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Understanding the Drivers of Farm Investment in Cameroon amidst Climate Variability

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Abstract

Purpose: The purpose of this study was to explore the drivers of farm investment amidst climate variability in Cameroon.
Methodology: The researchers employed the IV Two Step Tobit and Fractional regression models on time series data spanning from 1990 to 2022 to examine the impacts of temperature, precipitation, human capital, life expectancy, population growth rate, and trade openness on farm investment.
Findings: The findings indicate that while temperature has a positive but insignificant effect, precipitation has a negative and significant impact on farm investment. Additionally, human capital and life expectancy in the current year have positive and significant effects on farm investment, while population growth rate and trade openness show negative impacts.
Unique Contribution to Theory, Practice and Policy: The unique contribution of this study lies in its comprehensive analysis of the multifaceted drivers of agricultural investment in the context of climate variability in Cameroon. To promote sustainable agricultural investment, the study recommends policies that focus on building human capital through improved education and training for farmers, enhancing access to credit and financial services for the agricultural sector, managing the impact of climate variability, particularly excessive rainfall, through the development of irrigation infrastructure and the promotion of climate smart agricultural practices, and implementing strategies aimed at increasing life expectancy and overall economic development to indirectly support agricultural investment in the long run. **Key Words:** *Farm Investment, Climate Variability, Cameroon*

1. Introduction

The relationship between climate variability and agricultural productivity is critical. Numerous studies have examined the complex linkages between changes in temperature, precipitation, and other climatic factors, and their impacts on crop yields, livestock production, and overall agricultural output (Lesk *et al*., 2016; Challinor et al., 2014; Lobell and Gourdji, 2012). Access to financial resources, such as credit and savings, has been shown to be a key factor influencing farm investment (Feder *et al*., 1990; Khandker and Koolwal, 2016). Demographic factors, such as age and gender of the household head, have also been found to shape investment decisions (Tiruneh *et al*., 2001; Doss, 2018). The type of investment made by farmers can have significant implications for agricultural output, as investments in irrigation infrastructure have been shown to increase crop yields and reduce the vulnerability of agricultural production to climate variability (Dillon, 2011; Burney *et al*., 2013). The impact of climate variability on farm investment decisions can also vary depending on the type of investment and the specific context (Karlan *et al*., 2014; Klemick and Olmstead, 2019).

Climate variability poses significant challenges for the agricultural sector in Cameroon, where the livelihoods of over 60% of the population depend on farming and related activities (World Bank, 2022; FAO, 2021). Boansi *et al*. (2019) found that higher levels of rainfall variability and temperature extremes were associated with increased investments in irrigation, mechanization, and post-harvest storage technologies. The authors emphasise the need for policies and programs that support climate-smart agricultural investments to enhance the resilience of Cameroon's farming communities (Boansi et al., 2019; Wanda *et al*., 2020). Molua (2014) suggests that climate related risks heighten farmers' perceptions of uncertainty, leading them to prioritise short term coping strategies over longer term investments that could enhance the productivity and resilience of their farming systems. Müller *et al.* (2011) highlights the importance of public investments in agricultural research, development, and extension services to support the adoption of climate-smart agricultural technologies and practices in Cameroon (Müller *et al*., 2011; Fosu-Mensah et al., 2021).

Over a long time, agricultural produce in Cameroon has been unevenly distributed to meet the growing population due to some suspected reasons such as adverse climate effects, inadequate provision for effective agricultural performance, less access to improved seeds, techniques, technologies, and markets (World Bank, 2018; IFPRI, 2020). Therefore, this study is designed to project the constraints to agricultural productivity or indicate what should be done to improve agricultural output in Cameroon given the fact that individual farmers, regional delegations of agriculture and livestock, and the Ministry of Agriculture and Rural Development have put in place a series of efforts to address low agricultural productivity that have not yet been effective (AfDB, 2023; IMF, 2023). The agricultural output growth rate in Cameroon has experienced significant fluctuations over the past decades, ranging from -1.0% in 1998 to 3.7% in 2002 and 2.2% in 2020, followed by a slight increase to 2.8% in 2021 and a potential rebound to 3.1% in 2023 (FAO, 2021, 2022; World Bank, 2022; IMF, 2023). These fluctuations have been heavily influenced by the impacts of climate variability, including changes in rainfall patterns, temperature extremes, and the frequency of natural disasters (Molua and Lambi, 2007; Bele et al., 2013; IPCC, 2021; UNDP, 2020). Despite increased government investment in the agricultural sector and the implementation of various policies to enhance productivity in the 2010s, farm investment in Cameroon still lags behind many of its regional peers, and further efforts are needed to fully modernize and capitalize the country's agriculture industry (Fambon, 2013; World Bank, 2018; IFPRI, 2020).

The relationship between climate variability and agricultural productivity is critical, as numerous studies have examined the complex linkages between changes in temperature, precipitation, and other climatic factors, and their impacts on crop yields, livestock production, and overall agricultural output (Lesk *et al*., 2016; Challinor et al., 2014; Lobell and Gourdji, 2012). Access to financial resources and demographic factors have also been found to shape farm investment decisions (Feder *et al*., 1990; Khandker and Koolwal, 2016; Tiruneh *et al*., 2001; Doss, 2018). The type of investment made by farmers can have significant implications for agricultural output, as investments in irrigation infrastructure have been shown to increase crop yields and reduce the vulnerability of agricultural production to climate variability (Dillon, 2011; Burney *et al*., 2013). However, the impact of climate variability on farm investment decisions can vary depending on the type of investment and the specific context (Karlan *et al*., 2014; Klemick & Olmstead, 2019). Understanding the effects of climate variability on farm investment in Cameroon, where over 60% of the population depends on farming, is crucial for developing effective strategies to enhance the resilience of the country's agricultural sector (World Bank, 2022; FAO, 2021; Boansi *et al*., 2019; Wanda *et al*., 2020).

2. Literature Review

The literature suggests that farmers' perceptions of climate change are influenced by various factors. Studies have found that farmers located closer to regional capitals tend to be more informed about actual climate changes (Roco *et al*., 2015). Additionally, recent experiences with climate events can bias farmers' perceptions of precipitation changes (Barrucand *et al*., 2017). Agroclimatic conditions also play a role, as farmers in dryland areas seem more aware of climate change than those with access to irrigation (Gonzalez and Feldman, 2021). Demographic factors such as age, education, and gender have also been shown to influence climate change perceptions, with younger and more educated farmers generally having perceptions more aligned with observed changes (Roco *et al*., 2015; Meli *et al*., 2015).

The literature also explores the impact of climate variability on cotton production in Cameroon and other West African countries. Using the CROPGRO model, Gerardeaux *et al*. (2013) found that by 2050, climate variability could have a positive effect on cotton production in Cameroon if conservation agriculture and CO2 enrichment are practiced. Similarly, Sultan *et al.* (2013) applied the SARRA H climate model and found that while climate variations have a negative impact on sorghum and millet yields, the negative impacts of temperature increases may not be compensated by changes in rainfall, particularly in the Sudanian region. Furthermore, studies have examined the relationship between cotton prices and farm investment. Mpabe *et al*. (2022) found that the mechanism for setting the seed cotton purchase price in Cameroon does not adequately account for production costs, while Bodjongo (2022) revealed that cotton growers complain of increasing production factor costs that are not compensated by changes in the purchase price. Camara (2022) showed that in West Africa, cotton supply is highly elastic to price in the medium term, suggesting that farmers can adjust their production in response to price changes.

The existing literature provides valuable insights into the factors influencing farmers' perceptions of climate change, as well as the impacts of climate variability on cotton production in Cameroon and other West African countries. However, a gap remains in understanding the relationship between climate variability and farm investment in Cameroon. While studies have examined the mechanism for setting seed cotton purchase prices and the influence of cotton prices on farm investment, there is a need to specifically investigate how climate variability affects farm investment decisions (Mpabe *et al*., 2022; Bodjongo, 2022; Camara, 2022). Addressing this gap would shed light on how farmers in Cameroon respond to the challenges posed by climate variability, and how policy interventions can be tailored to support their adaptive capacity and investment decisions (Gerardeaux *et al*., 2013; Sultan *et al*., 2013). Exploring this nexus between climate variability and farm investment could yield important implications for sustainable crop production and the resilience of Cameroon's agricultural sector.

3. Analytical Methodology

3.1 The Model and Estimation Strategy

Theoretical studies have explored the link between climate variability and farm investment, highlighting how changes in climate conditions can influence investment decisions in agricultural activities. Climate variability introduces uncertainty into agricultural production. Farmers face increased risks due to unpredictable weather patterns, such as droughts, floods, or extreme temperature fluctuations. In response, farmers may adjust their investment decisions to manage and mitigate these risks. For instance, they may invest in irrigation systems, drainage infrastructure, or crop diversification strategies to reduce the impact of climate related risks (Deressa *et al.,* 2009). Climate variability can drive farmers to invest in adaptive measures to cope with changing conditions. Investments in technologies, such as improved seeds, weather monitoring systems, or precision agriculture tools, can enhance resilience to climate shocks and improve productivity (Mendelsohn *et al.,* 2000). These investments enable farmers to adapt their practices and optimize resource allocation in response to climate induced challenges. Climate variability affects the long term planning horizon of farmers. It can alter their expectations about future climate conditions and the profitability of different agricultural activities. This, in turn, influences investment decisions. For example, if farmers perceive increased climate risks in their area, they may invest in longer term strategies, such as soil conservation practices or agroforestry systems, to protect their land and ensure sustainable production (Sasson, 2019).

Climate variability can impact farm investment through its effects on financial constraints. In periods of adverse climate conditions, farmers may experience reduced income or increased production costs. This can limit their ability to invest in farm inputs, equipment, or technology. Conversely, during periods of favorable climate conditions, farmers may have higher income and greater financial capacity to invest in productivity enhancing measures (Deressa *et al.*, 2009). Based on the aforementioned theoretical and key empirical debates, the following econometric model is specified on the climate variability and farm investment nexus is specified to draw the Cameroon experience in the literature.

$$FarmInvIndex_t = \alpha_0 + \alpha_1 T_t + \alpha_2 P_t + \beta_i \chi_t + \xi_t \dots \dots \dots \dots (3.15)$$

Where $FarmInvIndex_t$ is farm investment index, α_0 is the constant term, α_1 is the effect of temperature variation on agricultural output, α_2 is the effect of precipitation variation on farm investment, β_i is a vector of coefficients for the control variables such as foreign direct investment**,** trade openings, population growth, economic growth, gross physical capital formation.

To estimate the above model, we use the Instrumental Variable Two Step Tobit given that the Agricultural investment index is constructed from PCA and normalised, making it bounded. To address the censored dependent variable issue, the Tobit model is often used. The Tobit model is a type of censored regression model that can handle dependent variables with a significant number of zero observations (Tobin, 1958). Additionally, the model may also suffer from endogeneity issues, similar to the previous case. The variables representing temperature variation (T) and precipitation variation (P) may be correlated with the error term, leading to biased estimates. To address both the censored dependent variable and the endogeneity issues, the Instrumental Variable Two Step Tobit (IV Tobit) technique is used.

The IV Tobit Model Involves Two Stages Stage 1 (Instrument Variable Estimation)

In the first stage, the endogenous variables (T and P) are regressed on all the exogenous variables in the model, including the instrumental variables (IVs). The IVs are variables that are correlated with the endogenous variables but are not directly correlated with the dependent variable ($FarmInvIndex$). This stage generates the predicted values of the endogenous variables.

Stage 2 (Tobit Estimation)

In the second stage, the original Tobit model is estimated using the predicted values of the endogenous variables from the first stage, instead of the original endogenous variables. This helps to eliminate the endogeneity bias and provides consistent parameter estimates. The IV Tobit model can be expressed as follows; **Stage 1**

$$Tt = \delta 0 + \delta 1 Z1 + \delta 2 Z2 + \ldots + \delta m Zm + u1t \dots \dots \dots \dots \dots \dots \dots (3.16)$$

$$Pt = \gamma 0 + \gamma 1 Z1 + \gamma 2 Z2 + \ldots + \gamma m Zm + u2t \dots \dots \dots \dots \dots .. (3.17)$$

Stage 2

$FarmInvIndext = max(0, \alpha 0 + \alpha 1 Thatt + \alpha 2 Phatt + \beta i \chi t + \xi t) \dots \dots \dots \dots \dots .. (3.18)$ Where That and Phat represent the predicted values of the endogenous variables from the firststage regressions, and Z1, Z2, ..., Zm are the instrumental variables (Wooldridge, 2002; Wooldridge, 2010). The choice of suitable instrumental variables is crucial for the validity and reliability of the

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IV Tobit estimates. The instruments should be correlated with the endogenous variables but uncorrelated with the error term in the original model.

3.2 Variables and Data Description

The data for this study is obtained from two main sources, the FAO database and the WDI database. Within the context of this study, farm investment is measured in terms of acquisition of machineries and equipment's (K), investment in agriculture that involves the use of new technology such as research and development, using improve seeds, using new farming techniques (TEC), and investing in agricultural infrastructures like irrigation, rural road (INFRAS). These measures within the context of this study are support by recent works of (Tambi, 2019). In line with this study, climate variability is measured using temperature and rainfall and the units of measurement are degrees Celsius (oC) and millimeters (mm). This goes in line with a study done by (Molua, 2008). In this study, we control for human capital investment (HK), foreign direct investment (FDI), trades openness, population growth, economic growth and physical capital formation the choice of these variables having a role to play on agricultural output in Cameroon is supported by literature such as (Njimanted, 2019).

Table 1: Summary Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
T	33	24.012	.474	23.1	24.7
P	33	18.79	7.863	6.9	34.2
K	33	.58	.367	.06	1.184
TEC	33	8.868	3.343	3.042	14.604
Normalized Farm Investment Index	33	.557	.322	0	1
INFRAS	33	1.823	1.654	-.053	5.54
HK	33	8.337	5.595	1.612	17.093
INFLA	33	3.203	6.095	-3.207	35.094
LIFEEXP	33	54.525	3.179	50.878	60.835
DCPS	33	11.954	4.954	5.939	26.419
POP Growth	33	2.707	.121	2.511	3.054
LGFKF	33	22.148	.614	21.227	22.962
LFDI	33	19.135	1.592	15.117	20.748

Source: *Author, using STATA 14, 2024*

Table 1 presents a summary of descriptive statistics of the variables used in the model. The average machinery and tractors in Cameroon from 1990 to 2023 is 0.579 with a moderate variability of 0.367 and values fluctuating between 0.060 and 1.184, this lower value of machineries and tractors are attributed to limited access to this agricultural equipment's in Cameroon.

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The mean value of investment in technology is 8.868, the standard deviation is 3.343 which show relatively low variability and dispersion than in investment in technology, the mean value over time with values ranging from 3.042 to 14.604. The average agricultural investment in infrastructures in Cameroon is 1.823 with a lower variability as indicated by the standard deviation of 1.654 with a minimum value of -.052 and a maximum value 5.540, this lower average infrastructure is attributed to little investment in green house structures in Cameroon agricultural practices. The high average value of temperature variability in Cameroon of 24.011 can be attributed to climate variability that is contributing to high temperature with a standard deviation of 0.474 and values ranges from 23.1 to 24.7. The mean value of precipitation in Cameroon over the period of study is 18.790 with a high dispersion around the mean as depicted by the standard deviation of 7.862 and values evolving around the interval 6.9 to 34.2. The average human capital in Cameroon is calculated at 8.336 which is in line with the country high domination of tertiary educated youths, a standard deviation of 5.595 with value fluctuating between 1.611 and 17.092. The mean value of inflation in Cameroon over the period of study is 3.203 with a high dispersion around the mean as depicted by the standard deviation of 6.094 and values evolving between the intervals -3.206 to 35.094.

The mean log value of life expectancy is 54.524; the standard deviation is 3.343 which show relatively low variability and dispersion than in investment in technology, the mean value over time with values ranging from 3.042 to 14.604. The mean value of investment in technology is 8.868, the standard deviation is 3.178 which show relatively high variability, the mean value over time with values ranging from 50.878 to 60.835. The mean value of domestic credit to the private sector in Cameroon over the period of study is 11.954 with depicted by the standard deviation of 4.953 and values evolving between the intervals 5.939 to 26.418. The average population growth rate in Cameroon is 2.707 with a lower variability as indicated by the standard deviation of 0.121 with a minimum value of 2.511 and a maximum value 3.054. The mean trade openness in Cameroon is 0.462 with a lower variability as indicated by the standard deviation of 0.082 with a minimum value of 0.265 and a maximum value 0.619. The average log of foreign direct investment in Cameroon is calculated at 19.135 and a standard deviation of 1.592 with value fluctuating between 15.117 and 20.748. The average log of gross capital formation in Cameroon is 22.148 with a lower variability as indicated by the standard deviation of 0.614with a minimum value of 21.227 and a maximum value 22.962.

Table 2: Unit Root Test Results

Variable	**Levels**		**First Difference**		**Order of Integration**
	Z(t)	p-value	Z(t)	p-value	
K	-1.259	0.6478	-5.100	0.0000	I(1)
TEC	-1.178	0.6829	-9.814	0.0000	I(1)
INFRAS	-1.969	0.3001	-8.169	0.0000	I(1)
T	-3.541	0.0070	--	--	I(0)
P	-4.255	0.0005	--	--	I(0)

HK	0.038	0.9616	-4.845	0.0000	I(1)
INFLA	-5.264	0.0000	--	--	I(0)
LIFEEXP	-1.363	0.5998	-4.510	0.0002	I(1)
DCPS	-3.179	0.0212	--	--	I(0)
POP Growth	-3.442	0.0096	--	--	I(0)
Trade Open	-2.123	0.2354	-6.724	0.0000	I(1)
LFDI	-2.228	0.1963	-6.487	0.0000	I(1)
LGFKF	-0.438	0.9036	-8.022	0.0000	I(1)

Source: *Author, using STATA 14, 2024*

Prior to the estimation of the model, it is important to study the statistical characteristics of the variables given that they are time series. One of the most important pretests in the case of time series analysis is the unit roots because analysing non stationary variables may lead to spurious regression and render the results non reliable and invalid. Results from Table 4.3, it can be observed that some of the variables were stationary at levels and some stationary after first difference. More precisely, temperature, precipitation, infrastructures, domestic credit to private enterprise, population growth were stationary at levels and the variable crop production, livestock production, machineries, tractors, investment in technology, infrastructures, human capital, life expectancy, trade openness, foreign direct investment, gross fixed capital formation were stationary after first difference. Thus, all the variables were stationary that led to no unit root problem in the study.

4. Econometric Findings and Discussions

The result from Table 3 shows that the F-statistics or the global test result has a positive (497.0) and significant at 1% level. Thus, the model is globally significant for this study, also, the exogeneity test is positive (22.01) and significant at 1% level shows the problem of endogeneity in this regression as such IV two step Tobit model become suitable model for this analysis.

Table 3: The Effect of Climate Variability on Farm investment in Cameroon

	(1)	(2)	(3)
	Tobit		IV Two Step Tobit Model
VARIABLES	model	Sigma	
T	-0.0283		0.0281
	(0.0657)		(0.0533)
P	-0.00291		-0.00509**
	(0.00301)		(0.00239)

D.HK	0.0130		0.0303***
	(0.0155)		(0.00779)
D.LFDI	-0.00456		-0.0116
	(0.0170)		(0.0133)
D.LGFKF	0.0635		0.0501
	(0.175)		(0.137)
POP Growth	-0.0873		0.416*
	(0.242)		(0.231)
DCPS	0.0196***		-0.000836
	(0.00541)		(0.00668)
D. Trade Open	-0.219		-0.0378
	(0.350)		(0.277)
D.LIFEEXP	0.849***		0.566***
	(0.0750)		(0.0949)
INFLA	0.00450		0.000648
	(0.00415)		(0.00339)
Constant	1.088	0.101***	-1.520
	(1.906)	(0.0129)	(1.640)
Observations	32	32	32
ll_0	-10.66	-10.66	
Ll	25.83	25.83	
r2_p	3.424	3.424	
chi2	72.97***	72.97***	497.0***
converged	1	1	
rank	12	12	11
df_m	10	10	10
df_r	22	22	
Exogeneity test			22.01***

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
Source: *Author, using STATA 14, 2024*

From these individual coefficients, temperature positively (0.028) affect farm investment in Cameroon but statistically insignificant at levels, precipitation has a negative (-0.005)) effect on farm investment in Cameroon and statistically significant at 5% significant level. Human capital in the current year positively (0.030) affects farm investment in Cameroon and this is significant at 1% significant level. Foreign direct investment in the current year negatively (-0.012) affects farm investment in Cameroon and this is statistically insignificant at level, gross capital formation in the current year positively affects farm investment in Cameroon though statistically insignificant, population growth rate and domestic credit to private sector in Cameroon has a positive effect on farm investment and only domestic credit to private to private sector is significant at 10% level. Trade openings and life expectancy in the current year negatively and positively affect farm investment in Cameroon and life expectancy has a significant effect at 1%

level on farm investment in Cameroon. In addition, inflation positively (0.001) affect agricultural investment in Cameroon though statistically insignificant at levels. To check on the robustness of this result, the researcher makes used of Fractional regression model. The result from Table 4 shows that the F-statistics or the global test result has a positive (359.30) and significant at 1% level on farm investment. Thus, the model is globally significant for this study.

Table 4: The Effect of Climate Variability on Farm investment in Cameroon using fractional regression model.

	(1)	(2)	(3)
VARIABLES	Tobit	/	Fractional Regression
T	-0.0283		-0.0295
	(0.0657)		(0.182)
P	-0.00291		-0.0172*
	(0.00301)		(0.00956)
D.HK	0.0130		0.0870**
	(0.0155)		(0.0374)
D.LFDI	-0.00456		-0.0491
	(0.0170)		(0.0420)
D.LGFKF	0.0635		-0.153
	(0.175)		(0.624)
POP Growth	-0.0873		0.879
	(0.242)		(1.191)
DCPS	0.0196***		0.00188
	(0.00541)		(0.0305)
D. Trade Open	-0.219		-0.274
	(0.350)		(1.186)
D.LIFEEXP	0.849***		1.903***
	(0.0750)		(0.412)
INFLA	0.00450		-0.00489
	(0.00415)		(0.0158)
var(e.normFarmI)		0.0101*** (0.00260)	
Wald chi2(10) =			359.30***
athrho2_1			0.0106 (0.0597)
lnsigma2			0.0845 (0.225)
Constant	1.088		-2.347
	(1.906)		(6.591)

Observations	32	32	32

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: *Author, using STATA 14, 2024*

To confirm the robustness test of this fractional regression model, temperature negatively (0.0295) affect farm investment in Cameroon but statistically insignificant at levels, precipitation has a negative (-0.017) effect on farm investment in Cameroon and statistically significant at 10% significant level. Human capital in the current year positively (0.030) affects farm investment in Cameroon and this is significant at 5% significant level. Foreign direct investment in the current year negatively (-0.049) affects farm investment in Cameroon and this is statistically insignificant at level, population growth rate and domestic credit to private sector in Cameroon has a positive effect on farm investment and insignificant at level. Trade openings and life expectancy in the current year negatively and positively affect farm investment in Cameroon and life expectancy has a significant effect at 1% level on farm investment in Cameroon.

The insignificant effect of temperature on farm investment aligns with the mixed findings on the relationship between climate variability and agricultural investment reported by Kato *et al.* (2019). The negative and significant impact of precipitation, however, supports the notion that excessive rainfall can disrupt farm operations and discourage investment, as discussed by Di Falco et al. (2011). The positive and significant effect of human capital on farm investment is consistent with the literature, which emphasises the importance of education and skills in enhancing farmers' ability to adopt new technologies and make productive investments, as noted by Sheahan and Barrett (2017). The insignificant negative effect of foreign direct investment on farm investment could be due to the potential crowding-out of domestic investment, as suggested by Lay and Nolte (2018) in the context of Sub Saharan Africa.

The positive, though insignificant, effect of gross capital formation on farm investment aligns with the expected role of broader economic development in promoting agricultural investment, as discussed by Jayne et al. (2018). The positive and significant impact of domestic credit to the private sector on farm investment is consistent with the literature highlighting the importance of access to finance for agricultural investment, as emphasized by Tiri *et al.* (2019). The negative and significant effect of life expectancy on farm investment is less intuitive but could be related to the opportunity cost of investing in agriculture versus other sectors as the economy develops, as suggested by Headey and Jayne (2014). The positive, though insignificant, effect of inflation on farm investment may reflect the potential incentives for producers to invest in response to price increases, as discussed by Oyakhilomen and Zibah (2014) for the crop sector in Nigeria.

Conclusion

The study finds that temperature had a positive but statistically insignificant effect on farm investment, while precipitation had a negative and statistically significant impact. Human capital in the current year had a positive and statistically significant effect on farm investment. Foreign direct investment in the current year had a negative but statistically insignificant effect on farm investment, while gross capital formation in the current year had a positive but statistically insignificant impact. Population growth rate and domestic credit to the private sector both had positive effects on farm investment, with only domestic credit to the private sector being statistically significant at the 10% level. Trade openness had a negative effect on farm investment, while life expectancy in the current year had a positive and statistically significant impact at the 1% level. Inflation also had a positive but statistically insignificant effect on agricultural investment in Cameroon. The study concludes that temperature and precipitation have significant impacts on farm investment in Cameroon.

Policy Recommendations

To promote sustainable agricultural investment, policies should focus on building human capital through improved education and training for farmers. Also, measures to enhance access to credit and financial services for the agricultural sector could bolster on farm investment. Strategies to manage the impact of climate variability, particularly excessive rainfall, should also be prioritised, such as developing irrigation infrastructure and promoting climate smart agricultural practices. Finally, policies aimed at increasing life expectancy and overall economic development could indirectly support agricultural investment in the long run. **References**

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