flows represent a relatively small share in GDP, the shocks in these flows contribute positively to the economic growth. When the remittances flows became an integral part of the developing economies, the stability starts to play a more critical role and increased volatility and uncertainty tends to contribute negatively to the sustainable economic growth. These results support the conclusion of Reference [8] focused on five South Asian countries. Although they generally found a positive effect of remittances, their volatility had a negative and significant effect on economic growth in the majority of the studied countries.

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