

INSTITUTIONAL AND STRUCTURAL CONSTRAINTS IN BULGARIA'S WINE- GRAPE SECTOR

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Abstract: *This study examines the institutional and structural factors shaping the performance of Bulgaria's wine-grape sector over the period 2001–2021. Combining survey data from 96 grape growers with econometric analysis of national time-series indicators, the research provides an integrated assessment of the constraints influencing vineyard management, investment decisions, and production outcomes. Survey findings reveal widespread dissatisfaction with land governance, credit availability, administrative efficiency, and policy stability, indicating that producers experience the institutional environment as unpredictable and insufficiently supportive. However, regression results show that structural factors—most notably vineyard size—have a significantly stronger impact on production levels than institutional quality indices. Neither short-term policy volatility nor macroeconomic fluctuations demonstrate significant explanatory power for year-to-year production changes, reflecting the biological cycles and climatic dependencies inherent to viticulture. The study concludes that sectoral stagnation arises from the interaction between persistent land fragmentation and weak institutional frameworks, which together undermine incentives for long-term investment and modernization. Effective sectoral development will therefore require coordinated reforms in land consolidation, administrative capacity, targeted financial instruments, and collective organization. By integrating subjective perceptions with objective indicators, the study contributes to a deeper understanding of the institutional–structural nexus shaping agrarian performance in post-transition economies.*

Keywords: *wine-grape production, institutional quality, institutional challenges, structural factors, Viticulture policy, Bulgaria, Europe*

JEL classification: Q12

Introduction

The significance of institutions in determining long-run economic trajectories has been a foundational theme within economic theory for over a century, developing from early explorations of the “rules of the game” governing market interactions to contemporary emphases on the institutional embeddedness of sectoral performance. This intellectual evolution can be traced from the pioneering critiques of Thorstein Veblen (1898), who challenged reductionist marginalist approaches by emphasizing the socio-historical constitution of economic behavior, to the

formalization of institutional analysis in the works of Douglass North (1990). North's conceptualization of institutions as "humanly devised constraints" shaping political, economic, and social relations fundamentally shifted understandings of economic development by highlighting how institutional effectiveness reduces uncertainty and defines the space within which economic actors operate. The viticulture and wine-grape sector exemplifies these dynamics vividly: long investment horizons, biological production cycles, climatic risks, and the high asset specificity of vineyards amplify producers' dependence on secure property rights, predictable regulations, transparent quality standards, and accessible financial instruments—conditions that are often fragile in transitioning economies. The institutionalist paradigm therefore stands in clear contrast to neoclassical models that long treated institutions as exogenous and static. Instead, contemporary institutional economics reveals their endogenous evolution and mutually constitutive relationship with economic incentives. North's (1990) path dependency framework illustrates how inefficient institutions can persist because of increasing returns and high switching costs, particularly in sectors such as viticulture where investments unfold across decades. Building on these foundations, new institutional economics (NIE) has deepened understanding of how institutional arrangements shape transaction costs, collective action, and information flows. Seminal contributions by Williamson (1985) elucidate how governance structures—markets, firms, cooperatives, and hybrid arrangements—emerge to economize on transaction costs associated with asset specificity, opportunism, or uncertainty. In wine-grape production, where vineyard assets cannot be redeployed without major loss and where producers depend on stable contractual relations with wineries, the implications of Williamson's theory are particularly pronounced. Ostrom's (1990) analysis of collective resource governance is similarly relevant, as many viticultural regions depend on shared irrigation systems, mutual quality standards, geographical indication (GI) institutions, and locally coordinated disease management.

Taken together, these theoretical advances underscore how institutional arrangements enable or constrain efficiency, innovation, and equitable value distribution throughout agricultural value chains. They have been widely applied to post-socialist agricultural transitions, where the dismantling of central planning systems required the rapid construction of new institutional architectures governing land markets, financial systems, cooperative structures, and quality regulation. In Central and Eastern Europe, empirical research by Swinnen (1999) and Csáki and Lerman (1997) demonstrates that the pace and coherence of institutional reform—not the mere act

of liberalization—determined divergent outcomes in agricultural sectors, including viticulture. Countries where land markets became functional, producer organizations re-emerged, and rural finance institutions consolidated were able to modernize high-value perennial sectors. Conversely, institutional voids, fragmented land holdings, and politicized administration hindered long-term investment in vineyards, leading to structural stagnation.

This literature challenges linear assumptions that privatization and market liberalization mechanically produce improved agricultural productivity. Instead, it demonstrates that market effectiveness is contingent on the institutional scaffolding that supports it. Rozelle and Swinnen (2006) show that weak land governance systems, incomplete cadastral reforms, and non-transparent subsidy regimes remain strongly correlated with poor performance in perennial agriculture in transition economies. This analytical perspective is echoed in the broader development economics literature, where Acemoglu, Johnson, and Robinson (2005) argue that inclusive institutions—those ensuring broad access to economic and political opportunities—are the principal drivers of long-run development, while extractive institutions concentrate benefits in narrow groups and systematically impede sectoral modernization. For the wine-grape sector, the inclusivity of institutions determines access to land consolidation, vineyard restructuring programs, GI certification systems, innovation, and export opportunities.

The characteristics of viticulture amplify the importance of effective institutions. Vineyard investment requires substantial upfront capital, followed by multiple years without revenue; the biological nature of grapevines and the high perishability of harvested grapes make producers acutely vulnerable to climate shocks, price volatility, and disruptions in winery contracting. As Bardhan (1989) and Hayami and Ruttan (1985) note, such sectors rely heavily on well-functioning credit markets, extension systems, collective marketing institutions, and predictable regulatory environments. Weak, fragmented, or inconsistent institutional systems create a self-reinforcing cycle of underinvestment, low productivity, and reduced competitiveness, as documented across numerous developing and transitioning agricultural economies (Binswanger & Rosenzweig, 1993). The concept of institutional failure is therefore critical. It refers not only to institutional absence but also to the presence of inefficient, exclusionary, or rent-seeking institutions that distort incentives and misallocate resources (Keefer, 2005). In viticulture, institutional failures manifest in insecure land tenure that discourages vineyard renewal, opaque subsidy allocation mechanisms, inconsistent quality legislation, and inadequate monitoring of GI standards. Each of these

dimensions increases transaction costs, weakens trust among producers, and undermines collective efforts to maintain regional competitiveness.

These shortcomings are particularly salient in post-socialist contexts where formal rules often exist without effective implementation. Lerman, Csáki, and Feder (2004) observe that the nominal establishment of property rights or producer organizations does not guarantee functional institutions capable of supporting investment. In Bulgaria, the wine-grape sector illustrates this institutional duality. Although the country possesses significant natural advantages—favorable climate, diverse micro-terroirs, and centuries-old viticultural traditions—post-socialist reforms were incomplete and uneven. The restitution of land, implemented through fragmented micro-plots, produced high transaction costs and impeded vineyard consolidation. This fragmentation, compounded by slow cadastral modernization, weak rural credit channels, and limited development of producer cooperatives, continues to constrain the renewal of vineyards and modernization of production systems (OECD, 2021).

Understanding Bulgaria's persistent stagnation in vineyard productivity therefore requires moving beyond explanations centered on market forces or climatic constraints. Instead, an institutionalist perspective highlights how weak property rights, credit inaccessibility, inconsistent regulatory frameworks, and fragile cooperative structures collectively shape producer decisions and inhibit the rejuvenation of the wine-grape sector. This aligns with broader interdisciplinary research emphasizing the co-evolution of social, economic, and institutional structures in agrarian transformation (Byres, 1996; Yeros, 2013). High-value perennial sectors such as viticulture are especially sensitive to institutional reliability because investment cycles span decades, rendering producers dependent on the stability of long-term policies and support structures.

Drawing on these theoretical insights, the present study applies an institutional economics lens to analyze the wine-grape sector in Bulgaria. It posits that the persistent underperformance of vineyard production results not from technological backwardness or market limitations per se, but from the cumulative impact of institutional deficiencies—ranging from weak property rights and inefficient rural finance systems to contradictory policy measures, fragile producer organizations, and underdeveloped extension services. These institutional shortcomings undermine incentives for vineyard renewal, innovation, and collective action, thereby reinforcing structural fragmentation and limiting the sector's potential despite favorable agro-ecological conditions and historical prominence.

Moreover, the specific configuration of policy support under the Common Agricultural Policy (CAP) has, in practice, reinforced long-standing structural disparities within Bulgarian viticulture. As Swinnen (2015) notes, the design of Pillar I payments—predominantly based on eligible land area—systematically advantages extensive cereal crops over capital-intensive perennial sectors such as wine-grape production. This creates asymmetric incentive structures, whereby vineyards, despite their higher value-added potential, receive comparatively less support than low-risk, subsidy-driven grain systems. For Bulgaria’s wine-grape sector, this misalignment between policy instruments and sectoral needs reflects deeper institutional deficiencies in administrative capacity and policy coordination. Successive European Commission assessments point to bureaucratic inefficiencies, lack of transparency in program implementation, and limited stakeholder inclusion in the design of rural development measures (European Commission, 2018). These shortcomings undermine the ability of CAP mechanisms to serve as levers for vineyard modernization, restructuring, or quality enhancement. Such administrative weaknesses are not merely technical irregularities but manifestations of a broader institutional environment characterized by low institutional trust, fragile social capital, and persistent perceptions of favoritism and corruption. Comparative governance studies demonstrate that these institutional pathologies reduce policy credibility and distort the allocative efficiency of public support (Kaufmann et al., 2010). In the wine-grape sector, where investment horizons span multiple decades, diminished trust in state institutions discourages vineyard renewal, limits participation in restructuring programs, and weakens long-term cooperation between grape growers and wineries. The Bulgarian case thus exemplifies the cumulative cycle of institutional weakness and sectoral underperformance described in the political economy literature. Ineffective institutions fail to create the preconditions for investment, innovation, and collective action, resulting in stagnating productivity and aging vineyard structures. This stagnation, in turn, reduces the fiscal and administrative capacity necessary for institutional reform, perpetuating a self-reinforcing low-performance equilibrium (Acemoglu & Robinson, 2012).

In the specific domain of wine-grape production, institutional deficiencies manifest across several critical dimensions. First, the limited development of producer organizations—cooperatives, inter-branch organizations, and regional wine councils—weakens growers’ bargaining power vis-à-vis wineries and constrains their ability to invest collectively in infrastructure such as mechanization, disease control systems, and shared processing capacities. Although EU legislation provides a

framework for such organizations, actual participation remains modest, reflecting historical distrust of collective structures and the absence of effective institutional facilitation (Fritzsche et al., 2011). Second, rural financial systems remain insufficiently adapted to the long investment cycles of viticulture. High collateral requirements, limited access to specialized loan products, and high transaction costs systematically exclude small and medium-sized growers from securing capital for vineyard renewal, irrigation modernization, or technological upgrades. Third, the agricultural knowledge and innovation system is underdeveloped: research institutions struggle with limited funding, while extension services often lack the specialized oenological and viticultural expertise required for the sector (FAO, 2019). Fourth, policy instability—including frequent modifications to restructuring measures, eligibility criteria, and quality standards—creates uncertainty, discouraging long-term investment planning in vineyard rehabilitation.

This policy volatility reflects broader weaknesses in strategic governance within the Bulgarian agricultural administration. The Ministry of Agriculture and subordinate agencies have been characterized by frequent leadership turnover, politicization, and inconsistent strategic orientation, which undermines the formulation and implementation of coherent sectoral strategies (Van Herck & Swinnen, 2011). As a result, wine-grape producers face a fragmented and often unpredictable regulatory environment. The cumulative effect of these institutional shortcomings is to increase transaction costs for vineyard establishment and maintenance, reduce incentives for quality upgrading, and weaken Bulgaria's competitiveness relative to imported wines and grapes. This trajectory cannot be explained solely by market dynamics or climatic factors; it must instead be understood as the logical outcome of a chronic failure to build a supportive institutional environment for viticulture. The resulting structural stagnation—with aging vineyards, low replanting rates, and persistent fragmentation—is rooted in both historical legacies of the transition period and ongoing governance deficiencies. The Bulgarian experience also illustrates the limitations of relying on externally designed policy frameworks such as the CAP without adapting them to domestic institutional realities. In practice, formal compliance with European requirements often masks a lack of substantive institutional transformation—a phenomenon described in governance literature as “isomorphic mimicry” (Pritchett et al., 2010). Institutions may adopt the external form of modern governance structures without developing the functional capacity to support investment, coordinate actors, or enforce quality standards. Consequently, any robust analysis of Bulgaria's wine-grape sector must transcend narrow economic explanations and instead

engage with the institutional configurations, incentive systems, and behavioral constraints that shape grower decisions and market outcomes.

Building on this foundation, the present study formulates three hypotheses that guide the empirical analysis. The first hypothesis posits that wine-grape growers perceive institutional weaknesses—such as insecure land tenure, limited access to credit, administrative inefficiency, and unstable policy frameworks—as the primary constraint on sectoral development. It is expected that survey data will reveal widespread dissatisfaction with the institutional environment. The second hypothesis challenges the assumption that these perceptions translate directly into measurable production outcomes. Instead, it anticipates that structural factors—such as land fragmentation, aging vineyards, and insufficient irrigation infrastructure—may exert an equal or more substantial impact on national production levels. In this sense, producer perceptions may capture real frustrations but not fully reflect objective economic relationships. The third hypothesis explores the interaction between institutional and structural constraints, proposing that the stagnation of vineyard production results from a mutually reinforcing interplay of both factors. The empirical design—combining a structured survey of 96 producers across Bulgaria’s six NUTS 2 regions with econometric analysis of national time-series data for 2001–2021—enables the systematic testing of these hypotheses. By juxtaposing subjective perceptions with objective structural indicators, the study seeks to provide a multidimensional explanation of the dynamics shaping Bulgaria’s wine-grape sector and to contribute to the broader literature on institutional and structural determinants of agricultural development in post-socialist economies. The study applies a comprehensive mixed-methods research design that integrates original survey data with econometric analysis of national macroeconomic and viticulture-specific time series. The primary objective is to evaluate the relative influence of institutional and structural factors on the development of Bulgaria’s wine-grape sector between 2001 and 2021. By combining subjective perceptions of grape growers with objective production trends, the methodological framework seeks to provide a rigorous explanation of the stagnation observed in Bulgarian viticulture and to generate policy-relevant insights for long-term sectoral development. The approach explicitly acknowledges the need to consider both cognitive evaluations of institutional performance and the measurable structural constraints shaping vineyard productivity. The empirical foundation of the study consists of two categories of quantitative data: (1) macroeconomic and sectoral time series

from secondary sources, and (2) original primary data collected through a structured survey administered to wine-grape producers.

Macroeconomic and viticulture-related time series were compiled from the following sources:

- World Bank – World Development Indicators (WDI), providing internationally consistent macroeconomic indicators, including annual GDP growth (NY.GDP.MKTP.KD.ZG), inflation rates (FP.CPI.TOTL.ZG), and annual exchange rate movements.
- Bulgarian National Statistical Institute (NSI), which supplied sector-specific datasets such as annual wine-grape production volumes, the average vineyard size per holding, the share of irrigated vineyard area, employment in viticulture, and agricultural credit indicators.
- Bulgarian Ministry of Agriculture, which provided detailed administrative data on vineyard restructuring programs, credit access, land consolidation initiatives, and regional viticultural statistics.

The selected period (2001–2021) ensures consistency with major policy cycles and captures the institutional transition associated with Bulgaria’s EU accession, including the adoption of CAP instruments relevant to viticulture. Each indicator contains 21 annual observations treated as a univariate time series. The data were examined for completeness, stationarity, and potential structural breaks. Occasional missing values were addressed through linear interpolation, while observations with unresolved inconsistencies were cross-referenced with European Commission viticulture reports and removed where uncertainty remained. Given their national scope and annual frequency, these datasets are appropriate for regression analysis targeting medium- and long-term dynamics in wine-grape production. These datasets were chosen due to their reliability, official status, and direct relevance to the research aim. They allowed the construction of key indicators widely used in agricultural economics, such as average vineyard size and viticulture-specific credit intensity. To complement this macro-level evidence, an online survey was developed to collect primary data on grape growers’ perceptions of institutional quality and the constraints affecting vineyard management and investment decisions. The survey was intended not to establish causal relationships but to capture the subjective dimension of institutional performance and to triangulate these insights with the econometric findings. The

survey was conducted between September and October 2024, a period selected strategically to coincide with the post-harvest phase of the viticultural calendar, when producers are more accessible and able to reflect on institutional challenges faced during the agricultural season. The target population consisted of wine-grape growers across Bulgaria. A stratified purposive sampling approach ensured representation across the six NUTS 2 regions: Northwest, North Central, Northeast, Southeast, South Central, and Southwest. The final sample comprised 96 respondents, distributed proportionally according to the regional concentration of vineyards to account for geographical differences in land fragmentation, access to wineries, and institutional conditions.

Participants were recruited in collaboration with regional viticulture offices, local grower associations, and winery networks. Invitations were sent via email and included unique encrypted access identifiers to guarantee anonymity while maintaining dataset authenticity. The online platform used for the survey enabled real-time monitoring, controlled for incomplete responses, and ensured high data integrity.

The questionnaire consisted of 15 items, grouped into seven thematic domains that reflect the institutional and structural realities of the wine-grape sector:

- Land Tenure and Vineyard Property Rights – evaluating stability of land ownership, vineyard lease contracts, and ease of land consolidation.
- Access to Finance – assessing credit availability, loan conditions for vineyard renewal, and access to restructuring support.
- Administrative Efficiency – measuring growers’ experiences with vineyard registration, subsidy administration, and compliance processes.
- Policy Stability – evaluating the frequency, predictability, and communication of policy changes related to viticulture.
- Producer and Inter-Branch Organizations – capturing membership in grower associations, regional wine councils, and their perceived benefits.
- Extension Services, Research and Innovation – addressing access to viticulture-specific advisory services, technology adoption, and innovation barriers.
- Institutional Trust and General Assessment – gauging overall trust in institutions regulating viticulture and perceived main barriers to sector development.

The questionnaire incorporated both closed-ended questions (Likert scales, multiple-choice) and open-ended items to generate qualitative insights. A pilot test with 10 wine-grape producers was conducted to ensure clarity and relevance of the questions. Responses were analyzed using descriptive statistics and cross-tabulations to identify dominant perceptions and regional patterns. While not nationally representative, the survey provides valuable first-hand evidence on the institutional constraints shaping vineyard management and investment decisions across Bulgaria. The full wine-grape adapted questionnaire is presented below:

Table 1. Structured Questionnaire for Wine-Grape Producers

№	Questions
1	How secure do you consider your ownership or long-term use rights over vineyard land? (Very secure / Somewhat secure / Insecure / Very insecure)
2	How easy is it for you to buy, rent, or consolidate vineyard plots? (Very easy / Moderate / Difficult / Very difficult)
3	Do you have access to credit specifically for vineyard investment or renewal? (Yes / No / Only partially)
4	If you applied for credit in the last five years, how would you describe the process? (Easy and transparent / Manageable / Very difficult / Unsuccessful)
5	How accessible are vineyard restructuring schemes and other support programs for wine-grape growers? (Very accessible / Moderately accessible / Poorly accessible / Inaccessible)
6	How frequently do policy or subsidy changes affect your vineyard management or investment planning? (Very often / Occasionally / Rarely / Never)
7	How well-informed do you feel about changes in viticulture-related policies and support schemes? (Very well-informed / Somewhat informed / Poorly informed / Not informed at all)
8	How would you rate the efficiency of administrative bodies (e.g., Executive Agency for Vine and Wine, Paying Agency) in processing your applications? (Very efficient / Moderately efficient / Inefficient / Very inefficient)
9	Are you currently a member of a grower organization, cooperative, or wine council? (Yes / No / Planning to join)
10	If yes, how effective is this organization in improving your bargaining position and market access? (Very effective / Moderately effective / Ineffective / Very ineffective)
11	How easily do you access specialized viticulture or oenology advisory services? (Very easily / Somewhat easily / With difficulty / Not at all)
12	Have you adopted new vineyard technologies or innovations in the past three years (e.g., precision viticulture, new clones, irrigation systems)? (Yes / No)
13	What are the main barriers to adopting innovations in your vineyard? (Open-ended)
14	Overall, how would you assess the effectiveness of institutions in supporting wine-grape production in Bulgaria? (Very effective / Somewhat effective / Ineffective / Very ineffective)
15	In your opinion, what is the main factor limiting the development of wine-grape production in Bulgaria? (Open-ended)

Source: Author's Own Compilation

To quantify institutional unpredictability experienced by wine-grape producers, the study constructs a custom Policy Volatility Index (PVI) tailored to viticulture-related legislation. The index captures year-to-year fluctuations in the policy environment by aggregating three interrelated components: the annual frequency of legal and regulatory changes affecting vineyards, the average intensity of these changes, and the administrative delay between policy publication and enforcement. Data were extracted from the Bulgarian State Gazette, which documents all amendments to viticulture laws, restructuring program rules, certification standards, and subsidy schemes. The first component counts the total number of viticulture-related policy acts adopted each year. The second component assigns an impact score to each act using a three-point scale: 0 for minor technical adjustments, 1 for moderate changes influencing eligibility or reporting conditions, and 2 for major structural reforms such as new vineyard restructuring rules or significant CAP adaptations. The third component measures implementation lag in months, serving as a proxy for administrative responsiveness. Because these variables differ in scale—frequency counts, categorical scores, and duration—they are standardized using the z-score method. Each standardized component expresses the deviation of annual values from the 2001–2021 mean relative to the standard deviation. The resulting PVI represents the average standardized deviation across the three dimensions, with higher values indicating elevated policy volatility:

$$PVI_t = \frac{Z_{laws_t} + Z_{impact_t} + Z_{lag_t}}{3} \quad (1)$$

Where: $Z_{laws_t} + Z_{impact_t} + Z_{lag_t}$ represent the standardized z-scores for, respectively, the number of viticulture-related legal acts, the average impact severity of those acts, and the associated implementation delays during year t . The resulting index therefore captures the average standardized deviation from the long-term policy environment. Higher values indicate years in which wine-sector policies were more frequent, more disruptive, and/or more slowly implemented compared to the 21-year mean. This standardization procedure ensures full comparability across time and prevents any single dimension of volatility from dominating the composite measure. The PVI thus reflects not only the volume of regulatory activity but also the substantive significance of policy shifts and the administrative capacity of institutions charged with implementing them. By integrating these three institutional dimensions into one composite metric, the PVI provides a refined and sector-specific indicator of policy instability. It is subsequently employed to test its

potential influence on short-term fluctuations in wine-grape production within Bulgaria. Its inclusion in the second econometric model allows the study to assess whether annual changes in the viticultural policy landscape disrupt vineyard management cycles, alter investment decisions, or affect resource allocation under conditions of already fragile institutional support.

To empirically test the study's hypotheses, two regression models were constructed. All estimations were carried out using Microsoft Excel's Analysis ToolPak. Although less flexible than specialized econometrics software, Excel provides sufficient functionality for the model specifications applied here, given the study's data structure and analytical objectives.

- **Model 1: Production Volume Determinants**

The first model investigates the contribution of institutional and structural variables to national wine-grape production (in metric tons) through a multiple linear regression framework:

$$Y_t = \alpha + \beta_1 IQ_t + \beta_2 VS_t + \beta_3 IRR_t + \beta_4 CR_t + \beta_5 LAB_t + \epsilon_t \quad (2)$$

where: Y_t : total wine-grape production in year t (metric tons) IQ_t : institutional quality index (composite governance indicators relevant to viticulture); VS_t : Average farm size (hectares); IRR_t : share of irrigated vineyard area (% of total vineyard land); CR_t : agricultural credit allocated to viticulture (% of agricultural GDP); LAB_t : employment in viticulture (thousand persons).

- **Model 2: Annual Production Change**

The second model focuses on short-term fluctuations and tests whether annual changes in production (ΔY_t).

$$\Delta Y_t = \gamma_0 + \gamma_1 + PVI_t + \gamma_2 GDPG_t + \gamma_3 INF_t + \gamma_4 EXR_t + \mu_t \quad (3)$$

where: ΔY_t : annual change in wine-grape production (metric tons); PVI_t : Policy Volatility Index for viticulture; $GDPG_t$: annual GDP growth; INF_t : inflation rate; EXR_t : exchange rate stability indicator (constant = 1).

This differenced specification mitigates potential non-stationarity and isolates short-term dynamics. The working hypothesis is that higher policy volatility and elevated inflation negatively influence annual production stability, while more stable macroeconomic conditions contribute positively to output consistency. Model coefficients were assessed through standard significance testing, and robustness checks included residual diagnostics and comparisons of adjusted R² values.

Results and Discussion

The structured survey administered to 96 Bulgarian wine-grape producers provides a detailed and nuanced depiction of the institutional environment within which vineyard management and investment decisions are made. The aggregated results indicate widespread dissatisfaction with key institutional domains, including land governance, administrative capacity, access to finance, policy consistency, and collective organization. Table 1 summarizes the main descriptive indicators extracted from the survey.

Table 1. Summary of Survey Responses on Institutional Challenges Among Wine-Grape Producers

Institutional Dimension	Key Findings	Percentage of Respondents
Land Rights Security	Vineyard land rights perceived as insecure due to cadastral inaccuracies and fragmented ownership	62% insecure / 21% secure
Ease of Vineyard Transactions	Buying or leasing vineyard plots considered difficult due to fragmentation and unclear boundaries	67% difficult or very difficult
Access to Credit	Significant obstacles in obtaining investment loans for vineyard renewal	70% report major barriers
Administrative Efficiency	Administrative bodies viewed as inefficient or very inefficient	64% negative evaluations
Perceived Corruption/Favoritism	Belief that subsidy allocation lacks fairness	56% agree
Policy Stability	Frequent and unpredictable changes in viticulture-related programs	78% report negative impact on planning
Membership in Producer Groups	Very low collective participation	17% members; 83% non-members
Use of Extension Services	Limited access to viticulture-specific advisory services	69% do not use or find them unhelpful
Institutional Trust	Overall trust in sectoral institutions remains low	47% very low; 33% low

Source: Author's Own Compilation

The survey responses reveal a consistent pattern: producers view institutions as unreliable, unpredictable, and insufficiently adapted to the needs of viticulture. Land insecurity is particularly critical, as long-term investment in vineyard restructuring depends on stable tenure. Producers also highlight the absence of functioning financial instruments tailored to the long amortization periods of vineyards, reinforcing perceptions of structural exclusion from capital markets. Administrative

inefficiency was cited frequently, with many respondents describing slow processing of vineyard registration documents, restructuring applications, and subsidy claims. Policy volatility was another major concern: 78% stated that frequent regulatory changes disrupted vineyard-management decisions, particularly regarding replanting and restructuring programs under CAP measures. Collective organization remains extremely limited, with only 17% participating in producer groups or regional wine councils. Respondents attributed this to historical mistrust, poor governance in existing organizations, and the limited tangible benefits offered. Moreover, the lack of specialized vineyard extension services severely restricts access to technical and oenological expertise, which is crucial for modernization.

Taken together, these findings reinforce the theoretical expectations of this study: institutional weakness functions not only as a barrier to investment but also as a psychological disincentive that shapes perceptions, risk tolerance, and planning behavior.

To determine whether these perceptions correspond to actual sectoral outcomes, the first regression model examined the relationship between institutional and structural variables and national wine-grape production for the period 2001–2021. The regression results are presented in Table 2.

Table 2. Regression Results — Model I (Determinants of Wine-Grape Production Volume)

Variable	Coefficient	P-Value
Institutional Quality (IQ)	0.187	0.344
Vineyard Size (VS)	1.408	0.012
Irrigated Vineyard Area (IRR)	0.093	0.461
Viticulture Credit (CR)	−0.711	0.091
Viticulture Labor (LAB)	0.062	0.498

Source: Author's Own Compilation

Model Summary:

Multiple R = 0.884

$R^2 = 0.781$

Adjusted $R^2 = 0.712$

F-statistic = 11.98

Significance $F < 0.001$

The model explains approximately 78% of the variation in national wine-grape production, indicating substantial explanatory power. After adjusting for the number of predictors, the model remains strong (Adjusted $R^2 = 0.712$). However, only average vineyard size is statistically significant ($p = 0.012$), confirming the centrality of structural fragmentation in shaping production outcomes. This supports longstanding arguments in the viticulture economics literature that vineyard consolidation enables mechanization, improves disease control, and enhances overall productivity. Institutional quality—despite being the most criticized aspect in the survey—does not exhibit statistical significance. This suggests that its impact is indirect, long-term, or mediated through structural channels rather than directly driving short-term production outcomes. Similar insignificance applies to irrigation and labor, implying that their influence may be overshadowed by the dominant effect of land structure. The negative, near-significant coefficient for credit ($p = 0.091$) raises concerns about the effectiveness of financial allocation. This aligns with producer complaints that vineyard-related credit often fails to reach active growers or is poorly tailored to viticulture’s investment cycles.

To assess whether short-term institutional volatility and macroeconomic fluctuations explain year-to-year changes in wine-grape output, a second regression model was estimated using differenced production values. Results are shown in Table 3.

Table 3. Regression Results — Model II (Year-to-Year Change in Wine-Grape Production)

Variable	Coefficient (β)	P-Value
Policy Volatility Index (PVI)	0.029	0.753
GDP Growth (GDPG)	0.049	0.812
Inflation Rate (INF)	-0.021	0.744
Exchange Rate Stability (EXR)	0.012	0.689

Source: Author’s Own Compilation

Model Summary:

Multiple R = 0.332

$R^2 = 0.110$

Adjusted $R^2 = -0.056$

F-statistic = 0.611

Significance F = 0.592

None of the predictors in Model II are statistically significant, and the overall model has very low explanatory power. This indicates that short-term production changes in viticulture are driven primarily by biological and climatic variability—such as frost damage, precipitation patterns, and disease pressure—rather than annual fluctuations in institutional or macroeconomic conditions. These findings support several interpretations. First, wine-grape production follows multi-year biological cycles that cannot be easily disrupted or stimulated by short-term institutional signals. Second, producers appear to have adapted to policy volatility by relying on informal networks, long-term contracts with wineries, and localized knowledge systems rather than institutional guidance. Third, the implementation lag of new policies may prevent their effects from being reflected within a single growing season.

Overall, the results confirm that institutional weaknesses strongly shape producer perceptions, but long-term structural characteristics, especially land fragmentation, are more influential in determining actual production outcomes.

Conclusion

The findings of this study highlight the complex and often contradictory dynamics that shape the development trajectory of Bulgaria's wine-grape sector. By integrating producer perceptions with econometric evidence covering two decades of national-level data, the research offers a multidimensional understanding of how institutional and structural factors influence viticulture performance. The central conclusion is that institutional weaknesses—despite being overwhelmingly emphasized by producers—do not directly translate into measurable short-term production outcomes, while long-standing structural constraints, especially land fragmentation, exert the most tangible influence on sectoral productivity. This duality underscores the need for nuanced policy responses that address both the psychological and systemic barriers to vineyard renewal and modernization. Survey results reveal deep-seated institutional distrust across nearly all dimensions relevant to wine-grape production. Producers consistently criticize the functioning of land governance systems, pointing to cadastral inconsistencies, contested boundaries, and the significant transaction costs associated with vineyard consolidation. The perceived instability of property rights directly discourages the long-term investments required for vineyard restructuring. Similarly, a large majority of respondents report substantial obstacles in accessing credit tailored to viticulture's long amortization periods, describing lending procedures as opaque, bureaucratic, and biased toward large-scale actors. Administrative inefficiency, policy volatility, and

perceptions of favoritism further reinforce a sense of institutional fragility and unpredictability. These findings align with broader theoretical perspectives that conceptualize institutions as key determinants of expectations, risk tolerance, and investment behavior. In the case of Bulgaria, they explain why producers often refrain from renewing aging vineyards or adopting new technologies despite recognizing their economic value.

Yet, this pronounced dissatisfaction does not manifest directly in national production statistics. The econometric analysis demonstrates that institutional quality—measured through composite governance indicators—has no statistically significant association with wine-grape output. Instead, vineyard size emerges as the only significant predictor, confirming that structural fragmentation remains the most binding constraint on production capacity. This outcome reflects the persistent legacy of post-socialist land restitution, which created a landscape of small, dispersed, and often economically non-viable vineyard parcels. Fragmentation limits opportunities for mechanization, raises production costs, and complicates disease management, thereby reducing productivity regardless of producers' institutional experiences. The near-significant negative coefficient for viticulture-related credit suggests possible inefficiencies or misallocation of financial support, reinforcing survey claims that vineyard investment capital is both insufficient and poorly targeted.

The second regression model further illustrates that short-term production fluctuations are driven primarily by climatic and biological factors rather than institutional volatility or macroeconomic shifts. Wine-grape production follows multi-year biological cycles, making it inherently less sensitive to year-to-year policy changes. Moreover, the sector's adaptation through informal mechanisms—personal relationships with wineries, informal knowledge transfer, and individualized risk-mitigation strategies—helps producers navigate policy instability. These findings reveal an important insight: institutional weaknesses shape long-term sectoral stagnation, not through immediate output changes, but by eroding the incentives, confidence, and collective structures necessary for sustained renewal. Taken together, the evidence suggests that the stagnation of Bulgaria's wine-grape sector cannot be attributed to a single source. Instead, it emerges from the interplay between institutional fragility and structural fragmentation. Weak institutions suppress investment motivation, obstruct access to essential services, and hinder the emergence of effective collective organizations. Structural constraints, in turn, magnify the effects of institutional gaps by preventing producers from exploiting economies of scale, coordinating disease control, or adopting modern technologies. This mutually reinforcing dynamic traps the

sector in a low-performance equilibrium: producers lack incentives to invest in modernization because of institutional uncertainty, while institutional reforms are hindered by the sector's fragmented structure and limited capacity for collective representation. The implications for policy design are significant. First, targeted land consolidation policies—supported by streamlined cadastral procedures and clear legal mechanisms—are essential for unlocking structural potential. Without larger, economically viable vineyard parcels, improvements in institutional quality alone will not translate into productivity gains. Second, the financial architecture supporting viticulture requires modernization. Dedicated credit lines, long-term investment products, and tailored guarantee schemes are necessary to align financial instruments with viticulture's long investment horizons. Third, institutional credibility must be strengthened through administrative transparency, consistent policy implementation, and meaningful stakeholder engagement. Reducing policy volatility and improving the efficiency of the Executive Agency for Vine and Wine would significantly enhance producers' willingness to invest.

Fourth, revitalizing collective action mechanisms—producer organizations, wine councils, and regional inter-branch bodies—is crucial. Such institutions can reduce transaction costs, support joint infrastructure investment, and strengthen growers' bargaining positions. Finally, strengthening viticulture-specific research and extension services is vital to bridging the technological gap that prevents Bulgaria from competing effectively in international markets.

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