



COINTEGRATION AND CAUSALITY BETWEEN FINANCIAL DEVELOPMENT AND EMPLOYMENT: EVIDENCE FROM ALBANIA

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Abstract

Financial systems play a crucial role in transition economies by allocating capital efficiently and facilitating structural transformation, by stimulating investment, increasing employment, and contributing to long-term financial stability. This study examines the relationship between financial development and employment in Albania over the period 1994-2023, using domestic credit as the main indicator of financial development and employment as a labor market outcome. GDP growth and inflation are included as control variables. Estimates from a Vector Error Correction Model reveal that, in the long run, domestic credit exerts negative effects on formal employment, reflecting both the misallocation of credit towards capital-intensive and low-labor sectors and the persistence of informality. The findings suggest that financial development, under current structural conditions, does not automatically translate into inclusive job creation. To strengthen the role of financial development on employment, policies should prioritize channeling credit to labor-intensive sectors, maintaining price stability, and promoting growth that supports formal employment.

Keywords: Financial Development; Employment; Domestic Credit; GDP; Inflation; Albania; VECM

INTRODUCTION

The economic literature generally supports the idea that financial deepening can increase productive investment, support entrepreneurship, and generate employment, when credit is directed toward labor-intensive, high-value-added sectors. The impact of financial development on employment is far from uniform; it is influenced by factors such as institutional quality, macroeconomic stability, and the sectoral distribution of credit.

In Albania, the transition from a centrally planned to a market-based economy was accompanied by liberalization, privatization, and banking reforms that expanded the role of the private sector. While these changes boosted economic growth, especially in the post-pandemic period, formal job creation has lagged behind economic growth. Most domestic credit has been directed towards construction, real estate and household consumption – sectors that grow GDP but have low employment elasticity and high levels of informality. At the same time, small and medium-sized enterprises (SMEs), which provide the majority of jobs, face persistent financing constraints, such as high collateral requirements, short maturities and high interest rates.

As a result, Albania has experienced periods of “jobless growth”, where GDP expansion does not translate into proportional growth in formal employment. This pattern is reinforced by structural characteristics of the labour market, including a large informal economy, high self-employment and a predominantly rural workforce.

This study investigates how domestic credit to the private sector, GDP growth and inflation together affect formal employment in Albania, both directly and indirectly through economic growth. Using annual data from 1994–2023 and applying a Vector Error Correction Model (VECM), the analysis aims to provide evidence on whether financial development in Albania functions as an employment booster, or whether structural and institutional constraints limit its ability to generate sustainable employment

LITERATURE REVIEW

The relationship between financial development and employment has long been a focus of economic theory and empirical research. Early literature by Schumpeter (1934), King and Levine (1993), and Levine (1997) supported the idea that financial systems can serve as catalysts for translating economic growth into employment gains, especially when credit flows to productive, labor-intensive sectors. However, the impact of financial development on employment is context-dependent. Financial development positively affects employment, but the relationship is nonlinear and depends on institutional quality (Ayadi, Ben Naceur, and Goaid 2021). Although financial deepening can reduce inequality and increase employment (Song et al (2024), Bui (2020), (Afonso and Blanco Arana 2021), these positive effects depend on institutional quality and

sectoral allocation of credit. When credit is concentrated in capital-intensive or speculative activities, the link between growth and employment weakens (Berry (2008). Evidence from developing and transition economies suggests that the growth-credit-employment nexus is often less favorable. In some developing contexts, credit expansion without strong institutions can lead to resource misallocation, speculative bubbles, and minimal impact on employment (Appiah, Gyau, Gyamfi, & Asongu, 2023). While domestic credit supports GDP growth in Central and Eastern Europe (Égert, Backé, & Zumer, 2006), the employment effects are weak due to skills mismatches (World Bank 2025), informality (Malkova et al 2021) and sectoral concentration of credit in activities with low labor demand (Égert, Backé, and Zumer 2006).

In the Western Balkans, macroeconomic instability and weak institutional capacity hinder the capacity of credit markets to support job creation. For Albania, most credit is directed to non-tradable sectors such as construction and real estate, which generate limited formal employment (International Monetary Fund, 2024). Small and medium-sized enterprises' access to credit is limited by high collateral requirements, short maturities and high interest rates, reducing their potential to expand and employ. (Moder & Bonifai, 2017) In the case of Albania, structural characteristics of the labor market - such as persistently high rates of self-employment (TheGlobalEconomy.com, 2022), widespread informality and a predominantly rural workforce (Meçe, & Ribaj 2019). - combined with the sectoral concentration of credit in activities with limited potential for job creation (International Monetary Fund 2024), contribute to a more complex and potentially weaker link between financial deepening and employment gains. A particularly important factor for interpreting employment data in Albania is the large informal economy (European Commission 2024). The informal economy in Albania accounts for around 27–35% of GDP and about 56.7% of total employment (dropping to roughly 29% when excluding agriculture) (Elgin, Kose, Ohnsorge, & Yu, 2021). This is consistent with international findings that in economies with large informal sectors, GDP growth and financial deepening can appear decoupled from formal job creation (Khayati & Terzi, 2023).

Despite a large body of cross-country and regional research, empirical studies that focus specifically on Albania remain limited. Existing analyses have often examined bivariate relationships or have focused on the effect of credit on GDP growth, without clearly defining employment outcomes. Empirical evidence for Albania shows that microcredit positively impacts employment, with Muço (2024) and Muharremi and Madani (2021) finding significant gains in employment, and Loca & Kola (2013) reporting more employees among microfinance clients. The World Bank (2019) identifies access to finance as a key constraint to firm growth and job creation, which was reflected in the 2019 Albanian Enterprise Survey. Larger studies covering Albania, such as Leitner (2015) and Islam (2023), confirm that financing constraints significantly reduce firms' employment growth.

METHODOLOGY

This study examines whether domestic credit, along with variables such as GDP and inflation, jointly affect employment in Albania, with the aim of understanding how financial development translates into sustainable job creation. Using annual data on employment, GDP growth, inflation and domestic credit to the private sector - extracted from the World Bank, and Unctad - the analysis covers the period 1994–2023.

Employment is measured as Employment to population ratio, (15+, total (%) modeled ILO estimate), INF as GDP deflator (annual %), Domestic credit as Domestic credit to private sector by banks (% of GDP) and GDP as Annual average growth rate. The data for Employment, INF, Domestic credit are taken from World Bank Data. The data for GDP are taken from UNCTAD (UN Trade and Development). A structured time series framework is implemented to avoid spurious regressions (Granger & Newbold, 1974), with stationarity tested using Augmented Dickey-Fuller and Phillips-Perron procedures. Optimal lag length tests are used to identify the best number of past observations to include in a time series model for accuracy and efficiency (Lütkepohl, 2005). The cointegration method of Johansen (1988, 1991) is used to detect long-run relationships. A Vector Error Correction Model (Engle & Granger, 1987) is estimated to capture both short- and long-run dynamics, with robustness confirmed through standard diagnostic tests.

EMPIRICAL ANALYSIS

Before estimating the model, the stationarity of the variables and their order of integration were assessed using unit root tests. The Augmented Dickey-Fuller (ADF) test was first applied to all variables in their levels, and the Phillips-Perron (1988) test was subsequently employed to validate the results. The optimal lag length was determined prior to conducting these stationarity tests. The results of the unit root tests are presented in Table 1.

Table 1. Results of unit root tests of variables at levels

Variable	ADF Test Statistic	5% Critical Value	P-value	PP Test (Z(t))	Stationary at Level?
Employment	-2.015	-2.986	0.28	-3.806 (p=0.0163)	Non-stationary by ADF, borderline by PP
GDP	-2.995	-3.588	0.1336	-9.047 (p=0.0000)	Non-stationary by ADF, stationary by PP
Dom_Credit	-1.187	-3.592	0.9131	-0.883 (p=0.9580)	Non-stationary
Inflation	-1.714	-3.588	0.7447	-3.673 (p=0.0242)	Non-stationary by ADF, borderline by PP

ADF tests show that Employment, GDP, Domestic Credit, and Inflation are non-stationary in levels at the 5% significance level. PP tests indicate possible stationarity for GDP and Inflation, borderline evidence for Employment, but confirm non-stationarity for Domestic Credit. Given the ADF's conservatism and to avoid spurious regression, all variables are treated as I(1). Reapplying ADF and PP tests to first differences confirms stationarity, indicating all variables are integrated of order one (Table 2).

Table 2. Results of Unit Root Tests for Variables in First Differences

Variable (First Diff)	ADF Test Statistic	5% Critical Value	P-value	Stationary?
Employment_D1	-4.826	-3.584	0.0004	Stationary
GDP_D1	-8.461	-3.592	0	Stationary
Dom_Credit_D1	-2.522	-3.592	0.3169	Weak, borderline
Inflation_D1	-4.237	-3.592	0.0039	Stationary

After first differencing, Employment, GDP, and Inflation are stationary at the 5% significance level, confirming they are I(1). Domestic Credit shows a borderline result: the ADF statistic fails to reject the null of a unit root at 5%, indicating weak stationarity evidence. Nonetheless, PP test confirmation or economic reasoning supports treating it as I(1). Overall, with the exception of Domestic Credit's borderline case, all variables are stationary in first differences, consistent with integration of order one.

Given these results, the next step is to examine whether short-run or long-run relationships exist among Employment, GDP, Inflation, and Domestic Credit. For this purpose, the Johansen cointegration test is applied.

Table 3. Johansen tests for cointegration

Johansen tests for cointegration						Number of obs =	28
Trend: constant						Lags =	2
Sample: 1996 - 2023							
-----						5%	
maximum				trace	critical		
rank	parms	LL	eigenvalue	statistic	value		
0	20	-269.81736	.	74.8059	47.21		
1	27	-248.29357	0.78506	31.7583	29.68		
2	32	-238.93295	0.48758	13.0371*	15.41		
3	35	-235.22342	0.23277	5.6180	3.76		
4	36	-232.41441	0.18180				

The Johansen cointegration test results indicate the presence of up to two long-run relationships among Employment, GDP, Inflation, and Domestic Credit. Using the Trace statistic, the null hypothesis of no cointegration (rank = 0) is rejected since the test statistic (TS = 74.8059) exceeds the 5% critical value (CV = 47.21). For rank = 1, the null of at most one cointegrating vector is also rejected (TS = 31.7583 > CV = 29.68), confirming at least two cointegrating relationships. However, for rank = 2, the test statistic (TS = 13.0371) is below the critical value (CV = 15.41), indicating no additional significant vectors beyond the two already identified.

These findings suggest that the variables are linked in the long run through two cointegrating vectors, supporting the application of a Vector Error Correction Model (VECM) to capture both long-term equilibrium relationships and short-term adjustment dynamics. Before estimating the VECM, the optimal lag length was selected using information criteria.

Table 4. The lag length in the VECM model

Selection-order criteria					Number of obs = 26			
lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-279.524				34827.1	21.8095	21.8652	22.0031
1	-219.743	119.56	16	0.000	1223.76	18.4418	18.7205	19.4096
2	-193.217	53.053	16	0.000	601.768	17.6321	18.1337	19.3741
3	-164.821	56.793	16	0.000	305.348*	16.6785*	17.4031*	19.1947*
4	-149.628	30.386*	16	0.016	610.455	16.7406	17.6881	20.031

Endogenous: Employment GDP Inflation Dom_credit
Exogenous: _cons

Both the Final Prediction Error (FPE) and the Akaike Information Criterion (AIC) are lowest at lag p=3, meaning this lag gives the best model fit without adding unnecessary complexity.

The results of the VECM model are presented in Table 5. From the VECM output, we can derive a long-run cointegration equation between Employment and GDP, Inflation, and Domestic Credit.

Cointegration equation:

$$\text{Employment} + 947.05 \cdot \text{GDP} + 121.38 \cdot \text{Inflation} + 143.20 \cdot \text{Dom_credit} - 8130.94$$

This means that in the long-run equilibrium (when the cointegration equation is equal to zero), we have:

$$\text{Employment} = -947.05 \cdot \text{GDP} - 121.38 \cdot \text{Inflation} - 143.20 \cdot \text{Dom_credit} + 8130.94$$

Table 5: VECM Model

Vector error-correction model

Sample: 1996 - 2023	No. of obs	=	28
Log likelihood = -248.2936	AIC	=	19.66383
Det(Sigma_ml) = 592.1423	HQIC	=	20.05655
	SBIC	=	20.94845

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_Employment	6	1.97155	0.1331	3.377702	0.7602
D_GDP	6	2.96686	0.8153	97.08057	0.0000
D_Inflation	6	4.50615	0.7351	61.03765	0.0000
D_Dom_credit	6	2.03941	0.5933	32.09338	0.0000

Identification: beta is exactly identified

Johansen normalization restriction imposed

beta	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
_cel						
Employment	1	.	.	.	.	.
GDP	947.0545	109.0326	8.69	0.000	733.3545	1160.755
Inflation	121.3805	54.69788	2.22	0.026	14.17467	228.5864
Dom_credit	143.2042	28.90542	4.95	0.000	86.55061	199.8578
_cons	-8130.936	.	.	.	.	.

The cointegrated linear regression equation expresses the functional relationship between the dependent variable Employment and the independent variables GDP, Inflation, and Domestic Credit. Thus, the VECM model estimated that there is a significant long-run relationship between Employment and the independent variables GDP, Inflation, and Domestic Credit.

This means that, in the long-run equilibrium:

- GDP (-947.05): A 1-unit increase in GDP is associated with a significant *decrease* in employment. This negative relationship may reflect productivity gains or automation, where economic growth is achieved without generating more jobs.
- Inflation (-121.38): Higher inflation reduces employment, likely due to increased production costs and economic uncertainty, which discourage hiring.
- Domestic Credit (-143.20): Growth in domestic credit is linked to lower employment, possibly because loans are channeled into sectors with low labor demand rather than job-intensive industries.

Diagnostics of the VECM Model

It is important to verify that the estimated model produces reliable results and does not contain errors; therefore, we applied diagnostic tests. First, the stability test was conducted to ensure that the model is correctly specified and free from specification errors. If the moduli of

the remaining roots are greater than one, the model is unstable, and its results are inaccurate and error-prone. However, if the eigenvalues are less than or equal to one, the model is considered stable, and its results can be used for forecasting.

Figure 1: companion matrix of the VECM roots

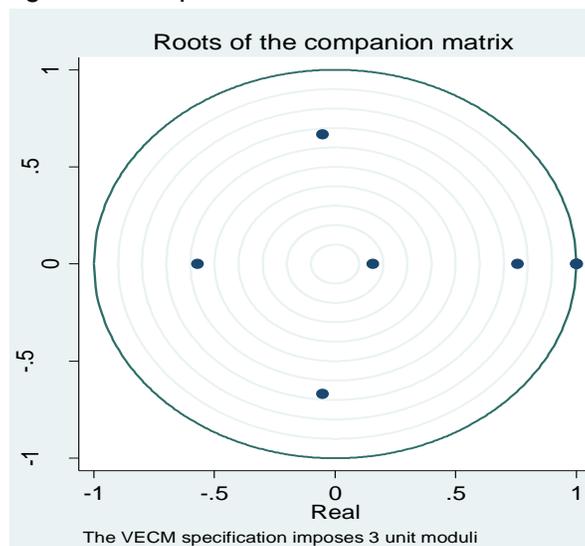


Table 6: The stability test of the VECM

Eigenvalue stability condition	
Eigenvalue	Modulus
1	1
1	1
1	1
.7551128	.755113
-.05302374 + .6679435i	.670045
-.05302374 - .6679435i	.670045
-.570399	.570399
.1560671	.156067

The VECM specification imposes 3 unit moduli

The second test applied is the Lagrange Multiplier (LM) test for autocorrelation among the residuals. This test autocorrelation in the residuals for any of the tested lags.

Table 7: Lagrange Multiplier Test of VECM

lag	chi2	df	Prob > chi2
1	16.7164	16	0.40418
2	10.7330	16	0.82566
3	12.2148	16	0.72907
4	17.0167	16	0.38452

H0: no autocorrelation at lag order

Also, the results of the tests Jarque-Bera, Skewness, and Kurtosis statistics lead to the conclusion that the residuals are normally distributed.

Table 8. Jarque-Bera, Skewness, and Kurtosis Tests

Jarque-Bera test					
Equation		chi2	df	Prob >	chi2
D_Employment		2.391	2	0.30253	
D_GDP		0.404	2	0.81721	
D_Inflation		0.945	2	0.62341	
D_Dom_credit		0.502	2	0.77791	
ALL		4.242	8	0.83463	

Skewness test					
Equation	Skewness	chi2	df	Prob >	chi2
D_Employment	-.40822	0.778	1	0.37785	
D_GDP	.18207	0.155	1	0.69409	
D_Inflation	-.40722	0.774	1	0.37902	
D_Dom_credit	.07192	0.024	1	0.87653	
ALL		1.730	4	0.78519	

Kurtosis test					
Equation	Kurtosis	chi2	df	Prob >	chi2
D_Employment	4.176	1.613	1	0.20401	
D_GDP	3.462	0.249	1	0.61776	
D_Inflation	2.6169	0.171	1	0.67902	
D_Dom_credit	2.3598	0.478	1	0.48926	
ALL		2.512	4	0.64251	

DISCUSSION AND CONCLUSION

The international literature supports the idea that countries with developed financial systems foster job creation by channeling resources into productive and labor-intensive sectors. The growth of credit to the domestic private sector is an important measure of a country's financial development. In Albania, the relationship between financial development and employment is limited by structural and institutional weaknesses. A large share of domestic credit in Albania has flowed into construction, real estate, and household consumption—sectors that contribute to GDP growth but are characterized by low employment elasticity and high informality. On the other hand, widespread informality and a predominantly rural workforce further weaken the growth-employment nexus.

Our empirical findings confirm these dynamics. GDP growth, inflation and private sector credit exert long-term negative effects on formal employment, reflecting a growth model driven by productivity gains and structural changes rather than expected effects in employment levels.

The sectoral distribution of credit to domestic businesses has been a crucial factor. In the mid-2000s, over 40% of bank loans were channeled to the construction and real estate sectors, while agriculture and manufacturing together benefited from less than 15%. On the other hand, given that the informal economy is estimated to account for 30–40% of GDP, most of the employment generated during periods of economic expansion has remained undeclared, creating the perception of ‘jobless growth’. The high level of self-employment in Albania represents one of the few channels through which economic development reflects positively on the labor market, offering an alternative form of income generation. Small and Medium Enterprises (SMEs), which constitute the main source of employment in Albania, face heavy collateral requirements, short loan maturities and high financing costs, while larger enterprises often favor automation over labor.

As a conclusion of our work, we can say that financial deepening alone cannot guarantee inclusive job growth in Albania. Albania can use the country's financial development as a real driver of inclusive and sustainable employment growth if it orients its policies towards promoting domestic lending to labor-intensive sectors, such as manufacturing, agribusiness and exports, using targeted credit schemes, guarantees and differentiated reserve requirements, increasing access to finance for small and medium-sized businesses, preserving the country's macroeconomic stability, reducing informality by combining stronger regulations with incentives such as simplified taxation, lower compliance costs and digital reporting.

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