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Article

Divestment of foreign direct investment and domestic investment in developing countries agriculture

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Abstract: Divestment of foreign direct investment has accompanied foreign direct investment. The literature on the interface of foreign direct investment and domestic investment in the agricultural sector is limited. None of these addressed the effect of agricultural foreign divestment on agricultural domestic investment. This paper filled this gap by assessing the direction and extent of the effect of agricultural foreign divestment on agricultural domestic investment in developing countries. The panel data of 50 countries, covering 1995 to 2020 and making up 619 observations, was fitted to fixed and random effects as well as generalised estimation equation estimators. We found agricultural foreign divestment crowded out agricultural domestic investment in developing countries. Economic managers in developing countries must work towards strong macroeconomic indicators, as these have collateral benefits for enhancing agricultural domestic investment.

Keywords: agriculture; developing countries; domestic investment; foreign direct investment; foreign divestment

JEL Classification: C33; E22; F21

1. Introduction

The agricultural sector is essential for food and nutrition security for mankind. Growth in the agricultural sector is more effective in raising incomes among the poorest compared to other sectors [1,2]. In 2019, the sector accounted for 4% of the global gross domestic product (GDP), which rose to 4.4% in 2020, based on FAOSTAT data. In some developing countries, it accounted for more than 25% of the gross domestic product [1]. Agricultural development is thus one of the most powerful tools to end extreme poverty, boost shared prosperity, and feed the projected 9.7 billion people by 2050 [1,2]. The inflow of foreign direct investment (FDI) as well as domestic investment (DI) is crucial to the development of the agricultural sector [3,4]. Agricultural DI is the value of physical resources used in the product creation process, encompassing land improvement, irrigation development, farm buildings, equipment, and livestock within an economy [3,5]. Thus, DI represents the resources for agricultural production. Increased investment led to the physical improvement of materials and technology [6]. Agricultural investment drives economic progression, rural incomes, and structural transformation [7,8].

Gains from FDI inflow into agriculture arise from capital inflows and technology transfer, resulting in improved domestic output and efficiency, quality enhancement, the generation of jobs, and horizontal integration [3,9]. Further, there could also be

doubling effects through the domestic acquisition of labour services and other factors of production, processing of outputs, and possibly a rise in food supplies for the local and export markets [3]. However, Boddewyn [10–12] has acknowledged the existence of foreign divestment, the result of the critical decision of foreign firms in a host country to change their business collection, ultimately leading to a reduction in the level of resources [10,13–16]. Foreign divestment manifests in three ways: downsizing, relocation, and termination. Downsizing is the partial sale or disposal of physical and organisational assets and the reduction of the workforce of the organisation [16,17]. The total closure of the factory and redeploying operations to another country constitute relocation [13,16,18]. Termination encompasses the total selling or discarding of physical and firm properties, the closure of the factory, and the organisations' operations in an economy without moving to another economy [16,19]. The assets of the affiliate firm are ordinarily sent back to the head office of the multinational company [16].

Since foreign divestment is the reverse movement of FDI inflow [10–12,20,21], the incidence of foreign divestment would not only reduce the stock of FDI in the host country but also portend the curtailment or cessation of the benefits of the inflow of FDI. Beyond this, the incidence of foreign divestment could increase DI through the acquisition of the divested affiliates by multinational enterprises in the host country or by indigenous firms with a subsequent revamp and expansion of operations. On the other hand, where there is a relocation or complete cessation of the divested enterprise without any subsequent acquisition, foreign divestment could reduce the total investment in the host economy. The events that lead to increased DI and decreased DI could balance, thereby creating a middle ground in which foreign divestment does not affect DI. Considering the foregoing and the available data, what is the direction and extent of agricultural foreign divestment in agricultural DI in developing countries?

Gameli Djokoto, Miao, and Djokoto [3,22,23] studied the relationship between agricultural FDI and agricultural DI. Whilst [3] focused on Ghana, Miao [22] addressed China. Djokoto [23] focused on developed, transitioning, and developing countries. Djokoto et al. [24] investigated the policy options available to the agricultural sector in the presence of agricultural foreign divestment. However, the authors explored the effect of divestment of FDI on economic growth. None of these addressed the divestment of FDI and its effect on DI. Although Djokoto [25] investigated the effect of agricultural divestment on domestic investment, the focus was on developed countries. Since foreign divestments are the reverse of inward FDI, the incidence would have implications for the benefits of FDI, which include investment accumulation. We fill this gap by investigating the effect of divestment of agricultural inward FDI on agricultural DI in developing countries. Based on panel data from 50 countries, covering 1995 to 2020, we found agricultural foreign divestment crowded out agricultural DI in developing countries. Economic managers in developing countries must work towards attaining strong macroeconomic indicators, as these have collateral benefits for enhancing agricultural domestic investment.

In Section 2, we outline the literature on domestic investment, FDI, and foreign divestment. We provide empirical evidence on the effect of outward and inward FDI on domestic investment. We elaborate on the modelling and data as well as the estimation strategy in Section 3. We present the results of our estimation in Section 4, with a discussion of the same. In that section, we provide the policy implications of our findings. Concluding remarks constitute Section 5.

2. Literature review

2.1. Theoretical review

There are competing theories of investment in the literature, including accelerator theory [26,27], and neoclassical theory [28,29]. The focus here is on the neoclassical theory as it informed the studies on the crowding effects of FDI on DI [30–33]. The neoclassical investment theory holds that the decision to invest is informed by the cost of capital. Bischoff et al. [34] extended the theory by focusing on the capital-output ratio, which can be altered to influence the substitution effect. The goal of tweaking the substitution effect is to induce effective domestic investment.

Existing theories of FDI can explain foreign divestments. Firms often prefer FDI to licensing as a strategy for entering a foreign market. This is the internationalisation theory of FDI [34]. Once the condition that favoured FDI to licensing changes, foreign divestment (FD) could occur. The oligopolistic industry theory of Knickerbocker [35] posits that firms undertake FDI in response to the actions of market leaders. Firms thus adopt a follower strategy. In the same way, FD by market leaders could trigger FD by followers. Firms also engage in FDI at a certain stage in the life cycle of the product they pioneered [36]. As the product matures in the country of origin, seeking foreign markets for production beyond the export strategy becomes eminent when local demand in those countries grows large enough to support local production. In the same way, maturing the product in a foreign market and exporting it to another market could trigger relocation to other host countries. This would constitute FD.

Boddewyn [10] flipped Dunning's eclectic theory [37–39] to explain FD. As FDI occurs under certain conditions in Dunning's eclectic theory, Boddewyn [10] states that FD would also occur under certain conditions. First, if an organisation no longer possesses net competitive advantages over foreign organisations. Second, if a firm does not get the benefit of using the competitive advantage itself anymore but trades, sells, or leases it to other firms, Finally, if the firm does not find it lucrative to exploit its internalised net competitive advantage outside its home region, that is, it is now more meritorious to serve markets other than the home country with local production or abandon markets completely.

Aside from these, the industrial-organisation perspective also explains business divestment [11,40,41]. Some studies also address specific factors and managerial dimensions, with a specific focus on what factors cause FD [10,11,42,43]. "These managerial studies have generally focused on the deliberate and voluntary reduction or elimination of actively controlled foreign subsidiaries and branches through sale or liquidation, thereby excluding nationalisations, expropriations, spin-offs, 'fade-out' and 'harvest' cases, as well as passive subsidiaries" [11].

2.2. Empirical review

These theories inform the three papers on the crowding effects of the inflow of FDI on DI in the available pertinent literature. Gameli Djokoto [3] used time series data from 1976 to 2007 to show that FDI inflow into agriculture crowd-in DI into agriculture in the long run, but a 'no effect' was reported for the short run. Two reasons were adduced for the short-run result: 1. Agricultural firms need time to set up. For example, the planning and execution of irrigation facilities take some months or years. 2. Agricultural commodities have gestation periods. The biological processes in agricultural production to obtain outputs span some time, which could extend beyond the short run. However, these could go beyond those of non-agricultural commodities. Economic growth was found not to significantly influence DI in agriculture for Ghana in both the short and long run. A directed approach that would draw FDI into agriculture was recommended to accompany efforts at enhancing agricultural domestic investment.

China attracted most of the FDI in the world. Although the percentage of agricultural inward FDI was barely 2%, its importance was not ignored, considering domestic agricultural security. In acknowledging these, Miao [22] conceived a simultaneous equation model, estimated using two-stage least square and ordinary least square estimators with time series data from 1997 to 2009. Miao found a crowding-out effect of agricultural FDI inflow on agricultural DI. Specifically, a 1% increase in agricultural FDI will crowd out 0.2% of agricultural DI. Consequently, policy recommendations bothered on the effect of agricultural FDI on domestic agricultural security in China.

In contributing to the academic exchanges on the crowding effects of FDI on DI, Djokoto [23] examined the crowding effects of FDI on DI in agriculture, based on panel data from 64 countries between 1997 and 2016. The panel data provided an opportunity to benefit from both the time and cross-sectional dimensions of the data. Moreover, results and recommendations would be relevant for countries over time. For transition and developing economies, Djokoto [23] found FDI had no significant influence on DI in the short run. However, there was a crowd-out effect in developed countries. Overall, and in the short run, no crowding-in effect was observed. FDI crowded out DI in developed countries. There was no long-run effect overall. Djokoto [23] recommended enhancing the regulatory and administrative processes of the investment environment and the absorptive capacity of the study countries.

OFDI discourages DI in the total economies of developing countries [44] and China [45]. While the economic growth rate enhances DI [44,45], trade openness discourages DI [44–46]. Ameer et al. [47] however, reported a neutral effect of trade openness on DI. Yet Mamatkulov [46] found a positive effect of trade openness on domestic investment. Domestic savings promoted DI in developing countries [44,48] and developed countries [49]. Inflation discouraged DI [44,46].

It is evident from the empirical review that the focus of the studies has been FDI on DI. Moreover, only one study employed a panel data structure, which provides the best of two worlds: cross-section and time. The role of divestment in inward FDI has not been explored. We fill these gaps for the agricultural sector in this study.

3. Data and modelling

3.1. Model and modelling

The key variables are the divestment of *AGFDI* and *AGDI*.

$$AGDI = f(AGFD) \quad (1)$$

Other macroeconomic variables could influence domestic investment [44–49]. Agricultural outward foreign direct investment (*AGOFDI*) does occur with agricultural inward FDI (*AGIFDI*) in some developing countries; therefore, this must be accounted for. Inflation (*INFLA*) is the rise in the general price level. This reduces the real income of households and firms. The effect on households would be a lower capacity to purchase goods and services. This could move labour unions to demand more wages if employers are not proactive and increase wages. This process could create costly problems for businesses that are unable to respond quickly and adequately to price changes. This could discourage agricultural DI. Inflation is hypothesised to influence agricultural DI. Investment theories show that the interest rate is a strong determinant of investment. Despite the multiple sources of data for the lending rate, there were still many gaps. Thus, interest rates were replaced with domestic savings rates (*SR*), as interest rates are known to be correlated to savings. Existing studies also note the relevance of agricultural growth rate (*AGGR*) and agricultural trade (*AGTO*). From the foregoing,

$$AGDI = f(AGFD, AGOFDI, INFLA, SR, AGGR, AGTO) \quad (2)$$

Equation (2) is specified as

$$AGDI_{it} = \alpha_0 + \alpha_1 AGDIFDI_{it} + \alpha_2 AGIFDI_{it} + \alpha_3 AGOFDI_{it} + \alpha_4 AGGR_{it} + \alpha_5 AGTO_{it} + \alpha_6 SR_{it} + \alpha_7 INFLA_{it} + \varphi_{it} \quad (3)$$

AGDI is agricultural domestic investment and is measured as the agricultural gross fixed capital formation to the ratio of agricultural GDP. Agricultural FD is defined as *AGFD* = 1, and 0 otherwise. *AGFD* interacted with *AGIFDI* to create *AGDIFDI*. *AGFD* is measured as the negative of the agricultural net inward *FDI*. The recognition of *AGFD* as the negative of the net *AGFDI* inflow has been acknowledged by the United Nations [50–52] and others [24,53,54]. FD is measured by the balance of payments (BOP) and the directional (DA) approaches [55]. With the BOP approach, foreign direct investment statistics are presented based on whether the investment relates to an asset or a liability for the reporting country. With the DA approach, however, the direct investment statistics are based on the direction of the investment for the reporting country—either inward or outward. As the latter better assists policymakers and government officials in formulating investment policies, it has been adopted here. *AGDIFDI* and *AGIFDI* are measured as a ratio of agricultural GDP. However, *AGOFDI* is measured as a dummy variable. That is, *AGOFDI* = 1 if a country reported *AGOFDI* and 0 otherwise. This is because there are fewer observations on *AGOFDI* than those on *AGIFDI* and other explanatory variables. Moreover, the *AGOFDI* data could not match all the data for all the explanatory variables, hence the use of the dummy. *AGGR* is the annual growth rate of agricultural value added in 2015 at constant prices. *SR* is the gross domestic savings to GDP ratio. *AGTO, or* trade openness, is the sum of exports and imports to the GDP ratio for the agricultural sector. Inflation, or *INFLA,* is the annual growth rate of the consumer price

index. α_k are parameters to be estimated. While *i* and *t* are the cross-sectional and time series dimensions of the data, respectively, φ is the idiosyncratic error term.

3.2. Data

The data dimension was limited largely by the availability of data on the chosen variables of the study. Data on *AGDI* started in 1995. This limited the start date to 1995 instead of 1991 in the case of the other variables. The combination of these occurrences culminated in the data on 50 developing countries (Appendix A) from 1995 to 2020 yielding 619 observations. Gaps in the data were filled by interpolation. Data on *AGDI*, *AGDIFDI,* and *AGOFDI* were obtained from FAOSTAT [56], while [57] is the source of the others. Although the countries may appear heterogeneous, the results are generalisable as they belong to the same economic or development group.

3.3. Estimation procedure

Macroeconomic variables could affect one another. For example, domestic investment (*AGDI*) in agriculture is a constituent of agricultural GDP, although in our equation, agricultural GDP growth is hypothesised to explain agricultural DI. The existence of indigenous businesses may be the basis of partnerships with foreign firms, resulting in partly foreign-owned businesses. As the indigenous businesses create agricultural DI, the agricultural DI may cause agricultural FDI. For these and other reasons, there is likely endogeneity among the variables. A test of the possible endogeneity of the key variables could not be confirmed (Appendix B). We applied a generalised estimated equations (*GEE*) estimator, a special case of the general method of moments, to the data. *GEE* is a population-level approach based on a quasi-likelihood function. This provides the population-averaged estimates of the parameters with a possible unknown correlation between outcomes [58–60]. The measurement of the DI within the unit interval, 0 and 1, permitted the use of *GEE*.

4. Results and discussion

4.1. Description of data

The mean *AGDI* for developing countries is 11.73% of *AGGDP*, coinciding with that of Guatemala in 2015 (**Table 1**).

Table 1. Descriptive statistics.

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
AGDI	619	0.1173	0.0618	0.0125	0.4491
AGDIFDI	619	–0.0044	0.0847	–2.1006	0
AGIFDI	619	0.0158	0.1498	–2.1006	1.7386
AGOFDI	619	0.2694	0.4440	0	1
AGGR	619	0.0313	0.0644	–0.2978	0.7801
AGTO	619	1.3125	6.5794	0.0918	119.6798
SR	619	0.2161	0.1111	–0.0569	0.5706
INFLA	619	0.0595	0.0639	–0.0140	0.9609

The mean *AGDIFDI* is low because the calculation of the mean includes zero for countries and years without divestment. The mean *AGIFDI* is 1.58% of *AGGDP,* close to that of Columbia in 2016. About 27% of the observations are outward *AGFDI*. Notwithstanding the mean of 3.13%, there was evidence of negative growth (30%, Paraguay for 2012) in agriculture and maximum growth of 78% (Morocco in 1996) in developing countries. The highest inflation is 96% (Ecuador in 2000).

4.2. Results

The estimates of the *GEE* are reported in **Table 2,** with the elasticities in **Table 3**. The estimates of *AGDIFDI* and *AGIFDI* are similar across models 1 to 7. Similarly, the estimates of *AGDIFDI* and *AGIFDI* are also consistent across models 8 to 14 in **Table 3**. This suggests the estimates are robust to the control variables. The differences between the estimates are statistically indistinguishable from zero. This further confirms the absence of endogeneity in the model.

Table 2. Estimations of the panel generalised estimation equations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables	**AGDI**	**AGDI**	**AGDI**	**AGDI**	**AGDI**	**AGDI**	**AGDI**
AGDIFDI	0.3883*	0.4849**	0.3783*	0.3243	0.3879**	0.3910*	0.4110**
	(0.2046)	(0.1945)	(0.1997)	(0.2017)	(0.1892)	(0.2051)	(0.1680)
AGIFDI	–0.2411*	–0.3027***	–0.2386*	–0.1922	–0.2449**	–0.2426*	–0.2509**
	(0.1247)	(0.1163)	(0.1227)	(0.1261)	(0.1158)	(0.1249)	(0.1074)
AGOFDI		0.0999**					0.0917*
		(0.0469)					(0.0516)
AGGR			–0.0496				–0.0554
			(0.0449)				(0.0440)
AGTO				0.0098***			0.0095***
				(0.0007)			(0.0006)
SR					0.3129*		0.1771
					(0.1844)		(0.1561)
INFLA						–0.0321	–0.0022
						(0.0576)	(0.0585)
Constant	–1.1795***	–1.1995***	–1.1781***	–1.2231***	–1.2527***	–1.1778***	–1.2786***
	(0.0513)	(0.0516)	(0.0514)	(0.0438)	(0.0605)	(0.0512)	(0.0547)
Model diagnostics							
Observations	619	619	619	619	619	619	619
Countries	50	50	50	50	50	50	50
Wald	3.8500	20.2700***	4.0200	212.3500***	6.8100*	3.9000	415.1400***

Notes: 1. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$. 2. Standard errors in parenthesis are adjusted for clustering at the country level. 3. Binomial family GEE with Probit link function and exchangeable correlation structure.

4.3. Discussion of control variables

Although *AGGR* is negative, it is not statistically distinguishable from zero (**Table 3**). Thus, growth in the agricultural sector is not expected to induce domestic investment in agriculture. This is inconsistent with existing literature on the total economies of developing countries [44] and China [45,47]. A decrease in inflation would induce domestic investment. A decrease in inflation will increase the value of

money in the hands of households. This will enable them to spend on the consumption of commodities, including food. This is consistent with the whole economy findings of Al-Sadiq [44] and Mamatkulov [46] for developing countries. The positive sign of *SR* will increase domestic investment. This finding is consistent with the existing literature [44,48,49]. The positive sign and statistically significant coefficient for trade imply that trade openness promotes DI. While our finding is consistent with Mamatkulov [48], it diverges with Al-Sadiq, Goh, and Wong [44,48].

Table 3. Estimations of elasticities of the panel generalised estimation equations.

	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Variables	**EY/EX**	**EY/EX**	**EY/EX**	**EY/EX**	**EY/EX**	**EY/EX**	**EY/EX**
AGDIFDI	–0.0029* (0.0015)	–0.0036** (0.0015)	–0.0028* (0.0015)	–0.0025 (0.0015)	–0.0029** (0.0014)	–0.0029* (0.0015)	–0.0031** (0.0013)
AGIFDI	–0.0064* (0.0033)	–0.0080*** (0.0031)	–0.0063* (0.0033)	–0.0051 (0.0034)	–0.0065** (0.0031)	–0.0064* (0.0033)	–0.0067** (0.0029)
AGOFDI		0.0450** (0.0212)					0.0420* (0.0235)
AGGR			–0.0026 (0.0024)				–0.0029 (0.0023)
AGTO				0.0218*** (0.0018)			0.0211*** (0.0016)
SR					0.1135* (0.0668)		0.0649 (0.0575)
INFLA						–0.0032 (0.0058)	–0.0002 (0.0059)
Model diagnostics							
Observations	619	619	619	619	619	619	619

Notes: 1. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$. 2. Delta-method standard errors in parenthesis.

Increased *AGOFDI* will allow home multinationals to export and import products from foreign affiliates. Also, the receipt of dividends will facilitate an increase in investment in home agricultural businesses. The literature, however, shows a negative effect of *AGOFDI* on *AGDI* [44,48,49].

4.4. Discussion of foreign divestment inward foreign direct investment on domestic investment

The estimates of *AGDIFDI* are not the ultimate results, as these have been used to compute the Wald and subsequent tests, as reported in **Table 4**. Based on Wald, a 1% increase in inward *AGFDI* will induce a 1.64% decline in domestic investment (**Table 4**). That is, *AGIFDI* will crowd out domestic investment in developing countries agriculture. The monetary value of the decline in *AGDI* is about US$16 million per year. Our crowd-out effect constitutes a departure from Gameli Djokoto [3] and Djokoto [23]. The former found a crowd-in effect for Ghana, which is not part of the data, and the latter found no discernible effect for developing countries. However, our finding is consistent with that of Miao [22], who found a crowd-out effect for China, which is part of the data. In developing countries, land grabs are not absent [61–63]. This deprives producers of land, and the land grabbers do leave the

land fallow. As there are no investments in land development and production, no indigenous domestic investment gets recorded beyond the initial investment outlay.

Table 4. Crowding effects of foreign direct investment on domestic investment.

Effect on domestic investment	**General estimation equations**
Inward foreign direct investment	–0.0067 [122,650]***
Divestment of inward foreign direct investment	–0.0098 [59,376]***
Monetarised crowding effect	
Loss of DI from IFDI	US$16.17 m
Loss of DI from FD	US$23.64 m

Notes: 1. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$. 2. Chi-square test statistics.

The null hypothesis that the Wald of the estimate of *AGDIFDI* and *AGIFDI* is equal to 1 is rejected. Since the Wald statistic is –0.0098, a 1% increase in the divestment of *AGIFDI* will induce a decline of 0.98% in DI in agriculture. This is less than 1, the null hypothesis at a chi-square level of 1% given the chi-square statistic of 59,376. Thus, there is a crowd-out effect of the divestment of *AGIFDI* on DI in developing country agriculture. The DI crowded out annually is about US$24 million, exceeding that of *the AGIFDI* by US$16 million. The reasons adduced for the crowd-out for IFDI are still relevant here. Since the *AGIFDI* was expected to contribute to investment accumulation, jobs, and technology improvement [3–5,9], divestment directly reduces the level of investment available in developing countries. In the case of the sale of the firm by the foreign affiliate of the multinational enterprise, local firms or foreign firms are unable to take over and expand the divested firms to increase investment. Also, when the foreign firms in the host country downsize, other firms in the economies of developing countries are unable to augment output through additional investment that would have made up for the decline in investment.

4.5. Policy implications

The decrease in *AGDI* calls for efforts that will create about US$24 million annually in developing countries' agriculture. These are achievable by increasing both local and foreign investment in the host economy. Increasing local investment depends on savings [64,65]. Increased savings create loanable funds that financial intermediaries would lend to deficit funds units. Interest rates are also positively related to the savings rate; however, interest rates are negatively related to investment. Thus, there is a need to optimise interest rates to induce both savings and investment. This calls for effective management of the macroeconomy. As our results have shown that inflation discourages investment, effective management of inflation would discourage hiking interest rates to mop up excess liquidity. Governments in developing countries and their Central Banks must coordinate both fiscal and monetary policy in economic management.

Since divestment of *AGIFDI* is observable and is one of the causes of the decrease in *AGDI*, efforts must be directed at the retention of *AGIFDI*. Existing literature has shown that the drivers of IFDI are macroeconomic factors such as inflation, exchange

rate, trade, and savings rate, among others [66–69]. Also, these factors drive the divestment of IFDI [53,70]. Economic managers in developing countries must, therefore, keep their fingers on these indicators. As managing these indicators is a key goal of macroeconomic management, effective macroeconomic management will have collateral benefits for agricultural domestic investment in developing countries.

Inducing trade creates market access. This increase would arise from increased production. The increased production would call for increased investment, which can be funded from foreign receipts.

5. Concluding remarks

This paper contributes to the literature by assessing the effect of agricultural FD on agricultural DI in developing countries. The study employed unbalanced panel data from 50 countries, covering 1995–2020 and making up 619 observations.

Agricultural growth did not influence agricultural DI. Agricultural outward foreign direct investment, agricultural trade openness, and the savings rate promoted agricultural domestic investment. Inflation, however, discouraged domestic investment. Agricultural inward foreign direct investment and agricultural divestment of agricultural inward foreign direct investment crowd out agricultural domestic investment. Economic managers in developing countries must attain strong macroeconomic indicators, as these have collateral benefits for enhancing agricultural domestic investment.

The study is limited to developing countries, although the phenomenon of FD and DI is not peculiar to only developing countries. Moreover, the sector under consideration is agriculture, not the total economy of developing countries. Further research could overcome these limitations.

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Appendix A

Table A1. List of developing countries in the data.

Algeria	Côte d'Ivoire	Israel	Mozambique	Saudi Arabia
Bangladesh	Ecuador	Jamaica	Myanmar	Singapore
Bolivia	Egypt	Jordan	Nicaragua	Thailand
Brazil	El Salvador	Kenya	Oman	Tunisia
Cabo Verde	Fiji	Lao PDR	Panama	Türkiye (Turkey)
Cambodia	Guatemala	Madagascar	Paraguay	Uganda
Chile	Guyana	Malaysia	Peru	United Rep. of Tanzania
China	Honduras	Mauritius	Philippines	Uruguay
Colombia	India	Mongolia	Rep. of Korea	Vanuatu
Costa Rica	Indonesia	Morocco	Rwanda	Zambia

Notes: The designation of developing countries is informed by the United Nations (2021).

Appendix B

Table A2. Results of auxiliary regression for the test of endogeneity.

	(A1)	(A2)	(A3)	(A4)	(A5)	(A6)	(A7)
Variables	**AGDI**	**AGDI**	**AGDI**	**AGDI**	**AGDI**	**AGDI**	**AGDI**
AGIFDI	0.0316 (0.5598)					–0.0013 (0.0013)	–0.0016 (0.0078)
AGOFDI	0.0195* (0.0104)	0.0169 (0.0140)				0.0170 (0.0184)	0.0206 (0.0181)
SR	0.0332 (0.0610)	0.0248 (0.0327)	0.0248 (0.0348)	0.0394 (0.0329)	0.0276 (0.0338)	0.0388 (0.2315)	
AGGR			0.1275 (0.2456)			–0.0117 (0.0135)	–0.0144 (0.0400)
AGTO			0.0050 (0.0051)	0.0036 (0.0054)		0.0041 (0.0047)	0.0041 (0.0046)
INFLA							0.0981 (0.8212)
AGDIFDI					0.0391 (0.2909)		
v2AGIFDI	–0.0334 (0.5605)						
v2AGOFDI		0.0016 (0.0127)					
v2AGGR			–0.1378 (0.2405)				
v2AGTO				0.0015 (0.0028)			
vAG2DIFDI					–0.0391 (0.2908)		
v2AGSR						–0.0133 (0.2322)	
v2AGINFLA							–0.0927 (0.8253)
Constant	0.1065*** (0.0118)	0.1075*** (0.0060)	0.1015*** (0.0108)	0.1042*** (0.0094)	0.1116*** (0.0071)	0.0994** (0.0458)	0.1010* (0.0522)
Model diagnostics							
Observations	619	619	619	619	619	619	619
Countries	50	50	50	50	50	50	50

Notes: 1. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.