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DETERMINANTS OF VENTURE CAPITAL EXPANSION: THE IMPACT OF INSTITUTIONS, ECONOMIC DEVELOPMENT, AND MARKET LIQUIDITY

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Abstract

This study examines the determinants of venture capital development with a focus on institutional quality, economic development, and market depth of countries. Using unbalanced panel data across countries, the analysis applies advanced econometric techniques, including the Mundlak (Correlated Random Effects) approach, to account for unobserved heterogeneity and distinguish between within- and between-country effects. The results show that GDP per capita and stock market activity positively influence venture capital investment, highlighting the importance of economic development and exit opportunities. While the within-country effect of the rule of law appears negative, its between-country (mean) effect is positive and statistically significant, suggesting that countries with consistently stronger institutional environments attract higher levels of venture capital in the long run. Overall, the findings emphasize that venture capital development is primarily driven by structural differences in institutional quality and market conditions rather than short-term changes. The study provides important policy implications, particularly for emerging economies, underscoring the need to strengthen legal systems, develop exit markets, and support risk-sharing financial mechanisms.

Keywords: Venture capital, institutional quality, exit markets, M&A, IPO, contract enforcement, investor protection.

Introduction

The last financial crisis highlighted the downsides of today's financial system, its risk-management tools and methods, and the consequences of a debt-based financial system. Today's reality is making specialists not simply change the instrument. They must look at the problem from a broader perspective, even when building a new system. And here we are talking about a risk-management approach. To safeguard against unfavorable situations, risk management must ensure that other parties are not adversely affected by this protection. In risk management, everybody should be responsible for their part of the pie. Sage investors already understood that risk-shifting is the main cause of the problem and have already chosen risk-sharing finance. Because risk-shifting, such as shifting risk with "too big to fail" status to other

financial institutions or to taxpayers, shifting risk with "quantitative easing" to future generations, shifting risk with "deposit insurance" to taxpayers, short-term pros began showing their long-term consequences. After the pandemic, the world saw significant rises in venture capital (320–350 billion USD) and equity crowdfunding (2.5–3.0 billion USD), as well as in Islamic finance (5.5 trillion USD) volumes, demonstrating investors' preference for risk-sharing finance in response to crises and vulnerabilities.

But risk-sharing finance's dramatic growth didn't make debt-based (risk-shifting) finance shorter. If awareness leads some investors to choose risk-sharing finance, the conventional financial system's debt bias is likely to make risk-shifting grow too. Our current task is to analyze the depth of risk-shifting results and identify the determinants of the development of risk-sharing finance, including venture capital investments.

Literature review

The theory and evolution of venture capital have been shaped by a combination of innovation-driven growth theories, institutional economics, and financial contracting frameworks. Early contributions by Schumpeter (1934) emphasized the central role of innovation and entrepreneurship in economic development, laying the conceptual foundation for venture financing. Over time, the emergence of venture capital as a formal financial intermediary—particularly with the establishment of the American Research and Development Corporation (ARDC) by Georges Doriot—marked a shift toward organized provision of risk capital.

Table 1. Key Theoretical Contributions to Venture Capital Development

Author / Period	Key Work / Idea	Contribution to Venture Capital
Joseph Schumpeter	Theory of Economic Development	Established the link between innovation, entrepreneurship, and financing
Georges Doriot (1940–1960)	Founder of ARDC	Established the first venture capital fund and created institutional foundations
William A. Sahlman (1980–1990)	VC structure and governance	Systematized venture capital contracts and incentive mechanisms
Michael Jensen & William Meckling	Theory of the Firm	Introduced agency theory and incentive alignment, forming the theoretical basis of VC
Paul Gompers	Venture capital cycles and stages	Analyzed staged financing, monitoring, and the role of IPOs
Josh Lerner	Institutional analysis	Highlighted the importance of investor protection, IPO markets, and institutions
Bernard Black & Ronald Gilson	VC and financial systems	Emphasized the role of legal systems and exit markets
Thomas Hellmann	VC and risk-sharing	Analyzed control rights, convertible securities, and governance mechanisms
Marco Da Rin	VC policy and institutions	Demonstrated the role of institutions and exit infrastructure in VC development

Previous studies consistently find that GDP per capita is a key determinant of venture capital development, as higher income levels reflect greater market sophistication, stronger demand for innovation, and a more developed entrepreneurial ecosystem (Gompers & Lerner, 1998; Da Rin et al., 2013; Cumming et al., 2019). Paul Gompers and Josh Lerner (1998) investigated what drives venture capital fundraising and concluded that the country's economic prosperity, as measured by GDP per capita, is the key factor. High-income countries invest more and, as a result, have a more developed innovation market. Marco Da Rin et al. (2013) also highlighted that Venture capital activity is more prevalent in developed countries, and a high GDP per capita indicates market sophistication and demand for innovation. Douglas Cumming et al. (2019) empirically investigated international markets and decided that income level is a key driver of venture capital investment volumes.

A large body of literature emphasizes that the availability of exit mechanisms, particularly IPOs and mergers and acquisitions, is a critical determinant of venture capital development. Well-functioning exit markets enable investors to realize returns, thereby incentivizing venture capital investment (Black & Gilson, 1998; Gompers, 1995; Lerner, 2002). Bernard Black and Ronald Gilson (1998) investigated the structure of capital markets and emphasized that the development of venture capital markets is correlated with the existence of an IPO market. Strong stock markets make strong venture capital, and exit markets are the heart of the venture capital ecosystem. Paul Gompers (1995) also studied exit markets and the correlation between venture capital and exit markets in another work, concluding that staged financing prepares for exit. Josh Lerner (2002) added that the success of venture capital is related to both IPOs and mergers and acquisitions (M&A).

Previous studies consistently highlight the importance of institutional quality, particularly the rule of law, in shaping venture capital development too. Strong legal systems improve investor protection, reduce agency problems, and enhance contract enforcement, thereby fostering venture capital activity (La Porta et al., 1998; Lerner & Schoar, 2005; Cumming et al., 2019). Rafael La Porta et al. (1997, 1998) highlighted that the Rule of Law deepens capital markets and that the Venture capital sector is particularly sensitive to investor protection. Josh Lerner and Antoinette Schoar (2005) argued that the Rule of Law improves contract quality and that strong enforcement attracts more venture capital. Institutional weakness makes venture capital scarce. Douglas Cumming et al. (2019) empirically investigated venture capital determinants and concluded that institutional quality is a strong positive determinant of Venture capital in the country.

The literature consistently demonstrates that venture capital development is driven by a combination of economic prosperity, institutional quality, and exit market conditions, where higher GDP per capita reflects market sophistication, stricter rule of law enhances investor protection and contract enforcement, and well-developed exit mechanisms such as IPOs and M&A enable investors to realize returns and sustain venture capital activity.

However, most existing studies focus primarily on developed economies. At the same time, limited attention has been given to how these relationships operate in emerging and developing countries, where institutional frameworks are weaker, and exit markets are less mature. This creates an important research gap in understanding whether the same determinants apply and how their effects differ across contexts.

Building on this theoretical and empirical literature, the study formulates the following hypotheses:

H1: Higher levels of economic development (GDP per capita) are associated with greater venture capital investment.

H2: Stronger institutional quality (rule of law) positively influences venture capital activity.

H3: More developed exit markets (IPO and M&A) contribute to higher levels of venture capital investment.

Methodology

This study employs a panel data approach to examine the impact of institutional quality on venture capital development, while controlling for macroeconomic and financial factors. The analysis is based on an unbalanced panel of countries over the period 2013–2024.

To address potential endogeneity arising from unobserved country-specific heterogeneity, the study adopts the Correlated Random Effects (CRE) model, also known as the Mundlak (1978) approach. The general econometric specification is given as:

$$ihs\_VC_{it} = \alpha + \beta X_{it} + \gamma \bar{X}_i \quad + \lambda_t + u_i + \varepsilon_{it};$$

Where ihs_VC_{it} denotes the inverse hyperbolic sine transformation of venture capital investment in country i at time t.

The vector X_{it} includes both the key explanatory variable and a set of control variables. The main variable of interest is the "Rule of Law Index", capturing institutional quality. In addition, the model includes a lagged proxy for exit opportunities ($Exit_{i,t-1}$), reflecting the importance of exit markets in venture capital decisions.

Control variables include the logarithm of GDP per capita (ln $GDPpc_{it}$) to capture the level of economic development, GDP growth ($GDPGrowth_{it}$) to reflect macroeconomic dynamics, GDP deflator ($GDPDeflator_{it}$) to control for inflationary effects, and domestic credit to the private sector ($DomesticCredit_{it}$) as a proxy for financial development.

The term $\bar{X}_i$represents the country-specific means of all explanatory variables and is included to account for potential correlation between regressors and unobserved individual effects, following the Mundlak approach. Year fixed effects (λ_t) are incorporated to control for global shocks and time-specific factors affecting venture capital markets. The error term is composed of a country-specific component (u_i) and an idiosyncratic disturbance (ϵ_{it}).

Estimation Strategy. Initially, both Fixed Effects (FE) and Random Effects (RE) estimators were applied. However, the Hausman test did not yield statistically significant differences between the estimators. Therefore, the CRE (Mundlak) model was preferred, as it allows for consistent estimation while relaxing the strict exogeneity assumption of the RE model and retaining the ability to estimate time-invariant effects.

Robustness Checks. To ensure robustness, alternative specifications were estimated. Fixed Effects models with clustered standard errors at the country level were employed to account for heteroskedasticity and serial correlation.

Results

The model is specified using the Mundlak (Correlated Random Effects) approach, which allows for the simultaneous estimation of both time-varying effects and cross-country differences in explanatory variables. This framework partially combines the advantages of fixed-effects and random-effects models, making it particularly suitable for analyzing the determinants of venture capital development.

The empirical strategy decomposes the effects into two components:

• Within effect — capturing variations within countries over time.

• Between effect — capturing differences in average levels across countries.

Given that institutional quality, particularly the rule of law, tends to evolve slowly over time, its impact is expected to be driven primarily by the between-country variation.

Model Selection. As an initial step, both Fixed Effects (FE) and Random Effects (RE) models were estimated. The Hausman specification test was then applied to assess the consistency of the RE estimator.

Table 2. Fixed Effects Estimation Results (Dependent variable: ihs_vc)

Variable	**Coefficient**	**Std. Error**	**t-statistic**	**p-value**
Lagged Exit Opportunity (L1_EXIT)	0.0027	0.0019	1.40	0.161
Rule of Law (ROL)	-1.3658***	0.3525	-3.87	0.000
Log GDP per capita (GDPPC)	1.4870***	0.3321	4.48	0.000
GDP Growth (GDPGR)	0.0063	0.0178	0.35	0.724
GDP Deflator (DEF)	0.0155	0.0206	0.76	0.450
Domestic Credit to Private Sector (DCPS)	0.0025	0.0027	0.92	0.357
Constant	-8.6799**	3.2784	-2.65	0.008
Model statistics				
Indicator	**Value**			
Number of observations	389			
Number of countries	29			
R^2 (within)	0.4189			
R^2 (between)	0.2057			
R^2 (overall)	0.2187			
F-statistic	10.56			
Prob > F	0.000			
sigma_u	2.231			
sigma_e	0.680			
Rho	0.9149			
Fixed effects test				
Test	**Result**			
F-test that all u_i = 0	F(28,337) = 62.56			
Prob > F	0.000			
Notes				
Year fixed effects are included in the model				
*** p < 0.01				
** p < 0.05				
p < 0.10				

Table 3. Random Effects Regression Results (Dependent variable: ihs_vc)

Variable	**Coefficient**	**Std. Error**	**z-statistic**	**p-value**
Lagged Exit Opportunity (L1_EXIT)	0.00463**	0.00187	2.48	0.013
Rule of Law (ROL)	-1.108***	0.331	-3.35	0.001
Log GDP per capita (GDPPC)	**1.726*** **	**0.302**	**5.72**	**0.000**
GDP Growth (GDPGR)	0.0122	0.0179	0.68	0.495
GDP Deflator (DEF)	0.0137	0.0206	0.66	0.507
Domestic Credit to Private Sector (DCPS)	0.00462*	0.00263	1.76	0.079
Constant	-11.622***	2.945	-3.95	0.000
Model statistics				
Indicator	**Value**			
Number of observations	389			
Number of countries	29			
R^2 (within)	0.4129			
R^2 (between)	0.4231			
R^2 (overall)	0.3937			
Wald χ^2	249.66			
Prob > χ^2	0.000			
Random Effects Parameters				
Parameter	**Value**			
sigma_u	1.835			
sigma_e	0.680			
Rho	0.879			
Notes				
Year fixed effects are included in the model				
*** p < 0.01				
** p < 0.05				
p < 0.10				

Table 4. Hausman Test: Fixed Effects vs Random Effects

Variable	**FE Coefficient**	**RE Coefficient**	**Difference (FE–RE)**	**Std. Error**
Lagged Exit Opportunity (L1_EXIT)	0.00268	0.00463	-0.00195	0.00049
Rule of Law Index (ROL)	-1.36577	-1.10800	-0.25777	0.13099
Log GDP per capita (GDPPC)	1.48697	1.72559	-0.23861	0.14685
GDP Growth (GDPGR)	0.00631	0.01223	-0.00592	0.00197
GDP Deflator (DEF)	0.01554	0.01365	0.00189	0.00297
Domestic Credit to Private Sector (DCPS)	0.00249	0.00462	-0.00213	0.00074
Hausman Test Result				
Test Statistic	**Value**			
Chi-square	24.19			
Degrees of freedom	17			
p-value	0.1144			
Notes				
Null hypothesis: Random Effects estimator is consistent				
Alternative hypothesis: Fixed Effects estimator is preferred				

According to the Hausman test, the difference between the Fixed Effects (FE) and Random Effects (RE) estimators is not statistically significant ($p = 0.114$), indicating that the RE model cannot be rejected and may be considered appropriate.

However, the RE model relies on the strict assumption that the unobserved country-specific effects are uncorrelated with the explanatory variables. Given the potential violation of this assumption, the study adopts the Correlated Random Effects (CRE) approach, also known as the Mundlak specification. This approach addresses the limitation by incorporating the country-specific means of the explanatory variables into the model, thereby controlling for potential correlation between regressors and unobserved individual effects. Furthermore, given the prevalence of zero values in venture capital data, the Mundlak model is preferred as a more flexible and robust estimation strategy, enabling more reliable inference under such conditions.

Table 5. Correlated Random Effects (Mundlak) Regression Results

Within effects				
Variable	**Coefficient**	**Robust Std. Error**	**z-statistic**	**p-value**
Lagged Exit Opportunity (L1_EXIT)	0.00271	0.00190	1.43	0.154
Rule of Law (ROL)	-1.36262**	0.53452	-2.55	0.011
Log GDP per capita (GDPPC)	**1.47494*** **	**0.43242**	**3.41**	**0.001**
GDP Growth (GDPGR)	0.00619	0.02542	0.24	0.807
GDP Deflator (DEF)	0.01602	0.02265	0.71	0.479
Domestic Credit to Private Sector (DCPS)	0.00248	0.00337	0.74	0.462
Between Effects (Mundlak Means)				
Variable	**Coefficient**	**Robust Std. Error**	**z-statistic**	**p-value**
Mean Exit Opportunity (EXIT_mean)	**0.03306*** **	**0.00590**	**5.60**	**0.000**
Mean Rule of Law (ROL_mean)	**2.23060****	**1.09219**	**2.04**	**0.041**
Mean Log GDP per capita (GDPPC_mean)	-1.42955*	0.75962	-1.88	0.060
Mean GDP Growth (GDPGR_mean)	0.11998	0.30662	0.39	0.696
Mean GDP Deflator (DEF_mean)	-0.11676	0.11713	-1.00	0.319
Mean Domestic Credit to Private Sector (DCPS_mean)	-0.00280	0.00786	-0.36	0.721
Model Statistics				
Indicator	**Value**			
Number of observations	389			
Number of countries	29			
R^2 (within)	0.4189			
R^2 (between)	0.6941			
R^2 (overall)	0.6815			
Random Effects Parameters				
Parameter	**Value**			
sigma_u	2.5458			
sigma_e	0.6803			
Rho	**0.9333**			
Notes				
Year fixed effects are included in the model				
Standard errors are clustered at the country level				
*** p < 0.01; ** p < 0.05; p < 0.10				

Table 6. Robustness Check: Fixed Effects Model (Clustered Standard Errors)

Variable	**Coefficient**	**Robust Std. Error**	**t-statistic**	**p-value**
Lagged Exit Opportunity (L1_EXIT)	0.00268	0.00188	1.42	0.165
Rule of Law (ROL)	-1.36577**	0.53014	-2.58	0.016
Log GDP per capita (GDPPC)	1.48697***	0.42963	3.46	0.002
GDP Growth (GDPGR)	0.00631	0.02523	0.25	0.804
GDP Deflator (DEF)	0.01554	0.02256	0.69	0.497
Domestic Credit to Private Sector (DCPS)	0.00249	0.00334	0.75	0.461
Constant	-8.67988*	4.39939	-1.97	0.058
Model Statistics				
Indicator	**Value**			
Number of observations	389			
Number of countries	29			
R^2 (within)	0.4189			
R^2 (between)	0.2057			
R^2 (overall)	0.2187			
F-statistic	143.57			
Prob > F	0.000			
Fixed Effects Parameters				
Parameter	**Value**			
sigma_u	2.2311			
sigma_e	0.6803			
Rho	0.9149			
Notes				
Year fixed effects are included in the model				
Standard errors are clustered at the country level				
*** $p < 0.01$				
** $p < 0.05$				
$p < 0.10$				

The results of the Mundlak (Correlated Random Effects) model (Table 5) indicate that both institutional and market factors play a significant role in shaping venture capital investment. In particular, the variable capturing country-level average exit opportunities (EXIT_mean) is positive and highly statistically significant ($p < 0.01$). This suggests that countries with more developed exit mechanisms—such as IPO markets and mergers and acquisitions (M&A)—tend to attract higher levels of venture capital investment. Moreover, institutional quality, proxied by the rule of law, and economic development, measured by GDP per capita, emerge as important determinants of venture capital development. The findings confirm that the venture capital ecosystem is closely linked to the broader institutional environment. Overall, the results provide evidence of a structural relationship between institutional quality, exit opportunities, and venture capital development. This highlights the critical importance of institutional reforms in fostering a supportive environment for the growth of venture capital markets.

As a robustness check, the Fixed Effects model (Table 6) with standard errors clustered at the country level was re-estimated. The results confirm the stability of the main findings. In

particular, the Rule of Law Index and GDP Per Capita remain statistically significant determinants of venture capital investment. This further supports the conclusion that institutional quality and economic development play a crucial role in shaping venture capital markets. In contrast, other control variables do not exhibit statistically significant effects in this specification, suggesting the dominant role of institutional factors in venture capital development.

Discussion

The econometric analysis evaluates the determinants of venture capital using multiple model specifications. Initially, Fixed Effects (FE) and Random Effects (RE) models were estimated and compared using the Hausman test. Although the test results indicated no statistically significant difference between the two estimators, the Mundlak (Correlated Random Effects) model was adopted to account for potential correlation between unobserved country-specific effects and the explanatory variables.

The results from the Mundlak model indicate that GDP per capita has a positive, statistically significant effect on venture capital investment. In addition, exit opportunities at the country level emerge as an important determinant, indicating that countries with more developed exit markets—such as IPOs and mergers and acquisitions (M&A)—tend to attract higher levels of venture capital. The rule of law variable is also statistically significant in the Mundlak specification, confirming the importance of institutional quality in fostering venture capital development.

To further verify the robustness of the findings, the Fixed Effects model with clustered standard errors was employed. The results remain consistent across specifications, reinforcing the conclusion that venture capital development is closely linked to institutional quality, economic development, and exit opportunities.

An interesting and non-trivial finding of the Mundlak model is the contrasting effect of the rule of law across the within and between dimensions. While the within-country coefficient of the rule of law is negative and statistically significant, the between-country effect (ROL_mean) is positive and significant.

This divergence suggests that short-term improvements in a country's rule of law may not immediately translate into increased venture capital investment. One possible explanation is that institutional reforms often introduce transitional frictions, such as regulatory adjustments, increased compliance costs, or uncertainty during the implementation phase, which may temporarily discourage investment activity.

In contrast, the positive and significant between-effects indicate that countries with consistently higher levels of institutional quality tend to attract more venture capital in the long run. Strong legal systems reduce uncertainty, improve contract enforcement, and mitigate agency problems, thereby fostering investor confidence and supporting the development of venture capital markets.

This finding highlights the importance of distinguishing between short-term institutional dynamics and long-term structural differences. It also reinforces the argument that venture capital development is primarily driven by stable, well-established institutional environments rather than by short-term policy changes.

Conclusion

The empirical analysis confirms all three proposed hypotheses regarding the determinants of risk-sharing finance, proxied by venture capital investment. First, the results support H1, showing that higher GDP per capita is positively associated with venture capital volume, reflecting the role of economic development, market sophistication, and demand for innovation-driven financing. Second, H2 is also confirmed, as institutional quality—measured by the rule of law—emerges as a significant determinant, particularly in the long run. Third, the findings validate H3, indicating that stronger exit opportunities, such as developed IPO markets and M&A activity, play a crucial role in attracting venture capital investments.

A key insight of the study lies in distinguishing between short-term and long-term dynamics. The results suggest that, in the short run, venture capital growth is primarily driven by immediate financing conditions and market activity. However, over the long term, the sustainability and expansion of venture capital markets depend critically on structural factors, particularly the strength of the rule of law and the availability of efficient exit mechanisms. The positive and significant between-country effects for institutional quality and exit opportunities highlight that countries with consistently stronger legal systems and more developed exit markets are better positioned to sustain higher levels of venture capital activity.

Overall, the findings demonstrate that venture capital development is not only a function of financial availability but also deeply embedded in institutional and market infrastructures. This underscores the importance of long-term institutional reforms and the development of exit ecosystems in fostering risk-sharing financial mechanisms. For emerging economies, the results suggest that policies aimed at strengthening legal frameworks, enhancing investor protection, and developing capital markets are essential for building a resilient and sustainable venture capital ecosystem.

References:

1. Black, B. S., & Gilson, R. J. (1998). Venture capital and the structure of capital markets: Banks versus stock markets. Journal of Financial Economics, 47(3), 243–277.
2. Cambridge Centre for Alternative Finance. (2024). The global alternative finance market benchmarking report. University of Cambridge.
3. Cumming, D., Johan, S., & Schweizer, D. (2019). The determinants of venture capital: Evidence from international markets. Journal of Banking & Finance, 105, 111–124.
4. Cumming, D., Johan, S., & Schweizer, D. (2019). The determinants of venture capital: Evidence from international markets. Journal of Banking & Finance, 105, 111–124.
5. Da Rin, M., Hellmann, T., & Puri, M. (2013). A survey of venture capital research. In G. Constantinides et al. (Eds.), Handbook of the Economics of Finance (Vol. 2). Elsevier.
6. Gompers, P. (1995). Optimal investment, monitoring, and the staging of venture capital. Journal of Finance, 50(5), 1461–1489.
7. Gompers, P., & Lerner, J. (1998). What drives venture capital fundraising? Brookings Papers on Economic Activity, 1998(2), 149–204.
8. La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (1998). Law and finance. Journal of Political Economy, 106(6), 1113–1155.

9. Lerner, J. (2002). When bureaucrats meet entrepreneurs: The design of effective public venture capital programmes. Economic Journal, 112(477), F73–F84.
10. Lerner, J., & Schoar, A. (2005). Does legal enforcement affect financial transactions? The contractual channel in private equity. Quarterly Journal of Economics, 120(1), 223–246.
11. Mordor Intelligence. (2025). Global Islamic finance market – growth, trends, and forecast (2025–2030).
12. PwC & CB Insights. (2025). Global venture capital report 2025. Retrieved from https://www.pwc.com
13. Statista. (2025). Equity crowdfunding market size worldwide. Retrieved from https://www.statista.com